Digitization of Theses and Dissertations:
Status Quo India

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ABSTRACT

The fruits of research from the formal research programmes of conventional universities and academic research institutions in India were under-utilized as the access to theses, dissertations and research reports were very limited to the next generation researchers and scholars. Modern information and communication technology (ICT) acts as an effective intervener for paradigm shifting from closed access theses and dissertations to open access electronic theses and dissertations (ETD).

The present study brings out the ETD initiatives undertaken in India. These initiatives are presented under national and institutional level. 6 national and 17 institutional ETD repositories are studied in the paper. It also discusses National Policy framework in India for building ETD repositories. UGC Regulations 2005 and 2009, INDEST Consortium, ICSSR – NASSDOC and National Knowledge Commission have provided guidelines to improve the quality of research and also to provide world wide access to research under open access. The paper aims to take an overview of the contents of these repositories and to highlight the problems in self archiving approach of researchers in India.

Keywords   Electronic Theses and Dissertations (ETD), India, Open Access

INTRODUCTION

India is a major South Asian country, where an array of specialized research institutions, research centres and universities situated in almost all major subject areas. Theses and dissertations are known to be the rich and unique source of information, often the only source for research work that does not find its way into various publication channels. Doctoral dissertations are manifestation of result of four to five years of intense work involving huge investment of resources, both mental and physical and infrastructure and other support from the universities. The theses collection in most of the Indian libraries, are kept in closed access, making it difficult for other students to access them. It remains an un-tapped and under-utilized asset, leading to unnecessary duplication and repetition that, in effect, is the antitheses of research and wastage of huge resources, both human and financial.

The digital libraries of electronic theses and dissertations (ETDs) are promising to be extremely advantageous to scholars especially in developing countries. The ETD initiatives started in India during late nineties and popularity of this concept is growing rapidly in the higher educational and research institutions to disseminate newly emerged knowledge and expertise.

REVIEW OF LITERATURE

Defining ETD

ETDs are dissertations and theses prepared for submission as text-based Adobe PDF (Portable Document Format) files. ETDs can contain non-text elements that cannot be incorporated into traditional hard-copy theses and dissertations. Multimedia, sound, video, and hypertext links can be included to expand and deepen the expression of ideas and the presentation of research. Importantly, ETDs give broader exposure to graduate student research. It also promotes better research because of better exchange.

Merits of ETDs

Bandra (2002) identifies the merits of ETDs:

- To empower students to convey a richer message through the use of multimedia and hypermedia technologies;
- To improve graduate education by allowing students to produce electronic documents, use digital libraries and understand issues in publishing;
- To increase the availability of student research for scholars and preserve it electronically;
- To lower the cost of submitting and handling theses and dissertations;
- To empower universities to unlock their information resources; and
- To advance digital library technology.

Need for developing ETD Repositories

Doctoral theses and dissertations are primary source of documents which contain lot of new ideas, innovations and new results in highly specific topic. They give insight into the developments/trends in selected specific areas and also come up with solutions to the identified problem. They also put forth the prior art on a specific topic. These are useful documents for further research and must be made accessible to everyone irrespective of their physical location. In India, the access policy to the theses collection varies from university to university. In most of the universities the access is limited. Recognising the need for increasing the accessibility of theses documents, the Government of India and other agencies of national importance have framed distinctive policies and strategies to develop bibliographical and full text ETD databases.

Indian national agencies like University Grants Commission (UGC), Indian Council of Agricultural Research (ICAR), Council of Scientific and Industrial Research (CSIR), ICSSR (Indian Council of Social Science Research) are initiating several steps to promote the ETD culture by providing, policy guidelines, required infrastructure and imparting training to people involved. Organizations like INFLIBNET and others have already created sizeable online database containing metadata and are accessible to every one. Major projects like Vidyanidhi have demonstrated the need and feasibility of creating ETD databases at the national level. Some of the leading universities and institutions have already taken a plunge and started creating ETD collection. Quite a few subject discipline based self archives have sprung up during the last few years who also cover ETDs. The ETD momentum is fast catching up and one can now see increasing visibility for the Indian academic research. (Kumbar T.S., 2009)

NATIONAL POLICY FRAMEWORK IN INDIA

University Grants Commission, INDEST Consortium – An Open Access Advocacy Group, ICSSR and National Knowledge Commission have played a vital role in framing national policies for digitization of theses and dissertations in India.

