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UGC-INFONET DIGITAL LIBRARY CONSORTIUM: A REVOLUTION IN INDIAN HIGHER EDUCATION

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Abstract:

India has one of the largest higher education systems in the world. It has over 24 million students and faculty members in higher education system which are hungry for information. Internet has brought tremendous changes in all spheres of life and libraries are also not spared from it. Information explosion has created a problem of bibliographic control for libraries and dwindling budget, escalating price hike made scenario more worst. Almost one decade ago situation was more pathetic and it was observed that some of the universities were not even subscribing to any scholarly international journal. Realizing need of information and availability of scholarly resources over Internet, University Grants Commission (UGC) of India initiated UGC-Infonet Digital Library Consortium in the year 2004. The paper presents a brief evaluation of UGC-Infonet Digital Library consortium and its impact on higher education with respect to research output of India universities.

Subject headings: *Library Consortium; UGC-Infonet; Higher Education – l,India; Academic research output; E-resources.*

Introduction:

None of the library of this world is self-sufficient. Information explosion and increasing cost of documents bring scarcity of funds in the libraries. Hence, since beginning libraries have been relying on cooperation among themselves. The homogeneous nature of libraries give more benefits of cooperation instead of heterogeneous kind of libraries. Cooperation among libraries for sharing their resource is being practiced and experimented since long. The mode of cooperation has gone under a transformation with infusion of information technological innovations from print based environment to digital environment. The emergence of internet has provided a new mediums of information storage, dissemination and utilization. The access to resources over internet has been most utilized by users and publishers.

History of Library Consortia:

The library consortium term was earlier defined as 'partnership' or 'association' in law related aspects. Later it was picked up by manufacturing and banking enterprises. According to Lang (1975) the modern usage of the word consortium began late in the 19th century when it was used as banking partnership in the banks of two or more nations to aid another nation financially. In 1950s or 1960s the term was used in science and education. During these years this term was picked up by library professionals and somehow used in library literature. Baathuli and Darko-Ampem (2002) have studied that the common form of library cooperation was the sharing of union catalogue information, storage facilities, collection

development and human resources at local, national and regional levels. The consortia term was also defined as a series of resource sharing activities were developed and matured into a consortium or consortia (Asare-Kyire and Asamoah-Hassan, 2011). The old concept of library consortia means a strategic alliance of institutions having common interests. Basically consortia mean 'group of libraries come together with common interest to form consortium. In the library consortium one library or agency work as a coordinator for identifying needed resources, publishers, vendors, aggregators and negotiate with them on behalf of whole members of the group. The aim of the consortia is to achieve what members of the group cannot achieve individually.

It is important to know, how library experts have described library cooperation and how this term transformed to library consortium. Kraus (1975) had reported emergence of library cooperation with an exhaustive study. He found that catalogues of manuscripts in a monastery library existed in beginning of the thirteenth century and by sixteenth century these catalogues were shared among friends. Later in mode of 18th century (1740) three prominent libraries signed an agreement to share their catalogues, these libraries were Universities of Lund, Abo and Greifswald. In 1846, the Librarians' conference committee has proposed that the institution (Smithsonian) become the centre of the library and all bibliographical reference for the entire country. In the process Smithsonian institution started act like a national library. Libraries were to submit copy for their books using cataloging

rules prepared by Cutter, but the project of Smithsonian institute as national library and few other ventures of library cooperation got failed because of inadequate technology, inadequate financial support, and the lack of an organization to support the project. In 1880s library cooperation was known as an established term and various issued about library cooperation were discussed by E A Mac in 1885 and by Melvil Dewey in 1886 in issues of the Library Journal.

