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6-1-2011

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Library Philosophy and Practice 2011

ISSN 1522-0222

Database Searching in Central University Libraries in India

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Introduction

In consequence of the recommendation of the National Knowledge Commission (NKC, 2005-2008), each of the Indian states has at least one fully-funded central university. Now there are 39 central universities. Privately funded and owned state-legislated universities are also being established to cater to the increased demand for higher education. In between there are many universities that are not legislation-based but are authorized by the University Grant Commission (UGC, New Delhi) to award degrees. Central universities are better-equipped in terms of financial resources, faculty, and infrastructure, and thus have an edge over the usually fund-starved state universities.

The libraries across the globe are challenged to integrate e-resources into their collection, services, and patrons' lives and academic libraries face obstacles when virtual learning environment (VLEs) become "the primary means of interaction between students and universities (Tenopir, 2008). Providing access to electronic journals and other e-resources is an important area of librarianship (Prabhu, 2002). The design of usable online interfaces is a crucial issue (Xie and Cool, 2000). Traditional library services and printed material are still more effective to researchers in Indian universities than web-based information and resources. Barriers to progress in this area in university libraries in India cannot be overlooked (Chandrakar, 2003).

Scope

When this study (Roy 2009) started in 2006, there were only 16 central

universities. The present study has been conducted on a sample of eight central universities which are well established:

- Assam University (AU) (1994), Silchar.
- Banaras Hindu University (BHU) (1916), Varanasi
- Delhi University (DU) (1922), Delhi.
- Indura Gandhi National Open University (IGNOU) (1985), Delhi.
- Jamia Milia Islamia (JMI) (1969), Delhi.
- Jawaharlal Nehru University (JNU) (1969), Delhi.
- Pondicherry University (PU) (1985), Poducherry.
- Viswa Bharati University (VBU) (1951), Shantinikatan.

These eight universities have been chosen on the basis of their bandwidth use ranking and grouping. Two universities in each group that represent the highest and lowest bandwidth have been chosen.

Table 1. Bandwidth use

Name of the University	Abbreviation	Accessibility Frequency	%
Assam University	AU	137.6 kb/s (6.7%)	0.2
Mizoram University	MU	140.8 kb/s (6.9%)	0.8
Maulana Azad National Urdu University	MANUV	157.8 kb/s (7.0%)	1.2
Indira Gandhi National Open University	IGNOU	16.4 kb/s (0.8%)	4.6
Vishwa Bharati University	VBU	161.1 kb/s (7.7%)	6.7
Hyderabad University	HU	163.1 kb/s (7.2%)	6.9
Aligarh Muslim University	AMU	213.6 kb/s (10.4%)	7
Banaras Hindu University	BHU	24.9 kb/s (1.2%)	7.2
Jawaharlal Nehru University	JNU	3240.0 b/s (0.2%)	7.7
Mahatma Gandhi Antarrashtriya Hindi Vishwavidyalay	MGAHV	427.4 kb/s (19.0%	10.4
Babasaheb Bhimrao Ambedkar University	BBAU	639.0 kb/s (31.2%)	19
Jamia Mallia Islamia University	JAMIA	647.9 kb/s (30.9%)	30.9
Delhi University	DU	649.1 kb/s (31.0%)	31
North Eastern Hill University	NEHU	70.8 kb/s (4.6%)	31.2
Tezpur University	TU	782.5 kb/s (38.2%)	38.2

Pondicherry University	PU	808.1 kb/s (38.5%)	38.5

Four of these universities (DU, IGNOU, JAMIA, and JNU) are in NCR Delhi. One each represents South (PU), North-East (AU), East (Viswa Bharati), and North Central (BHU) regions. This gives fair representation to all regions of India.

Network Infrastructure and Strength

Fast and effective information retrieval to support information sharing requires sound and wide network with adequate bandwidth. The UGC-sponsored Infonet is the mainstay of the academic info-network infrastructure. The UGC has constituted a national committee called the Central Monitoring Committee (CMC) for smooth implementation and execution of information infrastructure. The CMC has chosen ERNET India (Education and Research Network) to establish information network in universities. The committee has recommended high bandwidth campus wide networks for Internet and external connectivity. So far 149 universities have been provided connectivity with raw bandwidth ranging from 512 KBPS to 20 MBPS. The Inflibnet is administering and funds its cost for all these universities.

Online Databases

Out of the eight universities surveyed, seven are members of the UGC-Infonet consortia. The IGNOU, due to its unique character, subscribes to 17 databases of its own. A tabulated picture is given below:

Table 2. Numbers of Databases in Different University Libraries

Name of the Universities	UGC-Infonet databases	Self Subscribe Databases	Public Domain Databases
AU	16	0	0
BHU	23	24	-
DU	23	25	41
IGNOU	-	17	52
JMI	21	15	-
JNU	21	15	-
PU	22	-	-
VBU	18	-	-

There are 77 databases in all in these eight universities. But strangely enough only one online database, namely Project Muse, is common to all the universities, and 69 databases are subscribed by single universities.

