

**Development and Management of Institutional Repository for
Tilak Maharashtra Vidyapeeth Pune : Plan of Action**

**A Dissertation Submitted to the
Tilak Maharashtra Vidyapeeth, Pune**

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LIBRARY AND INFORMATION SCIENCE

Submitted by

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DECLARATION

I hereby declare that the dissertation entitled “**Development and Management of Institutional Repository for Tilak Maharashtra Vidyapeeth Pune : Plan of Action**” completed by me for the degree of Master of Philosophy in library and Information Science. The entire work embodied in this thesis has been carried out by me under the guidance of Dr. N.B. Dahibhate, National Chemical Laboratory, and Digital Information Resource Center (DIRC) Pune.

Place: Pune

Date: 12th January 2015

(Ms Sujata Sambhaji Hargude)

Research Student (M.Phil.)

CERTIFICATE

This is to certify that the thesis entitled “**Development and Management of Institutional Repository for Tilak Maharashtra Vidyapeeth Pune : Plan of Action**” which is being submitted herewith for the award of the Degree of Master of Philosophy (M.Phil.) in Library and Information Science of Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by **Ms. Sujata Sambhaji Hargude** under my supervision and guidance. To the best of my knowledge and belief the work incorporated in this thesis has not formed the basis for award of any Degree or similar title of this or any other University or examining body.

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Executive Summary

Institutional repositories generally covers digital collections capturing and preserving the intellectual output of a single or multi-university community and provide services to the academic institutions. Such repositories are critical components in reforming the system of scholarly communication, a component that expands access to research, reasserts control over scholarship by the academy, increases competition and reduces the monopoly power of journals, and brings economic relief and heightened relevance to the institutions and libraries that support them. IR has the potential to serve as tangible indicators of a university's quality and to demonstrate the scientific, societal, and economic relevance of its research activities. This also increases the institution's visibility, status, and public value.

Institutional repositories can provide an immediate and valuable complement to the existing scholarly publishing model, while stimulating innovation in a new disaggregated publishing structure that may evolve and improve over time. Further, IR build to develop practice of self-posting research online. IR offer a strategic response to systemic problems in the existing scholarly journal system and the response can be applied immediately, reaping both short-term and ongoing benefits for universities and their faculty and advancing the positive transformation of scholarly communication over the long term.

This research study is performed to study and examines different elements of institutional repositories strategically, from two complementary perspectives: 1) as a natural extension of academic institutions' responsibility as generators of primary research seeking to preserve and leverage their constituents intellectual assets; and 2) as one potentially major component in the evolving structure of scholarly communication. We describe the roles of institutional repositories in this study structure and explore the impact on major stakeholders in the process and outcomes.

The aim of institutional repositories is to aid the management and dissemination of scholarly electronic resources produced by academics. To date most research has focused on the impact for formal scholarly publishing. The purpose of this exploratory research study is to discover the impact of IRs on the visibility and use of digital resources with particular focus on resources available in institutes and outside the formal publishing area. The present study focuses mainly on the different issues of IR like need, development, challenges faced, selection of HW and SW, IR softwares, functions and purpose of IR in digital era and well as need of the policies to maintain the IR.

This is a sort of experience shared with the professionals indicating the intricacies of developing IR, this helps the professionals to develop an IR for their library comfortably. The objectives fixed for this researched study were:

- 1 To study the importance and requirements for developing institutional repository.
- 2 To study the different components required for development of IR.
- 3 To analyze different software available for developing IR.
- 4 To critically examine the collection available in TMV to add in the repository.
- 5 To prepare a plan for development of IR for TMV.
- 6 To develop an IR with some data and software from TMV records.
- 7 To prepare a policy for maintenance of the IR.

The hypotheses considered are:

- IR initiation is not strong enough in university or academic libraries and need to analyze the challenges
- IR helps in developing resource sharing but such efforts are needed more in academic sector.

The research method adopted is descriptive research in which data is compiled using different publications published (secondary analysis) similarly evaluative technique to assess the utility of SW useful to develop iR from the many SW available for the same purpose. An online survey and interviews with repository managers were conducted especially from CSIR-NCL Pune and determined types of web resources which can be linked to items within repositories.

The experience of developing an IR in TMV shows that a wide range of non-formal e-resources are accepted and repository managers' attitudes are positive towards their importance. Workflow processes for content acquisition in repositories vary considerably and are quite complex in particular for non-formal e-resources. Repository managers consider usage data important and its most popular uses are for advocacy and securing funding.

The study demonstrates that institutional repositories are not particularly successful at handling of resources outside the framework of formal publishing.

The research study is completed in seven chapters as details below:

Chapter 1: Introduction: This chapter covers general background of the study and reason to select this research study, aim and objectives of research study. The research method is also elaborated in this chapter with scope and limitations.

Chapter 2: Literature Review: This chapter covers the review of the literature which is analysed in facets like IR: definitions, concepts, need, functions, benefits; overview of IR, Case studies, software's for IR, IR and role of the librarian etc. The detailed review of the communications published in the various information sources helped uses in drafting the concepts in different chapters as well as supporting to the statements made in the text.

Chapter 3: Institutional Repository: Concepts, Need, Characteristics and Benefits

This chapter is an overview in which researcher has narrated the details of the IR right from the definitions, need to the benefits and software's available etc. The detailed study is performed by the researcher in respect of IR and reported in this chapter.

Chapter 4: Tilak Maharashtra Vidyapeeth: A Treasure of Information Wealth In this chapter a review of the TMV collection its importance and need to include in IR is discussed and a plan is suggested in the following chapters.

Chapter 5: Institutional Repositories: Software's and Technical Support This chapter is an analysis of the OSS available for developing IR. Based on the analytical study suitable software is selected for the IR in TMV

Chapter 6: Model Plan for the Development of IR for the TMV In this chapter a model plan is suggested by the researcher to develop an IR for the TMV and different working phases in it.

Chapter 7: Suggestions and Conclusion This chapter is based on the suggestions to develop a sustainable repository for IR and concluded the study with scope for the future researchers in this area.

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Abbreviations

Abbreviations	Detailed Full Form
DL	Digital Library
DOAR	Directory of Open Access Repositories
DOI	Digital Object Identifier
ETD	Electronic Theses and Dissertations
FEDORA	Flexible Extensible Digital Object and Repository Architecture
GSDL	Greenstone Digital Library
HTML	HTML Hyper Text Markup Language
HW	Hard ware
ICT	Information Communication Technology
IIMK	Indian Institute of Management, Kozhikode
IITB	IIT Bombay
INFLIBNET	Information and Library Network
IPR	Intellectual Property Rights
IR	Institutional Repository
LAN	Local Area Network
MIT	MIT Massachusetts Institute of Technology
MIT	Massachusetts Institute of Technology
NCL	National Chemical laboratory
NCSA	National Centre for Supercomputing Applications
OA	Open Access
OAI	Open Archives Initiative
OCR	OCR Optical Character Recognition
OSS	Open Source Software
PDF	Portable Document Format
RDBMS	Relational Database Management System.
RM	Research Methodology
ROAR	Registry of Open Access Repositories
RoMEO	Rights Metadata for Open archiving

RS	Resource Sharing
SLIM	System for Library and Information Management
SW	Software
WAN	Wide Area Network

Chapter 1: Introduction

1.1 Introduction:

The advent of Internet has proved to be a great boon for accessing any information from any part of the world practically in no time either free or subscribed or paid. Information society uses the published information and also adds new knowledge base based on the existing information. Information society contribute information and knowledge in different forms such as books, periodicals, patents, theses, standards, catalogues, dictionaries, encyclopedias, bibliographies, reviews etc. The publishing practices are changing due to use of ICT and traditional printing is shifting towards e-publishing and most of the information is uploaded over the web tools and net by the publishers for developing awareness among users and scholars and also to get instant availability of the information about the knowledge contribution. The open access publishing is also leading ahead in the information society. The open access publishing permit all users to read, download, use, disseminate, print or link to the original full text source of the same, carry them to indexing, and use the same as raw data. Institutional repositories are significant platform of open access such as open access discussion forum, open access journals, self-archiving etc.

Trends in using ICT i.e. computing, communication, networking, digital publications, and digital libraries change the activities of library and Information centres and developed a new area. Information technology has played an important role in library and information science. Due to the developments in information technology, now, it is possible for libraries to provide several new services to the library users along with traditional services. Libraries are now able to provide information in print form as well as in digital form. Information Communication Technology being used in the profession since 1980's. The traditional practices and the methods are shifted due to use of the technology and changed the face of libraries from traditional (In which print media was the major contribution) to the electronic (using electronic Gadgets to operate the functions and to store the voluminous information in electronic for using computers) and then to digital in which the information is store in digital media and everything is in digital form. Internet played a major role in establishing the network.

IT and its application in library supported to the benefits like resource sharing, knowledge base database creation, capturing images, acquiring e-contents and storing in digital form and retrieval in digital form. The drastic change from paper to electronic media made impact over libraries. This also supported to develop digital libraries and institutional repositories.

Libraries and information centers are changing their face and practices new methods by applying information technology to carry out different activities and functions in libraries more effectively and efficiently. ICT has helped libraries to modernize and also develop specialized databases and storage of information which can be retrievable at any time. Shifting trends in publishing from print to digital proved as boon in publishing and storage of information generated in different sources for the use. Research without information is difficult and hence it is necessary to organize the information published in different ways by an organization to avoid duplication of efforts. Due to new techniques, technologies and methods followed in preserving documents i.e. digital as well as retro conversion from print to digital by way of digitization helped for quick dissemination of information in the society. If every institute or educational organizations brings its scholarly communication under one group and make it available to scholars then it would be a great help for the students, researchers and faculty to select new areas and get the literature available in an organization for further new research. Due to availability of open source software, development of institutional repository is possible for either librarians or technology persons or academic staff in any organization.

1.2 Background:

Institutional repositories are created all over the world to preserve and share intellectual output of the scholarly literature published by the faculty, students and other members of the organization. It serves as a channel to record origin, history, development and activities of the Institution's various activities related to academic, administrative and other units since its inception. The objective of the repository is to ensure archiving and dissemination of all documents that are initiated by all members of the institute. Most records added in the repository are open and available for use by students, faculty, and staff of the Institute or outside the institute. However, in order to

protect the records and to ensure their long-term preservation and accessibility, materials added to the repository are properly authenticated and authorized.

Institutional Repository is established to provide services to institute members and its community to support the development of new concepts and provide assistance in available literature published in the past. It is an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, collection, organization, preservation and access or distribution is effectively monitored. Libraries of leading research institutions and universities are now developing IR and archive research papers of scientists and scholars of their institution. These repositories are used by the entire research community. Some institution in India, like Indian Institute of Science, Bangalore, Indian Institute of Management, Kozikode, Indian Institute of Technology, Delhi, National Institute Technology, Rourela, National Chemical Laboratory, Pune, Indira Gandhi Open University and many more have developed their open access Institutional Repositories (IRs) to disseminate the research output along with courseware of their institute available on their IR through Internet. Due to availability of IRs users can easily retrieve information. Sometimes these are self archived; otherwise administrators of the repositories collect the research documents from different sources and submit them to the IR on behalf of the organisation. There is no doubt need of the IR in the academic institutes as these are main creators of the information. Around 850 institutional repository projects have been initiated by various academic and research organisation these includes electronics thesis and dissertations project. Online access to the documents significantly increases the use of these repositories which in turn lead to greater citation to literature. It is necessary to study in depth the development of IR for every academic institute.

1.3 Role of IR in Sharing Information

IR serves as a source for scholarly collection of information published or compiled in an institution. Different authors and scholars defined IR but “an Institutional Repository is an organization based set of services which the organization offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially

an organizational commitment to the stewardship of these digital materials, including long-term preservation, where appropriate, as well as organization and access or distribution” (Lynch, 2003)

Institutional repository includes variety of document materials produced by scholars from many units, such as preprints, post prints, technical reports, theses and dissertations, data sets and teaching materials. Some institutional repositories are also being used as electronic presses, publishing e-books and e-journals. (Bailey, 2005). IR is very useful information product which helps in compiling the institutional intellectual resources at one place and make it available for common use.

1.4 Reason for Selecting the Topic:

The reason to undertake the present study is to make a detailed study in respect of development and maintenance of IR and prepare a base model for the creation of IR in TMV. IR is very useful to researchers and sharing digital resources with others on demand. TMV has sufficient publications and research output which can be converted in to digital media and can be made available to users of TMV through IR. While creating any IR it is necessary to establish IR and also set the policies for its operation. While developing an IR for any organization / institution there is a need to conduct a detailed study covering different components required for the establishment of the repository viz. available technology, hardware, storage capacity, software for IR, scholarly and needful collection, manpower, expertise, contents to be included in IR and maintenance issues and policies for sustainable creation of IR.

TMV is a very old university having very good collection in different areas of knowledge and if these collection are made available to users on Internet collection would be more used as well as they will get wider publicity within organization as well as outside organization. In the present study detailed analysis and study required for the development of IR for TMV has been carried out. Present research will also be useful to TMV as well as other organizations to develop similar IR for their organizations. Hence present study is entitled as “Development and Management of Institutional Repository for Tilak Maharashtra Vidyapeeth, Pune: Plan of Action”.

The main reason behind selecting this study is to develop an IR, for Tilak Maharashtra Vidyapeeth Pune for its intellectual property protection and developing compilation at one place for the efficient use. IR concept is developing fast due to availability of open source software and mandate to open access policy. Developing an IR is not an easy task and need to look into different factors like data, software selection, and administration of IR etc. The IR development depends on organizational, administrative, and cultural aspects of the institution or group of institutions. TMV, Pune library has a large collection of thesis, manuscripts, question papers, scholarly publications published by TMV researchers and some more other documents which have an archival value. These contents are from different subject discipline. Keeping in mind the development of contributions and contents it is essential to develop an IR for TMV which may also act as role model for the other educational institutes and universities.

1.5 Need for the Present Study:

An IR is a digital archive of scholarly and intellectual publications of the organization and this is created by the faculty, researchers, scholars etc of an institute and made it accessible to the users of the institutes as well as similar institutes. IR provides prestige, centralised data, and archive of the rare data or resources at one place and supports to the learning and sharing the organizational literature among the group of users. IR provides many benefits to authors and society, not only this but also ensures safe archival of institute's intellectual academic collection. Thus there is a need to identify the various information resources available in academic organizations to share the contents among the similar users. Tilak Maharashtra Vidyapeeth has long tradition in imparting education and has literature published in various forms and formats. This valuable collection is to be made known to the users, the literature in full text is to be added in the Institutional Repository of TMV, Pune to get free access to the institutional users.

The primary aim of this research study is to investigate the role of institutional repositories and its creation. This study may help in developing networked research environment which allows academics to produce, communicate and access information in different ways and also collects and distributes research output among

the institutes and other institutes. Every academic institute is now planning to develop the IR of their collection and achieve the resources sharing and avoid duplication of efforts in the same organization.

1.6 Aim and Purpose of the Study:

The main aim behind development of IR is to organize the literature published as an intellectual and scholarly output of grey literature of an institute in full text form and provide open access by self archiving at institute.

The purpose is to provide access to institutional literature to everyone and also share the information. For development of IR the main functions involved are document submission (Verification, Authenticity, uploading etc), Archiving (date, identifier, indexing), Dissemination (Search, browse) administration (maintenance) and user registration and directory maintenance etc. digital archives of intellectual products created by the faculty, staff, scholars and students of an institution or group of institutions accessible to end users both within and outside the institution is the main aim behind IR.

There are many reasons to implement an IR in an institute and few common ones are : increase the visibility and citation impact of institution's scholarship , provide unified access to institution's scholarship. provide open access to institution's scholarship, create mechanism for sharing information with other institutes and avoid duplication efforts and waste of time

PALS (2004) report stated that universities and research libraries around the world use institutional repository in the following ways:

- Scholarly communication, storing learning materials and courseware's
- Electronic publishing and preserving digital materials for the long term
- Adding to the university's prestige by showcasing its academic research
- Knowledge management and research assessment
- Encouraging open access to scholarly research

- Each university has a unique culture and assets that require a customized approach. The information model that best suits to institution would not fit to another campus.

Objectives behind Developing IR:

An IR is multifunctional and can serve a range of educational purposes and the objectives are:

Provision to the visibility of scholarly publication at local and global level

- Tool for archiving and sharing the resources from the institutional output
- Resource for bringing out the Grey Literature of the Organization
- Enhance the reputation of the library
- Support the open access, and bring in to the light the scholarly communication.
- Preservation of all the institutional documents in digital form at central place and making available to others
- Develop open access and self archiving mechanism
- Marketing efforts

The primary aim of the present research study is to establish an institutional repository at TMV Pune, and present a plan of action for the development of IR including selection of software and defining policy of sustainable IR at TMV. The purpose is to develop an IR in TMV and make the scholarly and archival information available in TMV to the researchers. This research study on development of repositories is also useful to all the professionals working in different libraries and information centers.

1.7 Objectives of the Study:

The objectives considered for this study are:

- 1 To study the importance and requirements for developing institutional repository.
- 2 To study the different components required for development of IR.
- 3 To analyze different software available for developing IR.

- 4 To critically examine the collection available in TMV to add in the repository.
- 5 To prepare a plan for development of IR for TMV.
- 6 To develop an IR with some data and software from TMV records.
- 7 To prepare a policy for maintenance of the IR.

1.8 Hypothesis:

The hypothesis considered for this study is:

- IR initiation is not strong enough in university or academic libraries and need to analyze the challenges.
- IR helps in developing resource sharing but such efforts are needed more in academic sector.

1.9 Scope and Limitations:

This study is mainly concerned with development of IR and its maintenance. In this study different hardware, selection of software, evaluation of the software will be focused in detail. Based on the depth study for the TMV library, IR is developed and few entries are made using open source software. A policy and a guide lines for managing the IR is also developed. The scope of the content is restricted to digital documents available in TMV library only in the beginning.

Tilak Maharashtra Vidyapeeth - Pune was established in 1921 as per the directions given by Mahatma Gandhi. This Vidyapeeth was established as an educational memorial of Lokmanya Bal Gangadhar Tilak. The main aim of establishment of this Vidyapeeth was imparting National Education.

The excellent work done in the field of Sanskrit, Ayurveda, Social science and Distance Education was taken into account by the UGC, New Delhi and on its recommendations the status of a “Deemed to be University” to the Tilak Maharashtra Vidyapeeth in the 1987. With its top class infrastructural facilities, quality education is provided to students by the professionally qualified and experienced faculty. All the courses conducted and degrees awarded by the Vidyapeeth are as per the norms and guidelines of UGC. The Departments like Administration, Accounts, Examination, Admission Section, Publication and Library are centralized and computerized. These

Departments are well-equipped with ICT facilities. With a team of dedicated staff the Vidyapeeth is all geared up to serve the student community as per the changing educational environment. TMV Vidyapeeth has achieved tremendous progress through quantitative expansion and qualitative improvements on various academic fronts. The Vidyapeeth is committed to maximize the knowledge and skills of students, thus making them competent. The ethics of value-based education system are strictly followed in the Vidyapeeth to promote good character building among the young generation.

The Tilak Maharashtra Vidyapeeth library was established in 1965. Collection available in the library include collection from different subject areas such as Sanskrit, Ayurveda, Philosophy, Social science, Management, engineering, Education etc. Library also holds excellent collection on reference books. The TMV library is getting access to many online journals through the UGC-INFONET consortia apart from the UGC-INFONET e-journals. TMV library is also subscribing 3 databases such as EBSCO, Manupatra, All India Reporter. Currently from TMV Library services offered for users are Photocopy, scanning, newspaper clipping, email alerts, reading hall facility to students and members of staff of TMV, Web OPAC access, subscription to various electronic journals. Presently library I using library software named as **SLIM-21** (Network version with web –OPAC) with online OPAC system. Total collection available in TMV-Library is:

Sr. No.	Name of collection	No. of collection
1.	Books	92060
2.	Journal/ Periodicals	230
3.	Ph.D. Thesis	380
4.	M.Phil. Dissertation	376
5.	CD's	270
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Table 1.1 Library Collection

This Vidyapeeth has a special importance of collection of Sanskrit and Tibetan Manuscripts from 16th, 17th Century. These manuscripts are kept well folded in red and yellow cloth. They have been arranged and kept separately.

The rare manuscripts collections of this Vidyapeeth are in Sanskrit language, a few in Ayurveda and some in Tibetan languages which may prove to be of tremendous importance to the research scholars both at national and international level.

It is very essential that these manuscripts may be digitized and their access may be increased through the Institutional Repository for the research community. Currently library holds large number of these manuscripts in digitized form. More than 1400 manuscripts are already scanned and are available in TMV library in CD format under the project of Patanjali. This hidden treasure must be brought out and made available for the benefit of all.

1.10 Research Methodology:

Research method is basically selected based on the nature of study and work. In this study the research methodology used is mainly based on descriptive and experimental research. Research is a matter of raising a question and then trying to find out the answer. In other words, research means a sort of investigation describing the fact that some problem is being investigated to shed for generalization. Research is activity of solving problem which adds latest information and developing theory as well as gathering of proof to test generalization. The Webster's International Dictionary defines research as "a careful critical enquiry or examination in seeking facts for principles, diligent investigation in order to ascertain something."

Francis Rummel: "Research is a careful inquiry or examination to discover new information or relationships and expand and to verify existing knowledge."

Lundberg: Research is sufficiently objective and systematic to make possible classification, generalisation and verification of the data observed.”

Types of research:

- Historical research
- Descriptive research
- Experimental research

The Present study is mainly based on descriptive as well as experimental research methods. An IR is set up for the compilation of the intellectual collections available in TMV library.

