



ISSN Print: 2394-7500  
ISSN Online: 2394-5869  
Impact Factor: 5.2  
IJAR 2015; 1(13): 95-99  
www.allresearchjournal.com  
Received: 22-09-2015  
Accepted: 23-10-2015

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## Approaches to Shodhganga: A reservoir of Indian theses

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### Abstract

India does not have a central repository in which theses are stored from various PhDs across different disciplines. This has led to various kinds of problems from lack of visibility for Indian research to duplication, repetition and even plagiarism in some cases. Most countries have created an online central database where universities as well as researchers post their theses and dissertations. With the proliferation of the Web, this has become a global showcase of research capabilities of each country. Theses and dissertations are known to be the rich and unique source of information, often the only source of research work that does not find its way into various publication channels. The UGC vide its Notification (Minimum Standards & Procedure for Award of. Phil. / Ph.D Degree, Regulation, 2009) dated 1st June 2009 provides for submission of electronic version of theses and dissertation by the researchers in universities in Shodhganga maintained by the INFLIBNET Centre. Universities that sign MoU with the INFLIBNET Centre and mandate submission of electronic version of their theses and dissertation to Shodhganga may get financial assistance from the UGC for digitizing their back-files of theses. Besides, UGC may also provide financial assistance to the INFLIBNET Centre for subscription to software tools that detect plagiarized portion of theses and dissertations. In time to come, ETDs would become more commonplace, grant-giving agencies and accreditation bodies like AICTE, UGC and NAAC would make judgments regarding innovative universities by taking note of their initiatives such as ETDs and IRs. This article aim to explain the purpose and approach of Shodhganga. It is also aim to explain the process and responsibility of every level to submit the ETD.

**Keywords:** Theses, Shodhganga, plagiarism, INFLIBNET, UGC

### 1. Introduction

Theses and dissertations are known to be the rich and unique source of information, often the only source of research work that does not find its way into various publication channels. Theses and dissertations remain an un-tapped and under-utilized asset, leading to unnecessary duplication and repetition that, in effect, is the anti-theses of research and wastage of huge resources, both human and financial. The UGC Notification (Minimum Standards & Procedure for Award of M.Phil. / Ph.D Degree, Regulation, 2009) dated 1st June 2009 mandates submission of electronic version of theses and dissertations by the researchers in universities with an aim to facilitate open access to Indian theses and dissertations to the academic community world-wide. Online availability of electronic theses through Ancestrally-maintained digital repositories, 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 (called "Shodhganga"), accessible to all institutions and universities, is assigned to the INFLIBNET Centre.

"Shodhganga" is the name coined to denote digital repository of Indian Electronic Theses and Dissertations set-up by the INFLIBNET Centre. The word "Shodh" originates from Sanskrit and stands for research and discovery. The "Ganga" is the holiest, largest and longest of all rivers in Indian subcontinent. The Ganga is the symbol of India's age-long culture and civilisation, everchanging, ever-flowing, ever-loved and revered by its people, and has held India's heart captive and drawn uncounted millions to her banks since the dawn

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of history. Shodhganga stands for the reservoir of Indian intellectual output stored in a repository hosted and maintained by the INFLIBNET Centre.

The Shodhganga@INFLIBNET is set-up using an open source digital repository software called DSpace developed by MIT (Massachusetts Institute of Technology) in partnership between Hewlett-Packard (HP). The DSpace uses internationally recognized protocols and interoperability standards. Shodhganga provides a platform for research scholars 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 (Electronic Theses and Dissertations) submitted by the researchers.

DSpace supports "Open Archives Initiative's Protocol for Metadata Harvesting" (OAI-PMH) and uses a qualified version of the Dublin Core schema for its metadata. The INFLIBNET Centre, promotes setting-up of institutional and ETD repositories in member universities using OAI-PMH compliant software. A number of member universities have already set-up their institutional and ETD repositories using either DSpace or other OAI-PMH compliant Institutional Repository software. It would be possible for universities having sufficient network and computing infrastructure to maintain their own ETD repositories wherein their research scholars could deposit e-versions of their theses and dissertations. Moreover, they can use Shodhganga to host their theses as backup archives. INFLIBNET Centre, besides maintaining the Central ETD Repository (Shodhganga) would also deploy a central server to harvest the metadata from all such ETD repositories distributed in universities with an aim to provide unified access to theses and dissertations through its harvesting server.