UGC Regulations 2005

In 2005, the University Grants Commission of India (UGC) drafted a national policy framework entitled "UGC (Submission of Metadata and Full-text of Doctoral Theses in Electronic Format) Regulations, 2005". UGC's Regulatory Framework aims at evolving a mechanism to improve the quality, accessibility and availability of Indian theses and to implement uniform standards for creating metadata of doctoral theses and a system for collecting and collating this standardized data. (UGC Regulation, 2005)

Regulation proposed two sets of planned actions, such as:

- *Creation of Indian National Theses Database (INTED):*

Proposed Indian National Theses Database (INTED) is an online centralized bibliographic database, where online submission of metadata sets of a PhD thesis is made mandatory when the researcher finally submits his/her PhD thesis to the Research Cell of a university. The PhD supervisor verifies and validates the metadata of submitting PhD thesis. The INTED will be freely accessible worldwide and will have simple and advanced search interfaces. Hence, bibliographic control of all recent PhD theses is assured. Although this online database will be accessible free of charge, its CD-ROM version will be made available at a price.

- *Submission of PhD Theses in Electronic Form*

The researcher will submit his/her PhD thesis in an appropriate electronic format, along side hard copies of his/ her thesis. The UGC Regulations also suggest a specific content structure of electronic thesis, which is derived from the best practices of international ETD sites. The submitted electronic copy of the doctoral thesis will be stored in the respected University's ETD

repository or institutional repository. The ETD repository or institutional repository should be OAI-PMH compliant, so that metadata harvesting services can collect metadata of each submitted/ awarded doctoral thesis. The administrator of the ETD repository will also check the quality of metadata information.

The university will set up committees to formulate copyright and IPR policies, access policy, plagiarism monitoring policy, and other norms related to ETD repository. The access to ETD database can be allowed any of the following: worldwide open access, campus-only access, temporary restricted access, and mixed access (partially open). The ETD may contain textual data along with images, audio objects, video objects, animation objects, spatial objects and other kind of multimedia objects. The ETD can be navigated non-linearly. Thus, hard copy of a thesis document has less number of functionalities than electronic copy of a thesis. The proposed ETD repositories in universities will be developed using latest versions of IR software and will adopt latest versions of metadata schema to handle the advanced features of ETD.

UGC Regulations 2009

In 2009, UGC has given one more regulation in context to "Minimum Standards and Procedure for awards of M. Phil / Ph.D." Under Clause 19, the regulation provides guidelines for creation for Depository with UGC. The Clause 19 is reproduced as it is below.

> "19. Following the successful completion of the evaluation process and announcement of the award of M.Phil/Ph.D., the university shall submit a soft copy of the M.Phil / Ph.D. thesis to the UGC within a period of thirty days, for hosting the same in INFLIBNET, accessible to all institutions / universities".

Implications of UGC Regulations

UGC Regulations 2005, though Regulations formulates a roadmap in achieving wide dissemination of results of doctoral research conducted in Indian universities and bibliographic control of theses and dissertations of research degrees, the universities and the researcher were reluctant to change their status quo. This may be due to the fear of plagiarism as well as the fear that the contents will be observed by pioneers worldwide.

UGC Regulations 2009 has made it mandatory to deposit soft copy of thesis to INFLIBNET and set the minimum standards for the award of research degrees ultimately motivated to produce quality doctoral theses and maintain certain international standards. Online availability of electronic theses through centrally-maintained digital repositories, will not only ensure easy access and archiving of Indian doctoral theses but will also help in raising the standard and quality of research. This would overcome serious problem of duplication of research and poor quality resulting from the "poor visibility" and the "unseen" factor in research output. As per the Regulation, the responsibility of hosting, maintaining and making the digital repository of Indian Electronic Theses and Dissertation (Shodhganga) accessible to all institutions and universities is assigned to the INFLIBNET Centre.