Experimental research is considered to be the mirror image of the scientific methods. It involves process for gaining knowledge by collecting new or fresh observations under controlled situation. In experimental research the independent variable as well as dependent variable are involved where the former can be manipulated as an experimental variable in order to see the effect on the latter. The experimental research is again divided in to (a) laboratory experiment and (b) field experiment.

Experimental approach is generally regarded more rigorous than other two approaches. Unlike the other two, experimental approach can be used to study casual relationship. This is mainly due to the use of true experimental designs, which use equivalent comparison group, allowing manipulation of experimental variables and controlling influences on the dependable variables.

The present work deals with the evaluation and selection of Open Source Digital Library Software. Experimental concepts create a model of IR in available material of TMV, library. The selection of OSS-DL software is made under the basic criteria of having the soft-ware available through Open Source License terms and conditions as well as available free on Internet.

The RM is based on the nature of research and generally more than two methods are also needed to apply to get the proper results. The descriptive research method in which secondary research method is used in which the published literature in terms of repositories are collected from different forms like books, journal articles, reports,

thesis etc. The analytical assessment of literature was very useful in getting the opinions of experts, need of IR, development of effective IR, selection of software and also framing policies. It also helped in building the model. Thus this study is based on descriptive research, covering survey and analysis of published literature (documentary or secondary analysis), interview and observation as well as loading the software and testing its suitability are the core efforts made by the researcher to develop IR which can be sustainable. In addition to this, the researcher has used comparative and experimental process to complete the task and develop an IR for TMV.

1.11 Analysis of the Previous Studies:

According to Busha and Harter (1980) “A literature search and literature review is an attempt made by the researcher to identify, locate and synthesize published research reports, articles, books and other materials about specific problems of a research topic.” Literature search process is essential to understand the general problem and its context as well as review the past development in the area and plan the research to avoid duplication in the research study. Hence the researcher has made an effort to track the similar or related studies to IR and the records found are placed below.

There are many studies noticed while searching literature. These are reported below.

- Lalitha P et al (2005) Building an Image Repository for Indian Cultural Heritage Materials – A Digital Library Approach. 3rd Convention PLANNER -2005, Assam Univ., Silchar, 10-11 Nov., 2005
- Shreeves Sarah L. and Cragin Melissa H. (2008) Introduction: Institutional Repositories: Current State and Future. Library Trends Vol 57(2) Fall pp 89-97
- Mishra, J (2010) Institutional Repositories and Libraries. IASLIC Bulletin Vol.56(2) pp 126-128
- Bansode, S. (2011) Developing Institutional Repository in University Library. International Journal of Information Dissemination and Technology. Vol. 1(4) Oct-Dec pp 188-192.

- Shewale, N. (2012) Building Digital Library using DSpace : Case Study of GIPE's Dhananjayrao Gadgil Digital Library. DESIDOC Journal of Library & Information Technology. Vol. 32(5) September pp 417-420
- Gireesh Kumar, T K and Jaya P. M. (2013) Knowledge Management and Electronic thesis and dissertations in Libraries: Perils and solutions in Indian Perspective. AISLIC Bulletin Vol.58(4) pp 206-227
- Nandi, S G and Mazumdar, R P (2013). Institutional Repository of Visva-Bharati University Library: The practical Approach. IASLIC Bulletin. Vol. 58(3) September PP 159-175
- Sinha, M.(2013) Scenario of Institutional and Digital Repositories in Academic and Technical Libraries of India for Open Access. IASLIC Bulletin Vol. 58(1) pp 29-48.

From these studies it is reflected that there is a need to undertake a study of IR and develop an IR for the TMV University for preserving the valuable culture. Such effort is not yet traced in the study and hence the topic “Development and Management of Institutional Repository for Tilak Maharashtra Vidyapeeth Pune : Plan of Action” was undertaken.

1.12 Structure of the Research Study:

The total research study is organised in seven chapters.

Chapter 1: Introduction

This chapter covers general background of the study and reasons to select this research study, aim and objectives of research study. The research method is also elaborated in this chapter with scope and limitations.

Chapter 2: Literature Review

This chapter covers the review of the literature which is analysed in facets like IR: definitions, concepts, need, functions, benefits; overview of IR, Case studies, software's for IR, IR and role of the librarian etc. The detailed review of the communications published in the various information sources helped uses in drafting

the concepts in different chapters as well as supporting to the statements made in the text.

Chapter 3: Institutional Repository: Concepts, Need, Characteristics and Benefits

This chapter is an overview in which researcher has narrated the details of the IR right from the definitions, need to the benefits and software's available etc. The detailed study is performed by the researcher in respect of IR and reported in this chapter.

Chapter 4: Tilak Maharashtra Vidyapeeth : A Treasure of Information Wealth

In this chapter a review of the TMV collection its importance and need to include in IR is discussed and a plan is suggested in the following chapters.

Chapter 5: Institutional Repositories: Software and Technical Support

This chapter is an analysis of the OSS available for developing IR. Based on the analytical study suitable software is selected for the IR in TMV.

Chapter 6: Action Plan for the Development of IR for the TMV

In this chapter a model plan is suggested by the researcher to develop an IR for the TMV and different working phases in it.

Chapter 7: Suggestions and Conclusion

This chapter is based on the suggestions to develop a sustainable repository for IR and concluded the study with scope for the future researchers in this area.

Summary of the Chapter:

This chapter has focused the importance of IR in its development. Technological change, in the form of digital publishing technologies and ubiquitous networking, has driven the demand for broader access to research and for more robust digital presentation. All these factors have evolved and combined to create new expectations in the academic community for the production, distribution, and interchange of scholarly communications and to force a rethinking of the relative roles of authors, librarians, and publishers as well as the possibility of entirely new actors who may emerge as the publishing model evolves. In such an environment, institutional

repositories might well act to preserve an institution's intellectual work product while contributing to a fundamental, and long-term, change in the structure of scholarly communication. This research study explores the impact that institutional repositories, digital collections that preserve and provide access to the intellectual output of an institutional community, and the potential benefit they deliver to the institutions. The potential roles of institutional digital repositories in the evolving structure of scholarly communication and relative to alternative repository models. Based on the study the researcher planned to develop IR for the TMV.

In addition to this researcher has elaborated the research methods used, aim and objectives, scope and limitations of the study etc.

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Chapter 2: Literature Review

2.1 Introduction:

Literature review is important for research studies because it describes how the proposed research is related to prior research in statistics and concepts and proves the originality and relevance of current research problem undertaken by the researcher. Literature review also helps in identifying and stating the research is of different nature from other studies conducted and visualized. The decision of fixing research methodology for the study is also decided on the basis of literature review and plan of research. It also presents researchers preparedness to complete the research in proper manner. The literature review is nothing but a critical discussion and summary of literature published and is of 'general' and 'specialized' relevance to the particular area and topic of the research problem. In literature search researcher discover the knowledge exists related to research topic, increase knowledge in research area, helps in identifying gaps (and possibly errors) in published research and based on this generates new original ideas and presents in the research work as well as avoid duplicating the results and justify the relevance of proposed research.

2.2 Why Literature Review:

The literature review performs a number of important functions like: demonstrates the student has read a large amount of literature available on the topic and prove that the student is aware of the wide range of research in theory and methodology related to the proposed research topic. In the research proposal researcher can emphasizes or stress the originality of the dissertation. With-out a good literature review, student cannot convince that the proposed research is original. Literature Review is more than a summary of publications. It provides evidence that research conducted will be an original and relevant contribution to topic.

2.3 Facets Selected for Review:

For the present research study following facets is selected:

1. Institutional Repository (IR) : definition, need and functions, benefits etc
2. Overview of IR in India and case studies

3. Software available for building IR
4. IR: building for the institute Policies and maintenance
5. IR and role of Librarian

The literature scanned form the different published information sources, primary, secondary and Internet based resources.

2.4 Institutional Repository (IR): Definition, Need Functions, and Benefits etc.

In the era of digital information and ICT new methods for archiving knowledge base is growing and IR is one of the new development. IR establishment is now one of the criteria for compiling the institutional intellectual collection in academic sector. The development of IR though looks simple but its maintenance is more complex. The IR is tool used for disclosing publications of the institutes on the web but needs efforts for setting the system. IR is possible due to e-publishing and digital content management and open source software's available for IR. IR is created all over the world to preserve and share intellectual output of the literature published by faculty, researcher, students, and other members of the institute. IR serves as channel to record the literature related to origin, history, and development of institution as well as intellectual contribution.

Gireesh K. and Jaya P.(2013) discussed Knowledge Management (KM) efforts for the thesis in libraries and its challenges, technical issues, maintenance problems, framing policies and copy right issues etc. Repositories are treated as tools of KM. Drake (www.infotoday.com) in presenting report on IR: hidden Treasures indicated that IR is a treasure encompassing scientific, technological, cultural, artistic, and historical material generally not available to searchers of the information. IR are now maintained to preserve the digital assets, intellectual outputs, and histories of the institution.

Phugnar et al (2012) in their article "Institutional Repository (IR): Need for Knowledge Preservation and resource sharing" discussed the importance of IR and narrated the overview in developing IR.

Parekh (2009) and Aswat and Gupta (2009) have discussed the role of IR in terms of knowledge sharing activity which supports to knowledge breeders. Now the libraries specifically, of higher education have to start changing their role in knowledge management. Not only manage the knowledge but also contribute in the process of knowledge generation & knowledge sharing, should be the working of academic libraries.

Mishra (2010) in her article "Institutional Repository and Libraries" elucidated the concept, need, characteristics, advantages, drawbacks of IR. Contents of IR and its importance in academic sector are also highlighted prominently.

Drake (2004) highlighted reasons for building an IR at educational institutions. Repositories offer services to the faculty, researchers and administrators from the archival intellectual contents of institute developed by researchers, students and teachers.

Whereas Lynch (2003) indicated the importance of building an Institutional Repository (IR) and facilities dissemination of information through Institution's network. One of the main benefits of going in for an IR is the encouragement and adoption of new forms of scholarly communication that exploit the digital medium.

Raym C. (2002) pointed out that increasing access to the literature is one goal in developing institutional repositories. The effect of IR is taking out the role of scholarly publishing from publishers and placing it back to the academy.

2.5 Overview of IR in India

Nandi and Muzumdar (2013) in their communication discussed the development of IR for the Visva Bharati University Library. This is a case study based on the practical experience and useful for creation of IR in universities. The article covers concepts, creation, development, of IR and experience of University IR. Sinha (2013) in an article discussed the issues related to IR in Academic and technical libraries. Author is of the opinion that from the IR value added services can be provided and hence every library in academic sector has to decide for the initiations in developing IR. In the same communication concept, design, definitions, need and status in India is also elaborated.

Ansari (2013) also highlighted the Indian scenario in respect of IR in digital era. The communication highlights the needs and importance to Institutional Digital Repositories (IDR). IR software's, need and development of IR is elaborated in the communication.

2.6 Software Used for Building IR

Tennant (2002) opines that for an institution wishing to implement a repository, there are now implementation models to be considered and software selection decisions to make from available software like Eprints & DSpace i.e. Open source Software. (Tennant, 2002)

Heery & Anderson (2005) pointed out that the implementation of IR and maintenance of an IR require technical support even they are available free open source software upon which most IRs run is too restrictive sometimes in its functionality and its future is too uncertain. However it is generally agreed that the technical challenges and the costs of installing IR software are relatively minor issues. (Foster & Gibbons, 2005).

Nandi and Muzumdar (2013) in their communication discussed the development of IR for the Visva Bharati University Library. This article is very useful for developing an IR for any academic institutions.

2.7 IR: Policies and Maintenance

Crow (2002) in his paper discussed the economic, market, and technological foundations that are necessary to develop a sustained IR with development of different policies. Foster & Gibbons, (2005) narated the future of IR and deduced the importance of policies while developing a disciplinary repository providing the scholarly information to the society and a good place for preserving grey literature (preprints and versions of articles from 'green journals') of the institute and for non-commercially published journals.

Nicholas Joint (2006) suggests that, libraries and librarians are well placed to give input to the metadata and digital preservation activities inherent in building

institutional repositories. For developing a sustainable repository need good policies in written form.

Gadd (2003) pointed out that materials placed in an Institutional Repository are subject to coverage under intellectual property rights. These may be owned by the institution, the author or, in the case of a post print, a publisher, hence this effort needs the IPR policies for developing IR. The author can self-archive his/her publications if, he/she holds the copyright for the pre-refereeing preprint or authors can try to revise copyright transfer agreement to obtain the right to self-archive the post print, or failing to that can append or hyperlink with preprint (E-print copyright, 2006). Text written by author himself is his own intellectual property. In this case the author holds the copyright and is always free to sell or distribute copies. Heery and Anderson (2005) emphasized need of intellectual property rights which are major limiting factors to the authors considering posting their work on IRs, and this has resulted in several repositories being populated with bibliographic records rather than full text. Pinfield et al.(2005) observed that it is important to note that authors are discouraged from signing away their copyright to publishers to avoid IP conflicts.

The ROMEO project (2003) and Gadd, (2003) have extensively considered the copy rights issues of OA publishing. They suggested following Creative Commons licenses to express the rights attached to individual research papers and protect them. Nicholas Joint (2006) rightly pointed out the attitudes and need of policies for IR so that intellectual property (IP) matters such as plagiarism, self-archiving on research repositories and respect for commercially owned copyright material is uniformly developed and protected. Author also stated that the current culture, especially in higher education towards intellectual property rights, need to make aware of IP issues. Policies need to be clarified to the contributors so that confusion of the contributors gets cleared.

The issue of quality and maintenance is an important aspect in IR building. Readers want to find out high quality, peer reviewed articles in their respective field from the IR and hence IR need currency in its maintenance (Swan, Needham, & Brown, 2005). Davis and Connolly (2008) indicated the reasons for not using repositories by the researchers.

Raym C. (2002) stated that Institutional repositories can provide an immediate and valuable complement to the existing scholarly publishing model, while stimulating innovation in a new disaggregated publishing structure that will evolve and improve over time. MIT uses a distributed model, championed by Southampton's Stevan Hamad and others as 'self-archiving,' whereby individual faculty upload and manage their own scholarly output. DSpace has the widest focus of any repository described here; it explicitly welcomes any scholarly object.

Cox (2005) describes appropriate technologies to create knowledge based institutional repositories, and to deliver government information in more consistent digital formats; compatibilities with course management software, distance delivery platforms and other larger technology-based services should be the main criteria for setting up of IRs. The success of the institutional repository depends on appropriate communication with faculty, a deep understanding of the publishing process, identifying appropriate partners, designing a flexible technology infrastructure, and engaging in active collaboration with key players.(Kervit & Crays, 2007) Hulse et al. (2007) suggests a consortia model that draws on the experience and expertise of multiple institutions to achieve a common goal.

2.8 IR and Role of Librarian:

The biggest challenge facing IR managers is that of generating content. Some authors suggest that resistance to change hamper the adoption of the working practices needed to support the IR ((Hubbard, 2003) and (Ware, 2004)). Lack of awareness about self-archiving and concerns over quality control, copyright, plagiarism are crucial issues of developing IR (Pinfield, 2005. Dhar (2010) discussed the role of library professionals in the IT era and elucidated the applications of ICT in different functions of libraries as well as specific activities in the field. The different efforts made by the librarians are narrated below in brief

Anuradha (2005) discussed about the compilation of an institutional repository. She has discussed problems in design and developing IR such as defining metadata for different types of publications, standardization of metadata values and removal of duplicate records is addressed quite satisfactorily while compiling this database. She has highlighted good features of IR, preserving and archiving an institutional research

locally and give wide accessibility and visibility to the research work carried out in an institution. Sutradhar (2006) provided evidences in his paper for set up an IR and to create different communities. According to him setting up an IR is very simple but its maintenance is very difficult. Ghosh and Das (2007) observed that, the developing countries are facing barriers of accessing scholarly literature, as the cost of accessing peer-reviewed journals have increased manifold over the time. India is no exception, and high impact factor scholarly literature available to the research communities is limited to the elite institutions. In India, there are number of open access initiatives in many forms, such as open access journals, archives of back volumes of journals, institutional repositories, subject-specific repositories, document-specific repositories, open courseware, etc..

Gayatri Doctor (2008) indicates that faculty in business schools from different academic areas and teaching experience do use digital resources for scholarly publications and teaching material, they do indicate a knowledge sharing culture and tend to show a positive attitude towards the need and use of a Digital institutional repository. Implementing the pilot institutional repository using Open Source DSpace software was an experience and provided visibility to the institutional intellectual capital. Digitization of manuscripts is a difficult process because of the fragility and discolouration (yellowishness) of manuscripts. Creation of metadata and especially subject headings for manuscripts is difficult and time consuming. 'QuickScan' software is good for image capturing and DSpace is good for providing access to digital contents. (Londe, Desale, & Patil, 2011)

Sawant S. (2011) pointed out that most institutions were dominated by science and technology related subjects. In the majority of the cases IRs were developed by library science professionals. This indicates that LIS community has always adapted positive change in library. DSpace and other allied software are available through open source and free of cost. Among them DSpace is user friendly software to establish IR. It also requires the training and knowledge regarding installation of this software and uploading of data then it can help you to work with digitization. For this purpose, scanner, digital camera, Internet connection (for Internet data upload and web hosting of this project) some dedicated skilled manpower etc. will help to carry on the digital

library project as well as to help the internal and external users enormously. (Thorat & Patil, 2011)

Chapter Summary:

IR needs different activities like installing the software, content development and policies etc. Implementing IR in an incremental way may allow institutions to speed up their IR implementations and learn from their own (and others) implementations. There are many software's available, both open source and commercial and DSpace is a best and user-friendly of them. It is also used in huge number by all types of academic institutions such as universities, research organizations, industries etc. to preserve, organize, and disseminate their research output / information to its Right Users at Right Time in Right Format. There is a need to assess the different issues related to IR before installation, so as to maintain the repository efficiently. This chapter covers detailed review of literature published and identified by the researcher on IR which supports to the concepts of IR especially facets covering general information of IR, its policies, IPR and Issues, IR software's, technology, open access, IR models, scholarly communication, cultural change and diversity, responsibility and control, quality and literature published by Indian authors etc. for the ease of the study. This literature review assisted and helped in drafting the different chapters and making the study different than the previous one.

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Chapter 3: Institutional Repository: Concept, Need, Characteristics and Benefits

3.1 Introduction:

Information technology has played an important role in library and information science. Due to the developments in information technology, now, it is possible for libraries to provide several new services to the library users along with traditional services. Information Communication Technology is being used in the profession since 1980's and traditional practices and the methods followed are shifted and changed the face of libraries from traditional (In which print media was the major contribution) to the electronic (using electronic Gadgets to operate the functions and to store the voluminous information in electronic for using computers) and later to digital where information is stored in digital media and used for different services to patrons. Computing, communication, networking, digital publications, and digital libraries changed the practices of library and Information centers, and supported to the benefits like resource sharing, knowledge base/ database creation/ generation, capturing images, acquiring e-contents and storing and retrieval of information in digital form. This environment helped mainly in creating digital libraries and Institutional Repositories. Institutional repository has emerged as a means of storing digital contents produced by research organizations, institution and universities etc.

In India, there are number of reputed research and academic institutes which produces scholarly intellectual research documents and stored for future use and provide services. With mandate to bring together and preserve the intellectual properties of individual institutes showing their interest and coming forward to set up this new service keeping in view of its advantages efforts are made towards developing IR. Academic library have to build up IR's by digital archiving of research literature and equivalent to other output of institution. Commonly the contents for IR included covers preprint of journal articles, seminar paper, technical reports, research work, theses, dissertation, technical reports, digitized manuscripts, images / photos collection, annual reports and other documenting related to the history of institute.

3.2 Definitions of IR

“A set of services that an organization offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members.” (Lynch 2003)

Wiki represents IR as “An Institutional Repository is an online locus for collecting, preserving, and disseminating -- in digital form -- the intellectual output of an institution, particularly a research institution”. ([en.wikipedia.org/wiki/Institutional Repositories](http://en.wikipedia.org/wiki/Institutional_Repositories)).

Narayana (2009) defined_“Digital archives of intellectual products created by the faculty, staff and students of an institution or group of institutions accessible to end users both within and outside the institution.”

In summary it is concluded that IR is also called as a web based database (repository) of scholarly material. IR collects stores and disseminates digital resources and efforts made for long term preservation of organizational or institutional intellectual property in digital form. The meaning of repository is in brief “A facility for storing and maintaining digital information in accessible form. It is also called Digital Archive also. Repositories use different technologies for storage and distribution of digital contents.

According to Robers (PPT Presentation at <http://www.rsp.ac.in>) A digital repository is a mechanism for managing and storing digital content. Repositories can be subject or institutional in their focus. Putting content into an institutional repository enables staff and institutions to manage and preserve contents, and therefore derive maximum value out of IR. A repository can support research, learning, and administrative processes. Repositories use open standards to ensure that the content they contain is accessible in that it can be searched and retrieved for later use. The use of these agreed international standards allows mechanisms to be set up which import, export, identify, store and retrieve the digital content within the repository.

3.3 Institutional Repository (IR): Aim and Purpose

The main aim behind development of Institutional repository (IR) is to develop a mechanism at institutional or organizational level for deposition of the intellectual property which includes research documents, teaching and learning resources, projects, technical reports, research dissertations, organizational manuscripts and rare documents etc. The resources uploaded over the repository can be searched on Intranet. (Phugnar et al 2012).