Shodhganga replicates academic structure of each University in terms of Departments/ Centres/ Colleges each University has to facilitate ease of navigation. This structure facilitates research scholars from universities to deposit their theses in the respective Department / Centre / College. The Centre is also developing a semantic web-based interface to facilitate subject-based browsing, navigation, search and retrieval of content available in the repository.

## 2. Aim of Shodhganga

The UGC vide its Notification (Minimum Standards & Procedure for Award of. Phil. / Ph.D Degree, Regulation, 2009) dated 1st June 2009 provides for submission of electronic version of theses and dissertation by the researchers in universities in Shodhganga maintained by the INFLIBNET Centre. Universities that sign MoU with the INFLIBNET Centre and mandate submission of electronic version of their theses and dissertation to Shodhganga may get financial assistance from the UGC for digitizing their back-files of theses. Besides, UGC may also provide financial assistance to the INFLIBNET Centre for subscription to software tools that detect plagiarized portion of theses and dissertations. Access to software designed to detect plagiarism will be provided to universities that sign MoU with the INFLIBNET Centre for Shodhganga. In time to come, ETDs would become more commonplace, grant-giving agencies and accreditation bodies like AICTE, UGC and NAAC would make judgments regarding innovative universities by taking note of their initiatives such as ETDs and IRs.

Furthermore, Plagiarism is a major concern in the area of research which results in the poor quality of research. Proper

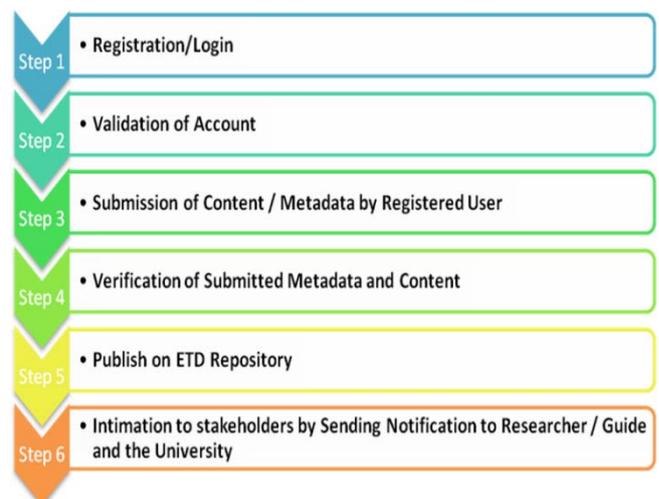
software tools are now available to detect and deter plagiarism. The increased visibility of theses and dissertations through open access repositories would further act as a deterrent to plagiarism. Moreover, it will attract other organisations in India and abroad to collaborate with Indian universities on topics of mutual interests. Besides, availability of formidable number of theses through a single repository would facilitate the INFLIBNET Centre to launch alerting and analytical services deploying data mining and other technology tools.

## 3 Objectives

- To examine the provision made in the UGC Notification (Minimum Standards & Procedure for Award of M.Phil. / Ph.D Degree), Regulation, 2009 regarding submission of electronic version of Ph.D. theses to the UGC / INFLIBNET Centre
- To examine the proposal evolved by the INFLIBNET Centre regarding implementation of ETDs and advice on the financial provision;
- To advice and examine the role to be played by INFLIBNET Centre / individual universities
- Methodologies / procedures to be followed for implementing of ETDs in universities / other institutions of higher learning across the country
- Propose standards and protocols to be used to ensure inter-operability of ETD repositories set-up by individual universities
- Propose standards for formats, resolution, etc. to be used in the process of digitization of old Ph.D. theses
- To constitute sub-committee for smooth functioning of different task for successful implementation of ETD.

## 4 Submission Process

The Shodhganga repository at INFLIBNET replicates structure of each university in terms of Departments / Centres and School each university has. This structure facilitates researchers from each university to deposit their theses in the respective Department / Centre. While online submission of electronic theses by researchers / supervisor or university's representative under university's mandate is preferred, the INFLIBNET encourages individual researchers to submit their theses and dissertations either online or off-line (through E-mail or CD / DVD) on voluntary basis till universities adopt and implement UGC Notification, 2009. Workflow for submission of electronic version of theses and dissertations consists of the following six steps:



**4.1 Step 1. Registration/Login**

The Ph.D. student, his / her research supervisor or an authorized representative of the University (submitter), visits the INFLIBNET's ETD Web site and register himself / herself following the steps mentioned below:

- a. Visit ETD Registration Website
- b. Choose University and Department
- c. Choose Role (Researcher / Guide / University Representative)
- d. Enter e-mail ID (User-ID) and other details and upload scanned copy of certificate

**4.2 Step 2. Validation of Account**

As soon as a submitter registers himself / herself, an e-mail alert is triggered alerting INFLIBNET Staff to validate the registered user and allow him / her to submit his / her thesis. As soon as the account is validated by the concerned INFLIBNET staff, an email addressed to the submitter is triggered with a web link prompting him / her to submit his / her thesis.

