Access to E-journals through UGC INFONET Digital Library Consortium: A Study of Usage Trends among the Universities of North East India

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Abstract

The paper highlights the usage trends of access to e-journals in ten universities of North East India. The preliminary findings from the data of last five years revealed that there is an upward trend. The paper briefly describes open access journals and the measurement tools of e-journals.

Keywords: E-resources, Library Consortia, UGC INFONET Digital Library Consortium, Usage statistics, COUNTER. INFLIBNET

1. Introduction

In mankind's quest for acquiring, utilising and propagating knowledge, the academic journal has been the lifeblood of scholarly communication. In the emerging IT driven knowledge society of the twenty-first century, access to e-journals has emerged as a critical component for all-round growth in all areas of academic and scientific endeavour. From the seventeenth century *Journal des Scavans* and the *Philosophical Transactions of the Royal Society,* the academic journal has grown and evolved to the present-day electronic journal.

Electronic journals are now a firmly established part of the academic landscape. However, institutions that subscribe to electronic journals face the problem of affording them because subscription prices are spiralling upwards, making subscriptions to even a few titles unviable. Under the circumstances, academic libraries face the dilemma of prioritising titles to be subscribed, thereby resulting in a decline in the availability of electronic journals to most academic libraries. The state of affairs in Indian university libraries are no exception to this global phenomenon. Even where budgetary allocations appear to be increasing, they are insufficient for libraries to maintain the number of titles or to subscribe to new ones.

Today, most academic libraries are exploring alternative means of access, such as consortia-based subscriptions. To this end, the University Grants Commission has taken the initiative to address the issue of serials crisis in university libraries and launched a programme which is popularly known as UGC-INFONET Digital Library Consortium. INFLIBNET Centre is responsible for implementing this nation wide programme, which has benefited millions of users (teachers, research scholars and students) across the country. The consortium provides access to more than 5000 e-journals in various disciplines.

2. UGC INFONET Digital Library Consortium

The UGC INFONET Digital Library Consortium was launched in 2004, as a nation wide programme to facilitate access to e-resources to university libraries in India. The thoughts of building UGC INFONET

Digital Library Consortium is based on the fact that no single library can collect all the information published in the world, and no single library can serve all the needs required by the users. The consortium-based subscription offers access to high quality peer reviewed journals, published by society, commercial and institute publishers to its members. More than 5000 e-journals in Science, Social Science and Humanities are accessible to its member without charging any subscription fee from the members. It is centrally funded consortium where members do not contribute for the subscription fee for access to e-resources. University Grants Commission provides funds to operate this ambitious programme, which has successfully completed four and half years. The INFLIBNET Centre is implementing the entire programme. The consortium has 150 universities as member, which is categorized in three different phases.

3. Universities and colleges in North East

There are 550 colleges and 16 universities or other institute of national importance. Among these states Assam has 348 colleges and 7 universities or other national institute of importance. There are nine Central Universities in the North East, namely, Assam University, Tezpur University, Mizoram University, North Eastern Hill University (NEHU), Manipur University, Nagaland University, Rajiv Gandhi University (Arunachal Pradesh), Tripura University and Sikkim University. Thus each state in the North East Region now has at least one Central University to achieve the goals of higher education in these states. Among these the UGC-Infonet programme covers 10 universities and the Central University of Sikkim is to be covered very soon.

4. E-journals

Recently, especially since about 1995, the development of full-fledged information services on the Internet has made it possible to transmit information in ways that bypass periodicals. Even the journals themselves have repeatedly experimented with new way s of utilizing these services. At first, there has been a shift to electronic formats for work and information that were formerly paper based, namely, the digitization of journal in formation and the conversion of review work to electronic media. Subsequently, various electronic journal services that utilize the unique characteristics of the Internet and that would have been impossible with paper-based journals have been examined, enabling the realization of functions such as citation links. Now, electronic journals are even able to offer everything from search functions to provision of final primary data as integrated services, including links to databases. The result is that many more people now have opportunities to see scientific and technical information, which formerly circulated only among a few experts. Meanwhile, a vigorous debate from the perspective of journal publication as a business, including electronic journals, is now underway regarding the proper form for journal publication. In particular, the appearance of open – access activities has begun to have a major impact on the publishing model, which formerly focused on subscriptions by libraries.