INDEST Consortium – An Open Access Advocacy Group

The Indian National Digital Library in Engineering Sciences and Technology (INDEST) Consortium is an innovative initiative supported by the Ministry of Human Resource Development (MHRD) and All India Council for Technical Education (AICTE). Indian Institute of Technology Delhi (IITD) is the coordinating agency for this consortium. In 2003, INDEST core members proposed to establish an 'INDEST Digital Theses Archive.'

Six recommendations of Recommendations of INDEST Working Group on 'ETD and EPrint Archives' as reported in the document - Minutes of the Meeting held on 7th October, 2003 at IIT Delhi are reproduced below. (INDEST Working Group, 2003)

- All IITs (Indian Institute if Technology) and IISc (Indian Institute of Science) should implement electronic submission of theses and dissertations in addition to their current practice of submissions in theses and dissertations in print;
- Following the model set-up by the IISc Bangalore, all IITs may set-up e-print archives using OAI complaint e-print software. While pre-prints and re-prints may be submitted at e-print servers set-up at various IITs / IISc, a central server may be deployed to harvest the metadata from all such e-print archives. The use of OIA-complaint e-print software would facilitate such an environment. It was strongly felt that if the pre-print / re-print submission is followed strictly at all IITs / IISc, the unified collection developed in the process at IITs and IISc (as well as at other such repositories) would offer a strong alternative to existing model of scholarly publishing;

- All INDEST Consortium members (i.e. IITs and IISc) should follow common protocols and procedures to ensure interoperability of digital collections built-up in the process of e-submissions of theses, dissertations and preprints. The IITs and IISc may adopt OAI-complaint software available in public domain, such as e-prints archive, D-space or the Virginia Tech. ETD, to ensure interoperability; 4. The ETD may be planned as distributed archives with individual institutions holding their theses and dissertations on their own servers while the metadata may be harvested either online or offline on a single server;
- IIT Bombay and IIT Kanpur, the two institutions who have already implemented ETD at their respective institutions, may provide trial access to their ETDs to other IITs / IISc;
- A core development group may be formed to give the technical specifications for the ETD as well as for preprints and for the development of the archive site. This group will also prepare a template for the ETD and preprint site, which can be used by any of the INDEST members to host their ETD archive. The Group may also finalize standards for the metadata needed for the ETD.

Implications of INDEST Recommendations

48 centrally-funded Government institutions constitute the core group of the Consortium that are divided into the four categories based on e-resources allocated to them. These are IITs, IISc, National Institute of Technology (NITs), Indian Institute of Information Technology (IIITs), Indian Institute of Management (IIMs), etc. Some core member institutions have already established open access institutional repositories and ETD repositories in their respective institutions. Some core member institutions, such as, IISc, IITs, have started digitization of their back volumes of thesis and dissertation collections on project basis and make them available through open access or campus wide institutional/ETD repositories. ETD@IISc is considered as a role model of open access ETD repository in the INDEST family. The INDEST Consortium in association with IISc prepared a number of guidelines on the ETD and organized training workshops for implementations of open access repositories in member institutions. This Consortium also provides consultative supports to other Indian consortiums, research agencies and individual institutions in formulation of open access policies and implementation of ETD/institutional repositories. (Das, A K, et.al., 2007) There is no visible progress with respect to having 'INDEST Digital Theses Archive' at the national level at this moment.

ICSSR – NASSDOC

National Social Science Documentation Centre (NASSDOC), was established in 1969 as a Division of the ICSSR with the objective to provide library and information support services to researchers in social sciences; those working in academic institutions, autonomous research organisations, policy making, planning and research units of government departments, business and industry etc. NASSDOC also provides guidance to libraries of ICSSR Regional Centres and ICSSR supported Research Institutes.