Institutional Repository is an electronic archive of the scientific and scholarly outputs of an institution. The data is stored in a searchable digital format and also retrieved for later use internally, nationally, and worldwide. A Repository supports mechanisms to import, identify, store, preserve, retrieve, and export an institution's digital assets, usually in the form of web pages. It is a type of content management system that holds the core intellectual assets of a university or college, and enables them to be used in a flexible way to support a variety of business processes. These intellectual assets include research and scholarly outputs, such as journal articles and theses, but may also include teaching and learning materials, presentations, research datasets, audiovisual records, and e-learning objects. (<http://www.ugr.es/~afporcel/guidelines.doc>)

As producers of primary research, it is only to be expected that academic institutions would take an interest in capturing and preserving the intellectual output of their faculty, students, and staff. Traditionally, scholarly publishers (as aggregators and distributors) and institutional libraries (as managers and preservers) served complementary roles in facilitating scholarly communication and preserving in a diffuse and indirect manner an institution's intellectual legacy. Over the past several decades, however, the economic, market, and technological foundations that sustained this symbiotic publisher library market relationship have begun to shift. Several coinciding factors are forcing change in the structure of scholarly journal publishing. Technological change, in the form of digital publishing technologies and ubiquitous networking, has driven the demand for broader access to research and for more robust digital presentation.

Significant increases in the overall volume of research, especially in the sciences, has strained the capacity of the print publishing model and exacerbated user dissatisfaction with the latency inherent in print publication. Increasing dissatisfaction, especially on the part of librarians, with traditional print and electronic journal price and market models—models that have become less relevant and more difficult to sustain in a period of rapidly escalating prices and relatively flat library budgets. Increasing uncertainty over who will handle the preservation archiving of digital scholarly research material.

All these factors have evolved and combined to create new expectations in the academic community for the production, distribution, and interchange of scholarly communications and to force a rethinking of the relative roles of authors, librarians, and publishers as well as the possibility of entirely new actors who may emerge as the publishing model evolves. In such an environment, institutional repositories might well act to preserve an institution's intellectual work product while contributing to a fundamental, and long-term, change in the structure of scholarly communication.

Researchers, librarians, and publishers have applied considerable thought to the various issues like technical, organizational, cultural, economic, and legal to understanding the impact of digital media on scholarly communications. This research study explores the impact that institutional repositories, digital collections that preserve and provide access to the intellectual output of an institutional community, and the potential benefit they deliver to the institutions. The potential roles of institutional digital repositories in the evolving structure of scholarly communication and relative to alternative repository models. Based on the study the researcher planned to develop IR for the TMV.

3.4. Rationale for Institutional Repositories

The rationale for universities and colleges implementing institutional repositories rests on two interrelated propositions: one is that supports a broad, pan-institutional effort and another that offers direct and immediate benefits to each institution that implements a repository. Institutional repositories centralize, preserve, and make accessible an institution's intellectual capital, at the same time they may form part of

a global system of distributed, interoperable repositories that provides the foundation for a new disaggregated model of scholarly publishing.

In brief IR works as:

1. An Institutional repository is an Organization based set of services which the organization offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation, where appropriate, as well as organization and access or distribution” (Clifford Lynch 2003)
2. “Digital archives of intellectual products created by the faculty, staff and students of an institution or group of institutions accessible to end users both within and outside the institution.”
3. An Institutional repository is a digital collection of an institution’s intellectual output. IR’s are a key infrastructure component in the digital environment because they provide better access to our digital assets and they ensure that digital objects are managed appropriately.
4. There is other definition as given in Bailey C. (2008) Introduction to institutional repositories. In its entry for institutional repositories Wikipedia states that: “An institutional repository is an online locus for collecting, preserving, and disseminating, in digital form, the intellectual output of an institution, particularly research institution.

The changing environment, publishing and archiving literature are the reasons in developing IR and also to achieve resource sharing, hence it is needed to develop IR in academics.

3.5 What is IR?

The meaning of repository is “A facility for storing and maintaining digital information in accessible form. It is also called Digital Archive also. Repositories use different technologies for storage and distribution of digital contents. Thus Wiki represents IR as “An Institutional Repository is an online locus for collecting,

preserving, and disseminating -- in digital form -- the intellectual output of an institution, particularly a research institution”. ([en.wikipedia.org/wiki/Institutional Repositories](http://en.wikipedia.org/wiki/Institutional_Repositories)). Narayana (2009) defined_“Digital archives of intellectual products created by the faculty, staff and students of an institution or group of institutions accessible to end users both within and outside the institution.”. Lynch (2003) stated that “an institutional repository is an Organization based set of services which the organization offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation, where appropriate, as well as organization and access or distribution”

IR is also called as a web based database (repository) of scholarly material. IR collects stores and disseminates digital resources and efforts made for long term preservation of organizational or institutional intellectual property in digital form.

3.6 Why IR?

There are many reasons to implement an IR in an institute and few common ones are (Phugnar et al 2012). To increase the visibility and citation impact of institution’s scholarship

- To provide unified access to institution’s scholarship.
- To provide open access to institution’s scholarship
- To create mechanism for sharing information with other institutes

IR Protects the intellectual work of an institute contributed by members. IR provide access to the literature to its members and avoid duplication of efforts.

- Showcasing academics
- Overall improvement of academic culture
- Facilitates Collaboration
- Transparency in outcomes

- Ranking of institution
- Facilitates evaluation of collections
- Demand for 'India Context' research
- Changing metrics of impact or use of research
- IR brings library to users
- Better delivery of information than past
- Powerful searching of data from repository
- Protection and preservation of institutional intellectual contribution for future generation
- The repository makes the University's research, teaching and learning materials more visible and widely available to all users.
- For providing better delivery of information than possible in the past.
- Computer power is used for storing and sharing the information as well as useful to academic community for effective searching and browsing of information from the IR.

3.7 Factors Supporting for Developing IR:

Rajashekar (2010) pointed out that due to availability of digital publishing tools and technologies, Internet usage and need for fast scholarly information communication and preservation, IR emerged as a solution for digital library for meeting the requirement. Apart from this following issues are supportive to IR initiation

- Development of integrated library systems, use of metadata standards for digital objects
- Development of Web and portal environment
- Number of IR demonstration projects developing globally
- Availability of free software's to build IR
- To protect IPR and share resources

PALS (2004) report stated that universities and research libraries around the world use institutional repository in the following ways:

- Scholarly communication, storing learning materials and courseware's
- Electronic publishing and preserving digital materials for the long term
- Adding to the university's prestige by showcasing its academic research
- Knowledge management and research assessment
- Encouraging open access to scholarly research

Each university has a unique culture and assets that require a customized approach. The information model that best suits to institution would not fit to another campus.

3.8 Contents of IR

Rajashekar (2010) indicated that the content is in digital form might be born or digitized and in different file formats developed by members of the institutions. The nature of access to these content is either free or registration based or membership based to anyone.

In summary generally the repository consists of following:

- Published material like e-books, e- Journal articles, chapters from books, newspaper articles, conference papers (preprint from) in digital form
- Unpublished materials like rare documents, manuscripts, theses, reports, manuals, guides presentations, speeches of guests and subject experts, photographs, project reports, standards, patents, internal circulated documents, workshop, conference material, proceedings
- Any digital assets developed in institute in grey form like data sets, models and simulations
- Audio, Video files, films and images of distinguished staffs, visitors, monuments and buildings
- Conferment of Honorary degrees, working papers, conference proceedings, Preprint articles, workshop materials
- College publications like magazines, annual reports, newsletters, notices, circulars
- Television broadcasts, interviews, tutorials, etc.

3.9 Tools for IR Development:

Basically the hardware technology is made available by the institutions but availability of free open software's for development of IR, helped institutes to develop IR. Among many following are preferred and commonly used. (Phugnar et al 2012).

- EPrints (University of Southampton, UK)<http://software.eprints.org>
- DSpace (MIT + HP USA) <http://www.dspace.org>
- FEDORA (Cornell University and Virginia university USA) www.fedora.info
- Greenstone (new Zealand digital library project Uni. of Waikato) www.greenstone.org
- CDS-Invenio (CERN document server software, Geneva Switzerland) <http://cdsware.cern.ch>.

Out of these Eprints, fedora, Greenstone, D-space is very popularly used.

3.10 Librarian's Role in IR

Institutional repositories are a popular recent development for distributing and communicating research. They are a useful academic tool for administrating and publishing electronic resources produced by university members in order to increase access to these, both at an institutional and global level. However, there is still no general consensus about the characteristics of an institutional repository. What types of material are deposited? Librarian is responsible for building and maintaining a repository, how will copyright be managed, Library will cover installation and maintenance costs? However quality, integrity and preservation of the materials should be assured by the Librarian. The technical setting up of an institutional repository is only the beginning. The quantity and quality of the electronic resources that it contains is crucial. The administrative setting of a repository will vary greatly from institution to institution. Administrative procedures to support these processes can be determined. What is important to note is that administrative processes for an institutional repository will vary greatly depending on the institution where they are held and there is no prescriptive model to describe them.

One of the greatest problems for institutional repositories has been to generate a significant corpus of electronic materials. Most groups responsible for implementing an institutional repository (usually the Library) have reported great difficulty in engaging active participation from the community.

The main role of the librarian in building the IR is to derive the benefits of IR, building contents for IR, administration and management of IR, define the policies for the development of sustainable IR, train the staff and users.

In short the role of the librarian is to:

- librarians have critical roles to play in both establishing and maintaining an IR like
- **Advocacy:** Librarians need to know all about the IR, its principles, benefits and operational processes in order to promote it and act as ‘IR evangelists’
- **Building content:** Librarians can employ advocacy and marketing strategies to promote engagement with faculty members and help to generate content. They assist by proactively searching for content independently.
- **Collection administrators and metadata specialists:** Librarians have potential roles as collection administrators and metadata specialists. For effective implementation of IR, libraries will need to recruit or train librarians with digital collection management and provide a mediated deposit service for reluctant ‘self-archives’.
- **Training:** Librarians able to train staff and students to use the IR and help them to prepare their digital products.

3.11 Institutional Repositories: An Overview

3.11.1 Initial Global Efforts:-

Many Institutional repositories have been established worldwide. More than 2000 repositories have been registered in Open Access Repository (ROAR) (<http://roar.eprint.org/>) maintained by University of Southampton, UK. Many academic institutes are making efforts towards creating their own Institutional

Repositories. Some important initiatives in this regards have been described briefly in the following paragraphs.

SHERPA Project (<http://www.sherpa.ac.uk/>) :

The SHERPA project (Securing a Hybrid Environment for Research Preservation and Access) has been set up to encourage change in the scholarly communication process by creating open-access institutional e-print repositories for the dissemination of research findings. The teams also suggest and provide solutions for building and maintenance of IRs, helps in preparing guidelines on IR and IPR issues, as well as advocacy material to publicize an institution's repositories in different areas.

RoMEO Project (<http://www.sherpa.ac.uk/romeo/index.php?fidnum=|&la=en>)

Rights Metadata for Open archiving (RoMEO) provides information about publisher copyright policies and self archiving which have been developed as part of FAIR programme.

DARE (Digital Academic Repositories) : It is a collective initiatives managed by the Dutch universities to develop and maintain all their research results digitally accessible. DARE though at a national level project but is a federally structured, repository for the information.

MIT (<https://dspace.mit.edu>) : DSpace had been launched in November 2003 and also used by MIT Libraries, Massachusetts Institute of Technology (MIT), United States. MIT has developed DSpace Open source software, and developed IR for peer-reviewed scholarly articles, preprints, technical reports, theses and working papers.

ARNO : The Academic Research in the Netherlands Online (ARNO) project, initiated in September 2000, seeks to design and implement university digital archive servers to preserve the academic output (including research reports, pre-prints, theses and dissertations, and articles published in regular scholarly journals) of member institutions. The project's ultimate goal is to make the repository freely accessible via OAI interoperability standards. The project is being implemented by the library staffs of the University of Twente, the University of Amsterdam, and Tilburg University.

California Digital Library eScholarship Repository:

The California Digital Library (CDL) eScholarship Repository, announced in April 2002, illustrates the continuum between digital libraries broadly conceived and institutional repositories. The CDL launched the eScholarship repository, a web site and a suite of digital support services, to distribute academic research and working papers of University of California faculty. The CDL service adopted the OAI metadata harvesting protocol in order to participate in the global network of shared repository contents. The CDL initiative includes a suite of digital services to store and disseminate faculty research in digital formats. The CDL system uses the web-based be press (vendor) system to manage paper submission, processing, and dissemination. Additionally, the system.

Rajashekar (2010) also reviewed the development worldwide and pointed out that several universalities and research organizations from developed countries have set up IRs. Few of them are listed below

- Australian National University (<http://eprints.anu.edu.au>)
- CERN Scientific Information Service (<http://cds.cern.ch>)
- University of Glasgow (<http://eprints.lib.gla.ac.uk>)
- MIT (<http://hpds1.mit.edu/index.jsp>)
- University Nottingham (<http://eprints.nottingham.ac.uk>)

3.11.2 Efforts towards IR in India:

These organizations have developed and maintained IR to disseminate research and educational output as well as course ware. Nearly 850 IR projects have been initiated by various academic institutes and research organizations including electronic thesis and dissertation projects. In India efforts are made towards this direction and many universities, research organizations like CSIR, institutes are developing IRs (Phugnar et al 2012).

- Indian Institute of Technology, Mumbai (<http://dspace.library.iitb.ac.in>)
- National institute of oceanography, Goa (<http://drs.nio.org>)
- National Chemical Laboratory Pune (<http://ncl.csircentral.net>)

- Information and Library Network, Ahmedabad.
(<http://www.inflibnet.ac.in/>)
- Indian Institute of Science, Bangalore (<http://eprints.iisc.ernet.in>)
- National Aerospace Laboratories, Bangalore (<http://nal-ir.res.in>)
- NISCAIR online periodicals repository (nopr.niscair.res.in)
- Open MED@NIC (<http://openmed.nic.in>)
- Indian Institute of Management, Kozhikode(<http://eprints.iimk.ac.in>)
- Indian Institute of Science, Bangalore (<http://eprint.iitd.ac.in>)
- Indian Institute of Technology, Delhi (<http://eprint.iitd.ac.in>)
- National Institute of Technology, Rourkela(<http://dspace.nitrkl.ac.in>)
- URDIP Pune (<http://oa.csirexplorations.com/>)
- Institutional Repository of North-Eastern Hill University: An Evaluative Study

Many countries have taken initiative to develop IR for the better use of the resources. From the analysis of the data available from the ROAR (Registry of Open Access Repositories) it is found that around 1511 IR , are listed all over the world in different subjects(USA 298, UK 158, Germany 109, Japan 72, Australia 51, India 49, France 47) However the top 5 countries in Asia are: Japan 72, India 49, China 11.

3.12 Institutional Repository: Policies

Being creator and manager of IR, librarians have to take care of variety of decisions in Policies, systems architecture, and other elements. Policies appropriate for an academic institution may not work in a corporate setting. Librarian has to consider following issues while developing IR: (Phugnar et al 2012).

- To build the culture of trust and cooperative environment amongst the staff and management, and convince the staff the concept of IR and how their contribution to a repository may enhance their reputations in their disciplines and result in wider dissemination of their work.

- Decide the scope of IR and communicate with management and staff in advance and decisions may be taken to develop and include contents which could centrally shared and also shared globally. Access policies differ institution to institution. Many institutions prefer to provide access to IR to selected users (password protected contents) or access to material on request only. Many institutions appoint a committee for content creation, deposition, evaluation and circulation.
- It is necessary to ensure all legal requirements are met while developing and inclusion of contents in IR. The main requirements includes appropriate software and legal contents. Many universities have developed comprehensive intellectual property policies for setting IR, including responsibilities of faculty and administration. Academic institutions usually opt for open access but may have to restrict access for some research activities.
- Collaboration involves thinking and working together, with different people contributing their different talents, working with others to solve problems, and making important decisions. Recently librarians, archivists, faculty, and information technology staff have gained increased understanding with each other's work and learnt to work more collaboratively. Each group now recognizes and appreciate the expertise and creativity of the others while developing IR. The talents and commitment of time and energy from each group are essential to develop a successful repository project.
- IR cannot be sustained without long-term infusions of funds. A repository cannot run by itself. It needs constant attention, maintenance and funding. Policies concerning deposit, accessibility, and other anticipated contingencies help in problem-solving process. Everyone, involved in a repository needs to understand importance of project and act for their role effectively.

In short for developing sustainable IR different policies are necessary which are briefed like policies regarding

- Software selection (Infrastructure Selection policy)
- Content Development Policy (Content Policy).

- Content Management Policy
- Administrative policies
- Maintenance policies.
- IPR monitoring policies
- Metadata Policy
- Preservation and Retention Policy
- Withdrawal Policy
- Searching Policy
- Access and security Policy

3.13 Benefits of IR:

The primary advantages of IR are:

- Expansion of knowledge and also sharing of knowledge
- Information dissemination
- Protection of literature and honor IPR
- Collection of intellectual contents at one place
- Opportunities for scholarly communication
- Support to E-Learning system

The overall benefits are:

- Useful for teaching and learning process
- It brings together all institutional intellectual literature at single point
- Increases the institution status
- Establish priority for research finding
- Provide wider accessibility and shared unpublished ideas with their co-workers
- Develop a new dimension for scholarly communication process

3.13.1 Benefits to Researcher

- A)** Increased visibility of research output and consequently the department and the institution
- B)** Potentially increased impact of your publications by you as an author at the institution. Research made freely available can be disseminated more widely and have greater impact. Work done on citation analysis has demonstrated that research that is made freely available is going to be easier to cite
- C)** In fast moving subjects such as Electronics, researchers can make preprints (as opposed to peer reviewed papers) available via a repository, to establish that they were first and to get feedback
- D)** Helps you manage and store digital content connected with your research, including the underlying research data
- E)** Helps researchers manage the likely requirements of funding bodies for publications to be made available in a repository.
- F)** Provides the possibility to standardise institutional records e.g. Academic's CVs and published papers
- G)** Allows the creation of personalised publications lists
- H)** Offers usage metrics so researchers can determine hit rates on specific papers
- I)** Creates the potential to undertake citation analysis through following links to papers held in other repositories.

3.13.2 To the Institution

- A repository can interoperate with other university systems and maximise efficiencies between them by sharing information
- Increases visibility and prestige of institution (depending on content contained)
- Repository content is readily searchable both locally and globally
- Allows an institution to manage their intellectual property rights by raising awareness of copyright issues and facilitating the recording of relevant rights information

- A repository that contains high quality content could be used as 'shop window' or marketing tool to entice staff, students and funding
- Repository can store other types of content that isn't necessarily published, sometimes known as 'grey literature'
- Learning and teaching materials previously locked away in Virtual Learning Environments for specific courses could be stored centrally to increase the potential reuse, repurposing and sharing of the materials
- Repositories could provide cost savings in the long run provided that a significant amount of content is deposited in them
- Offers greater flexibility over websites with better security and preservation of various kinds of digital materials through the collection of standardised metadata about each item.

The main advantage is if scholars retain a copyright to their articles, they can deposit any version of their article wherever they wish. But most of the time scholars transfer their article rights to a journal publisher as part of the publication process and, consequently, it is the publisher's policies that govern deposit. For example, a publisher may permit use of a preprint, but not the published article file. Copyright and publisher policies need to be considered for self-archiving of published scholarly works.

3.14 Drawback of IR

- Because information is easily available, it can be easily copied and misused.
- Copyright issues are violated many a times.
- Rely on poor methods for long term digital preservations
- Initial cost is very high and need additional budgets
- Stop functioning if budgets are not provided to IR projects

Summary of the Chapter:

Institutional repositories are one of the most promising developments that utilize new web technologies to offer a viable and sustainable alternative to the current model of scholarly publishing. The repositories also serve as a comprehensive publications database of the parent organization. The aim of institutional repositories is to aid the management and dissemination of the scholarly electronic resources produced by academics.

IR are the face index of any educational institute or university shows the status of its strength in the form of research productivity and hence importance is to be given for development of IR and for this libraries have to take positive initiation to develop institute. This chapter has summarized all the IR related concepts in brief to know the technology and its applications.

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Chapter 4: Tilak Maharashtra Vidyapeeth: A Treasure of Information Wealth

4.1 Introduction

Every organization generates variety of information especially in academic institutes the intellectual knowledge is generated by the researchers, faculty, scholars and even students. The Intellectual contents are contributed in different forms and published in different information sources. The knowledge generated in universities is in the form of publishing books, publishing articles in journals, writing research proposals and consultancy reports, annual reports, technical projects, thesis, reports, patents etc. These intellectual products are to be preserved by every institute for the use to next generation users as well as make them available to users for the consolations. However it is observed that there is no fixed process to compile this data at one place which can be accessed over networks with search and browse feature. Such types of institutional collection are essential to reduce the duplication efforts and save the money and time. Use of ICT in libraries and also in all the sectors of society develops a new concepts to compile this type of intellectual data in digital form. The information products are also now published in digital form and these are easy to compile.

Universities in India have decided to initiate the creation of Institutional repository of the intellectual publications of the patrons and develop a full text data for use of every one online. This data is available to any user sitting anywhere in the world to search and browse the full texts of documents added in the repository. Access to repository initiated by university is given to all users. The development of IR is now an essential part and need of the time. The IR of the institutes can be shares among other institutes and a good tool for achieving resource sharing.

For developing IR it needs digital contents or conversion of the print to digital and stores it for the future use. The IR is also now very easy to develop as free open source software is available and enough IT infrastructures are also available at the institutes. However acquiring skilled professionals is the need for the institution to manage the IR effectively.