The following Databases are available in seven of the eight university libraries: ACS, AIP, APS, Annual Review, BWP, CUP, IOP, ISID, JCCC, JSTOR, OUP, RSC, SIAM, Springerlink and Taylor & Francis. A tabulated picture is given below:

Table 3: Percentage of availability of online database

No. of Database	No. of Universities	% of Occurrence
1	8	100%
16	7	87%
1	6	75%
3	5	62.5%
4	4	50%
5	3	32.5%
16	2	25%
69	1	12.5%

These are further categorized as:

- Full Text e-Journals - 72
- Bibliographic Databases 15
- E-Books 29
- Total Databases 116

Of these there are 15 bibliographic/indexing databases, while 29 are e-book databases. There is no single common e-book database available in all eight libraries.

Among the bibliographic databases, DELNET and ISID are most popular, which are available in seven libraries, while MathSciNet is subscribed by six university libraries. Exemptions are Assam and Viswabharati Universities. It is natural and normal as each central university located in different region has its own requirements based upon its courses of study and areas of research. The subject needs of the JNU differ from that of Delhi University, while Jamia has its own needs. Need and Specialization of IGNOU are of quite different nature. Still some of the databases are very common to all universities especially the Project Muse, JSTOR, American Chemical Society, American Institute of Physics, American Physical Society, Annual Review, Blackwell Publishing, Cambridge University Press, Institute of Physics, Oxford University of Press, Royal Society of Chemistry, SIAM, Springerlink and Taylor & Francis.

Retrieval Techniques

Net Server and CD-ROM mirror servers are very popular among the universities. The university libraries under study no longer provide CD-ROM services. Multimedia databases are available only in DU and JNU, while all the eight libraries own and provide access to full text and bibliographic databases. For academic libraries the two most important consortia are the UGC-Infonet and Indest. All the libraries have self-subscribed as well as consortia based databases, whereas the DU and JNU have also developed in-house databases. Being traditional and general universities under the preview of the UGC, all are members of the UGC-Infonet, while DU is also member of AICTE Indest consortia.

All the universities use commercial as well as open source databases while DU and JNU have also their home grown databases. Open source databases are also available there, but the study found that only DU, BHU, IGNOU and JNU host important open source online databases on their websites. Other universities are not able to create this kind of facility for their users merely because the staff of these libraries are not conversant with open access sources on the Internet.

Databases can be accessed through login and password, but the misuse of these is a common complaint. Therefore, IP access is more suitable. Now most of the universities allow online access to databases either through their intranet or directly from the Web.

Experienced librarians prefer a campus-wide facility for providing access to databases. AU, IGNOU, Jamia, JNU and Viswabharati allow access from limited and specified terminals within campuses. Assam, IGNOU, Jamia, JNU and Viswabharati allow access through campus wide Intranet or Internet with identification and password. Many busy scholars and faculty have less time to visit the library. Therefore, access to online information must be provided on their desktops. This requires campus wide Internet accessibility.

Further it was found that AU, BHU, DU, Jamia, JNU, PU and Viswabharati allow IP enabled access while IGNOU databases are password based.

Download Facility

Downloading of the required files is a critical issue. In case of commercial databases it is costly as the host library has to pay per download. But indeed it is an essential facility. It has been found that all the libraries provide downloading of PDF and HTML files, while image downloading facilities are available in all except at BHU and DU. RTF downloading is not permitted by BHU, DU and Jamia Millia Islamia, Whereas word file are not downloadable at BHU, DU and Jamia. DU and JNU provide DBMS software to download the data oriented information.

Data Retrieval Techniques

Some of the universities provide common databases linked through federated search. Only DU has the federated search engine GIST find. In this survey, only DU and PU revealed their online search techniques while the other libraries kept these confidential. DU uses Boolean, Interactive, and Proximity searches, while PU uses quick search. Simple search Advanced/Boolean search in addition to menu-driven searches are provided by their vendors. Both these libraries provide facilities for further refinement of large chunks of search output to make the search more precise and relevant. Nevertheless, none of the universities use data mining.

Complexity of Information Retrieval

Indeed information retrieval techniques vary from university to university system. It depends upon both internal and external factor of database. In the questionnaire about 48 aspects or facilities for information retrieval were identified and the users of these eight libraries were asked to mark their ease of use on the Likert scale as :

- Easy 3
- Challenging 2
- Difficult 1

The mean value of university wise pattern is given below:

Table 4: Complexity level of IR in different university libraries

Universities	AU	BHU	DU	IGNOU	JMI	JNU	PU	VBU
Mean Std. Deviation	2.58 (0.54)	1.95 (0.92)	2.54 (2.54)	2.52 (0.64)	2.22 (0.85)	2.61 (0.57)	2.37 (0.6)	2.34 (0.89)