There is an exponential growth in the number of electronic journals. As of June 2007, there are 59,549 active online serials; within these there are 25,520 refereed journals. The advantages of e-journals are that it can be accessed simultaneously and instantly besides it links to the citation. The full text articles can be retrieved within minutes, or even seconds, rather than hours.

4.1 Open Access

Open Access (OA) means that electronic scholarly articles are available freely at the point of use. The subject has been discussed for over 10 years, but has gained momentum in last few years with various declarations in favour of OA from groups of researchers or their representatives and Government initiatives. In July 2004, the director of the NIH announced that researchers using NIH funds would be required to deposit their results in PubMed Central, a popular open access archive maintained by the National Library of Medicine. If a researcher uses NIH funds to pay any publication charges (such as page or color charges, or fees for digital distribution), PubMed Central deposit would have to be immediate; all papers must be deposited within six months after publication.

In 1992 just five journals offered open access to the material they published. Today, that number has tremendous grown up. DOAJ has list of about 3691 journals. Some 25,000 scientific and scholarly journals are published worldwide, and journals that offer public, open access still represent only a small part of that publishing universe. However, the idea that there should be open public access to the results of scientific and scholarly work, which began with scientists and research librarians and built slowly, now seems to have entered a period of explosive growth, with very broad support from library and professional groups, university faculties, and even journal publishers.

Open access is still a debatable issue. New models of author pay for publishing article is interesting development. Under such model, journals charge authors a publication fee and make their papers available to the public, without charge. Examples of early adopters of the author-pay model are BioMed Central in life sciences and the New Journal of Physics, a joint production of the UK's Institute of Physics Publishing and German Physical Society. The most representative current examples actively applying this model are the scientific journals of the Public Library of Science (PLoS). For example, PLoS Biology requires a publication fee of US$2,500 from authors to pay for operations, whereas access to the electronic journal is completely free. However, the initial publication fee, when the journal started in 2003, was US$1,500, and this rise in only its third year of operation raises the question of whether the author-pays model is viable.

4.2 Types of Open Access

It is important to distinguish several dimensions of the issue: OA can be delivered in two ways:

- 'green': the author can self-archive at the time of submission of the publication (the 'green' route) whether the publication is grey literature (usually internal non-peer-reviewed), a

peer-reviewed journal publication, a peer-reviewed conference proceedings paper or a monograph

- ‘gold’: the author or author institution can pay a fee to the publisher at publication time, the publisher thereafter making the material available ‘free’ at the point of access (the ‘gold’ route). The two are not, of course, incompatible and can co-exist.

The ‘green’ route makes publications available freely in parallel with any publication system but is not, itself, publishing. The ‘gold’ route is one example of electronic publishing. At present it is much more common to have non-OA electronic access to publications in a publisher’s database for a subscription fee.

The second dimension to be distinguished is the timing and quality aspect: preprints are pre-peer-review articles, postprints are post-peer-review and post-publication articles while e-prints can be either but in electronic form.

A third dimension is white/grey literature. White literature is peer-reviewed, published articles while grey is preprints or internal ‘know-how’ material. Of course there are usually many interesting relationships between grey and white articles.

5. E-resources to the North East Universities

Considering the diversity of resources required and ICT infrastructure available in ten universities in North East, these universities have been covered under three different phases. The first phase universities were given access to entire resources whereas second phase universities were given access to less resource. The list of e-resources accessible to various universities is given in Annexure I. All expenses on subscription to e-resources for these universities are borne by the UGC. Universities covered under different phases are given below:

Phase I: Gauhati University, Manipur University, North Eastern Hill University, and Tezpur University are covered under Phase I.

