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Planning and Implementation of Digital Library in Engineering Colleges of Andhra Pradesh: A Study

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Abstract Digital library systems compose a family of automated systems that together provide a comprehensive capability to manage the digital content of an enterprise. As keepers and providers of information, the age-old social responsibility of libraries is re-emerging in the information society. In this paper the investigator tried to study the steps taken by the Engineering colleges towards the installation of Digital libraries, study the digital collection development, digital services of the libraries, identify the constraints in the digital library initiatives, and offer suggestions towards the improvement of digital library services.
Keywords *Digital libraries; JNTU; Engineering Colleges; Digital Collection Development; Digital Services*

1. Introduction

Information technology and globalization are likely to change the nature of libraries and their activities. Today, the library services are in transition from local traditional collections to global resources provided on demand via the most advanced networking technologies. With the advent of the internet, individuals' expectations for access to information have increased dramatically.

Digital library systems compose a family of automated systems that together provide a comprehensive capability to manage the digital content of an enterprise. As keepers and providers of information, the age-old social responsibility of libraries is re-emerging in the information society. Here the investigator tried to study the steps taken by the Engineering colleges towards the installation of Digital libraries, study the digital collection development, digital services of the libraries, identify the constraints in the digital library initiatives, and offer suggestions towards the improvement of digital library services.

2. Literature Reviewed

Ongus and Nyamboga (2004) discussed digital research libraries, reasons, advantages and disadvantages of digitization. They also described the development of research library studies and types of clients who were beneficiaries of the services. Finally they concluded that the essence of the digital library was to cater for the information needs of researchers in specific fields of specialization. Pradhan (2004) discussed the basics of developing a digital library and explained the new concepts underlying the digital library development, procedures, regarding technologies and managerial skills. Measures were needed to overcome the problems of computer viruses and also unauthorized user initial investment in digital libraries was high as maintenance and was therefore essential to explore the new sources of fund. Mandal and Panda (2005) conducted a study on collection development; that article provided an insight into the different dimensions of collection development with specific reference to engineering college libraries. They analyzed the data on library collections received from seventeen major Engineering College libraries of West Bengal. They enumerated the activities of seven major Library consortia of the world engaged in sharing resources among Engineering College libraries. Vignesh (2009) felt that over the past decade there have been many new initiatives in scholarly communications, Digital libraries and the development of educational, scientific and cultural heritage institutions with significant commitments to online resources and online services. The future of the digital library was a topic of continuing concern for the library professionals. Devraj (2002) discussed the Digital Libraries and their importance with the aid of internet for library operations by downloading information from remote databases. He stated on the minute classification of such libraries having standard protocol. He also narrated search engines and digital libraries on website via Internet. He also discussed all these aspects from the Indian point of view and the digital library network in operation in India. Krishnamurthy (2004) described the objectives of digital libraries. He also discussed the role of the digital library standards, collection management, cataloguing, and stages of digital libraries, and evaluation of various aspects. He emerged with a number of lessons from his paper which were described as model for digital library.

3. Objectives of the Study

- To study the steps taken by the JNTU affiliated Engineering colleges in A.P. towards the installation of digital libraries.
- To study the digital collection, digital services of the libraries.
- To offer suggestions towards the improvement of digital library initiatives.
- To identify the constraints in the digital library initiatives by the sample Engineering Colleges.

4. Hypotheses

- There is consensus among Engineering Colleges in developing a policy for establishing a digital library.
- There are constraints in establishing a digital library among engineering colleges in A.P.

5. Limitations of the Study

- The present study is confined to JNTU affiliated Engineering Colleges in A.P.
- Data has been collected from librarians of the Engineering Colleges only.

6. Methodology

This study attempts to examine the steps taken by the Engineering colleges towards the installation of digital libraries, study the availability of digital collection, digital services, identify the constraints in the digital initiatives, and offer suggestions towards the improvement of digital library services. The

universe of study covers all the JNTU-Kakinada (JNTUK) and JNTU-Anantapur (JNTUA) affiliated Engineering colleges in A.P. Purposive sampling was used to select the sample. The librarians have been considered as respondents for the study. The data was collected through the structured questionnaire.

7. Sample Size

In the present study, the Engineering colleges for survey are 22 out of 85 which were established between the years 1995 and 2005 in A.P. 26% of Engineering colleges were covered. Hence sample study system has been followed.

Table 1: *Sample Size*

Affiliation	Actual No. of Engineering Colleges	Select No. of Colleges for Sample	Percentage
JNTUK	55	14	25
JNTUA	30	8	25
Total	**85**	**22**	**25**

8. Provision of Digital Library in JNTU Engineering Colleges

11 (100%) Engineering Colleges of JNTUK and 7 (87.5%) Engineering colleges of JNTUA have provided Digital library facility in their respective libraries.

Table 2: *Provision of Digital Library in JNTU Engineering College Libraries*

n= 22

	Provision of Digital Library		Total
	Yes	No	
JNTUK	11 (78.57)	03(21.42)	14
JNTUA	07 (87.5)	01 (12.5)	08
Total	**18 (81.81)**	**04 (18.18)**	**22**

(Figures in Parentheses indicate percentage)

The above said data is presented in the Table 2. Totally 18(81.81%) of Engineering colleges provide Digital library facility. So, for the following tables the n is 22.

9. Availability of Digital Materials in the Engineering College Libraries of JNTU

Table 3: *Availability of Digital Materials in the Engineering College Libraries of JNTU*

n= 18

Type of Digital Material	JNTUK		JNTUA		Total
	Yes	No	Yes	No	
CD-ROMs, DVDs	11 (100.0)	-	7 (100.0)	-	18
Digital collections developed by the library	10 (90.9)	1 (9.1)	5 (71.4)	2 (28.6)	18
Digital materials downloaded from Internet	11 (100.0)	-	2 (28.6)	5 (71.4)	18
Learning materials	11 (100.0)	-	6 (85.7)	1 (14.2)	18
E-Books	2 (18.2)	9 (81.8)	2 (28.6)	5 (71.4)	18

E-Journals	9 (81.8)	2 (18.2)	6 (85.7)	1 (14.2)	18
Videos of the lectures of faculty	7 (63.6)	4 (36.4)	5 (71.4)	2 (28.6)	18
Model Question papers for competitive exams	11 (100.0)	-	7 (100.0)	-	18
Electronic theses and dissertations	4 (36.4)	7 (63.6)	2 (28.6)	5 (71.4)	18
Course material	8 (72.7)	3 (27.3)	7 (100.0)	-	18

(Figures in Parentheses Indicate Percentage)

The digital materials available in Engineering college libraries such as CD-ROMs, DVDs, digital collections developed by the libraries, materials downloaded from the Internet, learning materials in digital form, E-Books, E-Journals, videos of the lectures of the faculty of the respective colleges and as well as outside, model question papers, Electronic theses and dissertations, course materials from digital library software packages or somewhere etc.

The Table 3 clearly shows that the digital materials which are available in the Engineering college libraries under JNTU affiliation.

10. Acquisition of Digital Collection

From the Table 4 it is observed that 100% and 85.7% of JNTUK and JNTUA Engineering college libraries are acquiring the digital collection from Internet. Totally 94.4% of engineering college libraries of JNTU is acquiring digital collection from Internet. Less than 50% of JNTUK Engineering college libraries have acquired digital collection by donation, own preparation and also by purchasing software package. But in case of JNTUA Engineering college libraries 57.1% libraries are acquiring by own preparation and from purchased software packages. But these libraries are less dependent on donation for acquiring digital collections. From the tabulated data it is found that majority of engineering college libraries of JNTU did not depend on donation, own preparation and purchasing for acquisition of digital collection. Majority of them are depended on Internet.

Table 4: *Acquisition of Digital Collection by Engineering College Libraries of JNTU*

	From Internet		Donation		Own Preparation		Purchasing	
	Yes	No	Yes	No	Yes	No	Yes	No
JNTUK	11(100.0)	-	-	11(100.0)	1(9.1)	10(90.9)	2(18.2)	9(81.8)
JNTUA	6(85.7)	1(14.3)	3(42.8)	4(57.1)	4(57.1)	3(42.8)	4(57.1)	3(42.8)
Total	17(94.44)	1(5.5)	3(16.7)	15(83.33)	5(27.77)	13(72.22)	6(33.33)	12(66.66)

(Figures in Parentheses indicate percentage)

11. Method of Digitalize the Data in Engineering College Libraries

From the Table 5, it is observed that the Engineering college librarians are using key boards and scanners for converting the text document in to digital form and digital camera, web camera are using for recording the audio visual materials like lectures of the faculty, programs conducted by the college authorities.(i.e. seminars, conferences, workshops, college day celebrations etc.)

Table 5: *Method of Digitalize the Data in Engineering College Libraries of JNTU*

n= 18

	In case of Print Documents			In case of Audio Visual Documents		
	By Typing	By Scanning	Both	Digital Camera	Web Camera	Both
JNTUK	5 (45.4)	4 (36.4)	2 (18.0)	6 (54.5)	3 (27.3)	2(18.0)
JNTUA	3 (42.8)	2 (28.6)	2 (28.6)	3 (42.8)	2 (28.6)	2(28.6)
Total	8(44.44)	6(33.33)	4(22.22)	9 (50)	5(27.7)	4(22.22)

(Figures in Parentheses indicate percentage)

The above tabulated detailed data inferred that 45.4% of librarians of JNTUK Engineering colleges have digitalized their documents by typing, 36.4% of librarians are using scanners for digitalizing and 18% of librarians are using both keyboard and scanners for converting the text documents in to digital documents. JNTUA Engineering College librarians are using keyboards (42.8%), scanners (28.6%) and 28.6% are using both keyboards and scanners for converting the text documents into digital documents.

54.5% of JNTUK librarians of Engineering colleges are using digital cameras, 27.3% are using web cameras and 18.2% are using both the cameras for digitalizing the documents. JNTUA Engineering college librarians are using digital cameras (42.8%), 28.6% are using web cameras and 28.6% are using both digital and web cameras for converting text documents in to digital documents.

12. Data Storage Devices used by the Librarians of Engineering College of JNTU

The storage devices which are being used in engineering college libraries have been presented in the Table 6. The usage of CD-ROMs and DVDs as storage devices in engineering college libraries is very high i.e. above 70%. The next ranks go to hard disks followed by optical character recognition (OCR).

Table 6: *Storage Devices Used by the Librarians of JNTU Engineering Colleges to Store the Digital Data*

n=18

	CD-ROMs		Digital Video Discs (DVDs)		Optical Character Recognition (OCR)		Hard Discs	
	Yes	No	Yes	No	Yes	No	Yes	No
JNTUK	11 (100.0)	-	9 (81.8)	2 (18.2)	4 (36.4)	7 (63.6)	6 (54.5)	5 (45.5)
JNTUA	3 (42.8)	4 (57.2)	6 (85.7)	1 (14.3)	3 (42.9)	4 (57.2)	3 (42.9)	4 (57.2)
Total	14 (77.8)	4 (22.22)	15 (83.33)	3 (16.66)	7 (38.88)	11 (61.11)	9 (50)	9 (50)

(Figures in Parentheses indicate percentage)

100% of JNTUK Engineering college librarians are using CD-ROMs, 81.8% are using DVDs, 36.4% are using OCR, and 54.5% are using hard discs as storage devices. In case of JNTUA Engineering college librarians 42.8% are using CD-ROMs, 85.7% are using DVDs, 42.9% are using OCR, and 42.8% are using hard discs as storage devices to store the digital data of their libraries.

13. Retrieval of the Digital Collections in JNTU Engineering College Libraries

The retrieval system of digital collection of the JNTU Engineering college libraries is clearly shown in the Table 7. It is observed from the Table 8, JNTUK Engineering College libraries are depending on print documents (18.2%), preserved documents (72.7%), softwares (27.3%) and web (36.4%) for retrieving the digital collections. JNTUA Engineering college libraries are depending on print documents (28.6%), preserved documents (71.4%), software (14.3%) and web (42.9) for retrieving

the digital data of their libraries. Engineering College libraries are dependent on preserved documents to retrieve or recovery of the digital data in all JNTU Engineering colleges.

Table 7: *Retrieval of the Digital Collections in JNTU Engineering College Libraries*

n=18

	By Print Documents		By Preserved Documents		By Searching The Softwares		From Web	
	Yes	No	Yes	No	Yes	No	Yes	No
JNTUK	2(18.2)	9 (81.9)	8(72.7)	3(27.3)	3(27.3)	8(72.7)	4(36.4)	7(63.6)
JNTUA	2(28.6)	5(71.4)	5(71.4)	2(28.6)	1(14.3)	6(85.7)	3(42.9)	4(57.1)
Total	4(22.22)	14(77.8)	13(72.22)	5(27.8)	4(22.22)	14(77.8)	7(38.88)	11(61.11)

(Figures in Parentheses indicate percentage)

14. Access of Digital information

Table 8: *Access of Digital Information by Librarians of Engineering College Libraries of JNTU*

n= 18

	Through Internet		From CD-ROM/ DVDs		From Digital Library Software Package	
	Yes	No	Yes	No	Yes	No
JNTUK	8(72.7)	3(27.3)	6(54.5)	5(45.5)	3(27.3)	8(72.7)
JNTUA	5(71.4)	2(28.6)	5(71.4)	2(28.6)	2(28.6)	5(71.4)
Total	13(72.22)	5(27.8)	11(61.11)	7(38.88)	5(27.8)	13(72.22)

(Figures in Parentheses indicate percentage)

Majority (72.22%) of the librarians of JNTU Engineering colleges accessed the digital data through Internet followed by CD-ROM/ DVD (61.11%) and digital library software package (27.8%). The above said data clearly presented in the Table 8.

15. Globally Availability of Digital Information

The Table 9 presents the data about availability of digital information globally of engineering college libraries of JNTU. 63.6% of engineering college libraries allowed accessing their digital information for all users. 62.5% of engineering college libraries of JNTUK and 57.1% of JNTUA libraries did not allow the digital information of their own globally.

Table 9: *Globally Availability of Digital Information of JNTU Engineering College Libraries*

n=18

	Digital Information Globally Available	
	Yes	No
JNTUK	7(63.6)	4 (36.4)
JNTUA	3 (42.9)	4 (57.1)
Total	10(55.55)	8 (44.44)

(Figures in Parentheses indicate percentage)

Totally 47.1% of JNTU Engineering college libraries are permitting to access their digital information globally. But 52.9% are not allowing accessing the same.

16. The Users of the Digital Libraries of Engineering Colleges

Faculty and students are using 100% of Digital library services in JNTUH, JNTUK and JNTUA Engineering colleges. But only in 29.4% of colleges the non-teaching staff is also using the digital library services. This data is presented in Table 10.

Table 10: *Users of the Digital Libraries of JNTU Engineering Colleges*

n=18

	Type of Users					
	Faculty		Non-Teaching staff		Students	
	Yes	No	Yes	No	Yes	No
JNTUK	11 (100.0)	-	3 (27.3)	8 (72.7)	11 (100.0)	-
JNTUA	7 (100.0)	-	2(28.6)	5 (71.4)	7 (100.0)	-
Total	18 (100.0)	-	5(27.8)	13(72.22)	18 (100.0)	-

(Figures in Parentheses indicate percentage)

17. Materials going to be digitalized

The researcher asked about the digitalization i.e. the type of materials which are going to be digitalized. The respondent librarians answered against the reading materials, Old question papers (70.6%), Newspaper clippings, and Faculty lectures (50%), Programs conducted by college authorities (47%), rare books (44.1%), old books (32.4%) and manuscripts (26.5%). From the data presented in the Table 11 is understood that the librarians are very much interested to digitalize the rare books, reading materials and old question papers.

18. Subscription of Consortia

Table 11: *Type of Materials going to be digitalized in Engineering College Libraries of JNTU*

n=18

	Rare Books		Old Books		Reading Materials		Programs Conducted by College		Manuscripts		Old Question Papers		Newspaper Clippings		Lectures of Faculty	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
JNTUK	3 (27.3)	8 (72.7)	2 (18.2)	9 (81.8)	8 (72.7)	3 (27.3)	4 (36.4)	7 (63.6)	3 (27.3)	8 (72.7)	7 (63.6)	4 (36.4)	4 (36.4)	7 (63.6)	4 (36.4)	7 (63.6)
JNTUA	5 (71.4)	2 (28.6)	2 (28.6)	5 (71.4)	4 (57.1)	3 (42.9)	3 (42.9)	4 (57.1)	2 (28.6)	5 (71.4)	2 (28.6)	5 (71.4)	5 (71.4)	2 (28.6)	3 (42.9)	4 (57.1)
Total	8 (44.4)	10 (55.5)	4 (22.22)	14 (77.77)	12 (66.7)	6 (33.33)	7 (38.88)	11 (61.11)	5 (27.77)	13 (72.22)	9 (50)	9 (50)	9 (50.0)	9 (50.0)	7 (38.88)	11 (61.11)

Only 36.4% of engineering college libraries of JNTUK is subscribing consortia. But 57.1% of JNTUA libraries are subscribing consortia. Totally only 38.2% of JNTU Engineering College libraries are tied up with different consortia. The following Table.12 presented the data regarding the same.

Table 12: *Subscription of Consortia by JNTU Engineering College Libraries*

n=18

	Subscription of Consortia	
	Yes	No
JNTUK	4 (36.4)	7 (63.6)
JNTUA	4 (57.1)	3 (42.9)
Total	8 (44.44)	10 (55.55)

(Figures in Parentheses indicate percentage)

19. Constraints in Digital Library Initiatives

The librarians who are working in the JNTU Engineering colleges are facing some problems while initiating to install the digital libraries in their respective Engineering colleges. The researcher presented the related data in the Table.13.

Table 13: *Constraints in Digital Library Initiatives by Librarians of Engineering Colleges of JNTU*

n=18

S. No.	Constraints in Digital Library Initiatives	JNTUK	JNTUA
1	Insufficient funds	07 (63.6)	04 (57.1)
2	Inability to absorb recurring costs	05 (45.4)	05 (71.4)
3	Initial cost is very high	10 (90.9)	07 (100.0)
4	Top management not interested	02 (18.2)	04 (57.1)
5	Lack of professional recognition	05 (45.4)	06 (85.7)
6	Library staff are not interested in Digital initiatives	05 (45.4)	06 (85.7)
7	Lack of adequate trained staff in digitization activities	05 (45.4)	06 (85.7)
8	Library staff are not interested in learning digitization activities	05 (45.4)	06 (85.7)
9	Legal problems (Copy right problems etc.)	11 (100.0)	07 (100.0)
10	Hacking	07 (63.6)	06 (85.7)
11	Virus effect	10 (90.9)	07 (100.0)
12	Delete and format of hard disk	04 (36.3)	07 (100.0)
13	Preservation problems	10 (90.9)	07 (100.0)

(Figures in Parentheses indicate percentage)

100% of JNTU librarians are facing the legal problems. The librarians of JNTUK Engineering colleges felt that “initial cost is very high” and “preservation” (90.9%) is also a problem for them. And also they have pointed that insufficient funds, hacking (63.6%) are also the major problems. 45.4% of librarians felt that inability to absorb recurring costs, lack of professional recognition, library staff are not interested in digital initiatives, lack of adequate trained staff in digitalization activities and also that they are not interested in learning. 36.3% are facing the problem of delete and format of hard disk and finally only 18.2% have answered against the problem that- “Top management not interested”.

100% of JNTUA Engineering college librarians felt that initial cost is very high; virus problems, delete and format the hard disk and preservation are the major problems. 85.7% librarians felt that professional recognition, lack of adequate trained staff, and library staff are not interested in digitization activities. 71.4% are facing the problem of inability to absorb recurring costs. 57.1% are answered against insufficient funds, top management not interested.

20. Suggestions to Improve Digital Library Initiatives

Finally the librarians offered few suggestions to improve the digital library initiatives. The related data is presented in the Table 14 here under.

Table 14: *Suggestions to Improve Digital Library Initiatives*

S. No.	Suggestions to Improve DL Initiatives	JNTUK	JNTUA	Total
1	Adequate funds should be made to subscribe On-line journals from time to time.	11 (100.0)	07 (100.0)	18 (100)
2	Sufficient number of latest computers for users to use digital library and as well as Internet	05 (45.4)	05 (71.4)	10 (55.55)
3	The library should procure software which will be capable of meeting the Digital Library's as well as user's requirements	11 (100.0)	07 (100.0)	18 (100)
4	There is need for trained and skilled professional staff to shoulder the responsibility of the IT operations and services should be undertaken	10 (90.9)	06 (85.7)	17 (94.44)
5	Need for periodic In service training of staff in handling latest techniques.	11 (100.0)	07 (100.0)	18 (100)

(Figures in Parentheses indicate percentage)

100% of librarians of JNTU Engineering colleges have suggested that adequate funds should be used to subscribe On-line journals from time to time and accepted that –

i. The library should procure software which will be capable of meeting the Digital Library's as well as user's requirements.
ii. There is need for trained and skilled professional staff to shoulder the responsibility of the IT operations and services should be undertaken.
iii. There is need for periodic in service training of staff in handling latest techniques.

But 55.55% of librarians have suggested that sufficient number of latest computers are required for users to use digital library and as well as Internet.

21. Results and Discussions

- 81.81% of engineering colleges are providing Digital library facility. (Table 2)
- 94.44% of engineering college libraries of JNTU acquiring digital collection from Internet. (Table 4)
- In case of print documents 44.44% of librarians of JNTU affiliated Engineering colleges are digitalizing their documents by typing, 33.33% are by scanning and 22.22% are using both the methods. In case of Audio visuals 50% are using digital camera, 27.7% are using web camera and 22.22% librarians are using both the cameras for digitalizing their documents. (Table 5)
- 77.8% of librarians are using CD-ROMs and 83.33% are using DVDs as storage devices. (Table 6)
- Majority (greater than 70%) of JNTU Engineering College libraries are depending on preserved documents to retrieve or recovery of the digital data. (Table 7)
- Majority (greater than 70%) of the librarians of JNTU Engineering colleges accessed the digital data through Internet followed by CD-ROM/ DVD (61.11%) and digital library software package (27.8%). (Table 8)
- 55.55% of JNTU Engineering college libraries are permitting to access their digital information globally. But 44.44% are not allowing accessing the same. (Table 9)
- Faculty and students are using the Digital library services in 100% of JNTUK and JNTUA Engineering colleges. But only in 27.8% of colleges the non-teaching staff is also using the digital library services. (Table 10)
- The librarians are very much interested to digitalize the rare books, reading materials and old question papers for their libraries. (Table 11)
- 44.44% of JNTU Engineering college libraries are tie up with different consortia. (Table 12)

- The librarians of JNTU Engineering colleges are facing different problems while installing the digital libraries. (Table 13)
- The librarians of JNTU Engineering colleges offered some suggestions towards the improvement of the Digital library initiatives. (Table 14)

22. Hypotheses Testing

i. There is consensus among engineering colleges in developing a policy for establishing a digital library. The librarians gave different suggestions to improve the Digital Library initiatives among JNTU Engineering college libraries. Hence the hypothesis is partially proved. (Table 14)

ii. There are constraints in establishing a digital library among engineering colleges in A.P. (Table 13)

23. Conclusion

From the findings of the study majority of the JNTU affiliated Engineering Colleges are taking steps towards installation of digital libraries. The librarians of JNTU Engineering colleges are facing different problems while installing the digital libraries. Planning a digital library requires thoughtful analysis of the organization and its users, and an acknowledgement of the cost and the need for infrastructure and ongoing maintenance.

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Acknowledgement Patterns: A Bibliometrics Study on International Journal of Information Management

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Abstract The purpose of this article is to analyze the acknowledgements appears in the research articles of International Journal of Information Management covering period 2003-2013. In the present study period 123 articles out of 538 (22.86%) articles contained acknowledgements. The acknowledgements appearing in this journal are further analyses in order to find out number of acknowledgements per paper, frequency of occurrence, types, and highly acknowledged individuals. The results show that the Peer Interactive Communication (PIC) acknowledgements are highest (28.28%) which is followed by Financial Support with (22.36%) Clerical support acknowledgements are lowest with (1.31%).

Keywords *International Journal of Information Management; Acknowledgement Patterns; Bibliometrics Study*

1. Introduction

Bibliometrics is recent and most active field of “Library and Information science. The word bibliometrics appeared in print in Alan pitchards article statistical bibliography or bibliometrics. (Khaparde, 2011). Bibliometrics has been known by other names, including “Statistical analysis of the literature” while Hulme used the term “Statistical bibliography” in 1923. (Khaparde, 2013). Acknowledging the assistance and contributions of others is now a well-established feature of the scholarly communication process. Acknowledgement sections are now common place in academic books and research articles and appear to be almost universal in dissertations, where they offer students a unique rhetorical space to both convey their genuine gratitude for assistance and to promote a capable academic and social identity (Hyland, 2004).

Acknowledgments in scientific publications are a common element in the scientific community, having a social function and cognitive significance (Tiew & Sen, 2002). Acknowledgments find their origin in the gratitude expressed to patrons, mentors, and powerful benefactors in cover letters accompanying scientific article by (Hyland, 2004).

Classified Acknowledgements according to B. Cronin's (1995) and C.L. Giles & I.G. Council's (2004) typology.

a) Access Support

It provides access to data, infrastructure facilities, etc.

b) Moral Support

It is a way of giving support to a person or cause, or to one side in a conflict, without making any contribution beyond the emotional or psychological value.

c) Financial Support

It is the act of providing resources, usually in form of money.

d) **Technical Support**

It provides help in the use of tools, technologies, furnishing technical expertise sample preparation, etc.

e) Peer Interactive Communication (PIC) Support

It deals with the advice and discussion, critical insight, intellectual guidance, valuable suggestions, assessment on the study, etc.

f) Clerical Support

The Secretarial services, helps in data collection/entry/management, etc.

g) Editorial/Linguistic Support

Editing, proof-reading, and translating the manuscript.

h) Unclassifiable

When it is impossible to categories an acknowledgement according to any of the above categories due to inherent ambiguity, vagueness or lack of contextual clues, the acknowledgement is classified under this category.

1.1. Definition

Acknowledgement

"Acknowledgement is a way of giving credit or props. *Acknowledgments* let you know who contributed or did work on something" (vocabulary.com).

"Acknowledgements allow researchers to reflect their gratitude for any kind of help received from others during the writing of articles" (Rattan, 2014).

Bibliometrics

Bibliometrics is a set of methods to quantitatively analyze scientific and technological literature. (Wikipedia.org)

Bibliometrics is described essentially a quantitative analysis of publications for the purpose of ascertaining specific kinds of phenomena (Khaparde, 2011).

The* International Journal of Information Management *(IJIM)

The *International Journal of Information Management* (IJIM) is an international, peer-reviewed journal which aims to bring its readers the very best analysis and discussion in the developing field of information management.

The Journal

- Keeps the reader briefed with major papers, reports and reviews.
- Is topical: Viewpoint articles and other regular features including Research Notes, Case Studies and a Reviews section help keep the reader up to date with current issues.
- Focuses on high quality papers that address contemporary issues for all those involved in information management and which make a contribution to advancing information management theory and practice. (elsevier.com)

1.2. Review of Literature

Mackintosh in 1972 in an unpublished dissertation examined acknowledgements pattern in sociology. A three–tier classification scheme was developed for the study, viz., facilities, access to data and help of individuals to study acknowledgements in the American Sociological Review. He concluded that the lack of interest in acknowledgements does not necessarily indicate their irrelevance and also that the lack of interest of Bibliometrician in acknowledgement does not indicate their irrelevance (Rattan, G.K., 2014).

Cronin in 1991 explored the social functions and the cognitive significance of acknowledgements figured in Journal of the American Society for Information Science (JASIS*)* for the years 1970-1990. A six-category typology was developed by Cronin namely;

a. Trusted assessor
b. Moral support
c. Technical support
d. Dogs body
e. Paymasters
f. Prime mover

Again Cronin in 1995 carried study on acknowledgements in information science, psychology, history, philosophy and sociology (Rattan, 2013).

2. Scope

The Cronin-McKenzie-Rubio typology has been used in the present study attempts to examine the acknowledgements including 445 research papers *in International Journal of Information Management* (IJIM) during 2003-2013, 22.86% i.e. 123 articles out of 538 articles contain acknowledgement of some kind.

Objectives

The purpose of the present study is to examine the generic structure of the acknowledgements in IJIM journal in order to find out frequency of their occurrence, types, number of acknowledgements per paper, highly acknowledged individuals.

3. Methodology

These acknowledgements of all the research articles published in the journal between 2003-2013 were examined to locate the acknowledgements and then were examined, classified and analyzed from various angles and results were tabulated.

3.1. Data Analysis

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision making. (wikipedia.org)

4. Results and Discussions

Table 1: *Acknowledgements Appearing in the Journal*

Year	Number of Articles	Number of Articles with Acknowledgements	Percentage
2003	35	4	11.42
2004	36	8	22.22
2005	35	5	14.28
2006	39	8	20.15
2007	32	5	15.62
2008	52	12	23.07
2009	50	7	0.14
2010	49	25	44.89
2011	61	13	21.31
2012	56	11	19.64
2013	93	25	26.88
Total	538	123	22.86

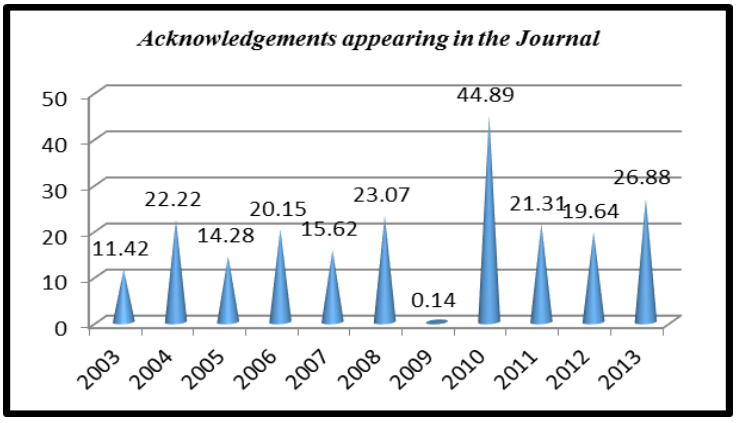

Figure 1: *Shows Acknowledgements Appearing in the Journal*

Table 1 depict that the practice of acknowledgements in research articles is not so common in this journal. Only 123 articles (22.86%) out 538 articles contain acknowledgements. The maximum number of articles 25(44.89%) contains acknowledgements in the year 2010 and minimum number if articles 4(11.42) in the year 2003.

Table 2: *Frequency Distribution of Acknowledgements*

Year	Number of Articles with Acknowledgements	Number of Acknowledgements in Articles	Mean
2003	4	5	1.25
2004	8	11	1.37
2005	5	8	1.6
2006	8	10	1.25
2007	5	5	1
2008	12	13	1.08
2009	7	8	1.14
2010	25	32	1.28
2011	13	15	1.15
2012	11	14	1.27
2013	25	31	1.24
Total	**123**	**152**	**1.22**

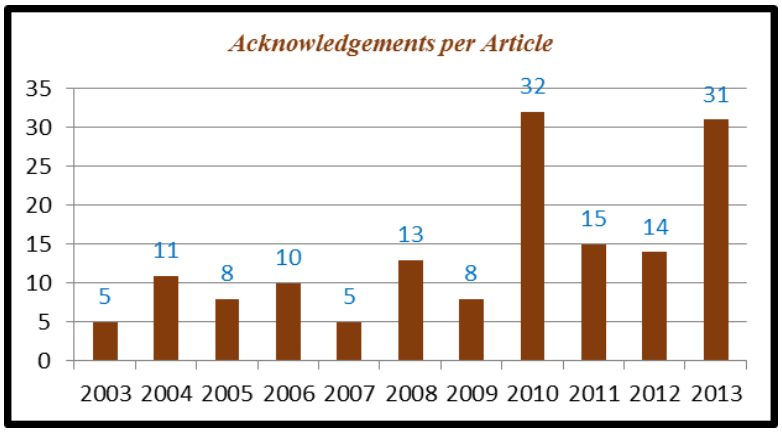

Figure 2: *Shows Frequency Distribution of Acknowledgements*

Table 2 reports the frequency distribution of acknowledgements. The highest number of acknowledgements per article 32 (1.28%) is found in 2010 and the lowest in 20035 (1.25%). On an average, each article contained 1.22% acknowledgements.

Table 3: *Categories of Acknowledgements*

Year	AS	MS	FS	CS	TS	PIC	ES	US	Total
2003	2	-	1	-	-	2	-	-	5
2004	4	1	2	-	-	4	-	-	11
2005	-	1	2	-	3	2	-	-	8
2006	2	-	4	-	1	2	-	1	10
2007	-	-	-	-	1	3	-	1	5
2008	3	2	5	-	1	1	1	-	13
2009	3		3		-	2	-	-	8
2010	5	2	7	2	1	12	-	3	32
2011	3	2	2	-	2	2	3	1	15

2012	3		5	-	-	4	2	-	14
2013	-	1	3	-	-	9	-	18	31
Total	**25 16.44%**	**9 5.92%**	**34 22.36%**	**2 1.31%**	**9 5.92%**	**43 28.28%**	**6 3.94%**	**24 15.78%**	**152**

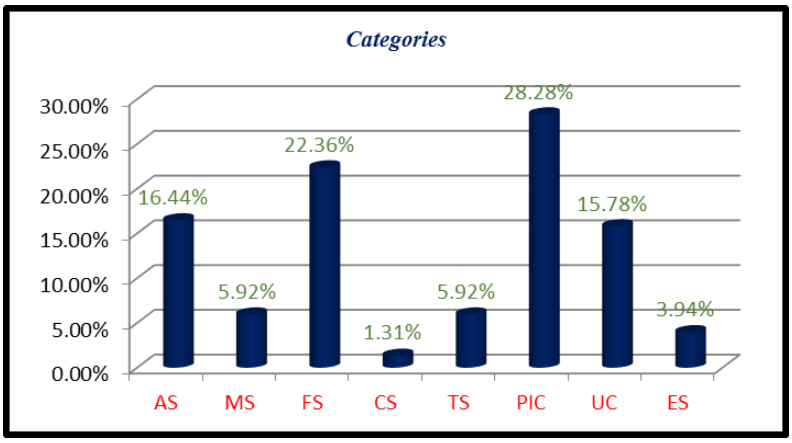

Figure 3: *Shows Categories of Acknowledgements*

Table 3.reveals the acknowledgements of the journal under study by categories. The distribution is done on the basis of number of categories in one article. The results shows that the largest number of acknowledgements are in the Peer Interactive Communication (PIC) category w followed by financial support category 34 (22.36%), access support 25 (16.44%). About 25 (15.78%) of the acknowledgements could not be classified under the categories mentioned due to inherent ambiguity, vagueness or lack of contextual clues.

Table 4: *Peer Interactive Communication Acknowledgements*

Year	No. of Articles with Acknowledgements	Peer Interactive Communication	%
2003	4	2	50%
2004	8	4	50%
2005	5	2	40%
2006	8	2	25%
2007	5	3	60%
2008	12	1	8.33%
2009	7	2	28.57%
2010	25	12	48%
2011	13	2	15.38%
2012	11	4	36.36%
2013	25	9	36%
Total	123	43	34.95%

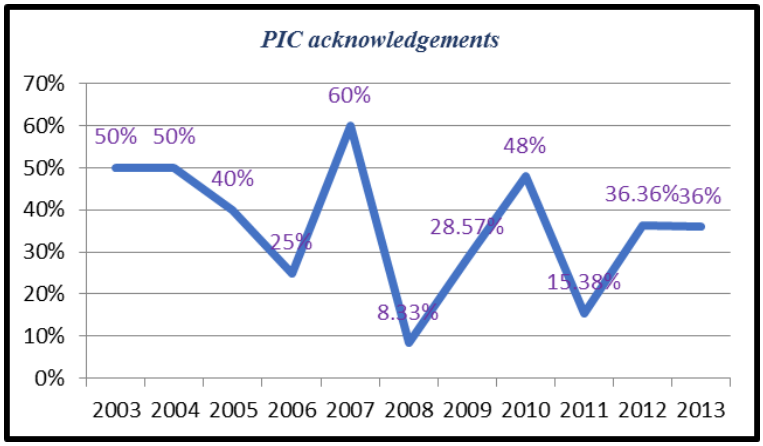

Figure 4: *Shows Peer Interactive Communication Acknowledgements*

Table 4 shows the distribution of PIC acknowledgements. The highest number of PIC acknowledgements 12(48%) is seen in 2010 while the lowest number 1(8.33%) in 2008, and the mean is 34.95%.

Table 5: *No. of Acknowledgements per Individual*

No. of Times Acknowledged	No. of Individuals
1	86
2	-
3	1

Table 5 reveals the number of acknowledgements per individual. Out of 87 Individuals acknowledged, only one has been mentioned three times while the rest have been acknowledged once.

Table 6: *List of Individuals Acknowledged*

Sr. No.	Name	Acknowledgement Score
1	Dr. Sian, Hin Thompson Teo	3
2	Amrit Tiwana	1
3	Eric Verbeek	1
4	Ivan Aaen	1
5	Jane Fedorowicz	1
6	Melissa Rogers	1
7	Ms. Emma Challans	1
8	Ms. Jan Ellen	1
9	Myoungsun Namkung	1
10	Prof. Paul Jeffrey	1
11	Rok Skrinjar	1
12	Vincent Ferrari	1
13	Amy Ray	1
14	Andre Bell	1
15	Angela Wang	1
16	Anne Bowtell	1
17	Anol Bhattacherjee	1
18	Anusha Ranganathan	1
19	Ard Huizing	1
20	Ben O'Steen	1
21	Bev Earle	1
22	Bill Buchholz	1

23	Bova	1
24	Cecilia Haskins	1
25	Cecilia Loureiro-Koechlin	1
26	Charo Narvaez	1
27	Dick van Gorkum	1
28	Don Chand	1
29	Donald Zack	1
30	Dr. Andreas Persidis	1
31	Dr. Andrej Kovacic	1
32	Dr. Navonil Mustafee	1
33	Dr. Neil McBride	1
34	Dr. Philip Hills	1
35	Dr.Chung Li	1
36	Dr. Richard Marchese Robinson	1
37	Dr. Tong Cheng Kui, Huang	1
38	Drs. Steven G	1
39	Elke U. Webe	1
40	Eric J. Johnson	1
41	G. Premkumar	1
42	Gary David	1
43	Harm Hoebergen	1
44	Heikki Topi	1
45	Jan Horsky	1
46	Janak Parekh	1
47	Janet Mendelsohn	1
48	Jason Dunn	1
49	Jek Swan Tan	1
50	Jian Wang	1
51	Jiapeng He	1
52	Jie Wei	1
53	Jinbi Yang	1
54	Kees van Hee	1
55	Lucille Ponte	1
56	Man Wang	1
57	Mark Carlson	1
58	Mary Ann Robbert	1
59	Mary Culnan	1
60	Mary Ochs	1
61	Mary Reiser	1
62	Min Bang	1
69	Monica Garfield	1
64	Monica Messaggi Kaya	1
65	Mr. Munnesh Patel	1
66	Ms. Debra Canning	1
67	Ms. Leokadia Glogowski	1
68	Neil Jefferies	1
69	Olivia Vent	1
70	Oscar Ommert	1
71	Peter Axel Nielsen	1
72	Philip J. Hills	1
73	Prof. Aldo Romano	1
74	Prof. Guy Fitzgerald	1
75	Prof. Trevor Wood Harper	1
76	Prof. Philip J.Hills	1
77	Prof. Raymond Hackney	1
78	Professor Sandeep Krisnamurthy	1

79	Rene Theunissen	1
80	Robert Herdt	1
81	Rochelle Degens	1
82	Simon Singh	1
83	Steve Lichtenstein	1
84	Sue Newell	1
85	t Veld	1
86	Tjitske Kamphuis	1
87	Traci Logan	1

List of individuals acknowledged in PIC category is shown in Table 6. One individual from this category, Dr. Sian, Hin Thompson Teo has been acknowledged three times while the rest have been acknowledged once.

5. Findings and Conclusion

The practice of acknowledgements in IJIM research communication is not as common as only 22.86% of research articles contain acknowledgements. The average acknowledgement per communication is 1.22 the most common category of acknowledgement found is PIC category i.e. 43(28.28%) number of acknowledgements. The mean percentage of the PIC acknowledgements is 34.95%.

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Research Article | Open Access

Development of Library Portal– In Print and Non-Print Era

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Abstract Libraries are rapidly changing and expanding to web-based delivery of content and related access services to cater the information needs and expectations of their modern users. One approach is to design and develop multi tired architectures that include an integration layer providing programme level services for user level applications such as a portal. The library portal is a tool to organize information resources and services in a way that supports the users' needs. However, LIS professionals should be aware about portal technology, its applications in academics and usability of the portal which is based on effective content management system. Library portal is key to knowledge, it is an effective Tool for Web-enabled information Services. The main aim of this paper is to highlight the historical development of library portal and the role of the librarian in developing significant library portal.

Keywords *Library Portals; Library Automation; Portal Approach*

1. Introduction

Libraries provide effective services to the academic community by selecting and organizing information resources, and disseminating information resources supports research and education. As the use of electronic resources has grown libraries have developed 'Library Portal' or 'Gateway Systems', online to provide some of these selection and organization services in the digital era. Retrieval of library information resources has undergone rapid changes in post liberalization. The credit goes to impact of Information Communication and Technology in different fields of economy. Availability of data and information in different format has become the need of information maker and information searcher due to complexity of various forms of information resources. Library has been considered as the knowledge hub based on which Managers and top executives can take important business decisions in time. The need of library portal was first realized on the user's wide use of Internet in all the fields. This paper aims to study the situation of library portal (Knowledge Bank) before and after the computerization and its benefit to different facet of users.

2. What is a Portal?

The “portal” is called as an entry point to a world of resources, [1] purposely designed to save the users’ time, to act as a best guide to library users with relevant resources, and to motivate the maximum use of acquired resources, free resources available on it [2].

1) “A Portal is a website that collects information for a group of users that have common interest” [4].
2) “A variety of useful information into a single, ‘one-stop’ web-page, helping the user to avoid being overwhelmed by ‘Infoglut’ or feeling lost on the web” [8].

The term “portal” describes a variety of web based interfaces at one place [5]. It is also called as one-stop homepage where users can customize the content to meet their information needs. It is also called as a place to return to when user get lost, a place to store the user’s information and a place from which to communicate with others.

Origin of Portal

The word "portal" is derived from the Latin word “porta”, which translates to “gate” [9]. In the context of network, the portal server acts as gateway to the enterprise. Web portals originated from web search engines in the early 1990s to its mature model in the late 1990s. It was a hot commodity at that time. Excite was among the first portal to offer users the ability to create a site that is personalized for individual interest. “Portal” has been the buzzword of the networked age since 1997. Portals were so popular in business-to-business (B2B) and business-to-consumers (B2C) applications. After the proliferation of web browsers in the late 1990s many companies tried to build or acquire a portal to have a piece of the Internet market [12]. The history of current Web portal can be traced back to the Boolean Search technology develop in 1994 and 1995, Web portal refers to only the website that can be customized by individual users. Recently the Portal Technology is becoming popular in education system [8] and in libraries and Information Centers which gave birth to the concept Library Portal.

3. What is a Library Portal?

The developments in information and communication technologies (ICT) and their application in library and information science (LIS) have forced information professionals to change the way they are functioning their role in modern libraries. Because of the popularity with the users, an overwhelming attention is being given to the web-based information services in libraries [6]. Thus, LIS professionals understand the importance of Library portals in higher education. It enhances the value of electronic resources with functions such as resource description & discovery, combined searching of multiple resources, context-sensitive linking, and personalized services. It is define as,

“Library portal is a single-user interface for accessing wide variety of electronic resources, both within and outside the library” [14]

Library portals are also called as an information hub. It is a density of resources and services on the network. A ‘portfolio’ of resources, potentially customized to specific role or individual interests. An aggregation or collection of resources organized to assist particular categories of users. A library portal mediates the engagement of users and resources in a network environment [2].

4. Development of Library Portal in Print Era

Though the term ‘Library Portal’ appears new in this digital era, it has found that it’s deeply rooted from print era when in traditional library users were using Card Catalogues to cater their information needs. In historical days Card Catalogue was acting as a ‘Portal’ or ‘Single Stop’ to find desired

printed information [11]. Card catalogue was an effective tool for information discovery in the library. Library catalogs originated as manuscript lists, arranged by format (folio, quarto, etc.) or in a rough alphabetical arrangement by author. Printed catalogs, sometimes called dictionary catalogs enabled scholars outside a library to gain an idea of its contents. These would sometimes be interleaved with blank leaves on which additions could be recorded, or bound as guard books in which slips of paper were bound in for new entries. Slips could also be kept loose in cardboard or tin boxes, stored on shelves. The first card catalogs appeared in the nineteenth century, enabling much more flexibility, and towards the end of the twentieth century the OPAC was developed Card catalogs are now electronic databases that are called Online Public Access Catalogs (OPACS) for short.

5. Development of Library Portals in Non- Print Era

Online Public Access Catalog (OPAC) is a long term which is now transformed and known as “electronic library catalog" or the "library database". Now it has become a buzz word and very rarely we find paper cards in modern libraries. Though, those good old cards catalogues had/have value but now OPAC also offer lots of features. The evolution of library automation systems starts with the development of the Web OPAC. It has a basic feature like the ability to search a library’s catalogue remotely, through an easy-to-use and nontechnical interface has opened up the resources of many libraries in a way that could not have been envisaged earlier. The second stage in this development has been the extension of these OPACs, to allow it to search remote metadata (primarily through Z39.50) [9] and more recently, local & remote digital information, allowing primitive 'interoperability' between the library system and the other resources available on web and opened a new, innovative digital platform for libraries.

6. Birth of Library Portal

The Library portal is growing in its importance as the preferred way of organizing and using information in libraries. The Web portals became positive potential frameworks for achieving order out of chaos [10]. As portals become a primary means for transacting information and commerce, libraries of all types are becoming involved in thinking, planning and building various frameworks and services for their libraries. LIS professional should aware that the concept is not new in Library and Information Science field. ‘Library Portal’ is nothing but a combination of OPAC and Web discovery tools. Librarians and library automation companies have started calling this combination of OPAC and broader discovery tools known as 'library portal'. Librarians need to recognize that the portal is not a new concept; it is transformation of Card catalogue into Library portals [13]. Many libraries were in impression that the portal is a very narrow concept, but it is not, it born out of an extension of the traditional Web OPAC.

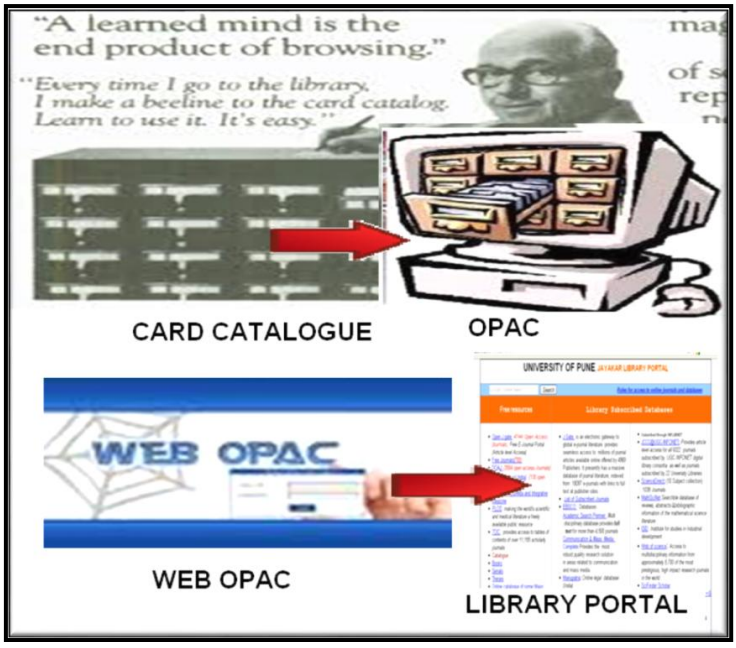

Figure 1: *Evolution of Library Portal*

The portal gives the library a tool to channel users towards preferred resources. As this tool is invented by librarians it is essential to adopt this technology in the modern libraries. Librarian should be positive towards the new technology and its effective implementation to cater the users need.

7. Role of a Librarian in the Development of Library Portal

Library portals need librarianship skills and library-managed content to be truly effective. As efficient educators who organize and evaluate information resources, academic librarians bring unique perspectives and skills to the development of portals in their colleges and universities to campus portal planning and implementation, they bring their expertise with content, their knowledge of copyright, their commitment to customer service, and their experience in creating customized web-based information delivery systems.

Librarians need to actively engage with enterprise portal projects, both to add value and to preserve their role in the enterprise. In this scenario the library portal has the same issues that other targets have, including how to define the attributes and entitlements necessary to determine what resources and services to offer the user. But the portal must also implement access policy for a wide range of resources in order to present the appropriate links to the user. These rules may make use of entitlement attributes from the origin or be based on group membership attributes that are associated in the portal with authorization for certain resources. Academic librarians can provide credible content that has been selected for a specific learning community. The students who may have difficulty determining what is valuable and what is useless on the web, the librarians offers a safe harbor in a flood of information. Thus, Librarian's role is very important in designing and implementing Library portal system on the web.

8. Conclusion

Library portal is an art and science of the usage and application of library knowledge for decisions as well as research purposes which will in turn support our education system. Portal technology is about to become very significant, and is both an opportunity and a threat to the library. The use of Library card system was replaced by Online Public Access Catalogue (OPAC) which is further developed as

Web-OPAC, further it transformed into Library Portals. Library Portal plays significant role in the advancement of the education system. Library portal is meant to create a nascent mind turned into a well-developed, talented mind. Well-developed mind means the capability of creating new ideas and theories and its application in the challenging world. In this social networking era, to fulfill the ever increasing requirements of users in a most efficient manner, there is a need for every library to provide its services and collection through an easy interface by developing a library portal.

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Research Article | Open Access

Collection Development in Academic Libraries in Imo State Nigeria: Status Analysis and Way Forward

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Abstract The study was conceived to x-ray the performance of collection development function in five academic libraries in Imo State, Nigeria, in order to determine possible operational flaws and proffer solution. Data were collected from all the one hundred and nine professional and para-professional staff of the libraries using a self-developed questionnaire. Findings of the study include: absence of comprehensive collection development policy, lack of a coordinating unit for collection development activities, low participation of faculty in book selection, inadequate book votes and irregular weeding of stock. Measures addressing the flaws were suggested as a way forward in the discharge of the important function of collection development in the studied libraries.
Keywords *Collection Development Policy; Book Selection; Book Acquisition; Nigerian Libraries*

1. Introduction

The core of the library is the collection. Its pivotal place is enshrined in the basic mandate of the library to stock information materials to meet the needs of users. Thus, the collection, composed of the information resources, constitutes the basic instrument of service delivery in the library. Lending credence to this view, Ifidon (2007:1), states thus: “Beautiful buildings, well-trained staff and modern information storage and retrieval systems can only be appreciated if excellent services are given to users. These services cannot be given without live collections”. The significance of the above submission is that effective service in the library is closely related to the availability of an adequate library collection.