NASSDOC has a programme of acquiring copies of unpublished Ph.D. theses in social sciences accepted by Indian universities. Since 2003 NASSDOC has revised its thesis acquisition policy. It has been decided to pay Rs 1500/- to a scholar for a copy of Ph.D. thesis. A scholar is required to submit a soft version, preferably CD-ROM, along with a hard copy (print version) of the thesis. (ICSSR, 2011)

NASSDOC has signed a memorandum of understanding (MOU) with Vidyanidhi Digital Library Project of Mysore University to digitise the Ph.D. Theses collection of NASSDOC for wider dissemination to scholars. More than 2000 Ph.D. Theses have been digitised and put on CD – ROM format. The ultimate objective is to put them on the web, so that research scholars can view them on the website. Vidyanidhi Digital Library, University of Mysore Indian ETD Collection : http://dspace.vidyanidhi.org.in:8080/dspace/

Recommendations of National Knowledge Commission

The National Knowledge Commission of India (NKC), constituted on 13th June 2005, is a high level advisory body to the Prime Minister of India, with a mandate to guide policy and direct reforms. NKC 's overarching aim is to transform India into a vibrant knowledge-based society. In its first annual report entitled 'Report to the Nation 2006', NKC published its first set of recommendations to the PM of India (NKC, 2006). If implemented, these recommendations will have far reaching implications in the knowledge creation and dissemination cycle. NKC strongly advocates open access to public-funded research literature. The theses and dissertations produced by state-sponsored researchers would then make accessible through

open access channels, such as, ETD repositories or institutional repositories. NKC also recommends expansion of Indian higher education system through establishment of new universities, including 50 national universities, totaling about 1500 universities across the country, which is about 3 times addition to existing system. This expansion would enable India to attain a gross enrolment ratio of higher education at least 15 per cent by 2015. This kind of phenomenon expansion requires a huge pool of qualified teaching and research staff, equipped with research degrees, to maintain a minimum standard of teaching and research. Similarly, present university system should also take proper measures to attract meritorious research students for future requirements and disseminate their research papers, theses and dissertations by establishing ETD/institutional repositories.

More recently in November, 2008, the National Knowledge Commission has in its report on **'More Quality Ph.Ds'** has recommended to the Prime Minister of India that, "Ph.D thesis should be uploaded on the Internet, preferably on the proposed National Research Portal. In any event, open and free access to research output in archives and other digital media resources should be made mandatory". Also the same Commission in its report 'Libraries: A road map for revitalization' strongly recommended that , libraries should offer new services by creating" institutional repositories of research articles, reports, institutional publications and Electronic Theses and Dissertations (ETD)" and to support these services the Commission further recommends that " all academic institutions must set up institutional repositories of ETD. This should be made mandatory for accreditation. Such repositories should offer open access" (National Knowledge Commission). With this kind of initiatives and policy directions from the national bodies, ETD work in India will gain a momentum and facilitate wider access to Indian research. (NKC, 2008)

METHODOLOGY

This preliminary study concentrates on the state of the art ETD digital libraries in India. The research method used in this study is the triangulation of three different methods

- e-mail questionnaire
- telephonic conversation and
- content analysis of ETD websites.

ANALYSIS

ETD Initiatives in India

The Indian libraries have witnessed a great impact of Information and Communication Technology (ICT) in last three decades. The development can be traced in three phases viz.

- First Phase: 1980s: Automation of House-keeping operations
- Second Phase: 1990s: Networking of Libraries
- Third Phase: 2001 onwards: Digitization initiatives; E-content creation; Digital Repositories and Library 2.0

DOAR and ROAR

There are 47 digital repository initiatives from India have been reported in Directory of Open Access Repositories (DOAR) and 59 Indian initiatives have been reported in Registry of Open Access Repositories (ROAR). (As on 17th May 2011) (OpenDOAR and ROAR, 2011)

The ETD initiatives in India can be broadly grouped into two categories.

- ETD initiatives at National Level
- ETD initiatives at Institutional Level

ETD Initiatives at National Level

Table No. 1 provides the details of 6 ETD initiatives at National Level.