Phase II: Assam University, Dibrugarh University, Nagaland University, Rajiv Gandhi University, and Tripura University are covered under phase II of the consortium.

Phase III: Mizoram University is covered under phase III. The university has access to limited e-resources. Since Sikkim University is recently established, it will be covered under phase III and access will be activated once the university establishes network infrastructure.

Under the UGC-Infonet programme internet connectivity of all these universities has been upgraded to 2Mbps and the Central University of Sikkim has also been provided internet connectivity of 2Mbps. Expenses on one-time expenditure for up-gradation of Internet bandwidth to 2 Mbps are being met

from the special grant given to the INFLIBNET Centre for modernization of the libraries in North Eastern region.

6. Subscription Cost

The INFLIBNET Centre spends huge amount for the subscription of e-resources. In 2008, Rs. 32,213,354 was spent for the subscription of number of E-journals to ten universities located in the North Eastern region.

7. Measurement of Usage Statistics

Licensed electronic journals involved huge subscription cost. INFLIBNET has been spending crores of Rupees for subscription of e-resources. Licensee, and publishers, need to understand how much these e-resources are used and when. Within an aggregated journal collection, which titles are used the heaviest and which the least? There are questions about how the content itself is used. How much is printed out, e-mailed, or downloaded? Since the consortia subscription of UGC-Infonet digital Library Consortium includes large number of journals published by single publishers and gives the user unlimited access to all articles, the primary unit of statistics will be collated by journal title. In this model, titles that are highly used will have a lower cost per-use and be perceived as a better value.

For a full-text journal database, the ICOLC guidelines define the use of articles as viewing, downloading, printing, or e-mailing the full text. Summaries of data usage by journal title can help librarians decide what titles to add, change, or delete and can assist publishers in determining the health of the journal. With a full-text journal database, the conversation centers on three measures: hits (equated to searches), sessions (equated to users), and documents used (equated to downloads). However, measuring hits or sessions can yield misleading information. The number of hits will vary, depending on network access and telecommunication factors. Likewise, the number of sessions will vary because of time-outs and other network protocols. These measurements can be summarized by time periods of hour, day, week, month, and year. The systems staff analyzes data from server logs to determine the ability of the server to meet the load during periods of peak demand.

In the past few years, librarians, vendors, and publishers have recognized that the development of acceptable, global standards for measuring online usage required an international response. This led to the formation of Project COUNTER.

7.1 Project COUNTER

Project COUNTER (Counting Online Usage of NeTworked Electronic Resources) provides the tool needed to measure e-usage accurately. The first COUNTER Code of Practice, covering online journals and databases, was published in 2003. COUNTER's coverage was extended further with the launch of the Code of Practice for online books and reference works in 2006.

The objective of Project COUNTER is to address the measurement problem by developing an international Code of Practice governing the recording and exchange of online usage data.

To comply with COUNTER Code, vendors will have to provide to customers (at no extra charge) the set of basic usage reports for e-journals and databases. The journal report gives the details of the number of full-text articles requested, number of turnaways for each month, identified by journal. The database report breaks down total searches, sessions, full-text requests, and turnaways by month and database. The Code of Practice specifies that usage reports must be delivered at least monthly. There will be no format problems: reports must be delivered as a CSV file, a Microsoft Excel file, or in a format that can be easily imported into Microsoft Excel.

At present, publishers, online vendors content is COUNTER release 2 complaint. However, recently new and final version of Release 3 of the COUNTER Code of Practice for Journals and Databases has been published on the COUNTER website at http://www.projectcounter.org/code_practice.html The deadline date for implementation of this Release is 31 **August 2009**, giving vendors a full year to meet its specifications. After this date only those vendors compliant with Release 3 will be considered COUNTER to be compliant

7.2 Other initiatives on usage statistics

COUNTER has been built on, and liaises with, a number of important, ongoing industry initiatives that have done much valuable work to define customer requirements for usage statistics from vendors. Most notable in this context are:

7.2.1 ARL New Measures Initiative (http://www.arl.org/stats/newmeas/newmeas.html)

The ARL Association of Research Libraries) New Measures Initiative has been set up in response to the following two needs: increasing demand for libraries to demonstrate outcomes/impacts in areas important to the institution, and increasing pressure to maximize use of resources.