The academic library is a purpose-driven organization. It is the major support infrastructure for the tripartite function of higher education, teaching, research and extension. In view of this, the need for ‘live collections’ in academic libraries is unquestionable. A live collection is one that is well-groomed, active and hence responsive to the needs of users. It is the functional domain of collection development to achieve a live collection in the library. Collection development is a multi-faceted activity. Its scope traverses acquisition, user assessment, policies, selection, weeding and evaluation (Edoka, 2000). Similarly, Kumar et al (2008), identify the constituent parts of collection development as assessing user needs, evaluating the present collection, determining selection policies,

coordinating selection, re-evaluating and storing parts of the collection, and planning for resource sharing. None of these aspects of collection development is inconsequential as they all work in synergy to ensure the functional effectiveness of the library collection.

However, a cursory observation by the researchers suggests a collection development practice skewed towards selection and acquisition in many academic libraries in Imo State, Nigeria. Hence, this study, conceived as an enquiry into the way and manner in which collection development function is conducted in five academic libraries in Imo State, Nigeria with a view to exposing the flaws and proffering recommendations as a way forward.

The academic libraries studied are those of Imo State University, (IMSU) Owerri, Federal University of Technology, Owerri (FUTO), Federal Polytechnic Nekede, (FEDPOLY), Alvan Ikoku Federal College of Education, (AIFCE) Owerri, and Imo Polytechnic, Umuagwo, (IMOPOLY). These libraries typify the academic libraries in Nigeria and therefore generalizations can be made about academic libraries in Nigeria based on data collected from them. Imo State is located in the South East of Nigeria.

2. Objectives

The broad objective of the study is to investigate the status of collection development in the studied libraries. The specific objectives are:

i. To ascertain the types of library resources acquired by the studied libraries.
ii. To ascertain the status of collection development policy in the studied libraries.
iii. To determine the category of persons involved in the selection of materials.
iv. To identify the acquisition methods adopted by the libraries.
v. To ascertain the aspects of collection development carried out in the studied libraries.
vi. To determine the factors that militates against the effective discharge of the collection development function.
vii. To recommend ways of enhancing collection development in academic libraries.

3. Literature Review

The crucial function of building the library collection has been variously termed ordering, acquisition, and collection development depending on the prevailing understanding of the scope of the function. Ordering appears limited to purchasing as a method of bringing books into the library. However, Welch (2003), has noted the gradual replacement of the term ‘order’ in libraries with acquisition which, in his view, embraces other sources of library resources such as gifts and exchange. Collection development is conceptualized by Ojebode (2009), as comprising a great number of library activities including selection of resources, acquisition of those materials selected, the development of plans for sharing resources between libraries, the maintenance of resources acquired, weeding and evaluation. In recent times, collection management has been used by some librarians to refer to the maintenance of library materials as distinct from collection development. Attempting to show the boundary between collection development and collection management, Adewuyi (2005), classifies the identification, selection and procurement of library materials as “acquisition process” or collection development, and refers to processing, organization, maintenance, stocktaking, preservation and ensuring maximum exposure of these materials for the benefit of the general public as collection management. In real practice, however, the distinction is not clear-cut as part of what is regarded as collection management is performed as collection development.

Baughman, cited in Ojoade (1981), illustrates the components of collection development with an equation thus: collection planning + collection implementation + collection evaluation = collection development. Collection planning comprises community analysis or user study and policies.

Collection implementation refers to selection and acquisition of library materials and funds while collection evaluation involves the process of ensuring that the library collection is relevant to the needs of the users. Lending their joint voice to the conceptualization of collection development, Anyanwu et al (2006), view it as the selection, acquisition, weeding and evaluation of library materials. It is a systematic building of library collection to satisfy the needs of users.

Collection development is guided in most libraries by the collection development policy. It is necessary to have the collection development policy written to make for objectivity in developing the library collection. A collection development policy is essential for a balanced and robust collection. It specifies the scope of the collection, authority for selection, criteria for allocation of funds and for selection of various types of materials, priorities in selection and criteria for weeding Kumar et al (2008). In spite of its importance, some libraries do not have comprehensive collection development policies. For example, reporting a six-month exercise aimed at rejuvenating the reference collection of the University of Mauritius Library, Ephraim (2001:17), notes that his team was 'faced with the daunting situation where there was no collection development policy with clear guidelines on stock relegation'. Similarly, Adewuyi 2005 reports that most of the libraries studied in his survey of collection management practices in Nigerian university libraries lack documented weeding policy.

Selection is a necessary first step in the acquisition process. Information materials are selected on the basis of their perceived usefulness to a group of readers. This is because "the amount of satisfaction a reader finds in the library depends directly upon the materials the librarian has available for his use" (Carter et al 1974:1). Hence, the rationale for selection is to get into the collection, a maximum number of desirable titles from a plethora of titles published every year. It is clear that many of the publications cannot be selected for a particular library because they fall outside the scope of the library's collection. A library's scope is approximately equal to its area of interest, determined by the perceived interest of clientele. Clientele interest-directed selection will doubtless result to higher library patronage and user satisfaction. It is for this reason that Nwaigwe and Onwuama (2004), opine that selection of materials in the library should be preceded by a study of the present and future needs of library users to be able to make informed selection. In agreement, Oparaku et al. (2005), state that ascertaining the needs of users is a necessary prelude to provision of materials relevant to these needs. Ulveling (1974), draws attention to another point of consideration in selection; he insists that the determination of the library's objectives is the most important fundamental in the selection process.

Adewuyi (2005), views acquisition as the bedrock upon which stock development is based. Acquisition procedure usually begins with stock checking and ends when the materials ordered for are received and certified by the acquisition staff. A study by Ojebode (2009), indicted poor funding of libraries as the bane of effective acquisition of library materials. The study found out that the number of books acquired through gifts and donations outnumbered those purchased between 1996 and 2006 in the studied libraries because of insufficient funds for purchase. This finding corroborates the finding of an earlier study by the same author, Ojebode (2001) that gifts constituted the major method of acquiring books at St. Andrew College Oyo Library, Oyo State, Nigeria. However, it is at variance with results of studies by Adebimpe, 2001 and, Egunjobi and Olarenwaju (2002) reporting higher acquisition of library materials via the purchase method. Adebimpe is of the view that although the purchase and non-purchase systems are veritable methods of library acquisition, the non-purchase methods comprising gifts, exchange, legal deposit and bequeaths should be employed as complements to purchase. But the problem with purchase is that it is cash dependent and hence less acquisition would be recorded in situations of inadequate funding. Okoro (2006:81), found out that "the libraries of universities in the Eastern States of Nigeria are not properly funded … the dire funding situation of these libraries affected the growth of their collections". Fortunately, the Federal Government of Nigeria has introduced some intervention measures to mitigate the problems of poor acquisition status in academic libraries among other factors. Ekoja (2003), reports the positive impact

of three intervention measures viz: the World Bank Federal Universities Development Sector Adjustment Credit, the Petroleum (Special) Trust Fund (PTF), National University Materials Procurement Programme, and the Education Tax Fund (ETF), on collection development at Abubakar Tafawa Balewa University Library, Bauchi, Nigeria.

Collection evaluation is done periodically to ascertain the collection's validity in relation to the library's objectives. According to Ifidon (1995), collection evaluation is done to determine the scope, depth and usefulness of the collection, test the effectiveness, the utility and practical applicability of the written collection development policy, assess the collection's adequacy and hence highlight its inadequacies and strategize to identify areas where weeding is required. Eze and Eze (2006), opine that collection evaluation is necessary to determine from time to time, how well the selection policy is working out. It shows whether the provisions of the policy in terms of the types of materials to be acquired are implemented or not.

Weeding logically results from stock evaluation. Its benefits to the library have been summarized by Bantai (2002:21), as "creation of space, increase in circulation turnover and greater accessibility of useful materials". Ephraim (2001) agrees that weeding improves access to usable materials as it frees shelving space from unused materials. Despite its benefits, many librarians are reluctant to weed their collections for reasons adduced by Ifidon (1997), as librarian's penchant for impressive set of gross statistics of holdings, lack of time, and the rigour of systematic weeding. Bantai (2002) has empirically ascertained the constraints to effective weeding in Nigerian university libraries as inadequate finance, high cost of importation of foreign books and scarcity of local tertiary books.

The significance of the present study lies in the hope that it will make bare, the flaws in the conduct of collection development in the selected libraries as well as chart a new course for improving collection development practices in the libraries.

4. Methodology

The study employed the descriptive survey research design. The population comprised the professional and para-professional staff of the five academic libraries under study. Their number is one hundred and nine (109) distributed as follows:

Table 1: *Distribution of Population*

Library	No. of Respondents
IMSU Library	16
FUTO Library	53
AICE Library	12
FEDPOLY Library	26
IMOPOLY Library	2
Total	**109**

The entire 109 staff were used since the number was small and accessible. The questionnaire constituted the instrument for data collection. A self-developed questionnaire was administered to the 109 subjects personally and all were returned in usable form, indicating a 100% return rate. Analysis was done using simple statistical tools of frequency counts, percentage and bar chart.

5. Data Analysis, Findings and Discussion

5.1. Information Materials in the Library

As can be gleaned from Table 2, all the academic libraries studied acquired both print and non-print materials. This indicates a widespread understanding of the benefits of a mixed collection among the libraries. In an age when Information and Communication Technology (ICT) holds sway as the major tool for disseminating and accessing information, the inclusion of ICT materials in the collection of academic libraries in Nigeria is most commendable. Some of the subjects indicated 'others' acquired by their libraries as projects/theses/dissertation, and manuscripts.

Table 2: *Types of Materials Acquired*

Option	Frequency	Percentage
Books/monographs	109	100
Reference materials	109	100
Journals	109	100
Audio visuals	96	88
ICT hardware and software	109	100
Others	42	39

5.2. Status of Collection Development Policy

The researchers enquired from the subjects if their libraries operated a written collection development policy and all 109 (100%) subjects answered 'no'. This result is worrisome in the light of the importance of such a document as a guide in discharging the collection development function. The researchers found out that all the libraries had acquisition policies, which simply guide decisions on what materials to select for purchase. The absence of a written comprehensive collection development policy in the studied libraries implies a lack of systematic approach in the discharge of the various facets of the collection development function. Previous studies confirm the lack of written comprehensive collection development policy in academic libraries in Nigeria. Ojebode (2009), found that gifts constituted the main means of acquisition for the libraries he studied but these libraries had no policy guidelines on gifts. Hence he recommended that "there should be written collection development policies, particularly on acceptance of gifts in academic libraries …" (Ojebode, 2009:90). This he opines would shield the libraries from being dumping grounds for unwanted materials from donors. Adewuyi (2005), found out that most of the libraries he studied had no documented weeding policy. Similarly, Ephraim (2001), reported the lack of weeding policy in University of Mauritius Library.

5.3. Collection Development Activities

To determine the range of collection development activities carried out in the studied libraries, the researchers provided subjects with a checklist to indicate from. Table 3 shows their responses.

Table 3: *Collection Development Activities*

Option	Frequency	Percentage
Selection	109	100
Acquisition	109	100
Stock evaluation	109	100
User study/community analysis	109	100
Weeding	109	100
Library cooperation	109	100

All the subjects checked out all the listed options. This means that collection development is well conceived among the libraries as encompassing selection, acquisition, user studies, stock evaluation, weeding and library cooperation. This conception meshes into the American Library Association (ALA 2013) definition of collection development as a term encompassing a number of activities related to the development of the library collection, including the determination and coordination of selection policy, collection evaluation, planning for resource sharing, collection maintenance and weeding. It is thus myopic to view collection development as a mere synonym for acquisition, as Adewuyi (2005), does.

However, asked if these activities were performed under a coordinating department in the libraries, the subjects unanimously answered 'no'. In the absence of a coordinating department, the discharge of the various facets of the collection development function would be haphazard and hence, ineffective

5.4. Selection of Materials

Table 4: *Responsibility for Selection*

Option	Frequency	Percentage
College/University/Polytechnic Librarian	3	3
Teaching staff	23	21
Students	0	0
Subject specialists	9	8
Acquisitions Librarian	53	49
All of the above	21	19

The implication of the result shown in Table 4 is that the responsibility for selection in the studied libraries rests mainly with the acquisitions librarian. Teaching staff are not adequately involved, while students are not involved at all in the selection of information materials. The low participation of teaching staff in the selection process has been pointed out by Ifidon (1985), who argues that their higher participation is necessary since they stand in a position to determine books that are relevant to the courses taught by them. On the factors considered in selection, the subjects indicated book vote, academic programmes of the institution and available space, adding that hardware and software compatibility is considered in selecting ICT materials.

5.5. Acquisition Methods

Figure 1 shows that purchase is the major method of acquiring information materials in the studied libraries. While this agrees with the findings of Adebimpe (2001), and Egunjobi and Olanrewaju (2002), regarding the prevalent method of stock acquisition in Special Education (SPED) Library, Oyo and Gani Bello Library, Federal College of Education, Abeokuta respectively, it disagrees with the findings of Ojebode (2001), and Ojebode (2009) about the libraries of St. Andrew's College of Education, Oyo, Oyo State College of Education and Federal College of Education (Special), Oyo, where gift was the major acquisition method. One major advantage of purchase as a method of acquisition is that it results in the acquisition of premeditated materials following the process of selection. This is as opposed to the gift method where the donor merely gives what he wants to give whether relevant to the receiver-library or not. However, the snag with the purchase system is that less acquisition would be recorded in the face of dwindling book votes.

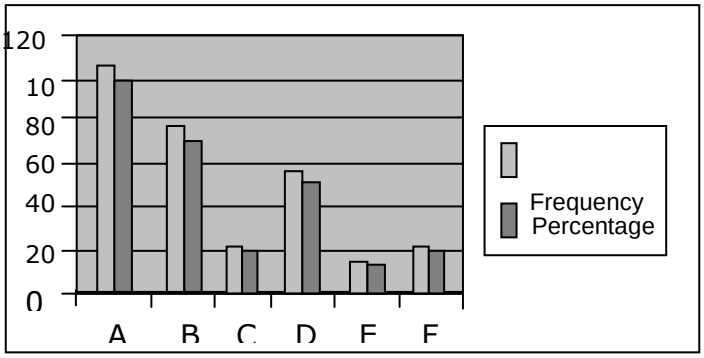

Figure 1: *Methods of Acquiring Information Materials*

Key

A = Purchase
B = Gift/Donation
C = Exchange
D = Bequeath
E = Photocopying
F = Professional Association Membership

5.6. Weeding

Table 4: *Criteria for Weeding*

Option	Frequency	Percentage
Obsolescence	95	87
Poor physical condition	109	100
Low demand/use	0	0
Adhering to policy	0	0
Inadequate space	82	75
Others	0	0

The subjects were required to choose as many options as were applicable to their libraries. It is clear from Table 4 that 'poor physical condition' ranks highest among the criteria for weeding out materials in the studied libraries. Usually, the worn out condition of a book is an evidence of heavy demand. Therefore it is imperative that materials withdrawn on account of poor physical condition are rehabilitated and returned to the shelf if still relevant. Unfortunately, none of the studied libraries has a functional bindery section; rather their bindery needs are usually met by commercial binderies whose business it is not to ensure a quick return of the books to the shelves. None of the subjects chose 'adhering to policy' as a criterion for weeding, a confirmation of the lack of comprehensive collection development policy in the libraries. It is also worrisome that weeding is not a regular exercise in the libraries as witnessed to by the 109 (100%) subjects.

5.7. Inter-library Cooperation

There was a 100% affirmative response to the question "Is your library involved in resource sharing with other academic libraries in Imo State? The reality of dwindling book votes has forced academic libraries all over the world to increase their rate of cooperation for the mutual benefit of their patrons. Aguolu and Aguolu (2002), have noted the increased cooperative activities of libraries at local, national and international levels, linking the development to the realization by librarians that no library

however large or comprehensive can possess all the resources needed to satisfy the needs of its users. It is a good thing that the studied libraries have cued into this global trend.

5.8. Problems of Collection Development

Table 5 shows 'inadequate book vote' as the major problem of collection development in the studied libraries. Some other previous studies have also indicted finance as a key problem in collection development (Bantai, 2002, Oyebode, 2009, Okoro, 2006). Book acquisitions decline in the face of inadequate book votes resulting in heavy dependence on gifts to grow the collection. No library can grow a wholesome collection based on gifts alone since donors give what they want. However, academic libraries in Nigeria have, in recent years, had a respite from the Library intervention programme of the Tertiary Education Trust Fund (TETFund). TETFund makes periodic allocations to academic libraries for the purchase of learning resources. It does appear that many academic institutions in Nigeria now take the TETFund library intervention as a substitute for the traditional book vote allocated in the budgets; hence the budgets no longer reflect the prime place of the book vote.

Also ranking high in the list of problems of collection development is the lack of a coordinating department for all the facets of the collection development function. A coordinating department for collection Development would make for a planned and systematic discharge of the constituent activities. Its absence in the studied libraries suggests that the performance of these activities is haphazard and most likely ineffective. It is equally significant that 53% of the subjects opined that inadequate staff position was a factor against effective collection development in their libraries.

Table 5: *Problems of Collection Development*

Option	Frequency	Percentage
Lack of **comprehensive** policy	48	44
Inadequate book vote	92	84
Lack of a well-organized system of interlibrary cooperation	10	9
Lack of a coordinating department for all aspects of collection development	61	56
Inadequate staff strength	58	53

6. Way Forward

Based on the findings of the study, the following recommendations are made as a way forward in achieving effectiveness in collection development in academic libraries.

A. A formalized comprehensive collection development policy should be developed and operated in academic libraries. The policy will specify the *modus operandi* of all the facets of collection development function. It will therefore serve as a justification for actions taken or not taken in the process of discharging the collection development function. The document should be reviewed periodically for up-to-dateness.

B. The academic libraries should create a Collection Development Department with a mandate to coordinate all collection development activities of selection, acquisition, stock evaluation, weeding and interlibrary cooperation.

C. Increased partnership with the faculty should be explored especially in the determination of materials to acquire. As specialists in their disciplines, faculty members are in a position to make valid judgements on the relevance of texts to be included in the collection. Hence, their increased involvement in materials selection will add to the richness of the library collection.

D. Librarians should press for the re-institution of the book vote in their institutional budgets as well as its release for the purchase of learning and research materials.

E. Weeding should be a periodic exercise in academic libraries to rid the shelves of irrelevant or unusable materials and increase access to usable ones.

F. Academic libraries should own functional binderies for quick rehabilitation of damaged but relevant books for prompt replacement on the shelves.

G. The staff strength of the libraries should be increased by recruiting more staff into these libraries. This will increase effectiveness in the discharge of collection development activities.

7. Conclusion

The quality of the collection remains the litmus test of service delivery effectiveness in the academic library. It is the functional domain of collection development to peg collection quality high. Well-conceived, collection development encompasses a range of activities such as selection, acquisition, user studies, stock evaluation, weeding and interlibrary cooperation. None of these activities is inconsequential in the bid to achieve high quality collection as they all work in synergy. The study identified certain logistic lapses affecting the functioning of collection development in the studied libraries such as lack of written comprehensive collection development policy, lack of a collection development department, low faculty involvement in selection, inadequate book votes, irregular weeding and poor staff strength. Addressing these lapses by implementing the recommendations above is the way forward in enhancing optimal performance of collection development activities in academic libraries.

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Funding and Library Resources in Government Owned University Libraries in Nigeria

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Abstract The main thrust of this study was to investigate funding and library resources in university libraries in Rivers State, Nigeria. Survey research design was adopted for the study. A sample of 105 was used for the study; purposive sampling technique was used to select the sample for the study. Questionnaire was the main instrument used for data collection. The data collected were analysed using one way analysis of variance (ANOVA). The result of the analysis revealed that the perceived source of funding significantly influenced library resources in university libraries in Rivers State, Nigeria in terms of provision of information resources, library facilities provision and maintenance, human resources availability and provision of library services. Based on these findings, it was recommended that librarians should explore other means of funding where necessary to improve their services. Efforts should also be made to address the issues of human resources development, facility procurement and maintenance. Finally, the university librarian should be carried along in the strategic planning of their institutions.

Keywords *Funding; Information Resources; University Libraries; Rivers State*

1. Introduction

1.1. Background to the Study

Universities are veritable tools for the realisation of national development, the development of cultural citizens, promotion of basic research, conversation of knowledge; pursuit and dissemination of knowledge through teaching; provision of intellectual leadership.

The University library helps the university to fulfil its mandate of teaching, learning, research, cultural development through her collections, visual materials, print, non-print materials and computer databases. However, for a university library to remain relevant, it must be stocked with current and relevant information resources to meet the needs of the host institution and other information seekers. This explains the reason why during the "oil boom" era, Nigerian University libraries flourished; library shelves were filled with learning materials in order to sustain the main academic disciplines established by their parent universities. Unfortunately the story is very different today because,

University libraries are faced with the problems of maintaining core library collections, which represent their universities' curricula and the challenges of the emergence of information and communication technology (ICT) into the educational system worldwide.

Library funding is the act of providing or making available financial resources for use in developing and equipping the library, these funds are needed to provide library services, materials and development of human resources. In fact, funding has the capacity to bring about renewal, maintenance, and sustenance, nourishment, durability of university libraries. However the library is invariably a part of a wider university and its budget is negotiated with its parent organization. The parent body is therefore the proprietor that takes full responsibility for its funding. Academic libraries are financed from the budgets of their parent institutions. These funds usually cover only the current expenditure. But sometimes, libraries are supported by government ministries particularly Ministry of Education, non-governmental organisations, donor agencies, Tertiary Education Trust Fund and individuals.

Cursory observations indicate that libraries are gradually losing their credibility and standard, which has brought about an outcry among academics, students and users. This falling standard is attributable to many factors which may include; inadequate funding. Students no longer use the libraries. The materials in these libraries are seen as out dated, while internet facilities are epileptic. If the university libraries receive funds from the various sources mentioned above, then what actually is the problem?

It is however not certain whether or not the financial support given to university libraries has any influence on the development of the library in terms of material and human resources. The main thrust of this study is to find out how the various sources of funds given university libraries contribute to the sustainability of library resources in Rivers State of Nigeria.

2. Purpose of the Study

The purpose of this study was to investigate the influence of the funding on library resources in university libraries in Rivers State, Nigeria. The study specifically aimed:

1) To determine the influence of government subvention on library resources in university libraries in Rivers State.
2) To examine the influence of internally generated revenue from the library on library resources in university libraries in Rivers state.
3) To determine the influence of Tertiary Education Trust Fund on library resources in university libraries in Rivers state.

3. Research Methods

The survey research design was adopted for this study. Three (3) university libraries in Rivers state were selected for the study. They are Rivers State University of Science and Technology library (RSUST), University of Port Harcourt (UNIPORT) and Ignatius Ajuru University of Education, Port Harcourt (IAUOE) the entire population was used for the study as the number of library staff was small, the sample of this study comprised 105 library staff. Thus, all the professional and Para – professional librarians in these libraries constituted the sample (See Table 1)

Table 1: *Population Showing Number of Library Staff in Rivers State University of Science and Technology, University of Port Harcourt and Ignatius Ajuru University of Education, Port Harcourt*

S/N	Library	Total Library staff
1.	RSUST	34
2.	IAUOE	15
3.	UNIPORT	56
	Total	105

Source: (RSUST, UNIPORT and IAUOE Libraries 2015)

For The Purpose of data collection, a structured questionnaire titled funding and library resources in university library questionnaire (PFLSIULQ) was used. The questionnaire consisted of two sections (A and B). Section A of the questionnaire deals with demographic data of respondents while section B was used to measure funding and library resources.

To ascertain that the research instrument measured consistently what it was designed to measure, the instrument was trial tested using twenty (20) subjects who were randomly selected outside the population under study. The data generated were analysed to establish its internal consistency using the Cronbach alpha reliability estimates. Cronbach alpha is useful to estimate the proportion of variance that is systematic and consistent in a set of scores. The result shows that the reliability estimate range estimate of the sub-scales ranged from 0.70 to 0.89, hence the instrument was adjudged reliable enough to be used for the study.

The major dependent variable of the study was the state of library resources in University libraries. This major dependent variable had four sub-variables, namely; information resources, human resources, library facilities and library services. Each of these variables was measured on a four-point rating scale using six questionnaire items. Based on the four point scale, the minimum and maximum scores obtainable by respondents were 4 and 24 respectively. Summaries of descriptive statistical analysis are presented in Table 2.

Table 2: *Descriptive Statistics for All Continuous Variables in the Study*

S/No.	Variable	N	$\bar{X}$	SD
1	government subvention	95	18.21	4.23
2	library internally generated revenue	95	17.64	4.13
3	tertiary education tax fund	95	19.44	4.93
4	Information resources	95	20.68	3.49
5	Human resources	95	21.08	3.38
6	library facilities	95	18.17	3.18
7	library services	95	20.32	3.52

4. Presentation of Results

4.1. Hypothesis One

There is no significant influence of government subvention on library resources in university libraries in Rivers State.

The independent variable in this hypothesis is government subvention (classified into highly funded, moderately funded, and lowly funded) while the dependent variable is library resources in university libraries which is divided into Information resources, human resources, library facilities and library services. The classification of the government subvention under funding of university libraries was

based on their mean scores from the university libraries funding questionnaire. Respondents that scored above the mean were classified as being “Highly funded”, while those below the mean were classified as “Lowly funded”, and respondents whose scored about the mean were classified as “Moderately funded”. One-Way Analysis of Variance statistical technique was employed in testing the hypothesis. See the results of the analysis in Tables 3 and 4.

Table 3: *Descriptive Statistics for the Influence of Government Subvention on Library Resources in University Libraries*

S/No.	Variable	Level of Funding	N	$\bar{X}$	SD
1	Information resources	Lowly funded	22	18.05	4.87
		Moderately funded	41	20.71	2.67
		Highly funded	32	22.47	1.83
		Total	95	20.68	3.49
2	Human resources	Low funded	22	18.32	4.41
		Moderately funded	41	21.20	2.86
		Highly funded	32	22.84	1.51
		Total	95	21.08	3.38
3	Library facilities	Lowly funded	22	16.23	3.75
		Moderately funded	41	17.46	2.62
		Highly funded	32	20.41	1.93
		Total	95	18.17	3.18
4	Library services	Lowly funded	22	18.09	4.17
		Moderately funded	41	20.15	3.03
		Highly funded	32	22.06	2.69
		Total	95	20.32	3.52

Table 4: *One-Way ANOVA for the Influence of Perceived Government Subvention on Library Resources in University Libraries*

S/No.	Variable	Source of Variation	Sum of Squares	Df	MS	F
1	Information resources	Between Groups	255.115	2	127.558	13.224*
		Within Groups	887.411	92	9.646	
		Total	1142.526	94		
2	Human resources	Between Groups	267.896	2	133.948	15.300*
		Within Groups	806.431	92	8.755	
		Total	1073.326	94		
3	Library facilities	Between Groups	263.528	2	131.764	17.677*
		Within Groups	685.778	92	7.454	
		Total	949.305	94		
4	Library services	Between Groups	207.711	2	103.856	9.986*
		Within Groups	956.815	92	10.400	
		Total	1164.526	94		

*significant at .05; critical F=3.09

Results of analysis in Table 4 show that the calculated F ratio for the influence of perceived government subvention on library resources in university libraries in terms of Information resources (13.224), human resources (15.300), library facilities (17.677) and in terms of library services (9.986) were each greater than the critical F ratio of 3.09 at .05 level of significance, with 2 and 92 degrees of freedom. This means that, government subvention funding as perceived significantly influence library resources in university libraries in Rivers State in terms of Information resources, human resources, library facilities and use of library services. By these results the null hypothesis was rejected and the alternate upheld.

A Post-Hoc comparison test was carried out using Fisher's Least Significant Difference (LSD) method to discover the pair-wise group means difference responsible for the significant influence. Results of the analysis are presented in Table 5.

Table 5: *Fisher's LSD for the Influence of Government Subvention on Library Resources in University Libraries*

S/No.	Variable	Level of Funding	High (n=32)	Moderate (n=41)	Low (n=22)
1	Information resources	Highly funded	22.47a	1.76b	4.42
		Moderately funded	2.41*c	20.71	2.66
		lowly funded	5.19*	3.24*	18.05
		(MSW=9.646)			
2	Human resources	Highly funded	22.84	1.64	4.52
		Moderately funded	2.34*	21.20	2.88
		Lowly funded	5.51*	3.69*	18.32
		(MSW=8.755)			
3	Library facilities	Highly funded	20.41	2.95	4.18
		Moderately funded	4.56*	17.46	1.23
		Lowly funded	5.50*	1.71	16.23
		(MSW=7.454)			
4	library services	Highly funded	22.06	1.91	3.87
		Moderately funded	2.51*	20.15	2.06
		Lowly funded	4.35*	2.42*	18.09
		(MSW=10.400)			

*significant at .05

(a) Group Means are along principal diagonals
(b) Differences among group means are above the principal diagonals
(c) t-values are below the principal diagonals.

Results of analysis in Table 5 show that there were significant pair-wise group differences as follows: library services – highly funded versus moderately funded (2.41, p<.05), highly funded versus lowly funded (5.19, p<.05) and moderately funded versus lowly funded (3.24, p<.05), human resources - highly funded versus moderately funded (2.34, p<.05), highly funded versus lowly funded (5.51, p<.05) and moderately funded versus Lowly funded (3.69, p<.05); Library facilities – highly funded versus moderately funded (t=4.56, p<.05) and highly funded versus lowly funded (5.50; p<.05) and library services– highly funded versus moderately funded (t=2.51, p<.05), highly funded versus Lowly funded (2.34, p<.05); moderately funded versus lowly funded (t=2.42, p<.05). If the results are considered using the group means there is an indication that it was university libraries that were highly funded through government subvention that sustained it services and resources than their counterparts. That is the higher the level of government subvention funding of university libraries the better the level of their resources.

4.2. Hypothesis Two

Library internally generated revenue has no significant influence on library resources in university libraries in Rivers State.

The independent variable in this hypothesis is perceived library internally generated revenue (classified into highly funded, moderately funded, and lowly funded) while the dependent variable is university library resources in terms of Information resources, human resources, library facilities and library services. The classification of the perceived library internally generated revenue funding of university libraries was based on their mean scores from the university libraries funding questionnaire. Respondents that scored above the mean were classified as being "Highly funded", while those

scored below the mean were classified as “Lowly funded”, and respondents whose scored about the mean were classified as “Moderately funded”. One-Way Analysis of Variance statistical technique was employed in testing the hypothesis. See the results of the analysis in Tables 6 and 7.

Table 6: *Descriptive Statistics for the Influence of Perceived Library Internally Generated Revenue on Library Resources in University Libraries in Rivers State*

S/No.	Variable	Level of Funding	N	$\bar{X}$	SD
1	Information resources	Lowly funded	22	18.08	4.89
		Moderately funded	34	20.09	2.64
		Highly funded	39	22.69	1.51
		Total	95	20.68	3.49
2	Human resources	Low funded	22	18.36	4.76
		Moderately funded	34	20.76	2.51
		Highly funded	39	22.90	1.59
		Total	95	21.08	3.38
3	Library facilities	Lowly funded	22	16.05	3.65
		Moderately funded	34	17.35	2.59
		Highly funded	39	20.08	2.21
		Total	95	18.17	3.18
4	library services	Lowly funded	22	18.00	4.07
		Moderately funded	34	18.82	2.89
		Highly funded	39	22.92	1.48
		Total	95	20.32	3.52

Table 7: *One-Way ANOVA for the Influence of Perceived Library Internally Generated Revenue on Library Resources in University Libraries in Rivers State*

S/No.	Variable	Source of Variation	Sum of Squares	Df	MS	F
1	Information resources	Between Groups	322.529	2	161.264	18.093*
		Within Groups	819.998	92	8.913	
		Total	1142.526	94		
2	Human resources	Between Groups	294.528	2	147.264	17.396*
		Within Groups	778.798	92	8.465	
		Total	1073.326	94		
3	Library facilities	Between Groups	263.817	2	131.908	17.704*
		Within Groups	685.488	92	7.451	
		Total	949.305	94		
4	library services	Between Groups	458.816	2	229.408	29.907*
		Within Groups	705.710	92	7.671	
		Total	1164.526	94		

*significant at .05; critical F=3.09

Results of analysis in Table 7 show that the calculated F ratio for the influence of perceived library internally generated revenue on library resources in university libraries in terms of Information resources (18.093), human resources (17.396), library facilities (17.704) and in terms library services (29.907) were each greater than the critical F ratio of 3.09 at .05 level of significance, with 2 and 92 degrees of freedom. This means that, perceived library internally generated revenue funding as perceived significantly influence on library resources in university libraries in Rivers State in terms of Information resources, human resources, library facilities and use of library services. By these results the null hypothesis was rejected and the alternate uphold.

A Post-Hoc comparison test was carried out using Fisher's Least Significant Difference (LSD) method to discover the pair-wise group means difference responsible for the significant influence. Results of the analysis are presented in Table 8.

Results of analysis in Table 8 show that there were significant pair-wise group differences as follows: library services – Highly funded versus moderately funded (3.71, p<.05), highly funded versus lowly funded (5.76, p<.05) and moderately funded

Table 8: *Fisher's LSD for the Influence of Perceived Library Internally Generated Revenue on Library Resources in University Libraries*

S/No.	Variable	Level of Funding	High (n=39)	Moderate (n=34)	Low (n=22)
1	Information resources	Highly funded	22.69a	2.60c	4.61
		Moderately funded	3.71*c	20.09	2.01
		lowly funded	5.76*	2.45*	18.08
		(MSW=8.913)			
2	Human resources	Highly funded	22.90	2.14	4.54
		Moderately funded	3.15*	20.76	2.40
		Lowly funded	5.82*	2.96*	18.36
		(MSW=8.465)			
3	Library facilities	Highly funded	20.08	2.73	4.03
		Moderately funded	4.27*	17.35	1.30
		Lowly funded	5.52*	1.73	16.05
		(MSW=7.451)			
4	Library services	Highly funded	22.92	4.10	4.92
		Moderately funded	6.31*	18.82	.82
		Lowly funded	6.65*	1.08	18.00
		(MSW=7.671)			

*significant at .05

(a) Group Means are along principal diagonals
(b) Differences among group means are above the principal diagonals
(c) t-values are below the principal diagonals.

versus lowly funded (5.76, p<.05); human resources – Highly funded versus moderately funded (t=3.15, p<.05), highly funded versus lowly funded(5.82, p<.05) and moderately funded versus lowly funded (2.96; p<.05) library facilities – Highly funded versus moderately funded (4.27, p<.05) and highly funded versus lowly funded (5.52, p<.05); library service – Highly funded versus moderately funded (t=6.31, p<.05), highly funded versus lowly funded (6.65, p<.05). If the results are considered using the group means there is an indication that it was university libraries that were highly funded through perceived library internally generated revenue that sustained it services and resources than their counterparts. That is, the higher the level of perceived library internally generated revenue funding of university libraries the better the level of their sustainability.

4.3. Hypothesis Three

Perceived tertiary Education Trust Fund assistance has no significant influence on library resources in university libraries in Rivers State.

The independent variable in this hypothesis is perceived tertiary Education Trust Fund assistance (classified into highly funded, moderately funded, and lowly funded) while the dependent variable is university library resources through Information resources, human resources, library facilities and library services. Respondents that scored above the mean were classified as being "highly funded",

while those scored below the mean were classified as “lowly funded”, and respondents whose scored about the mean were classified as “moderately funded”. One-Way Analysis of Variance statistical technique was employed in testing the hypothesis. See the results of the analysis in Tables 9 and 10.

Table 9: *Descriptive Statistics for the Influence of Perceived Tertiary Education Trust Fund Assistance on Library Resources in University Libraries*

S/No.	Variable	Level of Funding	N	$\bar{X}$	SD
1	Information resources	Lowly funded	12	15.42	4.72
		Moderately funded	35	20.09	2.47
		Highly funded	48	22.44	2.05
		Total	95	20.68	3.49
2	Human resources	Low funded	12	16.33	4.52
		Moderately funded	35	20.51	2.77
		Highly funded	48	22.69	1.97
		Total	95	21.08	3.38
3	Library facilities	Lowly funded	12	14.58	3.20
		Moderately funded	35	17.89	2.89
		Highly funded	48	19.27	2.68
		Total	95	18.17	3.18
4	library services	Lowly funded	12	15.83	3.19
		Moderately funded	35	19.06	3.07
		Highly funded	48	22.35	2.25
		Total	95	20.32	3.52

Table 10: *One-Way ANOVA for the Influence of Perceived Tertiary Education Trust Funds Assistance on Library Resources in University Libraries*

S/No.	Variable	Source of Variation	Sum of Squares	Df	MS	F
1	Information resources	Between Groups	493.054	2	246.527	34.921*
		Within Groups	649.472	92	7.059	
		Total	1142.526	94		
2	Human resources	Between Groups	405.604	2	202.802	27.942*
		Within Groups	667.722	92	7.258	
		Total	1073.326	94		
3	Library facilities	Between Groups	215.367	2	107.683	13.498*
		Within Groups	733.939	92	7.978	
		Total	949.305	94		
4	Library services	Between Groups	495.995	2	247.997	34.128*
		Within Groups	668.532	92	7.267	
		Total	1164.526	94		

*significant at .05; critical F=3.06

Results of analysis in Table 10 shows that the calculated F ratio for the influence perceived tertiary Education fund assistance on library resources in university libraries in terms of Information resources (34.921), human resources (27.942), library facilities (13.498) and library services (34.128) were each greater than the critical F ratio of 3.09 at .05 level of significance, with 2 and 92 degrees of freedom. This means that, Tertiary Education fund assistance significantly influence library resources in university libraries in Rivers State in terms of Information resources, human resources, library facilities and library services. By these results the null hypothesis was rejected and the alternate uphold.

A Post-Hoc comparison test was carried out using Fisher’s Least Significant Difference (LSD) method to discover the pair-wise group means difference responsible for the significant influence. Results of the analysis are presented in Table 11.

Results of analysis in Table 11 shows that there were significant pair-wise group differences as follows: Information resources – Highly funded versus moderately funded (3.98, p<.05) and highly funded versus lowly funded (8.26, p<.05) and moderately funded versus lowly funded (5.25, p<.05); human resources- highly funded versus moderately funded (3.63, p<.05), highly funded versus lowly funded (7.31, p<.05) and moderately funded versus lowly funded (4.64, p<.05); library facilities- highly funded versus moderately funded (2.16, p<.05), highly funded versus lowly funded (5.15, p<.05) and moderately funded versus lowly funded (3.52, p<.05) and library services – Highly funded versus moderately funded (t=5.48, p<.05), highly funded versus lowly funded (7.49, p<.05) and moderately funded versus lowly funded (3.59, p<.05) If the results are considered using the group means there is an indication that it was university libraries that were highly funded through Tertiary education Fund assistance that sustained it services and resources than their counterparts. That is the higher the level of Tertiary Education fund assistance of university libraries the better the library resources

Table 11: *Fisher's LSD for the Influence of Perceived Tertiary Education Funds on Library Resources in University Libraries*

S/No.	Variable	Level of funding	High (n=48)	Moderate (n=35)	Low (n=12)
1	Information resources	Highly funded	22.44	2.35	7.02
		Moderately funded	3.98*	20.09	4.67
		lowly funded	8.26*	5.25*	15.42
		(MSW=7.059)			
2	Human resources	Highly funded	22.69	2.18	6.36
		Moderately funded	3.63*	20.51	4.18
		Lowly funded	7.31*	4.64*	16.33
		(MSW=7.258)			
3	Library facilities	Highly funded	19.27	1.36	4.69
		Moderately funded	2.16*	17.89	3.31
		Lowly funded	5.15*	3.52*	14.58
		(MSW=7.978)			
4	Library services	Highly funded	22.35	3.29	6.52
		Moderately funded	5.48*	19.06	3.23
		Lowly funded	7.49*	3.59*	15.83
		(MSW=7.267)			

*significant at .05

(a) Group Means are along principal diagonals
(b) Differences among group means are above the principal diagonals
(c) t-values are below the principal diagonals.

5. Discussion of Results

5.1. Hypothesis One

Perceived government subvention and library resources in university libraries in Rivers state: The result shows that there is a significant influence of government subvention on library resources in university libraries in Rivers state. The result also indicates that, government subvention influences Information resources, library facilities, human resources and library services.

This result is in agreement with Fawowe (2006) in his study of funding academic libraries in Nigeria: a survey of some university libraries in Nigeria. The study revealed that, university libraries depend entirely on government funding to survive. The result of the study is also in line with the findings of Ubogu and Okiy (2010) which revealed that the main source of funding academic libraries is government subvention. Thus, perceived government subvention has an influence on university

library sustainability, the higher the level of perceived government subvention, the higher the level of library efficiency in form of it resources.

5.2. Hypothesis Two

Perceived library internally generated revenue and university library resources in Rivers state: The findings of the study shows that, there is a significant influence of perceived library internally generated revenue on library resources in university libraries in Rivers state. The result also shows that, perceived library internally generated revenue has a high influence on library facilities, human resources and library services. Little wonder, Okojie (1999) stated the federal government through the NUC has consciously directed all federal universities to explore ways of generating revenues internally. However the study is in agreement with Zaid (2008) who revealed in his study of internally generated revenue (IGR) by university libraries in Nigeria. That, in order for Nigerian academic libraries to survive in the 21st century, there is need for some internally generated revenue which he said will make Nigerian libraries services efficient, viable and relevant. Thus university libraries with various means of internally generated revenue, tends to have a greater level of library resources sustainability.

5.3. Hypothesis Three

Perceived tertiary Education Trust Fund and library resources in Rivers state: The result shows that, there is significant influence of perceived tertiary Education Trust Fund (TETFUND) on the state of library resources in university libraries in Rivers state in terms of Information resources, human resources, library facilities and library services. This study is consistent with that of Odunsanya and Osinulu (2004) whose findings revealed that, prior to the intervention of the education trust fund (ETF), budgetary allocation to the library was abysmally low and hence the library was not able to perform many of its functions satisfactorily. With the intervention of the ETF, the library was able to purchase computers equipment and library processing tools needed for the effective functioning of the library. Similarly Osinulu and Daramola (2011) who studied government intervention in the funding of Nigerian university libraries: the role of the Tertiary Education Trust Fund (TETF) revealed that the Tetfund agency came at the right time to alleviate the inadequate funding experienced in the education sector and the university library in particular. They further revealed that, acquisition of learning resources such as journals and ICT facilities by the participating libraries in the south west has been reinforced and greatly enriched. Thus, the greater the support received the higher the level of the resources

6. Conclusion

The study investigated funding and library resources in university libraries in Rivers State; perceived government subvention, perceived library internally generated revenue, perceived tertiary Education Trust Fund, were studied as sub variables of funding while information resources, human resources, library facilities and library services were studied as sub variables of library resources.

Based on the result of the study the following conclusions were reached, perceived funding significantly influenced library resources in university libraries in terms of provision of Information resources, library facilities, human resources and provision library services. The result of this survey has also revealed that in Nigeria the main source of academic library funding is from the university budget which invariably comes from the government. However, the time has come when academic libraries should begin to think of alternative sources of funding to supplement whatever is provided by the government. At present, although libraries make some money from overdue fines, photocopying and charges for lost books, such money is paid into the universities central account (library internally generated revenue). Perhaps, academic libraries now need to make a case for the retention of these fees and fines in their account. For example, the money realised from photocopying can be used to

maintain the machines which will enable it to be in constant working condition. This will increase the amount realised from this source. It will also provide some more money which can be used to maintain other library services. Another source of potential revenue that can be tapped in the library is through binding and the two libraries studied have a functional bindery section. This section can be expanded to cater for people outside the university environment.

Endowments and Foundations as a way of attracting more funds specifically into university libraries must be given a trial. Adequate funding of libraries by universities should be considered a basic necessity for the effective development of these libraries. It is for this reason that the National Universities Commission has recommended that 10 percent of the university budget be allocated to the library.

Faculty members who serve on important committees such as the Senate Estimates Committee or the Finance and General Purposes Committee of the universities must join in advocating for adequate funding for the libraries. After all, the materials and services being provided by the academic libraries are meant to serve these faculty members and their students. Perhaps, there is no better time to start this campaign than now when staff and students cannot afford any extra money to purchase books and journals which they need. It must always be made clear to the university community, particularly the administrators that library services cannot be run successfully on token and inadequate funding.

Recommendations

1) Librarians in universities should be carried along in the strategic planning of the institution to enable them meet the set goals and objectives of the institution.
2) Continuous training and re-training of academic library staff is recommended.
3) Academic library authorities should make fund available in order to acquire materials.
4) Comprehensive assessment of library materials should be carried out with adequate participation by users.
5) Where there are in-adequate facilities, efforts should be made to address them.
6) Evaluation process should be made available electronically giving opportunities for all categories of users to participate.
7) Librarians should explore other means of funding.

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Research Article | Open Access

Analytical Study of Title Wise Usage of UGC INFONET Consortium Journals at University of Hyderabad

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Abstract This paper discusses in detail the title wise usage in the 17 databases for which title wise usage is available. It is noticed that 100% titles usage in 4 databases. On an average for 3 years (2012-2014) 82.25% of titles are used. Most highly used databases Science Direct, ACS & JSTOR are contributing 62.96% on an average for 3 years and are in the range above 10%. The databases Wiley Black well, RSC & Springer Link which are moderately used recorded 21.02% and are in the range of above 5%. The highly used databases are from sciences. The rest of the databases which are less used are in the range of below 5% and thus contributing 16%. On an average titles with 0.22% contributed to the 27.95% usage, while 1.23% titles contributed to 22.31% usage and 98.57% titles contributed to 49.73% usage which means nearly 50% usage. Nearly 1.45% titles have contributed to 50.26%. Project Euclid is the least used database. H-index is a form of measuring the research output of Scientists. The research output of science faculty of university of Hyderabad is cited as an example. The UGC consortium is highly benefitting the Universities in increasing the research output. In order to increase the research output the UGC- INFONET consortium should group the universities using the same databases as per the high usage, moderate usage and less usage title wise and pick & choose the titles so that cost can be brought down as there are also titles unused.

Keywords *UGC-INFONET Consortium; University of Hyderabad; Usage; E-resources*

1. Introduction

The consortia can be defined as a group of organizations coming together for achieving a common goal. The main idea of forming a consortium is to come together by forming a group and achieving that which cannot be achieved individually. The ICT developments in information retrieval system and speedy access to information through technologies have made the libraries to come together for licensing the information available in digital form.

Library consortium is a group of libraries coming together with a common interest to access e resources by a number of libraries without additional fees to access number of e resources as the

member institutions can share the resources. When more and more libraries join the costs come down thereby libraries are benefitted and it is a good bargain with publishers.

1.2. Important Consortia

CSIR consortia: The 40 national laboratories of Council of Scientific and Industrial Research are formed to suit R&D work in the areas of Engineering, Biological, Chemical, Physical, Environmental and Information Sciences. The Indian Astrophysics Consortium named Forum for Resource Sharing in Astronomy (FORSA) is a homogeneous group of members and the libraries have a common area of interest.

Other popular consortia are namely the Indian Council of Agricultural Research (ICAR), State Agricultural Universities, Indian Space Research Organisation (ISRO), Defense Research and Development Organisation (DRDO), AICTE etc.

The Ministry of Human Resource Development (MHRD) has set up the Indian National Digital Library in Science and Technology (INDEST) Consortium. http://panit.iitd.ac.in/indest

The consortia approach to online access to e-resources plays an important role in the higher education level. As a backdrop to this situation, the UGC planned and established the information and Library Network (INFLIBNET), which is supposed to take care of networking libraries and their resources in the higher education institutions across the country.

The establishment of INFLIBNET (Information Library Networks) by UGC in 1988 is a Great achievement in the history of scholarly communication with regard to networking of academic institutions and libraries as well as resources in the country. Among the consortia the most prominent for the academic community are INDEST in 2002 and UGC INFONET E-journal consortia since 2004 launched by Dr APJ Abdul Kalam, the then President of India. These consortia have been hosting a large number of electronic resources to their member institutions. UGC -INFONET Digital Library Consortium under the auspices of UGC and the INFLIBNET (Information and Library Network) Centre, Ahmedabad emerged as gateway for reaching the academic community with the scholarly online resources in India since 2004 at free of cost. Initially provided access to online databases to 50 universities in the first phase and now has covered 421 institutions in different phases. University of Hyderabad was included in the first phase among the 50 universities.

Presently the consortium is providing online access to 11300 **plus** peer-reviewed current journals + back files, monographs through 24 full text databases, including 6 bibliographic databases covering almost all the disciplines of University of Hyderabad apart from subscription to other databases by the university covering approximately 23700 e- resources.

2. Review of Literature

Ever since library consortia made their way into library management scenario, many libraries have gained access to e-resources. Much of the published literature on library consortia deals with the structure and advantages; and only a few studies deal with the levels of usage. Some of the relevant papers have been reviewed for the sake of this study and are given below.

Vishala and Bhandi (2006) [8] studied the “availability of Library electronic journals through UGC-INFONET consortia and found that out of 61 full text titles available in library science 55 titles are provided by UGC- INFONET from various publishers and stated that every year more and more publishers are adding new titles and publishing e journals and thus through UGC INFONET consortia wider access to e content is provided.

Walmiki, Ramakrishna Gowda and Prithviraj (2010) [9] in their study about Awareness of UGC-INFONET consortium by the faculty members of Karnataka State Universities revealed that 35.79% of faculty members are aware of UGC- INFONET consortium and use it whereas 35.99% are aware but do not use and 24.22% are not at all aware about the UGC INFONET consortium. They found that majority of the faculty who use frequently belong to science discipline compared to social sciences and Humanities.

Mukherjee, B. and Prashant Kumar (2010) [4] observed that there is heavy demand for more e-journals although 61.90% are satisfied with the existing model of UGC- INFONET consortium in their study on "use of UGC INFONET consortium by the research scholars of Banaras Hindu University, Varanasi: A case Study". They also state that they need training and orientation for the use of e-journals. It is to mention Banaras Hindu University was covered by UGC- INFONET consortium in the first phase of 50 universities.

Dinesh, Rai and Jagdish Aurora (2010) [6] conducted a study on the "Implications of SUSHI analysis of usage statistics: A case study of UGC INFONET DIGITAL library Consortium mentioned that COUNTER (Counting Online Usage of Networked Electronic Resources) IN 2002) and SUSHI (Standardised Usage of Statistics Harvesting Initiative) are widely accepted standards for usage statistics. COUNTER does not support automated harvesting of usage data. SUSHI addresses the automatic import of usage data which saves the time of the staff.

Natarajan, K. et al. (2010) [5] revealed in his study that more than 50% of the users were of the opinion that relevance of e-journals covered by e-journals consortium was satisfactory.

Moorthy and Pant (2012) [3] made an attempt in Assessing the Use of Electronic Resources in DRDO Institutes: An analytical study of DRDO E-Journals Consortium and expressed that overall the consortium has been perceived as the major facilitator in providing the required information within the least possible time. Libraries can stop print journals and subscribe to e –journals through consortium availing deep discounts. An Amount of Rs 5 crore was saved by DRDO labs in the year 2009. This is recurring annually. The download statistics and usage analysis show that R&D community of DRDO is utilizing the resources in a positive way and left a good impact in their minds.

Doulat (2014) [2] studied the Trends in Acquisition and Usage of Indian Institute of Technology Libraries by examining web sites, annual report of Ministry of Human Resources Development, IITs and INDEST consortium and COUNTER data provided by publishers and found that E-Resources are heavily used in IITs as the number of downloads has increased from 32, 33,818 to 76, 71,691 articles reflecting a growth rate of 135% over a period of 8 years (2004-2011).

Baladhandayutham [1] (2014) attempted to know the use of UGC –INFONET journals by the faculty members, research scholars and students of Manonmaniam Sundaranar University, Tirunelveli and expressed that 80.91% of the respondents are aware of the UGC INFONET journals. Three fourths of the respondents are satisfied with the use of UGC INFONET journals. One third of the respondents use the INFONET journals daily.