**4.3 Step 3. Submission of Content / Metadata by Registered User**

After validation of account, submitter is permitted to create metadata for his / her thesis and upload the content of his / her thesis. During the process of submission, the researcher (submitter) is also asked to grant non-exclusive rights to the INFLIBNET Centre to host his / her theses in the INFLIBNET's open access digital repository. In case, a user sends his / her thesis via e-mail / CD, the INFLIBNET staff will be responsible for creation of metadata and uploading the theses on behalf of the submitter.

**4.4 Step 4. Verification of Submitted Metadata and Content**

The metadata created and chapter uploaded by the submitter will have to be verified for its completeness and correctness preferably by the research supervisor or university representative or alternatively by the INFLIBNET Staff. As soon as a submitter creates metadata for his / her theses and upload chapters of his / her theses, an e-mail is triggered to the research supervisor(s) / university representative to verify correctness and completeness of theses submitted.

**4.5 Step 5. Publish on ETD Repository**

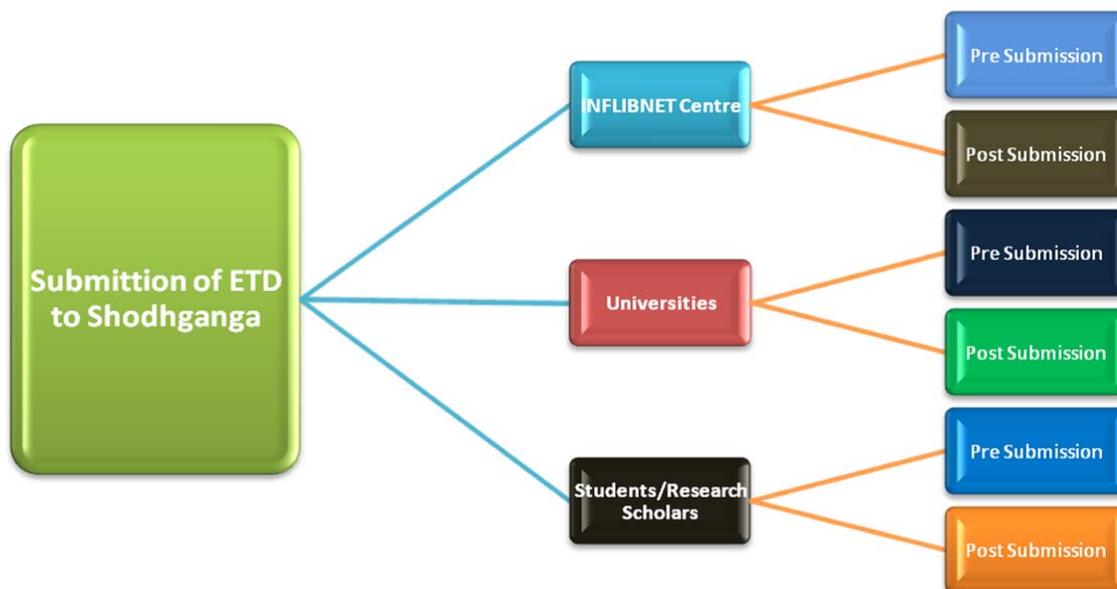
Once the metadata and uploaded content are verified for its completeness and correctness in the process mentioned above, theses get published in the ETD repository. While the metadata of thesis could be made available on submission, the full-text of thesis would be published only after receiving confirmation of award of degree by the University through notification / e-mail confirmation (in cases where theses is submitted prior to award of theses).

**4.6 Step 6. Intimation to stakeholders by Sending Notification to Researcher / Guide and the University**

Once full-text of theses is published in the INFLIBNET's ETD repository, all stakeholders including researcher, guide and the university will be informed through email which will be triggered automatically by the ETD repository. RSS Feed technology will be used to disseminate and deliver new content added to the ETD repository to the users.