Of particular interest is the work associated with the E-metrics portion of this initiative, which is an effort to explore the feasibility of defining and collecting data on the use and value of electronic resources.

7.2.2 ICOLC Guidelines for Statistical Measures of usage of Web-based Information Resources (http://www.library.yale.edu/consortia/2001webstats.htm)

The International Coalition of Library Consortia (ICOLC) has been in existence since 1996. The Coalition is an international, informal group currently comprising over 160 library consortia in North America, Australia, Asia and Africa. ICOLC has developed a set of Guidelines for Statistical Measures of Usage of Web-based Information Resources. Revised in 2001, the Guidelines specify a set of minimum requirements for usage data, and also provide guidance on privacy, confidentiality, access, delivery and report formats.

7.2.3 NISO/SUSHI (http://www/niso.org/schemas/sushi/index.html#COUNTER)

NISO is the National Information Standards Organization of the United States. COUNTER has worked with NISO on SUSHI (Standardized Usage Harvesting Initiative) to develop a protocol to facilitate the automated harvesting and consolidation of usage statistics from different vendors. This protocol is now available and may be found on the NISO/SUSHI website above.

8. Usage of E-resources in North Eastern Universities

The Centre has analysed the data of last five years (2004-2008) and found that there is a steady increase in the number of downloads of these universities.

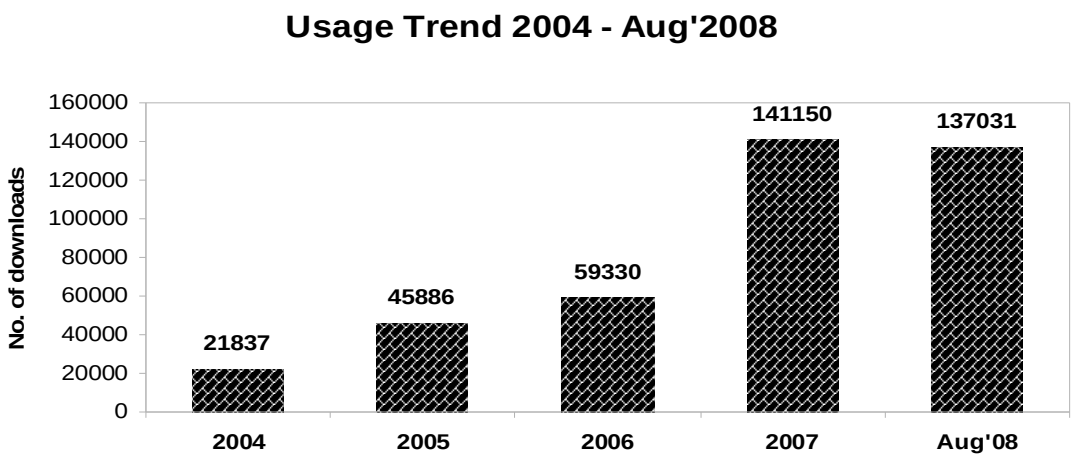

Figure 1: Usage Trends of North Eastern Universities During 2004 – Aug'2008

From the above Figure 1, it can be easily depicted that there is a steady increase in the usage of the e-journals. In 2004, the starting year of the consortium, the access was provided to only first phase universities (four universities) the total download in 2004 was 21,837, whereas in 2005 there was an increase of 110% with 45,886 downloads. However in 2005, the number of universities has also increased from four to nine. The Centre has included second phase universities, which consist of five additional universities from the region. In 2006, the usage has further increase by 29% with 59,330 downloads. In 2007, there was a phenomenal increased in overall usage of e-resources. The data compiled reveals that the usage has increased to 137% compared to the previous year (2006). The consortium members have downloaded 1, 41,150 articles from 18 publishers as shown in the figure 2. In 2008 till August the total number of downloads has reached to 1, 37,031.