4.2 About Tilak Maharashtra Vidyapeeth:

As per the directions given by Mahatma Gandhi during the Indian National Congress Session in 1920 at Nagpur to establish The Tilak Maharashtra Vidyapeeth (TMV) , TMV was established in 1921, as an educational memorial of Lokmanya Bal Gangadhar Tilak, “the Father of Indian Unrest” and an advocate of national education. The establishment of the Vidyapeeth was aimed towards imparting national education conceived by Lokmanya Tilak in his four-fold formula (other three were Swaraj, Swadeshi and Boycott). (<http://www.tmv.edu.in/>)

The Mission of this Vidyapeeth is to reach to common students and develop skills among them to sustain in the global trends with bridging traditional and modern sciences. The mission of TMV is:

- To reach the unreached
- To provide a fine blend of Traditional and modern sciences
- To equip the students with skills to face global challenges.

The vision of this Vidyapeeth is:

- To democratize the education
- To provide Accessibility towards higher education
- To impart quality education

The vision and mission of the Vidyapeeth is to upgrade the educational level.

The Vidyapeeth had established and developed a long-term national education program and implemented it successfully among its affiliated colleges/institutions. It co-ordinated the efforts with similar institutions and provided much-needed educational facilities in the faculties of Arts, Science, Commerce, Engineering and Ayurveda at different levels like the undergraduate and post-graduate levels. Emphasis was laid on the study of Sanskrit - the language of the national culture. The

Vidyapeeth's policy is to provide instruction through Marathi language which marked a beginning of a innovative change in the education system.

Since its establishment new courses are added under the guidance and moral support of Dr. Deepak Tilak, the Vice – Chancellor and Dr. Umesh Keskar the Registrar of the Vidyapeeth. Their direction and guidance and vision for the future has resulted transforming the university and developed sustainable systems to face the challenges of future and support to today's globalized world by means of collaborative efforts with many organizations. The Vidyapeeth presently offers different post-graduate education programs in different disciplines like MCA, MBA, B.Ed, M.Ed, MSW, L.L.B., M.J, B.Lib. I.Sc., M.Lib. I.Sc., MA (Social Sciences), MA (Marathi, Hindi, English, Japanese, Sanskrit, Indology), M.A. in Classical Music / Classical Dance, Ayurved and MCom along with under graduate education through BCA, BBA, BFA, JOURNALISM, BHMCT (Hotel Management), BPT, B.Sc Nursing, B.Com and BA etc. In addition to these foreign language courses in Chinese and Japanese are added in its crown.

Vidyapeeth has recently re-engineered practices with development of new multi-storied building, with facilities for classes having online connectivity and with advanced infrastructural facilities in ICT , and supported to develop quality in education to students by appointing well qualified and experienced faculty. All the courses conducted and degrees awarded by the Vidyapeeth are as per the norms of UGC. The Departments like Administration, Accounts, Examination, Admission Section, Publication and Library are centralized and computerized. These Departments are well-equipped with ICT facilities. Team of dedicated staff of the Vidyapeeth is geared up to serve the student community the best even in the changing educational environment including formal and informal. The Vidyapeeth has achieved tremendous progress through quantitative expansion and qualitative improvements on various academic fronts. The Vidyapeeth is committed to maximize the knowledge and skills of students, thus making them competent. The ethics of value-based education system are strictly followed in the Vidyapeeth to promote good character building among the young generation. Tilak Maharashtra University is a deemed university and sharing its contribution in expanding the knowledge.

4.3 Intellectual Assets of TMV Library:

As stated the Vidyapeeth is established before independence with a aim to promote National education in all sectors of disciplines, the intellectual contents since then are preserved by this university very well which is in the form of manuscripts also. The rare collection of Sanskrit literature, publications of eminent personalities and more valuable collection of Lokmanya Tilak's on Geeta and other areas published during independence period are preserved in this institute. Apart from these traditional good collection of books and journals in different disciplines are available. The users use this collection and develop new knowledge base and thus the continuous development of new knowledge is taking place in this university. The Rare letters, 'pothis', books, manuscripts in different areas including Sanskrit are available in this Vidyapeeth which are not seen elsewhere, and hence many philosophers visit to this institute. Today Vidyapeeth is in best of its services to student's community by developing new courses. The PG courses and research scholars and its faculty constantly contribute to knowledge using the treasure of traditional collection of heritage since pre-independence. This Vidyapeeth has a beautiful collection of Sanskrit, and Tibetan manuscripts from 16th, and 17th Century. It is very essential that these manuscripts may be digitized and their access may be increased through the IR. Library has more than 2000 manuscripts currently available out of which 1000 manuscripts are all ready digitized in CD ROM format.

At present following departments are functional in the university.

- Faculty of Arts and Fine Arts
- Faculty of Moral and Social Sciences
- Faculty of Ayurveda
- Faculty of Distance Education
- Faculty of Modern Sciences and Professional Skills
- College of Physiotherapy
- Faculty of Engineering
- Faculty of Law
- College of Nursing

The students, faculty, research scholars in these disciplines are regularly contributing to knowledge by means of writing articles, submitting thesis, dissertations, writing research proposals, developing technical project reports. Along with the traditional literature this literature is planned to compile by the library professionals by developing an institutional Repository and the efforts made towards this aim is detailed in this dissertation by the researcher.

4.4 TMV Library: A Knowledge House:

TMV Library is established in 1961 exactly after 60 years of establishment of the university. The library developed initially in the Bal Mukund Lohia building at Gultekdi campus Pune. In 2000 Vidyapeeth constructed a new building for library. The space problem solved to some extent since then. The library developed steadily in its collection and in 2002 the grant from UGC – INFLIBNET received which enhanced more expansion in the collection is witnessed. The automation of the library initiated with SOUL library automation software and later shifted to SLIM 21. The library is modernized with new infrastructure and is fully automated. Prior to 2000 all library work was done manually right from acquisition to dissemination of information but automation transformed the activities and the OPAC is developed and used by both users and library professionals. Library Web OPAC is available to all its users across the world through web link (<http://210.212.169.35/w27/>)

This library has a valuable collection of traditional as well as curricular collection useful to different faculty members of the Vidyapeeth. Since inception apart from the rare collection the library has more than 92,060 books and bound volumes of national and international journals. The total journals subscribed for the different faculties in reaching to the number 234. The research activity is very prominent in all fields and the research output of research thesis (Ph.D.) is 380, and dissertation, M.Phil. are 376. The library holds special collection of Sanskrit and Tibetan Manuscripts from 16th, 17th Century are also preserved in the library and made available in TMV library for consultation on demand. Currently these are kept well folded in red and yellow cloth with good preservation conditions. They have been arranged and kept separately near the main collection. Mostly research scholars use such literature for research purpose.

Research activities are increasing in TMV in the area Ayurveda, Sanskrit, Physiotherapy, Social science, Library Science, Nursing, education etc. and number of research papers are contributed in journals and conferences and presented by the faculty of Tilak Maharashtra Vidyapeeth in different conferences, seminar in national and international journals as well as UGC funded projects. The Tilak Maharashtra Vidyapeeth has also important collection of thesis, dissertation, and major-minor research projects etc. Annual report, syllabus, rare and good collection of Manuscripts available in TMV library. The above mentioned collection is intellectual property and need to be organized properly using tools of technology to ensure its best use in future and preservation of the wealth of TMV.

The objectives of making Institutional Repository for Tilak Maharashtra Vidyapeeth, Library is solution to provide effective use of the collection which is out of copyright limitations and most useful to users if made available through network. The main purpose is to preserve different collection in the form of different sources and organise them systematically. (Research Articles, Papers, working papers, thesis, manuscripts, annual reports, question papers etc). Research Journals Published by Vidyapeeth, Annual Reports, Question Bank, Convocation Addresses, other Publications, photos is also decided in plan to include in proposed IR. In some disciplines institutional repositories may play important roles in disseminating both unpublished and published research. Development of such an Institutional Repository (IR) requires in-depth study in terms of policy issues management techniques work flow pattern submission procedure long-term preservation, multi-script records management universal access and retrieval mechanism. The repository approach of organizing and consolidating information makes it possible for all of its potential users to access it easily and also enables information sharing. The repository approach also makes it possible for management to organize and access information by specific methods. In this research study researcher planned to initiate the IR and discuss the aspects in length and prepare a model for the IR.

References:-

Tilak Maharashtra Vidyapeeth. Web Page Accessed at 11:00am Accessed on 12-11-2014

Chapter 5: Institutional Repositories: Software and Technical Support

5.1 Introduction:

Institutional repository is a media through which the research output and scholarly publications are brought in to lime light to users. IR has emerged as a one of the best way for the research scholar to publish their research work and make it available to research community. Scholarly communications need wider reach and economically beneficial for the consultation of users. Increasing cost of journals subscriptions has restricted the free access to the users. Many researchers and users need resources to be preserved for future use and establish monopoly. Thus the concepts of creating institutional repositories developed where the concerned academic research community can publish and preserve their scholarly work with much more ease.

IR is also beneficial to academic institutes to compile the intellectual product brought out by the research community at one place and make it accessible to any user. IR is also a source to preserve the cultural and historical documents of an institute at one place. This includes rare collection, photographs, communications, special lectures etc

5.2 Types of Software used in Libraries: -

Software is a generic term for organized collection of computer data and instructions and these are grouped into different categories like 1) System software 2) Operating system software 3) Application software.etc. and now 4) Open Source Software's for developing digital libraries, managing library functions as well as developing IR etc. A brief account is discussed in following paragraphs

5.2.1 System Software and Operating system software: -

It is a set of one or more programs, designed to control the operation of a computer system. System software is responsible for controlling, integrating and the managing the individual hardware components of a computer system so that other software and the users of the system see it as a functional unit without having to be concerned with the low level details such as transferring data from memory to disk or rendering text in to a display. Generally, system software consists of an operating system and some

fundamental utilities such as disk formatters, file managers, text editors, users authentication (login) and management tools, and networking and device control software. MS DOS, Windows (3.1, 95, 98, NT, 2000, CE), IBM'S OS/2, UNIX, LINUX, JavaOS, Macintosh operating system etc are few examples of softwares.

5.2.2 Application software: -

It is a set of one or more programs designed for a specified application for the purpose of automation.. Application software may consist of a single program, such as an image viewer; a small collection of programs (often called a software package) that work closely together to accomplish a task, such as a spreadsheet or text processing system; a larger collection (often called a software suite) of related but independent programs and packages that have a common user interface or shared data format such as MS Office, which consist of closely integrated word processor, spreadsheet(Excel) , Power Point, database access etc. or a software system such as data base management system, which is a collection of fundamental programs that may provide some services to a variety of other independent applications. Application software are MS Word, WordStar, Lotus, LIBSYS, CDS/ISIS, Quick scan, Scan fix, Tally etc.

5.2.3 Utility software: -

It may be considered as application software or system software that is used quite often in the development of a program. For example, a program for the evaluation of logarithm or square root of a number may be required in developing some applications software, utility software also required to transfer data from tape-to-tape, tape-to-disk, and disk-to-printer. Other utility software programs like sort / merge programs are used to sort record into a particular sequence to facilitate updating files. Such software normally supplied by the hardware manufacturer and supplied along with the system. Hardware users can also develop his own utility software.

Turban classified software in tow types, depending on its price. a) Shareware b) Freeware. Shareware is software sold for a low price relative to other products in the market. Shareware programs are, for the most part, professional programs with complete documentation. Shareware publishers expect to make a modest profit.

Because they do not need to spend a lot of money on marketing, packaging, and advertising, shareware publishers can charge less than regular retailers. Cheap ware is free public-domain software and freeware is free copyrighted software.

The new area of the software is coming up which as also a part of the application is open source softwares and covered under freeware softwares. Open Source Software ("OSS") defines Open Source as software providing the following rights and obligations:

- No royalty or other fee imposed upon redistribution.
- Availability of the source code.
- Right to create modifications and derivative works.
- May require modified versions to be distributed as the original version plus patches.
- No discrimination against persons, fields, endeavor or groups
- All rights granted must flow through to/with-redistributed versions.
- The license applies to the program as a whole and each of its components.
- The license must not restrict other software, thus permitting the distribution of open source and closed source software together.

5.2.4 Library Software: -

Software is the most important part in the process of automation of libraries. Automation of libraries is helpful in providing the quick and better service to user and avoiding duplication of work. Software is as equal important as hardware in the computerization of libraries. Software integrates the task. In libraries functions and process like acquisition, cataloguing, classification, circulation, reporting, stock verification etc. makes easy with the help of software. There are various Library management software available in market for automating libraries like Libsys, LIBSOFT, Golden Libra, SANJAY SALIM, SLIM, WILISYS, CDS/ISIS, LIBRARIAN, MAITRAYEE etc. are useful for Indian library system. Each software has its own modules and special features.

Basically library software packages can classify as:

1) In-house software: This type of software built or produced in the institutions or parent organizations. Ex. University can be prepared software for university library. In-house softwares are specially made with taking into consideration users need of library. Such softwares are very cheap but appropriateness to the activities are not proper.

2) Commercial softwares: Commercial softwares are produced by companies and software firms and sold in the market on commercial basis. Several commercial companies prepared different software packages for library management such as SANJAY, SLIM, LIBSYS, and SALIM etc. Such softwares are costly, but comprehensive in nature. Companies can provide after sale service promptly and the changes required are also amended.

The new area coming in to the profession is digital Library and IR and the development of it. Is now possible due to availability of OSS.

5.3 Pre-requisites for developing IR

Hardware configuration required is , computer workstation with one data server of capacity 2.8-3.5 GHz (Quad core) RAM = 8 to 16 GB, HDD = 1TB to 2 TB. Other equipments like scanners, digital and movie cameras, UPS, printers, CD drives or tape drives etc. with Operating System Linux (Red Hat) RHEL 4/5. But availability of free open software's for development of IR, helped institutes to develop IR. Among many any of the following is preferred and commonly used for creation of IR.

- E-prints (University of Southampton, UK)<http://software.eprints.org>
- D-space (MIT + HP USA) <http://www.dspace.org>
- Fedora (Cornell University and Virginia university USA) www.fedora.info
- i-tor (Netherland Institute for scientific information services) www.i-tor.org
- Green Stone (new Zealand digital library project Uni. of Waikato) www.greenstone.org
- Digital Commons <http://www.bepress.com/ir/>

- CD Sware (CERN document server software, Geneva Switzerland)
<http://cdsware.cern.ch>.

Out of these Eprints, fedora, Greenstone, D-space are very popularly used.

Following freely available software are also useful while developing IR

- OCR software
- Scanning software
- Adobe acrobat reader
- CD read/write software
- PageMaker, paint brush
- Digital library software (D space, Green stone, Fedora-print etc.)
- Database management software.
- Web designing software like JAVA, Front page, XML etc.
- Full text search engine to index and provide access

The approximate initial cost required for the initiation of this activity varies from institute to institute but minimum Rs 3-4 Lack at the initial level is required to develop the IT platform required for the IR. The process of development also includes: material Selection and submission, development of metadata (Fix the elements), Access control, information discovery support (Index building), distribution of the information and preservation

- IR consists of repository server for storing institution publications, including metadata and full text documents (not merely bibliographic records).
- High capacity storage computer work station which act as server for hosting data.
- IR needs repository software for managing access to repository content and this is available free.

5.4 IR: Support for Creation:

Since ICT is affordable and many free open source software are available it is within the reach of an academic institute in developing an IR. Further crawlers are also available to harvest the data from the related IR's and present it to a common or main repository in case of having different branches at different places. It is also possible for a common user to upload his document in the IR. The importance of IR is growing and gaining in research and scholarly community. The different software's like DSpace, EPrint are easily downloaded from the net and can be used for developing IR. The maintenance of repository is a task of responsible staff either system administrator or a librarian. In many cases librarian is considered as a responsible staff for maintaining IR as he/she can maintain the metadata comfortably and help in accessing the IR to general user.

5.5 Open Source Software for IR:

Among the different open source software available DSpace is a suite of software which has an ability to serve digital library collections and build new collections in easy manner. It provides a new way for organizing information and publishing it on the Internet or on CD-ROM. DSpace is developed by MIT-HP. It is an open source software available from (<http://www.dspace.org/>) under the terms of the GNU General Public License.

For creating institutional repository for Tilak Maharashtra Vidyapeeth, it was decided to use open source software using DSpace and few reasons for using it are:-

- Available free of cost and can be downloaded from <http://sf.net> (Sourceforge.net).
- Software does not depend on any specific hardware or operating system.
- Open source software like DSpace allow customization to suite the end users requirement.
- It does not have any vendor lock and freely used even developing its own program.
- OSS shares the information with vast community.

Few prominent OSS are discussed below

5.5.1 EPrints- (<http://eprints.org>)

Eprints is an open source software package for building open access repositories for Metadata . It shares many of the features commonly seen in Document Management systems, but is primarily used for institutional repositories and scientific journals. EPrints has been developed at the University of Southampton School of Electronics and Computer Science and released under a GPL license.

History:-

EPrints was created in 2000 as a direct outcome of the 1999 in Santa Fe meeting.

The EPrints software was enthusiastically received, became the first and one of the most widely used free open access, institutional repository software, and it has since inspired many emulations. Version 3 of the software was officially released on the 24th January 2007 at the Open Repositories 2007 Conference and was described by its developers as "a major leap forward in functionality, giving even more control and flexibility to repository managers, depositors, researchers and technical administrators."

Technology

EPrints is a Web and command-line application based on the LAMP architecture (but is written in Perl rather than PHP). It has been successfully run under Linux, Solaris and Mac OS X.

Features:-

Configuring an EPrints repository involves modifying configuration files written in Perl or XML. Web based configuration tools are in development. The appearance of a repository is controlled by HTML templates, stylesheets and inline images. While Eprints is shipped with an English translation it has been translated to other languages through (redistributable) language-specific XML phrase files. Existing translations

include Bulgarian, French, German, Hungarian, Italian, Japanese, Russian, Spanish and Ukrainian.

5.5.2 Dspace :- (<http://www.dspace.org>)

Dspace is an open source software package that provides the tools for management of digital assets, and is commonly used as the basis for an institutional repository.

It is also intended as a platform for digital preservation activities. Since its release in 2002, as a product of the HP-MIT Alliance, it has been installed and is in production at over 240 institutions around the globe, from large universities to small higher education colleges, cultural organizations, and research centers. DSpace supports a wide variety of data, including books, theses, 3D digital scans of objects, photographs, film, video, research data sets and other forms of content. It is shared under a BSD licence, which enables users to customize or extend the software as needed.

History:

The first version of DSpace was released in November 2002, following a joint effort by developers from MIT and HP Labs in Cambridge, Massachusetts. In March 2004 the first DSpace User Group Meeting (DSUG) took place at Hotel@MIT, and it was there that the first discussions concerning the DSpace community and its future governance were discussed in earnest. The DSpace Federation formed a loose grouping of interested institutions, while the DSpace Committers group (see Community Development Model below) was formed shortly after, consisting of five developers from HP Labs, MIT, OCLC, University of Cambridge, and University of Edinburgh. Later two further developers from Australian National University and Texas AandM University also joined this group. DSpace 1.3 was released in 2005, and at around the same time the second DSpace User Group Meeting was held at the University of Cambridge. Following this, two further smaller user group meetings were spawned, the first in January/February 2006 in Sydney, and the second in April 2006 in Bergen, Norway. In March 2008, the DSpace Community released DSpace 1.5.

Technology

DSpace is written in Java and JSP, using the Java Servlet API. It uses a relational database, and supports the use of PostgreSQL and Oracle. It makes its holdings available primarily via a web interface, but it also supports the OAI-PMH v2.0, and is capable of exporting METS (Metadata Encoding and Transmission Standard) packages. Future versions are likely to see increasing use of web services, and changes to the user interface layer

5.5.3 Greenstone Software: -

Greenstone software is use for building and distributing digital library collection. Greenstone is developed by New Zealand Digital Library Project at the University of Waikato, in co-operation with UNESCO and the Human Info NGO. Greenstone provides a new way of organizing information and publishing it on the Internet or on CD-ROM. It is open source software which is available freely under the GNU General public licenses Greenstone is a multilingual software, available in English, French, Spanish, Kazakh and in other languages also.

The aim of software is to empower users, particularly in universities, libraries and other public service institutions to built their own digital libraries. The software may encourage the effective deployment of digital libraries to share information and place it in the public domain. Software can be download from Internet or from CD-ROM. Greenstone is available in different versions like 2.39, 2.40 and latest one is 2.41 version.

Software is available on version platforms like Linux, Windows, Mac, and Sun Solaris etc. Greenstone is useful for both digital collections i.e. born and converted from other media into digital media. Greenstone software is used in various organizations

Special features of Greenstone software: -

Greenstone digital Library software is open source software which has various features which gives easy way of collecting, management, distributing and accessing the digital library. They are: -

- **Support to formats: -**

Greenstone supports several document formats like Text, HTML, Word, PDF, PS, Bibliographic, E-mail, PowerPoint presentations (PPT) etc. from Greenstone it is easy to build collections of text, documents, images, photographs, multimedia formats etc.

- **Indexing: -**

Greenstone provides powerful indexing for full-text documents. Section level. This helps in retrieval of information easily. It also indexed document based on metadata information. It gives metadata based field-based indexing, automatic derivation explicit assignment. Greenstone support for Dublin Core and other metadata.

- **Searching and Browsing: -**

Greenstone gives more attention forwards retrieval of digitized information from large collections. It provides facility of full text and fielded searching. It uses Boolean searching and ranked retrieval along with Case folding and stemming facility. Browsing of collection make easy with field-based and hierarchical document browsing.

- **Widely acceptable standards: -**

Greenstone can provide facility of advanced compression for texts and indexes. It supported by strong RandD based development group. It supports Z39.50 standard as well as OAI.