From the above it is clear that the Consortia are best method for accessing e-journals and when the libraries are facing budget crisis. COUNTER & SUSHI standards are best methods for collecting usage data and knowing whether all the tiles are used or not. Hence this Particular studies.

3. Scope and Methodology

This paper covers the title wise usage data of UGC -INFONET CNSORTIUM of University of Hyderabad which was included by the INFLIBNET in the first phase of consortia covering 50

Universities. The University has good ICT environment and has to it's the first University Library to automate its in house operations. The University is always maintaining first five positions among other Universities in the consortium with regards to high usage. In the year as mentioned by Jagdish Aurora (2010) the highest usage for ACS in the year 2011 was recorded for University of Hyderabad and in the year 2013 the University received highest usage award for ACS in 2013 by the Publisher American Chemical Society (User meet at Hyderabad). This paper studies the title wise usage to identify highly used titles, moderately used titles, less used titles from 17 full text databases for the period of 3 years from 2012-2014 for which title wise usage statistics were available. The data was obtained from the Consortium usage portal uploaded by Publisher using SUSHI standards. The Titles are categorised as highly significant, significant and less significant titles based on their extent of full text downloads.

EPW is excluded as title wise statistics is not provided.

4. Objectives

- To know the percentage of Usage of titles as against availability of titles
- To observe the extent of highly used titles moderately used, less used titles.
- To know the highly significant titles, significant titles, less significant titles based on their full text downloads for each of 3 years (2012-2014).

Table 1: *Titles Available Verses Titles Used for the Period 2012-2014*

Database	2012 Titles Available	Titles (Used)	2013 Titles Available	Titles (Used)	2014 Titles Available	Titles (used)	2012-14 Average % of Used titles for 3 years
ACS	51	(51)	52	(52)	54	(54)	100%
AIP/APS	34	(34)	39	(38)	44	(44)	98.15%
AR (Annual Reviews)	38	(38)	40	(40)	39	(39)	100%
CUP	410	(219)	456	(219)	496	(235)	50.84%
IOP	111	(96)	117	(100)	120	(93)	83.16%
JSTOR	2150	(1500)	2150	(1602)	2400	(1828)	73.49%
Nature	19	(19)	23	(22)	137	(113)	92.71%
OUP	302	(254)	329	(261)	273	(273)	87.67%
Portland Press	9	(9)	10	(9)	6	(6)	90%
Project Euclid	42	(18)	44	(23)	45	(20)	46.52%
Project Muse	564	(408)	581	(435)	614	(448)	73.39%
RSC	47	(44)	51	(46)	51	(47)	92%
Science Direct	1943	(1905)	1931	(1749)	1728	(1641)	94.53%
SIAM	13	(13)	14	(14)	15	(15)	100%
Springer Link	2731	(1621)	2843	(1801)	3091	(1820)	60.53%
Tailor& Francis	1097	(1097)	1364	(1364)	1353	(1353)	100%
Wiley Blackwell	2171	(1211)	2330	(1280)	2483	(1366)	55.24%
Total	11732	8537	12374	9055	12949	9395	82.24%

Table 2: *Percentage of Downloads Against Total Downloads for the Period 2012-14*

Database	2012 % of Downloads to total downloads	2013 % of Downloads to total downloads	2014 % of Downloads to total downloads	Average % of downloads for 3 years from 2012-2014.
ACS	**145423 (16.59%)**	**155284 (17.21%)**	**145715 (15.07%)**	**(16.29%)**

AIP/APS	29334 (3.35%)	32644 (3.62%)	29924 (3.09%)	(3.35%)
AR	8775 (1.0 %)	10884 (1.21%)	6520 (0.67%)	(0.96%)
CUP	5189 (0.59%)	4352 0.48%)	7086 (0.73%)	(0.6%)
IOP	12068 (1.38)	12706 1.41%)	11447 (1.18%)	(1.32%)
JSTOR	**129054 (14.72)**	**139387 (15.45%)**	**152509 (15.77%)**	**(15.31%)**
Nature	9703 (1.11)	17492 1.94%)	40379 (4.17%)	(2.41%)
OUP	27321 (3.12%)	22294 (2.47%)	28554 (2.95%)	(2.85%)
Portland Press	2113 (0.24 %)	1182 (0.13%)	1439 (0.15%)	(0.17%)
Project Euclid	63 (0.01 %)	91 (0.01%)	81 (0.01%)	(0.01%)
Project Muse	10013 (1.14%)	12577 (1.39%)	9310 (0.96%)	(1.16%)
RSC	50561 (5.77%)	53502 (5.93%)	60884 (6.29%)	(6.0%)
Science Direct	**300797 (34.32%)**	**268989 (29.82%)**	**289452 (29.93%)**	**(31.36%)**
SIAM	53 (0.01 %)	290 (0.03%)	282 (0.03%)	(0.02%)
Springer Link	42870 (4.89%)	64078 (7.10%)	57651 (5.96%)	(5.98%)
Tailor& Francis	20779 (2.37%)	27254 (3.02%)	39254 (4.06%)	(3.15%)
Wiley Blackwell	82431 (9.40%)	79029 (8.76%)	86698 (8.96%)	(9.04%)
Total downloads	**876547 (100%)**	**902035 (100%)**	**967135 (100%)**	100 %

5. Analysis of Data

It is noticed from the Table 1, as per availability of titles that there is 100% usage of titles in the 4 databases ACS, AR, SIAM & Taylor & Francis on an average for 3 years. The 12 databases AIP/APS, CUP, IOP JSTOR Nature, OUP, Portland Press, Project Muse, RSC, Science Direct, and Springer Link & Wiley Blackwell are in the usage range of 98.15% to 50.84% thus accounting for more 50% usage. Only one database Project Euclid is below 50% usage i.e. 46.52%.

In the Table 2 for year 2012 science direct recorded 34.32% usage followed by ACS 16.59% and JSTOR 14.72% thus contributing 65.63% to the total and Wiley Blackwell 9.40%, Springer Link 4.89% and RSC 5.77% contributing 20.06% and other 11 databases contributing to 14.52%. In the year 2013 Science direct recorded 29.82% followed by ACS 17.21% and JSTOR 15.45% contributing 62.48% to the total and Wiley Blackwell 8,76% Springer Link 7.10% RSC 5.93% contributing 21.79% and other databases 11 databases contributing 15.71%. In the year 2014 Science direct recorded 29.93% followed by JSTOR 15.77% and ACS 15.07% contributing 60.67% to the total and Wiley Blackwell 8.96% followed by RSC 6.29% and Springer Link 5.96% contributing 21.21% to the total percentage and other 11 databases contributing 18%.

Science direct has always been retaining the first position but for next two years comparatively the downloads are lesser than 2012 because in the year 2012 the library had subscribed for additional 13

subject collection which increased the usage and downloads for Science direct. In the year 2014 JSTOR occupied the second position followed by ACS. Similarly the priority changed followed by Wiley Blackwell, RSC and Springer Link.

In the Table 2 on an average % for 3 years (2012-2014) the three databases Science direct, ACS & JSTOR recorded 62.96% and are in the range above 10%. The databases Wiley Black well, RSC & Springer Link recorded 21.02% and are in the range of above 5%. The rest of the databases are in the range of below 5% and thus contributing 16%.

Thus the three databases Science direct (31.36%), ACS (16.29%) & JSTOR (15.31%) are considered to be highly used databases totalling to 62.96%. Wiley Blackwell (9.04%), RSC (6.0%) & Springer Link (5.98%) are considered to be moderately used databases totalling to 21.02% and rest 11 databases are considered to be less used databases totalling to 16%. Among the 11 it is to mention that Project Euclid is the least used database contributing to 0.01% among the 11.

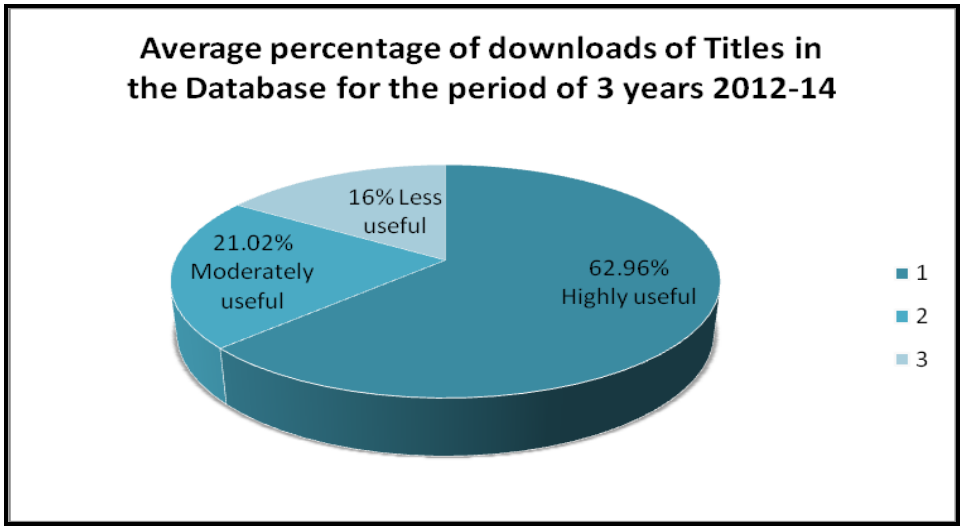

Figure 1: *Pie Chart Depicting the Average Percentage of Downloads of Highly Useful, Moderately Useful and Less Useful Databases*

Table 3: *Title Wise Usage Based on Downloads for 3 Years*

Databases /Downloads(DL)		2012			2013			2014		
		5000 above	1000-4999	1-999	5000 above	1000-4999	1-999	5000 above	1000-4999	1-999
ACS	Titles	6	18	25	7	16	28	6	17	31
	DL	101372 69.71%	38009 26.14%	6042 4.15%	110569 71.20%	34975 22.52%	9740 6.27%	100415 68.91%	35694 24.50%	9606 6.59%
AIP/APS	Titles	1	7	25	2	6	31	2	6	36
	DL	5302 18.49%	19677 66.77%	4355 14.73%	12445 31.86%	15613 54.28%	4586 13.86%	11944 34.97%	14038 52.09%	3942 12.94%
Annual Reviews	Titles	-	1	37	-	3	37	-	-	39
	DL	-	1377 15.69%	17550 84.31%	-	4797 44.07%	6087 55.93%	-	-	6520 100%
CUP	Titles	-	-	219	-	-	236	-	2	233
	DL	-	-	5189 100%	-	-	4352 100%	-	2427 34.25%	4659 65.75%
IOP	Titles	-	3	93	-	3	97	-	4	89
	DL	-	4554 37.74%	7514 62.26%	-	4554 35.84%	8152 64.16%	-	5493 47.99%	5954 52.01%

JSTOR	Titles	1	5	1494	2	8	1592	2	11	1815
	DL	26207 20.24%	10534 8.13%	92763 71.63%	25801 18.51%	17203 12.34%	96383 69.15%	25790 16.91%	23807 15.61%	102912 67.48%
Nature	Titles	1	-	18	1	3	19	1	7	105
	DL	7254 74.76%	-	2449 25.24%	8093 46.27%	3134 17.92%	6265 35.82%	11051 27.37%	15368 38.06%	13960 34.57%
OUP	Titles	-	5	249	-	4	257	-	4	269
	DL	-	10586 38.75%	60735 61.25%	-	8321 37.32%	13973 62.68%	-	10210 35.76%	18344 64.24%
Portland Press	Titles	-	1	8	-	-	9	-	1	5
	DL	-	1358 64.27%	755 35.73%	-	-	1182 100%	-	1046 72.69%	393 27.31%
Project Euclid	Titles	-	-	18	-	-	23	-	-	20
	DL	-	-	63 100%	-	-	91 100%	-	-	81 100%
Project Muse	Titles	-	2	406	-	1	434	-	1	447
	DL	-	2677 26.74%	7336 73.26%	-	1422 11.31%	11155 88.69%	-	1375 14.77%	7935 85.23%
RSC	Titles	2	8	34	3	7	36	3	11	37
	DL	22985 45.46%	21965 43.44%	5611 11.10%	27609 51.60%	18247 34.11%	7646 14.29%	29290 48.14%	25109 41.27%	6445 10.59%
Science direct	Titles	4	50	1851	3	42	1704	4	45	1592
	DL	57894 19.25%	80945 26.91%	161958 53.84%	49104 18.26%	76006 28.26%	143879 53.49%	54086 18.69%	81587 28.18%	153779 53.13%
SIAM	Titles	-	-	13	-	-	14	-	-	15
	DL	-	-	53 100%	-	-	290 100%	-	-	222 100%
Springer Link	Titles	-	1	1620	-	3	1798	-	3	1817
	DL	-	2599 6.06%	40271 93.94%	-	3684 5.75%	60394 94.25%	-	4360 7.56%	53291 92.44%
Taylor & Francis	Titles	-	1	1096	-	1	1363	-	4	1349
	DL	-	1701 8.19%	19078 91.81%	-	2946 10.81%	24308 89.19%	-	4224 10.76%	35030 89.24%
Wiley	Titles	3	4	1204	3	3	1274	3	5	1358
	DL	34425 41.76%	5432 6.59%	42574 51.65%	34747 43.97%	5861 7.42%	38421 48.62%	33795 38.98%	7766 8.96%	45137 52.06%
Total	**Titles**	**18**	**106**	**8410**	**21**	**100**	**8952**	**21**	**121**	**9257**
	DL	**255439**	**201414**	**474296**	**268368**	**196763**	**436304**	**266371**	**232504**	**468210**

The Table 3 shows that, in the year 2012, the total titles above 5000 range for all the data bases are 18 with downloads of 255439. In the range of 1000-4999, the total titles are 106 with downloads of 201414. In the range of 1 - 999, the total titles are 8410 with downloads of 474296.

In the year 2013, the total titles above 5000 range for all the data bases are 21 with downloads of 268368. In the range of 1000-4999, the total titles are 100 with downloads of 196763. In the range of 1 - 999, the total titles are 8952 with downloads of 436304.

In the year 2014, the total titles above 5000 range for all the data bases are 21 with downloads of 266371. In the range of 1000-4999, the total titles are 121 with downloads of 232504. In the range of 1 - 999, the total titles are 9257 with downloads of 468210.

Heavy downloads with more number of titles are noticed in the range of 1- 999 followed by heavy downloads in the range of above 5000 with less number of titles and finally moderate number of titles with moderate downloads in range of 1000 – 4999.

Table 4: *Highly Significant, Significant & Less Significant Titles Based on Downloads*

Year	Highly Significant >5000 downloads	No of Titles/ (Database)	Significant 4999-1000 downloads	No of Titles/ (Database)	Less Significant <1000 downloads	No of Title/ (Databases)
2012	255439	18 (7)	201414	106 (13)	474296	8410 (17)
2013	268368	21 (7)	196763	100 (13)	463304	8952 (17)
2014	266371	21 (7)	232504`	121 (14)	468210	9257 (17)
Total	**790178**	**60 (21)**	**630681**	**327 (40)**	**1405810**	**26619 (51)**
Average%	**263393**	**20 (7)**	**210227**	**109 (13)**	**468603**	**8873 (17)**
For 3 years	**27.95%**	**0.22%**	**22.31%**	**1.23%**	**49.73%**	**98.57%**

It is noticed from Table 4 that 18 titles from 7 databases considered to be highly significant contributed to 255439 downloads in the year 2012. The number of **highly significant titles** increased from 18 to 21 titles from 7 databases contributing to 268368 downloads in the year 2013. Again 21 titles from 7 databases contributed to 266371 download in the year 2014.

In the year 2013 titles 106 from 13 databases considered to be significant contributed to 201414 downloads followed by 100 **significant titles** from 13 databases contributed to 196763 downloads in the year 2013 and 121 significant titles from 14 databases contributed to 232504 downloads in the year 2014.

While in the year 2012 titles 8410 considered to be **less significant** from 17 databases contributed to 474296 downloads. In the year 2013 titles 8952 titles from same 17 databases contributed to 463304 downloads. While in 2014 titles 9257 from 17 databases contributed to 468210 downloads. In this category all the 17 databases under study are used.

This clearly indicates that 0.22% of titles contributed to the27.95% usage, while 1.23% titles contributed to 22.31% usage and 98..57% titles contributed to 49.73% usage which means nearly 50% usage.

As an example through web of science research output of science faculty in the form of h-index is shown in the chart. H-index measures research output based on the citations of the authors. If an author's h –index is 6 it means that each of his paper must have been cited at least 6 times. Number of papers = No of citations.

Research Output of Science Faculty in the form of h-Index at University of Hyderabad (from 1996-2015)

Table 5: *Research Output of Science Faculty in the Form of h-index*

S. No.	Name of the faculty	Subject	h-index
1	Reddanna	Animal Sciences	28
2	Babu P.P	Animal Sciences	14
3	Dutta Gupta A	Animal Sciences	14
4	Ramaiah K V A	Biochemistry	12
5	Mitra C K	Biochemistry	10
6	Samantha A	Chemistry	97
7	Nangia A	Chemistry	56
8	Desiraju G R	Chemistry	71
9	Radhakrishnan T P	Chemistry	27
10	Basavaiah D	Chemistry	38
11	Periaswamy M	Chemistry	17

12	Kaul S.N	Physics	25
13	Pathak A P	Physics	16
14	Sunandana C S	Physics	14
15	Chaturvedi S	Physics	47
16	Rao D N	Physics	37
17	Raghavendra Rao C	Plant Sciences	3
18	Prasad MNV	Plant Sciences	28
19	Kirti P B	Plant Sciences	22
20	Reddy A R	Plant Sciences	31

Source: Web of Science

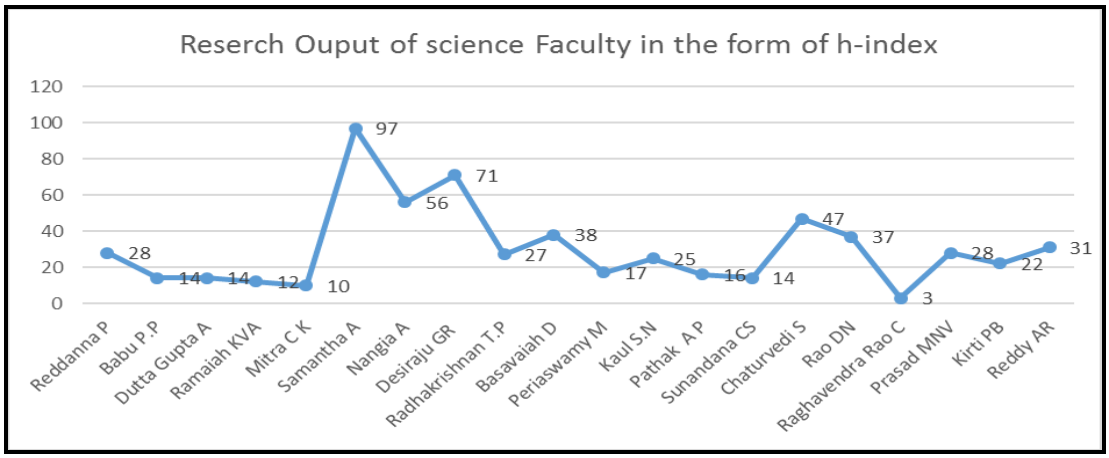

Figure 2: *Chart Depicting the h-index of Science Faculty of University of Hyderabad*

6. Findings and Interpretation

- As per the availability of titles that there is 100% usage of titles in the 4 databases ACS, AR, SIAM & Taylor & Francis on an average for 3 years. The 12 databases AIP/APS, CUP, IOP JSTOR Nature, OUP, Portland Press, Project Muse, RSC, Science Direct, and Springer Link & Wiley Blackwell are in the usage range of 98.15% to 50.84% thus accounting for more 50% usage. Only one database Project Euclid is below 50% usage i.e. 46.52%.

- On an average % for 3 years (2012-2014) the three databases Science direct, ACS & JSTOR recorded 62.96% and are in the above 10% range. The databases Wiley Black well; RSC & Springer Link recorded 21.02% and are in the range of above 5%. The rest of the databases are in the range of below 5% and thus contributing 16%.

- The three databases Science direct (31.36%), ACS (16.29%) & JSTOR (15.31%) are considered to be highly used databases totalling to 62.96%. Wiley Blackwell (9.04%), RSC (6.0%) & Springer Link (5.98%) are considered to be moderately used databases totalling to 21.02% and rest 11 databases are considered to be less used databases totalling to 16%. Science direct is the most highly used database ranking first always. Among the 11 it is to mention that Project Euclid is the least used database contributing to 0.01% and can be treated as unused database.

- According to Table 3 heavy downloads with more number of titles are noticed in the range of 1-999 followed by heavy downloads in the range of above 5000 with less number of titles and finally moderate number of titles with moderate downloads in the range of 1000 – 4999 for all the three years.

- It is observed from table 4 on an average that 20 titles from 7 databases are in the range of above 5000 downloads contributing to 27.95% usage and treated as highly significant titles, 109 titles from 13 databases are in the range of 4999-1000 downloads contributing to 22.31% usage and can be treated as significant titles and 8873 titles from 17 databases are in the range of below 1000 contributing to 49.73% usage and can be treated as less significant titles.

- On an average 98.57% titles contributed to 49.73% usage which means nearly 50% usage. Nearly 1.45% (0.22+1.23 %) titles have contributed to 50.26%.

7. Conclusion

When Universities were facing serials crisis the UGC through INFLIBNET helped many Universities to have access to scholarly information and helped in the infrastructure by providing funds for establishing networking environment and internet facilities so that the Universities can access the INFONET journals through UGC- INFONET Consortium. This was a blessing in disguise to all the Universities facing budget crunch and increasing prices of journals and fluctuating currency rates. The data and inferences obtained in this paper shows that most of the databases concentrating on sciences are highly used which depicts that science disciplines highly use these databases. As Arora, Kruti & Trivedi [1] in their paper on “Impact of access to e-resources through the UGC-INFONET Digital Library Consortium on research output of member universities” stated that while increase in research output in all three major subject disciplines, i.e. science, social science and arts and humanities, increase in research output is significantly higher in science, compared to the other two disciplines. Moreover, a strong positive correlation is found between the number of articles downloaded by the 50 universities from e-resources accessible to them through the consortium and research articles published by them. University of Hyderabad is included in these 50 Universities wherein university of Hyderabad is ranking among the first 10 most productive universities in terms of research articles. Hence as an example the research output of top science faculty in the form of h-index of University of Hyderabad is cited ranging from 97-3.

The preferences of titles may vary in different Universities so the consortium should group the universities using the same databases as per high usage, moderate usage and less usage and try to save the cost by selecting pick and choose the title packages or databases commonly used by member universities. Consortium should look into the titles that are not much used and try to revamp the titles in the light of usage considering all the Universities.

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Information on Global Challenges to Higher Education

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Abstract The scientific world is shrinking in the world community. Every new research in any field of science, technology and education in any part of world, is shared like a family. Henceforth the challenges to higher education are needed to be perceived in the global perspectives. The basic challenges to higher education can be categorized as following: Demand for greater levels of access, Improvement in the quality of higher education and Improvement in Equity. Higher education needs to shift from superficial bases of education to practical lands. If education cannot help a young man to encompass the true knowledge then righteousness of higher education is to be questioned. Final goal of education is the achievement of self. Thus education should be more flexible and linked to the employment sector. Independent institutions from universities have to be encouraged. Modular programmes, short term courses, choice based credit system, possibility of bringing mature learners in higher education. To combat global challenges to higher education we need more consistent and explicit linking of good teaching to salary adjustments, faculty appointments and very humanistic approach to democratic values.

Keywords *Globalization; Universalization of Resources; Digital Functional Knowledge of Computers; Higher Education; Education of Research Level; Qualitative Education*

1. Introduction

Globalization has terminated the distance of geography and has made the world a “global village.” Globally affirming India has the large higher education sector i.e. third largest in the world in students number, after China and United States. There are about 300 million students in the school age group. Higher education in India takes place in nearly 16000 institutes in India. According Selvam (2009) for 100 crore Indians, we have 345 Universities while Japan has 684 Universities for its 12.7 crore people. USA with 27.6 crore population has 2364 Universities. In UK and Germany there are 104 and 330 Universities whose populations are 5.58 and 8.2 crore respectively. If the strengths of India are to be considered, it has long academic tradition with profuse academic freedom, centrally sponsored and controlled higher education institutes, diverse curriculum and democratic ideals with a technology blooming but developing economy.

Despite all these strengths India is confronting various dire challenges like demand for creating high quality learning environment especially in science and technology, technology enabled education like virtual class rooms, smart schools and online learning; meeting the chore lines of democratic values of bridging the gap between those who need the information but lack the skills to get it from the skilled class. It is quite mentionable here that all developing nations are facing vulnerable challenges. These challenges to Higher education have rocked the world like anything. With the changing pace of time the focal point of higher education is not only exposed to basic or fundamental education but also to meet dares of socio, political and cultural aspects of higher education. The basic challenges to higher education can be categorized as following:

a) Demand for greater levels of access;
b) Improvement in the quality of higher education;
c) Improvement in Equity.

2. Demand for Greater Level of Access of Higher Education

2.1. Access to Rural and Marginalized Population

In fact the greater part of the world is living in the villages and it finds the world highly globalised and knowledge-based. It is found that mainly the student population, which receives international higher education, is from developing or underdeveloped countries. As in the beginning of this paper it is mentioned that India is having meager resources of higher education to nourish such a good number of aspirants of higher education. Moreover the approach to the needy one is very shady. Information communication technology has reached only to the most sumptuous one. The extremity between the widely using ICT and less adept users of higher education is worrisome.

2.2. Digital Gaps

Developing interactive multimedia learning material is not only an exceedingly interesting challenge but also very radical in nature. Daily some new innovation is added in the higher education by the ICT in CIA {computer assisted instruction} or virtual reality. To coop with currant researches and changes it is desired that the instant access should be available to everyone otherwise the digital gap is going to be unfathomed.

2.3. Digital Needs of Rural

In fact the needs of the women in higher education are quite changing in the global era. The minimum literacy in the computer education will not serve the purpose. The education has become a trade now. About 44% of adult women in developing countries could read or write. They family Obligation and about 10 hours daily in productive activity impair education.

2.4. World Market and Delivery of Education to World Community

Another greater challenge to higher education is to have competitive advantage. The economic, social and technological forces have influenced manufacturing processes, financial services, government policies and our teaching practices with learning behavior. Now the access to the world is of meeting the international standards of job and placement. In the global village every worker has to work as knowledge worker.

3. Improvement in the Quality of Higher Education

3.1. Academic Library

It is found that very good libraries are available in very few higher education institutes. Enriched libraries exist within the campus of most advance institutes. Public access is certainly tough. Moreover qualitative automatisation, on line access and e-resources is seriously needed by the academic libraries.

3.2. Qualitative Improvement in Curricular and Assessment Practices

In the fast changing educational forum, it is found that obsolete standards of traditional educational system, co-curricular activities and rotten practices of assessment have suffocated the proper growth of higher education. The education has become only degree oriented rather than job oriented. Consequently the number of degree holders has increased and the number of eligible applicants is decreased. As the unemployability is linked with the drawbacks and pulls and pushes of changing higher education therefore an insight is seriously required.

3.3. Revised and Reinvented Role for the Schools, Teachers and Educational Policies

Another challenge to improve the quality of higher education is the need of analyzing the role of school, teacher and the student. The school has to play the role of center of ICT, Life skills and developer of democratic values. The teacher has to become a facilitator of latest knowledge with its suitable applications, transformer of the society with the help of technology and producer of knowledge workers and stringer of values. And student has to become a real knowledge worker and harbinger of true society.

3.4. Exploration of Various Resources of Education

Both financially and physically resources are quite meager to meet the demand of the hour. As in the case of India it commonly said that India is rich but Indians are poor. It implies that the proper usage of resources and exploration of them is widely required. To compete with the global changes we need to work on wide scopes of available resources.

3.5. Qualitative Dealing of Core Issues of Curriculum Development

Curriculum development has become the central issue of this century. The integration of information technology in education, development of human resources for cultural and ethical dimensions have become the core features of curriculum development.

3.6. The Challenges of Accreditation

To meet the international challenges of education a regulatory authority is acutely is required. Only radical different official accreditation can make a difference between a society of frustration and society of success. Selvam (2009) suggests that a finer, more sensitive, more professional, and more human official accreditation system are needed. This may lead to the creation of a new profession—the profession of certificatory.

3.7. Qualitative Changes in 3 Ls i.e. Language, Law and Learning

To focus on these 3 Ls it is highly felt that qualitative parameters are needed to be practically implemented in teaching learning process.

3.8. Degrading System of Universities and Higher Education Institutes

It is of great concern that we have only a few good institutes of higher education and they are quite insufficient for such huge population. As we have entered in the age of learning societies so we need a supporting system of changing and demanding knowledge for lifelong learner. More over globalization has made the education a commodity and the student a product and higher education institutes the factories of preparing and shaping for world standards.

3.9. Accountability in Teaching and Research Performance

The accountability of teachers to give their best and bring forth the best of the potential of their students' needs high impetus. Similarly the lack of research aptitude in the teachers has crumbled the heritage of education in India. Therefore this aspect of higher education demands real input.

4. Improvement in Equity

Equality and equity are two different concepts. Educational opportunities should be provided to every one equally. But at the same time the concept of equity has erupted as a massive challenge in front of higher education in the society. The just and impartial distribution of scholarships and fellowship to the able students from impoverished or disadvantaged region is the area to be focused upon. Following features of higher education need serious over view.

4.1. Inclusive Education

Education should be extended in such a manner that everyone either normal or differently abled is taught in the same class room. Disabled children should interact in the natural environment with society, neighbors and the normal people. Differently abled should be treated with positive attitude and their personalities should be shaped to make them creative citizens for the nation. If we cannot provide proper education to dumb, deaf or any type of differently abled students where does stand our inclusive education. Students and teachers and even policy makers are in fix how to implement inclusive education in higher education.

4.2. Woman Education

Gender inequity can be seen not only in the developing countries; rather in the whole world the glimpses of disparity are clear. Globally and according to recent statistics enrolment ratios in primary schools were 74 % and for girls against 837 for boys. This imbalance is more atrocious as we more into the post-primary sector where the difference between girls and boys or men and women was between 15 and 55 percent depending on the location. At the end of the last century we find:

1) 44 percent of adult women in developing countries could not read or write.
2) 60% of the world's illiterate are women.
3) In a review of 47 countries, women aged 25 years and older and who went to school received less than two years of schooling while men as much as twice.
4) Generally women receive about half schooling than men.

In short gender disparity is found in economic, social, political and educational discrimination.

4.3. Teacher Education

In this global era the need of teacher education is widely recognized. Out dated methods of teaching, absence of content-courses, unrealistic courses, absence of professional attitude and isolation of teacher education institutes etc. are a few problems of teacher education.

4.4. Human Rights Education

While providing equity to the world, higher education has to inculcate human rights in itself. The race of human beings needs acknowledgement in itself. The sanctity of human rights is as important as the right of living is.

4.5. Virtual Education

Virtual class room which provides an attendee a live access to multi media should be in the approach to every desiring one.

Conclusively it can be said the impediments in front of higher education claim immediate dealing. Following suggestions are proposed.

5. Suggestions

Basically higher education needs a shift in the paradigm. The following pillars could give better perspective to higher education:

Four Pillars of Higher Education.

a) Learning to know (LTK)
b) Learning to do (LTD
c) Learning to live together (LTLT)
d) Learning to be (LTB)

Higher education needs to shift from superficial bases of education to practical lands. If education cannot help a young man to encompass the true knowledge then righteousness of higher education is to be questioned. Final goal of education is the achievement of self. Thus education should be more flexible and linked to the employment sector. Independent institutions from universities have to be encouraged. Modular programmes, short term courses, choice based credit system, possibility of bringing mature learners in higher education.

Another solution to the degrading standards of higher education particularly universities is to carve overprotection and sponsorship of them. The best institutes of higher education have become best because they have utilized their resources in the best way.

Similarly the curriculum needs a shift from content to learning pedestal. The customization of content should be learning outcomes and the learning preferences of student. Curriculum planners need to take care of every participant of higher education.

Role of teacher has become of mentor, facilitator and a resource personal of E-Learning. The mode of delivery of higher education should be technological. The death of distance will reduce the cost and save sufficient time for better learning and earning

Woman education should be free from gender biases. Their appointments should be non-discriminatory and promotional practices should be air and square. Similarly their education and training should include leadership, communication skills, managerial skills, visioning capacities and decision making skills.

Social cohesion should be maintained by higher education institutes through exhibiting professional ethics. If an institute rewards academic performance honestly and fairly and its faculty adheres to codes of conduct then it will have an exclusive impact on a nation's social cohesion.

For financial management it can be universally said that dilemma pertains to both public and private institutes. The funds could be raised from traditional resources like fee and rent etc. Some diversify new resources of revenue like copyrights on inventions or investing in equity markets can be explored.

Research in higher education is a very weak link. No exclusive findings are up to now report in higher education. Consequently very poor phase of collaborations is going on. Industry is waiting for quality products and patents eagerly.

World class universities should have world class professors and students and a culture to sustain and stimulate them.

The prerogatives of higher education should be:

- To build up the personals who can lead economical, social and political transformation.
- To form the personalities who can advertise and find out the resources which can make democracy successful?
- To form intellectual personalities so that social transformation may get proper help.
- To accept National/cultural heritage.
- To develop inventions and discoveries to form healthy mind and body.

6. Conclusion

In nut shell, keeping in view the fast pace of advanced countries towards mass higher education; we need to do commendable job in university research. More universities should be funded. There must be encouragement to establish private universities with adequate safeguards to ensure equality and healthy management. To combat global challenges to higher education we need more consistent and explicit linking of good teaching to salary adjustments, faculty appointments and very humanistic approach to democratic values. Finally we want a learning society in the coherence of human values so that this world could be better place to live in.

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Research Article | Open Access

Information on Transparency in Higher Education

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Abstract The entire social system depends upon the arduous stature of higher education. A nation can tolerate any upheaval if the basis of higher education is sturdy and stout. The sustenance of development is only possible if the standard of higher education also evolves with the changing demands of times. Higher education has many stakeholders just as institution, students, faculty, management and finally of course society. For the overall development all the stakeholders should be dealt equally well by higher education institutes. But this is the sorry state of affairs that higher education is passing through a very crucial phase in India. There is a certain gap between Indian potential and exhaustion of resources. Honestly speaking transparency in goals, execution and in evaluation is direly required. In nut shell every challenge of higher education can be managed well if translucency and transparency are the major concern.
Keywords *Transparency; Fair and Clear Virtue of a System for Working; Higher Education; Education above than Senior Secondary Education*

1. Introduction

Higher Education is considered the back bone of any nation. The entire social system depends upon the arduous stature of higher education. A nation can tolerate any upheaval if the basis of higher education is sturdy and stout. The sustenance of development is only possible if the standard of higher education also evolves with the changing demands of times. To understand the needs of society; the higher education institutes should clearly and publicly publish and exhibit their resources and features. The curiosity about the various professional and vocational courses of masses remains unsatisfied because of the lack of proper information .If all the necessary information of HEI's is publicly available then whole of the stakeholders will be satiated. And all the objectives of higher education will be achieved.

Higher education has many stakeholders just as institution, students, faculty, management and finally of course society. For the overall development all the stakeholders should be dealt equally well by higher education institutes. But this is the sorry state of affairs that higher education is passing through a very crucial phase in India. Globally speaking India has very good potential but she lacks in excellent higher education institutes and universally employable graduates. Honestly speaking transparency in goals, execution and in evaluation is direly required. In nut shell every challenge of

higher education can be managed well if translucency and transparency are the major concern. It is evident from the following review that transparency is a serious concern for both developing and developed nations.

Osipian, Ararat L. (2014), this study analyses the issue of comparative corruption in the national higher education sectors in the United States of America (USA) and the Russian Federation (RF). Corruption in higher education, as well as the way it is addressed in legislation and court cases and reflected in the media, appears to be consistent with the trajectory and pace of reforms that take place in the USA and the RF. The continuing massification of higher education, with increasing enrolment rates in both countries, as well as the emergence of the for-profit sector, necessitate more control and coordination on the part of the governments, educational institutions and the public. The two systems of higher education slowly and independently converge. In both systems, professional hierarchies based on meritocracy clash with managerialism based on the thriving for-profit principle. As a result, forms of corruption in higher education may become more similar.

Pitman (2014), this article explores the relationship between mass education, higher education quality and policy development in Australia in the period 2008-2014, during which access to higher education was significantly increased. Over this time, which included a change of national government, the discursive relationship between mass higher education and higher education quality shifted from Conceptualising quality as a function of economic productivity, through educational transformation and academic standards, to market competition and efficiency. Throughout, the student was more often positioned as a servant towards higher education quality, rather than its benefactor.

Välimaa, Terhi (2014), this article discusses social dynamics of higher education which is one of the most crucial but neglected perspectives in comparative studies of higher education. We pay attention to the importance of time, space and contexts--both geographical and socio-cultural ones--to reveal how they influence on different social dynamics in various systems of higher education. The article focuses on the national higher education system level. Theoretically we approach higher education systems from a relational perspective paying attention to dynamics created by changing relationships between different actors in cultural, geographical and historical contexts.

Altbach, Philip G. (2014), India, with the world's second largest higher education system and a rapidly growing economy as one of the BRIC nations, faces significant challenges in building both capacity and excellence in higher education. India's higher education system is characterized by "islands of excellence in a sea of mediocrity." The mainstream universities are recognized as lacking in quality. Only the Indian Institutes of Technology and related institutions garner international recognition. This article analyzes the challenges facing India's higher education system in the twenty-first century.

Fries & Jeanette (2015), informed by the literature and professional practice, this chapter examines the unique mentoring challenges facing women and underrepresented minorities in higher education. Findings indicate that traditional mentoring approaches fall short in fully supporting the needs of underrepresented populations in higher education.

It could be concluded from above cited studies that higher education management needs sincere efforts to improve present status. Every procedure related to student, faculty, management and maintenance of standards should have sustainability in higher education.

2. Challenges in Higher Education

2.1. Admission in Higher Education

The rules and regulations of admissions in higher education need to be crystal clear. Greater emphasis should be on merit list, lucid fee structure and benefits. At the very first step of filing the application an aspirant should have clear picture of fee structure, infrastructure ,various facilities (just as hostel, mess, labs, workshops) and well qualified faculty. The quite similar facilities must be physically available in that very institute during the course too.

2.2. High Qualified and Well Trained Faculty

This is a great challenge. As a few good and competent teachers are available .The teachers for true teaching are very rare. Moreover in depth knowledge for subject matter is lacking. Latest knowledge and training is not a compulsory part of teacher profile. The Low payment by private institutes has undermined the status of teaching profession.

2.3. Role of Management

The management of higher education should have lot of transparency in their mission, objectives, planning and execution. The welfare of the students and teachers should be the priority. To provide the maximum exposure to latest technology, innovations, skills and pedagogies should be volunteer taken by the management. Good remuneration perks for the motivation of staff and scholarship schemes as well as student loans; are the feeblest areas in India.

2.4. Transfer in Higher Education

Universal standards of education increase its employability. An engineer who receives higher education from India should be equally good in foreign country.

Why an Indian graduate has to study further in abroad to get a job? Why a well-qualified Indian does feels insecure even after getting numerous degrees? Certainly the quality and standards of present higher education are not transferable in global scene.

2.5. Learning Outcomes

Truly speaking, the learning out comes of any higher education institutes are its students and their employability. If the passed out students are not efficient for any job then it should be counted the failure of the institute. Moreover mostly the institutions don’t have clear cut placement policy for everyone.

2.6. Quality Assurance

The education imparted in the institutes is not of high standards. The practical values of this education are nothing in front of global competition. In fact the HEI’s are less concerned about the qualitative approbation. As there is no controlling authority for higher education institutions therefore Indian institutes are found of substandard. Internationally they fail to attract the good school.

2.7. Role in Character Building

The higher education builds the nation great. The goals of the education should be to make complete human beings. The learned persons should have work culture as well as love and respect for work.

Moreover dedication to the profession and inclination to contribute as much as possible can make a nation invincible.

2.8. Role of State

Here it is quite mandatory to mention that state is the major authority to chalk out balanced transparency policy for all higher education institutes. To make higher education globally competent and fully employable is the responsibility of state. Degradation of the standards or the poor standards is the direct out comes of the policies of state. If the state will control the higher education institutes as an administrative head the challenge of transparency will be automatically managed.

3. Tools to have in Education

Numerous tools have been designed by the educationist to achieve transparency in abroad. In USA students have perhaps more higher education options than students anywhere else in the world. The students have free access to every detail of the desired institute.

Example A

Colleges Measure.org is a new joint venture between the American Institute for Research and Matrix knowledge group. This interactive website enables users to evaluate the performance of four-year public and private colleges and universities focusing on key out- come measures.

3.1. Keyout Comes Areas

1) Graduation rates
2) 1st year retention rates
3) Education related cost per student
4) Cost per degree
5) Student loan default rates
6) Ratio of student loan payments to earning for recent graduates
7) Cost alteration that quantifies the cost to educate first time full time under graduate who do not begin a second year.

Example B

Another tool for maintaining transparency was taken as a model named ISS Investing in student success pilot project of jobs for the future and the Delta project on post-secondary costs for Productivity and Accountability.

The organization recruited 13 colleges and universities with student's success programs.

ISS pilot project Reports

- That data on spending relative to performance were unavailable for most campuses out of (13 institutions) for all programs not just student success programs so student success programs' cost effectiveness could not be determined.

4. Other Reforms for Higher Education for Accountability and Transparency

A. State should require cost and student outcome data reported as California do.
B. Data should be presented so institution comparison can be made.
C. Publishing Accreditation reports. Implementing tires (multiple Accreditations)
D. Accreditation should be replaced all together by simply measuring and reporting what student learn or can do and publicize those results so parents, students and state legislation could make more informed decisions about attendance.
E. Media should play a significant role to attain transparency in admission and evaluation practices.
F. From initial information, registration, entrance test, admission, evaluation to declaration of results or any other important detail of a higher education institution should be publicly available in black and white.
G. Massification and vast expansion of higher education, with increasing enrolment rates, as well as the emergence of the commercial sector, necessitate more control and coordination on the part of the governments, educational institutions and the public.

In India the challenge of transparency has got acute because of the lack of awareness among students, parents as well as society. As earlier mentioned the higher education institutes (management) and the state cannot get rid of their responsibilities of providing transparency. It is a surprising factor that no serious initiative has been taken in this regard by any regulatory body like U.G.C. (University Grants Commission). Ministry of Human Resource and Development etc. Why cannot we do the experiments like Investing in Student Success (ISS) pilot project and launch Collage Measures.org? Why cannot India again become the hub of education as it was in the ancient India? Why should India remain leader in producing and supplying most efficient and skilled workers for the world? Why cannot India retain the best for herself? In short this is the peak hour to amend the system for the betterment of all.

6. Conclusion

In nut shell with rapid and accelerated growth of higher education institutes; it has become quite mandatory to have transparency, clarity and control of state and society in all the relevant issues and aspects of higher education. From initial information, registration, entrance test, admission, evaluation to declaration of results or any other important detail of a higher education institution should be publicly available in black and white. In this dynamic and fast changing educational world; India should focus on qualitative and clear system of higher education. No ambiguity and duplicity should be found in the policies of higher education institutes. The profit making tendencies should be checked seriously. Even if the institute claims for global competence, the facilities should be at par with their commitments. Brain draining could be checked if India provides international standards of higher education in both qualitative and transparent terms.

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Use of Library and Internet Resources by Urdu Faculty, Research Scholars and P.G. Students in University Libraries of Andhra Pradesh State

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract The Information and communication technology has transformed the old concept of libraries from traditional to digital form. In today's world the most popular source of information is the Internet and electronic resources. The present study has been undertaken to assess the availability and use of library and web resources by Urdu faculty, research scholars and P.G. students in select university libraries of erstwhile Andhra Pradesh. The particular study was under taken to assess the awareness, availability and use of library and Urdu web resources by the users. Their extent of satisfaction, impediment and impact of Internet and Urdu web resources were analyzed. The findings of the study revealed that there are scanty Urdu resources available online and also there is lack of knowledge among scholars about the use of web resources. To utilize the Urdu web resources to its maximum, it is necessary to build awareness among the research scholars and train them in browsing internet as well as searching information on the internet and using resources. This can be done by conducting user orientation/awareness program.

Keywords *Urdu Resources; Urdu Web Resources; Osmania University Library-Urdu Resources; University of Hyderabad Library-Urdu Resources; Use of Urdu Resources; Urdu Resources-User Orientation*

1. Introduction

Urdu has always been predominantly the language of the Muslims, though millions of non-Muslims are able to read and write, millions more are able to understand and speak, whereas a few of them could make major contribution to Urdu literature.

Urdu is one of the chief languages of the South Asian subcontinent. It is cultivated and spoken from Kashmir to Kanyakumari and from Gujarat to West Bengal. Pakistan has adopted it as National Language and across the borders of India established the active nuclei in the countries like Great Britain, the United States, and also some of the Scandinavian, West Asian and African countries.

In India, status of Urdu language underwent a drastic change after Independence in 1947 when the monopolistic position of English as the exclusive official language and the main medium of instruction ended. Immediately after, there came the linguistic reorganization of states in 1956.

Urdu is the official language of Jammu and Kashmir and has acquired the status of a second language in Andhra Pradesh and Bihar. Since, the basic structure of Urdu as well the vocabulary is very much similar to Hindi language, it claims the same family history with Hindi. It has assimilated Persian, Arabic, English vocabulary and literary styles during the process of its long historical development.

2. Web Resources in Urdu Language

Since the past couple of decades, more and more people are browsing the Internet to gather the data and retrieve information. The shift to digital libraries has greatly influenced the common man's use of physical libraries. These factors resulted in the increased availability of Internet and web-resources. Research scholars have become more used to retrieve information from the Internet than a traditional library.

The Internet growth and the development of web technologies have given way to gather large-scale language data. The reduction in the cost of computers and increase of storage space has enabled the web researcher to easily collect enormous online text of various types and sources, such as news articles, novels, blogs etc. However, large volume of information on the Internet is in English Language. Although information exists in other languages, the growth of information on the Internet in other languages, especially in Indian languages is observed to be very slow. Some of the popular web resources available in Urdu language are listed below:

A. **Annual of Urdu studies:** The Annual of Urdu Studies is a free, web-based journal which provides full text of scholarly articles, translations, short stories, poetry and views of scholars working on Urdu literature. It also publishes reviews of books, reports, research-in-progress, notices and information on forthcoming events of interest to its readers (conferences, workshops, competitions, awards, etc.) and serves as an annual inventory of significant Western publications in the field. The website includes even full-text archives.

B. **Urdu poetry resources:** Urdu poetry resources' is a website that provides links to wide range of resources about Urdu poetry including English translations, technical, critical articles, reviews and online dictionaries. There are also web pages that give links to biographical and publication details of poets as well as ghazal singer's and also links to respective bookstores and audio websites.

C. **ImaginAsian:** ImagineAsian is a reader development project started in 2002, Leicester City, Brent Harrow and Hillingdon Libraries which aims to raise the profile and increase the recognition of Indic writing in Urdu, Gujarati, Punjabi and English. This online resource provides a selection of book titles

written in these four languages, including full bibliographic details and synopses. ImaginAsian brings together the authors who may only be approached individually in other online resources.

D. **U4U.Com:** U4U.Com is an online library with over 500,000 pages of world class Urdu literature with complete text of notable writers - from classic to contemporary. It is the only legal site featuring hundreds of authors and poets. U4U.COM is fully indexed, searchable, and highly interactive website, with custom skins (graphics designs) to suit the aesthetics of all users. Urdu literature is treasured with some finest world-recognized poets and writers, such as Ghalib, Mir, Faiz, Qasmi and has a large corpus, ranging from poetry to fiction to epics (dastaan). U4U.COM presents a tribute to Urdu writers.

E. **Urdu E-newspapers in India:** India has an effervescent Urdu press, though the circulation of newspapers is much higher in Pakistan. However, in India, the Urdu papers are published from far and widely distributed across the country. Some of the important newspapers available online are listed below:

Table 1: *List of Some of the Important Newspapers Available Online*

S. No.	Name of the Newspaper	Place of Publication	URL
1.	Inquilab	Mumbai	*www.inquilab.com*
2.	Siasat	Hyderabad	*www.siasat.com*
3.	Sahafat	Lucknow	*www.sahafat.in*
4.	Munsif	Hyderabad	www.munsif.com
5.	Roznama Rashtriya Sahara	Delhi	*www.roznamasahara.com*
6.	Urdu Times	Mumbai	*www.urdutimes.net*
7.	Hindustan Express	Delhi	*www.hindustanurdudaily.com*
8.	Etemaad	Hyderabad	www.*etemaaddaily.com*
9.	Milap	Delhi	*www.milap.com*
10.	Mashriq	Kashmir	*www.akhbaremashriq.com*
11.	Aftab	Kashmir	*www.dailyaftab.com*
12.	Chattan weekly	Kashmir	*www.chattanonline.com*

F. Apart from the above mentioned resources, there are several websites in Urdu poetry and Literature like – Urdu Point (http://www.urdupoint.com/); Urdu Life (http://www.urdulife.com/poetry/), etc.

G. Software: ‘Mutakallim’ is Urdu Text to Speech Software that speaks and recognizes Urdu language. It is also known as Urdu Genie/Urdu Jini. Mutakallim was an attempt to develop Urdu Software that can recognize spoken Urdu words and Speak Urdu statements written/typed by the user.

3. Statement of the Problem

Users differ from one Library to another. Public library is comprised of general public. In a special library users are researchers and specialists. In an academic library the students, teachers and research scholars are the users. Whatever may be the type, the role of the libraries is to provide information and satisfy the information needs of the users from time to time.

User study helps in knowing the difficulties faced by the user in using their services and in obtaining the requisite information for his work. User study and feedback from the user helps the librarians to plan the services, taking the necessary steps matching their user needs, by which the smooth flow of information from the information system to user is enabled.

Present study is a part of the Information use studies aimed at exploring the information seeking behavior; extent of use; satisfaction about library and web resources by Urdu faculty, research scholars and students in the following six selected university libraries in the erstwhile state of Andhra Pradesh –

- Maulana Azad National Urdu University, (MANUU) Hyderabad
- Osmania University, (OU) Hyderabad
- Satavahana University, (SU) Karimnagar
- Sri Venkateswara University, (SVU) Tirupati
- Telangana University, (TU) Nizambad and
- University of Hyderabad, (UOH) Hyderabad

The above mentioned six universities are offering M.Phil. and Ph.D. programmes in addition to Master's degree in Urdu language, having separate departments for Urdu. Hence these six universities are selected for the study.

As the total strength of the faculty, research scholars and students in the selected university libraries is only 500 in number, the researcher resorted to census method. Structured questionnaires were distributed to all the 500 members. However, 380 responses were received in time. The details of Total strength and the response obtained in the selected university libraries are shown in Table 2.