Table 5: Retrieval Techniques in Databases

Retrieval Features	AU	BHU	DU	IGNOU	JMIA	JNU	PU	VU
Article locater	3	3	3	3	3	2	2	1
Article types	3	3	3	3	3	2	2	3
Automatic translation software	2	2	1	3	1	2	1	2
Boolean logic	2	3	3	3	3	3	2	3
Citation Search	2	3	1	3	1	3	2	2
Classification code	3	2	2	3	2	2	2	3
Cross Reference Search	3	3	2	3	2	2	1	1
Custom links	3	1	2	1	2	3	2	3
Density of terms	3	1	3	3	3	3	2	1
E-mailing an article from the result list	3	3	2	3	2	3	3	3
E-mailing citations from the result list	3	3	1	3	1	3	3	3
Explode/expand search	3	1	3	3	3	3	2	3
Field specific searches	3	3	3	3	3	3	3	3
Frequency of terms	1	1	3	3	3	3	3	1
Fuzzy searching	3	1	3	2	3	3	3	1
Google custom search	3	3	3	3	3	3	3	3
Have rules of precedence with nested queries	2	2	3	2	2	2	2	2
Help menu/online tutorial/guide	3	3	3	3	3	3	3	3

Hyphen	3	1	3	2	3	2	3	1
Journal browsing	3	3	2	2	2	3	3	3
Lateral searching	2	1	1	3	1	3	3	2
Limit field searches.	3	3	3	3	3	3	3	3
Mapping	3	1	2	3	1	2	3	3
Match of exact words/phrases	2	3	3	3	3	3	2	3
Nested queries	3	1	1	1	1	1	2	1
Persistent links	3	1	1	1	3	1	2	3
Phases Searching	2	2	3	3	3	3	2	3
Proximity search	2	1	3	2	2	2	2	1
Punctuation marks	3	3	2	2	3	2	2	1
Query by example	3	1	2	2	3	2	1	3
Range searching	2	2	3	2	2	2	2	3
Reference link	3	1	3	2	3	3	3	3
Save search	3	2	3	3	3	3	3	3
Search history	3	2	3	3	3	3	3	3
Searching for Common Phrases	3	1	3	3	1	3	3	3
SMART Links	3	1	3	3	2	3	2	1
Sort order	2	1	3	2	2	3	2	3
Special characters	2	3	2	1	3	2	2	1
Spell check	2	3	3	3	2	3	2	3
Stemming	2	2	3	2	1	2	3	2
Stop Word	2	1	2	3	1	2	2	3
Subject authority	2	1	3	3	1	3	2	1

Subject search	3	3	3	3	3	3	3	3
Suggest subject headings	2	1	3	2	1	3	2	3
Table of content	3	3	3	2	3	3	3	3
Times cited	2	1	3	2	1	3	2	3
Truncation	3	3	3	3	3	3	3	3
Use of thesaurus or permuted index for searching	2	1	3	2	1	3	2	2

It is clear that some aspects and component of information retrieval systems are complex and difficult. The library staff have not only to learn them thoroughly make their users familiar with them. To overcome the problem we require:

1. Online training and library orientation of users
2. Asking the vendors to supply them in easy format

User Orientation

For optimum use of all resources and services of a library, user orientation programmes, especially of new users, are a proven effective measure. User orientation is the most important component in the online databases for the users to gain knowledge and enhance usability of databases. All the university libraries in this study have positively voted for provision of such programmes to help users in the effective use of the retrieval system for information access. This survey found that orientation programme are conducted by all except AU, BHU, IGNOU, and Viswa Bharati. It is important to note that regular orientation programmes are required to make the users familiar with new feature of new databases. DU conducted programmes as “How to search the online databases,” while the Pondicherry library provides instructions in the use of library resources including e-resources and effective online searching. BHU conducts programmes on Science Direct and Proquest. DU provides need-based instruction and PU provides general instruction in effective search and the publishers also conducted such programmes to faciliatets searching of their supplied databases. DU conducts such programmes throughout the years, while PU organizes orientation of the users at the beginning of the academic years. PU also offers need based person to person training. It is clear that there is no uniform pattern of conducting user’s orientation programmes.

Indeed we need a dedicated library staff for online training of library users, especially in the electronic environment. There are posts of information scientist in universities funded initially by the by UGC. Those hired are mostly from computer science and not conversant with library philosophy and routine. There is an urgent need of a designated post for an online librarian who can provide assistance in using e-resources and may also take care of any aspect of user orientation for sharing and dissemination of library e-resources.

The survey showed that none of the library staff has any formal education and training in online searching. Most have learned it on the job, and most have learned by trial and error.

Conclusion

Training for librarians is a major issue. There is no agency to guide and train library staff in using databases. The staff has little time to train themselves,

nor do database providers. Database providers generally supply a slide show rather than hands-on training. Moreover, INFLIBNET should provide periodic training for library staff. Accessing full-text is also a problem at times. Some agency servers also create problem. In India we have seen that if the IFLIBNET server is not working properly, it creates problem in downloading full text. University servers may also create such problems. Universities need proper standalone servers with proper power backup.

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