8.1 University rankings

In terms of the usage of e-resources during the last three years, the ranking of following ten universities is given below:

Sl. No	University Name	Rank'05	Rank'06	Rank'07
1	North Eastern Hill University	37	24	16
2	Gauhati University	86	29	19
3	Tezpur University	28	32	38
4	Manipur University	68	81	51
5	Assam University	82	76	71
6	Tripura University	64	86	72
7	Dibrugarh University	73	71	77
8	Nagaland University	99	97	87
9	Rajiv Gandhi University	95	96	91
10	Mizoram University	NA	NA	95

Table 1: Ranking of North Eastern Universities in comparison to the consortium members from 2005 to 2007

The ranking is based on 100 universities who are consortium members. Out of 100 universities, only 3 universities from North East are among the 50 universities with highest usage. In 2005 Tezpur ranked top in usage among the ten North Eastern Universities. However, in 2006 and 2007, NEHU ranked top among these universities followed by Guwhati University. University with low usage, especially Nagaland and Rajiv Gandhi University needs to take suitable steps to improve the usage.

In 2008, it was observed that Guwhati University has made remarkable increase in usage of e-resources. The data compiled till August 2008 demonstrates that Guwhati University has more usage than NEHU. Thus till August 2008, Guwhati ranked top in terms of over all usage. The details of 2008 Usage is given below in Table 2.

Sl. No.	University Name	ACS	AIP/ APS	AR	CUP	Elsevier	IOP	JSTOR	Nature	OUP	P.Press	Pr. Muse	RSC	Springer	Total
1	Gauhati univ	7923	1234	307	243	319	816	18601	216	455	74	1779	2001	2360	36328
2	NEHU	4749	1712	281	1362	706	814	16044	141	2833	125	368	1347	5476	35958
3	Tezpur univ	5160	1556	428	389	1194	1895	6526	39	126	14	1583	1713	4852	25475
4	Manipur univ	2876	837	144	198	192	628	10770	70	706	39	429	1051	4080	22020
5	Dibrugarh univ	135	1982	34	176	NS	235	NS	NS	379	NS	438	115	1526	5020
6	Tripura univ	861	2461	7	40	NS	5	NS	0	17	NS	1	40	856	4288
7	Assam Univ	969	75	91	131	NS	112	NS	NS	418	NS	83	173	1397	3449
8	Mizoram univ	18	NS	NS	NS	NS	229	NS	NS	507	NS	56	NS	1134	1944
9	Rajiv Gandhi Univ	NA	NA	20	91	NS	NA	NS	NS	378	NS	123	16	1290	1918
10	Nagaland univ	110	21	5	6	NS	67	NS	NS	283	NS	11	57	71	631

Table 2: Publisher wise Usage Statistics of North Eastern Universities from Jan – Aug 2008

8.2 Usage trends

The data for the year 2006 and 2007 were analysed to determine the usage trends. It shows that there is upward trend of overall usage. The figure 2 shows the usage trends of access in last two years, which clearly indicates that there is an upward trend.