The first interlibrary lending code was drawn up in 1917 by the ALA Committee on Coordination of college libraries, the code was revised and updated few times before publishing as interlibrary loan procedure manual in 1970. The photocopying of original publication was suggested in 1917 code but photocopying process was very expensive at that point of time. The national library of medicine added photo-duplication as a part of interlibrary loan service in 1956. Library of Congress first demonstrated using facsimile transmission for fast delivery of copies of printed pages in 1950. Maintenance of print union list of holding and circulating it to a group of members has been a base for sharing resources. By the end of 1956, the same list which was published under the Union List of Serials, was covering 15,7000 titles of 956 libraries. The cooperative acquisitions project was established in 1945 by American Research Library and the Library of Congress. A Latin American Cooperative Acquisitions Program enveloping forty libraries was also found in action during 1963.

Slowly and steadily various library consortia were established all around the world. In UK, Consortium of University Research Libraries (CURL), After that NESLI (UK National Electronic Site Licensing Initiative) was established in 1998 in which 476 libraries participated. As stated by Pye and Ball (1999) the M25 Consortium of Academic Libraries founded in 1993 is one of the most successful library consortia projects of UK. In South Africa the first formal library consortium namely 'Cape Library Cooperative' (CALICO) was established in 1992. Darch, Rapp and Underwood (1999) had also discussed other consortia who bring lot of improvement in library system in South Africa. These consortia are ESAL (Eastern Seaboard Association of Libraries) established in 1997, FRELICO (FREe State Libraries and Information Consortium) in 1996, SEALS (South East Academic Libraries' System), SANLiC (South African National Library and information Consortium). CAVAL (known as CAVAL Ltd.) is the first of its library consortia which was created in 1978 for providing shared services to the information and library sectors throughout Australia. The CSIRO (Commonwealth Scientific and Industrial Research Organization) is another library consortia which was established to facilitate science and research related activities in Australia. The CAUL (Council of Australian University Librarians) provides access to electronic resources to students and faculty of Australian universities. The National & State Libraries Australasia (NSLA) E-Resources Consortium was established in 2002. National Electronic Information Consortium (NEICON) in Russia and Regional University and Science Library Advanced Network (RUSLANet) became a common information space

of libraries and integrating services in the Northwest of Russia. Coordinamento Interuniversitario Basi Dati & Editoria in Rete (CIBER) was established in 1999. ThaiL was created in Thailand for providing quality library services among members.

History of Library Consortia in India:

Indian has also witnessed library consortia to establish library cooperation among homogeneous institutions. Although, Form for Resource Sharing in Astronomy (FORSA) consortium was the first non-formal library consortium which was established in 1981 to share scholarly literature in the area of astronomy and astrophysics. Information resources in both the areas were limited but were of high cost. The first formal library consortium was known as 'Consortium for Material Science and Aerospace Collection (COMSAC)' which was established in 1998 by National Aerospace Laboratory. Looking into history of library consortia in India following consortia are mainly being highlighted. Afterwards various other consortia initiatives were taken at national level. Following table shows and overview of some active library consortia of India.

Table 1

Active library consortia in India

S. No	Name of Consortium	Implementing agency	Year of Establishment	Subject coverage
1	FORSA Consortium	Indian Institute of Astrophysics	1982	Astronomy and Astrophysics
2	IIM Consortium	IIM	2000	Business, Management, Standards & Patents
3	DAE Consortium	Department of Atomic Energy	2001	Science & Technology
4	RGUHS-HELINET Consortium	Rajiv Gandhi University of Health Science	2003	Health & Medical Sciences
5	INDEST-AICTE Consortium	IIT, Delhi	2003	Engineering, Science and Technology
6	UGC-INFONET Digital Library Consortium	INFLIBNET Centre	2004	All discipline
7	MCIT Library Consortium	Ministry of Communications and Information Technology	2005	Engineering & Information Technology
8	ERMED Consortium	National Medical Library	2008	Medical Sciences
9	Consortium for E-resources in Agriculture (CeRA)	Indian Council of Agriculture (ICAR)	2008	Veterinary, Animal, Fisheries and Agricultural Sciences
10	NKRC E-journal Consortium. (CSIR/ DST)	NISCAIR	2009	Science & Technology