**5. Roles and Responsibilities of Inflibnet, Universities and Researchers**

Successful execution of "Shodhganga" necessitates that all the three stake holders involves in the process of content generation, hosting and extending access should have well-defined roles and responsibilities. Roles and responsibilities of INFLIBNET, Universities, researchers are as follows:



5.1 Roles and Responsibilities of INFLIBNET Centre	
Pre-submission	Post-submission
<ul style="list-style-type: none"> <li>❖ Define and provide multiple methods that can be used by students/universities to submit their theses and dissertations into the central repository (Shodhganga) ie. online, off-line, officially through University's Research Cell or voluntarily by students themselves and methods to get the thesis authenticated;</li> <li>❖ Set-up web based interface for registration of students prior to</li> </ul>	<ul style="list-style-type: none"> <li>❖ Get all theses submitted to Shodhganga authenticated. Provide appropriate interface to supervisor / designated University Coordinator to authenticate the thesis submitted and send periodic reminders to the concerned person(s) for authenticating the theses.</li> <li>❖ Set-up Web-based interface to facilitate university</li> </ul>

<p>submission of theses into Shodhganga.</p> <ul style="list-style-type: none"> <li>❖ Set-up Shodhganga Repository reflecting organizational structure of all universities so as to facilitate:</li> <li>❖ students to submit their theses into respective department, centre and college; and</li> <li>❖ supervisors/designated University Coordinator to authenticate the theses submitted into Shodhganga by their researcher.</li> <li>❖ Recommend to the UGC to provide financial assistance to universities recognised under 12(B) and 2(f) Sections of the UGC Act for digitization of backlist of theses;</li> <li>❖ Provide system configuration and specifications for procurement of computer hardware and related equipment for setting up of IRs for ETDs in universities;</li> <li>❖ Provide training to one or two persons from each university on various aspects of Shodhganga/ETD repositories; and</li> <li>❖ Provide access to internationally renowned anti-plagiarism software service to the universities to facilitate detection of plagiarism in the theses and dissertations.</li> </ul>	<p>coordinators to create departments/ centres/colleges, etc.</p>
<b>5.2 Roles and Responsibilities of Universities</b>	
<ul style="list-style-type: none"> <li>❖ <b>Mandate Submission of E-theses:</b> Universities signatory to "Shodhganga" should mandate submission of electronic version of theses into Shodhganga. The existing sets of Ph.D. regulations may be suitably modified to include a clause on submission of e-version of Ph.D. theses along with printed version of theses in User Guide.</li> <li>❖ <b>Open Access to ETDs:</b> The universities should allow the INFLIBNET Centre to host and share full-text theses and dissertations submitted to their universities in open access through Shodhganga.</li> <li>❖ <b>Copyright and IPR:</b> The universities should agree to abide by copyright laws and IPR for their theses. The universities should make all attempts to deter plagiarism in theses submitted to their universities.</li> <li>❖ <b>Extend Infrastructural Facility:</b> The universities should extend computer and network infrastructure and requisite software to facilitate online submission of theses and dissertations by researchers into Shodhganga and requisite manpower for support and guidance.</li> <li>❖ <b>Digitization of Theses:</b> The universities should agree to digitize its backlist of theses and dissertations (at least for past five years) and associated metadata using funds made available by the UGC. The universities should also commit to invest its own funds, if required, for this purpose.</li> <li>❖ <b>Student Approval Form:</b> Universities should obtain declaration/consent from the students assigning non-exclusive rights to archive and distribute their doctoral work through Shodhganga as well as through university's IR in full-text.</li> <li>❖ <b>Submission Format:</b> Universities should formulate or adopt a policy on ETD submission format. Students may be encouraged to submit their theses preferably in PDF format. Alternatively, they may also be allowed to make submission in Open Office document format, MS Office document format, Tex, LaTeX, or other standard formats approved by the university. Facility for converting various formats into PDF may be provided in the Research Cell or in the library of university.</li> <li>❖ <b>Training to Students:</b> Universities may organize formal training programme(s) to educate students on various aspects of electronic submission of theses and dissertations including its advantages, creation, submission, conversion from native format into PDF, etc. The INFLIBNET Centre would proactively help universities in this process.</li> <li>❖ <b>Institutional Repository:</b> Universities may set-up and maintain their institutional repository of e-theses. All the theses submitted to a university should be archived and maintained in the institutional repository set-up for this purpose in addition to making a copy available into "Shodhganga" as per the provision of MoU on Shodhganga.</li> <li>❖ <b>E-Theses Web Site:</b> The web site of each University should provide information to the students regarding policy and procedures for electronic submission of theses and dissertations. It should also provide link to the Shodhganga at the INFLIBNET</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>Submission of E-theses to INFLIBNET's Shodhganga:</b> Research scholars/authorized person from the University should be instructed to submit electronic version of theses in Shodhganga on regular basis.</li> <li>❖ <b>Alternate Submission:</b> If a university is not able to facilitate online submission of theses into Shodhganga, the university may accept e-version of theses on CD ROM / DVD ROM and send it to the INFLIBNET for offline submission.</li> <li>❖ <b>Authenticate Theses Submitted by Research Student to Shodhganga:</b> University should either designate one of its officers as University Coordinator for Shodhganga (e.g. Asstt. Registrar, Research Cell or Librarian) or research supervisor of the thesis to verify or certify that the student has submitted complete, correct and same version of thesis that is submitted in print.</li> </ul>

