
ELECTRONIC RESOURCE MANAGEMENT : EMERGING KEY ISSUES

AJAY P SINGH

M T M KHAN

SURESH K CHAUHAN

Abstract

Emergence of electronic information has changed modes of communication, information demands of users and information management system in the libraries. Innovation in the field of information and communication technology is boosting research and development activities all around the world. Earlier libraries were facing various problems for managing print documents rescued by the electronic resources. The consortia initiatives are mushrooming in the world rapidly. UGC-Infonet: E-Journals Consortium launched by the University Grants Commission (UGC) through Information and Library Network (INFLIBNET) Centre is considered one of the best consortium models in the globe. The consortium is subscribing thousands of fulltext electronic journals and databases and making them available online to 120+ universities of the country. A notable usage of electronic resources has been observed in the first three years of operation of the consortium. But millions of articles downloaded by the member universities are not being re-managed for further use. Through this paper an attempt is made to lay emphasis on an urgent need to manage downloaded scholarly e-contents with the help of various e-documents management software (OSS) keeping in mind the copyright limitations.

Keywords: Information Management/ Electronic Resources/ Information Searching/ Open Source Software/ Usage Statistics.

1. Introduction

Information is the vital element for human beings in today's world. It has become the basic need of the man as food, shelter, cloths and electricity. Since beginning our libraries have been trying to manage the available literatures. Even memoir of kings, various courtiers and individual person's engraved on the clay tables, coins and on leaves etc. are still being managed by the libraries. These rare documents are the only sources to reveal most of the hidden parts of our ancient and medieval history. Invention of typewriter or printing press had given momentum to keep records of day to day activities. In the beginning of 20th Century, informal libraries got converted into well

managed and formal library system. One hand various publishers had taken publishing as their sole profession and other hand libraries casually started believing on these publishers for the information. To make a study or research, users were only depended on libraries and to fulfill the needs of researchers, libraries were depended on publishers. Computer has started putting its effect on various research and developmental activities and finally computer intruded in the libraries during the 60s and 70s of the 20th Century. The active library professionals started using computer as a tool to manage libraries as well as fulfill the information needs of end users. Appearance of World Wide Web (WWW) transformed the scattered world into a global village and brought the revolutionary changes. With the help of computer, libraries started changing its nature from traditional libraries to automated libraries, then electronic libraries and now in the beginning of 21st Century we are dealing with online or digital libraries. The same way print publishing industry has also shifted to e-publishing. The information demands of users are also getting changed with reference to format and speed to access the information. The library managers, its users as well as the publishers dealing with print documents were facing various difficulties. The emergence of electronic resources came to rescue to remove these difficulties and are being welcomed by the whole world. Today, to subscribe and manage electronic resources is the cutthroat need of the hour.

2. Electronic Information

Internet is full of information. All types of documents are available through it. Publishing industry has been heavily depending on it. Informally we can divide all available resources in two categories:

1. Paid e-resources: Publisher/owner is charging some fee to access the resource, which comes under this category. Access to products from the commercial publishers is mostly available on payment. Few of the leading publishers under this category are Royal Society of Chemistry, Elsevier, Springer, Blackwell Publishing Agency, Cambridge University Press, etc.
 2. Free e-resources: The list of this type of resources is quite long and it can be divided in few more sub-categories like:
 - Open Access Journals/Free Journals: Many of the publishers are providing free access to few of their journals and many organizations are making open access for their product/s.
 - Information available at Institutional Repositories: Various institutional repositories are accessible to the world without any cost, e.g. Institutional Repository of Dspace at the INFLIBNET (<http://dspace.inflibnet.ac.in>) and Institutional Repository of Indian Institute of Science, Bangalore can be accessed freely.
 - Organizational/Individual's websites: Organizational and Individual websites are also a source of accurate information. For example Union Databases (books, serials and these available with Indian universities) and other specialized
-

databases which are being maintained and hosted by the Information and Library Network Centre (INFLIBNET) at its official website are good source of information.

- Individual Blogs/Professional discussion Forums: These are the latest and new web options on the Internet to share your views or opinions with other fellow professionals around the world. Day by day various forums, discussion groups and blogs are flourishing with explosive speed.

3. Access to Electronic Resources

Formally two types of electronic access resources are available.