Table 2: *Total Strength of Students, Research Scholars and Faculty and the Response Obtained (As per University)*

S. No.	Name of the University	PG	M.Phil. /Ph.D.	Faculty	Total	Response Obtained (Percentage)
1.	Maulana Azad National Urdu University	60	57	26	143	109 (76.22%)
2.	Osmania University	25	36	10	71	44 (61.97%)
3.	Satavahana University	45	0	03	48	35 (72.91%)
4.	Sri Venkateswara University	50	14	04	68	53 (77.94%)
5.	Telangana University	54	08	04	66	48 (72.72%)
6.	University of Hyderabad	57	37	10	104	91 (87.5%)
	Total	291	152	57	500	380 (76%)

4. Objectives of the Study

The specific objectives of the study are to –

1. Examine the frequency of library use
2. Analyze the pattern of internet use including – frequency and place of internet use
3. Analyze the use of Urdu e-resources
4. Analyze the preference for print and electronic resources
5. Study the impact of library and internet on academic performance of the respondents.

A. Need and Significance of the Study

A review of the existing literature reveals that intermittent efforts are made to study the problems encountered in the acquisition and development of Urdu library collections, evolving classification systems suitable for Urdu language books. The present study therefore, aims to fill these gaps in the literature.

Studies focusing on the Information needs of Urdu scholars are not carried out in India, especially in Andhra Pradesh where several libraries like Osmania University Library, MAANU and other libraries with rich collections of Urdu resources are existing and Urdu scholars as well as learners are extensively using these collections. Hence this study would be of immense value to these libraries and learners.

5. Review of Literature

Several studies are conducted on the use of the library, Information needs and information seeking behavior and the use of electronic sources by academicians belonging to different faculties like sciences, social sciences and the humanities in general. However, the use of library and information sources by Urdu faculty, students and researchers are very scarcely found in the literature.

Das, A. and Basu, D. (2009) conducted study at Bidhan Chandra KrishiViswavidyalaya, West Bengal, which aimed to understand the differential purposes of “Internet use by the students and researchers”. The study also examined the students’ learning mode of Internet use, perception regarding its benefits, impact and influence in performance, user satisfaction and first hand problems faced by the students and researchers in use of internet.

Madhusudhan, M. (2007) made a study on “Internet use by research scholars in University of Delhi, India”. It was found that the Internet browsing facility has enabled the research scholars to enhance their academic excellence by providing them the latest information and access to worldwide information. A high proportion of respondents are using e-journals and databases.

Purnima Devi and Herojit Sing (2009) in their article “Internet users: a study of Manipur University Library” assessed the attitude of Internet users, especially the research scholars. The major objectives were to identify Internet is not a substitute for the library and to find the use of Internet resources by research scholars for their research work.

Vasappa Gowda and D. Shivalingaiah (2009) conducted a study on “Attitude of research scholars towards usage of electronic information resources: a survey of University Libraries in Karnataka.” Questionnaire was distributed to gather data from researchers of humanities, social science disciplines in six universities in Karnataka and responses were received from 845 research scholars. In general the research scholars preferred print resources and there exists significant differences in the preferences of print and electronic resources among various disciplines. Further the study identified the gaps in the need and availability of electronic resources like online journals and databases in the university libraries and also revealed that the electronic resources have created a positive hope among the research community in searching the information.

Mahajan (2006) on analyzed the Internet use by researchers in Punjab University, Chandigarh, and also how the convergence of information and communication technologies, as embodied by the Internet, has transformed the present day society into a knowledge society.

Mulimani, Mallikarjun N. and Gudiman, Suresh B. conducted a survey on “Usage of Internet by Students and Research Scholars of Karnataka University Library”. The main aim of this survey was to understand student’s usage of Internet and computer technology, their experience with technology and their

aptitudes and expectation about technology resources and identify areas for improvement of services. The paper discusses the impact of Internet in Karnataka University Library.

6. Data Analysis and Findings

The findings drawn from 380 responses of 6 selected universities, as per the following objectives are analyzed below.

1. The frequency of library use
2. The pattern of internet use including – frequency and place of internet use
3. The use of Urdu e-resources
4. Preference of Print / Electronic
5. The impact of library and internet on academic performance of the respondents.

A. **Frequency of Library Visit**

Table 3: *Distribution of Respondents according to Frequency of Library Visit*

S. No.	Frequency of Library Visit	Faculty	Research Scholars	Students	Total
1	Everyday	6 (11.5%)	44 (32.6%)	51 (26.4%)	101 (26.6%)
2	Weekly	27 (51.9%)	54 (40%)	73 (37.8%)	154 (40.5%)
3	Fortnightly	8 (15.4%)	29 (21.5%)	48 (24.9%)	85 (22.4%)
4	Monthly	4 (7.7%)	2 (1.5%)	9 (4.7%)	15 (3.9%)
5	Rarely	7 (13.5%)	6 (4.4%)	12 (6.2%)	25 (6.6%)
	Total	52	135	193	380

The Table 3 shows the frequency of library use by Urdu faculty, research scholars and students of Andhra Pradesh. From the table, it is clear that less than half of the respondents (40.5%) visit the library once in a week and just above one fourths of the respondents (26.6%) visit the library every day.

Analysis of the frequency of library visit by different groups of users reveals interesting findings. Just above half of the faculty (51.9%) visit the library once in a week. Out of the remaining, 15.4% visit the library fortnightly. It is also noticed that 13.5% of the faculty rarely visit the library. Among the research scholars, less than half (40%) of them visit the library once in a week and 32.6% visit the library every day. Majority of the students (37.8%) visit the library once in a week, followed by 26.4% of them -visiting the library every day.

B. **Frequency of Internet Use**

The Table 4 shows Internet use in terms of hours per day by Urdu faculty, research scholars and students of Andhra Pradesh. Majority of the faculty (88.5%), research scholars (94.1%) and students (91.2%) are using internet at a minimum of one hour per day. For the hours of use per day for two and three hours, the response is very less from all three categories of users.

Table 4: *Frequency of Internet Use (In Terms of Hours per Day)*

S. No.	Internet Use (In hours)	Faculty	Research Scholars	Students	Total
1	One Hour	46 (88.5%)	127 (94.1%)	176 (91.2%)	349 (91.8%)
2	Two Hours	4 (7.7%)	5 (3.7%)	12 (6.2%)	21 (5.5%)
3	Three Hours	2 (3.8%)	3 (2.2%)	5 (2.6%)	10 (2.6%)
	Total	52 (13.7%)	135 (35.6%)	193 (50.7%)	380 (100%)

C. **Place of Internet Access**

The Table 5 shows the ranking of criteria for access of Internet facility by Urdu faculty, research scholars and students in Universities of Andhra Pradesh. A majority of the respondents (60.3%) percent accessed Internet from the Library, while 46.6% accessed from the Cyber Café. Another 51.6% accessed from home and 38.2% accessed Internet from the University Department/Computer center.

Table 5: *Ranking Criteria as per the Place Preference for Accessing Internet*

Ranking	Faculty	Research Scholars	Students	Total
(a) From the Place of Residence				
First Rank	14 (7.1%)	69 (35.2%)	113 (57.7%)	196 (51.6%)
Second Rank	14 (24.1%)	24 (41.4%)	20 (34.5%)	58 (15.3%)
Third Rank	21 (21.2%)	27 (27.3%)	51 (51.5%)	99 (26.1%)
Fourth Rank	3 (11.1%)	15 (55.6%)	9 (33.3%)	27 (7.1%)
Total	52 (13.7%)	135 (35.6%)	193 (50.7%)	380 (100%)
(b) Cyber Café				
First Rank	11 (20.4%)	22 (40.7%)	21 (38.9%)	54 (14.2%)
Second Rank	26 (14.7%)	62 (35.0%)	89 (50.3%)	177 (46.6%)
Third Rank	5 (7.0%)	40 (56.3%)	26 (36.6%)	71 (18.7%)
Fourth Rank	10 (%)	11 (14.5%)	57 (75.0%)	78 (20.0%)
Total	52 (13.7%)	135 (35.6%)	193 (50.7%)	380 (100%)
(c) Library				
First Rank	42 (18.3%)	74 (32.3%)	113 (49.3%)	229 (60.3%)
Second Rank	1 (1.4%)	30 (41.7%)	41 (56.9%)	72 (18.9%)
Third Rank	8 (11.1%)	26 (36.1%)	38 (52.8%)	72 (18.9%)
Fourth Rank	1 (14.3%)	5 (71.4%)	1 (14.3%)	7 (1.8%)
Total	52 (13.7%)	135 (35.6%)	193 (50.7%)	380 (100%)
(d) University Department / Computer Centre etc.				
First Rank	13 (8.9%)	72 (49.7%)	60 (41.4%)	145 (38.2%)
Second Rank	25 (23.1%)	33 (30.6%)	50 (46.3%)	108 (28.4%)
Third Rank	4 (9.3%)	10 (23.3%)	29 (67.4%)	43 (11.3%)
Fourth Rank	10 (11.9%)	20 (23.8%)	54 (64.3%)	84 (22.1%)
Total	52 (13.7%	135 (35.6%)	193 (50.7%)	380 00%)

D. **Use of Urdu E-journals and Magazines**

The Table 6 gives the data about the use of Urdu e-journals like (a) Annual of Urdu studies, (b) Urdu language jihadi journal, (c) Maarif-e-Raza journal (d) Yojana and (e) Bazm-e-sahara by faculty, research scholars and students of Andhra Pradesh. Out of 380 respondents, 193 (50.8%) respondents belongs students, 135 (35.5%) are research scholars, 52 (13.7%) are faculty. A major number of respondents either faculty or research scholars or students has shown average use towards Yojana 165 (43.4%) and Bazm-e-sahara 183 (48.2%). The least use has been shown towards the Annual of Urdu Studies 262 (68.9%), Urdu language jihadi journal 368 (96.8%) and Maarif-e-Raza journal 355 (93.4%).

Table 6: *Use of Urdu E-journals and Magazines*

Use	Faculty	Research Scholars	Students	Total
(a) The Annual of Urdu Studies, USA				
Most	2 (7.4%)	4 (14.8%)	21 (77.8%)	27 (7.1%)
Average	17 (18.7%)	40 (44.0%)	34 (37.4%)	91 (23.9%)
Least	33 (12.6%)	91 (34.7%)	138 (52.7%)	262 (68.9%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)
(b) Urdu Language Jihadi journal, Pakistan				
Most	0 (0%)	1 (50.0%)	1 (50.0%)	2 (0.5%)
Average	0 (0%)	8 (80.0%)	2 (20.0%)	10 (2.6%)
Least	52 (14.1%)	126 (34.2%)	190 (51.6%)	368 (96.8%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)
(c) Maarif-e-Raza journal, Pakistan				
Most	4 (36.4%)	6 (54.5%)	1 (9.1%)	11 (2.9%)
Average	2 (14.3%)	7 (50.0%)	5 (35.7%)	14 (3.7%)
Least	46 (13.0%)	122 (34.4%)	187 (52.7%)	355 (93.4%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)
(d) Yojana, India				
Most	16 (15.7%)	47 (46.1%)	39 (38.2%)	102 (26.8%)
Average	14 (8.5%)	60 (36.4%)	91 (55.2%)	165 (43.4%)
Least	22 (19.5%)	28 (24.8%)	63 (55.8%)	113 (29.7%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)
(e) Bazm-e-Sahara, India				
Most	14 (15.2%)	33 (35.9%)	45 (48.9%)	92 (24.2%)
Average	12 (6.6%)	67 (36.6%)	104 (56.8%)	183 (48.2%)
Least	26 (24.8%)	35 (33.3%)	44 (41.9%)	105 (27.6%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)

E. **Use of Urdu E-books**

The Table 7 gives the use of Urdu e-books resources like (a) Urdudost.com, (b) Urduweb.in, (c) Urdupoint.com and (d) u4u, by faculty, research scholars and students of Andhra Pradesh. Out of 380 respondents, 193 (50.8%) respondents belong students, 135 (35.5%) are research scholars, 52 (13.7%) are faculty. A majority of respondents in all categories either from faculty or research scholars or students have shown average use towards Urdudost.com 177 (46.6%), Urduweb.in 196 (51.6%) and Urdupoint.com 180 (47.4%).

Table 7: *Use of Urdu e-books*

Use	Faculty	Research Scholars	Students	Total
(a) www.urdudost.com				
Most	16 (16.2%)	45 (45.5%)	38 (38.4%)	99 (26.1%)
Average	18 (10.2%)	68 (38.4%)	91 (51.4%)	177 (46.6%)
Least	18 (17.3%)	22 (21.2%)	64 (61.5%)	104 (27.4%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)
(b) www.urduweb.in				
Most	16 (22.9%)	40 (57.1%)	14 (20.0%)	70 (18.4%)
Average	18(9.2%)	67 (34.2%)	111 (56.6%)	196 (51.6%)
Least	18(15.8%)	28 (24.6%)	68 (59.6%)	114 (30.0%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)
(c) www.urdupoint.com				
Most	12 (18.8%)	34 (53.1%)	18 (28.1%)	64 (16.8%)
Average	22 (12.2%)	68 (37.8%)	90 (50.0%)	180 (47.4%)
Least	18 (13.2%)	33 (24.3%)	85 (62.5%)	136 (35.8%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)
(d) www.u4u.com				
Most	4 (13.3%)	21 (70.0%)	5 (16.7%)	30 (7.9%)
Average	18 (10.3%)	66 (37.9%)	90 (51.7%)	174 (45.8%)
Least	30 (17.0%)	48 (27.3%)	98 (55.7%)	176 (46.3%)
Total	52 (13.7%)	135 (35.5%)	193 (50.8%)	380 (100%)

F. **Use of Online Urdu Resources**

Table 8: *Use Regarding Different Types of Online Urdu Resources by the Respondents*

S. No.	Online Urdu Resources	Use as per the No. of respondents (%)		
		Most	Average	Least
1	Urdu e-books	115 (30.3%)	162 (42.6%)	103 (27.1%)
2	Urdu e-journals	61 (16.1%)	190 (50.0%)	129 (33.9%)
3	Urdu Databases	37 (9.8%)	181 (47.6%)	162 (42.6%)
4	Online Newspapers in Urdu Language	313 (82.3%)	50 (13.2%)	17 (4.5%)

The Table 8 reflects the data on the Use of online Urdu resources by faculty, research scholars and students of Andhra Pradesh. A major number of respondents either faculty or research scholars or students marked average use towards Urdu e-journals 50%, Urdu databases 47.6% Urdu e-books 42.6%. The use of Online Newspapers in Urdu Language has been rated as “Most” by faculty with 82.3%.

G. **Preference for Print and Electronic Information**

S. No.	Type of Source	Satisfaction As per No. of respondents (%)
1	Print Information	238 (62.6%)
2	Electronic Information	142 (37.36%)

The respondents were asked to mark their preference of use of print and electronic sources of information to satisfy their information needs. It can be seen from the Table 9, that 62.6% of the respondent's preferred print information and only 37.36% of respondents stated that they use electronic sources to satisfy their information needs.

H. **The Impact of Internet Use on Library**

The Table 10 shows the impact of Internet use on library. Out of 332 (87.4%) respondents who said "NO", 45 (13.6%) are faculty members, 121 (36.4%) are research scholars and 166 (50.0%) of them are students. The respondents prefer library resources more than the Internet resources. Since there are very few resources available on the internet, very few electronic journals being published in Urdu language and very few electronic books resources available, there is very less use of Internet and more use of printed Urdu material. Hence there is more usage of library resources than the internet resources. Therefore it can be observed that the respondents are more used towards printed material and their usage of library resources is also more. It is also apparent from the data that Internet cannot decrease the importance of Library resources. Since, the electronic resources in Urdu language are scanty, the use is more focused towards print resources and the respondents ultimately depend on print form. The situation implies that there is a need to improve digital resources in Urdu language.

Table 10: *Respondent's Opinion on Whether Internet Decrease the Importance of Library Resources*

S. No.	Type of Users	No. of Respondents (%)		Total
		Yes	No	
1	Faculty	7 (13.5%)	45 (86.5%)	52 (13.7%)
2	Research Scholars	14 (10.3%)	121 (89.6%)	135 (35.6%)
3	Students	27 (14%)	166 (86%)	193 (50.7%)
	Total	48 (12.6%)	332 (87.4%)	380 (100%)

7. Summary of Findings

- Majority of respondents (40.5%) reported that they visit the library once in a week and only 26.6% visit the library every day. Considerable respondents (6.6%) reported the rare use of the library. From the data, it can be stated that Library is not used to the optimum level by the respondents. The reasons for the less frequent visits could be because of lack of up-to-date collection of Urdu books or lack of proper arrangement and maintenance in the library. The study finds that respondents make more use of textbooks, Internet and newspapers in the library compared to other resources.
- Frequency of Internet use by the respondents shows that majority of the faculty (88.5%), research scholars (94.1%) and students (91.2%) are using internet for one hour per day.
- Respondents were asked about the place of Internet access. The responses were ranked based on the average score received for each option. Respondents ranked internet accessed from the

library as first rank (3.37) followed by accessing internet from the place of residence (3.11) and from the University department/ Computer center (2.82).

- The Urdu magazines published in electronic form in India - Yojana (26.8%) and Bazm-e-sahara (24.2%) is used to a greater extent by the respondents. The least use has been shown towards the Annual of Urdu Studies 262 (69%), Urdu language jihadi journal 368 (97%) and Maarif-e-Raza journal 355 (93.4%). The reason for less usage towards e-journals and magazines may be either the library is not subscribing the e-journals or the respondents are not aware of using the e-journals and magazines. Since there are very less online e-journals and magazines published in Urdu language and literature, the usage is also very less.
- Although use of e-books is observed to be less by the respondents, they rated Urdu dost.com (26%) as most used website for e-books. Other websites including Urduweb.in (18.4%) and Urdupoint.com are used by 16.8% respondents only.
- Average satisfaction is received from the respondents towards Urdu e-journals 50%, Urdu databases 47.6% and Urdu e-books 42.6%. The satisfaction regarding the Online Newspapers in Urdu Language has been rated as “Good” by respondents with 82.3%.
- It is found that Print is the most preferred medium for satisfying the information needs compared to the electronic medium.
- Very high percentage (87.4%) of respondents opined that use of Internet do not reduce the use of Library. All the respondents agreed that library has positive impact on the academic performance.

8. Recommendation & Conclusion

Since, the electronic resources in Urdu language are scanty; there is a need to improve digital resources in Urdu language. The above data also indicate that still there is a gap in publishing e-resources in Urdu language as well using those are available by all the categories of users. Though good number of students, research scholars and faculty members are using and preferring Urdu e-resources, the findings reveal that –

- There is need to increase awareness about the availability of information resources such as full text digital resources more and more information gateways, groups, discussion forums, etc. coming up in this era and also about searching OPACs.
- There is a need to develop knowledge about use of electronic resources of all types available online including books, journals, theses and dissertations, technical reports, patents, databases, etc.

The Internet has become a major source of communication and dissemination of information in the twenty-first century. Libraries in India are rapidly transforming into digital libraries and virtual learning resource centers. A large portion of user populations in the university are aware about the Internet, but they do not know all its techniques and applications. Further, a few users of the universities in the country still do not have sufficient knowledge about the Internet and related applications. For this purpose, there is need for effective user education, to develop awareness and knowledge among users for the effective use of ever populating learning resources in electronic form. More efforts by library professionals are needed to educate users to effectively use the Internet and its techniques and applications.

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Collection Centric to User Centric Academic Library Spaces: Building Requirements of Net Generation Users

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract This paper intends to examine the needs of the net generation users regarding library spaces. In the light of the data collected from 81 users from University of Hyderabad and Maulana Azad National Urdu University, the study looks into the preferences of users and whether the increasing use of Internet requires changes in the library spaces for the future generation. The modern academic community including teachers, students and researchers are more oriented towards using information available on the internet. There is a tendency of the users to spend more time on the web. Libraries are looked up on as learning spaces for collaborative and networked learning. The future of libraries lies in providing a platform to the users where they can converse, collaborate and share the information. Hence, library buildings in the 21st century are moving away from traditional collection-centric to user-centric service rich libraries.

Keywords *Modern Library Buildings; Academic Library Spaces; Net Generation Library Spaces; User Centric Academic Library Buildings; University of Hyderabad Library Building; Maulana Azad National Urdu University Library Building*

1. Introduction

A well-established library is essential for an academic institution. Library houses the books and other material to support the research and other educational activities of the academic institution and provides variety of services to promote the use of books and satisfy the needs of users. Library provides the space required for learning and expanding the knowledge of the students.

Traditionally, libraries were collection centric, primarily focused on acquiring, organizing, storing and preserving the required information for easy retrieval and use. Literature reveals that in the pre Gutenberg era, the monastic libraries, church libraries etc. housed great collections of manuscripts and contained huge reading rooms. The paintings of great artists decorated the walls of these libraries. The libraries served only a selected few and are not open for the public. In the 18th and early 19th centuries with the expansion of education and growth of educational institutions, Libraries also envisaged a change in terms of their growth and services. There is a growth in terms of the collection of books and also readers. The libraries were no longer limited to the selected few. The libraries had different areas- stack area, reading rooms etc. but still closed access was practiced in most of the libraries.

In the late 19th century, several universities have established their libraries. Libraries usually are located in the centre of the campus. The libraries had spacious rooms adjoining the stacks and open access was encouraged. The entrance of the library is usually occupied by circulation desks, cataloguing cabinets. The book stacks occupied more room. The buildings had good ventilation allowing natural light and air. Growth of the collection demanded more physical space. Preservation, maintenance and security of the books were the major concern of library staff which is continuing even today. The important criteria for planning collection centric library buildings were –

- Growth in the physical collection
- More space to accommodate the growing book stacks and collection
- Providing spaces for readers to access the collections
- Service spaces
- Maintenance, preservation and conservation of library collections
- Safety and Security of the library holdings
- Extension or expansion of the buildings

21st century witnessed number of changes brought about by the technology, explosion of information sources, growth in the number of open access and open educational resources and thereby changes in the needs of the users. The modern academic community including teachers, students and researchers are more oriented towards using information available on the internet. There is a tendency of the users to spend more time on the web. Libraries are looked up on as learning spaces for collaborative and networked learning. The future of libraries lies in providing a platform to the users where they can converse, collaborate and share the information. Hence, library buildings in the 21st century are moving away from traditional collection-centric to user-centric, service rich libraries. This paper intends to examine the needs of the net generation users regarding library spaces.

2. Research Questions

The Study intends to address two important questions –

- In the light of increasing use of internet by the students, do they still prefer physical library space?
- What changes, the net generation users are looking for in terms of library spaces?

3. Review of Literature

There is difference of opinion regarding the requirement of physical library buildings in the internet era. Many people believe that there will be no need for a physical library, because information will be accessible from the computers on their desktops with the press of a button. Others believe that Technology itself is causing increased demand for space in many areas of the library. There are growing numbers of computer workstations for patrons and staff alike and other equipment such as network files, server's needs are specialized and additional space often not found in existing facilities (Lucker, 1992).

A growing role of the library is helping students and others learn to use the new technology to access information. This is requiring libraries to supply more space for face-to-face consultation with information professionals (Clemmer & Smith, 1992) and most often necessitating the provision of a large, well-equipped user instruction room (Bazillion, 1994).

The digital age, contrary to predictions, has had a largely positive impact on library design. The increase in the use of IT and e-resources allow libraries to be more flexible and the spaces within them are more fluid. Library spaces are no longer defined by the collections as in the past but need to encourage interaction between, and among, library users and library staff. The technological advancements referred above are releasing library staff from routine tasks and driving the move toward a user-focused rather than a collection-based approach to both services and the layout of spaces. Library premises are no longer largely governed by the storage and display of resources or by the need for space-consuming issues and service desks but rather by the needs of users. The creation of exciting and attractive library space has been shown to bring people into the physical library to use the virtual resources. The library as meeting place is another well-recognized trend in library design. The concept of the library as a "third place"—a place away from both the workplace and the home to study in peace, work collaboratively, or socialize—has been much documented (Banning et al., 2006; Oldenburg, 2001).

Freeman (2005), has noted that "rather than threatening the traditional concept of the library, the integration of new information technology has actually become the catalyst that transforms the library into a more vital and critical intellectual centre of life at colleges and universities today" (Latimer, 2010) has identified the following drivers leading to a changing approach to the design of academic libraries: the increasing availability of e-resources and the concomitant shift in the balance between printed and virtual collections; technological advances such as self-issue/return, the automation of manual handling, the use of sorting robots, compact shelving, and RFID technology; social networking—the library as a meeting place; and the need to market libraries in the face of increasing competition from other information providers.

The need for libraries to market themselves has become increasingly important, and this in turn has had an impact on library design. There is a strong need to create an identity for the library; as Arets (2005) has pointed out, a building that looks exciting on the outside will entice people in to find out what is going on inside. The library building itself becomes a marketing tool. The library at Cottbus has been visited by approximately 20,000 tourists since it opened in 2005 (Degwitz, 2010).

In India there are very few studies focused on library buildings. Some researchers attempted to study the standards and norms for library layout in India. Kumud Prabha (2005) studied the norms and standards used for library layout in India. Bureau of Indian Standards provides that a library should have a stack room, a Librarian's room and a reading room having seating capacity of 40 to 120 chairs. The Stack room should be big enough to accommodate 6,000 to 10,000 books at least. The paper concludes that there are no authentic standards for libraries in India.

Rathinasabhapathy, G. (2014) examined the various standards prescribed by various regulatory bodies of professional education such as AICTE, MCI, DCI, PCI, NCTE etc. And found that none of the professional bodies have suggested clear cut norms for library buildings and furniture.

Review of literature reveals that –

- There are no significant studies on the impact of technology on library design in India
- In countries like UK and USA, approach to library buildings is moving from collection centric to user centric and providing space for collaboration, networking and sharing information for the net-generation users.

4. Methodology

In order to know the needs and preferences of users regarding the library space, a small survey is conducted where structured questionnaire is distributed to 100 students studying at the two central universities namely – University of Hyderabad (UOH) and Maulana Azad National Urdu University (MANUU), Hyderabad. Convenience sampling is used. Eighty two responses are received. Data regarding - requirement of physical library building, frequency of library visits, user preferences regarding spaces for quiet study, discussions, presentations, training rooms etc. were collected.

5. Library Building Specifications of Selected Universities

A. University of Hyderabad

(http://igmlnet.uohyd.ac.in:8000)

University of Hyderabad is one of the reputed institutes of higher education, known for its excellence in research and distinguished faculty. IGM Library caters to the information needs of faculty, research scholars and students in Arts, Humanities, Social Sciences, Management, Sciences and Engineering. The main objective is to make the Library the most effective Learning Resource centre to contribute to the quality of higher education. The library has latest ICT infrastructure. Library Building provides congenial learning environment to the users through its various sections including Online Public Access Catalog (OPAC) Searching Area, Internet browsing area for accessing e-resources, Laptop zone with Wi-Fi facility, specialized workstations & software for visually-challenged students.

The University Library is situated at a central place and constitutes 57000 S. ft. Area The building has a reading space with seating capacity to accommodate 400 users. Apart from the reading space, there are 30 individual reading carrels, a lounge of 2000 S. ft. for browsing and relaxed reading. The Building also has an IT Zone for accessing e-resources. Library has a separate Air-conditioned Annex Building with 2 reading halls with 200 seating capacity and Wi-Fi, which is kept open on all the days round the clock (365 days 24 hrs.)

At present the library has a total collection of about 4.00 lakhs volumes including monographs, text books, back volumes of journals, theses/dissertations, CDs/DVDs. The library is subscribing around 300 print journals in various disciplines of the university and providing access to more than 35000 e-resources including e-books and UGC Infonet e-resources.

B. Maulana Azad National Urdu University (MANUU), Hyderabad

(http://www.manuu.ac.in/central_library.php)

The MANUU Library was established in the year 1998 along with the University. The Library has shifted to its newly constructed independent building in Dec. 2008. The New Library Building has G+1 with 3300 sq.mts of built up area and Seating capacity of 200. The Central Library is the most modular, functional and uses modern technology for its operations. The library is fully computerized and using NewGenLib LIS Software for day to day operations. The library is equipped with state of the art ICT infrastructure including CD/DVD mirror server, Bar code technology, 3M Security System, Biometric device and paging system for public announcements.

The library has more than 58,000 books, subscribes to 179 journals and 389 Audio and Video CDs. The University is a member of the countrywide Infonet e-journal consortium. The Library has a Reading Room with seating capacity of 200. Library Building includes separate section for OPAC, cubicles for research scholars, audio visual section comprising T.V., MP3 System, Walkman with Headphones for listening to Audio cassettes. Library provides online access to Springer link, JCCC-UGC infonet, JSTOR, etc. through INFLIBNET E-journal consortium. Library also provides links to several freely available

online databases such as Wikipedia, answers.com, DOAJ, DOAB, Indiastat etc. The library provides Internet Access service to all library members free of charge for browsing e-resources.

6. Analysis & Findings

A. Background

The background information of the respondents under study is presented in Table 1.

***Table 1**: Background Information of the Respondents*

S. No.	Description	MANUU No. (%age)	UOH No. (%age)	Total
1	No. of Respondents	41 (50%)	41 (50%)	82 (100)
2	Category of the Respondents			
	Undergraduate	15 (36.6%)	4 (9.8%)	19 (23.3%)
	Postgraduate	21 (51.2%)	22 (54.7%)	43 (52.4%)
3	Gender of the Respondents			
	Male	37 (90.2%)	33 (80.5%)	70 (85.4%)
	Female	4 (9.8%)	8 (19.5%)	12 (14.6%)

The Table 1 gives the background information of the respondents from the two Universities under study. Out of total 82 respondents, 41 are from UOH and 41 are from MANUU. Out of the total respondents, 23.3% are under graduate students & 52.4% are post graduate students. Gender-wise analysis of the respondents reveals that majority (85.4%) are male students and only 14.6% of them are female.

B. Library Building

The respondents are asked whether they require a physical library building in the context of changing information & communication scenario.

***Table 2:** Respondent's Opinion Regarding Requirement of a Physical Library Building*

S. No.	Requirement of Physical Library Building	Name of the University		Total No. (%)
		MANUU No. (%)	UOH No. (%)	
1	Yes	39 (95.1)	40 (97.6)	79 (96.3)
2	No	2 (4.9)	1 (2.4)	3 (3.7)
	Total	41 (50)	41(50)	82 (100)

It is evident from Table 2 that 96.3% responded in favour of the physical library building and only 3 (3.7%) users in both the universities felt that physical library building requirement is not necessary.

C. Library Visits

Table 3: *Frequency of Library Visits by the Respondents*

S. No.	Frequency of Library Visits	Name of the University		Total No. (%)
		MANUU No. (%)	UOH No. (%)	
1	Daily	35 (85.4%)	30 (73.2%)	65 (79.3%)
2	Weekly	6 (14.6%)	10 (24.4%)	16 (19.5%)
3	Monthly	0 (0%)	1 (2.4%)	1 (1.2%)
4	Total	41 (50%)	41 (50%)	82 (100%)

Data from Table 3 reveals that 79.3% users visit the library every day, 19.5% visit the library once in a week and only 1.2% respondents visit the library once in a month.

Table 4: *Response with Regard to the Quick Visits to the Library*

S. No.	Quick visits	Name of the University		Total No. (%)
		MANUU No. (%)	UOH No. (%)	
1	Yes	33 (80.5)	37 (90.2)	70 (85.4)
2	No	8 (19.5)	4 (9.8)	12 (14.6)
	Total	41 (50)	41 (50)	82 (100)

The respondents are asked whether they make quick visit to the library or spend considerable time in the library. The analysis is presented in Table 4. Majority of users i.e. 85.4% responded that they made quick visits to the library, whereas only 14.6% of them spend considerable time in the library.

D. Library Assistance

From the table no.5, it can be seen that majority of the users (81.7%) preferred to search for books and information on their own and only 19.5% seek assistance of the library staff in locating the books.

Table 5: *Responses with regard to Searching/Locating books in the Library*

S. No.	Search/Locate books in the Library	Name of the University		Total No. (%)
		MANUU No. (%)	UOH No. (%)	
1	Self-search	31 (75.6)	36 (87.8)	67 (81.7)
2	Take assistance of library staff	10 (24.4)	5 (12.2)	15 (19.5)
	Total	41 (50)	41 (50)	82 (100)

E. Location of Library Building

Table 6: *Respondents' Preference for Library Building in the Vicinity of the Department*

S. No.	Location of the Library	Name of the University		Total No. (%)
		MANUU No. (%)	UOH No. (%)	
1	Strongly agree	40 (97.56)	41 (50)	81 (98.8)
2	Agree	1(2.44)	0 (0)	1 (1.2)
3	Disagree	0 (0)	0 (0)	0 (0)
	Total	41 (50)	41 (50)	82 (100)

The Table 6 shows that majority of respondents (98.8%) strongly felt that library should be located at a central place and should be within the vicinity of their departments.

F. Preferred Areas in the Library

Table 7: *User Preferences for Different Areas in the Library*

S. No.	Preferred Areas	Name of the University					
		MANUU			UOH		
		Yes	No	Total	Yes	No	Total
1.	Rooms for Library orientation / training programs for using e-resources	33	8	41	28	13	41
2	Rooms for Quiet Study	37	4	41	34	7	41
3	Discussion Rooms	28	13	41	23	18	41
4	Presentation Rooms	29	12	41	23	18	41
5	Food Counters	30	11	41	23	18	41
6	Separate reading rooms for men & women	26	15	41	9	32	41

From the Table 7, it is evident that majority users favour having separate rooms for library orientation/training programmes in using e-resources; rooms for quiet study, separate discussion rooms, presentation rooms, food counters. Due to religious customs, users of MANUU favoured separate reading rooms for men and women.

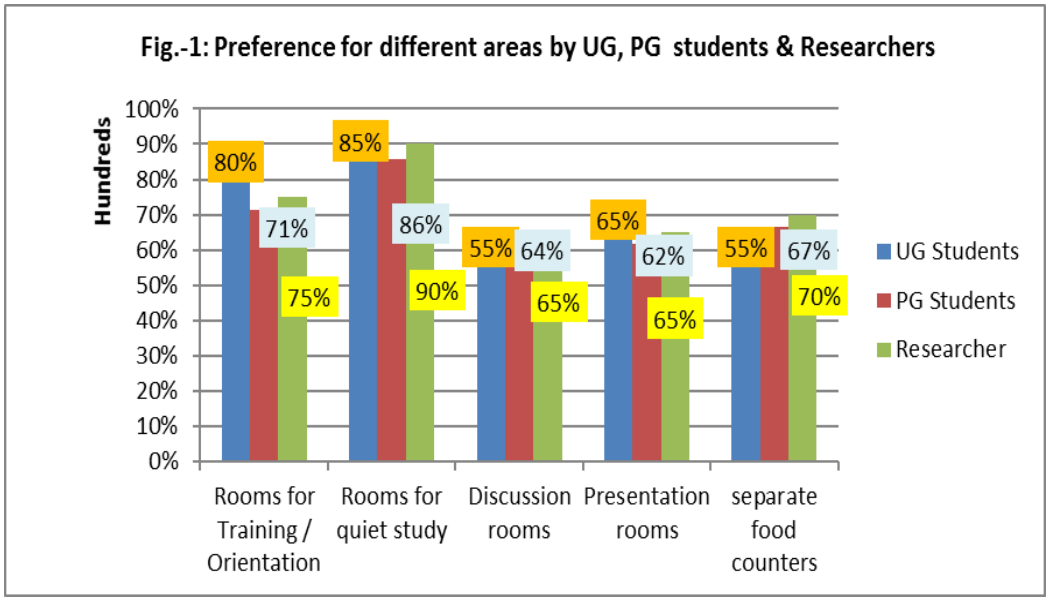

Figure 1: *Preference for Different Areas by UG, PG Students and Researchers*

Figure 1 presents analysis of preferences for different areas by 3 categories of students under study. UG students showed preference for separate rooms for training and orientation in the use of e-resources in the library, while all types of users agreed that there should be rooms for quiet study especially the researchers. Majority of Researchers and PG students require spaces for discussion and presentations also. Most of the Researchers and PG students expressed that separate food counters are required within the library so that they can spend longer hours in the library.

G. Facilities in the Library

Table 8 shows the preferences of the users for different facilities to be provided in the library. From the table, it is evident that users of both the universities preferred to have the facilities like – Internet Lab, Access to Institutional Repository, Digital Library, and Research Cubicle, computer workstations, laptop connections and Wi-Fi facilities in the library. The users preferred to have internet facility (98%), Generator (100%), Digital library and Laptop connection (96%), safety and security (83%), computer and other electronic equipment (74%). which are very much essential in present day library building planning.

Table 8: *Respondent's Preferences for Different Facilities in the Library*

S. No.	Facility	Name of the University							
		MANUU				UOH			
		Very much required	Required	Not required	Total	Very much required	Required	Not required	Total
1	**Internet Lab**	32 (78%)	8 (19.8%)	1 (2.4%)	41 (100%)	28 (68.3%)	13 (31.7%)	0	41 (100%)
2	**Institutional Repository**	20 (48.8%)	16 (39%)	5 (12.2%)	41 (100%)	21 (51.2%)	19 (46.3%)	1 (2.4%)	41 (100%)
3	**Digital Library**	30 (73.2%)	9 (21.9%)	2 (4.9%)	41 (100%)	30 (73.2%)	11 (26.8%)	0	41 (100%)
4	**Generator**	33 (80.5%)	8 (19.5%)	0	41 (100%)	31 (75.6%)	10 (24.4%)	0	41 (100%)
5	**Seminar Hall**	15 (36.6%)	13 (31.7%)	13 (31.7%)	41 (100%)	13 (31.7%)	18 (43.9%)	10 (24.4%)	41 (100%)
6	**Research cubicles**	30 (73.2%)	8 (19.5%)	3 (7.3%)	41 (100%)	27 (65.9%)	10 (24.4%)	4 (9.7%)	41 (100%)
7	**Computer workstations**	28 (68.3%)	11 (26.8%)	2 (4.9%)	41 (100%)	25 (61%)	16 (39%)	0	41 (100%)
8	**Laptop connections**	30 (73.2%)	8 (19.5%)	3 (7.3%)	41 (100%)	27 (65.9%)	10 (24.4%)	4 (9.7%)	41 (100%)
9	**LAN/WAN**	30 (73.2%)	8 (19.5%)	3 (7.3%)	41 (100%)	29 (70.7%)	11 (26.8%)	1 (2.4%)	41 (100%)
10	**Wi-Fi**	27 (65.9%)	9 (21.9%)	5 (12.2%)	41 (100%)	30 (73.2%)	11 (26.8%)	0	41 (100%)
11	**Classrooms**	15 (36.6%)	13 (31.7%)	13 (31.7%)	41 (100%)	13 (31.7%)	20 (48.8%)	8 (19.5%)	41 (100%)

H. Significant Factors of Library Buildings

The Table 9 gives the Users preference from both the universities for different factors important for Library building. The users opined that library should have more facilities for safety and security (83%); computer and other electronic equipment (74%), Plants (70%) and Open spaces (66%) are very important aspects in the library.

Table 9: *Respondent's Opinion on Factors Important for Library Building*

S. No.	Facility	Name of the University							
		MANUU				UOH			
		Very Important	Important	Not Important	Total	Very Important	Important	Not Important	Total
1	Open spaces	33 (80.4%)	7 (17%)	1 (2.4%)	41 (100%)	21 (51.2%)	17 (41.5%)	3 (7.3%)	41 (100%)
2	Colour	22 (53.7%)	15 (36.6%)	4 (9.7%)	41 (100%)	19 (46.3%)	18 (43.9%)	4 (9.7%)	41 (100%)
3	Natural lighting	29 (70.7%)	8 (19.5%)	4 (9.7%)	41 (100%)	26 (63.4%)	14 (34.1%)	1 (2.4%)	41 (100%)
4	Plants	35 (85.4%	5 (12.2%)	1 (2.4%)	41 (100%)	22 (53.7%)	16 (39%)	3 (7.3%)	41 (100%)
5	Tempting furniture	21 (51.2%)	14 (34.2%)	6 (14.6%)	41 (100%)	25 (61%)	12 (29.3%)	4 (9.7%)	41 (100%)
6	Computer & Other electronic devices	31 (75.6%)	8 (19.5%)	2 (4.9%)	41 (100%)	30 (73.2%)	10 (24.4%)	1 (2.4%)	41 (100%)
7	Mobility &Wireless communication	29 (70.7%)	10 (24.4%)	2 (4.9%)	41 (100%)	32 (78%)	8 (19.5%)	1 (2.4%)	41 (100%)
8	Safety & Security Measures	38 (92.7%)	2 (4.9%)	1 (2.4%)	41 (100%)	30 (73.2%)	10 (24.4%)	1 (2.4%)	41 (100%)

7. Findings

1. The students are asked if they need a physical library building in the present day context, 96.3% responded in favour of the physical library building.

2. Data revealed that 79.3% users visit the library every day, 19.5% visit the library once in a week and only 1.2% respondents visit the library one in a month.

3. While 85.4% of users responded they make quick visits to the library, only 12% of them spend considerable time in the library.

4. Just above half of the respondents (56.1%) preferred to sit at the same place in the library every day while the remaining 43.9% change their place for reading.

5. Majority of the users (80.5%) preferred to search for books and information on their own and only 19.5% seek assistance of the library staff in locating the books.

6. Almost all users (99.8%) felt that library should be located at a central place and should be within the vicinity of their departments.

7. Majority users favour having separate rooms for library orientation/training programmes in using e-resources; rooms for quiet study, separate discussion rooms, presentation rooms, food counters.

8. The users preferred to have internet facility (98%), Generator (100%), Digital library and Laptop connection (96%), safety and security (83%), computer and other electronic equipment (74%),

Plants (70%) and Open spaces (66%) which are very much essential in present day library building planning.

9. Generator facility has been recorded highest percentage from both the Universities i.e., 41 (100%) in MANUU and 41 (100%) in UOH, followed by Internet facility with 32 (78%) in MANUU and 28 (68.3%) in UOH.

10. The facility of Digital library has also recorded similar preference from both MANUU and UOH with 30 (73.2%) response. The LAN/WAN facility have been given 30 (73.2%) preference while 29 (70.7%) preference have been given in UOH.

11. The facility for laptop connections in MANUU has recorded 30 (73.2%) while UOH has recorded 27 (65.9%). Importance have been given to Wi-Fi facility with 27 (65.9%) in MANUU and 30 (73.2%) in UOH.

12. University-wise breakup of the responses for factors important for library building like Plants is 35 (85.4%) in MANUU while in UOH it is 22 (53.7%).

13. For Open spaces, the respondents have given their preference as 33 (80.4%) in MANUU while in UOH the preference is 21 (51.2%).

14. Another factor important for library building is availability of Computer and other electronic device for which the preference is 31 (75.6%) by respondents from MANUU and 30 (73.2%) from UOH.

15. Safety and security measures have been given more importance 38 (92.7%) by the respondents from MANUU and 30 (73.2%) from UOH

8. Conclusion

It is clearly seen from the findings that in-spite of the increase in use of Internet and electronic resources, learners and scholars prefer to have a physical library building with good collection of print and electronic resources. Study also shows that in the net-generation, people want to get connected to one another, learn collaboratively and share their research. Due to the same reason the users preferred to have discussion rooms and separate rooms for making and sharing presentations, apart from spaces usually allotted for quiet study by the libraries. Natural lighting, open spaces for circulation of air and plants will make learning environment more conducive to serious kind of studies and research.

It is interesting to note that even though technology enables 24/7, anytime, anywhere access to learning as well scholarly resources and users can access the library through their desktops without coming to the library, most of the users still prefer to spend more time in the library. Therefore, we can say that ICT is not posing a threat to the library buildings but can be seen as an opportunity for users to use the library space in more innovative ways. Academic Libraries should plan the spaces also keeping in view the current needs of the learners, in order to make them more and more user-centric learning spaces. Literature reveals that very few systematic studies are made on the different aspects of academic library buildings in India. Hence more research needs to be done on user-centric library spaces.

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Use of Document Delivery Services through J-Gate@UGC-INFONET - A Case Study of IGM Library, University of Hyderabad

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract The University Library & Information Centers are playing a prominent role in procurement, organization, preservation of resources and providing access to the research scholars. These centers are the basic source of information for present and future generations. This paper explains the importance of Inter Librarian Loan facility in University Libraries and also discusses about J-Gate@UGC-Infonet (http://jgateplus.com). Finally it analysis the document supply service of IGM Library, University of Hyderabad.

Keywords *Document Delivery Services; University Libraries-Resource Sharing; J-gate; JCCC for University Libraries*

1. Introduction

Libraries and information centres are the primary source of information or documents to students, research scholars and faculty in universities. Libraries are the basic support for teaching, research and advanced studies in universities. Though, libraries strive to provide all the required resources to their clientele, but unable to meet their complete requirements in-spite of spending maximum of their budgets. Moreover, cost escalations of resources and shrinking library budgets and ever increasing users demands for resources have posing constant challenges to librarians. Further no library is self sufficient to meet the entire research requirements, but relies on sharing the resources among themselves. Resource sharing also helps libraries to meet the gaps in individual library collection and when they cannot afford to purchase resources for their users. In addition to libraries mutually sharing resources, many library resource sharing networks and consortia are formed in this electronic and digital era and helping the member libraries to share their resources and increase the research output of the organization.

The term interlibrary loan service referred as a library to library transaction. It is considered essential service of the library because the other libraries do not give books directly to patrons of other different libraries. In olden days Inter Library Loan (ILL) service has been provided by libraries to obtain materials such as books, photocopies of journal articles and other materials from other libraries. The books will be returned to the lending library after taking photocopies of the required chapters. Libraries were not usually collecting any charges from their users or libraries for these services.

Library and Information services are being transformed by technology and they have to adapt to these changes to meet their users' changing needs and growing expectations. The implementations of ICT in the libraries have demanded new forms of library services to get more user satisfaction. Digital library service has evolved after the implementation of ICT in the library and information centers. Technological advancements in information industry and libraries also transformed the scenario of even document delivery services as the libraries are unable to meet the requirement of their library users with their limited resources.

All web-enabled libraries are in an ideal position to provide ILL services to their clientele through modern information communication technology (ICT). ILL services can be rendered more effectively in these days. Scanned articles now can be sent through electronic mail over the Internet. Patrons can also initiate a request that will go immediately to the library that owns the item, effectively bypassing the interlibrary loan unit of the home library. These changes have increased the speed of process of making request/delivery of article and its receipt by the user; thereby productivity for library staff is increased and ultimately speedy service to the patron.

2. Review of Literature

Brown (1997) described how maximum resources can be successfully accessed during budget constraints. Moreover, he addressed future concerns of university libraries in the electronic environment and recommended the adoption of resource-sharing, efficient delivery methods and clarification of legal issue. Conrolly (1999) was of the opinion that web based ILL Systems are replacing paper based manual systems.

Srivastva, Mehandra and Kanauja, Laleta (2004) conducted a survey for investigating the present situation of library automation, CD-ROM database services, internet and on-line facilities, reprographic services in Agricultural University libraries in India. This study also emphasized the traditional documentation and information services namely bibliographic service, current awareness service, abstracting and indexing and newspaper clipping services in agricultural Universities in India. Findings indicated that, 100% libraries are providing Current Awareness Service and bibliographic services.40% libraries providing indexing and abstracting services. Almost all the libraries providing reprographic services and 73.33% providing microfilm reading facility and they suggested that all the libraries should provide better information services electronically for meeting the requirement of the users.

Desale, Sanjay, Londhe, N.L. and Patil S.K. (2009), conducted a study on JCCC@UGCINFONET and the document supply service at the University of Pune. They faced problems while using the JCCC@UGCINFONET interface and the administrative interface in providing ILL service. They suggested the JCCC software should be evaluated from both the users and administrative point-of-view.

Sangeeta Kaul (2010), while conducted a survey of DELNET libraries for assessing the usage of DELNET services found that Photocopying of journal articles and supply is the most popular service

of DELNET. The study has found that 86% member libraries are benefited from the union catalogue and above 90% libraries are satisfied about the ILL/DD service of the DELNET.

In view of the importance of document delivery services to university users i.e. faculty, research scholars and students, it is aimed to overview the document delivery services organized by INFLIBNET Centre through their UGC Infonet Digital Library consortium, especially with special reference to the currently operated online service J-Gate@UGC-INFONET for university libraries and analyze its usage in University of Hyderabad by the Library quantitatively. The required data was collected from the library records, literature published in journals and usage statistics supplied by the UGC Infonet Digital Library Consortium

3. INFLIBNET Centre - Document Delivery Services

The Information and Library Network (INFLIBNET) Centre is an autonomous Inter-University Centre (IUC) of the University Grants Commission (UGC). It has involved in creating the infrastructure for the sharing of library and information resources and services among academic and research institutions in India. INFLIBNET works collaboratively with Indian university libraries to shape the future of academic libraries in the evolving information environment (INFLIBNET, 2008).

INFLIBNET has started a document supply service based upon the collection of subscribed journals within the UGC INFONET digital library consortium. Initially the document delivery service commenced with a group of 6 university libraries to host their resources to supply to all university users through their respective libraries. The service was upgraded to JCCC@UGC-Infonet increasing the resources from 16 host libraries, which is currently operating with 22 university libraries. These 22 libraries are designated as document supply centres to provide resources or services to users affiliated to 149 universities covered by the UGC through JCCC@UGC-Infonet. These document supply libraries provide their subscribed journals consisting of more than 2,000 titles, which are not available through the consortium. These journal articles are made available through the document delivery portal which can be accessed by the users of all the member universities of consortium. The Inflibnet DDS centres (university libraries) are listed as under.

1. Annamalai University
2. Assam University
3. Banaras Hindu University
4. Banasthali Vidyapith
5. Bangalore University
6. University of Calcutta
7. University of Delhi
8. University of Hyderabad
9. Jadavpur University
10. Jawaharlal Nehru University, New Delhi
11. Kurukshetra University
12. University of Madras
13. MS University, Baroda
14. Nagpur University
15. North Eastern Hill University

16. Panjab University
17. Pondicherry University
18. University of Pune
19. Punjabi University
20. 20 University of Rajasthan
21. Pandit Ravishankar Shukla University
22. Tata Institute of Social Sciences

J-Gate Custom Content for Consortium (JCCC) is a virtual library of journal literature created as a customized e-journals access gateway and database solution. It acts as a one point access to 7900+ journals subscribed currently under UGC INFONET Digital library consortium as well as university libraries designated as Inter Library Loan (ILL) Centers besides open access journals. INFLIBNET has identified 22 potential universities as ILL Centers in the country to fulfill ILL request from the users affiliated to universities covered under UGC- INFONET Digital Library Consortium. JCCC has facility to trigger e-mail request for article to Inter Library Loan Centers as well as to INFLIBNET Centre.

The INFLIBNET Centre has further upgraded the document delivery service portal from JCCC to J-gate with additional features which are useful to researchers. The universities are provided with a link to the Document Delivery Service Portal, J-Gate@UGC INFONET (http://igateplus.com) and also the search interface for directly using from library website to request research articles from other universities. Users from these universities can send requests that are not available in their own library, directly via the internet for articles found in J-gate portal.

4. J-Gate@UGC INFONET: The Journals Gateway

J-Gate is an electronic gateway to global e-journal literature, including good number of open access journals. It was launched in 2001 by Informatics India Limited, Bangalore, India. J-Gate also supports the online subscription of journals, electronic document delivery, archiving and other related services. J-Gate@UGC-INFONET (http://jgateplus.com) provides articles from the journals not subscribed to by the UGC-INFONET Digital Library Consortium by including the exclusive journals subscribed by 22 (university libraries) designated as document supply centres by INFLIBNET. These identified document supply centres by INFLIBNET are responsible for supplying journal articles to all other universities.