<p>web site from University website or Library website.</p> <ul style="list-style-type: none"> <li>❖ <b>Develop File Naming Convention:</b> Universities may define or adopt a formal convention for file name so as to have unique name for each file that are meaningful and convey the content of files being uploaded. Students may be instructed to store and upload each chapter in a separate file using an agreed file naming convention. It is suggested to start the file with 01_title_, 02_certificate_, 03_Abstract and so on, so that the content of thesis are displayed in the record as they appear in hard copy of thesis. It will also allow users to quickly look at the table of content and other introductory information without having to wait for the entire thesis to download.</li> <li>❖ <b>IPR Policy for University:</b> Each university should evolve IPR policy relating to the doctoral theses.</li> </ul>	
<b>5.3 Responsibilities of Students/Research Scholars</b>	
<ul style="list-style-type: none"> <li>❖ <b>Use Standard Application Software:</b> For composing the thesis, students/research scholars should use standard software.</li> <li>❖ <b>Use Standard Template and Citation Style:</b> Ensure that a standard template is used for compilation of a thesis and it contains all essential elements (like declaration, certificate, table of content, list of tables and figures, list of appendices, abbreviation used, abstract/ summary, chapters, conclusion and bibliography). In the website provides standard template for a thesis. Use standard citation style for rendering bibliographic references as well as web resources. (For example: APA/BIOSIS Style Manual/Chicago Style Manual).</li> <li>❖ <b>Register on Shodhganga Web Site:</b> A researcher should register himself/herself on Shodhganga web site and create an account so as to submit his/her thesis. In this process, researcher is assigned a user name (ie. e-mail ID) and password to register in the database that can be used for submission as well as for editing of submitted record and files.</li> <li>❖ <b>Create Multiple Files and Use File Name Convention:</b> Create a file for each chapter. Initial pages of thesis such as acknowledgement, certificate, abstract, etc. may be named as mentioned at 5.2.1.(xi) A formal convention for file name may be used so as to have a unique name for each file that are meaningful and convey the content of files uploaded.</li> <li>❖ <b>Convert all Files into PDF:</b> Convert all files into PDF before uploading them into Shodhganga.</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>Enter Metadata or Bibliographic Information:</b> Once registered and logged-in, researcher would be required to create metadata for his/her thesis based on basic bibliographic information. Researcher may, if required, edit the record thus created.</li> <li>❖ <b>Assign Keywords/ Descriptors:</b> Assign appropriate keywords/descriptors to thesis. If possible, use subject thesaurus / subject headings available in university library.</li> <li>❖ <b>Uploading E-Thesis Files:</b> Once bibliographic record is created, the researcher is required to upload files containing full-text of his / her thesis. Ensure use of corrected electronic version of theses incorporating all corrections/ modifications in it.</li> <li>❖ <b>Get Your Thesis Authenticated:</b> Student should request his/her guide/university coordinator to authenticate the thesis submitted into Shodhganga.</li> </ul>

## 6. Conclusion

India does not have a central repository in which theses are stored from various PhDs across different disciplines. This has led to various kinds of problems from lack of visibility for Indian research to duplication, repetition and even plagiarism in some cases. Most countries have created an online central database where universities as well as researchers post their theses and dissertations. With the proliferation of the Web, this has become a global showcase of research capabilities of each country. Electronically publish Theses & Dissertations make the results known nationally and internationally and ETDs can identify and connect national and international research groups. The Shodhganga initiatives started in India the popularity of this concept is growing rapidly in the higher educational and research institutions as a method to disseminate newly emerged knowledge and expertise. Shodhganga repositories can expose the intellectual output of country to a wider audience with the help of internet.

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