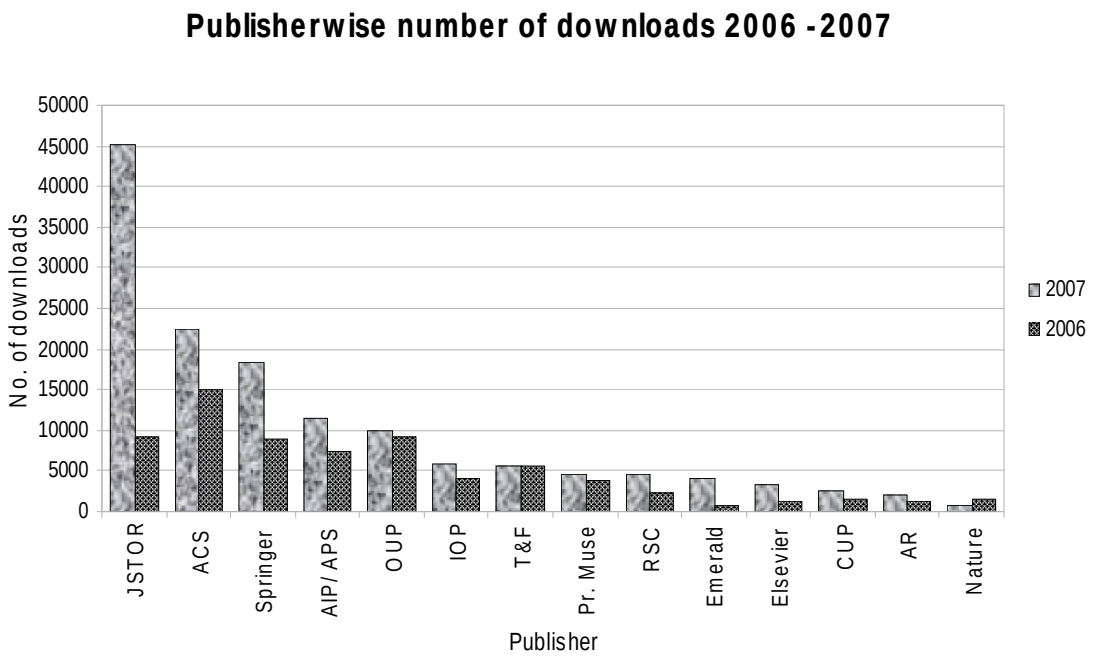

Figure 2: Publisher wise usage statistics of North Eastern Universities in 2006 & 2007

JSTOR is highly used resources followed by ACS, AIP/ APS. The usage of Portland Press, Project Euclid and Blackwell could not be analysed due to lack of relevant data. There is upward trend in usage of entire e-resources except Taylor and Francis and Nature Journal.

8.3 Comparison of usage with other major Universities

In 2007, out of total download, an attempt has been made to compare the data of North Eastern universities with top five universities in the country. The following graph shows the percentage of download by universities in North Eastern region and other top five universities. The North Eastern Universities contributes only 5 % of total usage, which is not very significant. The graph shows that Delhi University has maximum percentage (12.2%) followed by Bananas Hindu University (6.7%), University of Hyderabad (5.0%) etc.

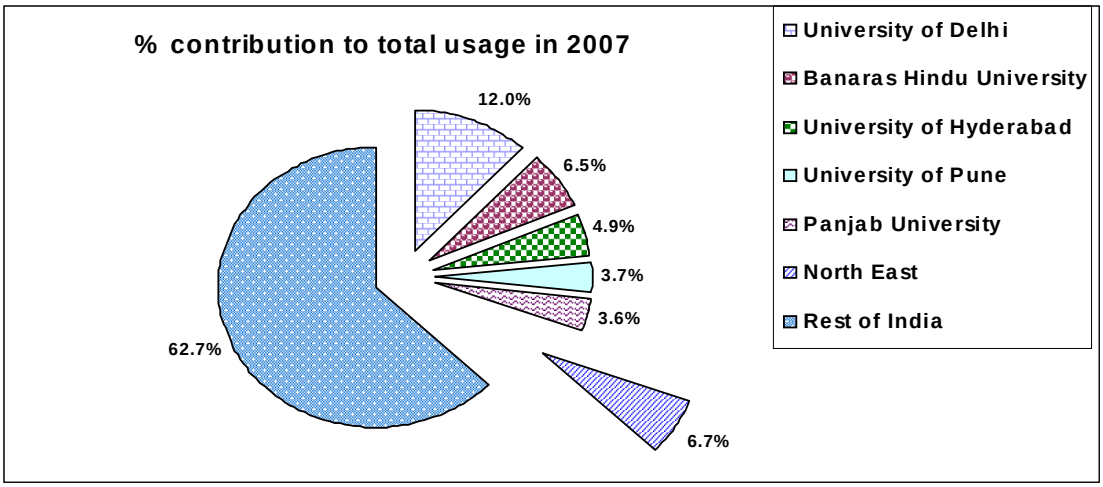

Figure 3: % Contribution of North Eastern Region and top five Universities towards downloads of consortium in 2007