Direct Access Resources: these are the resources which can be used at any time, e.g. Databases available in CD form.

+tive : can be used at any time and only computer is required.

- searching and downloading is easy and quick.

-tive : database CD can be protected from scratches or other things which may spoil it.

- information contained by these is getting out dated with minute span of time (not up to date regularly).

Remote Access Resources: These are the server and client based information resources. These are the online resources in which location of the server is somewhere else, may be in another country and clients are located in different geographical location (countries), e.g. Science Online, Chemical Abstract Services (CAS), etc. This type of access can be given on specific range of IP (Internet Protocol) within the campus, access through username password in which information can be downloaded from anywhere with the help of Internet. Access through IP range, as well as username password is also there (in combined).

+tive : update is regular feature of these type of resources.

- can be used by any number of users at a same time.

-tive : required Internet to use the resources.

- processing of quarry depend on Internet speed and processing speed of the remote server. Some problems at the server can hinder information access.

4. Type of E- resources:

To keep bibliographical control over the published information, with the help of computer and communication technology various methods have been developed and adopted by the libraries from time to time. Broadly three types of e-resources are available to cater scholarly information needs of the users.

- Bibliographical resources: These are the resources provide bibliographical information only like- title, author, name of the journal, volume and issue number, publication date, publisher and most importantly an abstract of the entry. Bibliographic e-resources are mainly containing information on single subject. These resources are not providing full-text but facilitating the user by providing linking facility to the full-texts in some of the cases, e.g. Biological Abstracts (database covering biological sciences), MathSciNet (bibliographical database deals with mathematics), Chemical Abstract Services (biggest bibliographical resource for chemical sciences), etc.
- Full-text E-resources: These e-resources, provide full-text of the document apart from its bibliographical information. The approach in these databases is journal-wise or publisher-wise only, e.g. American Chemical Society is the database and containing titles published by the American Chemical Society. The same way there are, Institute of Physics, Cambridge University Press, Springer Journals, Elsevier Journals and Taylor and Francis, etc. are various publishers who are providing access to fulltext journals/databases through Internet.
- Portals/Aggregator products: It is just like a super market, where one can get everything from a single shop. Portals provide a single interface to search various databases, e.g. Under UGC-Infonet: E-Journals Consortium Indian universities are accessing more than 20+ different databases or products. User has to search individually (has to open all the websites one by one to search within them) for a single term if s/he wants to search in all the provided products then this exercise needs much time to cover all 20+ products. Here portals can help a user, portals will search the needed term in all the products from single interface. There is no need to go for individual database. Portal does not have its own contents but all the contents have been taken from the member publishers and provide the linking facility to the full-text. Ingenta and J-Gate are the examples of these portals. So as the aggregator products, aggregator purchased the contents (on mutual or legal understanding) from the actual publishers and providing the access to users, e.g. EBSCO, JSTOR and ProQuest are the aggregators who are providing access to 1000+ publisher's journals from single window. Aggregators cannot provide latest issues of journals but they keep some embargo period for access. But even smaller libraries can have important journals through aggregators due to various low price subscription models.

5. Various Subscription Models

Various subscription models are available now a days. Few of the most demanded pricing models are:

- Print Plus Model: In this model print journals are being subscribed by a library and given electronic access to the subscribed information.
-

-
- **Print + Electronic Combined:** In this model combined electronic and print, information is being subscribed with where subscription rate will be based on print subscription.
 - **Bundle Purchase Model:** In this selected groups or subject clusters of titles are being subscribed.
 - **Pay-per-View:** In this model client has to pay for whatever has been downloaded by the users of this client.
 - **Subscription with Historical Archive (back volumes):** all the publishers have different subscription price for accessing back volumes of their products. Some time subscription is based on one time payment and some time access with moving wall option for few years of back volumes.