- **Easy to run:-**

Greenstone is capable of working on Linux, Windows, and Mac, sun Solaris etc. platforms. For Linux the source code is GCC and perl while for Windows it is VC++ and perl. Greenstone offers the common interface for different digital collection. It also provides good documentation and support through e-mail. Manuals of Greenstone available on CD-ROM, also the website WWW.greenstone.org provides good information, including FAQ, support, mailing list etc.

5.5.4. FEDORA – Fedora digital object repository management system is based on the flexible Extensible Digital object and repository Architecture. equally developed by university of Virginia and Cornell University² jointly developed Fedora with funding provided by a grant from the Andrew W. Mellon Foundation The software is flexible enough for serving variety of digital documents with different functionalities such as digital asset management, institutional repositories, digital archives, content management systems, scholarly publishing enterprises, digital libraries etc.

Since 1997, Open Source software (OSS) is accepted in large extent for different purposes. Now many Open Source Software are made available over the Internet. The world's largest OSS development web site is SourceForge.net which provides free hosting of OSS with a centralized resource for managing projects, issues, communications, and code. According to Raymond (1999), the Open Source Software (OSS) is Software which is freely redistributable and can readily be evolved and modified to fit in changing needs. In the open source movement, openness implies on ability to access and change the source code, at any time, to support a desired capability.

While selecting OSS for IR a review was performed considering criteria essentially covered by the OSS. The OSS having the Open Source License terms and conditions as well as available free on Internet and also suitable to an institute for its implementation are considered. ROAR as well as OSS4lib site provides a list of OSS-DL used for creating open access digital repositories/institutional repositories few are:

- ARNO – 6
- CDSWare – 92
- DoKS – 5
- DSpace – 1151
- EPrint - 378
- FEDORA –33
- Fez/Fedora–3

- GNU EPrints – 379
- MyCoRe–4

Thus availability of Open Source Software made revolution in development of IR. Among the software listed above the following three software are popularly used by repository managers to create institutional repositories.

Availability of OSS add their source code in public domain, which allows third parties to share code and facilitates the creation of a self-organizing networked community of developers. There have been many successful open-source projects e.g. Linux Operating System, Apache Web Server, Perl, Send mail, Bind, Tcl/tk and Python. OSS guarantees free access to the programming behind the precompiled binary or source code. All OSS software are copyrighted and distributed with license terms and conditions designed to ensure that the source code is always available. The most popular Open Source license is GPL i.e. GNU Public License. Value of any OSS is measured in terms of its simplicity and connectivity.

Many OSS are now available for use in libraries and librarians are making use of these tools. For creating institutional repositories OSS tools are increasingly considered as an optional instead of commercial software systems due to dissatisfaction with functionality.

Open source IR software, with its free access and good level of functionality have been used by large community all over. Since there are no purchase costs involved for using OSS, libraries can divert such funds to reallocate those funds for training the staff or hiring additional programmers to customize software as per specific requirements.

There are 2239 repositories in India which are listed OpenDOAR and run by different types of organizations such as universities, research institutes, government and non-government institutes etc. these repositories include various types of items, with different types of dissemination policies.

The repositories have been studied considering repository software used, repository type, content type operational status of the repository, language, subject area wise, multiple metadata support, recorded content policy, preservation support, user base,

persistent identification support, year wise increase in number of repositories . The ROAR site indicates that 2504 repositories from its 1472 registered using DSpace. The DOAR also showing detailed graph usages of OSS for Institutional Repository.

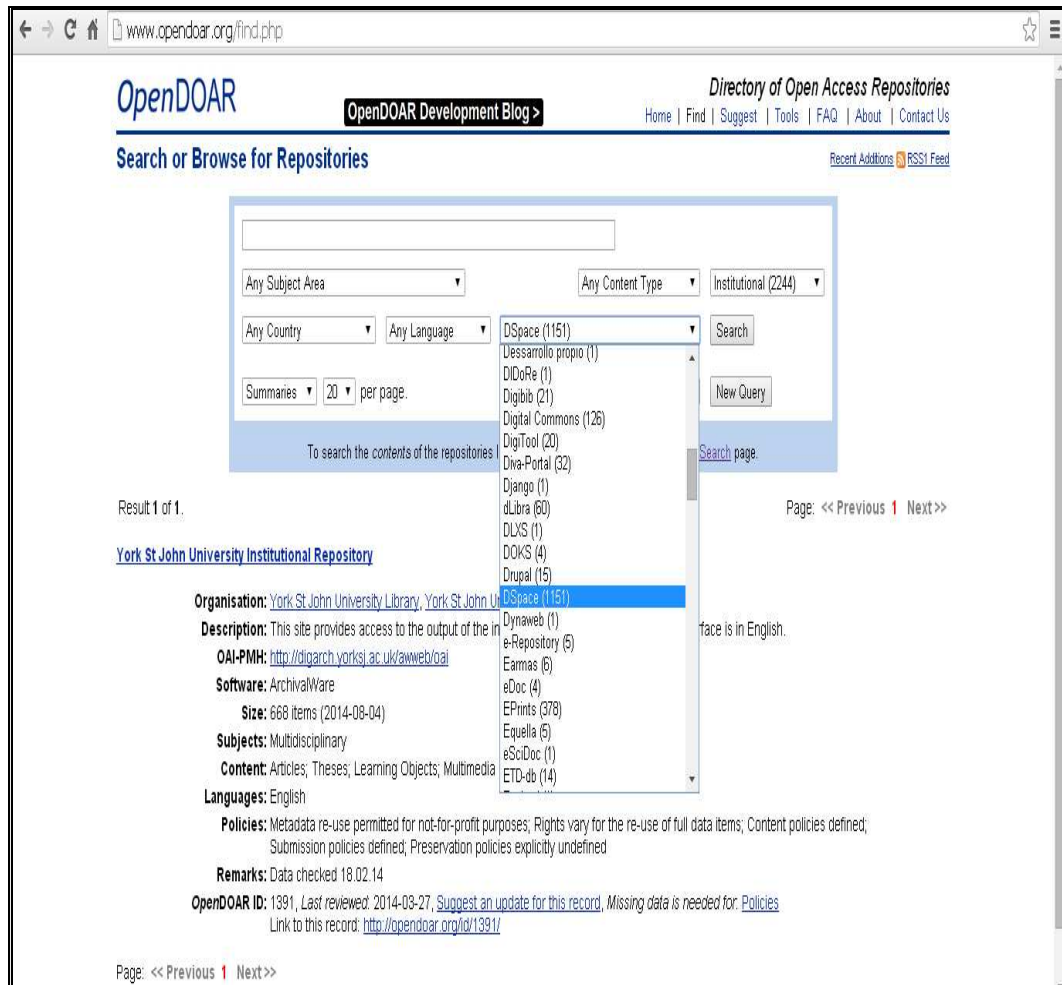


Fig.5.1 Directory of Open Access Repository

5.6 Comparison among the two Popular OSS:

The **GNU EPrints** self-archiving software, is developed at the Electronics and Computer Science Department of the University of Southampton, UK., **DSpace**, a newly developed digital repository as a joint project of the Massachusetts Institute of Technology (MIT) Libraries and the Hewlett-Packard Company, USA. These systems base on different technologies but are nearly identically in their functionality like search functions, document archiving, online interfaces for self archiving, integration of the OAI PMH etc.

Functions	Eprint	Dspace
Installation	Eprint is easy to set up. Most of the installation process is automated. MySQL, Apache and mod_Perl, these components are necessary for implementation of smooth installations. Linux is easier to maintain than Solaris. GNU Eprints has a separate website containing documentation, downloads, demonstration server and mailing lists: http://software.eprints.org/	The installation of DSpace requires a little more effort. But in fact DSpace is easy to run and maintain for any experienced systems engineer. In order to run DSpace the following list of Software is necessary to be installed and configured before: Java 1.3, Tomcat 4.0+, Apache 1.3, PostgreSQL 7.3+, Ant 1.5. Details of the requirements can be viewed at: http://dspace.org/technology/system-docs/install.html#prerequisite With the installation some common problems arose, e.g. that Tomcat doesn't work when the DSpace is connected to Tomcat. Some changes in the configuration script solved that problem There is no support service for the DSpace installation. But there is a detailed system documentation at: http://dspace.org/technology/system-docs/index.html . And also a public mailing list for the installation questions is supported.
Programming Language	Perl	Java
Operating System	Solaris and Linux it is also possible to install Eprints2 on any computer that is running with GNU/Linux or UNIX operating system	In general DSpace can run on Solaris, Linux and Windows systems.
Functions	Eprints is free software which creates online archives. It is possible to store documents in any common format that the archive administrator defined to be accepted. Each individual research paper/ eprint/ ... can be stored in more than one document format.	DSpace can be used for self archiving by institutions and faculties. It provides long-term physical storage and management of digital items in a repository. Currently DSpace supports only the Dublin Core metadata element set with a few qualifications conforming to the library application profile. More details of DSpace functionality

	More functions can be viewed at http://software.eprints.org/	can be founded at http://libraries.mit.edu/dspace-mit/technology/functionality.pdf
Technology	MySQL, Apache	Postgres, Tomcat Dspace supports and includes also handle server, which ensures that each document has unique and persistent URL.
Interoperability	Eprints is freely distributable and subject to the GNU General Public License. This means that its source code is open and freely modifiable by any programmer who wishes to modify it (on condition that modifications are all free and open). However Eprints offers no supporting documents there are nevertheless mailing lists for support.	The DSpace system is freely available as open-source software. This allows to make any necessary changes to the downloaded copy. The system was designed to make adaptations for individual organisations as easy as possible.
Search	Eprints allows to scan each of the metadata field types in the database by simple or advanced search. Any metadata field can be searched with fine granularity by SQL querying the database	DSpace offers two levels of text search: simple and advanced search. It's submission process also allows to use a qualified version of the Dublin Core metadata schema for the description of each item. These descriptions are stored in a relational database, which is used by the search engine to retrieve items.

Table 5.1 Comparison among the two Popular OSS

The main highlighted analysis is presented in the following table

	Short description	EPrint	DSpace
1.0	Core functions		
1.1	Browser access (common browsers supported)	√	√
1.2	Easy and intuitive to use with minimal training required	√	X
1.3	Platform independent (i.e. works on PC and MAC)	√	√
1.4	Integrates with core systems e.g. Learning Management System	√	√
1.5	Authenticate users	√	√
1.6	Simple search on all repository content (including metadata)	√	√
1.7	Browse on all repository content	√	√
1.8	Version control and retrieval	X	X
1.9	Easy to download/upload content: few steps with expected behaviors	√	X
1.10	Enforce workflows appropriate to content	√	X
1.11	Set and modify permissions e.g. read/write read only	√	√
1.12	Add/import/delete content as batch files	√	√
1.13	Stable/persistent unique identifiers (e.g. DOI, ARC)	√	√
1.14	Lock content against overwrite	X	X
1.15	Supports configuration of multiple metadata schema	X	X
1.16	Create, edit, display, and export metadata	√	√
1.17	Able to set mandatory metadata elements	√	X
1.18	Create and display aggregated records (collections)	√	√
1.19	Supports OAI-PMH	√	√
2.0	Important functions		
2.1	Notify users of content changes and tasks	√	√

2.2	Reporting functions	X	√
2.3	Conduct complex search	√	√
2.4	Refine and order search results	√	XQ
2.5	Save and export search results	X	X
2.6	Save Search criteria	X	X
2.7	User status display	X	X
2.8	Able to configure inline help (e.g. file naming conventions)	√	√
2.9	Create metadata record without digital object	√	X
2.10	Add digital object to metadata record	√	X
2.11	Able to clone a metadata record	√	X
2.12	Copy paste into metadata capture form	√	√
2.13	Derive metadata from log-on information	√	√
2.14	Export metadata as XML	√	√
2.15	Automatic revision prompt after specified time	X	X
2.16	Automatic publishing over specified time periods	X	X
2.17	Modification and migration history display	X	X
2.18	Automatic alert when duplicate objects are created	X	X
2.19	Conforms to W3C accessibility Standards	√	√
3.0	Useful functions		
3.1	Link to multiple manifestations of same object	√	√
3.2	Conversion of digital file types to preservation formats	X	X
3.3	Archive to offline storage or another system but retaining metadata	X	X
3.4	Store front page notices	X	√
3.5	Time based access restriction by rights status	X	X

3.6	Bibliographic citation export	X	X
3.7	Automatic alerts when rights expire	X	X
3.8	Fee payment control	X	X
3.9	Keeping of financial records for fee payments	X	X
3.10	Record sales of IP rights	X	X
3.11	Custom interfaces for users	X	X
3.12	Able to interrupt data entry and return to point of departure	√	√
3.13	Import and matching of metadata schemes	X	√
3.14	Suppression of metadata records	√	√
3.15	Australian spelling and synonym matching	√	X
3.16	Relevance ranking	X	X
3.17	Truncated search terms	√	X
3.18	GUI administration	√	√
3.19	Virus scan	X	X

Table 5.2 Analysis of EPrint & DSpace

5.7 Use of Dspace in Tilak Maharashtra Vidyapeeth for IR

More than 1472 IR in the world are using DSpace software because this is highest than any other software of this type. Dspace since after its inspection, has been one of the widely used by different institutes to create their institutional repository. DSpace is specially designed for “digital preservation” support for all the documents that are added into the repository in a simple method. DSpace by default supports to upload the variety of file formats such as : Adobe PDF, AIFF, audio/basic, BMP, CSS, FMP3, GIF, HTML, image/png, JPEG, Latex, MARC, Mathematical, Microsoft Excel, Microsoft PowerPoint, Microsoft Project, Microsoft visio, Microsoft Word, MPEG, MPEG Audio, PhotoCD, Photoshop, PostScript, Real Audio, RTF, SGML, TeX, Tex dvi, Text, TIFF, Video QuickTime,Wav, Word Perfect, XML. Since the IT

infrastructure suits the requirements of DSpace and also the library staff felt it convenient to use it is selected.

5.7.1 Key Factors for using DSpace:-

- DSpace is freely available under BSD license for institutes to preserve their research output in digital materials.
- DSpace support standard data formats and has the provision of registering new formats. Can handle variety of digital formats..
- DSpace is a service model for open access digital archiving.
- DSpace support to add descriptive metadata for all digital objects added into the repository.
- Collections / content in DSpace are searchable and retrievable through Internet/Intranet with full text search retrieval.

5.7.2 Technical Support: -

Tilak Maharashtra Vidyapeeth-Library decided to install DSpace on latest Ubuntu Operating System where Ubuntu 14.04 (LTS) version was installed as well as latest version of DSpace which is 4.2 was installed. Installation of the Ubuntu, DSpace and other important components are carried out using LibliveCD which is developed by Dr. ARD Prasad (DRTC, Banalore) and Dr. Sunita Barve (NCL, Pune) . Liblivecd automatically installs the following required software for DSpace to run smoothly such as:

Apache Web Server
Apache Tomcat server
PostgreSQL Server
EXim-4 mail server
Open-JDK

Recommended minimum requirement for developing of Institutional Repository

1. One computer with server configuration
2. Minimum 2 GB RAM

3. 200GB HDD for storage,
4. Linux OS (preferable)
5. Good Network Connectivity

5.7.3 Repository Software Used in India

The following table show different OSS used for IR development from different organizations in India.

No	Institute	URL	Content	No. of item as on	Software
1	INFLIBNET , Ahmedabad	http://ir.inflibnet.ac.in	Conference paper, report, journal articles, bibliographic database	1373	DSpace
2	Indian Institute of Management , Ahmedabad	http://vsilir.iimahd.ernet.in:8080/xmlui/	Annual reports, conference proceedings , Qest. paper, faculty collection ect.	12162	DSpace
3	National Chemical Laboratory, Pune	http://ncl.csircentral.net/	thesis, research papers, articles, repots etc.	946	DSpace
4	IIT, Bombay	http://dspace.library.iitb.ac.in/	Book chapters, technical reports, conference proceeding, journal re-print & post print, working paper, annual	17024	DSpace

			report		
5	DRS@nio : National Institute of oceanograph y, India	http://drs.nio.org	Journal articles, conference proceedings , technical reports, thesis & Dissertation	4633	DSpace
6	National Institute of Technology, Rourkela	http://ethesis.nitrkl.ac.in	Thesis collection	4115	EPrints
7	Management Developmen t Institute	http://dspace.mdi.ac.in/dspace	Articles, Conference , Books	325	DSpace
8	Indian Institute of Management	http://dspace.iimk.ac.in/	Journal Articles, Conference proceedings , technical report, thesis & Dissertation	666	DSpace
9	Raman Research Institute Digital Repository, Bangalore	http://dspace.rii.res.in/	Research work of faculty & students, collected paper of C. V. Raman and historical record.	5610	DSpace
10	Sardar Vallabhabai National Institute of Technology	http://eprintd.sv.nit.ac.in	Articles, conferences	14	Eprints
11	IIT, Delhi	http://eprint.iitd.ac.in/dspace/	Pre-print & Post print scholarly	2143	Eprints

			publications		
12	Tata Institute of Social Sciences, Mumbai	http://library.tiss.edu/dspace.html	Theses & Dissertations [full text] e-Books Institutional Repository TISS Project Reports Question Bank TISS Annual Reports Convocation Addresses	-	Dspace

Table 5.3 Different OSS used for IR development from different organizations in India

The analysis of the OSS available for developing IR indicates that Dspace is used more in academic institutes. Based on the analytical study suitable Dspace software is selected for the IR in TMV. The following chapter deals with Model Action Plan for initiation of Institutional Repository in TMV.

The purpose of developing IR in TMV is to compile intellectual data of an organization and bring it in lime light as well as provide different services to user community through it. The flow chart explains in brief the benefits achieved from IR.

Summary:

This chapter mainly focuses on the development of IR and discussing prerequisites required for developing IR. This helped in fixing the suitable software after analysis of usage by different institutes.

References:

- Baron, M. R., Walker, Julie H., (2002). MIT libraries' DSpace business plan project final report to the Andrew W. Mellon Foundation, 33 p.http://wiki.dspace.org/static_files/4/42/dspace_governance_report_03142006.pdf.(Browsed on20-8-14).
- Devika P M (2009). "A Digital Library of Library and Information Science form"<http://Eprint.rclis.org/archive/00008739/01/OSS-selectionmanagement.pdf>
- DOAR (<http://www.opendoar.org>) accessed on 12-08-2014
- Dspace software. <http://www.dspace.org>. (Accessed on 18, July 2013)
- Eprint software. <http://www.eprint.com>. (Accessed on 21 August 2013)
- Jonson, Richard K (2002), Institutional Repositories : Partnering with faculty to enhance scholarly communication .: DLib Magazine.2002 Vol. 8(11)
- Lynch, C.A. (2003). Institutional repositories : essential infrastructure for scholarship in the digital age" ARL: A Bimonthly Report on Research Library Issues and Action, No. 226, available at www.arl.org/resources/pub/br/br226/br226ir.shtml
- Inventories-Open Archives Software Tools: [ttp://www.oaforum.org/ otherfiles/tv-toos.pdf](http://www.oaforum.org/otherfiles/tv-toos.pdf). (Accessed on 26-12-2014)

Chapter 6: Model Plan of Action for Initiation of IR in TMV

6.1 Introduction:

An institutional repository can be developed by means of different components like capture data, store data, prepare index or metadata and preserve and redistribute a university's scholarly research in a digital form. The scholarly publishing and academic resources of institutional repository covers -

- Institutionally defined publications, data, literature, lecture series, speeches, photographs, different copy righted own publication and out of copy right publications
- Research output of university
- Academic literature useful to students community like tutorials, notes, question banks, exam papers, etc
- Historical documents of Institute and universities

The institutional repositories provide a critical component in reorganizing the system of scholarly communication as mentioned earlier. IR represents scientific, societal and economic relevance of research activities of an institute and serve as a tangible indicator of an institution's or university's research output. Institutional repositories are open and interoperable and allow open access to scholarly research to avoid duplication. (Lynch, 2003) Libraries using IR can provide services to users.

6.2 Need of IR in TMV:

TMV library holds variety of documents which are of importance to users of TMV. It is proposed to create IR of variety of documents available in TMV such as Annual Reports, Question Papers, Thesis, Books etc. In the present study main emphasis is given on proposing IR of manuscript collection available in TMV library. Library holds large collection of manuscripts which needs to be preserved in digital format. Manuscripts are precious part of our cultural heritage. Great ancient scholars dedicated their lives for creating written records of knowledge. India is most valued and revered gift to humanity is its profound and timeless heritage. This heritage encompasses almost every aspect of human enquiry, exploration and existence

covering philosophy, religion, language, literature, metaphysics, art and ayurveda, vyakaran and so on. Today this heritage is scattered in texts in libraries and in individual positions. This precious gift is slowly decaying and vanishing due to the improper handling. Indeed, preservation of this heritage presents a great challenge before us. However, fortunately the information technology is offering many solutions not only for preservation, but also for enhancement and for its wide scale access.

In the globalization the world has witnessed rapid changes over the last decade, increased competition and technological advances. The development of information technology and communicating system has brought innovative changes in the organization and management of information. Digitization is a process through which extension and enhancement of information storage and retrieval systems that manipulates digital data in any medium (text, images, sounds, static or dynamic images) and exist in distributed networks. Digitization is necessitated for both accessibility and preservation. In this sense, we can say that, digitization of manuscripts is the only way to exchange cultural heritage to the communities.