The J-gate functions as a common interface for all the publishers' content subscribed or even not subscribed by the UGC-INFONET Digital Library Consortium and the journals (print and e-journals) subscribed by 22 document supply centres. Thus provides a list of hyper linked articles on users search so that a user can select the article and access/ download those articles which were already licensed (through subscription/consortium) to the home university. The journal articles that are not accessible to a searcher from home university, the interface facilitates semi-automatic generation of a document supply request directing users to the INFLIBNET Centre or to one of the document supply centres as the case may be. J-gate collects the journal subscription information from all the document delivery centres and also the articles published in open access journals to list them in their portal, so that they will be visible to all university users when they search for journal articles.

The general features and search functionalities as given by J-gate plus (source: http://jgateplus.com.) are detailed below.

A. General Features

- J-Gate is an e-journal portal presently hosts content from 44,579 e-journals of 12,191 publishers, providing access to 6,250 online-only journals, which are not available in print.
- Captures and indexes articles from more than 22,847 open-access e-journals and maintaining links over 6,625,640 open-access articles.
- Browse TOC (table of contents) uniformly to all the journal titles browsable alphabetically by Journal title; publisher-wise and subject-wise.
- Basic bibliographic data is provided with abstracts (wherever available).
- Author address and e-mail is provided wherever available.
- Provides links to full-text articles (open-access, subscription and also unsubscribed).
- Link to Union List for finding availability.
- Daily updating.
- 24/7 availability of access.
- High-speed in-house Internet infrastructure.
- Content capturing and conversion system with high automation ensures high quality content aggregation.
- In-house software development team.
- Safe and reliable high-capacity storage system for content storage.

B. Search Functionalities

The J-gate home page gives various search options such as quick search, advanced search and browse journals for the user's convenience. The subscriber can choose to search by author, title, authors' address/institution, keywords, etc. Each of these options provides distinct features. Quick search allows users to search for articles using Boolean operators such as AND, OR and NOT. (Sanjay K. Desale, Londhe, N.L. and Suresh Patil).

C. DDS Process

Through J-gate portal photocopies of journal articles can be requested by the faculty and research scholars from any member university directly without depending on library at free of cost. The DDS process is illustrated vide the following screenshots.

However, the respective university libraries will be coordinating these operations, users' requests or complaints and usage within the organization and also with consortium regarding the development activities of DDS. Consortium conducts orientation or awareness programs for the benefit of university users with the help of providers, while conducting meetings with library administrators of DDS.

Authorized users (within recognized IP range/environment/campus) will be able to put their query through quick, advanced search interface or by browsing through journals list, selecting volume/number, table of content and finally the article by its location or locations. Further, users will be able register for their favourite journals and get their alerts notified through registered email.

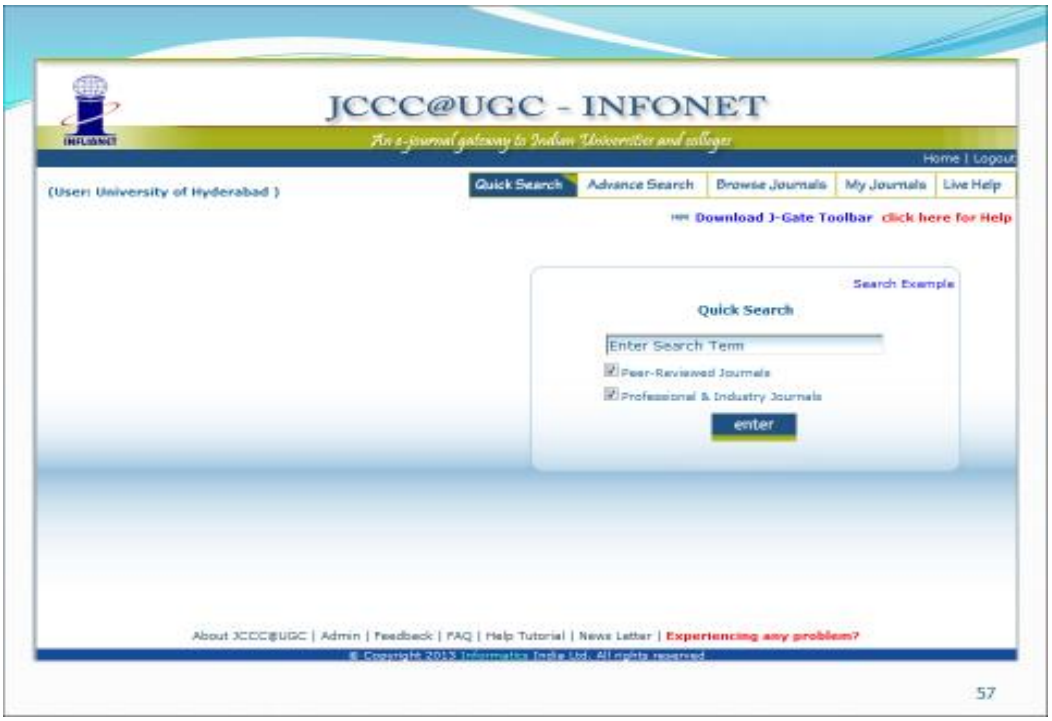


Figure 1: *Screenshot 1: JCCC@UGC- INFONET Search Interface*

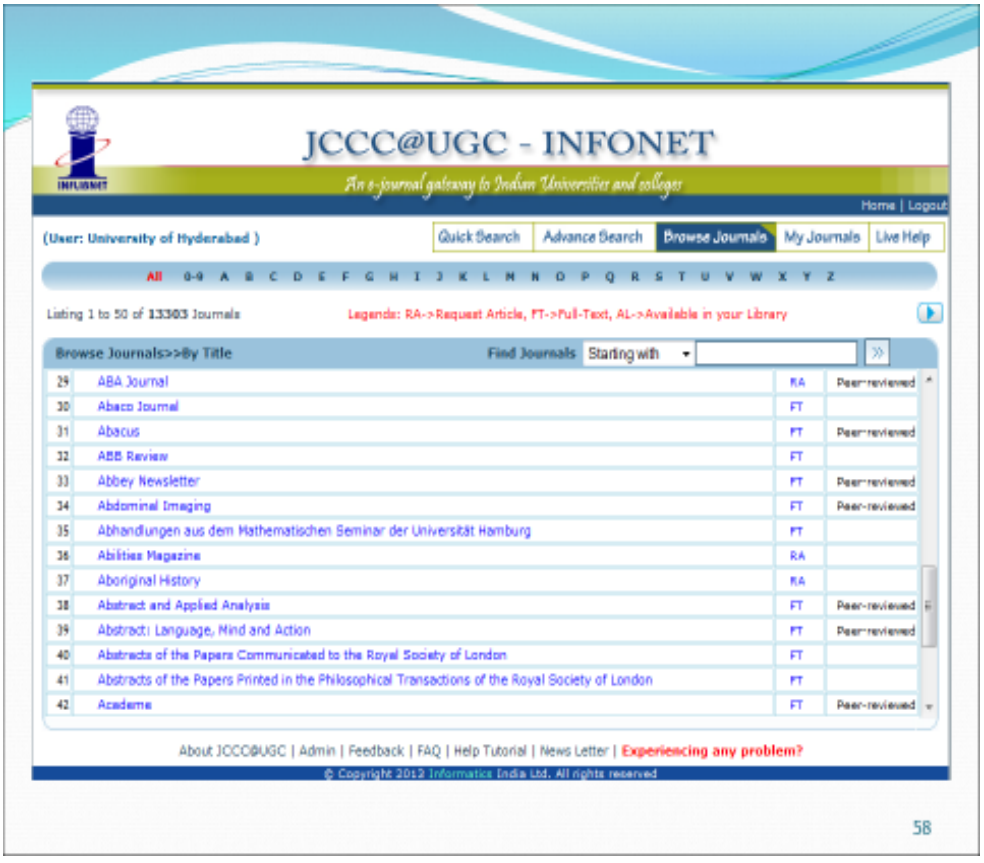


Figure 2: *Screenshot 2: Screenshot of Browse Journals Option (http://jgateplus.com)*

Figure 3: *Screenshot of Articles listed for Users Selection*
(Source: http://jgateplus.com)

The document supply requests will be generated to designated centres and INFLIBNET centre for the journal articles which are not accessible to their users in their own university and also they will be able to track request history and the fulfilment status of requests.

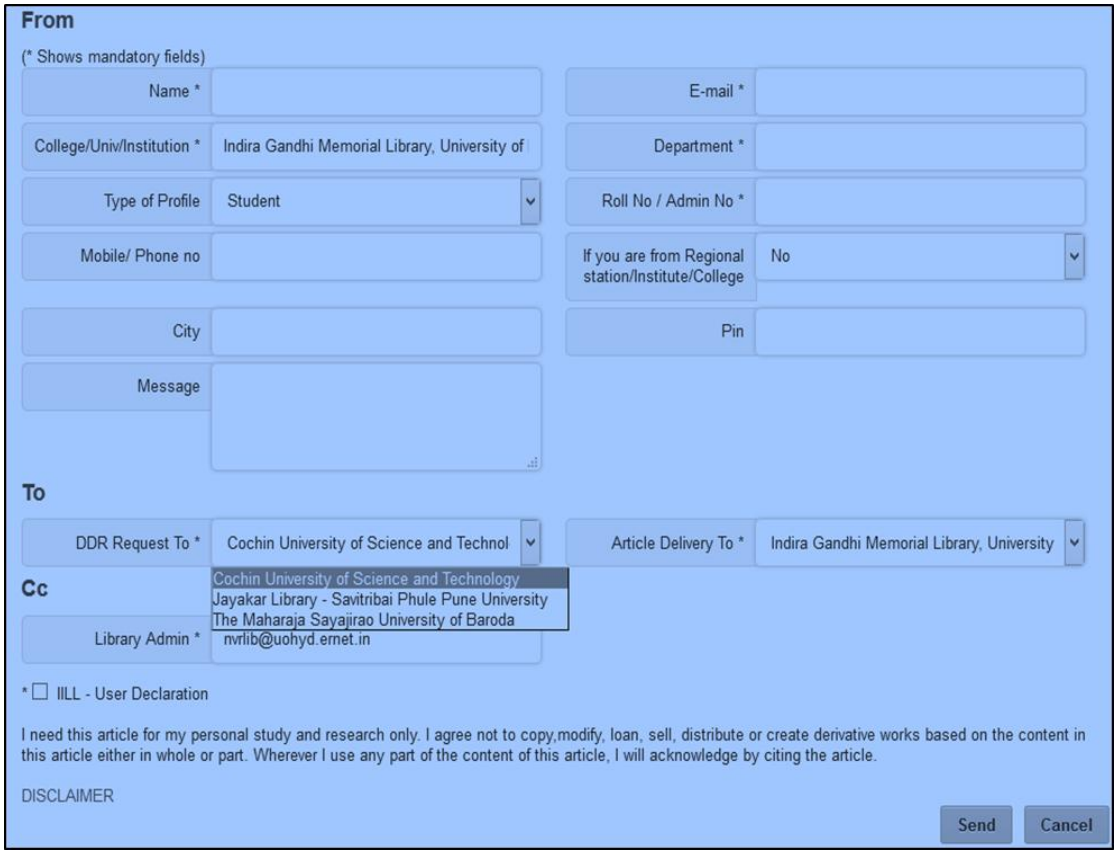


Figure 4: *Screenshot of Locations Listed Against the Selected Article for Users Selection of Location*
(Source: http://jgateplus.com)

5. IGM Library - Usage of Document Delivery Services

The University of Hyderabad Library is one of the leading university libraries in India established in the inception in 1975 and named as Indira Gandhi Memorial Library in 1988. The university library has been actively involving in interlibrary loan activities since the inception and later continued this service as despatch of photocopy of articles to other university libraries against their requests.The Indira Gandhi Memorial Library was the first university library in India to take advantage of ICT developments to provide information and online services to their users at right time. The online services being provided by the Library such as- Online Public Access Catalogue, memberships in resource sharing networks/consortia, subscription to e-journal databases, hosting collection in document delivery services and maintaining own library websites etc.

The library has been maintaining large collection of print, digital and electronic documents. The library has been subscribing to electronic resources since the year 1998 apart from licensing to online journals / web editions to print journals and full text journals databases since the year 2001. The library is additionally getting access to full text, abstracting databases and also the other portal services from UGC Infonet Digital Library Consortium. Further the library is providing access to back volumes of journals from 15 scholarly publishers from the first volume on perpetual access. At present, the library is subscribing to 47 journal databases covering almost 30,000 e'journals. The library is also providing access to around 5000 e'books/serial publications.

UGC INFLIBNET Centre has selected IGM Library as one of the 6 host libraries to provide Document Delivery services since the inception of the consortium. Ever since the consortium migrated to JCCC online platform for facilitating DDS with 16 host universities, the IGM library continued to be in important position in delivering these services.

Currently the number of hosting universities is increased to 22 under J-Gate@UGC-INFONET programme. Under this program photocopies of journal articles will be sent to the faculty and research scholars of other universities and also to the home university users at free of cost on their request.

As per the usage statistics provided by the UGC Infonet Digital Library Consortium, the document delivery service / activity pertaining to the university with JCCC @ UGC Infonet has been increasing from 9144 (2008) to 18914 (2010) as shown in the Figure 4 and then gradually decreased up to 11249 by 2012 (Suseela, 2013).

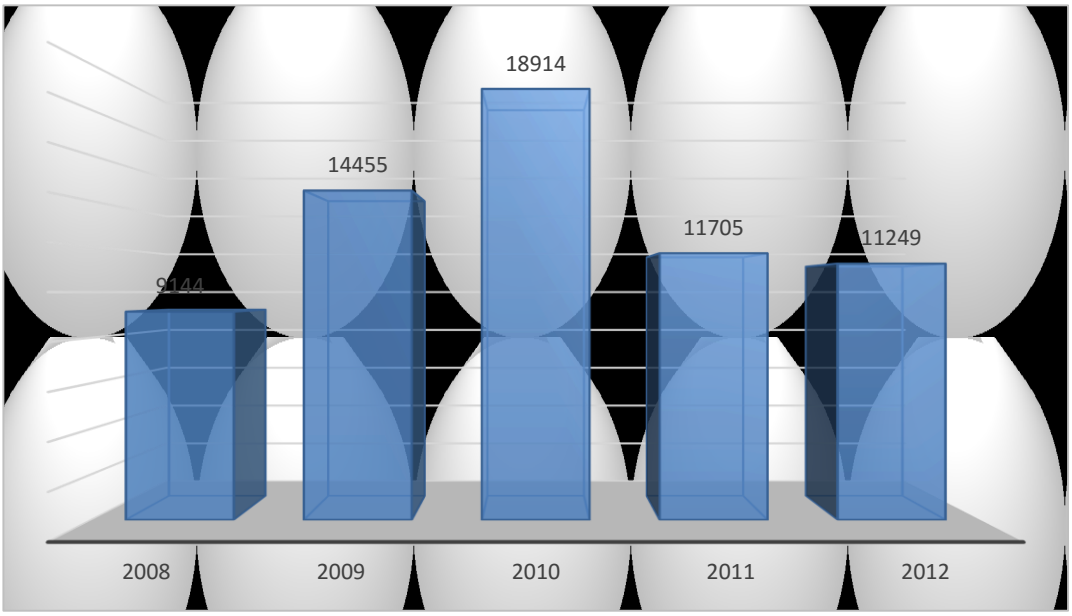


Figure 4: *UOH - JCCC@UGC Infonet Activity 2008 – 2012*
(Source: Suseela, 2013)

The latest statistics indicates further decrease of the activity by 2119 in the year 2014. The decrease in document delivery activity can be attributed to the decrease of print/online journal subscriptions by individual libraries, non-availability of required journals/articles to users through J-gate portal and the frequent changes in service portal and also the interface. The budget is decreasing with the increase in cost of the resources.

DDS-Article-wise

The article delivery service rendered by the IGM Library, University of Hyderabad for the current year is presented in Table 1. The data shows that, the university library has supplied 386 articles to the different Research Scholars requesting from all over Indian Universities, under INFLIBNET, J-Gateplus@UGC-Infonet Document Delivery Service portal for a period of 10 months i.e. from January, 2015 to October, 2015.

Table 1: *Number of Documents Supplied to Different Universities in India Under J-Gate@UGC-INFONET Portal (January to October, 2015)*

No. of Articles Supplied (Range)	Number of Universities Requested Articles
01 to 10	64
11 to 20	4
21 to 30	2
31 to 40	1
41 to 50	1
51 to 60	1
	73

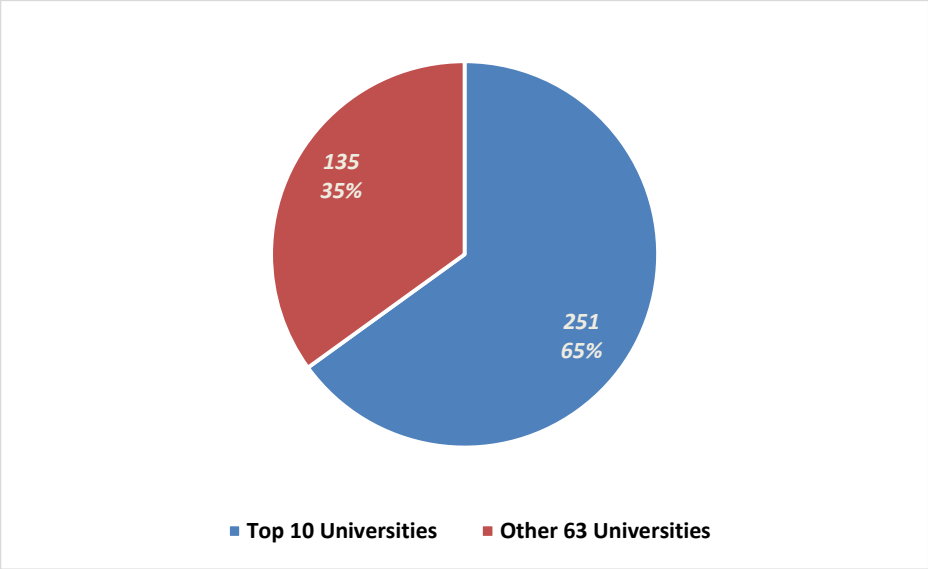
From the above Table it is observed that, during 10 months period, the IGM Library supplied 1 to 10 copies of articles to 64 Universities, 11 to 20 articles were supplied to 4 Universities, 21 to 30 articles to 2 Universities, 31 to 40 articles were supplied to 1 University, 41 to 50 articles were supplied to 1 University and 51 to 60 articles were supplied to a single university under INFLIBNET, J-gate@UGC-INFONET Document Delivery Service.

DDS - University-wise

Table 2: *Number of Articles Supplied to top 10 Universities by the IGM Library Under J-gate@UGC-INFONET*

Sl. No.	Name of the University	Number of Article Supplied
1	Guru Jambheshwar University, Hisar	52
2	Punjab University, Chandigarh	46
3	Bharathiar University, Tamil Nadu	31
4	Tata Institute of Social Sciences, Mumbai	26
5	Kuvempu University, Karnataka	23
6	University of Kerala, Thiruvananthapuram	19
7	Annamalai University, Tamil Nadu	19
8	Acharya Nagarjuna University, Guntur, Andhra Pradesh	14
9	Central University of Kerala	11
10	University of Calicut	10
11	Other Universities (63)	135 articles (less than 10 to each university)

The data about counts of articles sent to top 10 universities indicate that approximately 65% articles are sent to them, whereas 135 (around 35%) articles were sent to 63 universities.



During the 10 months period 73 University Research Scholars were requested through INFLIBNET, J-Gate@UGC-INFONET (http://jgateplus.com), Document Delivery Service. Out of 73 Universities, the highest numbers of articles i.e. 52 articles, were supplied to Guru Jambheshwar University, Hisar followed by 46 articles were supplied to Punjab University, Chandigarh, 31 articles were supplied to Bharathiar University, Tamil Nadu, 26 articles were supplied to Tata Institute of Social Sciences, Mumbai, 23 articles were supplied to Kuvempu University, Karnataka, 19 articles were supplied to the two universities i.e. University of Kerala, Thiruvananthapuram and Annamalai University, Tamil Nadu, 14 articles were supplied to Acharya Nagarjuna University, Guntur, Andhra Pradesh, 11 articles were supplied to Central University of Kerala and 10 articles were sent to the University of Calicut, Kerala State, whereas remaining 63 other universities received less than 10 articles as per their request through J-gate portal.

6. Discussion

Generally the Universities are not in a position to subscribe all the required resource to their research scholars, hence this DDS is very useful to get their required article from the other university Libraries. Though the service is prevalent since print resources only period, it gained momentum with the online supply of articles, which ultimately results in the increase of research output of Research Scholars and university. University Libraries have been developing their ICT infrastructure, resources and facilities with the Special grants given by UGC Inflibnet.

The usage statistics pertaining to this online service supplied by UGC Inflibnet reflect that the use of document delivery services was increasing in the initial years, but decreasing subsequently. The dependency on document delivery service might be reducing as almost all the universities are able to access innumerable journal resources with back files even since inception volume. Further the exclusive resources subscribed by host universities are coming down year by year, due to cut in budgets and increase in cost. The frequent changes in J-gate portal service and also the interface changes cause confusion and avoidance of using such self-support services.

Further in the current environment of subscribing digital/electronic resources and document delivery restrictions in electronic form, university libraries need to send them in only print form, which is

undoubtedly an added burden especially when staff as well as financial resources are diminishing day by day to undertake additional tasks.

Reciprocate activity of other libraries is another motivating factor for the supply of articles, especially when host libraries are not getting required articles. From the users experience/complaints it is observed that majority of users requests for articles are not getting response and only around 8 articles are received from other university libraries. Moreover the process of searching article in J-gate portal and sending requests for its supply is yet not familiar to majority of users, in spite of conducting regular orientation sessions by the library.

7. Conclusion

INFLIBNET Center, Ahmedabad has recently conducted a meeting to all the 22 university document supply centres at Bangalore. In that meeting the university librarians expressed several problems, which they were facing for sending the article to other university research scholars. Most of the librarians requested to provide finance for purchase of computers, scanners, and manpower and also for the stationary. And the librarians also expressed that due to the lack of finance and manpower they are not able to send the requested article to the research scholars.

The J-Gate@UGC-INFONET document supply can increase the speed of document supply. Once the document is located in the library, the requested article can be scanned and quickly sent to the requester by e-mail.

The Gate@UGC-INFONET is very useful and increases the speed of document supply to all the universities in India. J-gate is a gateway to all the resources of the member libraries and provides easy and quick passing of resources from library to library. The IGM library has provided highest number of articles to other university research scholars through e-mail and by post. It is most important for all the universities to participate in the program and send the required articles to the research scholars to support their research. The J-gate features and search facility should be explained to the users through orientation which the University of Hyderabad regularly conducts in the beginning of the year to reach the facilities to the students. To promote research every university should come forward in DDS since it is give and take service in which all participating university users are benefited.

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Strategic Management in Academic Libraries with Reference to Users Perspective

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract The rapid growth of digital technologies and electronic communications in academic libraries has dislocated the model of traditional library service, which was a long hold from the past century. The arrival of internet technology and the explosive growth of electronic content available on the web made the services of the academic libraries uncertain and creating challenges in rendering users services as per their requirements. This article attempts to provide a strategy for academic libraries applying principles and practices of strategic management highlighting the Ansoff matrix (model) in order to face the impediments coming in the way of providing better services to their users.
Keywords *Strategic Management; Strategic Library Planning; Environmental Scanning; Ansoff Model of Library Service*

1. Introduction

The strategic library management is one of the most important alternatives to make the future design and development of the library. The systematic planning of academic library is highly essential due to rapid advances of information technology in the current era. Most of the University and college libraries are sustaining both teaching and research in their academic periphery. Strategic planning is a cooperative endeavor with the active participation of administration, faculties, students and library staff. During strategic planning, the role of the librarian is very significant as he is an educator and leader in the process. The strategic plan developed should offer a pattern that incorporates major goals, policies and actions of the institution that constitutes the whole. It helps in the allocation of resources; capitalize on relative strengths and weakness with the environment, and allocation of resources to make a stronger

support in the hub of teaching and research. This article describes brief marketing concepts and their applications that are helpful to make academic libraries more users prone.

2. Strategic Management

Strategic management is the process through which organizations analyse and learn from their internal and external environments, establish direction, create strategies that are intended to achieve established goals, and execute those strategies, all in an effort to satisfy key organizational constituencies, which are called stakeholders. The model is not rigid, but simply represents a useful sequence to discuss the concept of strategic management. For example, while the activities may occur in the order specified in the model, especially if a firm is engaging in strategic planning program, it may also be carried out in some other order of simultaneously as per the need.

Steiner (1979) defines the strategic management as “designing a desired future and identifying ways to bring it about involves ideas and actions that are directed to the long-term future of the organization". According to Chandler, the strategy is “the determination of the basic long-term goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out those goals”.

A. Why Strategic Management in Libraries?

Strategic management empowers positive change by bringing together the diverse individuals, communities and information to advance research, education, and innovation in the academic library. It also advances the university’s attainment of academic excellence by bringing the world’s knowledge to faculty, students and research scholar at the professional, graduate, and undergraduate levels. Further, it strengthens all the academic community of a university or college’s in positive engagement and its transformation of local, national, and international arenas.

In the academic institutions, librarians are the inventive associates of the research and advanced studies. They collect, categorize, and archive information resources of relevant research for the purpose. They are managing these resources and provide quality services in order to meet the present and future needs of academic groups. They help to bridge the link among these groups and educate the whole community in the successful utilization of information. The academic community depends on the libraries when they need information.

B. Principles of Strategic Planning

The important principles of strategic planning are as follows while developing an academic library. It is very important to inquire exact query to originate exact alternative. The distinctive questions are as follows:

- How the library need to support the students in excellency
- How the library sustain different research needs including support in collaborative research of user in on or off campus.
- How the library can keep on encouraging and archiveing information over the campus to the extent of research needs and available grants.
- How to involve effectively in information technology applications of the parent organization in order to provide campus wide teaching and research support.
- How the library can support and strengthen the academic and research activity to campus users in an organization.

Today's complex and challenging environment requires the libraries to focus on mission and objectives of the organization and its willingness to experiment. Small changes may meet the university's short-term needs but they will be inadequate to sustain excellence on the long term needs.

3. Strategic Management for Academic Libraries

The role of the libraries as an essential partner of research, teaching and scholarly communication is significant in academic institutions. They provide access to world-wide resources within and beyond their collections, in all formats, as and when the user need. The physical spaces of the libraries will promote reflection, scholarly communication and intellectual exploration. The libraries will be an inventive pioneer for the whole academic group, especially when the corresponding frameworks are changed. An expert and flexible librarian as professional will interact with faculty, staff and students will be responsive to their needs of learning, research and teaching. As the academics progress toward its key objectives, it will take note that the libraries have assumed a major role in encouraging quality in teaching and scholarship interdisciplinary and information in the service society.

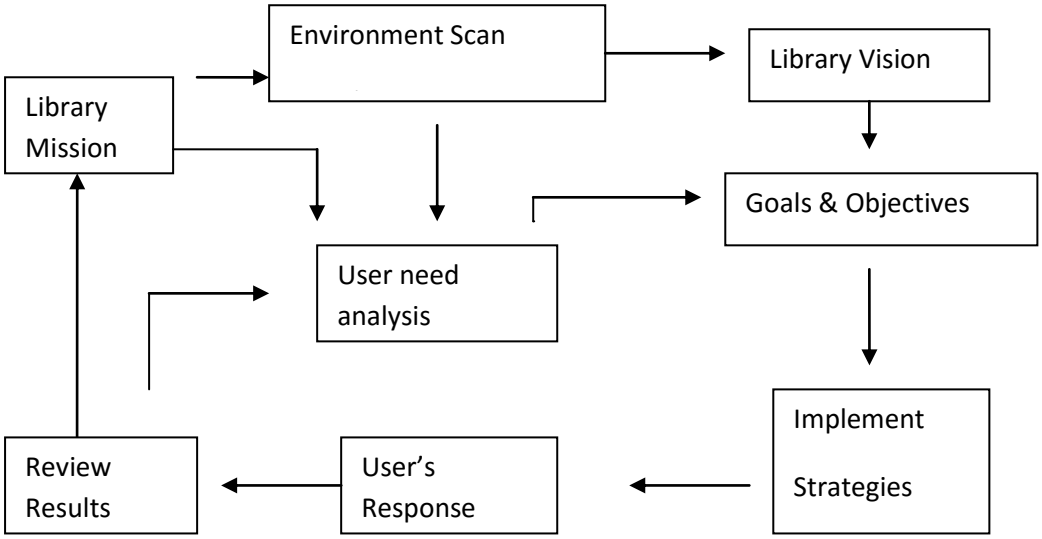

Figure 1: *Cycle of Strategic Library Planning*

A. Mission and Vision of Academic Library in Digital Era

The mission and vision of libraries in any academic system goes in line with the objectives of the concerned academic institutions. Academic libraries are the central point of dissemination of information services to the diverse groups of user, i.e. students, faculty and researchers to enhance their teaching, learning and research needs. Singh and Kaur (2009) stated that "preservation and access to knowledge and information is the main consent of academic libraries in addition to sustaining the mission of their parent. The academic libraries are playing supportive role to the university education give essential resources and services in the digital era". These facilitate the libraries to meet up the needs of their teaming users. Such resources range from print to non -print and electronic materials in line with what Yusuf and Iwu (2010), who emphasized that - "different patrons of academic libraries used different materials given by these libraries, i.e. reference materials, textbooks, journals, newspapers, past projects, electronic journals etc."

B. Environmental Scanning

Environmental scanning is the monitoring, evaluating and disseminating of information from the external and internal environment to key people within the corporation or organization (Kazmi, 2008). It is a process of gathering, analyzing all the information related with the opportunities and threats of the academic library. Further this process involves acquiring both accurate and subjective information on the business environments in which a library is working or considering to enter. Following are three modes by which an organization scans their environments.

- **Ad-hoc scanning:** - It is a short term scanning, where rare assessment usually initiated when a crisis happens in an organization. It scan the environment as a result of its affect, the company is able to recognize the problem which exists internal or external.

- **Regular scanning:** - In this mode, assessments are being carried once in a year with regular schedule. Most of the cognizant organizations believe that regular scanning should be done in regular basis and they used to perform such scanning every year.

- **Continuous scanning: -** It is a continuous scanning process, where an organization can perform assessment continuously.

C. SWOT Analysis

Strengths Weaknesses Opportunity and Threats (SWOT) are also known as SWOT analysis, is a tool for planning the academic library helps to find the key issues and problems that arise in the library environment. SWOT analysis a problem through internal and external analysis. In internal analysis, strengths and weaknesses are considered, whereas in external analysis, opportunity and threats are considered. The factors considered during internal analysis are –

- Library culture and image
- Organization structure of the library
- Organizational operational efficiency and capacity of library
- Brand awareness of library
- Financial resources of library
- Analysis of resource activities of the library

Each of these internal factors is considered as strengths and weakness of a library. Similar to internal analysis, various factors that need to be considered in external analysis are:

- Patrons of the library
- Competitors
- Recent trends of the library
- Vendors
- Members of the consortia
- Latest technology for library & information service
- Economic situation
- Political and legal restrictions

D. PEST Analysis

PEST stands for Political, economical, social and technological analysis helps the academic library to analyze the strategies to identify the environmental factors that highly affect the organization strategy. When analyzing the various factors effecting the strategy of any organization, it is also important to

consider the changes occurring in these forces at work in the wider environment and identifying the environmental factors that are effecting an organization. However, this generates a large amount of information but of limited value, if it only lists the environmental influences. It is necessary to use quantitative approach also to identify the environmental factors. Consider as example of the library and information services in technical university. At the time of long term pressures the ability of the library to provide information service largely depends on the three crucial factors, they are –

- Increasing demand of information services for the users of certain categories
- Rapid development of information communication technology in library and information service
- Restriction imposed by the management and government on funding that leads to uncertain economic conditions under which academic libraries need to operate.

These are the key factors that influence the strategy for the library and information services of a university. Sometimes, librarians are pressed with day to day problems, library services and fail to address them, wherein the strategy facilitates short-term response rather than long-term development

E. Strategic Goals

Strategic management demonstrates its commitment to academic excellence through a strong service orientation and user focus. It serves the diversity of the community by providing access to a wide range of materials, by recruiting a skilled / well informed staff, by employing collaborative, strategic but risk-taking techniques and the environment that supports experimentation to meet strategic goals of the academic library. The following are some of the important goals of strategic management of academic libraries.

- It provides research and curates of whole library's artifact.
- Create active learning spaces that boost the academic research and learning objectives of any academic institutions.
- Dexterously and effectively connect with the academic community
- Implementation of latest methodologies and pedagogies in a variety of information services
- Expand revenue sources of the library through development and grant support

F. User Need Analysis

Understanding user needs is a vital part of information services and plays a critical role in the service industries. It is widely accepted that success of any service industries depends of the satisfaction of the user's needs and requirement. As service institutions like academic library, the term user need analysis can be defined as a formal procedure emphasizing on how a library attends to the needs of its users. This tool is not just developed for business process, but is considered most important analytical technique to provide better information service to the library user. This technique is widely used in many industries i.e., automobiles, consumer products, banking and software development. It highlights new opportunities in the current environment, find out user needs, identifies problems with existing services, and encourages new technology. The bit of knowledge from user assessment leads to apply full thought for innovation.

Principles of Need Analysis

The user need analysis begins with a systematic understanding of the needs and requirement of the users, which benefits the organization to enhanced quality of work, increasing productivity, reducing supporting as well as training costs and improve the end user satisfaction. There are few principles mentioned hereunder –

- The Idea of end users is important to bring together a different, determined design group, and their assessment should rise above the wishes of your design group.
- Assessment of user needs is very important to bind together the end users thought, and to utilize quantitative research to locate the best way for service design.
- Appeal to the most minimized shared factor in end user needs. Promoting to the least ability levels results in the biggest potential innovation service.
- Do thorough beta tests of service over a long time to permit sufficient alterations before introducing item in the last assembling stage.
- Monitoring continuously user's feedback after the introduction of new service and report defects immediately and keep an exact record to apply to future releases.
- When the service designs are finished as a result of effective needs analysis, they should be put to the verification of service heads and peers.

G. Implementation of Strategy in Academic Library

Implementation of strategy in academic library is the analysis of selected strategy into organizational actions in order to accomplish strategic goals and objectives. Additionally, strategy implementation is characterized as the way in which an academic library should expand, use, and integrate the organizational structure, control systems, and culture to pursue strategies to lead competitive advantage and a better execution. Organizational structure allots exceptional creating tasks and roles to the employees and states how these can be connected so as to maximize the productivity, quality, and end user satisfaction and also to attain the competitive advantage.

The organizational structure alone is not adequate in itself to motivate the employees, but a control system is highly necessary for any sort of organization. This control system furnishes the managers the motivational impetuses of employees as well as feedback on employees in a hierarchical execution. Organizational culture refers to the particular accumulation of qualities, states of mind, standards and beliefs shared by individuals and groups hierarchy. The followings are some important process to implement strategy in academic libraries.

- **Strategy articulation** - consensus agreement of the strategic objectives to be achieved
- **Strategy communication** - engaging employees considering human behaviour or their psychology.
- **Strategy translation** - translating strategic goals into clear short-term operating goals
- **Strategy monitoring & controlling** - monitoring the progress and control the strategic goals till accomplished
- **Strategy engagement** - Keeping librarians engaged till achieving the goals

Well-structured strategies will be disrupted, if they are not properly executed. It is an important aspect to take a note that implementation of strategy in academic library will not be possible unless there is steadiness between strategy and all elements in whole organization i.e. allocation process, structure of reward, organizational structure etc.

4. Ansoff Model for Academic Library Services

Most of the library users expect variety, quality, and reliability in their services. The outcome of the market research leads to determine the needs and design services that fulfill the need of the users. Library services should be designed to meet general as well as the specific needs of the end users. To cite an illustration, many reference questions are posed each day in academic libraries, instead of answering the same questions again and again FAQ (frequently asked questions) can be included on the library website or a user guide can be issued to new users or user orientation can be conducted to

groups of users according to their academic specifications. Such user friendly activities can be designed inside or outside of the library to make the academic library services more users centric.

As the marketing principles are applied to academic library services, it is very important to determine what services need to be best for end user of a library. The famous author BS Mathews (2009) defines the experience of the library as “a series of interactions with a range of end user. Our goals is to recognize and separate favorable times to engage end user by presenting various feature of the library”

The Ansoff (Matrix) model is a strategic planning tool that provides a framework to help business executives to devise strategies for future development of the organization. The tool and concept was developed by Igor Ansoff. He devised 4 alternative growth strategies in a table or matrix.

Table 1: *Ansoff Model*

	Current Service	New Service
Current Market	• Market Penetration • Advertising existing product • Service to existing user	• Service Development • Offer new service to existing user
New Market	• Market Development • Advertising existing product • Service to existing user	• Diversification • Offer new service to existing user

- **Market Penetration:** Development can be accomplished by persuading the present users to make more utilization of existing services. This is the easiest methodology because the users are library’s end users.

- M**arket Development**: Development can be possible with new market segments by matching existing services including libraries, e.g. enabling online renewals, mobile applications, receiving online recommendation for books, journals and other material and obtaining feedback of newly launched or on trial information products or tools. Further the development of library websites not only displays the information about the collection, services and also flash messages.

- **Service Development:** New innovation can be adopted and targeted to existing market segments. Market research can be utilized to establish what services will help a particular market segment. For example in academic libraries applying providing remote login facility for faculty and researchers, enabling users access to resources, various applications and databases through online public access catalogues.

- **Diversification:** New innovation can be made for new markets. This will be enhanced by reaching the library to new groups as well as put in innovative services. For academic library users the current innovative practices like providing tools to discover or explore all the available resources in single search for quick and easy retrieval of information. Incorporation of web 2.0 applications in library websites facilitates the close interaction and feedback regarding the library services.

8. Conclusion

Strategic management in academic library is a very complex task. Due to the rapid growth of scholarly publications in electronic format and increasing complexities in the scholarly communications have tremendously transformed the role of the academic libraries in the present digital environment. Most of the libraries are facing great deal of uncertainty over this complexity. In the board outline, it is not difficult to envision. The challenge most of the libraries face today is complexity of scholar communication and

the long term preservation of digital information. Furthermore, the main aim of the library is to provide right information to right user. To fulfill the objective in the complex environment, it is very necessary to deploy new techniques and technology. Strategic management is the accumulation of continuous activities and procedures that a library can use to systematically arrange and adjust resources and activities to mission, vision and technique throughout an organization. This helps an academic library to transform the static arrangement into a framework that gives key strategic performance advice to decision making and empowers the arrangement to advance and develop which prerequisites different circumstances to change.

In order to develop an effective initiation of strategic planning in the academic library, the above study suggests the need of library leadership to change and rejuvenate its management model, structure and systems. Further this paper describes the main responsibility of the library is to initiative various developments in the academic culture. An academic library should develop and distribute the strategic plan, resulting in user satisfaction and accomplishment of organizational objectives.

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Web 2.0 Tools in Enhancing the Best Practices of User Services in Academic Libraries: A Comparative Study of Central University Libraries in Assam State

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract Applications of Web 2.0 tools are playing a significant role to enhance the best practices of library activities as well as on-line digital reference services. The tools are becoming more popular among avid users of this modern era as they are fast and effective tools for disseminating information. Use of these tools in a library will fascinate the users and disseminate information in a more attractive and agreeable medium. This paper is aimed at presenting the results of a study conducted in the central universities in Assam State on Web 2.0 applications among LIS professionals. During the survey, structured questionnaires were distributed randomly among LIS professionals and the responses were received with a rate of eighty eight percent. The comparative study revealed the respondents' awareness and rate of knowledge about the Web 2.0 tools in the central university libraries.
Keywords *Web 2.0; LIS Professionals; Best Practices; Central University Libraries; Assam*

1. Introduction

Web 2.0 tools are dominating the personal and professional lives of millions of users. The popularity of the tools draws the attention of all the people and it has changed the ways that libraries, museums, archives and other cultural heritage organizations work. As librarianship changes and adapts to the needs of the internet generation, use of these tools has become an essential feature in the work areas of the professionals [4].

Web 2.0 tools and plans have provided innovative practices to the normal way of working in the library profession. Web 2.0 facilities presently offered by libraries include Blogs, Wikis, RSS, Podcasts, Video

Casts, Instant Messaging, SNS and Twitter, etc [4]. The use of Web 2.0 tools and applications brought substantive change in library collection and services. The library collection is changed, becoming more interactive and fully accessible. The library's services are changed, focusing more on facilitating information dissemination and the information retrieval rather than providing controlled access to it [2].

Some important web 2.0 applications useful for libraries are mentioned below.

- Blogs are websites. They can be used to promote library services providing links to recommended sources, listing book reviews, promoting entertainment, providing news for LIS professionals, initiating book discussions, facilitating communication amongst library users and encouraging the development of a community.
- SNSs (social networking services) can encourage a variety of library services such as library announcements, posting news, updating resources, communicating with patrons, providing reference service, collaborating on projects, for customer service, sending alerts about requested materials, as a marketing tool, as a way to share information about professional development opportunities, for cataloging, for internal updates, and for networking with other staff, libraries, and library-relevant organizations.
- RSS feed through library can offer a variety of services such as workshops/classes, to market ideas, activities, event announcement, new acquisitions, exhibitions, to share library news and content, as well as to gather and distribute related information from other web sources. LIS professionals can use RSS feeds for Current Awareness Service and SDI (Selective Dissemination of Information) services. This resembles the traditional library services namely CAS and SDI.
- Wikis can be used for internal communications among staff, to create a knowledge base, to facilitate committee work, for instructional purposes in the classroom, to teach information literacy to students, in project management and strategic planning also.
- Instant messaging (IM) is similar to e-mail that can exchange text messages and it is a more immediate and informal way of communication system. One of the best examples of instant messaging service is used in 'chat reference' services, where users can interact with librarians.
- Podcasts can be facilitated through a variety of library services like provision of weekly updates new arrival book, lectures, tutorials, events, conferences, in information literacy instruction, library marketing, library instruction, keeping patrons up to date with library information, library guides and tours. Libraries can distribute iPods to their users to intensify their podcasting services and resources.
- In library environment, Vodcast's are playing an important role in information dissemination. It displays some of its lectures (through You Tube) using Web 2.0 technologies. Several libraries around the world are using You Tube for information dissemination.

Libraries are increasingly enhancing their websites by introducing Web 2.0 features in providing the users' services. The amalgamation of Web 2.0 features has endorsed the website to be more flexible and adaptable. With the adoption of Web 2.0 tools, LIS professionals effectively work on outreach activities and promotion. LIS professionals can get first-hand information about the users through interacting with them. They can then understand the behaviour of the users and design services to meet their needs [12].

There are only two central universities in Assam. They are, Tezpur University and Assam University situated at Brahmaputra Valley and Barak Valley regions of Assam respectively to cater the academic needs of the people. The Central Library of Assam University known as Rabindra library was established in the year 1994 as a central facility for meeting the information requirements of the academic community of the university. It possesses more than one lakh books and it is the largest library in the Barak Valley region of Assam along with other valuable resources [3].

The Central Library of Tezpur University was established in 1994 along with the establishment of the University. The library holds more than sixty five thousand volumes of print documents and subscribed to more than six hundred and thirty current journals.

Both the libraries are member of the UGC-Infonet Consortia of INFLIBNET and getting access facility to around 9081 (including 525 on perpetual basis) e-journals and seven databases. Both the libraries get online access of 926 e-journals through DelCon Consortium. Library users can access books database, these database, journal database, e-journals and other e-resources from any terminal within the university campus [9].

2. Statement of the Problem

Web 2.0 tools are not a new concept for libraries, and now-a-days, these tools have come up with innovative features and flexibilities. Many studies carried out on Web 2.0 tools in library services and activities in order to get benefits of these miraculous tools and explore the library services on virtual environment on web. No study was undertaken to understand the awareness and use of Web 2.0 technologies as the best practices among LIS Professionals in the central university libraries of Assam. Keeping the emerging use of Web 2.0 applications all over the world in view, this study was aimed at finding the use of Web 2.0 applications for enhancing the best practice in the central libraries of Assam.

3. Objectives of the Study

The main objective of the study is to determine LIS professional's awareness on Web 2.0 tools and its usage in the two central university libraries of Assam. The other objectives of the study are:

1) To assess the use of Web 2.0 tools by LIS professionals
2) To determine the sources of learning the Web 2.0 tools
3) To understand the impediments to use Web 2.0 tools
4) To determine the purposes and different challenges faced in using Web 2.0 tools
5) To find out training needs on Web 2.0 tools
6) To assess the type of training and tools of Web 2.0

4. Research Methodology

The present study has been undertaken in two central universities in Assam such as Assam University, Silchar and Tezpur University, Tezpur. Survey method was adopted to conduct the study and a structured questionnaire was designed to collect information from the LIS professionals. The structured questionnaire was set and distributed among LIS professionals of both the university libraries. Fifteen questionnaires were distributed to Assam University LIS Professionals. Out of fifteen questionnaires, fourteen professionals were responded that means response rate was ninety three percent of LIS Professionals in Assam University, Silchar. Ten questionnaires were circulated to Tezpur University LIS Professionals. Out of ten, eight questionnaires were received from respondents i.e.; eighty percent. On the whole twenty two responses were received from total twenty five questionnaires circulated and the response rate of both the universities was eighty eight percent. Functioning of the university libraries were personally observed and interviews with the respondents were also taken as and when became necessary.

5. Literature Review

Numerous studies on awareness and usage of Web 2.0 tools among various professionals have been conducted and literatures on the area are available in print and non-print form. A few of the earlier studies found on Web 2.0 applications among LIS professionals are summarized below.

- Abidinet et al. [1] in their studies indicated that most of the respondents were using Web 2.0 services in their daily lives. However, users did not use this service provided by the public libraries, although all 14 public libraries had adopted at least two or more Web 2.0 services, especially SNSs. In fact, the adoption of Web 2.0 services was at an initial stage of its development and thus, most of the Malaysian libraries were in the process of enhancing its progress for the betterment of the services. Conversely, the study also found that there were no definite policies on the adoption of these services.
- Baroet, al. [4] conducted a survey on awareness and use of web 2.0 tools by librarians in University Libraries in Nigeria. The survey report showed that the librarians were more familiar with SNSs, IMs, and media sharing sites, blogs and wikis. Web 2.0 tools like Flickr, RSS feeds, podcast and social bookmarking were among the least used. The study revealed that librarians used Web 2.0 tools mostly for reference services online, library news/events, training resources, and image and video sharing. Lack of facilities such as computers with internet access, lack of skills, and lack of time were indicated as some of the barriers in the use of Web 2.0 tools by librarians in university libraries in Nigeria.
- Mansor and Idris [7] conducted a survey on perceptions, awareness and acceptance of Library 2.0 applications among librarians at the international Islamic University Malaysia. The findings showed that there was high awareness among the librarians with Library 2.0 applications. The findings also indicated that there was high level of computer expertise among the respondents in terms of web browsers and search engines, in addition to high level of utilization in some of the Web 2.0 applications. In addition, the study observed high rates of using blogs and Wikipedia among the librarians.
- Tyagi [10] expressed that Web 2.0 was especially useful and creative when knowledge was digitized, modular and allowed to be used and distributed in a flexible way. The application of the Web 2.0 tools in Indian higher education was still marginal and it would have to overcome a lot of obstacles in order to hold its ground as in higher education of developed countries. The adoption of Web 2.0 tools at universities was associated with important challenges (potential risks, institutional fears) and an effective strategy to deal with implementation problems.
- Tyagi [11] observed that significant portion of the respondents had good knowledge about the Web 2.0 tools. Web 2.0 provided innovative and interesting resources for librarians to serve their users as quickly and effectively as possible with new ways. The respondents having excellent skills of internet usage were more inclined towards adoption of Web 2.0 technologies in their personal life.
- Thanuskodi [12] carried out a survey on awareness of library 2.0 applications among library and information science professionals at Annamalai University, India, which indicated that majority 37 (61.66%) of the respondents needed training on Web 2.0 technologies and tools. The study found that 20 (33.33%) of the respondents considered workshops as important for using blogs. When asked about workshop on using wikis, only a very few respondents (15.55%) agreed to it.

The reviews of literature indicate that there was no such literature to understand the level of awareness and use of Web 2.0 tools by the LIS professionals in the university libraries of Assam state.

6. Analysis and Interpretations

The analysis and interpretations are discussed below:

A. Level of Awareness of Web 2.0 Applications

LIS Professionals were asked to specify whether they were familiar about Web 2.0 tools such as blogs, Wikipedia, RSS feed, social networks, podcasting, and others. It was observed that all of the respondents have sufficient knowledge about the Web 2.0 tools (Table 1). 86% of respondents in Assam

University were aware of Web 2.0 tools. While, only 75% of respondents in Tezpur University were aware of the same.

Table 1: *Level of Awareness of Web 2.0 Tools*

Aspects	Assam University		Tezpur University	
	Responses (N = 14)	%	Responses (N = 8)	%
Yes	12	86	6	75
No	2	14	2	25
Total	14	100	8	100

A question was posed to identify which particular Web 2.0 tools were used and the respondents were aware of. The results are depicted in percentages and illustrated vide Figure 1.

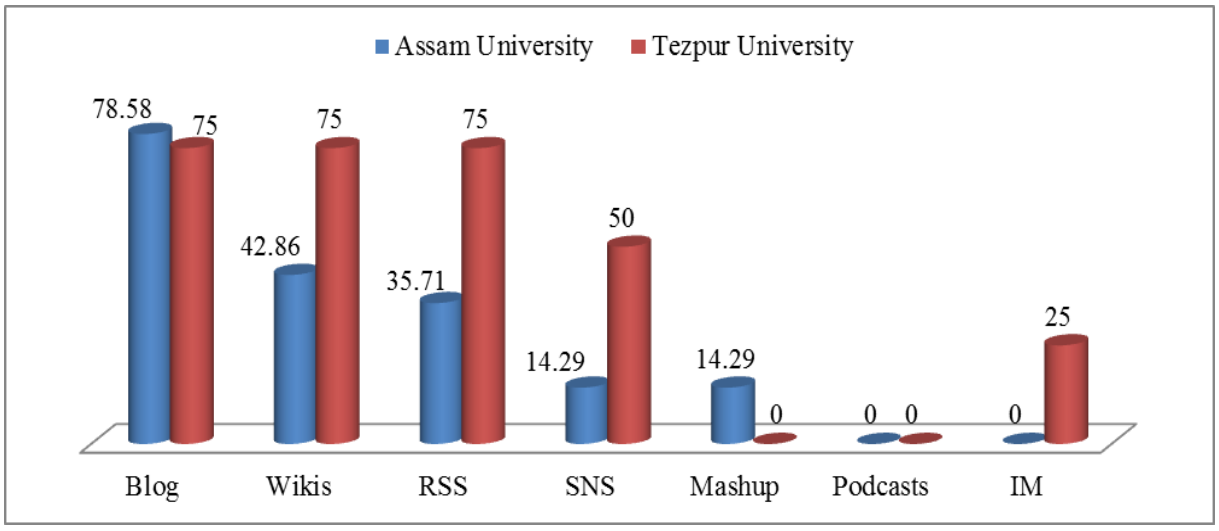

Figure 1: *Familiarity of Web 2.0 Tools (in percentages)*

It was revealed from the study that the respondents in both the universities are highly aware blogs as Web 2.0 tool**.** The percentage of response is 78.58% in Assam University and 75% in Tezpur University.