6. Searching Facilities and Techniques

Internet has thousands of databases containing millions of pages of information in them. All the databases have been using different techniques of indexing. Therefore, it is a quite a daunting exercise to find information which one is looking for. Hours could be spent on the Internet in search of specific information without anything productive being found. The one of the biggest advantage of e-resources is the ability to use computer for searching a word or words in an electronic product or database. There are various types of search options to search the electronic databases, some of these are:

- **Simple Search:** In simple search one can approach the needed information through one simple term or keyword. Simple term or small phrase without using AND, OR and NOT parameters.
 - **Direct Search:** It is also like a simple search, in this one can retrieve the document directly through the title, volume number, issue number, year of publication or through page numbers of the document.
 - **Advance Search:** It contains Boolean operators to combine the searchable keywords, means in this one can use two or more than two keywords to retrieve the related documents. Here one can also combine search fields like author, title, abstract, article title, or whole document and also limited upto one publisher or one journal only by using AND, OR and NOT operators.
 - **Search within the results:** Many databases are giving this search options to refine the result of one query.
 - **Federated Search:** it is a searching for resources from heterogeneous online contents, mainly known as 'cross-collection search', Portals like Ingenta and etc. and various search engines, are using federated search option.
-

7. Usage Statistics:

Authenticity and validation is the problem with open access journals or the information available freely. Nobody will bother about the use of that information. On the other hand scholarly information, which has been subscribed by paying huge amount, institution will ensure proper and exhaustive information use by its users. Access to scholarly information leads to well needed result in the area of research and development especially in the university system. Therefore, authentic usage statistics is useful to take the decision like, which are the subject areas need further support in future and which are the subject areas where university is doing well. It also shows which are the resources not being used by the University and which are in demand.

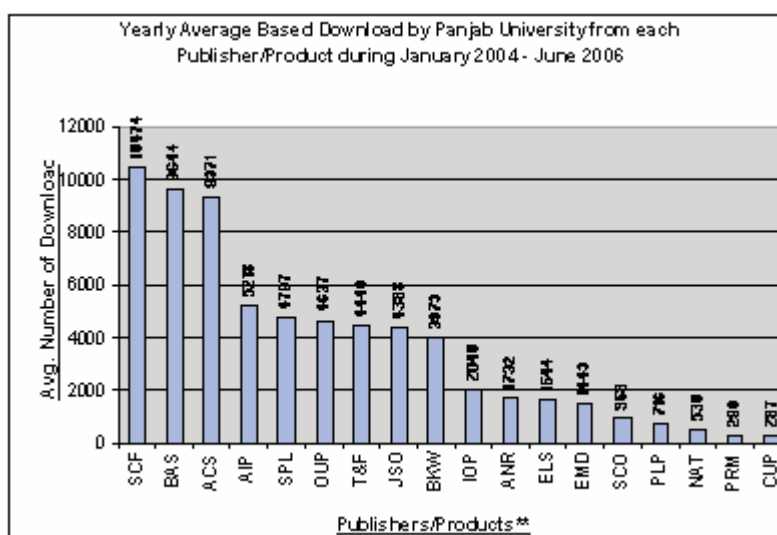
Example: Usage Statistics of Panjab University with reference to UGC-Infonet: E-Journals Consortium

INFLIBNET is monitoring the usage of e-resources by the member universities of UGC-Infonet programmes. Most of the publishers have COUNTER (Counting Online Usage of Networked Electronic Resources) compliance which facilitate the monitoring usage.

Year	Total Percentage*	Panjab University shared	Total Download
2004	(881629) 100%	4 %	32,830
2005	(2869616) 100%	3 %	74,834
2006**	(737247) 100%	5 %	On average

*Total download is for selected products in the year 2004, 2006 and upto June 2006.

**Usage statistics has been taken on average basis with the total statistics of up to June 2006.



**SCF= SciFinder Scholar; BAS= Biological Abstracts; ACS= American Chemical Society; AIP= American

Institute of Physics/American Physical Society; SPL= SpringerLink; OUP= Oxford University Press; T&F= Taylor and Francis; JSO= Jstor; BKW=Blackwell; IOP= Institute of Physics; ANR= Annual Reviews; ELS= Elsevier; EMD=Emerald; SCO= Science Online; PLP= Portland Press; NAT= Nature; PRM= Project Muse; CUP= Cambridge University Press.

According to INFLIBNET's 'UGC-Infonet: E-Journals Consortium: summary April 2006' a report of the usage statistics with reference to article downloads during the year 2005, this university is ranked at 10th position amongst 120 universities. In the first half of the year 2006 the rank of this university is reached to 4th in the list of 120 universities.