TMV is a multi-disciplinary, multi-campus university in India. This university impart in academic and educational activities in providing formal education system and conducting from bachelors to Ph. D. in the field of Arts, Science, Medicine, Dentistry, Ayurveda, Homeopathy, Nursing, , social work, Engineering, Management, Social Sciences, Law, Environmental Sciences, Architecture, Hotel Management and Catering Technology, Physical Education, Computer Science, Library Science, Information Technology, Bio-technology, and Performing Arts etc. Apart from this externally conducted courses like Sanskrit, Hindi, and Math's are also available from primary to higher secondary. TMV has fairly good information resources and its own publications such as Books, Journals, Theses, Research papers published by faculty, annual reports, syllabus and other general publications. To preserve the intellectual wealth of university an IR is essential.

The main causes of having IR:

- Continuous and significant increase in the overall volume of research;
- Increasing need of archival and access to gray information
- Access to institutional knowledge from anywhere at any time;

- Preservation and archiving of digital scholarly research materials for future use.
- An effort towards developing a national research repository infrastructure by creating, and linking individual repositories;
- Providing services that draw on research information made available through the repository infrastructure;

6.3 Benefits of IR

The benefits of IR at TMV may be for the users, contributors, organisations and to the information society. Few benefits might be:

- Easy access to intellectual data in digital form to the users.
- Institutional gray literature appears in light
- Fast publication and reporting the results to community
- The scholarly material generated in the university is made available at one place, and can serve as a valuable marketing tool.
- Increased visibility to the Library and support to research activity
- Support teaching and learning in e-learning system

While developing IR following stages are essential

- 1) Selection of hardware and software
- 2) Policy development
- 3) Appointing skilled staff
- 4) Selection of documents
- 5) Digitization of documents
- 5) Uploading the data on repository
- 7) Maintaining the repository

IR consists of repository server for storing institution publications, including metadata and full text documents. This need high capacity storage computer work station which act as server for hosting data. IR needs repository software for managing access to repository content and this s available free. The administrator has to monitor registration of users for putting document on the server as well as document

submission process. The aspects like dissemination of information, administration of IR, document submission policies, legalities, etc., to be framed properly.

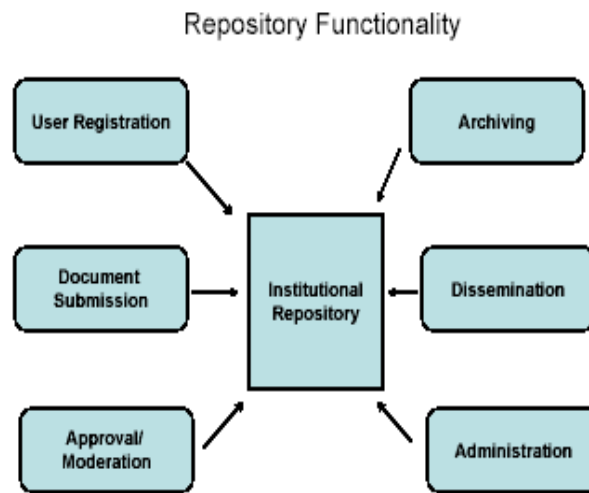


Fig. 6.1 Functions of Repository

A successful IR activity depends on setup policies and technical components the policies may cover issues related to scope of contents i.e. types of publications, subject and time period etc. In addition to this document formats for preservation, metadata formation, copyright issues, and maintenance of quality are few aspects to be covered.

Rajashekar T B (2010) detailed out the complete process of IR which covers orientation phase planning phase, Implication Phase and operational / maintenance phase. In orientation phase what and why IR to be establish and services provide through it IR. Planning phase covers areas Institutes to be covers, survey of Stakeholder develop policies and agreements as well as methods of submission i.e. Centralize or decentralize collection of user groups, Responsibilities involve, selection of IR software and Hardware etc. Implementation phase startup the activities like selection of objects for institutional repository, IR maintenance and harvesting services etc. to be looked in to.

6.4 Best Practices in Institutional Web Positioning:

- A large web presence is made possible only with the effort of a large group of authors. One can allow a large proportion of staff, researchers or graduate students to be potential authors and maintain their own websites. A distributed system of authoring can be operative at several levels.
- Although html is the standard format of web pages, sometimes it is better to use rich file formats like Adobe Acrobat pdf or MS Word doc as they allow a better distribution of documents. Sometimes postscript format is also difficult to open then PDF format is recommended.
- For enriching site the use of meaningful titles and descriptive Meta tags can increase the visibility of the pages. There are some standards like Dublin Core that can be used to add authoring info, keywords and other data about the web sites.
- Important resources in non electronic format that can be converted to web pages for easy access
- Institution should choose a unique institutional domain that can be used by all the websites of the institution. Well known acronyms should be used including descriptive word, like the name of the city, in the domain name
- IR design should be search engine friendly so avoiding cumbersome navigation menus based on Flash, Java or JavaScript that can block the robot access is advisable.
- IR Popularity and Visit statistics should be maintain.
- It is necessary and mandatory to maintain a copy of old or outdated material in the site. Sometimes relevant information is lost when the site is redesigned or simply updated and there is no way to recover easily the vanished pages.
- The Web (IR) is a hyper textual corpus with links connecting pages. So interlinking of WebPages should be done properly

- Web audience is global so language should be globally accepted. All pages should be mandatory in English

6.5 Skills required for developing IR:

There is a need of the skills for developing, maintaining, managing and sustaining the IR.

6.5.1 Management skills:

- Manage the IR as per the user needs
- Prepare the costing for the development of repository
- Manage day today working of the IR
- Develop policies for the sustainable IR
- Fix the type of deposit (global or at the nodal point)
- Handle complaints, and relationship

6.5.2 Software skills:

- Software awareness is more important while developing the IR
- The required software's are Unix, Linux, MySQL, SGML, XML, JAVA, PERL are preferred in IR
- Any one software Eprints, Dspace or Fedora etc.

6.5.3 Metadata:

For making the digital objects available at global level, it is necessary to adapt relevant metadata standards Dublin core, MARC, OAI PMH which helps in

- Developing metadata
- Monitor metadata quality

6.5.4 Storage and Preservation:

It is a key function of the IR. It should work with the IT services for the use of network storage and backup of the data.

- It is necessary to make provision for the long term storage
- Identify best practices and preserve the documents
- Develop a policy for different materials for its display and preservation
- Fix the file format (pdf) for storage

6.5.5 Content:

The documents must be authenticated by relevant IPR issues and suitable guide lines to be prepared to ensure good practices.

- Develop a content policy
- Categorize the material for deposit
- Management of submission and withdrawal of documents from the repository
- Increase the quality and quantity of material in the repository
- Identify suitable documents from the personal and departmental web pages
- Encourage the authors for the deposition of publication

6.5.6 Liaison:

Liaison within the organization and outside the organization is required.

- Liaise with several departments and interested groups
- Identify high level and long term institutional strategies, needs, which can be met through the repository
- Frame practical policies and procedures so that repository becomes embedded in the research process of the institution
- Create the awareness of benefits of IR among the users
- Channelize the process for the publishing material and it could be to routed through a publication committee, this will help in monitoring the publications and also inclusion in the IR later.
- Liaise with IT staff and maintain HW and SW

- Initiate the contacts with individual scientist / Research groups to identify their needs.
- Promote the repository outside the institution and propagate the institutional work. The repository must be registered with the Directory of Open Access Repository (Open DOAR), Open Access Initiatives (OAI).

6.5.7 Advocacy, Training and Support:

- Develop advocacy programs
- Announce the development of IR on the Institutional web page, news letters etc
- Training to the researchers

6.6 Challenges

- Copy right and legality
- Customization of Open source software
- Content of the IR (Classified or open)
- Formulating different policies for long sustainability
- Efforts to change mindset of Authors towards depositing literature in IR
- Continuous monitoring and additional manpower
- Lack of standardization
- Technical issues and maintenance
- Lack of policies / rules
- Lack of expertise at users and professionals
- Familiarization programme
- Size of repository
- Plagiarism and quality
- Digitization of Documents
- Multi languages / publication

- Extra finance
- Development of institutional culture
- Scope of the repository (self archiving, business documents, etc)
- Content criteria
- Access levels as each institute defines its own policies for access. Copy right materials may carry many restrictions.
- Management of Rights is a major challenge as material going to be added in the repository subject to IPR. These may be owned by institution, author, or a publisher in case of post print. The administrator of the IR to ensure all the legal requirements for the software and license etc.
- Sustainability is an important aspect in IR. It needs constant attention to run smoothly. The coordination of IR manager, archivist, scientific staff and IT staff is essential for the successful running of the IR.
- The manpower and the maintenance cost are high.
- Corruption of data and its maintenance

Despite the numerous benefits of an IR, there are implications and potential barriers to its success as summarised below (Pickton & Barwick, 2006):

· **Cost:** The initial financial cost for an open source software adopted by most institutions for creating IRs is not high but the recurrent costs, especially staff costs (e.g. time spent drafting policies, developing guidelines, publicising, training, supporting users and creating metadata, specialist IT consultancy) may be significant. This is further discussed below.

· **Difficulties in generating content:** A successful IR depends on the willingness of authors to deposit their work voluntarily and there may be local barriers and hindrances to be overcome. There are acknowledged difficulties in generating content, especially at the beginning. Unless the value of an IR can be demonstrated quickly, the organization's long-term commitment to the project may begin to wane. The best way to prove the enduring value of the IR and to ensure its long-term survival is to quickly populate it (Gibbons, 2004).

· **Sustaining support and commitment:** Far too often, it is difficult to sustain continuous support and commitment from the management and academic staff. Lynch (2003) has succinctly described this obstacle: “Stewardship is easy and inexpensive to claim; it is expensive and difficult to honour, and perhaps it will prove to be all too easy to later abdicate”. There is a need for institutions to think seriously before launching institutional repository program as it may disintegrate rapidly if not properly managed.

· **Rights management issues:** Sometimes researchers are apprehensive about infringing publishers’ copyright and lack adequate awareness about their own intellectual property rights. They may be uncertain about making their work available online before it is published by a traditional publisher.

· **Working Culture issues:** Contributing content to user-generated or ‘self-service’ sites is time-consuming; and time is something which academics often lack. They may be willing to contribute content but reluctant to do it themselves. This calls for mediated deposits service for them.

· **Policy Issues:** Experiences suggest that an IR will only function to its capacity when a mandate is in place to populate it but clearly researchers can react negatively to any suggestion of compulsion. Lynch (2003) has cautioned that an IR should not become a tool for enforcing administrative control over academic work.

· **Lack of incentives:** In the absence of any incentive academics feel reluctant to provide even bibliographic details of their scholarly output especially when they know that incentives are available in other institutions.

The challenge therefore in implementing an IR is to promote the benefits it offers while allaying stakeholders’ concerns.

6.7 How to Meet Out Challenges:

Barton et al (2005) has pointed out many problems and hurdles faced while implementation and building a repository includes:

- Proper development of policies and its sustainability

- Managing intellectual property rights for common use and awareness
- Management or institutional support as well as users support
- Digital preservation and identifying key stakeholders

It also needs personalized efforts of library staff to collect, scan and preserve and make it available on demand. This needs extra skills of maintaining IR.

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- It also needs personalized efforts of library staff to collect, scan and preserve and make it available on demand. This needs extra skills of maintaining IR.

6.8 Metadata

Metadata is data about data or information about information. Metadata is data associated with objects which helps end user to know existence of a object. The most common definition of the term 'metadata' is structured data about data, information that describes other information.

For example, if a Web page has an author, a title, a date of creation and a unique Internet address, these elements constitute metadata about the page. Metadata is an Internet- age term for information that librarians traditionally have put into catalogues and it commonly refers to descriptive information about Web/digital resources. The data can be textual information, graphics, audio/video information.

It is used in digital/electronic environment where it is necessary to describe a document available in digital/electronic form. It is also necessary to have metadata of a document for its discovery. Metadata is structured information that describes, explains, and locates an information resource.

Traditional library cataloguing is form of a metadata and MARC 21 is one of the metadata standard used for cataloguing print documents as well as digital/electronic documents.

6.8.1 Functions of Metadata

One of the main functions of metadata is resource discovery which helps to search, retrieve and access electronic resource. Metadata helps users to find out availability of information, details about information objects.

6.8.2 Types of Metadata:

There are three main types of metadata:

6.8.2.1 Descriptive Metadata:

This describes a document for purpose such as discovery and identification. An important reason for creating descriptive metadata is to make sure that document can be discovered through metadata fields. The metadata fields include author, title, classification number, abstract, ISBN, Language, and Number of Pages etc.

Descriptive metadata can indicate where an information resource is located, either physically or virtually. For e.g. Classification information, library holdings or URL

Descriptive metadata can distinguish one information resource from another without describing the entire collection of information resources. The ISBN helps to identify the resource from other resources. To identify data another e.g. Is PURL i.e. Persistent Uniform Resource Locator (PURL). Descriptive metadata helps to discover resource by using subject headings from controlled vocabulary.

Descriptive metadata can be into two parts. It can be embedded with the document or separately added into the database. Metadata should be stored along with the object so that it cannot be lost. Generally metadata is stored in database management systems and linked to the objects described. Digital information resources can include the descriptive metadata as part of the information they consists of. For e.g. A web site will have meta-tags describing the creator and subject content of the site. These tags are part of the same file as the actual content of the web site.

For e.g. for any web site its metadata is embedded in the upper portion of its html tags.

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />
<meta name="DOI" content="10.1045/march2010-manghi" />
<meta name="description" content="D-Lib Magazine" />
<meta name="keywords" content="D-Lib Magazine, Digital Libraries, Digital
Library Research" />
<link rel="metadata" href="03manghi.meta.xml" />
<link href="../../style/style1.css" rel="stylesheet" type="text/css" />
<link rel="shortcut icon" href="/favicon.ico" type="image/x-icon" />
<title>Realizing and Maintaining Aggregative Digital Library Systems: D-NET
Software Toolkit and OAIster System</title>
```

6.8.2.2 Structural Metadata:

This type of metadata indicates how compound objects are put together, for e. g. how pages of a book are ordered to form chapters. It recognizes that users expect certain "behaviors" from a work. While reading a book user may wish to jump from different pages and to provide this behavior structural metadata is required. Without structural metadata, the book would just be a series of individual scanned pages, and users would have a great deal of difficulty in reading a book. Structural metadata has also been applied to a variety of other types of works that can benefit from internal navigation, including diaries and journals. A book, which consists of pages and chapters, is one of the most straightforward examples of structural metadata. Structural metadata aids the user in navigating among individual objects that comprise a compound object.