B. Use of Web 2.0 Tools

One of the main objectives was to study the opinion of usage of Web 2.0 tools among LIS Professionals. Results showed that 86% of the participants of Assam University used Web 2.0 tools while 75% of the respondents of Tezpur University used Web 2.0 tools as shown in Figure 2**.**

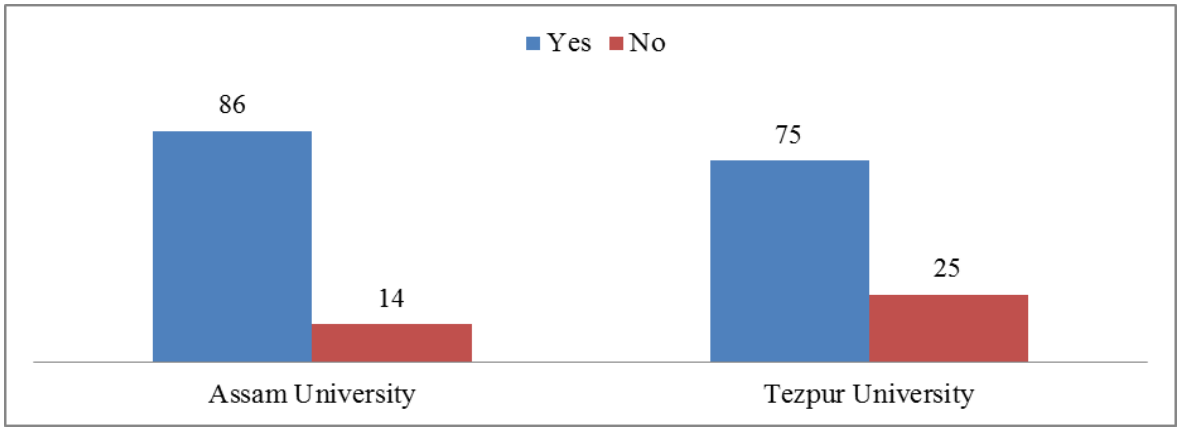

Figure 2: *Use of Web 2.0 Tools (in percentages)*

C. Sources of Learning the Web 2.0 Tools Use

Respondents were asked to classify the method used for acquiring the necessary skills to use Web 2.0 applications. The results are shown in Figure 3. It was revealed from the data that 64.29% of Assam University LIS professionals learnt through self-practice, while 75% respondents of Tezpur University acquired skills through self-practice; 42.86% of respondents learnt Web 2.0 tools through workshop and 12.5% of participants acquired knowledge through workshop respectively.

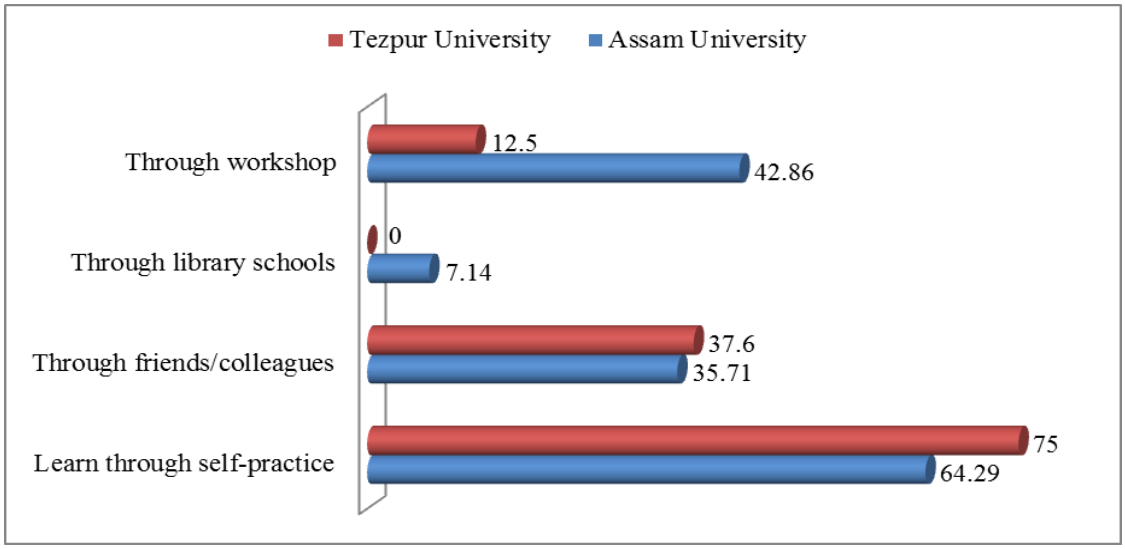

Figure 3: *Means of Acquiring Skills to Use of Web 2.0 tools (in percentages)*

D. Impediment to the Use of Web 2.0 Tools

Only a few LIS professionals responded to the question where they were asked to mention the reasons why they were not using Web 2.0 Applications. Table 2 discloses various reasons for not using Web 2.0 tools among LIS professionals. 21.42% of respondents in Assam University expressed that they have IPR/copyright issues and institutional fears in using Web 2.0 applications. While, only 12.5% of participants in Tezpur University responded that inability to prove "authenticity of the content" and IPR/copyright issues in using Web 2.0 applications. Only 14.29% of participants in Assam University realized unreliable power supply in using Web 2.0 applications in library.

Table 2: *Reasons for Not Using Web 2.0 tools*

Reasons for Not Using Web 2.0 Tools	Assam University		Tezpur University	
	Responses (N = 14)	%	Responses (N = 8)	%
Inability to prove "authenticity of the content"	0	0	1	12.5
IPR and copyright issues	3	21.42	1	12.5
Institutional fears	3	21.42	0	0
Unreliable power supply	2	14.29	0	0

E. Purposes of Web 2.0 Tools Use

Differences regarding the purposes for which LIS professionals use Web 2.0 tools also exist among LIS professionals in Assam University and Tezpur It was observed that 62.6% of LIS professionals in Tezpur University use the Web 2.0 tools for keeping users aware with knowledge of current subjects. While, only 35.71% of LIS professionals in Assam University use the Web 2.0 tools for keeping users aware with knowledge of current subjects. 50% of LIS professionals in Tezpur University engaged in sharing information about new arrival of books and participate in discussions/interactions. While, only 21.42% of LIS professionals in Assam University engaged themselves in sharing information about new arrival of books and participate in discussions/interaction (Figure 4).

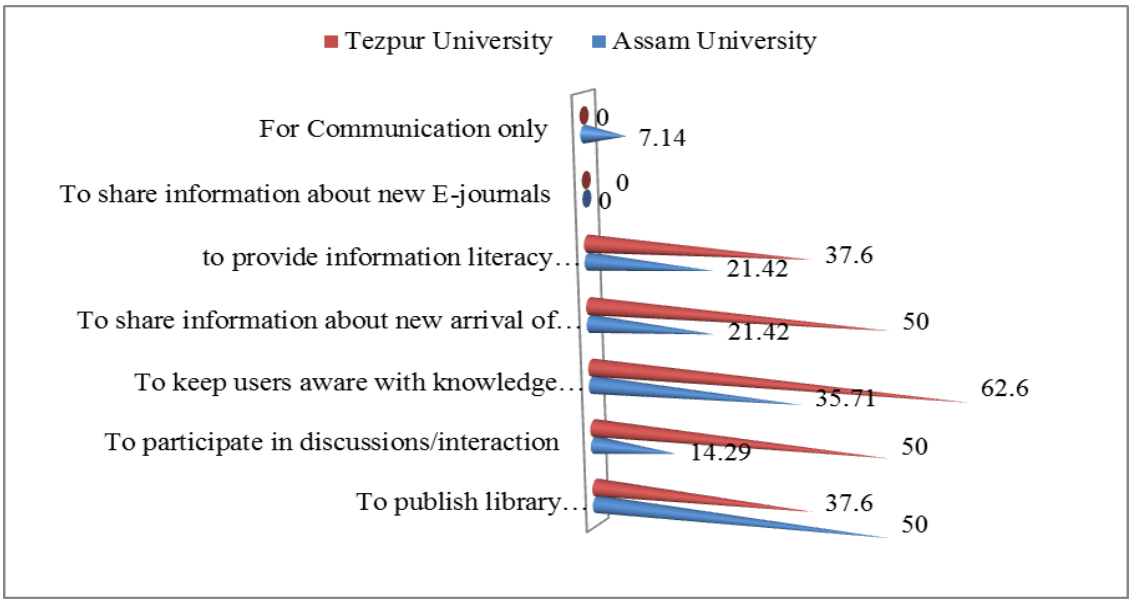

Figure 4*: Purposes of Web 2.0 tools use among LIS Professionals (in percentages)*

F. Challenges Faced in Using Web 2.0 Tools

LIS professionals were asked to indicate challenges faced in using Web 2.0 tools (Figure 5). Various problems have been mentioned by the respondents. 87.6% of LIS professionals in Tezpur University indicated lack of skills as one of the major encounters to effectively use Web 2.0 tools. While, only 50% of LIS professionals from Assam University realized lack of skills as a barrier. 62.5% of LIS professionals in Tezpur University opined lack of facility and lack of infrastructure as a challenge to use Web 2.0 tools. While 50% of LIS professionals in Assam University indicated that lack of facility and lack of infrastructure as challenges in using Web 2.0 tools.

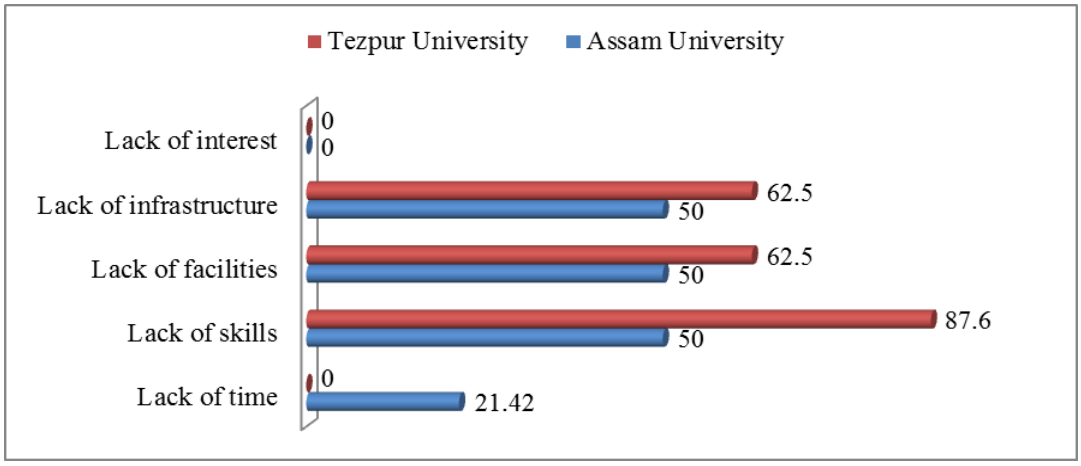

Figure 5: *Barrier in Using Web 2.0 tools among LIS Professionals (in percentages)*

G. Type of Training and Tools of Web 2.0

The study showed that 71.42% of LIS professionals of Assam University needed training on application of Web 2.0 technologies and tools. While only 75% of Tezpur University participants opined that they required training on application of Web 2.0 technologies and tools in libraries. 57.14% of the Assam University respondents felt the importance of workshop for using blogs, wikis, SNSs, and podcasting. While only 62.5% of Tezpur University respondents were of the view that they needed workshop to learn about blogs, wikis, SNSs and podcasting. When asked about workshops on application of mashups, only 35.71% of respondents of Assam University and 37.6% of Tezpur University agreed the same (Figure 6).

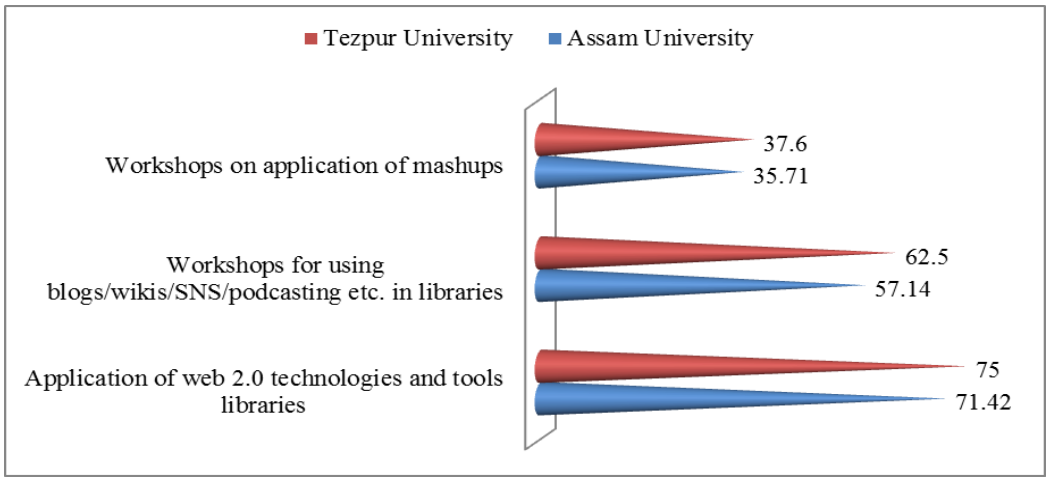

Figure 6: *Training Needs on Web 2.0 tools*

H. Training Needs on Web 2.0 Tools

Respondents were asked to indicate their outlook regarding the training wishes on Web 2.0 tools in libraries. Table 3 shows that LIS professionals of both the universities supported the needs for the training on Web 2.0 tools.

Table 3: *Training Needs on web 2.0 tools*

Training on Web 2.0 Tools	Assam University		Tezpur University	
	Responses (N = 14)	%	Responses (N = 8)	%
Yes	14	100	8	100
No	0	0	0	0
Total	14	100	8	100

7. Discussion

Web 2.0 tools facilitate different library services, geared towards the needs and expectation of today's library users. It makes information accessible whenever or wherever the users require it. Web 2.0 based library services are new trends for library and information centres. Library and information professionals should pay attention that Library 2.0 could revitalize the way they serve and interact with the customers [6]. The present study was conducted with a main objective to determine LIS professionals' awareness on Web 2.0 tools as a best practice and its usage in the two central university libraries of Assam. The usage of Web 2.0 tools among LIS Professionals derived from the study showed higher in Assam University than the Tezpur University. Respondents of both the universities felt the needs for the training on the use of Web 2.0 tools so that they can make optimum use of these tools for providing services to their users.

8. Recommendations

From the results discussed above following recommendations have been drawn:

- Seminars or workshops should be regularly organized from time to time for LIS professionals and users to support themselves to become familiar with different Web 2.0 tools. This would help to improve their level of competencies in delivery and use of library services.
- Many Web 2.0 tools are freely available in the web and students are already taking advantage of them. They can participate, contribute and collaborate in the creation of a new content over the web. Moreover, there is no financial constraint in using these tools. Thus, University Authority should support the use of these existing technologies rather than developing new technologies from scratch.
- The Web 2.0 tools support in enhancing the excellent as well as innovative and more efficient library services to the present users and will also help in reaching out to new potential users. Librarians and LIS professionals should be ready to adopt Web 2.0 tools based services to the users. It opens a way to interact/share their information to users.
- A separate course on Web 2.0 tools should be included in course curriculum in library science departments in universities. Teaching about Web 2.0 tools in library science department will enable to prepare the next generation library staff for the new challenges ahead.
- LIS professionals should acquire required knowledge and training to use Library 2.0 tools in their libraries effectively.
- Library 2.0 services are constantly updated and reevaluated to best serve the library users. LIS professionals should attempt to harness the Web 2.0 tools in the design and implementation of library services and by encouraging users' feedback and participation [8].

9. Conclusion

Many Web 2.0 tools are extensively available which can be of great help for the libraries. The LIS professionals in the central university libraries of Assam should take advantage out of them. They can participate, contribute, and collaborate in the creation of a new content over the web. These tools are simple to use and easy to customize as per needs. Web 2.0 tools support in enhancing the innovative and more efficient services to the library users. Some of them may successfully attract new patrons to the library, others may help to retain existing members or make libraries even more important as centres of the culture and history of their cities and academic institutions. These new services and on-going changes are likely to make libraries more interesting, more relevant, and better acceptable place [2]. Applications of Web 2.0 technologies in libraries will result in a meaningful and substantive change in libraries, its collection, services and methods of delivery of services. Central university libraries in Assam must thrive to embrace Web 2.0 tools for effective service delivery in this digital era. Although LIS professionals are aware of these tools still they must be proactive in their attempts to adopt and use different Web 2.0 tools fully in enhancing best practices. They should continue to play the role they have always played as facilitators between information and the end users. It is now mandatory for academic librarians to be aware of web 2.0 tools as most of the publishers who provide e-resources /databases are enabling these features for easy and prompt access to the user community.

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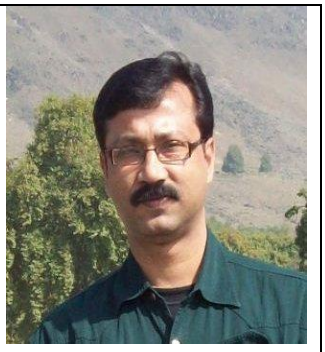

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Search Engines for User Centric Information Retrieval and Scholarly Communication

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract Search Engine (SE) is a software system that is designed to search for information on the World Wide Web. Search Engine helps users to find rapidly relevant information. Search Engines were established based on the traditional database and information retrieval methods and also many other algorithms have been added them to improve their search. The Interconnection of world through the use of Internet and Search Engines has changed the profession of Librarianship. The paper describes the Search Engine Architecture, Working Process, Information Retrieval Features, Scholarly Communication and different types of search engines and their usefulness in the field of Science, Arts, Social Sciences, Engineering, Medical, Legal other aspects. Search engines such as, Scirus, Infomine, Refseek, TechXtra, PubMed, Catalaw, Google, Bing, and Yahoo, are presented with their usefulness and the disciplines in which they are used. Search Engines are very important for retrieving information and scholarly communication in achieving academic excellence as per the changing needs of users in Higher Education. Search engines create an environment whereby scholars and researchers can easily share, publish their research findings and be able to locate and also retrieve the required information. Thus, the paper explains the usefulness of SEs to the wider academic community that prepares academicians to face challenges in Higher Education.

Keywords *Search Engines; Internet; Information Retrieval; World Wide Web*

1. Introduction

Searching for information on the World Wide Web (WWW) is much the same way that we look for information in a library, using an on-line catalog system. The difference and the advantage of WWW is that one can get information from all over the world, instead of from a single library collection. WWW allows people to share the information (data) from the largest database, globally. WWW plays a vital role in the day to day lives as it contains and constantly adds information in huge quantities through various sources that lay tremendous impact on the dissemination and retrieval of information by scholars, information scientists and even by non-professionals in the society. Internet has become the largest and important network which connects billions of people all around the world. World Wide Web has been growing rapidly and attracting the librarians to access the web. The term 'scholarly' is referred in academic domain, especially in higher education, in the context of 'scholarly communication' to describe how research is communicated among peers and evaluated.

Search Engines are used as a quick and direct reference to get any type of information all over the world from World Wide Web. Librarian's catalogue was the ultimate approach of users in searching information for their research before the web search engines took over. Search Engines have changed the way to find information as per the patron's needs, research requirements and connecting the library and resources with users and also beyond. Behind almost all online destinations whether it is a social network, or mobile phone or an online newspaper, individual blogs, or a database containing peer reviewed articles/chapters/data or bibliographic database, there is a search engine. There are many Search Engines available today, but retrieving relevant and meaningful information is very difficult. Perfect Search Engine is something that 'understands exactly what you mean and gives you back exactly what you want'. Ever since the web based information and internet came into existence, the web search engines also have been getting prominence and evolving from time to time adding more and more search options, facilities, connections as well as results display features as per the advancements taking place in processing the information and dissemination to users. Initial search engines are primitive and they had rudimentary general search options. According to the search / research requirements of users and their search behaviour, the trend of developing the search engines from general search options to advanced search features came into existence. In this process various types of search engines are emerged to provide approach to reach different types, forms of information /sources covering almost all disciplines.

A. Statement of the Problem

The present study on 'Search engines for information retrieval and scholarly communication' has been undertaken to answer what is search engine, how search engine works, different types of search engines and their usefulness. Since any individual or researcher simply cannot exactly retrieve the required information or document among billions of pages/documents available on the web, they need the help of search engines to zoom in to a small number of pages worth looking it.

B. Objectives of the Study

The main objective of this study is to explore the working process of Search Engines in Scholarly Communication. The other objectives of the study are –

- To explore the genesis of search engines technology
- To find out the architecture and working process of search engines
- To find out the search features of select search engines
- To find out the usefulness of various types of search engines

C. Significance of the Study

There are many search engines (SEs) available today, but retrieving relevant and meaningful information is yet difficult. SEs, are the most important tools in locating the information, so it is essential to know how to use them effectively. There is no 'perfect place' or 'all in one' search engine to search entire internet, because different search engines, will give different results. In this context, it is felt essential to study the useful features of search engines and their impact on libraries and library users.

D. Methodology

The study is based on an extensive review of literature available in documents, print journals, and online journals on internet, to investigate about the search engines technology its working process to retrieve information from the databases.

E. Limitations of the Study

Search Engines are available globally but the present study is confined to the search engines trends and technologies, working process of search-engines, search features of the search engines, usage of the select fifty (50) Search Engines. The definitions of significant terms are given below.

- **Search Engines:** A Search Engine is a program that searches documents on the Internet with specified keywords or characters and returns with a list of the websites, web documents, wherever the keywords are matched.
- **User Centered Design:** User Centered Design is a frame work of Processes in which the needs, wants and limitations of end users of a product, service or process are given extensive attention at each stage of the design process.
- **Internet:** It is a global network connecting millions of computers, networks.
- **Information Retrieval**: It is an activity of obtaining information against an information need from a source or multiple sources. It is a process of searching, and retrieving information from large amount of stored data.
- **World Wide Web**: It is a system of interlinked hypertext documents on the Internet, which can be accessed through a browser.
- **Scholarly Communication:** It is the process of publishing and sharing the research information, it involves creation, exchange and dissemination of information through search engines.

2. Review of Related Literature

Web search is now a major interdisciplinary area of study; studies on Web Search Engine crawling and retrieving have evolved as an important area of Web research since the mid-1990s. Researchers from different fields have proposed frame works for Search Engines research, taking different perspectives into account.

Bar-Ilan (2004) reveals that Information Science is divided into the two main sections. They are (1) Understanding the Web's structure and processes, and (2) understanding users' needs and behavior. Sufyan (2005) study dealt with web search quality and reveals that the quality of search depends on the search algorithm, indexing techniques used by the different Search Engines. It also revealed that the algorithm differs from Search Engine to Search Engine considerably. Hargittai (2007) stresses that research dealing with Search Engines' impact on society is largely missing, despite their central role in how people access information. However, little social science work has focused on the non-technical dimensions of Search Engine tools, the practices of the users who rely on them. Machill, Beiler and Zenker (2008) find "five topic fields considered to be central to future Search Engine research from an interdisciplinary perspective". These are 1) Search Engine policy and regulation, (2) Search Engine

economics, (3) Search Engines and journalism, (4) Search Engine technology and quality, and (5) user behavior and competence. Ginsberg et al. (2009) research on Search Engines from technical developments to studies on Search Engine quality, from investigations on the social impact of Search Engines approaches to using data from Search Engines to analytic approaches. Zimmer (2010) states that the areas deserve particular attention are: Search Engine bias, Search Engines as gatekeepers of information, values and ethics of Search Engines, framing the legal constrains and obligations. Purcell and others (2012) state that on the usage of web Search Engines from 2002 to 2012 by Americans shows a dramatic increase in the usage from 52% to 73%, the rate of increase is 21% and 91% of Americans find information when they use Search Engines. 73% of users find that Search Engines are accurate and trustworthy; overall view of Search Engine performance is very positive. Ding and Marchionini, (2013) finds that majority of students are unable to search web with efficiency, authors concluded that information literacy education is vital to teach students comprehensive web searching competency, which includes knowledge and techniques for both academic and daily-life search tasks. Egri and Bayrak (2014) states that 93% of internet traffic is managed by Search Engines, hence, exploring the potential of Search Engines is crucial, it shows the critical role of Search Engines on routing users to the right websites. The main focus was to measure the significance of time, speed, reduced bounce rate, page views, and page layout in keeping the user on the site.

3. Search Engine Architecture

Search engine gathers the contents of all web pages (using a program called crawler or spider); organize the contents of the pages in a way that allows efficient retrieval (indexing). It takes the query and determines which page matches the query and shows the results finally (ranking and displaying of results). The development of search engines enabling their complex operations according to the basic as well as the specific requirements of users is possible with a strategic application of user centered design process.

A. User Centered Design Process

User-Centered Design (UCD) is a process to design search engines software, web sites and products around the people who will use them. User-centered search engine design ensures that search engines are useful and usable.

Figure 1: *User Centered Design Process*
(Source: http://www.danygraig.com)

User centered design processes focus on typical users through the planning, analysis, design, implementation, deployment and development of a product. User centered design (UCD) process steps mainly are - know the users; analyze user tasks and goals, establish usability requirements; prototype on design ideas; usability test the concepts and repeat the process for user needs. User-centered search engine design brings the users need into consideration from the beginning of the search engine development. Efficient information retrieval, navigability and good typography, scholarly communication all contribute towards user-centered design. The search engine architecture model is presented below

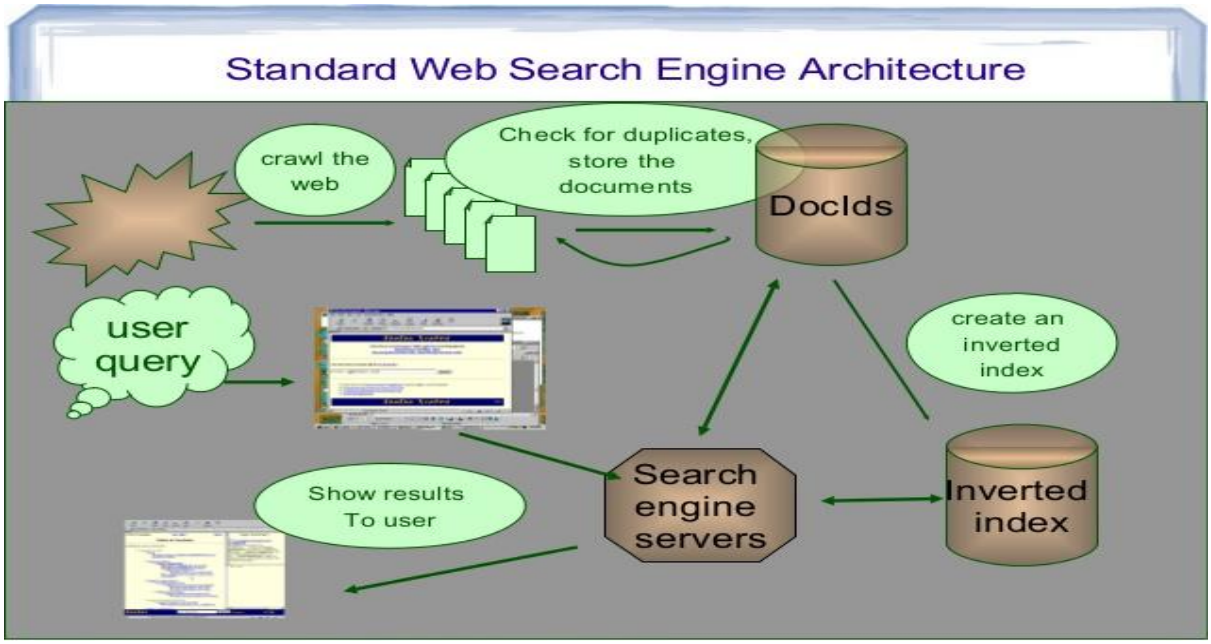

Figure 2: *Standard web Search Engine Architecture*
(Source: www.google.co.in/search?q=web+search+engine+architecture)

4. Working Process of Search Engines

Search Engines allow the user to enter keywords that are run against a database. Based on combination of criteria, Search Engine retrieves WWW documents from the database that match the keywords entered by the searcher. Search Engine works on the four main principles:

- Web crawling,
- Indexing web pages,
- Ranking the results, and
- Search and display the results.

For searching process, Search Engines, simultaneously adopts “Best match searching” as the default mode of operation with “Boolean Searching” as an alternative and advanced retrieval options. A single Search Engine cannot cover every available web resource, but may contain references to millions of resources and thus results may vary from one Search Engine to another.

5. Search Engines - Search Features

The important search features of search engines and the usefulness in search process is mentioned in the following table with examples.

Table 1: *Search Features of Search Engines*

Sl. No.	Search Feature	Description of Search Features	Example
e1	AND (+ plus sign)	Inclusion of Search Term.	Library AND Digital Library
2	OR	Result that contain at least one of the keyword.	Library OR Digital Library
3	NOT (- sign)	Result that contain one keyword but exclude the other keyword.	Library NOT Digital Library
4	Nesting ( ) Parentheses	Nesting utilizes parentheses to clarify relationships between search terms.	Using (India OR United States) AND Digital libraries
5	Proximity Searching	Proximity search is to search for two or more words that occur within a specified number of words (or fewer) of each other in the database.	Big Data Application retrieves records containing the three words immediately adjacent to one another and in the same order.
6	Phrase Search	Phrase Searching ensures that will retrieve search terms next to each other in the order user typed.	library science, “library science”
7	* Truncation.	Truncation expands a search term to include all forms of a root word,	patent* retrieves patent, patents, patented, etc.
9	File Format Search	Users can limit their search to any specific file format.	MicrosoftWord (.doc), (.pdf), (.xls), (.ppt), (.txt)
10	Site/Domain	Limit to domain search	.com / .gov / .edu / .org
11	Spelling Check	Mistake in spelling then system asks ‘did you mean this’.	LibrayScince Did you mean Library Science
12	Similar terms.	Use the "~" symbol to return similar terms.	~plane, also searches for aircraft, flight, jet, etc.

6. Search Engines/Databases – Usefulness

The search engines, their usefulness and the discipline in which they are employed are given in the following table.

Table 2: *Search Engines Usefulness*

Sl. No.	Search Engines (SEs)	Usefulness/Description
1	AOL Search	It is useful in Communication Mass Media, and digital distribution of content.
2	Academia.edu	It is a platform for academics to share research papers.
3	Awesome Library	It is an online library Search Engine to find full-text of books, journals, kid-safe sites, business information.
4	Bing	It is now known as “Bing” Search Engine of Microsoft.
5	BPubs	It is a Business Publications Search Engine, useful to access business and trade publications.
6	Bielefeld Academic Search Engine- (BASE)	It is one of the world’s most voluminous search engines, especially academic open access web resources.
7	CataLaw	It is Law Search Engine that organizes “all indexes of law and government into a uniform, universal and unique meta index.”
8	CiteSeer	It is useful to access Scientific Research Digital Library by using the CiteSeerX website.

9	Clusty	Clusty Search Engine organizes numerous search results into several meaningful categories called clusters.
10	Congoo	Congoo Search Engine is for current events and news searches; Congoo connects to the latest in technology, industry, business, world news, finance, politics, Internet trends and more.
11	Deeper Web	It allows navigating through search results. The technique involved is tag cloud technique.
12	Dogpile	Dogpile find is the best of all the major Search Engines like Google, Yahoo!, and Bing, with categories including Web, Images, Video, and even White Pages. It filters for duplicates and then presents the results to the user.
13	DuckDuckGo	DuckDuckGo has some slick features, like 'zero click' information.
14	Ethnologue	Ethnologue searches the world's known living languages. It can find more than 28,000 citations in the Ethnologue's language.
15	Excite	Excite is a collection of Internet sites and services and offers online service for a variety of content.
16	Google	Google's mission statement is 'to organize the world's information. Google is fast, relevant and the largest single catalogue of web pages available today. Google uses the page rank algorithm for displaying the pages. The main features of Google are images, maps news, geographic directions, photos etc. Google Indexes 8 Billion pages.
17	Google Books	Google Books can search through online in the field like literature, science, fiction, biology etc.
18	Google Scholar	Google Scholar searches wide array of scholarly literature, including journals, books, theses, universities, and academic publishers, etc.
19	HotBot	HotBot searches the Internet for user documents stored on a hard drive.
20	Harvester42	Harvester42 distributes queries over 30 major Search Engines in parallel and presents a large result page with the individual Search Engine results.
21	Internet Public Library	It searches the collections by subject, checks out the reading room when user visits this online public library.
22	INFOMINE	INFOMINE is a virtual library of Internet resources relevant to faculty, students and research staff at the university level.
23	Intute	Intute is a British Search Engine, specialized to search in science and technology, arts, humanities, social sciences, health and life sciences etc.
24	ISEEk Education	iSEEK is an excellent targeted search engine, designed especially for students and teachers.
25	Inspec	Inspec was made for scientists and engineers by the Institution of Engineering and Technology. Users will find nearly 13 million abstracts and research literature, primarily in the fields of physics and engineering.
26	JustCite	JustCite is an online legal research platform that helps users to find leading cases and establish the current status of the law.
27	Libdex	Libdex is a directory of library across the world as well as an extensive collection of books. Libdex searches the indexes about 18,000 different libraries.
28	Librarians' Internet Index	Librarians' Internet Index is a 17,000 plus websites evaluated and chosen by librarians in many subject categories. Search with keyword like business, government, media, health, computers, or the arts and humanities.
29	Library of Congress	Library of Congress new Search Engine Congress.gov is in beta form and will eventually replace the THOMAS legislative search system. It narrows search results by year, by subject, by House or Senate or other factors.
30	Lycos	Lycos is more of a content hub than a Search Engine destination Lycos Slogan is 'Simplify your Digital Life'. Lycos Entertainment is '*Gamesville', 'Lycos Television' and 'Lycos Video'.*
31	Mamma	Mamma is "the mother of all Search Engines," Meta search tool for web, news, image, video etc.
32	MetaCrawler	Meta Crawler was a Meta Search Engine that blended the top web search

		results from Google, Yahoo!, Bing Ask.com, About.com, and other popular Search Engines. Meta Crawler also provided users the option to search for images, video, news, yellow pages and white pages.
33	MsFreckles	MsFreckles.com provides an easy way to make professional searches for the ordinary internet user. It also offers translation of a text, calculator, super filter, blog search and more.
34	One Page Multi Search	It searches the Meta Search Engines & Search Engines at once. Alta Vista, AOL, Entire Web, Gigablast, Hot Bot, Lycos, Scrub, Yahoo!, Google, Dogpile, Ask Jeeves, and a many more.
35	OmniMedicalSearch.com	OmniMedicalSearch.com collects information from many of the top medical professional sites such as PubMed, NIH, and Merck; this Search Engine provides information from peer level sources. Partnered with Healthline.com and Google Custom Search, the results offered are from a full Search Engine. They also offer a "reference desk of hard-to-find medical resources."
36	OAIster	OAIster finds millions of digital resources from thousands of contributors, especially open access resources.
37	Picsearch	It is a photo Search Engine and has more than 2 billion images in its directory.
38	PubMed	It is a Health Sciences Search Engine. PubMed is for medical students and researchers. It can find journal articles, citations, clinical information etc.
39	RefDesk	RefDesk is known as the “fact checker for the Internet.” It can search MSN, Google, Yahoo! Wikipedia, as well as various dictionaries and periodicals.
40	RefSeek	RefSeek is an ad-free Search Engine delivers academic results from more than 1 billion indexed documents, web pages, books, journals, newspapers, and more.
41	Songza	Songza is a music Search Engine, “lets you listen to any song or band.” User can also search the featured list or top played list.
42	Scirus	Scirus is a free science-specific Search Engine from Elsevier, covering science-related journal articles, preprints, patents and websites in all areas of science. Scirus searches over 450 million science-specific web pages.
43	SweetSearch	SweetSearch helps students find outstanding information faster. It indexes 35,000 of the most relevant websites.
44	Savvy Search	Savvy Search accesses around a dozen different Search Engines return the results. It offers search forms in over 25 languages.
45	TechXtra	TechXtra is for mainly engineering students. Resource Discovery Tool for Engineering, Mathematics, and Computing.
46	The Open Library	The Open Library is a World's classic literature at user fingertips. Over 1,000,000 free ebook titles available. Here, librarians discover “one web page for every book.”
47	WorldCat	WorldCat find items from 10,000 libraries worldwide. WorldCat helps patrons and librarians “find items in libraries near you.” Search for books, DVDs, CDs and articles.
48	Yahoo	Yahoo finds information on Mail Search, Cricket, Finance, News, Astrology, Games, Lifestyle, Movies, Celebrity, Answers, Screen, Shopping, Flicker, Mobile, Movies, Messenger, My Yahoo, Transliteration, Travel, Weather etc.
49	Yovisto	Yovisto is a video search engine specialized on educational video content.
50	Yippy	Yippy (formerly ‘Clusty’) is a Deep Web Search Engine that searches other Search Engines. Deep web pages are usually harder to locate by conventional search.

7. Librarian and User Centric Design

Traditional librarians manage their holdings using catalogs that contain information about every collection library owns. The role of a librarian is continually evolving to meet the information needs of academicians, technical experts, researchers and needs of the society. A paradigm shift in librarianship is taking place since the 20th century with the advent of new information technologies and their applications to make the library services more and more user centric. A modern librarian deals with the information in different forms like physical books, electronic resources, magazines, newspapers, audio, video recordings, maps, manuscripts, archives, photographs, bibliographic databases, web-based and digital resources. World Wide Web has created a revolution in the accessibility of information to the user. Internet and the web search engines are the principal building blocks that are used in the development of several sources of information/documents/data i.e., databases, institutional repositories and digital or virtual libraries.

Resource discovery system helps the librarians in locating, retrieving and presenting information of relevance to their patrons. The new role of librarian in designing libraries to suit the user requirements is becoming a challenging task. Librarians began serving the library patrons as consortia manager, consultant, content manager, facilitator, guide, teacher, information intermediary, knowledge manager, researcher, web designer, etc. to transform libraries more user centric and to satisfy their information /research needs and demands. The Resource discovery tools and technologies - like search engines, meta search engines, web directories, subject gateways, search and retrieval protocols, metadata harvesters, federated search, Internet, metadata schemes like, Dublin Core, Text Encoding Initiative (TEI), Metadata Encoding and Transmission Standard (METS), Metadata Object Description Schema (MODS), Encoded Archival and Description (EAD), etc. play significant role in discovery and transfer of information to the library patrons.

Trained librarian is a powerful search engine. Google search engine brings back lakhs of answers to a single query, but a librarian can get the right one, in a strategic manner. The 21st century librarian when acquires and adopts the latest technologies, and current research trends will become not only well versed with information search and retrieval but will educate library users by conducting information literacy. With the ever increase flood of information, the librarian is transforming as a navigator of information. For this, librarian needs excellent planning, designing techniques, managerial strategies, and analytical skills, to design and deliver the information to suit the user needs.

8. Conclusion

The Human society has experienced unprecedented explosion of information with the advent of digital technologies. The millions of users search World Wide Web for information every day. The web Search Engines are developed with wonderful search features. Though the web search engines are developed with various search features currently there is no search engine that will be able to cover the entire World Wide Web or Internet. Searching across several search engines is more advantageous than searching through a single one. With the exponential growth of information, everyday millions of pages are being added, updated, and deleted to www. The modern day librarian is expected to develop adequate knowledge, competency and skills and be well versed on information search and retrieval tools. User centered search engine works effectively when user query better understands by the system, retrieves exact results as per users request, increases users satisfaction, loyalty, adoption and it also reduces development cost, support services cost and maintenance costs of search engines.

The future trend in Search Engines technology is very dynamic one, Google Glass and Flying Drones are the emerging players in search engines technology. The dynamics of a web search engines will be a great challenge to any designer of search engine. The spoken queries need to be translated into text queries using a speech recognition system, natural language processing and automatic translation of the

queries before matching them to documents for retrieval. The developers of search engines and designers look for the latest technological advancements, innovative ideas and also taking the new demands from users into consideration for redesigning search engines accordingly to meet the information needs ever arising and to face challenges in higher education.

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UCD Approach for the Management of User Services in University Libraries

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract This paper discusses User Centric Design (UCD) standards, processes in the light of user oriented services in academic Institutions. It discusses traditional methods of user services in libraries and shift to modern user centric services by which users are able access all types of resources online and can even interact with the librarian with regard to any services. The users are able to renew their books online and get the resources of other libraries through document delivery services without physically stepping into the library. Some of the models mentioned in this paper highlight the services which are designed as per users' needs. The changes of automation, e-publishing and publishers way of delivering online resources with added value services like e-mail alerts, RSS feeds etc. have forced librarians to concentrate on library users while planning services and to transform the libraries in academic institutions from document centric to User Centric.

Keywords *User Services; University Libraries; UCD-Standards; User Services-Management*

1. Introduction

User centred design (UCD) is an approach while designing any product, service or any related operations. Though the concept has become widely popular with the software development focussing on the end users all through the different stages of design process, it is now spread to all the domains connected with human interaction in the creation of any product or services or operations including those related to libraries and information centres. The concept UCD has been gaining prominence in the domain of the libraries and information centres, as they need to handle varied collections of information resources and services for their users, while experiencing transformation in their

environment with the emergence of latest information formats and the developments for disseminating scholarly information quickly.

Thus, the paper intends to outline the different perceptions of User Centred Design and discuss the application of UCD concept in planning the collection of information resources and user services for academic libraries.

2. UCD (User Centric Design)

The term 'design' (verb) is defined as 'to plan and make decisions about something that is being built or created' (Merriam-Webster Dictionary). Thus, the user-centered design (UCD) focusses on user's involvement all-through the planning, design and development of a product. Webopedia (http://www.webopedia.com/TERM/U/user_centered_design.html) defined it as "a design philosophy and a process in which the needs and limitations of end users of a product are given extensive attention at each stage of the design process". Several authors, associations, organizations made incredible efforts to conceptualize UCD in a way that can be applied to every condition. Usability Professional Association explained User centric design (UCD) "as an approach to design that grounds the process in information about the people who will use the product". Norman (2002) described UCD as "a philosophy based on the needs and interests of the user, with an emphasis on making products usable and understandable". By this definition, it is understood that actual user involvement does not form a part of UCD alone by necessity, but for the effective development of product or service. Whatever be the several perceptions of UCD, it can basically be characterized by a focus on the user, and on that the user's perspective should be incorporated in all stages of the design process. Further, it is understood that involving users in the design process is a common way of ensuring that their needs and interests are being met.

A. User Centic Design – Standards

The international standard ISO 13407 (Human centred design processes for interactive systems) was formed as the basis for many UCD methodologies. This standard defines a general process for including human-centred activities throughout the development life-cycle, but the model does not specify exact methods. The standard was further revised by ISO 9241-210:2010 - Ergonomics of human-system interaction - Part 210: Human-centred design for interactive systems, cancelling and replacing ISO 13407:1999. The revisions would be-

- clarifying the role of iteration in the whole design process (not just evaluation);
- emphasizing that human-centred method, can be used throughout the system life cycle;
- explaining design activities;
- clarifying the principles of human-centred design

The standard emphasizes that – "human-centred design is an approach to interactive systems development that aims to make systems usable and useful by focusing on the users, their needs and requirements, and by applying human factors/ergonomics, and usability knowledge and techniques. This approach enhances the effectiveness and efficiency improves human well-being, user satisfaction, accessibility and sustainability; and counteracts possible adverse effects of use on human health, safety and performance". Various approaches to UCD are following the latest specifications of the ISO standard. The standard lists 6 important principles that will ensure a design user centred:

1. The design should be based upon an explicit understanding of users, tasks and environments.
2. Users are involved throughout design and development.
3. The design is driven and refined by user-centred evaluation.
4. The process is iterative.
5. The design addresses the whole user experience.
6. The design team includes multidisciplinary skills and perspectives.

B. User Centric Design Process

The concept of user centric design for an information product can be understood in three concentric layers as visualized in Figure 1, wherein the core area indicates the 'user' and 'user needs'; surrounding the core area lies 'the information system' that is structured according to the user needs and the outer layer refers to the information retrieval and product access.

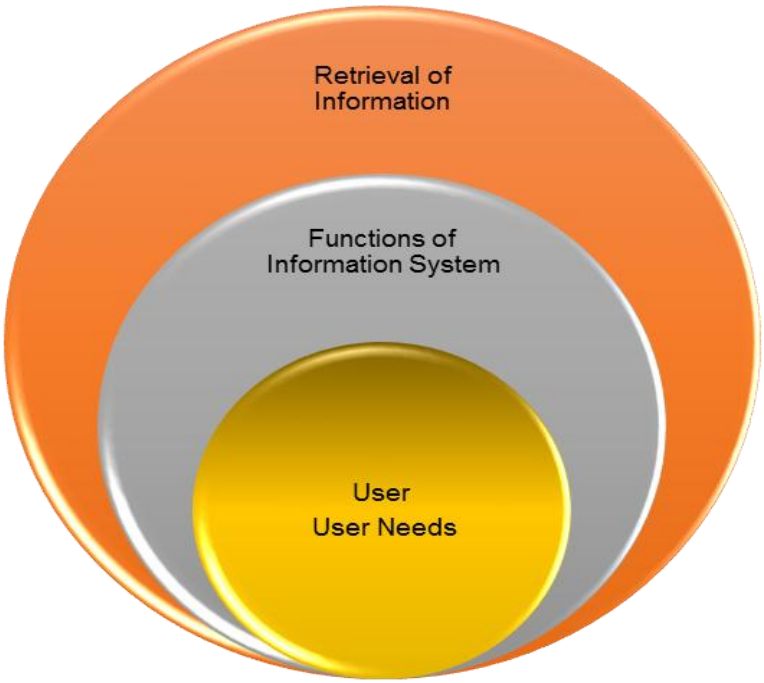


***Figure 1**: The Functional Information System UCD Model*

Thus the 'User' being the significant component in User Centric Design Process, the method of obtaining the data about users and their needs and testing the design is also important for making necessary modifications in redesign. These 'users' actually be the beneficiaries of the product/s, even though may never have truly connected with it during manufacturing stage, but have well impacted by their design. Such users were referred as - 'indirect stakeholders' by Friedman, Kahn, and Borning (2006), who have drawn distinction between the direct and Stakeholders, wherein the direct stakeholders should have priority in the conceptualization of a design, the interests of indirect stakeholders.

3. User Oriented Library Services in Academic Environment

In the context of user oriented library services, Bowler et al. (2011) were of the opinion that "User-centred design, as its name suggests, reflects the user, typically from a cognitive, affective or behavioural point of view, as well as the social, organizational, and cultural contexts in which users function. The shift from a system-centred to user-centred perspective in LIS arose from the emergence of information retrieval systems that could be operated without the intermediation of experts and a need to understand how to better serve a new clientele of end users". Thus, due to the predominance of web, web based technologies and tools and also web 2.0 applications in libraries, made the user involvement significant in the design of systems, services and spaces.

A. Library Users

The user/s can be any individual or any organization that use the product for a specified purpose. The users may vary according the type of organization/ library and the purpose. The integrated information system that is built can generate managerial information, data for clients (staff) at various operational desks and to the targeted end users of the system. The library users vary as per the type of library, public library users ranging from a common man to a business man, researcher, students, teachers, industrialists and politicians etc., while special library users needs are limited to their domain of work. The users of academic libraries refer to - undergraduate students, post graduate students and research scholars, faculty members, visiting faculty, project assistants and other Institutional members. The users can be in the normal state of using the products and also with different capabilities and competencies - physically handicapped and visually challenged users, etc.

B. Conventional Library User Services

Dr. S.R. Ranganathan, the father of library and information science in India and also the architect of Indian librarianship described the Library as - trinity of books (resources various types and formats); staff; and users. The five fundamental laws specify those resources and other components of the library should be only designed keeping in view of the respective users. It implies that library should provide the basic or extensive facilities according to the requirements, convenience and use of their clientele (users)

- Resources (based on the objectives of organization)
- Tools to access resources
- Functional Building
- Comfortable furniture
- Tidy and serene ambiance
- Professional and non-professional staff to maintain library and services
- Line of authority, Administration, policies and rules

When print (Books, reference books, journals, maps, atlas, etc.) resources are predominant, the library services and tools designed as per user's requirements is illustrated vide Figure 2

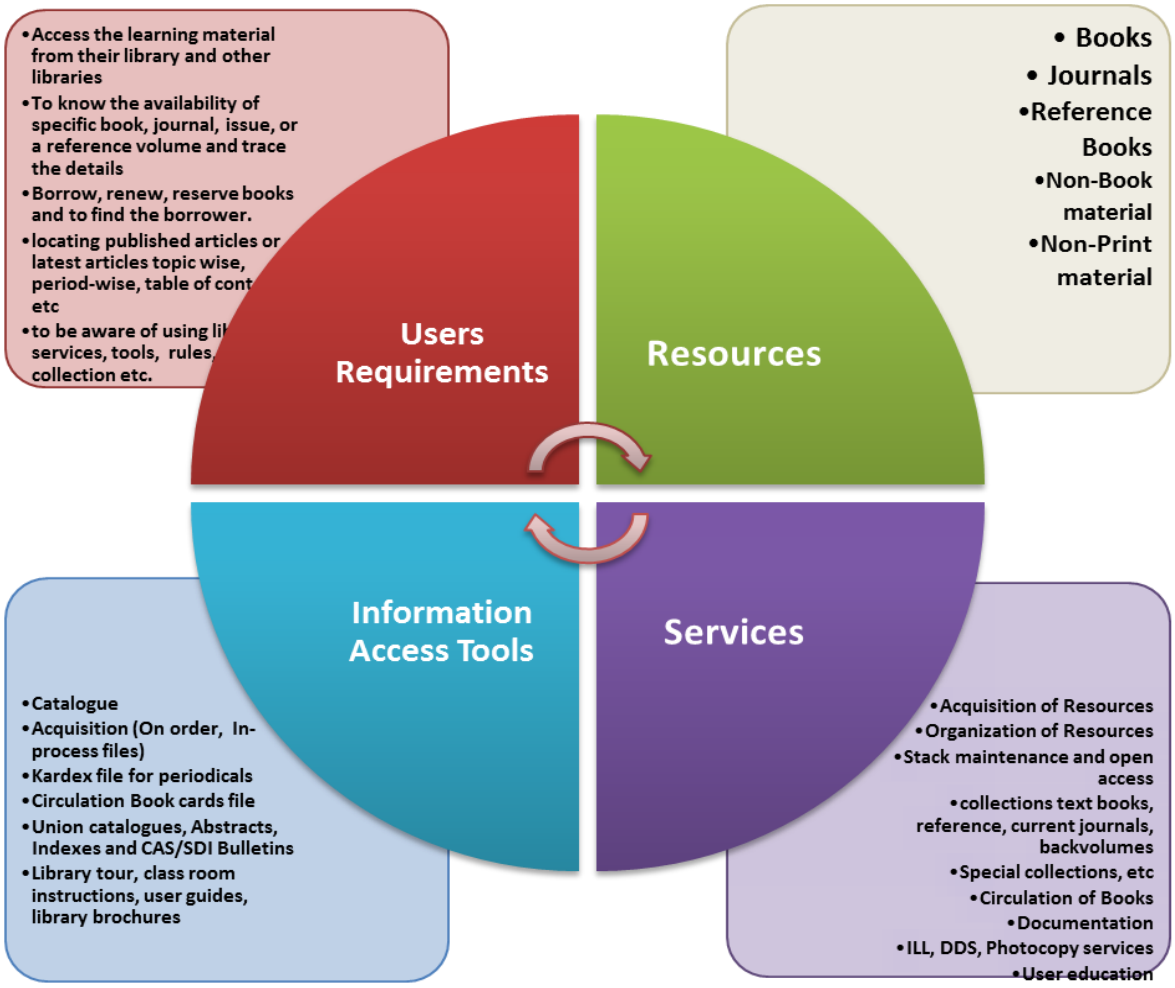


Figure 2: *User Based Services in Conventional Libraries*

C. Change of User's Requirements - Influencing Factors

There have been several factors influencing change in user's requirements in academic environment. Some of the significant factors are mentioned below.