11	DRDO Consortium	DESIDOC	2009	Engineering, Science & T
12	DeLCON Consortium	Department of Biotechnology (DBT),	2009	Science & Technology
13	N-LIST Consortium	INFLIBNET Centre	2010	All discipline

UGC-Infonet Digital Library Consortium:

The UGC-Infonet Digital Library consortium was established on objectives of making availability of scholarly literature in all areas of learning to improve quality of learning, teaching and research in higher education system. The UGC provides funds for subscription of needed resources on behalf of member universities that makes free access to e-resources for them. To avoid any complications, opinions from other active Indian library consortia were also taken into consideration before launching UGC-Infonet programme in the year 2004. Information and Library Network (INFLIBNET) Centre has been given the responsibility to execute and manage whole programme systematically. The programme operates under the direction of National Steering Committee. The programme has enveloped universities in different phases, as per status and up-gradation of their infrastructure.

All Academic institutions, which come under the purview of UGC, are members of this consortium. The access to subscribed resources was extended to universities in phased manner. In the Phase I, 50 universities which were ready with required infrastructure, offered

access to subscribed e-resources. In Phase-II, another set of 50 universities were offered access to e-resources in 2005. In Phase – III, the universities which were getting ready with the required infrastructure to access these subscribed resources. Initially the e-resources were subscribed for three years but after three years an evaluation of consortium with respect to its usage was observed and renewed for next five years. Here in this study, a brief evaluation is being done on usage, economy, and research output of the country so that impact of UGC-Infonet consortium can be assessed.

This study is based on articles published by India and Indian universities in indexed journals. The data retrieved from Science Citation Index, Social Science Citation Index and Humanities Citation Index of ISI. The data were accessed from Web of Knowledge for the year 2004 to 2011. Data for 50 Phase-I universities of UGC-Infonet was also extracted to assessed research productivity. Various reports and annual reports of INFLIBNET were also consulted to know the usage statistics of UGC-Infonet Digital Library consortium.

STATUS OF E-RESORUCES' USAGE SUBSCRIBED UNDER UGC-INFONET

Various training progarmmes were conducted in the universities to make user aware about this initiative of UGC. Library professionals and network officers of each member university were given specialized training to manage use of these resources at their universities.

An extensive use of e-resources was observed by all universities. In the year 2005, usage of e-resources gone up by 180.31 per cent over the usage of 2004 and a subsequent increase were observed during every passing year. Table 1 shows the usage of UGC-Infonet Digital Library Consortium by member universities. In the year 2004 member universities were downloaded 625684 articles which were reached to 14287356 by the year 2012.

Table 1

S. No.	Publishers	Total Number of Article Download								
		2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
1	ACS	259198	422816	478140	560506	594960	1031237	1196487	1398741	1563717
2	AIP/APS	105606	243856	292884	302270	336234	419658	377910	392744	426325
3	AR	33471	56504	76492	81533	62528	76731	71637	63115	80127