```
<P ALIGN="JUSTIFY">c) as a working document for meetings and workshops
related with neo-literate programmes in general and materials development
programmes in particular</P>
<P ALIGN="JUSTIFY"></P>
```


<P ALIGN="JUSTIFY">accordingly, the guidebook as a whole or any part of it could be adapted or adopted in its original form or in translated form in any language of the countries. (This could be arranged by writing a letter to ACCU, Tokyo.)</P>

<P ALIGN="JUSTIFY"></P>

<P ALIGN="JUSTIFY"> </P>

<P ALIGN="CENTER"></P>

<!—

</Section>

<Section>

<Description>

<Metadata name="Title">Section I: Rationale and principle of learning materials</Metadata>

</Description>

-->

<P ALIGN="JUSTIFY"></P>

<P></P>

<!—

<Section>

<Description>

<Metadata name="Title">1. Rationale and principle of learning Materials</Metadata>

</Description>

6.8.5 Administrative Metadata:

This type of metadata helps to understand how and when document was created, file type of the document and other technical information as well as who can access the document. This type also has subsets such as

- Rights Management Metadata which deals with intellectual property rights
- Preservation Metadata which contains information needed to archive and preserve a resource.

6.9 Metadata Standards

Many different metadata schemes/standards are being developed in a variety of user environments and disciplines. The following are different metadata standards available for variety of contents.

Dublin Core

The Dublin Core Metadata Element Set was formed from the discussions at a 1995 workshop sponsored by OCLC and the National Centre for Supercomputing Applications (NCSA). As the workshop was held in Dublin, Ohio, USA the standard was named as Dublin Core Metadata Standard. The continuing development of the Dublin Core and related specifications is managed by the Dublin Core Metadata Initiative (DCMI). In 2003, Dublin Core was issued as an international standard (ISO 15836)

The objective of the Dublin Core was to define a set of elements that could be used by authors to describe their own web resources. The Dublin Core was developed to catalogue all web-based documents or digital documents and it was made a simple cataloguing standard. The original 13 elements of Dublin Core were later increased to 15 elements such as Title, Creator, Subject, Description, Publisher, Contributor, Date, Type, Format, Identifier, Source, Language, Relation, Coverage and Rights. All Dublin Core metadata elements are optional and repeatable. For e.g. Creator can be a repeatable field. The following is one example of Dublin Core:

Title="Metadata Demystified"

Creator="Brand, Amy"

Creator="Daly, Frank"

Creator="Meyers, Barbara"

Subject="metadata"

Description="Presents an overview of metadata conventions in publishing."

Publisher="NISO Press"

Publisher="The Sheridan Press"

Date="2003-07"

Type="Text"

Format="application/pdf"

Identifier="http://www.niso.org/standards/resources/Metadata_Demystified.pdf"

Language="en"

Because of simplicity Dublin Core is used by many outside the library community – researchers, museum curators, music collectors etc. There are hundreds of projects worldwide that use the Dublin Core either for cataloguing or to collect data from the Internet. For Describing a manuscripts after Cumming out research and after studying manuscripts available in Tilak Maharashtra Vidyapeeth, Library. The following metadata fields are identify and which are required for cataloguing in manuscripts these fields are then mapped with Dublin Core metadata standards.

Following Metadata fields are created for describing manuscript available in TMV for adding in IR@TMV:-

1. Another Title
2. Script
3. Created Date of Manuscripts
4. No. of Folios
5. Missing portion
6. Status

7. Beginning Line & Ending Line
8. Material: for e.g. Paper, Tamrapat, Shilalekh ect.
9. Size of Manuscripts
10. Condition
11. Holder Rights

6.10 Digital Identification

Most metadata schemes include elements such as standard numbers to uniquely identify the work or object to which metadata refers. The location of a digital object may also be given using a file name, URL (Uniform Resource Locator) or more more persistent identifier such as PURL or DOI (Digital Object Identifier). Persistent identifiers are preferred for digital objects as location often change hence making the URL invalid.

6.10.1 Archiving and Preservation

Digital information keeps changing due to the fact that hardware and software are constantly been upgraded. Hence it is necessary that librarian has to update the metadata and digital documents as per the technology changes. Digital information is fragile. Digital formats keep changing hence it is necessary to keep metadata of digital documents from preservation point of view. Metadata is keys to ensuring that resources will survive and continue to be accessible into the future. There are metadata standard available for digital preservation. PREMIS is Preservation Metadata Maintenance Activity standard used from metadata preservation point of view. Preservation metadata supports activities intended to ensure the long-term usability of a digital resource.

6.11 IR@ TMV: Screen Displays

Communities and Collection:-

IR@TMV is created using a pilot study. Dspace is used to create IR@TMV. The community name given for the repository is “Institutional Repository of TMV Library”. Several collections were created in IR@TMV such as Annual Reports, Question Papers, and Manuscripts collection. The following screen shoot shows

details about community created in dspace and collection added in dspace as manuscripts, Question Papers, Thesis etc.

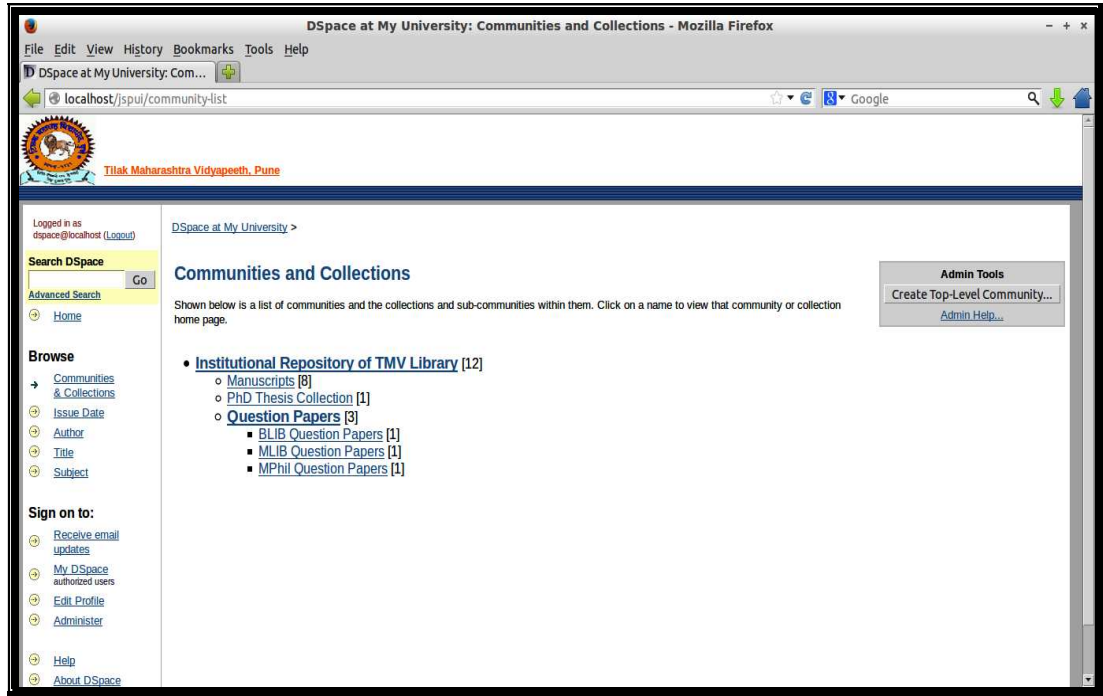


Fig. 6.2 Communities and Collection IR@TMV

A sample collection of various document types such as Question Papers, Thesis Collection, and Manuscripts is created in Dspace. While initiating repository at TMV the emphasis is initially given to documents already available in digital format such as thesis, question papers and manuscripts. The following screen shot describe a sample thesis added in Dspace.

Question paper screen shoot

The screenshot shows a Mozilla Firefox browser window displaying the DSpace interface for 'philosophy of Library and Information Science' at Tilak Maharashtra Vidyapeeth, Pune. The browser address bar shows 'localhost/jspui/handle/1/109'. The page features a navigation menu on the left with options like 'Search DSpace', 'Browse', and 'Sign on to:'. The main content area displays the following information:

Title: philosophy of Library and Information Science
Other Titles: ग्रंथालय आणि माहितीशास्त्राचे तत्वज्ञान आणि ग्रंथालयाचे सामाजिक महत्त्व
Keywords: Library and Information Science
philosophy of Library
Issue Date: 2014
Publisher: Tilak Maharashtra Vidyapeeth
URI: <http://hdl.handle.net/1/109>
Appears in Collections: [BLIB Question Papers](#)

A grey box highlights the URI: **Please use this identifier to cite or link to this item: <http://hdl.handle.net/1/109>**

Below this, a table titled 'Files in This Item:' lists the uploaded file:

File	Description	Size	Format
BL-111 (3).pdf		98.95 KB	Adobe PDF View/Open

Buttons for 'Export Item', 'Export (migrate) Item', 'Export metadata', and 'Edit...' are visible above the file table. A 'Show full item record' button is located below the table.

Fig 6.3 Question Paper uploading in Dspace

Thesis collection screen shoot

The screenshot shows a web browser window with the title "DSpace at My University: Information seeking behaviour of users of management institute libraries in Pune - Mozilla Firefox". The address bar shows "localhost/jspui/handle/1/108". The page features the logo of Tilak Maharashtra Vidyapeeth, Pune.

On the left side, there is a navigation menu with the following sections:

- Logged in as:** dspace@localhost (Logout)
- Search DSpace:** A search bar with a "Go" button and a link to "Advanced Search".
- Browse:** Links for Home, Communities & Collections, Issue Date, Author, Title, and Subject.
- Sign on to:** Links for Receive email updates, My DSpace authorized users, Edit Profile, and Administer.
- Help:** Links for Help and About DSpace.

The main content area displays the following information:

- Navigation:** DSpace at My University > Institutional Repository of TMV Library > PhD Thesis Collection >
- Identifier:** Please use this identifier to cite or link to this item: <http://hdl.handle.net/1/108>
- Buttons:** Export item, Export (migrate) item, Edit..., Export metadata
- Title:** Information seeking behaviour of users of management institute libraries in Pune
- Authors:** Khandare, Dhanishtha; Dahibhate, N.B.(Guide)
- Keywords:** Library and Information Science; Library Management; Information Seeking Behaviour
- Issue Date:** 2014
- URI:** <http://hdl.handle.net/1/108>
- Appears in Collections:** [PhD Thesis Collection](#)

Below this information is a table titled "Files in This Item":

File	Description	Size	Format	
01_title.pdf		18.36 kB	Adobe PDF	View/Open
02_certificates.pdf		26.85 kB	Adobe PDF	View/Open
03_acknowledgment.pdf		24.53 kB	Adobe PDF	View/Open

Fig 6.4 Thesis upload in Dspace

A sample collection of Manuscripts is also added in Manuscripts Collection. Before adding any manuscripts in Dspace new metadata fields are identified and added in Dspace Dublin core Metadata registry. These fields were not available in Dspace metadata registry. The following screen shoot describe details about their new metadata fields

ID	Type	Label	Description	Update	Delete
75	description	Folio		Update	Delete...
27	description	abstract	Abstract or summary.	Update	Delete...
28	description	provenance	The history of custody of the item since its creation, including any changes successive custodians made to it.	Update	Delete...
29	description	sponsorship	Information about sponsoring agencies, individuals, or contractual arrangements for the item.	Update	Delete...
30	description	statementofresponsibi	To preserve statement of responsibility from MARC records.	Update	Delete...
31	description	tableofcontents	A table of contents for a given item.	Update	Delete...
32	description	uri	Uniform Resource Identifier pointing to description of this item.	Update	Delete...
68	description	version	The Peer Reviewed status of an item	Update	Delete...
			Catch-all for any description not defined by qualifiers.		

Fig. 6.5 Additional Metadata Field create for Manuscript

After creating metadata fields few records were added. The following screen shoot describe view of records by Author, Tile, keywords, etc.

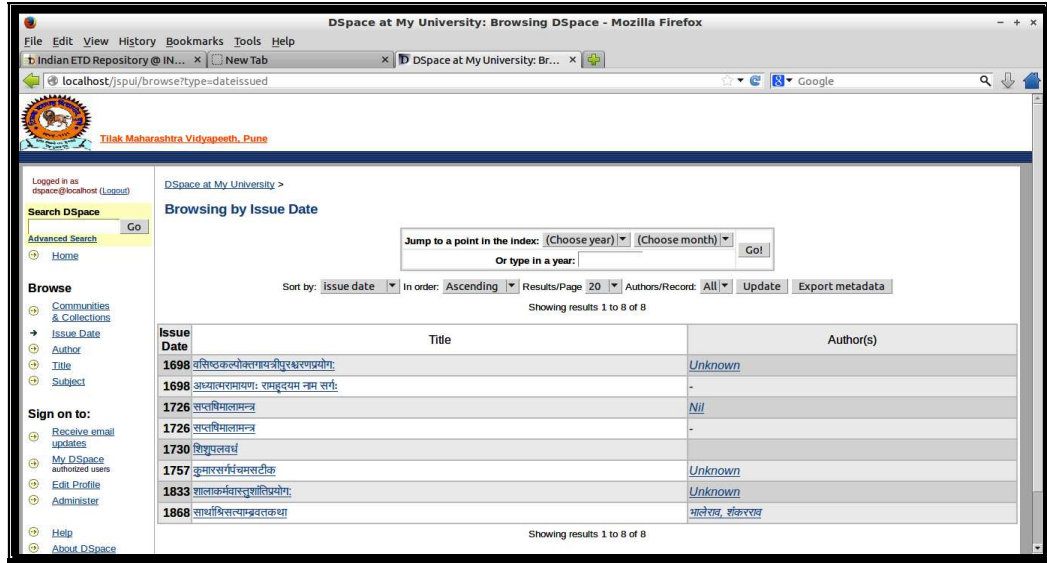


Fig 6.6 Browsing for phonetic language in which original manuscript

While adding individual manuscript in DSpace, metadata of each manuscript was entered in the same language in which original manuscript is in such as Devnagri Scripts. To achieve available records in same language for entering data in Devnagri Lipi “Language input method “ was used which allowed to type data using “ Marathi Phonetic “ keyboard. The following screen shoot describe details about metadata entered in Devnagri Lipi.

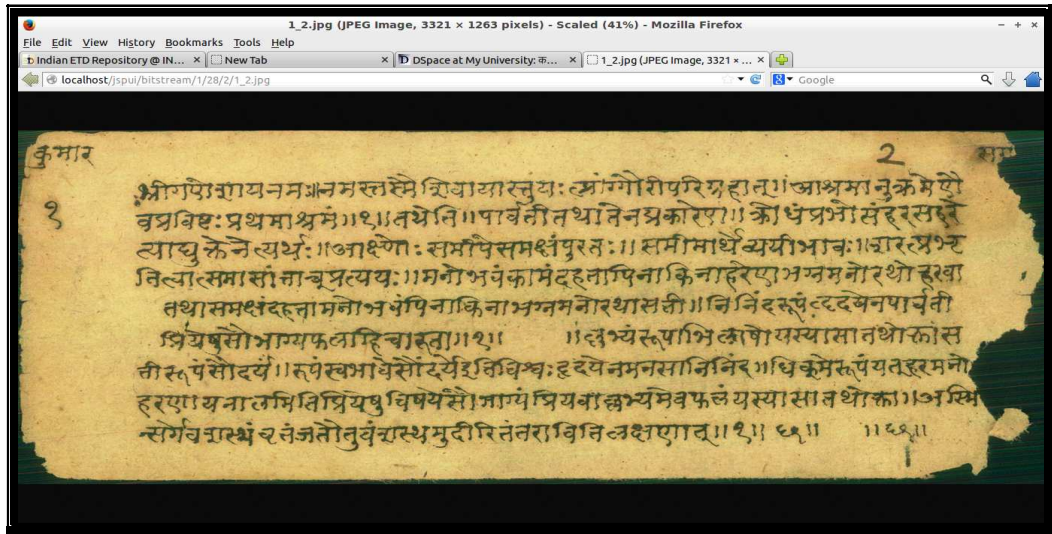


Fig 6.7 Actual scan copy of manuscript

With current scanned available manuscript in TMV Library each manuscript is scanned into several pages as JPG files. So there are many JPG files for a single manuscript. All these JPG files are attached to one metadata record is significant where we only needed to attach JPG files for each manuscript record. The following screen shoot describe about number of JPG files added for a single manuscript.

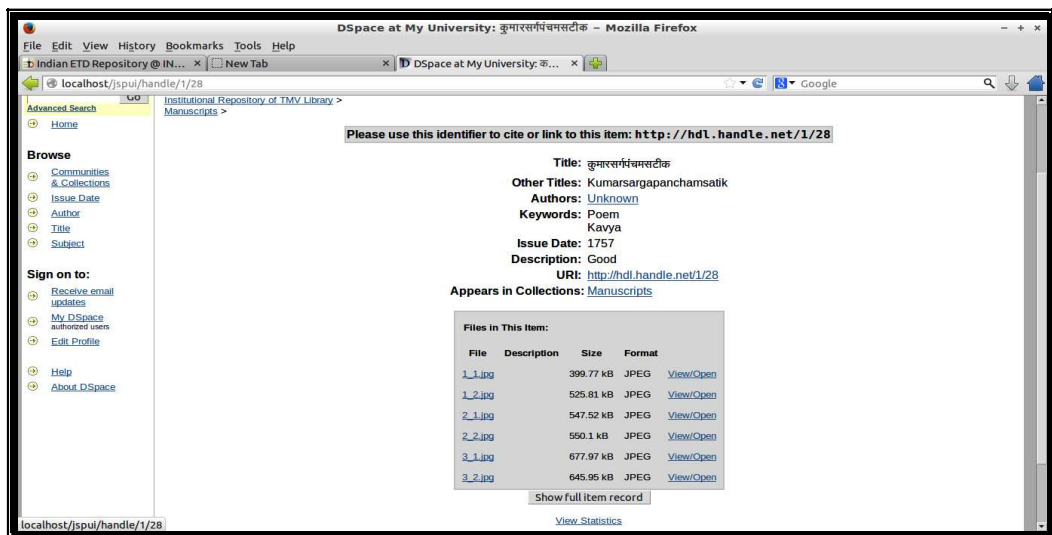


Fig 6.8 Record detail with additional all files

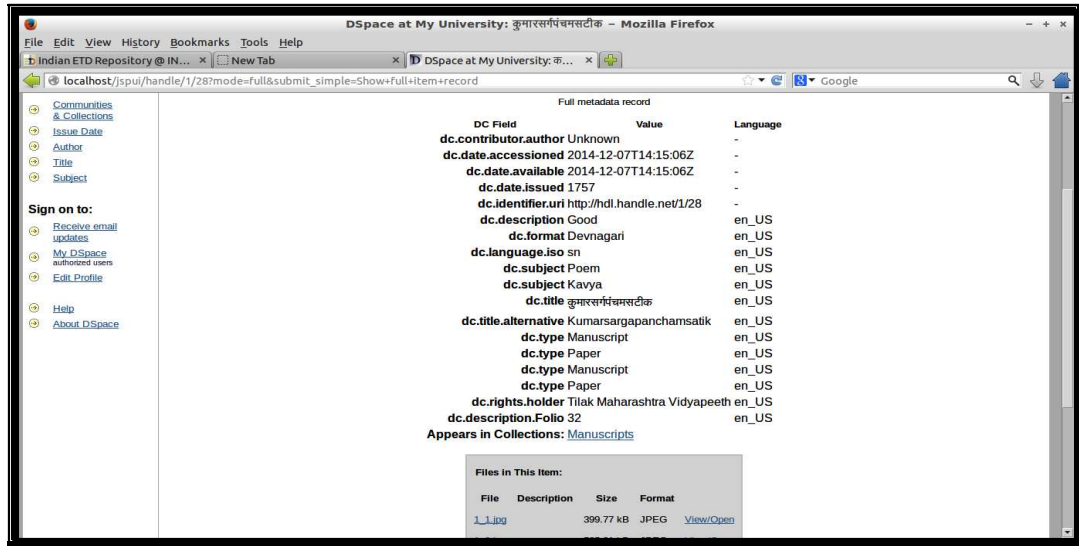


Fig 6.9 Browsing for phonetic language in which original manuscript

The above Screen shoot described view of a single manuscript added in DSpace. The following Screen shoot described a browse view of sample collection of manuscripts added in DSpace.

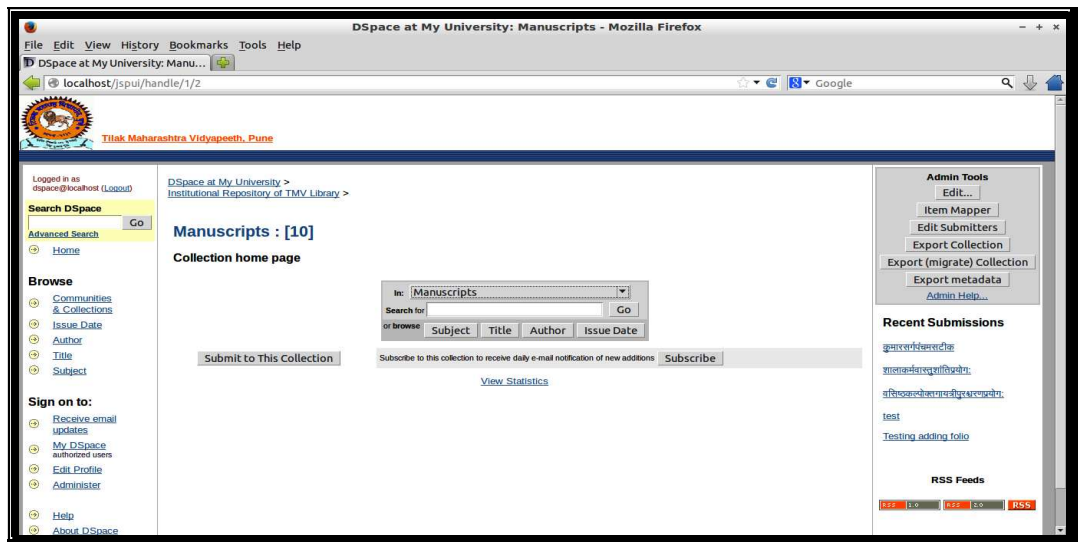


Fig 6.10 Browse by subject, title and author

The screen shots of the repository are elaborated above.

6.12 Policies framed for TMV- IR-

While initiating an IR for TMV these policies can be framed

1. Submission policy framed, which states that items may be deposited by atomized member of the institution or their delegates so that issues of quality and copyrights are protected.
2. The authors can submit their own work but it must be in the form of accepted preprint copy.
3. The articles have to be submitted immediately upon acceptance of paper for publication.
4. The documents must be submitted in PDF form only for easy inclusion.
5. The validity and authenticity of the submitted content may be the sole responsibility
6. Of the authors. The declaration for inclusion in IR must be submitted to management.
7. The documents added in the repository can be withdrawn in case of violation of the copyright.
8. The right and responsibilities of the maintenance are with vidyapeeth authorities' viz. Registrar and VC.
9. A policy is framed out of Intellectual output created by TMV members for uploading into IR.
10. A committee is established for the IR related issues.
11. The policy for digitization and inclusion of material in the IR is framed.
12. Data Security issues

Summary of Chapter:

This chapter covers mainly the issues faced while developing IR at TMV. Though the repository is recently developed but there are many logical issues need to be discussed to enhance the activities of IR and hence researcher tried to put forth the best practices

and action plan for the development of the IR. However a separate policy with new additions is suggested in concluding part of the research study by the researcher. The metadata is main aspect of the IR and this is discussed in brief along with meeting out the challenges.

References:-

- Barton, B. et. al (2005). Flight muscle properties and aerodynamic performance of *Drosophila* expressing a flight in transgene. *J. Exp. Biol.* 208(Pt 3): 549--560
- Lynch, C. A. (2003). *Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age*. c: ARL. Retrieved August 12, 2012, from <http://www.arl.org/resources/pubs/br/br226/br226ir.shtml>
- Rajashekar, T.B (2010) Institutional Repositories : Vehicles for digital preservation and dissemination of organizational intellectual output. *Librarianship Today* Ed. By Gadre, A and Rath, P N. Pune, Diamond Publications pp 10-24 (ISBN 978-81-8483-318-8) Robert Gordon University. Guidelines for developing and maintaining institutional repositories. Accessed at www.ugr.es/~afporcel/guidelines.doc , accessed on 12.12.2011)

Chapter 7: Observations, Suggestions and Conclusion

7.1 Introduction:

Developing an IR for any institution at the outset it looks an easy task but the reality is difficult as it involves many activities, which makes the process little bit complicated. The researcher experienced different issues while planning for the IR for the university where researcher is working. Creating and planning of an IR is different experience. ICT helped library professionals in disseminating the information required by the users but the process at the initial stage is crucial and the researcher has an experience of different issues to be faced while creating a facility for the compilation of experience. The experience observed while developing IR is placed in the following paragraphs.

Observations:

1. Concept of developing IR is growing in academic & research institutes to bring collections available in organizations at one place.
2. IR is basically developed to organize and share Gray Literature and other scholarly literature available in an organization so that it is possible to achieve maximum level of resource sharing.
3. Though IR development is initiated since 1990, the real growth started from 2003 and Lynch was the pioneer in developing IR.
4. The academician, researchers are busy in generally information in academic & research organizations/institutes & these if advised properly for future helps in avoid duplicate efforts.
5. The outline of research communications, senior papers Co/ workshops/ training material, notes hands on notes, annual reports, newsletters, University journals , thesis, reports, project reports can be kept in IR.

6. It is also possible to bring information services using IR collection.
7. While developing an IR there is a need to coordinate & collaborate with librarian, information technologists for its proper development.
8. There is a need of additional funds for development of IR especially for hardware, software, network connection, data scanning etc.

7.2 Challenges Faced while Developing IR:

Following challenges have been faced while developing IR@TMV:

1. Developing IR is a complicated process and involves many policies while considering creation.
2. Initial requirement is of ICT Infrastructure having enhanced and advanced hardware with maximum storage capacity servers as well as different software including OS and free software.
3. The initial cost for developing an IR is around Rs 7-8 Lack to prepare configuration and procurement of servers and hardware. The researcher has analysed the minimum requirement for establishing IR is as under:-
 - a) **Hardware required: One Server:** The configuration and specifications:
RAM = 8 to 16 GB, HDD = 1TB
 - b) **Software required:** a) Operating System Linux b) Dspace latest version.
 - c) **Additional Software:** a) PostgreSQL b)Apache Web Server c) Apache Tomcat d) JAVA e) Internet Public IP from for uploading the data.
 - d) **Back Up of the data:** in DSpace Master Data and Postgresql data is to be backed up regularly and for this purpose a small program is to be developed which takes the automatic back up of the data regularly.
 - e) **Training and Suggestion:** The administrator need to be trained in some issues for a week initially and then when ever required further help regarding maintaining repository can be taken with experts in the area or city.

- f) **Policy Document:** A policy framework related to IR is to be prepared for ease in operation. (Online and Offline). For adding scholarly publications in the repository guidelines provided by SHERA project will be helpful and those guidelines can be taken as a guiding help for developing different policies. However policies for data entry and content coverage, metadata, document submission, preservation policy, operating and updating policies are equally very essential elements.
- g) **User ID preparations:** For various purposes and authentication need to allot password to staff and administrators who are handling IR.
- h) **Subject headings:** Subject headings help to control added records in Dspace. For every entry added in repository 'subject heading' allow users to browse collections available in IR based on broad and narrow subject categories.
- i) **Test Database:** Initially a test database using Dspace is developed and then practiced for a week for the input of varied data formats into it and testing for various parameters (10 – 20 days).
- j) **Human Resource:** HR is required at the initial stage for data entry purpose and standardization of inputs in the initial stage of development.
- k) **Standardization:** It is necessary to fix the contents and the type of files in which data is to be added into it e.g. PDF file for text and gif or jpeg file for images etc.
- l) **Collection to be inputted:** Selection of contents is done on the basis of unique collections available in TMV library.
- m) **Approval from the Authority:** Approval of VC and staff involved in monitoring is to be fixed and informed to authorities.
- n) **Search facilities:** Search facilities mainly covers browse, advance search by author, institute, subject, year and other fields, as provided by the selected software for IR development.

The summary of the hardware and software is:

Hardware:

- Digital computer powered by Pentium IV with high capacity hard disk for server and clients in the LAN, web servers, FTP servers etc.
- Desktop workstations PC's.
- Capture devices such as scanners, camera cards etc.
- Cartridge tape or disk for back up.
- High power UPS (10 or 20 KV)
- Printers (Laser and Ink jet printers (Latest mode)), canboles and test computers.
- Secondary storage or output devices comprising of CD-ROM disks(R/RW),DVD,CD Tower ,Flatbed scanner and OCR ,data compression device;
- High speed LAN, WAN, Internet Connectivity either through dial up, connectivity or V-SAT, or through lease line or radio modem etc.

Software:

- Operating system software
 - OCR software
 - Scanning software
 - Adobe acrobat reader
 - CD read/write software
 - Digital library software i.e. Dspace
 - PostgreSQL server software, Database management software.
 - Web designing software like JAVA, Front page, XML etc.
 - Full text search engine to index and provide access to digital resources
4. Different policies are to be framed out for the sustainable maintenance of IR.
The policies are mainly:

Being creator and manager of IR, librarians have to take care of variety of decisions which can be included in Policies. Librarian has to consider following issues while developing IR:

- a) To build the culture of trust and cooperative environment amongst the staff and management, and convince the staff and researchers the concept of IR and how their contribution to a repository which may enhance institutional reputation and result in wider dissemination of institutional work.
- b) Fix the scope of IR and communicate with management and staff in advance. Contents can be developed and added in IR to make them available centrally and shared globally. Access policies will differ from institution to institution and hence there is a need for defining of proper policy for adding contents in IR. Many institutions appoint a committee for content creation, deposition, evaluation and circulation.
- c) It is necessary to ensure all legal requirements that are met while developing and inclusion of contents in IR. Many universities have developed comprehensive intellectual property policies for setting up IR, including responsibilities of faculty and administration. Academic institutions usually opt for open access but may have to restrict access for some documents which are added in IR.
- d) Collaboration among different people contributing their different talents, working with others to solve problems, and making important decisions. Each group now recognizes and appreciate the expertise and creativity of the others while developing IR. The talents and commitment of time and energy from each group are essential to develop a successful repository.
- e) IR cannot be sustained without long-term infusions of funds. A repository cannot run by itself. It needs constant attention, maintenance and funding. Policies concerning deposit, accessibility, and other anticipated contingencies help in problem-solving process.

Thus in brief, the different policies to be needed to be framed out by the administrator of the IR in consultation of authorities of the institute or committee established for IR development.