- Interdisciplinary/multidisciplinary research
- Ever growing publications and innumerable resources
- Transformation of physical format of information due to ICT advancements in processing and information/documents.
- Use of telecommunication networks for the dissemination of scholarly information and the use of web technologies to hyperlink resources, the development of search and discovery services
- Ever upgrading ICT infrastructure with the increasing users expectations
- ICT Applications in libraries such as automation, e-publishing, e-resources, resources sharing, formation of library consortia, development of access tools for subscribed as well as free resources, arresting plagiarism, possibility of providing remote access, etc.
- Wide spread campuses in research and academic institutions
- Research collaboration among distantly working people

The ICT applications in libraries are mostly visible to users through hyperlinked online platform, especially the library's catalogue OPAC which is the gateway to library resources and also formed as user interface that will be connecting to all the integrated library automated operations. Further the information, resources and services will be passed on to the library users remotely through online library catalogues or OPACs, websites of publishers/aggregators/providers and finally the library websites.

4. Need for UCD in Academic Library Environment

The users can be expert in their field of specialization, whereas librarians are well versed with the system of organizing the information or documents for facilitating easy retrieval. User's concerns need to be included while designing the library information system. The design needs constant updating or revision by incorporating the ever-changing user's requirements. A librarian can understand the user requirements as well the organization of knowledge or concepts and therefore will be able to structure the collection, services etc. accordingly. For example, for organizing the documents in the library, their indexing, the classification scheme; the catalogue formats and the subject indexing followed by library are unknown to the user, whereas the librarian will be able design in such a way that the similar subject numbers come together so that the user will be able to get all the documents in the subject area together on shelf and also in catalogue. The tools/services so designed and developed for serious researchers or library users, when print was predominant were expensive, inadequate, and far from the reach of researchers geographically or cost-wise.

Though the traditional library catalogues of any form meet the search requirements at a minimum level, author, title, subject and keyword etc. but are not be able to inform the status of a recommended book or any other material housed in the library nor the book lent to a borrower. The advent of ICT applications in libraries and publishing not only increased the content but also laid several pressures and demands on libraries through users. Since most of the library automation software designed focusing on entry of bibliographic records in view of building information retrieval systems, are found not so compatible with regard the acquisition and other maintenance operations of books and serials and other materials, in several instances users mostly depend on manual systems to suggest or recommend for additional copies of text books, reserve, renew books etc. Users should know the list of current journal titles to be renewed by invoking a key. Similarly the different statuses of library material such as in bindery, lost, damaged, written off etc. should be displayed in the similar way. The recently added books to the collection should be programmed in a way that the books added in the current week should be automatically displayed to the user by invoking a key.

So the Library automation software should be designed in a way that meets the user's requirements by accommodating different physical formats or types of resources. The catalogue should be able to direct the user to table of contents, abstract and also to the full text of the article through OPAC. In an example of library automation, patrons need to know the books outstanding against their names which are made online.

Further, the use of e–resources is bound by the license terms and agreements of publishers and the violation of these terms knowingly or unknowingly will be treated as abuse which results in access block to the entire gateway or institution. Libraries need to commence information literacy programs to make the users aware of these fair use rules of accessing electronic resources. Presently, all most of all the institutions are able to access numerous scholarly resources through various sources (publishers or targets) and users are often constrained to get the right information among hundreds/ thousands of heterogeneous sources, though each publisher provides search interface with all the

search facilities. Libraries needs to arrange or acquire meta-search, bibliographic search or discovery services that provides query based search, in addition to the article full text databases, where users are able to search across all the sources.

Moreover, the multidisciplinary research, and ease in the creation of content lead to the generation of new concepts and terms more than ever in this electronic era. The situation has been posing challenges in the organization of concepts (by relating terms both hierarchically and horizontally) and ultimately effecting the information retrieval. Archiving and digitization activities in these current decades demand the organization of classics, rare collections and research documents etc.and also need to be displayed on HTML platform for the use of researchers.

All most all the students are currently handling internet access with small and smart devices like tablets, mobiles in addition to personal computers/laptops. Thus, information services including OPACs need to be made compatible to these small/smart devices by designing apps for them. Accordingly, most of the LIS software providers, publishers of full text/bibliographic databases are building their websites in mobile enabled form including OPACs.

The Government's perception of ‘right to education’ enabled physically and visually challenged users to visit libraries for their education and research purpose. They need to be equipped with altogether different setup which is compatible to them.

Ever changing information formats, mode of dissemination of information, hardware, software and networking infrastructure lay demand on the libraries for constantly upgrading information access environment according to the users’ requirements, which is a challenge for librarians.

5. UCD Process for Academic Libraries

To design a user centric model applying the ISO-13407 standard in an academic library environment, it is needed to use a human centred design process, constituting the following cyclic activities.

1. Identifying the organizational goals and recognizing the objectives of library
2. Identifying the users of the product, purpose of using it and where it is used or under what context it is being used.
3. Identifying requirements of the system is very crucial for successful design of product
4. Design of solutions also should be the part of design process in all the stages of products precisely from the conceptualization to completion
5. Design implementation & completion process
6. Evaluating design or testing the design is one way the quality testing of the product, which is preferably performed through usability testing with actual users.
7. Modifying the design incorporating the user’s requirements based on the feedback to achieve the target.

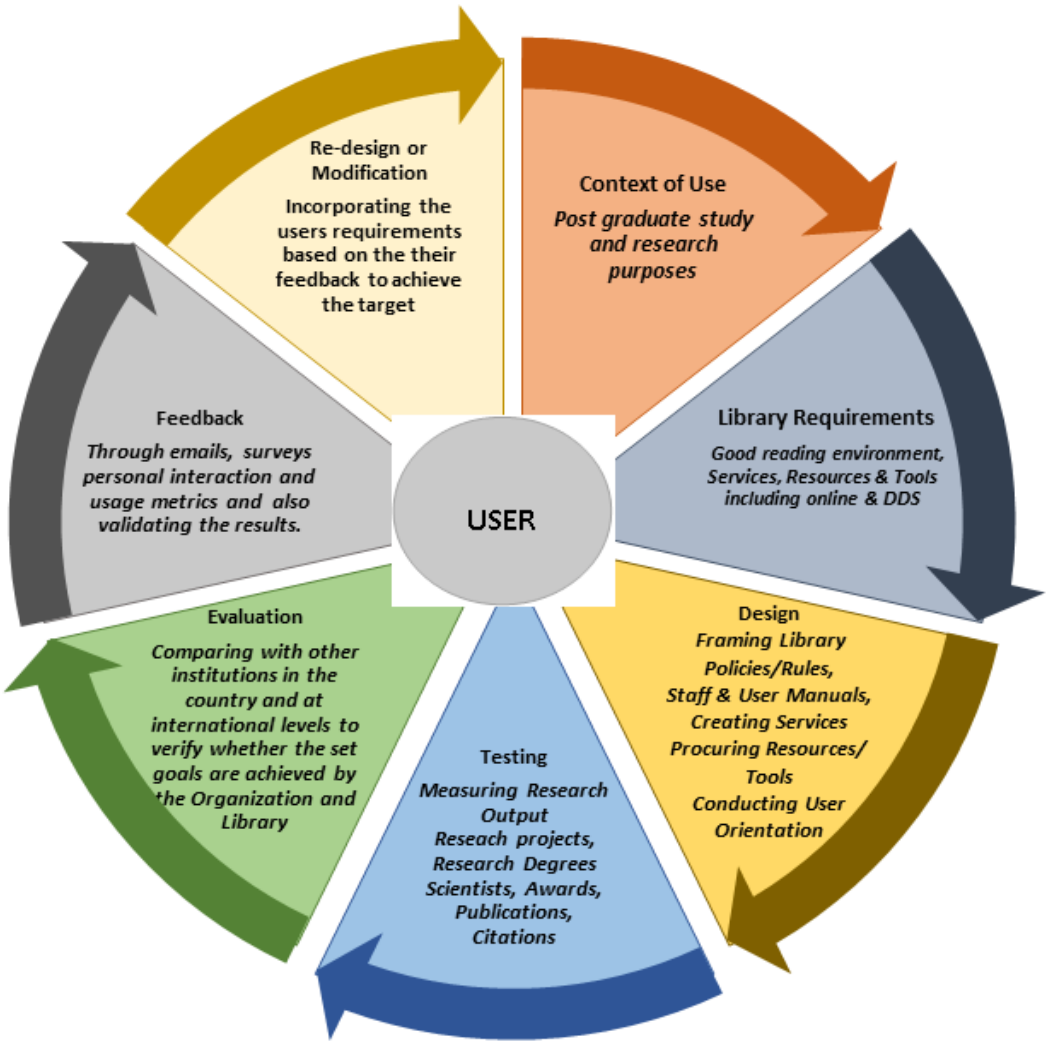


Figure 3 *- UCD Process for Academic Libraries*

The information to be disseminated to users is infinite and limitless. Thus the information architecture is highly significant for the design of website particularly while organizing the content and creating navigation for the content according to user's background and navigating style.

In LIS context, there have been several popular conventional and modern methods in practice for drawing user's feedback. Most of the libraries have been now relying on a complaint box at the library entrance; interaction with users; group mailing; surveys (both paper and online) and the usage data, etc. To cite an example – number of user's login into OPAC every day, number of searches made as against hits, number of transactions in circulation section for specified period and how many members visit the library every day on extended hours and on holidays, etc. Since the hypermedia is opted as the main platform for disseminating information, distributing resources, building digital/virtual libraries and to obtain feedback from users easily, several instances of applying UCD process for the design of websites and intuitive search interfaces are found in literature.

Manzari and Trinidad-Christensen (2006) applied user-centred design principles to the Library and Information Science (LIS) Website Library at the C. W. Post campus of Long Island University. The website was subjected to a heuristic evaluation and usability testing and the findings were applied for redesign incorporating the users' suggestions. They intended to list all resources and information related to connect to the main library's home page and library catalogue. An online survey was also posted on web site to update it based on user feedback. The usability test confirmed that the Web-site was designed well.

OCLC's WorldCat.org is a cloud-based, multi-institution, international catalogue. The 'User-centered design of a recommender system for a "Universal" Library Catalogue" was a joint research project with the Information School, University of Sheffield to develop the 'recommender systems' for retrieving journals, books, digital media, video, etc. User-centred design and empirical evaluation of a prototype system would provide invaluable data for OCLC in assessing the value of recommender services for WorldCat.org. Consequently the end users of WorldCat.org, effective recommender functionality will assist with information discovery within the library catalogue.

Kress and Del Bosque and Ipri (2010) investigated reasons for the user's failure to locate the electronic and print items from university library catalogues or websites by applying usability testing and quality control methods. The researchers have conducted the ILLiad analysis from the cancelled interlibrary loan requests of the years 2007, 2008 and 2009 identifying the categories available in e-journal collection; LASR and Lied Library. By using interlibrary loan data it was possible to analyse actual citations that the users were unable to find, despite the fact that the library owned the materials.

Tidal (2011) discussed the creation process of a user centred library homepage by conducting a survey and a usability test before shifting their Ursula C. Schwerin Library's library website to a content management system. The survey consisting of 24 respondents and the data from usability testing gave very useful feedback. So the alterations could be made based on first round usability test while transitioning the website to Drupal CMS reducing the number of links on home page and also later to make the site more users centric.

Sadeh (2007) explored the need for designing a new search interface for Ex Libris as a solution for the discovery and delivery of library collections as per users' expectations. He observed the following users' needs and expectations of the design of the interface. The information displayed on the screen should be minimal; the work flow and search options should be appropriate; Queries can be as simple or as complex as needed; should be supporting post-search tools that help users focus on relevant items within the result list; and also will be able to suggest alternative routes for finding relevant information; and also does not need training for searchers. It is found that the search interface is user friendly and all the participants in the usability test could manage with marginal help and time.

Guo and Pei (2011) applied both qualitative and quantitative methods to assess user's requirements. The results were analysed through cluster analysis, applying user testing combining with heuristic evaluation, the library website was evaluated and constructed by user-centred design methods such as - reducing the number of categories; error rate and help-frequency and thereby improving the user satisfaction significantly.

Sommerville and Brar (2009) described the application of user-centered and EBL (evidence-based librarianship) to enable the end-user's involvement in the digital library project design and development. From 2003 to 2006, user-centred design guided increasingly by the complex human-computer interaction projects at California Polytechnic State University to change the project from

library centric to “user centric.” Further it is found that purposeful conversations aimed at learning from user-generated evidence enrich the planning process for digital library projects. Practical implications – Collaborative design assumes that enabling interfaces, systems, and environments are best designed and developed inclusively, with and for beneficiaries. Towards the end, practical guidelines are offered to enable replication of this approach, which depends on user produced and interpreted evidence, in other organizational settings.

6. Implications of UCD on Users Information Services

The concept of UCD has brought drastic changes in information collection, processing, packing and information retrieval in simpler and easy means. The net generation users are becoming proactive in retrieving information in different formats without physically visiting the library because of remote connectivity and also the publishers new ways of publishing and delivering the information with added updating services. The libraries also have been providing the online information to users making it more users centric. The following aspects need to be looked upon while discussing the implications of UCD.

A. Library Automation

The automation not only eased various lengthy and tedious operations of the library, but also facilitates many more approaches and information to users, by building the database of bibliographic records. Automation of each module is expected to easily meet the basic requirements of library users and also been able to fulfil various other needs not met during manual processes.

- Acquisition module
- Processing (Catalogue or Creation of bibliographic records) module
- Serials module
- Circulation module
- Documentation services

Library catalogue is the inventory of library material or resources. Its physical form has been transforming from register, card during print only period to online and also online public access catalogue (OPAC) accommodating all types of resources in all the formats.

The conventional library catalogues had limited approaches for users to reach their information such as author, title, series, subject headings, reference, cross-reference and added entries. The author & subject analytical entries prepared to meet the user’s approach to individual chapters/parts of composite books, made librarians to do lot of clerical jobs and at the same time gives a very little understanding to users. The application of database management systems to library bibliographic records enable to sort and index all the keywords, which facilitates multiple search opportunities to library end users through modern OPACs. The online catalogues evolved in integrated automated library systems have been including many more services over the generations. In integrated library automation system each of the subsystem (module) is related to the other subsystems and contributes to the user information on the whole, e.g. an acquisition subsystem needs to provide interfaces to cataloguing. All the subsystems are well connected to built-in cataloguing subsystem to draw data for their sub-module activities while producing the information or data required for users.
The design decision by library automation software developers will be primarily based on the quantity as well as the type of database and information retrieval needs. The database is reflected and accessible to users through catalogue which is well optimized for efficient search and retrieval.

Online Public Access Catalogue- As mentioned above, through OPAC users will be able to search the library collection of books, journals and other material

- By author, title, subject etc. approaches or any keyword related to it.
- Find the status of searched item, whether available on shelf, or in issue or in bindery or damaged or withdrawn
- To find whether any digitized copy of a book or full text article/journal available online and get linked to the respective soft copy
- To find the searched item by location/s
- To know the availability of a specific journal by title/ISSN or a specific Issue or back volume of a journal
- Latest Issue of a specific journal
- View or download the list of books / Journals on a specific subject
- Additionally users should be able to self-register, modify the contact details, enter the topics of interest etc. and will be able to get the following advantages as authorized user.

Acquisitions Module- The Acquisitions Module as in integral part of library automation software should be able to include the following in user interfaces -

- OPAC interface should support an authorized user sending recommendations for books, journals, or any other material for purchase
- OPAC should display query acquisitions files – to track the status of recommended item, whether ORDERED, or RECEIVED or IN PROCESS
- Faculty may recommend items to be kept on reserve for a limited period /semester/for text book collection.

Automated Circulation Module- The automated circulation module in many LIS software is facilitating the following in user interface available through OPAC and enables the user to –

- Search member records by names, member IDs
- Retrieving information about borrowed items on loan, over dues if any to clear etc.
- To reserve books under loan and receive the notification regarding the check-in status of reserved book
- To renew books online
- Reporting of loss of book/s and loss of ID card
- Payment of cost of lost book or lost ID card and get the receipt
- Payment of overdue charges if any, online and get the receipt
- By adding email address to patron records, users can be notified through mail regarding their borrowed items, over dues, etc. at specified intervals
- Through adding small devices like additional monitor towards the user (opposite) side with the help of split connectors to computers at circulation counter, an added value service also can be provided to the users. Thereby the patrons would be able to view their transactions while issuing or returning the books.

Automated Serials Module- The automated is the basis for not only creating serials database with holdings but also for generating union catalogue of serials, i.e. serial holdings pertaining to many libraries and several article based services. These services can be designed by coordinating journal records, locations of institutions, and articles data with patron profiles.

- Availability of article/journal in other libraries
- Availability of articles on a various identified topic/s (CAS service)
- Articles related to the interests of identified members (SDI service)

B. Electronic Publishing, Electronic Resources and Software/Tool

- Possibility of accessing full text remotely from publishers servers
- Single/unified search across databases, publisher's resources, over a period different types i.e. journal articles, books or book chapters, a piece of information, or data table, an image or a formula
- Basic Search or keyword search
- Advanced search with multiple options,
- To enable federated search, use of Boolean operators, filters to narrow the search results without leaving the search results page
- To be able to track spelling or grammatical errors in the text
- Facility to verify the similarity in the text with already published content and be able to arrest plagiarism or copy paste culture in original writings.
- Ability to assess the usability of an article or a book or a chapter or an author by reading the abstract, table of contents, reviews and by the citations recorded
- Able to view citations and track the duplication, development and collaboration in research.
- Ability to establish the credibility of an author/institution/journal or book by way of citation based measures such as h-index, etc.
- Capacity to provide meta-search or discovery services to be able to search all subscribed as well as free resources at once with a single interface
- Ability to apply semantic technologies to connect the related concepts, methodologies, creations etc. in information retrieval.
- Some libraries provide specially designed facilities for physically disabled and visually challenged users in library buildings right from the entrance, seating arrangement and organization of collection to purchase of special software for accessing online resources and learn from them.
    - Library building is structurally designed in a way that the physically disabled users comfortably move on ramps with wheel chairs and lifts to easily climb the linear structure of building. A separate rooms/halls for such students are being provided organizing their exclusive collections (especially Braille), personal computers loaded with required software, printers within their reach.
    - Special programs for such students like competitive tests and reward can be encouraging.
    - The material kept on the top rows should be reachable by arranging small step-up stools
    - Since most of the current literature and information is available online, it will be made usable to visually challenged students by arranging the text to speech software, screen readers etc. in exclusive personal computers e.g. JAWS (Job access with speech) screen reading programs, Kurzweil TTS (Text to speech software) programs and printers etc. The different software compatible to regional languages should be explored and arranged for such deprived students.

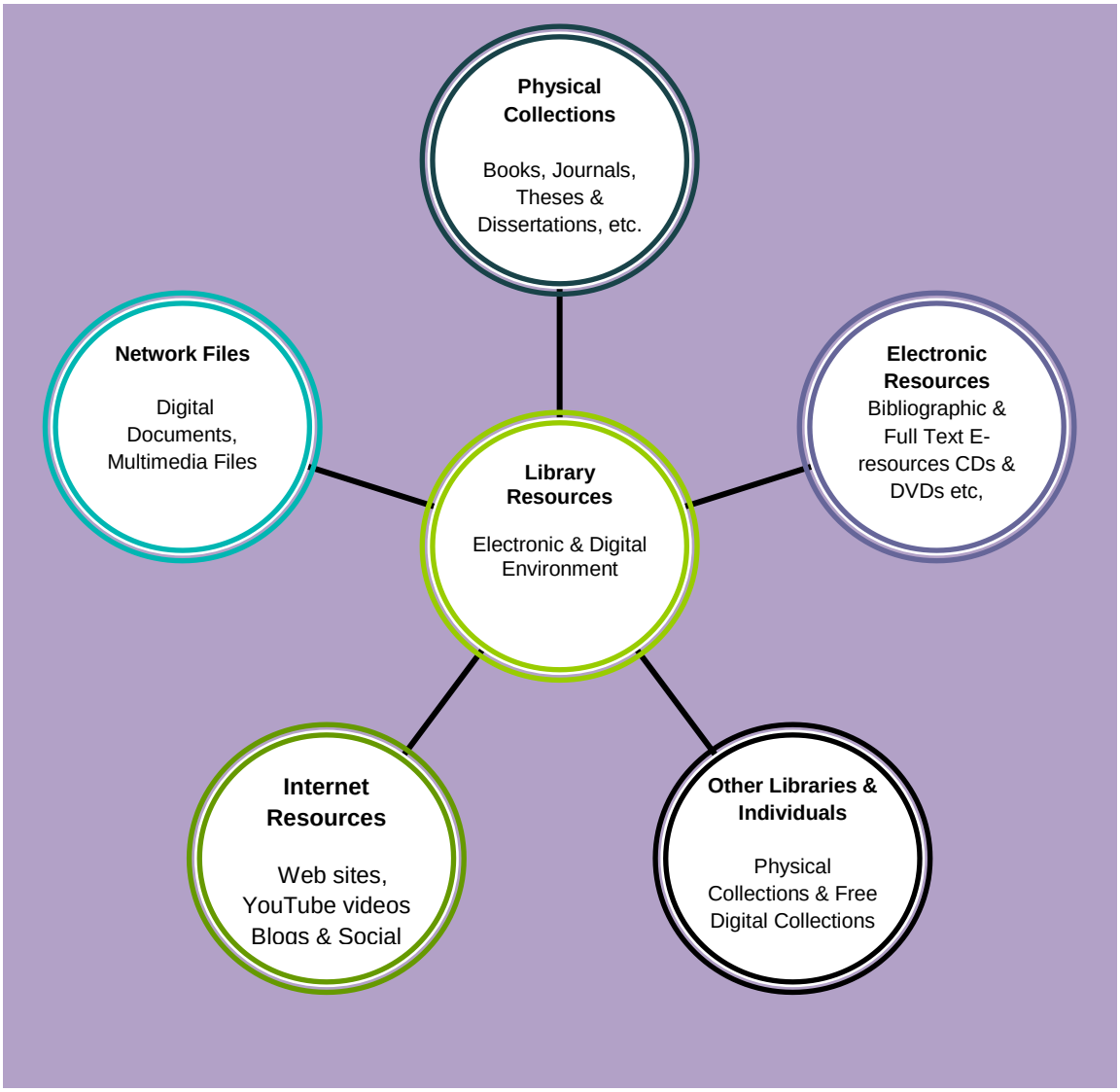


Figure 4: *Impact of Electronic and Digital Resources to Include Concepts, Data, Software/Tools*

C. Digital Libraries and Institutional Repositories

Stuart Snydman of Stanford University explained in digital libraries blog that the university library followed a user-centred approach in building portals for their digital library systems and services. Feedback obtained through interviews with scholars and faculty formed as a reference for designing and validating the website that supports both interaction and technical design. The organization of content and functions on a website were represented by block diagrams visualizing the relationship between site pages, content types and functional activities. They made a clear distinction between interaction design and visual design, in which interaction design emphasized on information architecture, layout, navigation, and content organization etc.

Further, an exclusive server can be arranged for digital library to upload all digital documents in searchable format and necessary metadata serves well for retrieving the relevant documents or information easily through separate search interface or commonly through OPAC without missing even related items. Schopfel Joachim (2013) mentioned “five specific characteristics that provide

scientific excellence to the ETD repositories – 1) quality of content; 2) metadata for the description of the content and context of the ETD (Electronic theses and dissertations) files; 3) format that is searchable and open for users and should be suitable for long-term preservation and intelligent exploitation of the content; 4) interoperability – for more visibility of the ETD, repositories should be networked at regional, state wise and international levels and also interconnected; and 5) in addition to the search and browsing services, some practises should be complimented using social media tools, federated tools and sophisticated discovery tools, collecting usage statistics and observing citations, videos and presentations on theses, printing in book format on demand, options for copyright protection & licensing, preservation in multiple copies etc. He also stated that the above best practices adopted by the librarian can add value to ETD repositories and make the services user centric with the least, flexible and innovative effort.

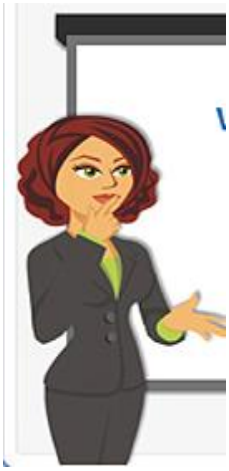
D. Information Literacy (User Education)

The library plays a vital role in educating the users, especially in academic institutions, where the user's population is large and be regularly floating every year. These user education programmes of earlier times have taken new shape into Information literacy with the advent of electronic resources, tools and services and also latest information retrieval systems. Usually such programmes will be conducted to newly admitted students and research scholars to explain about library rules, organization of collection, services and use of library tools and accessing the resources etc. Special orientation will be conducted by the library in the specific occasions or while introducing new information products to make the information/document centric to library centric. Though users are now familiar with different types of online resourses, they still need guidance from the library regarding the –

- I.P authenticated e-resources under copyright, fair-use terms of publishers, the way to register for databases access, wherever it is mandatory, for example Scifinder scholar, CMIE etc.; the availability of remote login, wherever publisher allows.
- Moblie applications especially for the use of webOPAC.
- Existing networking infrastructure for accessing e-resources and online based tools, like internet and OPAC terminals, Wi-Fi, importance of secured network in case of accessing valuable and highly expensive copyrighted material in electronic form etc.
- Further the users need to be explained about the benefits of registering for databases such as - receiving alerts regarding new publications in the selected area of research work i.e. article, new journal or a chapter or about launch of new product or a trial access.
- Researchers can even be trained to search and retrieve the required information or document precisely without missing relevance.
- Researchers can be taught about the value of citations, citation styles explaining about the plagiarism the research misconduct, researcher's gateways and their use of relevant tools.

With the increasing use of web based resources and tools for various purposes in academic and research environment, the networked users in the present era can be motivated to be aware of the policies/rules of the library and resources by prominently displaying on the library web page, without making much effort to contact the library personally during working hours / days and also access the resources. Thereby the library users will be able to access university's authenticated web resources on or off campus anywhere, anytime as they are connected through the campus-wide Wi-Fi, remote login facilities created for users.

These training sessions on the use of the library with audios & videos, online interactive sessions can even be posted on library websites for user's information and also to get the feedback from them. Surveys can be posted online to take users feedback on any product, resource or service.



- Are you satisfied with the Library services?
- Do you get the information easily & speedily than some years back?
- Do you feel that the library has shifted from document centric to user centric?
- Are you familiar with the web OPAC?
- Do you need training in the use of online resources?
- Are you able navigate and get the relevant information online?

Figure 5 *- E- Interaction with the User (modified from Koerber, 2015)*

Apart from library tours, user guides and instruction classes, libraries can even hyperlink the videos of instructional lectures and publishers tutorials to their websites for users to self-learn the various processes involved in information retrieval. A self-directed training can be made simple by hyperlinking the modules to library's website or Intranet, or as multi-part online courses. Moreover, such programs can be useful to train staff as well as patrons.

E. Library Websites

Since, the hypermedia has become prominent platform to display of resources as well as disseminate the information emerging in variable formats, libraries are gradually transforming into virtual libraries providing remote services and resources to widely distributed users across the campuses. There is a visible difference in the conventional static library websites, when users are not just satisfied with infrequent updated text by the site administrator, but requiring automatically updated information in dynamic mode. It is possible by embedding the respective web applications and scripts in Webpages. Further, the latest content management systems e.g. Word press support the user's interaction with websites like providing search interface, submitting feedback/contact us or ask us etc. and connecting to social networking as well as researcher's networks.

Moreover, the inclusion of web 2.0 tools such as library blogs, chat services, ask the librarian to library website or online catalogue will speed up the communication between the user and library. It will not only setup quick library contact service to the user but also get necessary feedback from users, which ultimately ignite the launch of new services or redesign of existing services.

7. Conclusion

"Google can bring you back 100,000 answers, a librarian can bring you back the right one"

- Neil Gaiman

It is pertinent to mention that most of the research scholars or faculty does not know how to fully tap the resources of the library. In this context if the role of librarian in managing the resources is considered as the most significant only when it is made user centric by flashing the new arrivals,

training sessions in the use of the web OPAC & online resources and document delivery services etc. In the recent years the libraries are even involving in screening theses & dissertations before submitting with the similarity index so that the researchers, institutions know the value and originality of the theses. This service is a value added service to the research output. In the light of novelty of the services provided in the present context in the established libraries it is never the less to mention that the libraries are becoming more and more user centric and user prone. The role of librarians and libraries in academic environment lies more in making the users to understand the resources/ services and enable them to achieve competency in tapping the resources whether print or online. Universities without research is meaningless so also libraries without users. Hence the importance of UCD.

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Research Article | Open Access

The Library Use Habits of Senior Secondary School Students in Ogun State, Nigeria

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Abstract This study investigated the library use habits of Public Senior Secondary School Students in Ogun State, Nigeria. The descriptive survey design was used for the study. The population consisted of 54,907 third year senior secondary students (SS 3) in the 2014/2015 session in 295 public senior secondary schools in Ogun State, Nigeria. Stratified sampling technique was used to select 977 respondents. The instrument used for data collection was a questionnaire titled Library Use Habits Questionnaire (LUHQ). The instrument was tested for reliability using Cronbach alpha. The reliability coefficient of Library use habit scale was= 0.9. Data collected were analysed using descriptive statistics. Findings indicate that majority of the respondents reported that nobody encouraged them to use the library. While, respondents were also tried to benefit from all facilities of the library; borrow books from the library. In the face of using library facilities, majority of the respondents established that they visit the library not only when they have assignment. Based on the findings, the study concludes that organizing a series of lecture under user instruction or user education or library orientation program is required in public senior secondary schools. The study recommends that teacher should also mandate students to use the school library effectively; it can help attain high academic achievement. It was also recommended that *p*rofessional librarians should be employed in public senior secondary schools to plan and execute result oriented information education.
Keywords *Library Use; Information Literacy; School Library; Senior Secondary School*

1. Introduction

The library is a storehouse of knowledge, and a habitual visit and use of it, is as compelling, as it is necessary (Okoro, 2004). In the same vein, Dange and Praveen (n.d) stated that library is a storehouse of resources and it provides many more opportunities to the learners to acquire the knowledge, which facilitates achievement of academic performance of students to a great extent. Therefore, the library is an inseparable aspect of education and culture (Savanur, 2011). Libraries are found in nursery, primary and secondary schools with the mission of contributing to the intellectual development of pupils and students. The activities which take place in school libraries involve collection of books and other learning materials organized by trained professionals and placed in one or two big rooms in the school for the use of the students and teachers. The objectives of school

libraries are to acquire process and make available to pupils and students, a wide range of books and audio-visual materials to supplement and enrich the teaching and learning situation in schools. Other objectives of school libraries are to encourage the development of skill in reading, to prompt reading and library use habits to some literacy in primary and secondary schools. School libraries serve primary and secondary school students by providing materials to meet their various needs and serve to encourage reading and the use of library. School libraries help children to discover for themselves, by independent study and learning, how to ask questions, when the need arises. This is realized through the services of information literacy librarians who are responsible for inculcating information literacy skills in students through the delivery of information literacy instructions. The information literate person uses critical thinking to analyze and evaluate information for use in projects and problem-solving. Information literacy enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning (Yusuf, 2013). Upon the objectives of establishing school library, literature has shown low usage of school library among students in public senior secondary schools. This has given rise to concern among librarians. Could this be as a result of lack of professional librarian to teach students on how to use library or lack of library orientation? It is in the light of this that the study investigated the library use habits of students in public senior secondary schools in Ogun State, Nigeria. The general objective of this study is to investigate the library use habits of Senior Secondary School Students in Ogun State, Nigeria. The specific objective is to identify the library use of Senior Secondary school students in Ogun State.

2. Literature Review

Libraries play a great and significant role in developing and sustaining reading habits by providing a variety of reading material without taxing the students too much in terms of money and space. However, the role of libraries and librarians in developing and sustaining reading habits cannot be over stated. The librarian leads the students from a few into many other books which supplement and augment knowledge contained in textbooks and class notes. They talk with verve and enthusiasm about other interesting books related to their studies and also other books of abiding value. Librarian can develop reading and library use by delving into a series of lectures under user instruction or user education or library orientation programme.

The library/librarian plays a vital role in the development of the personality of the students. As a student spends most of his/her life at school, school library can help with the critical need to expand background knowledge by proving conducive environment for students to read and a supply of books that are both interesting and varied. At this delicate age, students have to be motivated to read and use the library. They should be given books and audiovisual material in the form of CDs, VCDs and DVD. They should be given books as gifts. Students should be taken to libraries during library orientation.

Lack of functional school libraries can obstruct students from acquiring a library use habit at an early age. However, it is essential that reading and library habits must be acquired by students from an early stage. Students are especially expected to have acquired reading habits and developed skills in effective library usage. However, the limited numbers of research studies in the domestic literature have revealed that students do not have a positive attitude towards library use (Bayram, 2001; Bınarba, 2006).

Erdama and Demirel (2009) identified students' habits in the use of their own school library, it was found that more than half of the students go to the library once a week or month, while only a few students go everyday and that there were even participants, though very few, who never go to the library. One of the oldest pieces of research regarding library use was carried out in 1933. This study showed that libraries were not used effectively and students usually went to libraries to read

newspapers and journals (Cited by Clabo, 2002). The research carried out by Clabo (2002) in six high schools also revealed that 46.9 % of the students never go to library in a year, and another 22.3 % go to the library for once or twice. In other studies, it was also found that only a few students go to the library on a regular basis, while the remaining students do not need to do so and they spend very little time at the library (Burks, 1993; Barnard, 2000). Of the participants, 12.8 %, which is a considerable portion of the whole, has never borrowed a book from the library. The majority of the students make use of the libraries for research. Also, students prefer libraries in relation to the gaining of new knowledge and preparing for examinations since they are quiet places (Cited by Yılmaz, 1995).

It was concluded from many studies that students use school libraries for doing their homework and assignment tasks (Bolton, 1982; Drake, 1985; Bancroft, Croft, Speth ve Phillips, 1998; Whitmire, 2001). Half of the participants stay in the library for 1-2 hours. Research carried out in Iowa University regarding university students' library use level showed that only a few of them use microfilm, CD-Rom and video (Clougherty et al., 1998). During the interviews the students suggested that they go to the library only for studying and reading, since they were unable to use the resources efficiently. The reason for their not being able to use the resources efficiently might be that they do not know how to do that. According to the research; students are encouraged to use the library mainly by their friends and their own curiosity. The impact of the instructors on this end was found to be too low. However, it should be noted that the instructors' encouraging the students to go to the library, assigning homework that motivates students and being good models for students, affect students' attitude towards the library in a positive way (Burks 1993; Clabo, 2002; Erdamar and Demirel, 2009).

It was found in the study conducted by Erdamar and Demirel (2009), that the student teachers like spending time at the library; they usually go to the library for research, homework and assignments; they like the quiet and peaceful environment in the library and they prefer libraries to be clean and tidy. In line with the findings of the study, other researches have demonstrated that students make use of the library for its quietness (Gratch, 1980), studying (Erdamar & Demirel, 2009; Clabo, 2002; Talbot, Lowell ve Martin, 1998), Research (Erdamar & Demirel, 2009) and for acquiring new knowledge (Yu, 2006). Students do not ask librarians for help much. In line with the results of this study, other studies also showed that students have a negative perception about librarians and the students do not ask them for help (Drake, 1985; Harwood & Bydder, 1998; Kershaw, 2001). Daniel's (1983) and Musavi's studies (1977), also recorded that the students with a positive attitude towards the library and those that are members of the libraries, use the libraries more.

Research has shown that students expect libraries to be quiet, clean, tidy, and peaceful. They prefer to use books in libraries for studying and reading books. Erdamar and Demirel (2009) carried out research on the library use habits of student teachers and found that 3.9 % of students do not go to the library at all and another 12.8 % do not borrow books from library at all. 34.7 % of the interviewed group goes to the library once a week, 29 % once a month while 10.8 % borrow a book once a week and 13.1 % once a month. 60.1 % of the participants state that the frequency of borrowing books varies depending on the need for research.

The researcher further reveals the students' reasons for going to the library; it is found out that 90.0 % make use of the library for conducting research. Also, since libraries provide a quiet environment, they are preferred by students for gaining new knowledge, preparing for exams, spending free time and following up innovations in their respective areas. Students' period of stay in the library also shows that 51.0 % stay for 1-2 hours and 30 % for 3-4 hours. 53.0 % of the participants reported that they are encouraged to go to library by their friends, 36.9 and 7.1 % of the students went to the library out of curiosity and upon their instructors' encouraging them, respectively.

Erdamar and Demirel (2009) carried out a study titled the “library use habits of student teachers”. They found that the investigation in terms of positive items shows that half of the participants (49.0 %) agree at, medium level, with liking spending time at library, 31.0 % of the group likes spending time at the library, and another 19.4 % does not like spending time at the libraries. Whereas the majority of the group likes being at the library; more than half of the participants (61.5 %) do not spend their spare time at the library. A small portion of the group (10.3 %) stated that they spend their spare time at the library. While 35.9 % of the participants say that they can stay for too long at the library, 33.7 % agree at medium level only and another 30.3 % disagrees with that idea. The majority of the students (82.0 %) believe that libraries are good places for studying and again the majority of them (88.9 %) believe that libraries are good places for studying as they are clean and tidy.

As for the investigation in terms of negative items; almost all of the participants (85.8 %) disagree with the idea of feeling irritated at being at the library. Similarly; almost all of the participants (93.1 %) do not agree with the phrase “I regret over” spending time at the library”. 80.8 % of the group state that they do not feel bored at the library. 46.6 % of the participants disagree with the item about going to the library only when homework is assigned. 38.2 % of the participants can study in only a particular type of library. Similarly, Wilson (2009) in her study on library use found that the respondents make use of the library mainly to borrow books, reading, using the computers, photocopying. Wilson also discovered that her participants use the library as a place for recreation and relaxation and men came to the library more often than the women to study or read.

A school library is often found within the primary or secondary school environment, and its main purpose is to serve the user and entire school community with well stocked up-to-date information in form of books, digital resources, database, journals, magazines, newspapers, news review, CDs, Audio-visual etc. Supporting this view was Edoka (2012), who posited that a school library is established in a primary or secondary school. These libraries have been termed recently as school library resource centers.

According to Fayose (1995:32), a school library is that part of school where a collection of books periodicals, magazines, and newspapers, firms and filmstrips, videotapes, recording of all types, slides, computers, study kits, and other information resources are housed for use by teachers and pupils for learning, recreational activities, personal interest and inter personal relationships of children in school

The role and contribution of school library services in the provision of education at all learning levels cannot be overemphasized, especially when one considers the functions of a library within the secondary school system. As the university library is considered the intellectual center of a university, so also is the secondary school library considered as the center of intellectual activities in a school. For this reason, many educationally advanced countries pay much attention to the development of secondary school library services since it is the foundational base of student’s higher academic achievement as they aspire to further their career in life.

The school library, as a strategic arm of its parent institution, is established majorly to organize collections of all human efforts either in print or non-print forms that are relevant to the educational development of the children regardless of age, background and race. Correlating this view is Ezenwa (1993), who posits that school libraries are libraries in primary and secondary schools whose collections are majorly for the young. For him, the school library is not only a depository and a storehouse of knowledge and a center for the dissemination of knowledge but also a recreation and relaxation center for the students.

Apart from the school library, there exists what is called a classroom library. The classroom library is a small collection of books in a corner of the classroom. Its collection is meant to enrich and supplement the classroom study. Most classroom libraries within the schools are known as branch libraries.

According to Ezenwa (1993), today's libraries are seen as centres for wider varieties of educational media. The term 'media' here implies books, magazines, newspapers and pamphlets, records and tapes, maps, films, photographs and painting. Included also are equipment such as projectors, motion pictures and tape recorders. School libraries are named according to the diverse roles of the libraries or functionality they discharge, the names may include "media center" "resources center" "instructional material center".

Aguolu (2002) posited that service in any school library requires staff of various categories and levels of education and training, indicating that the following may be needed depending on the enrolment: staff, collection and academic programme; librarian employed as school librarian with or without any teacher qualification, teacher librarian (currently, teacher put in charge of the school library with or without any library training) library officers, library attendants, and library prefect. It is only when these are in place that effective library service can be guaranteed and users experience would be satisfactory.

School libraries have a number of functions they are known for as academic resource power houses. According to Elaturoti (1995), the functions of the school library include: to support the teaching and education work of the school and to develop a reading habit among young people both for pleasure and for the purpose of gathering information for themselves. This can be very effective if the school management educates the parents on the need to continue to teach their children at home about the importance of developing a good reading habit and employing professional teachers who are already ardent readers and are willing to impact that trait into the children (Battraw, 2012).

A study conducted on use of school library resources in Singapore Majid (2005) revealed that students and their teachers alike generally do not use their school libraries and various information resources effectively due to the inadequacy of their libraries in terms of education materials and structural conduciveness.

A library is a depository of collection of books, journals, magazine, newspapers etc. for users' accessibility and reading pleasure. A good student should be able to locate and extract primary and secondary sources of information from the school library. The challenge often faced by most secondary school students, especially in public schools is the fact that there are no well-equipped libraries within the school for conducive learning. Where there are libraries, they lack up-to-date books, have no adequate infrastructure, are short staffed, and have inexperienced Librarians to mention a few. A study conducted by Ibrahim (1995) discovered that despite the rapid growth in the educational sector in Nigeria, public secondary school libraries are still faced with the challenge of funding, staffing, collection and rendering services which hinder the use of library by the students.

Supporting this view is Uju (1987) and Obajemu (2002) who stated that secondary school library services in Nigeria are still at the developing stage displaying inadequacies in staffing, funding and services provided and these to a great extent, affect the use of library by students in the school.

Meanwhile, the inadequacy of the school library in terms of educational materials hinders the use of the library by both students and teachers alike. Inadequate access to the needed text books is another challenge towards students' effective use of the library. Meaning, increased access to books is related to increased reading achievement as discovered in several researches conducted by (Krashen, 2004, 2010; Lance, 2004; Lindsay, 2010).

Inadequate access to better libraries affects the use of library by secondary students. It implies that adequate access to quality school libraries collections guarantees higher scores on reading tests done in class. The aspects of school library quality that relate to reading achievement include: the size of the collection, the presence of a credentialed librarian, and overall staffing. When children have access to books, they read them a lot, and when they read a lot, all aspects of literacy improve.

Erdamar and Demirel (2009) revealed that the students do not ask librarians for help although they need it. The most important reason for this is that librarians are often cold and indifferent when asked for help. They recommended that librarians must be trained at regular intervals and seminars must be arranged on human relations and communication. The main people to lead students to use the library are listed as peers; they are also led there by their own curiosity. Instructors do not constitute an agent affecting and supporting the students in library use.

The instructors should assign students studies, projects and homework that require library use and promote library use and award such work with prizes. Furthermore; cooperation between librarians and the instructors should be fostered. The student will develop positive feelings towards a library where she/he can have access to the knowledge he or she needs. Libraries should arrange complaints procedures and self-assessment forms should be made use of. Complaints should be quickly dealt with and the necessary precautionary steps taken to prevent any further complaints. Furthermore, libraries should themselves carry out such research in order to identify user satisfaction levels. Finally; libraries must be places with clear catalogues and referencing systems and where a rich collection of books and other resources can be easily accessed, and where the copying services are of a high quality. The librarians should be smiling, helpful, informed, welcoming and friendly.

3. Methodology

The descriptive survey design was used for the study. The target population was the Senior Secondary 3 students in the 2014/2015 session in public senior secondary schools in Ogun State, Nigeria. There were two hundred and ninety-five (295) public secondary schools in Ogun State as at the time of this study. Total population of selected Senior Secondary school students in the public senior secondary schools in Ogun State was 54,907.

The multi-stage sampling technique was adopted for this study in order to have a representative sample. Multistage sampling technique allows for random sampling at different levels or stages. The technique was appropriate for sampling highly heterogeneous population. In the first stage, systematic random sampling technique was used. The local government in each zone was arranged separately in alphabetical order. The list is labeled 1st, 2nd and 3rd repeatedly by first dividing the 20 Local Government Areas in Ogun State along existing senatorial districts in Ogun State (Ogun Central, Ogun East and Ogun West). By balloting, the 1st number was selected. Then every first local government was chosen as an element in the sample. Seven local governments were used as sample for this study. In the second stage, simple random sampling by balloting was adopted to select three (3) secondary schools in each of the local government areas selected for the study. Therefore, this gave a total of 21 public secondary schools in seven (7) LGAs which were Abeokuta North, Ifo, Ijebu East, Ijebu Ode, Ikenne, Ado-Odo Ota and Imeko. All the senatorial districts in the study were represented and three (3) secondary schools were selected randomly. In the third stage, stratified random sampling technique based on proportional probability sampling technique was used to select 977 students in 21 public senior secondary schools in Ogun State from the total population. Therefore, a sample of nine hundred and seventy-seven (977) students was used for the study. A representative sample of 977 out of a population of 4872 students was considered adequate for generalization based on the general rule, the larger the population size, the smaller the percentage of the population required getting a representative sample (Gay & Airasian, 2003).

4. Presentation of Findings

A total number of nine hundred and seventy-seven (977) copies of questionnaire were administered to public secondary school students in each selected school in Ogun State, Nigeria. Nine hundred and sixty-eight (968) copies of the questionnaire were retrieved representing 99%.

Table 1: *Demographic Characteristics of the Respondent*

Demographic Information		**Population of Respondents**	
Characteristics	**Information**	**Frequency**	**%**
Area of specialization	Science class	468	48.3
	Art class	254	26.3
	Commercial class	246	25.4
	Total	**968**	**100.0**
Age	14-15	200	20.7
	16-17	514	53.0
	18-19	230	23.8
	20 and above	24	2.5
	Total	**968**	**100.0**
Gender	Male	416	43
	Female	552	57
	Total	**968**	**100.0**

Table 1 presents the demographic characteristics of respondents used for this study. It reveals that 48.3% of the participants were in science class while 26.2% were in art class and 25.4% were in commercial class. This implies that more science students participated in this study than either the art or and commercial students, an indication that more students in science class. It also indicates that 53%, a large proportion of the respondents fell into the age bracket of 16-17. Next to that is 18-19 years, with 23.8%, followed by 14-15 years with 20.7% and 20 and above years with 2.5%. This implies that majority of the respondents are relatively young, if they are well groomed, they may perform well academically. In respect of gender, the table shows that 43% of the respondents were male while the female counterparts were 57%. This implies that more females participated in this study than males; this may be due to the admission of more females in public senior secondary schools than males.

Table 2: *Showing the Rating of Library Use of Public Senior Secondary School Students in Ogun State*

Items	**Yes**	**No**
	F (%)	**F (%)**
Do you have a library in your school?	793(81.9)	175(18.1)
Have you used the library before?	786(81.2)	182(18.8)
	Items	**F (%)**
Who encouraged you to use the library?	Nobody	564(58.3)
	Friends	146(15.1)
	Teachers recommendation	172(17.8)
	Librarians recommendation	39(4)
	Principals recommendation	35(3.6)

Table 2: presents library use of students. Majority (81.9%) of the students reported that a library exists in their schools and 81.2% have used the library before. It also shows where students get recommendation on the use of library from. Majority (58.3%) reported that nobody encouraged them

to use the library. Others were encouraged by friends (15.1%), teachers (17.8%), librarians (4%), and school principals (3.6%), parents (0.6%) and during orientation programs (0.6%). This implies that organizing a series of lecture under user instruction or user education or library orientation program is required in public senior secondary schools. Also, students need to be counselled to use the library by teachers, librarians, school principal, and parents.

Table 3: *Frequency and Percentage of Library Use Habits of Students in Public Senior Secondary Schools in Ogun State*

Items/Statements	SA	A	D	SD	$\bar{X}$	SD
I try to benefit from all facilities of the library	398 (40.8%)	316 (32.6)	109 (11.3)	148 (15.3	2.99	1.065
I borrow books from the library	330 (34.1)	311 (32.1)	146 (15.1)	181 (18.7)	2.82	1.099
I consult the library staff while searching for materials	297 (30.7)	321 (33.2)	160 (16.5)	190 (19.6)	2.75	1.093
I ask the librarian for help as needed	290 (30)	337 (34.8)	153 (15.8)	188 (19.4)	2.75	1.084
I make use of the library catalogue when searching for reading materials	291 (30.1)	316 (32.6)	177 (18.3)	184 (19)	2.74	1.085
I browse through the shelves in search of materials for assignment	298 (30.8)	282 (29.1)	174 (18)	214 (22.1)	2.69	1.129
When I go to the library, I read mainly my lecture notes	272 (28.1)	303 (31.3)	201 (21.7)	183 (18.9)	2.69	1.075
I consult the reference materials in the library	245 (25.3)	338 (34.9)	187 (19.3)	198 (20.5)	2.65	1.069
I visit the library on daily basis	221 (22.8)	336 (34.7)	182 (18.8)	229 (23.7)	2.57	1.085
I go to the library to read newspaper	172 (17.8)	206 (21.3)	245 (25.3)	345 (35.6)	2.21	1.112
I make use of electronic resources in the library	147 (15.2)	224 (23.1)	272 (28.1)	325 (33.6)	2.2	1.066
I go to the library to socialize with my friends	174 (18)	181 (18.7)	218 (22.5)	395 (40.8)	2.14	1.139
I go to the library only when I have assignment	129 (13.3)	147 (15.2)	292 (30.2)	400 (41.3)	2.01	1.048
				Grand Mean	**2.55**	**.661**

Table 3 presents library use habits of public senior secondary school students. 57.5% visited the library on daily basis; 61.7% did not make use of electronic resources in the library; 63.3% reported not going to the library to socialize with their friends; 66.2% borrowed books from the library; 60% browsed through the shelves in search of materials for assignment; 63.9% consulted the library staff while searching for materials; 60.2% consulted the reference materials in the library; 39.1% reported going to the library to read newspaper; 59.4% read mainly their lecture notes when they went to the library; 62.7% made use of the library catalogue when searching for reading materials; 28.5% agreed that they go to the library only when they had assignment; 64.8% usually asked the librarian for help as needed; 73.4% tried to benefit from all facilities of the library.

Table 4: *Table Showing the Rating of Factors Hindering Library Use of Public Senior Secondary School Students in Ogun State*

Library Use	SA	A	D	SD	Mean	SD
	F (%)	F (%)	F (%)	F (%)		
Library hours not on the school time-table.	304 (31.4)	281 (29)	197 (20.4)	186 (19.2)	2.73	1.101
Lack of professional librarian to teach students on how to use library.	286 (29.5)	248 (25.6)	241 (24.9)	193 (19.9)	2.65	1.104
Lack of library orientation	263 (27.2)	289 (29.9)	220 (22.7)	196 (20.2)	2.64	1.086
Inadequate information materials in the library	268 (27.7)	280 (28.9)	211 (21.8)	209 (21.6)	2.63	1.105
Current and reliable information materials are not available in the library.	282 (29.1)	264 (27.3)	198 (20.5)	224 (23.1)	2.62	1.132

Table 4 shows that 55.1% of the participants agreed that total absence of professional librarians to teach students on how to use information is a contributing factor hindering library use. Also, 60.4% strongly agreed that library hour not being on the school time-table is a major factor hindering library use among public school students.