Name of Repository	URL	Software	Theses Collection
Vidyanidhi	http://dspace.vidyanidhi.org.in:8080/dspace/	Dspace	5496 full-text 100000 (Bibliographic)
Indian National Theses Database	http://indcat.inflibnet.ac.in/indcat/	Dspace	2,32,599 (Bibliographic)
Shodhganga	http://shodhganga.inflibnet.ac.in/	Dspace	1727 Full Text
CSIR Explorations	http://csirexplorations.com/	In-House Software	659 Metadata
Krishi Prabha: Indian Agricultural Doctoral Dissertation Repository	http://202.141.47.8:8080/equestthesis/	-----	6000 Full text
DELNET	http://delnet.nic.in/	In-House Software	48621
Table 1. ETD Initiatives at National Level			

Vidyanidhi

This is a digital library initiative to facilitate the creation, archiving and accessing of doctoral theses. Under this initiative, in addition to having created 'Indian Theses Database' (Bibliographical) a separate database 'Vidyanidhi Digital Library of Indian Doctoral Dissertations' providing access to 5496 full-text doctoral theses. **Indian Theses Database provides access to** more than 1,00,000 Indian theses metadata. Being Unicode compliant, it includes 1500 records in Kannada (for Kannada Theses) and 4000 records in Hindi Language (for theses in Hindi). . Vidyanidhi is registered with OpenDOAR and the metadata is harvested by OAIster and Cross Archive Search Services for Indian Repositories (CASSIR) and also by Google Scholar (Vidyanidhi, 2009, Urs, 2009). This project got underway in the year 2000 at the Department of Library and Information Science, University of Mysore, sponsored by the National Information System for Science and Technology, Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India.

Indian National Theses Database @INFLIBNET

Union database of Theses covers the bibliographic Metadata of Doctoral Theses submitted to **238** Universities/Institutes in India. It has over **2,32,599** unique records from all subject areas. This Data is contributed by participating Universities. (as on 18th May 2011).

Shodhganga

UGC 2005 regulations are issued to all universities in India, essentially to facilitate the systematic creation, collection, organization of metadata as well as full text of doctoral theses. INFLIBNET, being an organ of UGC, has been spear heading this gigantic task of creating Indian National Theses Database (INTED) in full text by coordinating with all universities in India. The Shodhganga@INFLIBNET is set-up using Dspace. Shodhganga@INFLIBNET provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs submitted by the researchers. 20 Universities started contributing and 23 Universities have signed the Memorandum of Understanding (MoU). This repository has 1727 full text theses. It is now expected that this repository will grow rapidly if the universities implement the recommendations of UGC Regulations 2009. The submission of full text e-theses ((as on 18th May 2011). by the universities is shown in Table No. 2

University	No. of e-theses deposited
Avinashilingam Deemed University For Women	07
Bharathiar University	01
Bharath University	20
Cochin University of Science & Technology	227
Jawaharlal Nehru University	01
Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya	01
Mahatma Gandhi University	517
Mangalore University	04
Manonmaniam Sundaranar University	19
Mizoram University	05
Nirma University	02
Pondicherry University	449
Punjabi University	05
Saurashtra University	61
Shivaji University	01
Tamil University	05
University of Calicut	12
University of Hyderabad	341
University of Jammu	0
University of Madras	01
University of Pune	48
Total	1727

Table 2. Submission of e-theses by Universities in Shodhganga

CSIR Explorations

The CSIR Explorations is a digital library of electronic dissertations, theses and research reports of the fellowships supported by Council of Scientific and Industrial Research (CSIR), Govt. of India. Under this fellowship program, at the time of submission of PhD thesis to an Indian University, the CSIR Fellow submits an electronic copy on CD-ROM to CSIR's Unit for Research and Development of Information Products (URDIP) along with a descriptive set of metadata for inclusion in the CSIR Explorations 'e-Theses database'. This has been initiated recently and currently, the e-theses database has 659 theses and serves as a valuable source of information about doctoral theses submitted to Indian universities. Currently, access is restricted only to metadata level and proposed to scale up with full text of theses as it has already been collecting full text of the theses in e- form.   Unfortunately, this database has been created and hosted using home grown software and does not follow any sets of metadata standards (CSIR, 2011).