The average cost per article download for all the products by this university is 1.55 USD for the year 2005 whereas National figure goes up to 3.99 USD.

8. Legal Issues during information use

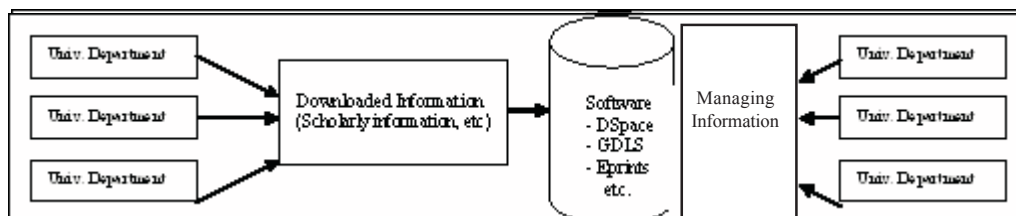
Though misuse of information in electronic form is quite easy, commercial publishers are putting some usage restrictions on the users to protect themselves from loss. The common usage restrictions are:

- The systematic reproduction is not allowed.
- Re-selling or Sub-licensing is not allowed.
- Distribution or systematic supply of the subscribed electronic contents in any form to anyone other than to members of the institution is not allowed.

Now the question arises what a user will do with downloaded information. The above legal clauses are not indicating anything whether s/he will destroy the information after using it or s/he can save it for the further use.

9. How to manage searched/downloaded information

Information on the Internet is just like an ocean, everything is there but question of authenticity or validation of the searched information, is matter of concern for the information managers as well as information users. Water is one of the major basic need of human beings but scientists have already predicted that time will come when inability of water will put whole world under drought. It is still unbelievable for us because 70% of our earth is covered with water. But only 1% of the world's water is suitable for drinking, about 97% is salty and 2% is frozen in glaciers. The same reality is with Information available on the Internet, though it is full of information but few issues like authenticity of the information, to find out the scholarly information and to manage searched information for further use etc. are to be addressed. Through UGC-Infonet: E-Journals Consortium users have been accessing millions of documents. Their desktop's are growing with e-documents day by day. Thus the libraries are in need to develop an information management system that can help to manage downloaded scholarly literature. Libraries can use the same information for their bonafied users in future. The following flow chart is giving the to manage downloaded e-contents.



Under UGC-Infonet: E-Journals Consortium member universities have been downloaded around 50 lakh articles in first two and half years. Thus single member universities like Panjab University, Chandigarh can collect all the e-documents, downloaded by users of this university, at a commonplace (server/computer) and manage it with the help of information management software for further use within the university only.

10. Some of the available Open Source Software

DSpace: DSpace is joint venture of Massachusetts Institute of Technology's libraries (MIT) and Hewlett-Packard (HP) Labs and it is freely available as an open source system that can be customized and improved further. DSpace runs on UNIX or LINUX operating system and also successfully installed on Window XP and Window 2000 professional. Other open source tools like Apache Ant, Apache Tomcat and PostgreSQL are also needed to install the DSpace.

EPrints: The EPrints software is the largest and most broadly distributed or installed software of any other open repository system. The University of Southampton (UK) developed it and first version of the system was publicly released in late 2000. Installation of this software is relatively easier, its installation needs support from the other open source software like LINUX, Apache and MySQL.

Greenstone: Greenston Digital Library Software, well known as GDLS, allows users to build their own digital libraries. It is a multilingual software which supports various languages and is available in English, French, Spanish, Russian, Kazakh and Vietnamese. Greenstone runs on Windows, UNIX and MacOSX with the help of Java environment. It can be installed in two ways, for a local library (Intranet) it requires Java virtual environment and for Web library it requires Java virtual environment and Apache or IIS web server running and it can be customized.

Fedora: It is again a open source software jointly developed by the University of Virginia and Cornell University. Fedora is a digital object repository management system, it is designed to be a foundation upon which full-featured institutional repositories and other interoperable web-based digital libraries can be built.