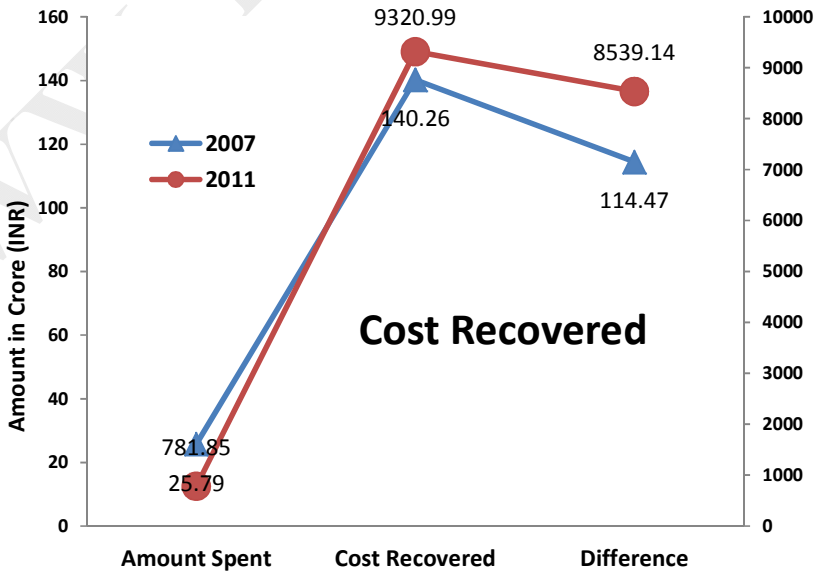
4	Blackwell	NA	116473	174081	278690	121077	178869	526986	1048171	1330343
5	CUP	8090	21321	23388	49304	66745	72972	58165	84932	92629
6	Elsevier (Cell Press)	44535	89585	72964	95770	155931	165029	181162	4121314	4965569
7	Emerald	502	18106	38995	48776	43480	69363	74499	79449	96351
8	IOP	62543	81071	124949	134241	168213	232573	249259	246445	245966
9	Jstor	NS	53924	121745	616560	138291	156695	214068	2252342	2479154
10	Nature	NA	48499	42839	42894	47996	79456	107648	121936	117517
11	OUP	NA	158096	205226	171952	198760	208692	304269	375761	373248
12	Project Muse	28194	51709	46699	46140	89975	89175	86094	96260	94458
13	Portland	NS	13301	12792	13706	13617	22294		20268	25979
14	RSC	NA	41786	88174	134121	178676	185985	220134	364576	554594
15	Springer Link	83545	190831	273319	443024	977395	1397193	1501513	1868341	1349891

16	T & F	NA	145958	201478	134141	247849	293286	378814	223041	491488
17	Project Euclid	NS	NS	NS	429	551	2124	2151	2919	6284
18	SIAM	NS	NS	NS	NS	828	1922	1643	5462	5354
	Total	625684	1753836	2274165	3153628	4686397	6089465	7475266	12757436	14287356
Increase in usage over last year			**180.31 %**	**29.67 %**	**38.67 %**	**48.60 %**	**29.94 %**	**22.76 %**	**70.66 %**	**11.99 %**

American Chemical Society (ACS); American Institute of Physics/American Physical Society (AIP/APS); Annual Review (AR); Blackwell Publishing (Blackwell); Cambridge University Press (CUP); Elsevier Science (Elsevier); Emerald Publishing (Emerald); Institute of Physics (IOP); J-Stor (Jstor); Nature Online (Nature); Oxford University Press (OUP); Project Muse; Royal Society of Chemistry (RSC); Taylor and Francis (T&F)

Status of Economy Envolved:

This assessment is one kind of return on investment. It is calculated on list price of the document the cost of article which is kept by publisher for any user. We can presume that each article would have cost us USD 15.00 (US $ 15.00) per article. Average cost of article taken from a study conducted by the American Research Libraries (ARL). This is clearly indicated by the Figure given below, the Consortium has recovered the cost incurred on subscription for all e-. The cost recovery is being derived with calculation of total number of articles downloaded multiplying with the cost assumed for a single article (US $ 15.00 as assumed above). In 2007 while calculating cost recovery factor, it was found that consortium members downloaded articles of cost 444% higher than the amount spent on their subscription. The cost recovery factor reached to 1092% increase for the year 2011.



Cost Per Download and Renewal of E-Resources:

The list price of resources subscribed for first three years was Rs.694.88 crore but consortium paid Rs.71.07 crore only. Under the consortium purchase INFLIBNET extracted 85% to 95 % discount over list price of databases. On based of usage, the cost per article download was also calculated and it was observed that cost per download was was USD 17.97, in 2005 USD 4.03 and in 2006 it come down to USD 3.62 per article. Observing terrific use of e-resources during the first three years of consortium the whole UGC-Infonet Programme was again extended for further five years aiming increase in research productivity by all member universities.