Krishi Prabha: Indian Agricultural Doctoral Dissertation Repository

KrishiPrabha is a full-text database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the 45 State/Deemed Agricultural Universities during the period from 1.1.2000 to 31.12.2007. This database, listing about 7500 Doctoral Dissertations with a full text of about 6000 Dissertations, has been created by Nehru Library, Ch. Charan Singh Haryana Agricultural University, Hisar with financial support from Indian Council of Agricultural Research, New Delhi under its National Agricultural Innovation Project.(Krishi Prabha, 2011)

DELNET (Developing Library Network)

DELNET was started at the India International Centre Library in January 1988 and was registered as a society in 1992. It was initially supported by the National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Reseach, Government of India. It was subsequently supported by the National Informatics Centre, Department of Information Technology, Ministry of Communications and Information Technology, Government of India and The Ministry of Culture, Government of India. DELNET has been established with the prime objective of promoting resource sharing among the libraries through the development of a network of libraries. It aims to collect, store, and disseminate information besides offering computerized services to users, to coordinate efforts for suitable collection development and also to reduce unnecessary duplication wherever possible. Along with union catalogues of books and periodicals, DELNET has also created Database of Theses and Dissertations submitted to Indian Universities, which covers various subjects. The database presently has 48,621 records (Bibliographic).

ETD initiatives at Institutional Level

The libraries in India have started providing access to theses metadata through their Online Public Access Catalogues (OPACs). Creation of ETD repositories at institutional level is in sporadic stage in India. Table No. 3 proves details of 17 ETD initiatives at institutional level.

Sr. No.	Repository	Organization	URL	Total Documents	ETD
1	DSpace@TU (Dspace)	Thapar University (TU), India	http://dspace.thapar.edu:8080/dspace/	1287	1168
2	ETD IISc (Dspace)	Indian Institute of Science, Bangalore	http://etd.ncsi.iisc.ernet.in/	1161	1161
3	MGU Theses Online (Online Nitya Digtal Archives)	Mahatma Gandhi University, Kottayam	http://www.mgutheses.org/	1129	1129
4	Eprints @ CMFRI (Eprint)	Central Marine Fisheries Research Institute	http://eprints.cmfri.org.in/	8174	166
5	Physical Research Laboratory, Ahmedabad (In-house)	Physical Research Laboratory, Ahmedabad	http://www.prl.res.in/	1832	106
6	Institutional	Delhi College of	http://www.dspace.dce.edu/	1392	92

		Engineering			
	Repository of Intellectual Contributions of Delhi Technological University (Dspace)	Engineering			
7	DSpace@IIA (Dspace)	<u>Indian Institute of Astrophysics</u>, India	http://prints.iiap.res.in/	5486	91
8	ePrints @ NCCR (Eprint)	National Centre for Catalysis Research, IIT Chennai	<u>http://203.199.213.48/</u>	1726	62
9	Kautilya @ IGIDR (Dspace)	Indira Gandhi Institute of Development Research, Mumbai	http://oii.igidr.ac.in:8080/dspace/index.jsp	204	58
10	<u>Delhi College of Engineering Repository</u> (Dspace)	Delhi College of Engineering	<u>http://www.dspace.dce.edu/</u>	1392	56
11	Dspace at NCRA (Dspace)	National Centre for Radio Astrophysics	http://ncralib1.ncra.tifr.res.in:8080/jspui/	316	47
12	Dspace @ NITR (Dspace)	National Institute of Technology, Rourkela	http://dspace.nitrkl.ac.in/dspace/	1389	37
13	<u>Eprint@NML</u> (Eprint)	<u>National Metallurgical Laboratory</u>, India	http://eprints.nmlindia.org/	2554	10
14	Librarian's Digital Library (LDL) (Dspace)	DRTC, Bangalore	<u>https://drtc.isibang.ac.in/</u>	358	05
15	Dspace @ IIMK (Dspace)	Indian Institute of Management, Kozhikode	http://dspace.iimk.ac.in/	638	2
16	Eprints @ IARI (Eprint)	Indian Agricultural Research Institute	http://eprints.iari.res.in/	227	01
17	Digital Knowledge Repository (Dspace)	Central Drug Research Institute, Lucknow	http://dkr.cdri.res.in:8080/dspace/index.jsp	357	01
Table 3. ETD initiatives at institutional level					