5. Discussion of Findings

There is a clear indication that “those who tried to benefit from all facilities of the library ranked highest by its mean score and were followed by “those who borrowed books from the library” and “those who visited the library only when there is assignment” had lowest mean score. An evaluation of library use habits of students in public senior secondary schools shows that overall mean score of the library use habits of respondents is 2.55 and that implies that the respondents (public senior secondary school students have low library use habits. Majority of the respondents agreed that they tried to benefit from all facilities of the library followed by borrowing books from the library. This finding is in line with that of Wilson (2009) in her study on library use found that the respondents make use of the library mainly to borrow books. The finding is in partial agreement with the findings of Tella, Owolabi and Attama (2009) whose study revealed that the most common use of the library for students is for reading, followed by using the library for borrowing books, making photocopies and searching the library catalogue. This is, however, in contrast to previous studies by Osinulu (1998); Olofinsawe and Ajayi (2008); Ifedili (2009), whose studies revealed that the library was not used. Although majority of the respondents did not affirm that the library is not their favourite place for reading, the study did establish that students do use the library for their other purposes. Most of the study respondents do borrow books from the library, consult the library staff while searching for materials, browse through the shelves in search of materials for assignment and make use of the library catalogue when searching for reading materials. This finding is this case is partially supported with the findings of Onuoha, Unegbu, and Umahi (2013) who assert that students browse the shelves in search for reading materials and consult library staff while searching for materials.

Majority of the students reported that a library exists in their schools and have used the library before. The result also showed that the respondents are not encouraged to use the library. This implies that organizing a series of lecture under user instruction or user education or library orientation program is required in public senior secondary schools. Students need to be counselled to use the library by teachers, librarians, school principal, and parents. This implies that the educational administrators and librarians should initiate students to read and use the libraries, and then it can help attain high academic achievement.

6. Conclusion and Recommendations

Based on the findings, it was concluded that the library use habits of public senior secondary school students in Ogun State, Nigeria have been at a low level. Therefore, low usage of library may be attributed to the fact that the students are not encouraged and introduced to the school library by professionals (teachers, principals or librarians) and the total absence of trained professional information literacy librarians to teach students on how to use various information sources. In addition, the absurd state of the libraries in most of the public secondary schools in Nigeria may not encourage most students to use the library. The fact that students are not encouraged to use the library and the state of the school libraries are not conducive and attractive may be a major factor affecting library use habits of students in public secondary schools.

Therefore, public secondary school students should be encouraged to use the school library. While, government at all levels should re-position school libraries through adequate funding because school libraries play a great and significant role in improving students' academic achievement. Also, educational administrators should ensure that use of library course is included in the secondary school curriculum. This may establish a relationship between library use habits and academic achievement.

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User Centric Design of Library Systems and Services in the Changing IT Era: An Overview

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract Defines the User Centric Library System (UCLS) and explains the need for user centric library systems and services (UCLSSs). Argues that the design of user centric library systems are basically meant for providing quality services to the users and for their empowerment, and also for sustenance of libraries. States that the embedded librarianship and user centric libraries have some similarities in terms of librarians and users working in teams to design and develop various services and products that will better suit the users requirements. The paper explains that the Internet and Web technologies have come handy in design and delivery of the user centric library systems and services in the changing technological era. It emphasizes that all the library operations and services are largely user centric professional commitments and responsibility of librarians, whereas, some of them pertain to the professionally warranted functions for accountability of the jobs held by the librarians. The core of the library operations and services, either explicitly or implicitly are user centric and their foundations are built on Dr S.R. Ranganathan's Five Laws of Library Science. Information Technology is aiding the libraries in maintaining contact with the users in diverse ways and to maintain collaborative sharing of knowledge or information. The paper concludes that, there is a need for the LIS professionals to shift their philosophy from the 'Library Centered' approach to the 'Learner or User Centered' approach, to make the libraries relevant with the changing times.

Keywords *Library Services-Five Laws of Library Science; IT Enabled Library Services; User Centric Library Systems; Web Based Library Services*

1. Introduction

Library is the trinity of users, collections and staff, and users constitute the most important component of all the three. The primary objective of a library is to provide either documents or information needed by its users. That is, to provide right information to the right reader at the right time in a right usable form. This explicitly or implicitly indicates that 'User' is the crucial most constituent of all types of libraries, and without users the existence of libraries cannot be thought of. Further, all the library operations and services are designed and executed, aiming at the users and in fulfilling their information needs. That is, 'putting the knowledge for use'. Therefore, naturally, the user centric design of libraries and library systems becomes imperative and essential for all kinds of libraries, whether academic, public or special. The quality of libraries or the quality of library systems and services are dependent on how well they are centered on users.

Librarians have two basic obligations to fulfill. They are: 1. Professional and Social responsibility, and 2) Professional accountability. All the library processes, activities, files, records, services and products, naturally fall in to one of the above two categories, i.e., professional responsibility or professional accountability. While, the first one is aimed at fulfilling the library users' needs and requirements, the second one is aimed at maintaining and managing the records and files as a means of accountability to the authorities and funding agencies, who provide finances or budget for running the libraries. However, the library services of all types of libraries are planned and designed focusing around the library users. Of course, some services are in direct contact with the users and felt easily by the users, whereas, some others performed behind the screen in libraries are not perceived directly by the users.

Libraries have been providing user oriented or user centric services right from their beginnings, as their very purpose is to meet the information needs of users in their respective fields of activities. Further, the user centric libraries require undertaking of two important activities which are a priori to user centric libraries. They are: 1. Identification of user needs, their information seeking behavior, and 2.User orientation, and offering Information Literacy (IL) to optimally make use of the resources, services and products of the libraries.

2. Objectives & Methods

The purpose of the present paper is to sensitize and create understanding on the librarians and information professionals who have been participating in the design and development of library systems that are aimed at users and performing all the library activities and services around the users keeping them in the central place as the essential component, to achieve the objectives of the library. It is further aimed at bringing to the knowledge of the library and information professionals that the acquisition policies, collection/resource building, library services & products are to be designed and developed keeping in view of the users of library, their information seeking behavior and information needs. Analytical and Descriptive methods are followed for this study in presenting an overview of the User Centric library design and development.

3. User Centric Libraries- Meaning/Definition

The phrase "user-centric," is synonymous for "User-centered" or "user-focused". The libraries planned/ designed around meeting the users' information needs/requirements at their best are generally considered as the 'User centric libraries'. Libraries being the social institutions and the society or people around the library (public library) constitute its users. Hence, the library has the responsibility to meet the users' information requirements. It is equally also in case of academic and special libraries, whose users are the members of the organization/institution in which the library is located. Although, user-centered design is widely supported in theory, but in practice, its conceptualization and implementation differ widely. Human Computer Interaction (HCI) specialist John Karath remarked that the phrase "user-

centered design" has no agreed-up on definition. The meaning of user-centered design is extraordinarily diverse, and depends greatly on the discipline, back-ground, and research interests of its proponents.

Wikipedia defines user Centered design as “a process in which the needs, wants, and limitations of end users of a product are given extensive attention at each stage of the design process”. Further, the user centered design process includes the phases or components such as, user requirement analysis; conceptual design; design and implementation; usability evaluation, launch and maintenance. The user centered design is presented below in a graphical way.

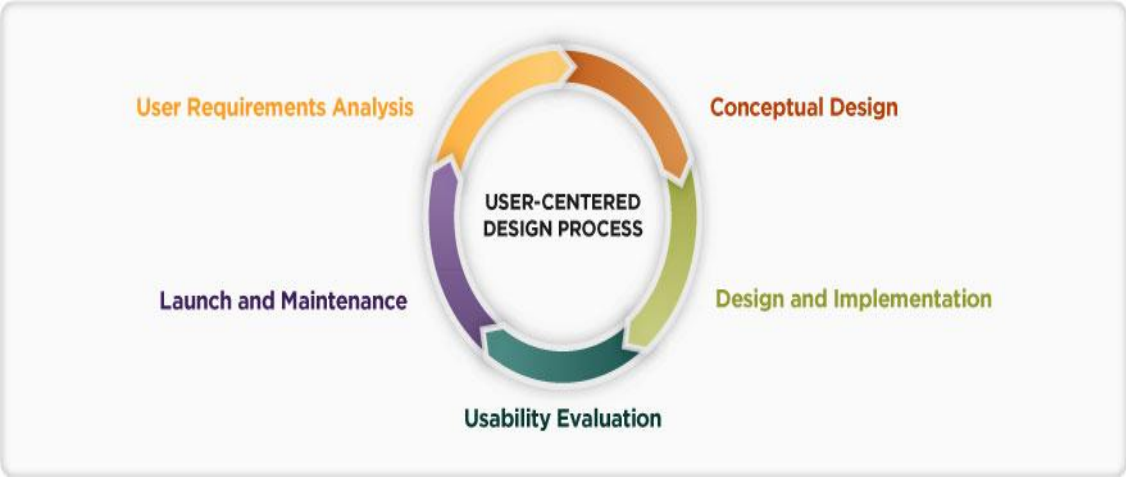

Figure 1: *User-centred Design Process*
(Source: http://usability.msu.edu/)

Therefore, for a user centric design of library systems, it is a priori and essential to find out the users requirements, their use attitude, behavior, use pattern and their satisfaction with the information products and services of the libraries. And once a design is made, it needs to be tested or evaluated to find out whether it is meeting the expected objectives and satisfaction of the users, and based on the feedback, redesign of the library system can be planned to make it effective.

A similar definition for User centric design is offered by a software company, Apple Inc., as ‘When you stay focused on your users throughout the design process, you have the best chance of delivering a product that meets their needs. After you determine who your target audience is and what, precisely, your app helps them do, it works well to use that knowledge as a tool to shape every design decision”. The Guidelines offered by the Apple Inc., for a user centric design are precisely:

1. Know your audience / user;
2. Analyze user tasks;
3. Build Prototypes;
4. Do Testing, and Focus on Solutions, not Features.

This definition equally suits to libraries also.

The embedded librarianship and user centric libraries have some similarities in terms of librarians working in teams with users and collaborating with each other for better and effective design and provision of information services and products. As partners with the library users, such as, faculty, researchers and students in academic libraries, or scientists or researchers in scientific and technical libraries, library services and instructional programmes that are needed can be designed and offered to the user community.

A. Advantages of User Centric Libraries

Since libraries are established with the basic purpose of serving the information needs of the users, they have to naturally function keeping the users as the central or focal point and to perform all their activities and services around them. The quality libraries and library services are none other than those that meet the information requirements of their users with highest level of satisfaction. Thus, delivering better and quality services is possible only when they are user centric. The justification for the budgets spent, the resources and infrastructure procured by the libraries is possible only when they meet the user' requirements. The user' interests and the interests of libraries have to go together in planning and designing of all the library policies, practices as well as services.

Dr. Ranganathan (2006) states that user is the 'king and queen of the library'. Similarly, various service oriented organizations, such as banks, consider customer as their God, and hence treat the customer is utmost important. Therefore, services of organizations are primarily aimed at satisfying the customer. The library collaborative (re)design approach focus beyond "library centric" thinking that only advances librarians' points of view on "what is the best for users". Whereas, Learner-centered and highly interactive, collaborative design is both a philosophy and a process in which the needs, wants and limitations of end users play a central role at each stage of the design process. (Somerville and Collins, 2008).

4. Review of Literature

A brief review of the literature on user centric libraries is presented below. Morris (1994), states that the concept of user-centered library services is considered as an antidote to a systems-centered approach. The author emphasizes that there is a need for a theoretical and conceptual underpinning to guide the development of a user-centered service. Morris also states that Dervin and others have provided some insights into the nature of information and information seeking that can serve as a conceptual base for understanding how our thinking has to change in order to develop user-centered services. This study suggests how an altered understanding of information can provide the basis for rethinking and potentially redesigning the library's mission, the provision of traditional services, the design of systems, and the measurement of services. Concepts from psychology are suggested as a tool for increasing the understanding of how to design user-centered services.

According to Schulze (2001), the information professionals largely agree that user-centered design contributes to high quality information systems. However, there is no general agreement about how to define the term "user-centered design," or how best to implement user-centered design strategies in the development of systems and services. Schulze proposes that a general definition of user centered design drawn from the literature of Human-Computer Interaction (HCI) could serve as a basic framework for information system design and support interdisciplinary work and also describes some useful methods of implementing this framework in the development of user-centered information systems.

Williams (2002), states that "our (library) product is the user". We did not start our planning with how service will be delivered. We started with how service will be experienced by the user. That drives everything library's user centric service links library effectiveness to how patrons rate their visit; brings backroom staff on to the floor to maximize the personal touch, promotes the multisensory learning environment'.

Arora (2008) explains that Library 2.0 encompasses a range of new and contemporary technological tools and techniques that are used for evolving collaborative environment required for Library 2.0 and in keeping the users well connected with the libraries as well as designing user centric information systems. These tools and techniques are broadly grouped into five categories, i.e. i) Synchronous Communication: Instant messaging; ii) Content Delivery: RSS Feed, HTML Feed, Streaming Media,

Podcasting, Vodcasting and SMS Enquiry Services; iii) Collaborative Publishing Tools: Blogs and Wikis; iv) Collaborative Service Platforms: Social Networks, Tagging, Social Bookmarking Services; and v) Hybrid Applications, Programs and Programming Tools: Mashups, AJAX, API and Toolbar. These tools and techniques are useful for libraries in providing new services and making existing services available in new and interesting ways. Implementation of some of these tools and techniques are likely to improve reputation and standing of libraries in the community. Some of them may successfully attract new patrons to the library, others may help to retain existing members or make libraries even more important as centres of the culture and history of their cities and academic institutions.

Somerville and Collins (2008) state that 'Information commons' were introduced into libraries in the early 1990s. Now universities are building 'library learning commons' and 'campus learning spaces'. The authors present a participatory library (re)design approach for collaborative planning "for and with" faculty teachers, student learners, and campus stakeholders. Collaborative design (co-design) employs user-centric investigations to produce products, applications, and environments aimed at advancing learning, sustaining communication, and building relationships. Examples from California Polytechnic State University and San Jose´ State University in California, USA, suggest the efficacy of this inclusive, learner-centered (re)design approach for library facilities, services, and systems. Inviting and enabling user input from the beginning, offers a fruitful planning approach in which campus librarians, stakeholders, and beneficiaries "learn their way" to appropriate library (re)design decisions. Also, user involvement in information gathering and interpretation activities initiates the interactive relationships necessary for continuous improvement. Collaborative design (co-design) yields sustained interaction with user beneficiaries and campus stakeholders. It changes how library staff members think and what they think about, concurrent with enhancing libraries' appeal and value.

Dahibhate, Patil, Dhawle and Mugde (2009) states that the primary role of the library and library professionals is to acquire the needed quality information resources that suits to the needs of the users. There is a need to provide user based or user centric services to satisfy the user requirements. The authors discuss about the user-based services and also the skills required for managing such libraries. They conclude that the technology can be used to provide more effective user centric services including induction to users, training with multimedia applications and also provide teaching and learning support to users, self-ordering documents, electronic publication, remote log in, FAQ services, etc.

Pianos (2010), states that virtual libraries try to combine traditional library services with new document types and services. The first generation of virtual libraries mostly tried to offer services based on a library-centric view of information retrieval systems. New virtual libraries try to concentrate on user's needs, but this is often easier said than done. Restrictions like copyright laws, technical limitations and the like often make it difficult to meet user requirements. A number of studies documented these needs: easy-to-use, comprehensive yet focused search, and easy access to print and online documents, subject specific, yet not too restricted to specific areas.

Bowler, et al. (2011) surveyed the landscape of user-centered design in LIS. They explored the history of the "user-centered paradigm," looking first at the historical schism between behavioral science and computer science, and then surveying some of the methods of user-centered design. Present examples of technological artifacts that reflect the basic functions of information systems—artifacts designed to collect, organize, and retrieve information—as a way to present some of the difficulties and opportunities that surround the creations of user-centered design. Specifically, it deals with how user-centered design relates to personal collections, social bookmarking, finding aids, Web interface design, information architecture, visualization systems, and personalization and adaptive search. The article then steps back and looks at design through the wider lens of values, asking the question, how are users represented (or misrepresented) through cultural, ethical, and political forces that influence information system design? Concludes with a summary of the major issues of current state of user-centered design and from this extracts some key lessons vis-à-vis research and teaching in LIS.

Swain and Swain (2012) State that with the proliferation of ICTs, the traditional library services have been considerably renovated, redesigned and refurnished in a way that the users no longer have to rely on consultation of physical documents at a certain place and time. Presently, the library services and services are extensively made user-centric using the technologies such as, Web 2.0, Lib 2.0, etc.

Bhatti and Hanif (2013) in their study on the faculty members of social science observed that the successful library services depend mainly on satisfaction level of its users with the relevant library collection, user-centric library services and library staffs' supportive attitude. Their study was based on survey method using questionnaire. It aimed at studying the types of material used for meeting academic and research needs, purposes of seeking information, respondent's satisfaction with library services, satisfaction with library collection, journals subscription, preferred format of information, problems faced during information search, satisfaction with the attitude of the library and opening hours of library. They made some recommendations to improve library usage frequency and satisfaction by the users.

Mazzocchi (2014) states that Blogs are among the first Web 2.0 tools that libraries have used to communicate with their users. In recent years, however, they seem to have lost their role in favour of other tools such as social networks, especially Facebook. This article analyses the downward trend that library blogs (especially academic library blogs) are experiencing in relation to the explosion of social networks. The relationship between blogs and social networks as library's communication tools is also analysed.

Eke, Omekwu and Odoh (2014) observe that Social networking sites are fast becoming very popular means of both interpersonal and public communication in Nigeria. Social networking sites are modern interactive communication channels through which people connect to one another, share ideas, experiences, pictures, messages and information of interest.

5. Five Laws of Library Science and User Centricity

Dr S R Ranganathan's '*Five Laws of Library Science'* -- the Bible and guiding spirit of libraries, emphasizes on user and the need for user centric design and development of libraries. All the Five Laws of Library Science, either explicitly or implicitly reveal the importance of users and user centric services. Let us re-look into the Five Laws as to how they focus on users and user centric libraries. The First Law 'Books are for use' (**by the readers/users of the library**). That is, all library resources and document collections are acquired keeping in view that they are required by the readers and hence can be put for use, but not for mere preservation or showcasing. Ranganathan states that "existence of books is justified only by the extent to which the library books are used by readers. Library is a collection of books kept for use". The Second Law 'Every Reader his/her book' in other words "Books for all". The approach and emphasis is from the side of the users of libraries. It is stated in other words as, 'Education for all', irrespective of men or women, urban or rural people, children or adults, normal or abnormal people. That is, every user visiting the library or every member of the library should find his or her required book(s) in the library. This requires that the libraries conduct user surveys/user studies regularly to find their information requirements and to acquire the collections or information resources according to the user requirements to fulfill the second law of library science, 'every reader his or her book'. The Third Law 'Every book it's Reader' emphasizes that every document contained in the library is just not for the purpose of preservation but it is aimed at its reader. Therefore, the document selection, and all the methods and techniques of organization of document collections should support the user in finding the documents of their concern with ease and comfort. The Fourth Law 'Save the time of the User' necessitates the libraries have to organize all the collections/resources, services and products in such a way that the users find their information without any time delays and orienting them to find their information as quickly and as conveniently by saving their time, as users time saving is of crucial importance to organization and management of library operations and services. The Fourth Law is completely oriented around the users and in economizing the users' time. The Fifth Law 'Library is a

growing organism' has bigger and comprehensive approach to library organization. Ranganathan states that growing organism shall only survive. The Fifth Law visualizes library as a living creature with growing users, library resources, infrastructures and library staff, etc. As time goes on, unlike other organizations libraries maintain direct interaction and collaboration with the users/customers of the organization. It can clearly be understood from the above that out of all the Five Laws, the first four Laws are directly emphasizing on the users/readers of libraries, whereas the Fifth Law inherently or implicitly speaks on users and various others such as library staff, resources, infrastructure and services so on.

6. Library Collection Building and User Centricity

The mission of libraries is to deliver effective and timely information to the users. This is also stated as 'right information to the right reader at the right time in a right usable form'. Libraries function with the graphic material and of course, in the present times with the digital/e-resources and databases. The acquisition policies and collection/resource building of the libraries are essentially to meet the present and the future needs of the users. Here, the First Law of Library Science 'Books are for Use' stands as guiding principle in collection building in libraries. Any document collection that is procured by libraries has to be in the user interest only and needs to be put to use. Therefore, the library acquisition policies are formulated and the collections are acquired and organized accordingly, keeping in view of the users' information needs. And for identifying the information needs of the users and information seeking behavior, libraries conduct user surveys regularly and obtain the feedback on the library services and products for their improvement.

7. IT Enabled Library Services and User Centricity

All the library services and methods of organizing resources are ultimately for aiding the users of the libraries. With the changing times and changing user needs, libraries have been inventing new services to meet the information requirements of the users. The traditional and predominant services of libraries were the lending service and reference service. These two services were the most sought after services even today. Of course, with the advent of digital resources, they are termed with different nomenclature, such as, Document Delivery Service and Virtual Reference Service. These library services are directly in contact with the users to share their ideas and information. Further, all the Library services are designed either on demand or in anticipation of the users' needs. In the present times, the ICT applications have come up as boon to the libraries in outreaching, interconnecting, and collaborating with the users in planning and design of library services and products.

The libraries with physical collections and spaces have been now under transformation into virtual libraries and one of the most important library services that maintain contact with the users, the Reference Service is being transformed into Virtual Reference Service. The users now can connect with the libraries, share their opinions, put their requests for information and receive the library services and information without physically visiting the libraries. The Internet and WWW have opened up new avenues of information sharing, communication and collaboration. The Web technologies have transformed the users as authors & publishers and offered new means of sharing of information and obtaining the responses and feedback from the users. Web 2.0 and Lib 2.0 technology have been helping the libraries in the collaborative design of library systems. The Lib 2.0 is the new generation library or the modernized library capable of delivering the instant and effective information services and enables the users to interact and share the information or knowledge. (Arora, 2009).

Some of the IT enabled services that are helping the libraries in the present times, in developing contacts with the users and delivering instant information services to the users -- synchronously or asynchronously-- to share and collaborate with the libraries and to make libraries as more dynamic partners in information and knowledge sharing.

They are:

- Document Delivery Services (Digital / e-Resources)
- Sharing of Consortia based resources
- Online Database Search & Retrieval service
- E-Mail
- Blogs & Wikis
- Social Networks
- Teleconferences / Videoconferences/ Webinars
- BBS (Bulletin Board service) / Current Awareness Services
- OPACs
- Library Websites
- Discussion Forums (listserv)
- Virtual Reference Service, etc.

8. Conclusion

The library systems and services from the beginning have been designed around the users, with the basic objective of providing either documents or information needed by the users. The Bible of Library Science, the *Five Laws of Library Science* of Dr S R Ranganathan lays the utmost emphasis on users of libraries. ICTs, especially the web technologies have been playing a key role in libraries in reaching to the users where ever they are, and enabling collaboration between the libraries and their users. Library websites, e-mails and social media such as blogs, Face book, etc are the fastest growing tools in integrating the users and libraries, enabling collaboration between them. In the present times, the libraries have been radically impacted by the ICTs and resulting in the growth and development of digital/e-resources, digital libraries, Institutional repositories, automation & networking of libraries, distributed networks, consortia resources, open Access resources, databases, etc. All these changes/ developments in information resources, their organization, search and retrieval methods necessitates organizing Information Literacy and orientation programmes to users by the libraries so that the expanding e-resources and databases can better be explored and utilized by the users.

Library collection building and acquisition policies are generally formulated keeping in view of the users' information needs and information seeking behavior. For identifying the information needs of the users and their information seeking behavior, libraries have to conduct user surveys regularly and obtain the feedback on the existing library services and products for further enhancing their quality.

The ICTs have opened up new avenues of not only reaching the users and maintaining contact with them wherever they are located, but also helped in integrating the users with the libraries and allowing them to share and collaborate with the libraries to gain benefits from them. The library resources and services if found unutilized to the expected levels can be understood as the services and resources are not planned in a user centric manner, which is detrimental to the very existence of the libraries, and would result in wastage of resources, finances and staff efforts made in organizing the libraries.

It is high time for the LIS professionals to shift their philosophy and approach from the 'Library Centered' to the 'Learner or User Centered' approach to make the libraries relevant with the current time, more visible, accessible and usable by applying Internet and Web Technologies. User centric design of libraries can only remain relevant with the changing times and the changing user needs.

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Paradigm Shift in Library Usage: Evidence Based on Corporate Library Users Survey

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This article belongs to the ***Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract This paper focuses on new ways to access and use information for corporate library users. There is an unbelievable growth in information technology sector, due to this, the information seeking pattern of the corporate library users have been changing quite often. As a result, the role of librarians is more focused on exploring awareness to gather the required information. The paradigm shift in the information seeking behavior of the corporate library users has created new value added market service to the library. Since majority of the software professionals are under work pressure they are not able to be present in the library so the library services should go to his/her place on time. This paper discusses on the user expectations of future corporate libraries, preferred place to access on-line resources, hindrance to access library resources, sharing of information and librarian's focus areas, in the future.
Keywords *Paradigm Shift in Corporate Libraries; Future Corporate Libraries; Information Sharing; Rating of Corporate Library Service*

1. Introduction

Information is powerful, valuable and therefore should be available everywhere. People are very fast in acquiring information and they rely on and live with technology. Technology changes are happening in every field and everyone needs information to be on their hands and thus expecting a new paradigm shift at every instance. In this context, the information seeking behavior of the library users is also changing towards new technologies. They are not willing to wait to get the information of their interest as they are pressurized to complete their task on time. It should be noted that the information seeking behavior or pattern of IT professionals distinctly differ from the other library users. This is because they are exposed to technology to a greater extent. They are well-versed in handling software devices and

tools and so prefer information through online resources, looking for a new paradigm shift in the libraries. This results in their fewer visits to the library. Some studies also show that they prefer to obtain information through social networking service (SNS) and various internet sources as of time and they feel that they could save the time in going to the library and searching for their needed information. In this context, due to the tremendous growth of availability of information and technology in this century, the corporate librarian's need a new paradigm to cater to the needs of the corporate library users and modify the library services by effectively planning for the future fate of corporate libraries.

2. Software Industry at a Glance

Information technology development has changed India's image from a bureaucratic economy to a land of innovative entrepreneurs. In India, the IT sector has generated 2.5 million direct employment making India to be one of the biggest hub of IT capital of this modern world, where all the major companies in the world IT sector are located. The IT companies are distributed in the major cities of India including Bangalore, Chennai, Kolkata, Hyderabad, Trivandrum, Noida, Mumbai and Pune. As Bangalore is the leading IT exporter, it is considered to be the silicon valley of India. The IT market in India is focusing on providing low cost solution in service business of the Global IT. There are only a few Indian companies involved in product development business of global IT, but now in the recent years a slow increase in the number of such companies has been stated. Certain high level software jobs like software development life cycle (SDLC), processes involving analysis, high level design and architectural design are not allocated to Indian IT players by the US giants, even though they have enough competencies to take up and complete these jobs successfully. Another visible change in the IT industry is the slow geographical diffusion of IT jobs that were confirmed to Bangalore which are now slowly moving into other cities like Chennai, Hyderabad and Pune.

3. Cognizant Technology Solutions: A Profile

Cognizant is a leading provider of information technology, consulting, Infrastructure Services and business process outsourcing (BPO) to successful leading IT companies in the world. Cognizant is organized into vertical and horizontal units where the vertical units focus on specific industries and the horizontals focus on specific technologies or process areas. Both the horizontal and vertical units have business consultants, together forming the Cognizant Business Consulting (CBC) team. Being the chief recruiter of MBAs Cognizant is involved in business development and business analysis for IT services projects. It has its headquarters in Teaneck, New Jersey with more than 100 development and delivery centers across the world and 217,700 employees as of March 31, 2015. Being a member of the NASDAQ-100, the Forbes Fast Tech 25, Information Weeks Top Innovators, the company is ranked #308 among the "Fortune 500" (up 44 places from 2013) and appeared on Fortunes "World Most Admired" list for seven consecutive years and is one of the fastest growing companies of the world. CTS is one among the top 10 companies receiving H1-B visa to send more employees to work in US offices and its locations. In 2015, Cognizant has first quarter revenue of $2.91 billion and is expecting second quarter revenue of at least $ 3.01 billion. Presently, Cognizant is headed by Francis D'Souza, its Chief Executive Officer under whose leadership CTS has a strong leadership team comprising of Gordon Coburn as its president and John E. Klein as its Chairman and Karen McLoughlin as its Chief Financial Officer.

4. Need for the Study

There are few studies have been conducted in corporate library users perception on library services. There is no even single study has been made to identify the factors lead to paradigm shift in library usage in corporate world. Corporate libraries are expected to grow day by day to meet the technology challenges and expectations from the users. Corporate library users are all very well talented and know how to get their information of interest when required. Certain external factors are also forcing the

corporate libraries to seriously evaluate and redefine their purpose that they have established within the IT industry. It is the duty of corporate librarian to identify and implement new paradigm services to meet the challenges posed by google, wiki and other Internet search tools that have changed the information seeking behavior of software professionals. In this crucial context, it is needed to carry out a study on corporate library users in the context of paradigm shift so as to focus on their search and accessing patterns of information to serve better.

5. Review of Literature

It has been observed that number of studies have been conducted on the Information Seeking Behaviour of which only a few studies are pertaining to software professionals. Most of the studies have shown that corporate libraries are providing wide range of services to the corporate users due to the unbelievable growth in the IT sector; the corporate library user's information seeking behaviour has been changed quite a lot and is expecting library services to be available at their desk or through mobile devices wherever they are. Leckie et al., (1996) presented that engineers work with a specific objective in mind – a particular product or device to be delivered to the client. This implies that accuracy, reliability of information is paramount. Information needs of engineers also vary by age, primary role and career stage. Oral communication is predominantly used to gather knowledge. Communication via telephone and face-to-face are considered important. It was also seen that experience affects the strategy chosen to seek information. Chun Wei Choo, Brian Detlor and Don Turnbull (2000) studied the usage of the Web to seek external information of IT specialists, managers, and research/marketing/consulting staff through questionnaire and interview method and suggested that a behavioral framework that relates motivations (Aguilar) and moves (Ellis) may be helpful in analyzing patterns of Web-based information seeking. Hertzum and Petersen (2000) proposed that engineers get most of the information from colleagues and internal reports. They spend 40-66% of their time communicating in order to get the necessary information. Yitzhaki and Hammershlag (2004) identified the information seeking behavior of software engineers and computer scientists and concluded that most of the software engineers and scientists preferred verbal discourse with colleagues, professional journals and printed text books as most accessible and often used them as information sources. Ko, A.J.; DeLine, R.; Venolia, G (2007) analyzed the software developers' day-to-day information needs and observed that their most frequently sought information included awareness about artifacts and coworkers whereas searches relating to knowledge about design and program behavior were deferred.

6. Objectives

The objectives of the research paper are:

- To identify the demographic and work profiles of the corporate library users of CTS library
- To identify the role of the library in their carrier growth and their preferred places to access the needed information
- To focus on their expectations for the future corporate libraries and the barriers to use their libraries
- To examine their information sharing modalities

7. Methodology

The study is based on the primary data collected from the library users in CTS Library. Since all the software professionals are busy with their work they are unable to spare time for an interview, so the questionnaires were posted to their respective official email ids with a request to fill the same. A number of 100 questionnaires were posted, of which, 95 filled questionnaires have received in return.

The study has adopted a simple random sampling technique to select the respondents belonging to CTS and is assumed that all the respondents are users of the library and therefore no clustering strategy is adopted. But the respondents are categorized according to their designation to make contrast in seeking pattern of information.

8. Results and Discussions

This section provides results of the survey in tabular form. Further, the results are interpreted and correlated with findings of the other studies. Among the 95 respondents 73 (76.84%) are male and 22 (23.16%) are female. The result shows large number of male respondents has actively participated in the survey.

Table 1: *Gender-wise Distribution*
(Source: Sample Survey, 2015)

Sl. No.	Gender	No. of Respondents	Percentage
1	Male	73	76.84
2	Female	22	23.16

A. Age Wise Distribution of the Respondents

Age is an important biological factor which is considered one of the prerequisite in job market especially in IT industry. Majority of the new entrants in the IT field will be less than 25 years and are fresh candidates. In the study, the same view is proved. Table 2 shows age wise distribution of the respondents

Table 2: *Age-wise Distribution*
(Source: Sample Survey, 2015)

Sl. No.	Age (in years)	No. of Respondents	Percentage
1	Below 25	40	42.11
2	26 - 30	42	44.21
3	31 - 35	5	5.26
4	36 - 40	6	6.31
5	41 - 45	2	2.11
6	46 - 50	0	0.00
7	Above 51	0	0.00

It is found from the table that majority of the respondents belong to the age group of below 30 years that accounts for 86.32 percent. Only few respondents are found in the rest of the age category i.e. above 30 years. An interesting findings is observed from the study is that there are no respondents from the age group of above 45 years. This is because the younger age group is more dynamic, suitable to diversity and adoptability. They would have an idea of improving their talents and skills. Therefore, they will refer more to update information and to standardize their carrier growth.

B. Educational Qualifications

Educational qualification is a main factor to set a job/employment in any field and is especially more important in software industry. In response to the booming of the industry, many fields have emerged, new courses and degrees are being offered by the educational institutions. Table 3 shows educational-wise classification of the respondents.

Table 3: *Educational Qualifications-wise Distribution*
Source: Sample Survey, 2015

Sl. No.	Educational Qualifications	No. of Respondents	Percentage
1	BE	48	50.53
2	B.Tech	17	17.89
3	M.E	9	9.47
4	M.Tech	7	7.37
5	BCA	8	8.42
6	MCA	3	3.16
7	Others	3	3.16

It is observed from the table that Graduates with B.E degrees (50.53%) are more in sample composition followed by B.Tech graduates (17.89%).The higher degree graduates and other technical holders are also low. It is clear from the table that fresh graduates are interested to participate in the survey and are happy to utilize the library resources efficiently.

C. Role of the Respondents in the CTS

Table 4 shows the various roles played by the respondents in the organization. It is evident that 32.63% of the respondents have Associates, 27.38% were program Analysts and 21.05% were Senior Associates revealing that software professionals in these roles have responded more. In addition 5.26% each of Programmer Analyst Trainee and Manager, 3.16% of Associate Director and 2.11% of Associate Vice President have participated in the survey. It is found that more than 81% of the respondents in the intermediate level have participated in this survey.

Table 4: *Roles of the Respondents*
(Source: Sample Survey, 2015)

Sl. No	Designation	No. of Respondents	Percentage
1	Programmer Analyst Trainee	5	5.26
2	Programmer Analyst	26	27.38
3	Associates	31	32.63
4	Senior Associate	20	21.05
5	Manager	5	5.26
6	Senior Manager	1	1.05
7	Associate Director	3	3.16
8	Director	1	1.05
9	Senior Director	1	1.05
10	Associate Vice President	2	2.11
11	Senior Vice President	0	0.00

D. Total Experience of the Respondents in the Industry

Table 5 shows the classification of the respondents according to their years of experience. It is found that professionals with <3 years of experience have responded more whose percentage share is 48.42%, followed by the respondents with 4-6 years of experience that accounts for 24.21% and respondents with 10-12 years of experience comprise 11.58%. An interesting finding is to be noted from the study is that the majority of the respondents are from the fresher's level who are having experience of less than three years as compared with experienced professionals.

Table 5: *Total Experience of the Respondents in the Industry*
(Source: Sample Survey, 2015)

Sl. No.	Years of Experience	No. of Respondents	Percentage
1	<3	46	48.42
2	4 to 6	23	24.21
3	7 to 9	8	8.42
4	10 to 12	11	11.58
5	13 to 15	5	5.26
6	>16	2	2.11

E. Respondent's Portfolio

Table 6 shows the distribution of the respondents based on the portfolio for which they are working. It is clear from the table that 16.84% of the respondents are in the Banking and Financial Services Industry, 13.68%each of the respondents are in the Insurance/Transportation & Logistics Industry and 12.63% of the respondents are in the Energy & Utilities Industry. It is found that majority of the respondents are working in Banking, Insurance and Transportation verticals.

Table 6: *Respondent's Portfolio*
(Source: Sample Survey, 2015)

Sl. No.	Respondent's Portfolio	No. of Respondents	Percentage
1	Banking & Financial Services	16	16.84
2	Communications	4	4.21
3	Consumer Goods	3	3.16
4	Education	0	0.00
5	Energy & Utilities	12	12.63
6	Healthcare	6	6.32
7	Information Services	6	6.32
8	Insurance	13	13.68
9	Life Sciences	1	1.05
10	Manufacturing	9	9.47
11	Media & Entertainment	2	2.11
12	Retail	6	6.32
13	Technology	4	4.21
14	Transportation & Logistics	13	13.68
15	Travel & Hospitality	0	0.00

F. Respondent's Services

Table 7 shows the distribution of the respondents based on the Services or capability through which they are linked to the verticals. It is seen from the task that 48.42% of the respondents are in the Application Services, 23.16% of them are in the Infrastructure Services, 7.37% of the respondents are in the Business Process Services etc. It is clear from the table that more respondents are from the application development side followed by infrastructure and BPO.

Table 7: *Respondent's Services*
(Source: Sample Survey, 2015)

Sl. No.	Services	No. of Respondents	Percentage
1	Analytics	3	3.16
2	Application Services	46	48.42
3	Business Process Services	7	7.37
4	Cloud	3	3.16
5	Digital Works	2	2.11
6	Infrastructure Services	22	23.16
8	Consulting	0	0.00
9	Customer Relationship Management	0	0.00
10	Engineering & Manufacturing Solutions	4	4.21
11	Enterprise Risk & Security Solutions	0	0.00
12	Experience Design	0	0.00
13	Human Capital Management	0	0.00
15	Mobility	5	5.26
16	Portals & Content Management	0	0.00
17	Quality Engineering & Assurance	2	2.11
18	Social	0	0.00
19	Supply Chain Management	1	1.05

G. Respondent's Competency

Table 8 shows the distribution of the respondents based on the competencies they possess. It is evident that 13.68% have Testing Competency, 10.53% have Web Development Competency, 7.37% have Network Administration, Security and Business Intelligence/Data Warehousing Tools Competencies each etc., It is evident from the table that professionals working in Testing projects have participated in this survey mostly followed by those working in Web Development projects.

Table 8: *Respondent's Competency*
(Source: Sample Survey, 2015)

Sl. No.	Competency	No. of Respondents	Percentage
1	DBA / Data Modeling / Data Engineering	4	4.21
2	Testing	13	13.68
3	Business Intelligence / Data warehousing Tools	7	7.37
4	Client Server	6	6.32
5	Usability Engineering	2	2.11
6	Mainframe Technologies	8	8.42
7	Content Management Solutions / Portals	7	7.37
8	Business Analysis	2	2.11
9	ERP Technology	2	2.11
10	Project/Program Management	4	4.21
11	Business Process Management	4	4.21
12	Web Development	10	10.53
13	Microsoft Technologies	6	6.32
14	Mobile applications and device management	5	5.26
15	Big Data	3	3.16
16	Middleware	2	2.11
17	Network Administration, Security	7	7.37
18	Training	0	0.00
19	Travel	0	0.00
20	HR, Recruitment, Administration	2	2.11
21	Accounts and Finance	1	1.05

H. Enhance and Apply the Techniques Acquired from the Library

Figure 1 demonstrates the knowledge and benefits acquired by the respondents through the library. 40% of the respondents have agreed and 17.89% have strongly agreed to the fact that they were able to enhance and apply the techniques acquired from the library. From this result, we can conclude that the library is still serving and helpful in the career growth of these professionals, even though modern technological means of obtaining information are available in their desk itself.

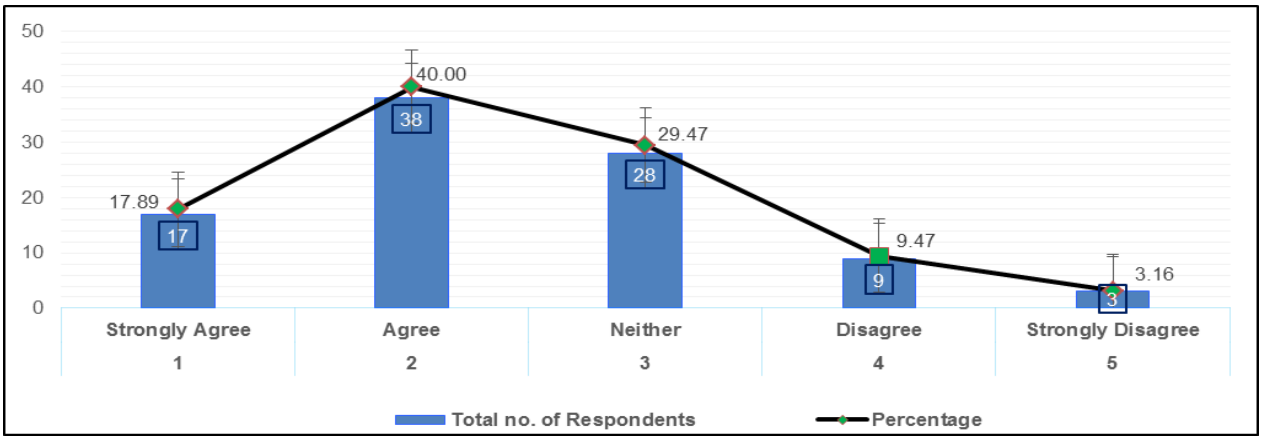

Figure 1: *Apply the Techniques Acquired from the Library*

I. Preferred Place to Access Online Resources

Figure 2 shows the place from which the respondents prefer to access online-resources. 62.11% prefer workstation, 24.21% prefer library, 11.57% prefer home and 2.10 % prefer internet centers to access online-resources. This finding clearly points out that majority of the respondents prefer to use online resources from their desk itself rather than coming to the library. It is also encouraging to find that 24.21% of the respondents are happy to choose library as their preferred place to access on-line resources. This confirms the success of the library in catering to the needs of these professionals.

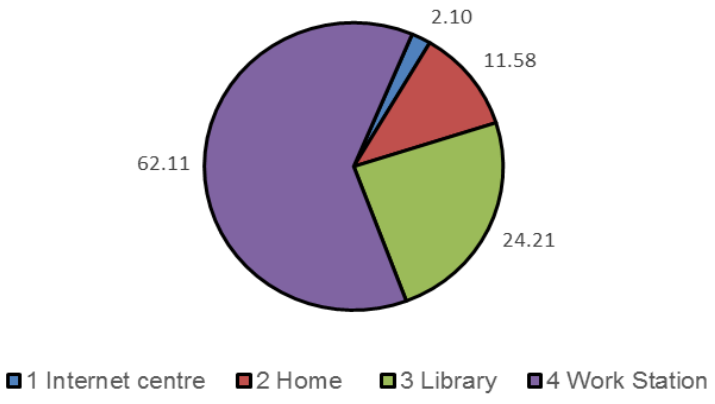

Figure 2: *Preference Place to Access Online Resources*

It is also pertinent to mention that libraries provide their resources on the desktops of the users with the ICT applications. The CTS library may subscribe to databases, which can be accessed on their desktops.

J. Expectation of Future Corporate Library

Figure 3 shows the future expectations of the respondents regarding the corporate library and its services. It is clear from the table that 48.42% of the respondents are expecting library services through handheld devices, 30.53% of the respondents prefer digitized resources for their information needs and 17.89% of the respondents are expecting to have a bigger and better library. An interesting finding from this table is that there is a moderate level of interest among IT professionals towards libraries amidst the tremendous technological developments.

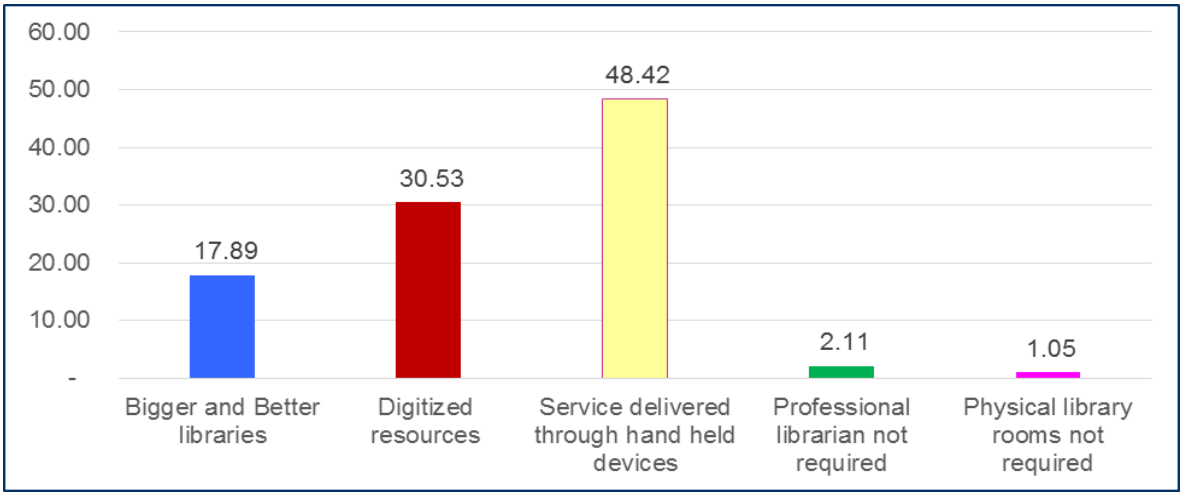

Figure 3: *Future Corporate Library*

K. Factors Affecting in Accessing the Library

Table 9 shows the various hindrances in accessing the library. It is clear from the table that 28.42% of the respondents are underwork pressure, 18.95% respondents are facing uncertainty of job, 15.79% of the respondents are having tight work schedules & are compelled to work long hours, 12.63% of the respondents are experiencing lack of role clarity & sense of dissatisfaction, 11.58% of the respondents are having lack of time to access the library, 8.41% of the respondents are working on shifts, 2.11 % each of the respondents are facing harassment from the reporting managers and are being distracted with social media and other activities. From the table a wide range of barriers faced by the software professionals in accessing the library are identified.

Table 9: *Factors Affecting the Access to Library*
(Source: Sample Survey, 2015)

Sl. No.	Barriers	No. of Respondents	Percentage
1	Work pressure	27	28.42
2	Lack of time	11	11.58
3	Uncertainty of job	18	18.95
4	Working on shifts	8	8.41
5	Lack of role clarity & Sense of dissatisfaction	12	12.63
6	Tight work schedules, Compelled to work long hours	15	15.79
7	Frequent work-related travel	0	0.00
8	Reporting managers harassment	2	2.11
9	Health problems	0	0.00
10	Emotional disorders	0	0.00
11	Distracted with social media, other activities	2	2.11

L. Sharing of Information

Table 10 exposes that many of the respondents of the study preferred to share either personal or career related information through either facebook or whatsApp. This is because the use of mobile devices has increased and people are becoming more dependent on them. It is clear that 1st and 2nd rankings were predominantly given to Facebook, WhatsApp, Twitter, YouTube and LinkedIn showing their popularity in sharing information. Google+ and Skype are shown to be used to a certain extent, whereas, Hike, and MySpace seemed to be of less popularity. Many organizations are themselves playing a major role in sharing information(s) to its employees by fixing mandatory learning hours as part of their goals. Social networking media is also playing a leading role in sharing information and libraries are also employing these tools to serve the user community.

The software professionals are asked to complete mandatory training courses through online resources like e-resources (books 24x7) which allows company employees to access learning assets around the globe in several modalities including video, audio and interactive formats at work place, home or on the road. Many IT companies have realized the importance of such media and have tied up with service providers like Skillport. Also the organizations have setup a credit system for using these resources that are directly linked to individual and group performance systems where defaulters will be rated accordingly.

Table 10: *Sharing of Information through SNS*
(Source: Sample Survey, 2015)

Sl. No.	Sharing of Information through SNS	Rank									
		1	2	3	4	5	6	7	8	9	No. of Respondents
1	Facebook	81	11	3	0	0	0	0	0	0	95
2	WhatsApp	79	10	2	1	1	1	1	0	0	95
3	Twitter	65	23	6	0	1	0	0	0	0	95
4	YouTube	53	7	9	11	3	12	0	0	0	95
5	LinkedIn	41	23	17	0	0	5	3	4	2	95
6	Google+	39	7	9	7	1	3	6	14	9	95
7	Skype	23	11	6	8	1	2	0	0	44	95
8	Hike	0	0	0	1	1	2	3	5	83	95
9	MySpace	0	0	0	0	1	0	2	3	89	95

M. Rating of Corporate Library Services

Table 11 shows the performance rating given to the various services provided by the library. The findings of this study express the satisfaction of the respondents towards the services rendered by the library. It is clear from the table that 44.02% of the responses were very good and 41.98% of responses were good making an average of 86%, which shows the success of the library in providing the required services to the users. It is also evident from the table that 13% of the responses were average and only 0.99% of the responses were poor. This shows that majority of the respondents have given positive responses towards availing the library services. It is also evident that the innovative services through electronic devices (Mobile phone, Tabs etc.,) are more preferable to the respondents as they can be benefitted through the services provided by library wherever they are.

Table 11: *Rating of Corporate Library Services*
(Source: Sample Survey, 2015)

Sl. No.	Rate the Below Services offered by Your Library	Poor	Average	Good	Very Good	No. of Respondents
1	Circulation	0	11	40	44	95
2	eBooks (Books 24x7)	0	12	47	36	95
3	eBooks on Mobile Device	0	14	33	48	95
4	eJournals	0	16	39	40	95
5	Reference Service	0	18	45	32	95
6	Digital Learning Centre	0	6	28	61	95
7	Transfer Library Resources	1	11	41	42	95
8	Library Connect Programmes	0	12	40	43	95
9	Content Page Service	0	3	51	41	95
10	Reprographic Services	0	14	41	40	95
11	Reservation	0	10	44	41	95
12	Inter-Library Loan	6	15	47	27	95
13	Document Scanning	5	4	18	68	95
14	Newspaper Clipping Services	1	18	40	36	95
15	Audio-Video Viewing	1	7	44	43	95
16	New Arrivals Display	1	31	36	27	95
17	Computer based Learning Courses	1	8	44	42	95
	Total No of Participants	16	210	678	711	1615
	Percentage	0.99	13.00	41.98	44.02	100

9. Summary and Conclusion

Information and communication technologies dominate the world. Everyone ultimately has to depend on the ICTs tools for their ordinary life. The positive growth of the sector leads to huge investment in the sector and paves way for opening up of millions job opportunities. Many MNCs have started their software companies in India and CTS is one of the popular companies. It offers employment opportunities for young and dynamic graduates with computer knowledge. The software professionals are generally viewed to be under work stress. They are not able to cope with stress due to many reasons. Psychologists suggest visiting the library and reading books would relieve them from stress. In this context the software companies are establishing separate libraries. Further, library offer more information to the corporate professionals to equip or enhance or update their knowledge. In the study, irrespective of designation, software professionals used to visit libraries for updating their knowledge and information. A majority of the respondents prefer to use online resources from their desk itself rather than coming to the library. A significant finding is observed from the survey that software professionals used to read/ access information through on-line. It is also found that respondents are expecting library services through handheld devices. Work pressure and uncertainty of their jobs are the major barriers for them to use the library. Many of the respondents of the study preferred to share either personal or career related information through either Facebook or WhatsApp. Thus, the librarian's role is much needed to upgrade and implement library services that can be delivered to their desk or through hand held devices.

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