11. Conclusion

Change is the only static thing in this world. Limitations imposed by print documents on the library system, were resolved with the help of electronic resources, which

changed the information scenario all around the world. Information on the Internet is getting doubled in every two to three years. The researchers and academicians are in need of scholarly information which is mostly being published by the professional publishers. The development is so fast that the information subscribed today will become outdated tomorrow. Increasing and speedy information demands of users library forced to subscribe scholarly literature by paying huge amount to the publisher. Developing country like India, University Grants Commission has started a consortium through the INFLIBNET to subscribe e-contents from the prominent publishers on behalf of Indian Universities. The subscribed e-contents are being given to 120+ universities of the country. The member universities downloaded millions of e-documents and it will be a good source of scholarly literature if all these downloaded information will be managed or arranged systematically with the help of e-contents management software for the further use by the same member university. It is being suggested that member university can collect all the downloaded contents at one place and manage or arrange them for further use.

References

1. Smith, M (January 2003) 'DSpace: an open source dynamic digital repository' D-LibMagazine, Volume 9, Number 1; ISSN 1082-9873. URL: <http://mybestdocs.com/smith-m-etaldspace.htm>
 2. Trulove, J., ed. (1999) Multimedia Networking Handbook 1999; CRC Press; Florida; ISBN 81-7649-076-8.
 3. Lynch, C A (August 2001) 'Metadata harvesting and the open archives initiative' ARL Bimonthly Report 217; downloaded on December 10, 2006. URL: <http://www.arl.org/newsltr/217/index.html>
 4. Murthy, TAV, etc.; UGC-Infonet E-Journals Consortium an Indian Model Bridging the Gap between Scholarly Information and End User; 3rd International CALIBER-2005, (Cochin , 2-4 February, 2005), INFLIBNET Centre, Ahmedabad.
 5. Arora, J (2003) 'Building Digital Libraries: an overview' Pre -conference tutorial CALIBER 2003.
 6. Smith, M (January 2003) 'DSpace: an open source dynamic digital repository' D-LibMagazine, Volume 9, Number 1; ISSN 1082-9873. URL: <http://mybestdocs.com/smith-m-etaldspace.htm>
 7. DSpace, <http://www.dspace.org>
 8. Greenstone, <http://www.greenstone.org>
 9. INFLIBNET Centre, Ahmedabad, <http://www.inflibnet.ac.in>
 10. Singh, A P; Khan, M T M and Chauhan, Suresh K (2006), 'Versatile World of Libraries in Digital Environment', PLANNER- 2006, pp. 532-9, Mizoram University, Aizawl, November 9-10, 2006.
-

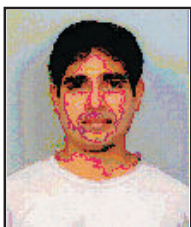
BIOGRAPHY OF AUTHORS

Dr. Ajay Pratap Singh holds BSc, MPA, MLISc, DSM, PhD (LIS). Presently serving as Assistant Professor in the Institute of Library and Information Science, Bundelkhand University, Jhansi. He is also performing his duties as University Communication Officer. He has a wide teaching and working experience of more than seven years in the field of creation and maintenance of digital libraries. He has published several research articles in various national and international conferences. He is associated with a number of national and international professional associations. His areas of interest include ICT, digitisation, library automation.

Email: apsingh_73@yahoo.co.in



Prof. M.T.M. Khan is working as Professor and Director of Institute of Library and Information Science, Bundelkhand University, Jhansi. Serving the profession since last 32 years. Presently he is also holding the post of Dean, Faculty of Arts and the Director of Self Finance Scheme programs of the university and administering the University Library as University Hon. Librarian. He has contributed around 25 research articles and authored 3 books in LIS. He has supervised 25 research scholars for their Ph.D. degree. He is associated with several national and international associations and organized a number of national conferences, seminars and symposia.



Shri Suresh K. Chauhan, is currently working INFLIBNET Centre as a Project Scientist for the last three years. Did his MA (English) and M L I S from Panjab University Chandigarh. Actively involved and assisting in UGC-Infonet E-Journals Consortium initiative of the Centre. Delivered lectures, presentations in the national seminars and workshops conducted by the Centre time to time. As a faculty visited universities for user awareness and training programmes. Prior to joining INFLIBNET worked as Library Assistant at the Centre for research in Rural and Industrial (CRRID) Chandigarh. Presented few papers.

Email : chauhan@inflibnet.ac.in