It is observed that there are 17 well established ETD repositories at institutional level. Some more institutional repositories

having ETD as their collection are reported in DOAR and ROAR viz. Dyuthi (Digital repository of Cochin University of Science & Technology), EPrints@IITD, DU Eprint Archive University of Delhi, DSpace at NCRA Indian Institue of Technology, Bombay (IITB), DRS @ nio of National Institute of Oceanography, Goa, Dspace @ Guru Gobind Singh Indraprastha University (GGSIPU), dspace @ sdmcet SDM College Of Engineering and Technology Dharwad, DSpace at National Chemical Laboratory, etc. It is observed that these were not in working condition during the span of the present study i.e. during April-May 2011.

The DSpace@TU has the highest number of ETDs followed by ETD IISc. It is observed that 11 ETD repositories use Dspace software, 4 use Eprint and 2 use in-house developed software.

Issues and Barriers

A short questionnaire was designed to trace the difficulties and barriers faced by the organizations in building and maintaining ETD repositories in India. Out of 17 organizations 12 responded to the questionnaire and remaining 5 were contacted on telephone to collect the data. Table No. 4 given below shows the observations.

Sr. No.	*Common Barriers in Building of IR*	*Number. of Repositories*	*%*
1	Difficulty of content recruitment	6	35.29
2	Lack of Institution Policy	4	23.93
3	Funding Problem	2	11.76
4	Lack of Skilled Human Resource	8	47.06
5	Lack of Necessary Infrastructure	2	23.93
6	Lack of interest by Authority	5	29.41
7	Problem of copyright issue	17	100
8	Software Problem	1	5.88
9	Problem of long term preservation	14	82.35
10	Unwillingness of Researcher	15	88.24
11	Integration of IR into Workflow and existing structure	5	29.41
12	Lack of Coordination of national body for IR	8	47.06
Table 4. Analysis of Common Barriers in Building of IR			

It is observed from the responses that the biggest issue in developing ETD repository is Copyright. All the 17 ETD repositories have cited it as a major issue. It is followed by 'unwillingness of the researchers' to deposit their thesis (88.24%). The researchers have a fear that online access to their full-text theses increases the chances of misuse of documents. Problem of long term preservation is the third important barrier quoted by 82.35% repositories. Difficulty of content recruitment; Lack of institutional policy; Funding problem; Lack of skilled Human Resource; Lack of necessary infrastructure; Lack of interest shown by authorities; Lack of coordination of a national body for IR; Software Problem and Integration of repository into workflow and existing structure are some of the issues in building ETD repositories.

CONCLUSION

The greatest advantages of ETDs are avoiding duplication in research work, ensuring quick retrieval of information, promoting resource sharing, and providing a permanent solution to the problem of space. There is no system of theses and dissertations legal deposit in India and universities/ institutions are not under the subjection of the archiving organizations, so the collecting work is not very smooth and some theses and dissertations are simply lost or accumulate dust. There is need for concerted effort by all ETD stakeholders to integrate theses and dissertations produced in India in a unified database to be

coordinated by a central agency of Government of India. INFLIBNET is now taking steps in this direction. It has started developing a complete national union catalogue of ETDs in India.

ETD Awareness program/ promotional activities- an improved understanding of the issues and options can encourage cooperation among institutions that are planning or have implemented ETD programs. There is a need to sensitize all the stakeholders about the need and issues involved in the creation of ETDs. Workshops and training programs for both students and faculty need to be conducted on issues of copyright, choice of access, and encourage researcher to submit theses online.

Many ETD repositories have the problem regarding copyright issues and fear of plagiarism, unwillingness of faculty and researchers for submission of their materials, lack of policy to safeguard the long term preservation of the deposited materials, lack of skilled human resource etc. which can be disastrous for ETD policies. Thus people and institutional interest must be constant and effective. UGC Regulations will play a vital role in developing ETD repositories in India in near future by making it mandatory to deposit a soft copy of thesis to its database.

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