Status of Research Production:

The impact of UGC-Infonet on Indian universities was also assessed by assessing quantity and quality of research papers produced. This was based on articles published by India and Indian universities in indexed journals. The data retrieved from Science Citation Index, Social Science Citation Index and Humanities Citation Index of ISI. The data were accessed from Web of Knowledge for the year 2004 to 2011. Data for 50 Phase-I universities of UGC-Infonet was also extracted to assessed research productivity. Various

reports and annual reports of INFLIBNET were also consulted to know the usage statistics of UGC-Infonet Digital Library consortium.

India had published 25668 scholarly articles in the year 2004, that means about 96.96 per cent of the total research produced by India was in general sciences whereas social sciences accommodated 2.59 per cent and humanities 0.44 per cent of the total scholarly publications. By the year 2011 the research productivity in general sciences covered 96.33 per cent of the total scholarly publications, 3.27 per cent in social sciences and humanities enveloped 0.40 per cent of the total research output of the country. The overall Annual Growth Rate (AGR) during 2004 -2011 in Sciences was 10.71 per cent, 14.55 per cent in Social sciences and 9.19 per cent in humanities, as depicted in Table 2.

Table 2

ANNUAL GROWTH RATE - INDIA

Areas	2004	2005	2006	2007	2008	2009	2010	2011	Beg Yr	End Yr	AGR
Sciences	24888	27641	31111	36313	42445	43763	46909	50732	24888	50732	10.71 %
SS	666	688	840	923	1212	1418	1579	1724	666	1724	14.55 %
Humanities	114	110	127	103	131	184	168	211	114	211	9.19%

Since 50 universities of Phase I were the first in using UGC-Infonet e-resources, hence number of scholarly articles published by these universities were assessed. As highlighted in Table 3, in total these universities had published 5939 scholarly articles in the year 2004, this shows that Phase I universities published 23.14 per cent of the total research productivity of the country in the same year. By the year 2011, the percentage of total research output reached to 24.1 in sciences, 20.2 per cent in Social sciences and 41.7 per cent in Humanities. The overall AGR was calculated 11.36 per cent in Sciences, 14.61 per cent in Social sciences and 10.06 per cent in Humanities during 2004 – 2011, which is slightly high than the AGR of India.

Table 3

ANNUAL GROWTH RATE - PHASE I UNIVERSITIES OF UGC-INFONET											
Areas	2004	2005	2006	2007	2008	2009	2010	2011	Beg Yr	End Yr	AGR
Sciences	5760	6613	7776	8733	9589	10340	10997	12236	5760	12236	11.36 %
SS	134	134	182	183	235	279	320	348	134	348	14.61 %
Humanities	45	58	58	49	54	79	62	88	45	88	10.06 %

Citation Analysis:

The impact of produced research was also assessed by broadly analysing the citations received by published articles. In the year 2004 the Phase I universities of UGC-Infonet published 5939 articles which received 25785 citations. Therefore, 4.34 citations per article was calculated for the year 2004. Similarly, in 2005 total scholarly articles published by Phase I universities were 6825 which received 34966 citations and 5.12 citations per article was calculated. By the year 2011 the citation per article was reached to 11.53 as calculated over total articles published (12672) and citations (146080) received by those articles.

Conclusion:

UGC-Infonet has bring a dynamic change in the higher education system of the country. Earlier each university was subscribing their resources independently and getting lesser discount as compare to consortia purchase. Library staff at each university were dealing with publishers and vendors for renewal of resources or sorting out any other issue which now being handled by INFLIBNET Centre as nodal point for all subscription and related problems. The UGC should start coordinating with other existing library consortia in the country so that duplication of subscription by within various consortium can also be avoided. Establishment of national library consortium will be more advisable and economical for improving the academic as well as research systems in the country. The INFLIBNET can subscribe national site licensing for various e-resources. The consortium has set an example

for all other contemporary consortia through its systematic management and approach. An extensive use of e-resources by the member universities can be one of the factures in improving the quantity and quality of research output at the international level.

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