8.4 Performance of E-journals in North Eastern Universities during 2007

Considering the two metrics to evaluate the value and the performance of e-journals, an attempt has been made to calculate the 'cost recovery factor' and the 'average cost per download' of e-resources for the year 2007. These two are the most important factors in analyzing the effectiveness of the consortium.

8.4.1 Percentage Cost recovered

The cost recovery factor calculated as the number of articles downloaded multiplied with the cost of a single article if it is purchased directly from the publishers in the pay per view model. According to ALPSP survey, 78% of the journal publishers surveyed offer pay-per-view or individual article purchase options In the pay-per-view model the cost of the articles is varied and nearly $30 per article. Assuming that if the electronic resources were not available through the Consortium, articles downloaded from these resources by the member institutions would have been sourced on inter-library loan / document delivery at a cost of US $ 15.00 per article. (The Average cost of article is taken from the Interlibrary Loan Cost Study conducted by the Association of Research Libraries). The following matrices is used to generate the % cost recovered for e-resources in ten universities

$$\% \text{ Cost Recovered} = \frac{(\text{No of Articles Downloaded} \times \$15) \times 100}{\text{Subscription cost}}$$

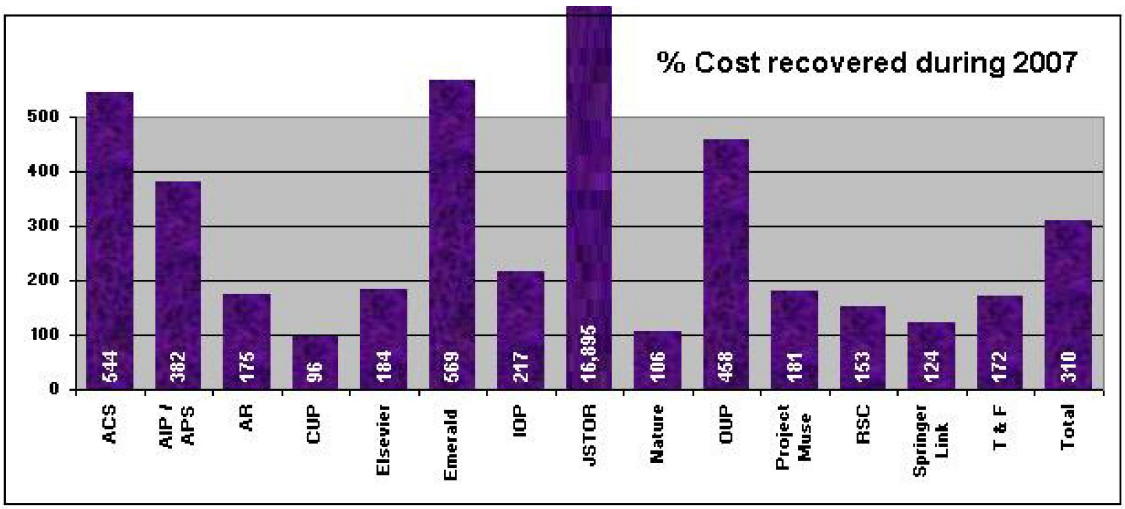

Figure 4: Publisher wise percentage cost recovered during the year 2007

The % cost recovered for JSTOR is the highest (16,895%) followed by ACS (544%), and then Emerald (569%). The % of cost recovery in case of Cambridge is the lowest, i.e., only 96%. However the over all cost recovery percentage came to 310%.

8.4.2 Cost Per Download

The average cost per download represents the average cost of each access event to a full-text article and is calculated from the e-journal's subscription price divided by the number of articles downloaded.

$$\text{Average Cost per Download} = \frac{\text{Subscription price of the journals}}{\text{Number of articles downloaded}}$$

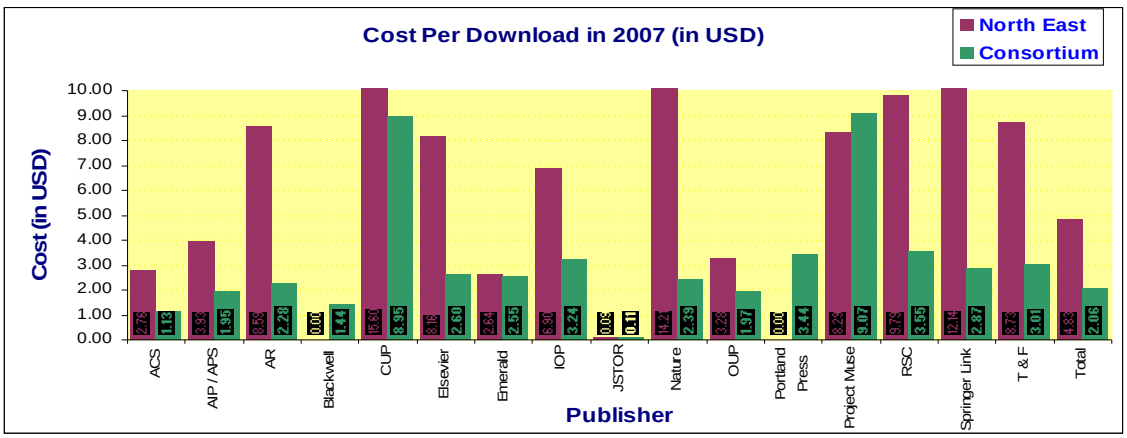

Figure 5: Publisher wise cost per download (in US$) for 2007

The average cost per download of an article for the North Eastern Universities is calculated as $4.03. The average cost per download for JSTOR is the lowest ($0.09). The average cost per download for Cambridge University Press journals is the highest ($15.60) followed by Nature ($14.21). However the average cost per download of an article is still higher in comparison to the consortium, which is calculated as $2.03. Though the average cost per download for each publisher in North Eastern Universities is higher in comparison to the consortium but in case JSTOR, it is lower than the consortium average ($0.11).

9. Conclusion

Access to e-journals has brought a visibly refreshing change in university libraries in India. However, more steps needs to be taken to improve e-journal usage. In this regard, INFLIBNET regularly organizes series of awareness programmes highlighting its activities and resources. These awareness programmes have had a very positive impact on all members of the scholarly community of the country. It can be safely concluded that consortia-based subscription has brought considerable benefits to the academic community in India in general and the academic community of North East India in particular.

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Annexure - I

Sl.	Publisher	Accessible to	13	Portland Press	Phase I
Full-text e-journals			14	Project Euclid	Phase I
1	American Chemical Society	All	15	Project Muse	All
2	AIP/APS	Phase I & II	16	Royal Society of Chemistry	Phase I & II
4	Annual Reviews	Phase I & II	17	SIAM	Phase I
5	Blackwell Publishing	All	18	Springer Link	All
6	Cambridge University Press	Phase I & II	19	Taylor & Francis	All
7	Elsevier Science(Cell Press)	Phase I	**Bibliographic Databases**		
8	Emerald (LIS Collection)	GHTU, MNPU, MZOU, NEHU	20	MathSciNet	Phase I
9	Institute of Physics	All	21	SciFinder Scholar	GHTU
10	JSTOR Archival Access	GHTU, MNPU, NEHU, TEZU	22	RSC Databases	Phase I & II
11	Nature	Phase I & TPRU	23	ISID	All
12	Oxford University Press	All	24	JCCC Gateway Portal	All

GHTU - Gauhati University; **MNPU -** Manipur University; **MZOU** – Mizoram University; **NEHU -** North Eastern Hill University; **TEZU -** Tezpur University; **TPRU -** Tripura University

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