5. Selection of Software is an essential part as many Open Source Softwares are available and the IR developer has to review and evaluate the available software. Mainly it is observed that Dspace, Eprint. Fedora is commonly used but these are to be evaluated for the acceptance in the system. The researcher evaluated these and decided to use Dspace. Though Open Source Software is free but evaluation is needed prior to downloading and getting aware about different features supported by the software.
6. The IPR issues are to be followed, In IR only full text is to be added and administrator have to look in to IPR issues. No post print communications are permissible to add in the repository. Hence there is a system to be developed to record the outgoing publications from the contributors of the institute and as soon as accepted for the publication the pre-prints are to be added in to IR. For this purpose a separate mechanism is to be established.
7. The metadata development is a main task which helps users for searching the IR as well as helps librarian to provide different services.
8. The contents of IR is to be fixed after discussing with experts, but the standard data included in IR is: (Mishra 2010)
 - a] Institutionally defined collection which includes, content generated by the community of an institution, content present historical and tangible embodiment of the intellectual life and output of an institution, etc.
 - b] Scholarly contents published like preprints, working papers, and published papers, Research material, staff information, teaching material, thesis, dissertations, Research and technical reports, numerical and statistical report or data.
 - c] Cumulative and perpetual type of data covering material included can be preserved for future scholars to use efficiently, more and more material or information accommodated which is out of print shadow.

However the purpose is to provide wider access to data and user outside the institute also may be in a position to find out information from the repository easily, similarly system maintain and expose the metadata to allow other services to harvest and search the content and both internal and external users can access the content from anywhere.

It can be stated that following useful material can be added into IR

- Preprints of an articles or research report submitted for publication.
- The text of articles accepted for publication in journal.
- Revised text of published work with comments for academic readers.
- Conference papers.
- Teaching materials and Student project Reports.
- Doctorial theses and dissertation.
- Data sets resulting for research projects.
- Works of art / Photographs and video recordings.
- Thesis, Manuscripts, Annual Reports, Question Papers

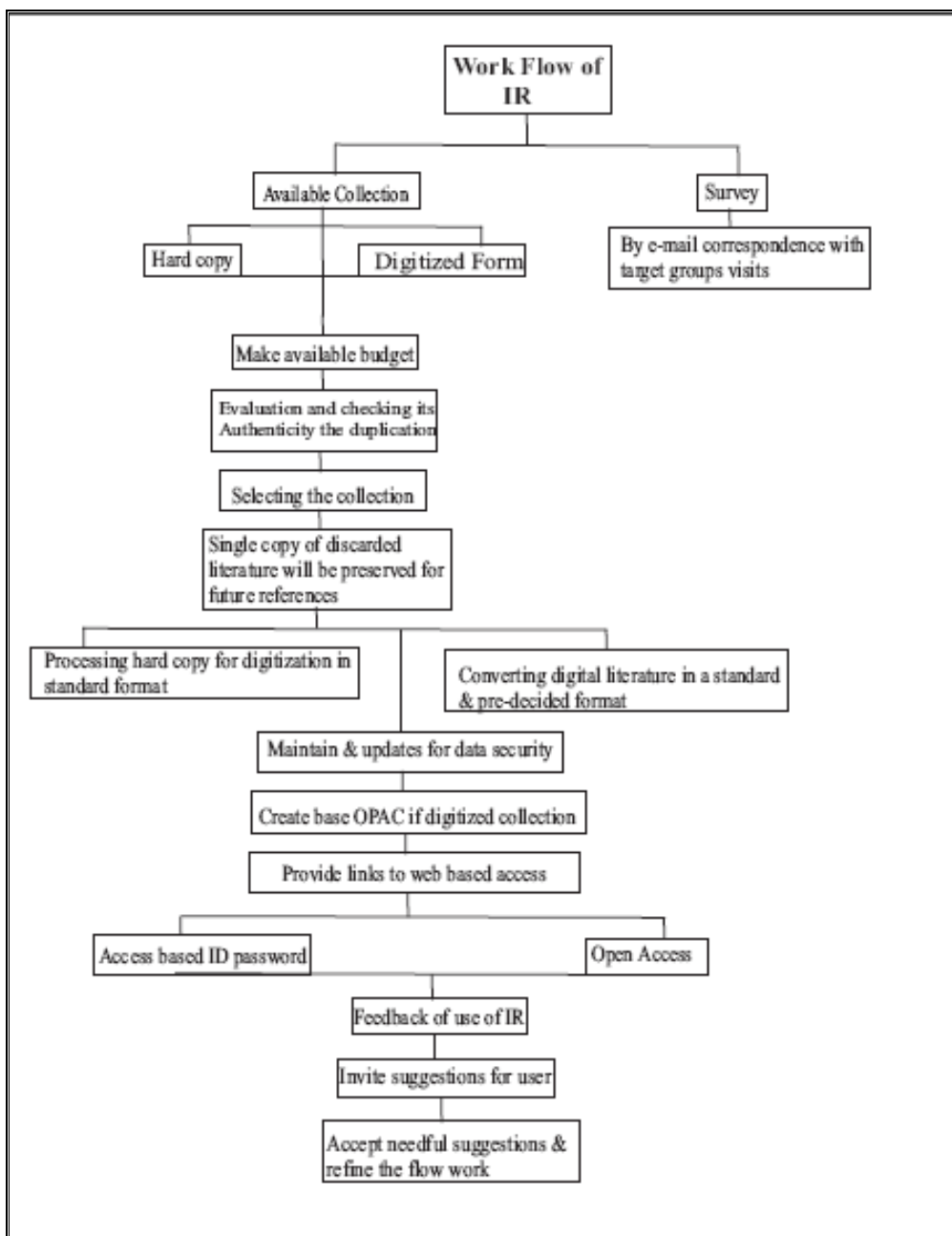


Fig. 7.1 Flow Diagram of IR activities

Workflow Description: -

A sample collection of various document types such as Question Papers, Thesis Collection, and Manuscripts is identified to add in the proposed repository. While initiating repository at TMV the emphasis is initially given to documents already available in “digital format” such as thesis, question papers and manuscripts.

TMV has made a mandate for every student to submit copy of his/her thesis in hard copy as well in CD form. Library also has other documents where TMV holds copyright for such collections which are available in the form of books, research papers, question papers, dissertation, annual reports, Vidyapeeth publications, conference proceeding and unpublished matter. These documents are current not available in digital form hence in due course these documents will first need to be made available in digital form and then these documents can be added in IR@TMV. Presently for the present work, researcher has identified documents which are already available in digital format such as Thesis, Question Papers, and Manuscripts etc.

9. For converting available print collections in digital format advanced technologies in the institute will be required such as digital camera, scanners, OCR software etc.

7.3 Suggestions:

Researcher has studied in depth the IR process and based on the evaluation and analysis of data few suggestions are recorded for the development of sustainable IR for Academic institutes.

1. There is a need to provide additional budget for the development of IR for the institute it is not possible to manage the development of IR in the regular annual budget provision.
2. The technology is becoming obsolete and hence there is need to replace the technological gadgets regularly to maintain the IR in shape. This also need frequent additional budget provision.
3. The contents of IR are to be fixed along with the scope of its inclusion.
4. There is a need to develop a proper comprehensive policy document in written form which is related to development, acquiring instruments and information material, stacking, using and access parameters are to be discussed at length.
5. The services are to be provided based on IR and an efforts is also to be made by librarian to put it on web for the different users at remote places.

6. The trained library staff is to be hired or even computer based personality can be hired to work in collaboration with librarian.
7. The IR not only to be developed once but it can also be sustainable.
8. There is a need to develop a system to manage the publication status so pre-prints can be added in to the IR.
9. IR can be accessible 24/7 to all the desired users
10. IR is developed for the compilation of explicit as well as implicit knowledge
11. A sustainable repository is necessary now a days with proper consideration all selection of pre-requisites and policies to be operate it at different levels. Hence before initiating frame to IR activity a detailed system analysis is to be conducted by the library materials.
12. For effective use of IR a care is to be taken that the intellectual contents are to be included which can be used by others for developing knowledge base.
13. An IR has to follow initial standards while developing to achieve maximum resource sharing of metadata as well as full text.

Recommendations

1. Preservation of documents required integration with IR design & software used for IR
2. IR software be modular flexible & extensible & to permit integration in the digital preservation.
3. IR policies for content preservation, access administration maintenance searching & document delivering to the define very clearly.
4. IPR issues need to be protected.
5. Trained library man power is required for well maintenance of IR.
6. Provide services based on IR

7.4 Draft Policy for Development of Sustainable IR:

It is observed that there are independent policies framed by every institute for creating and maintaining at their place. One concept is very clear that there is a need of developing a written policy for each institute operating IR. Keeping in mind the

researcher reviewed many policies which are already defined by other organizations who are successfully running their IRs and on the basis of their guidelines presenting here a model policy which covers many aspects relating to IR development / building and maintenance etc.

For establishing IR a careful strategic planning is required which contains, Policy decisions, IR Working committee/ expert committee, Registration of IR, Selection of material, Conversion of material to digital format, Training, Support to open access, Open Source, Open standards and funding to maintain IR.

The model policy suggested for development of IR is as mentioned below:

1. Consider the mission and vision of the institute and develop the background for the building of IR. Generally the education institutes like universities have the educational and research culture and the intellectual literature is published in different forms and formats. The intellectual contents need to be evaluated based on the mission of the institute and then need to be included in the IR.
2. The IR contains full text of documents hence there is a need to fix the criteria for the inclusion of documents in IR in digital forms only.
3. There is need to develop awareness of IR concepts and its benefits to faculty and researchers or the contributors and build the culture of trust and cooperative environment amongst the staff and management.
4. Decide the scope of IR and communicate with management and staff in advance and decisions may be taken to develop and include contents which could centrally shared and also shared globally. Access policies differ from institution to institution. Many institutions prefer to provide access to IR to selected users (password protected contents) or access to material on request only. Many institutions appoint a committee for content creation, deposition, evaluation and circulation. A clear statement regarding the access to the IR is defined. The main purpose of the IR is resource sharing and hence there is a need to share the intellectual contribution of the institute among others for building a strong network of unique collections available in any organization.

5. It is necessary to ensure all legal requirements which are met while developing and inclusion of contents in IR. The main requirements include appropriate software and legal contents. Many universities have developed comprehensive intellectual property policies for setting IR, including responsibilities of faculty and administration. Academic institutions usually opt for open access but may have to restrict access for some research collections. A clear statement is to be prepared in this regard.
6. IR cannot be sustained without long-term infusions of funds. A repository cannot run by itself. It needs constant attention, maintenance and funding. Policies concerning deposit, accessibility, and other anticipated contingencies help in problem-solving process. Everyone, involved in a repository needs to understand importance of project and act for their role effectively. An institute desirous has to provide additional funds to the developer of the IR for developing infrastructure required for the IR viz. HW, SW, additional SW, instruments to convert print to digital, digital camera, scanning equipments, content conversion with OCRing facility, high storage servers and data to be uploaded. Similarly trained manpower having ICT background is to be appointed or trained from the existing staff. Without additional budget support from the institute there is less possibility of developing sustainable IR.

The policy statement also need to cover details like posting of contents:

The main elements to be considered in this aspect are

- a) Who can join the repository as a contributor as well as user? (Generally in-house staff, faculty, researchers, scholars and students are the components of this element but retired faculty is also permissible as well as visiting faculty, but this depends on the institute policy)
- b) What should be deposited ? (Only preprints of literature i.e. the final accepted manuscript (after refereeing, revision, etc.) resulting from research projects fully or partially funded by the institute and to appear in peer-reviewed professional journals. This also includes review articles, both invited and author initiated. The full-text of the paper and metadata should be deposited.

Supplementary materials should be made available along with the publication. At the end of the full-text the acknowledgement should carry the grant number. Post print without the permission of publisher is not permitted. The documents under the preview of the university or institute is permitted)

- c) Where to deposit? (The manuscript should be deposited in the grantee's own institution's interoperable institutional repository (IR). Many institutes have made a central unit through which all the communications are monitored and hence it is easy to monitor the acceptance and pre-print loading of the document in the IR)
- d) When to deposit the communication? (Generally deposits need to submitted within one week of acceptance by the journal. However, if the journal insists on an embargo, the material should still be deposited, but therepository will keep the deposited papers non-OA and only make it fully OA at the end of the embargo period. Suggest that the period of embargo not be greater than one year. In any case before the publication of the post-print the only pre-print form)
- e) Who should deposit? (This policy applies to individual scientists/institutions who have directly received ad-hoc funding or other support/benefits/infrastructure from institute as well as to scientists / scholars, faculty, students working in institutions who benefit directly or indirectly from the infrastructure. Any one desirous of adding the communication is permissible only after the review by the moderators of the institute. The principal investigator (PI) or someone authorized by the PI, or anyone authorized by the head of the institution where the work is carried out (such as the librarian), can deposit the papers. Both the PI and the head of the institution will be responsible for timely deposit of the paper.
- f) Is it Mandatory to deposits in IR? (The policy decide which type of material is to be included in the IR. However the research for which future benefits are due, classical literature, confidential literature etc are not covered in the IR)

- g) How to deposit? (In case of IRs, the IR administrator (and his/her team) will deposit the material on behalf of the authors. If one wants to deposit the material in the central repository, the author or one of the authors in case of many) should forward the material to the administrator of the central repository. Those who want to self-archive in an IR may obtain the credentials from the administrators. The contents must be in digital form. The format of digital can be e.g. pdf, gif, etc.)
- h) Copyright issues? (In case the scientist produces research as part of his/her employment with a government body, the copyright vests in the government body, unless otherwise agreed upon to the contrary. Therefore, if the copyright continues to vest in the Government, transfer of rights would have to be by the Government or by the scientist after prior permission from the Government. If the research has been produced by the scientist in the course of his/her employment with any institution, copyrights vests in the institution concerned, unless otherwise agreed upon to the contrary.
- i) Agreement or Undertaking forms the contributor/ author (This is required to manage the legal part of content addition to the repository. The form may contain: Article name / Title:, Author (corresponding), Source, Publisher, Date, Statement of undertaking covering acceptance of author and publisher for the inclusion in IR)

In short the IR is aimed at to maximize the visibility, usage and impact of the University's research output by maximizing online access to it for all would-be users and researchers worldwide and also aims to minimize the effort that individual members of the University must expend in order to provide open online access to their research output. This requires all staff to submit copies of their research output, after it has been accepted as suitable for publication, to the University Institutional Repository.

In addition to these following policies are to be developed

1. Community policies: Describing the departments and faculty or researchers of the institute taking part

2. Community Rights and Responsibilities policies: Describes the contents to be submitted after observing university policies and free from copy right aspects with willingness to share (Undertaking)
3. Content Policies: Describes form, format, linking to other sources (Hyper linking or tagging)
4. Retention of document policies: Describe the retention of content in the IR which may be easier in maintaining the IR.
5. Metadata Policy: The policy for the use of metadata aspects and its use and re-use
6. Preservation policy: How long the data to be persevered life of the data to be fixed with the opinion of the experts
7. Submission policy: Contains policy such as who can deposit
8. Withdrawal policy: fixes the norms when to withdraw the document and in which condition.
9. Maintenance policy: This highlights the need of HW and replacement of HW etc as well as authority to management and permits the levels of usage etc.
10. Access policy: Decides up to what level the access and use of repository is permissible.
11. Distribution Policy: This indicates the requested data dissemination as well as services provided through IR to users.

7.5 Scope for the Further Study:

Any study conducted is not complete in its nature and there is a scope to expand the same considering the limitations identified in the work carried out. The researcher would like to point out the following studies to be conducted by the future researchers;

- 1) Harvesting of contents for the updating IR
- 2) Development of the Subject based repositories
- 3) Development of data banks
- 4) Linking of remote resources to IR

The research study has successfully satisfied the objectives which are fixed for the study and also discussed in the different chapters. The hypothesis considered for this study is also proved positive i.e. true.

- IR initiation is not strong enough in university or academic libraries and need to analyze the challenges
- IR helps in developing resource sharing but such efforts are needed more in academic sector.

7.6 Conclusion:

Institutional Repository is an electronic archive of the scientific and scholarly outputs of an institution. The main aim behind development of Institutional repository (IR) is to develop a mechanism at institutional or organizational level for deposition of the intellectual property which includes research documents, teaching and learning resources, projects, technical reports, research dissertations / thesis, organizational manuscripts, journal articles, research databases or specialized databases, presentations, and rare documents etc. The resources uploaded over the repository can be searched on Intranet or on Internet. A Repository supports mechanisms to import, identify, store, preserve, retrieve, and export an institution's digital assets, usually in the form of full texts. It is a type of content management system that holds the core intellectual assets of a university or college, and enables them to be used in a flexible way to support a variety of business processes.

Institutional repositories are one of the most promising developments that utilize new web technologies to offer a viable and sustainable alternative to the current model of scholarly publishing. The repositories also serve as a comprehensive publications database of the parent organization. The aim of institutional repositories is to aid the management and dissemination of the scholarly electronic resources produced by academics.

For better promotion of intellectual contents of institute librarians have to be engaged in managing and developing their collection through institutional repositories. As a result the libraries have many rolls to play to build up a successful institutional repository. Libraries and librarians can play a very vital role in helping to facilitate the

development of digital communication channels tailored to the needs of individual discipline. By providing the context and structure for the development of such channels through institutional repositories, librarians can apply their special skills and perspective, as well as make effective use of the substantial resources being committed to research and communications by academic institution, departments, government agencies and individual researchers. An individual institutional repository can offer a set of services including digital content submission, organization, access, distribution and preservation. An institutional repository of necessity represents collaboration among librarians, information technologies, archives and records managers, faculty and university administrators and policymakers.

Libraries have to play an important role in building and maintaining the infrastructure of these repositories, because libraries have always managed their institutional collections, they have accumulated abundant expertise in collection assessment, organization and development. The benefits of open access, libraries could provide direct access to scholarly publications via these repositories instead of via serials publishers and vendors. Libraries would consequently spend less time dealing subscription issues. To accomplish this, libraries would need to recruit librarians who possess digital collection management and OAI's management skills. Training faculty and students to use OAI's, helping them in preparing their digital products, involving them in institution wide policy making and setting repository goals would be some of the new task that librarians will face.

Considering the growing benefits of institutional repositories it is conceivable that establishing institutional repositories will be the next significant movement in the library landscape. As a result the libraries will have a many roles to play to build up successful institutional repositories. Libraries have always been engaged in managing their institutional collections, accumulated abundant expertise in collection assessment, organization and development. The libraries have a key role to play in building institutional repositories. Library roles are becoming more deeply engaged with the broader vision of the institution by becoming more intertwined and interdependent with other stakeholders, such as the university administration, faculty and other departments. Most of the faculty do not have the time to stay abreast of changes in information technology and will consider self archiving as extra

administrative work. The libraries level of relevance and visibility to faculty and the institution will increase as librarians support faculty in their digital publishing activities. He further states that the library can involve developing institutional repositories and serve as a collaborator in research, teaching and learning.

The libraries are moving from the traditional role of custodian, access and distributor into a new role as part of the creation and dissemination process. The libraries have long experience with developing and managing content and many of the skills applied to print and other forms of digital collections will be transferable to the institutional repository environment and the librarians can greatly increase the relevance and visibility of an institution by involving themselves in building an institutional repository. If the libraries are to build repositories that incorporate informal scholarly communication, then they will need to develop an improved understanding of how this content contributes to the processes of research and scholarly communication.

Most repositories are building upon a system of self archiving, with a producer being responsible for adding an item to a repository and creating the associated metadata. A particular challenge libraries face in assuming the lead role in the development of institutional repositories and their normalization within the collection management programs will be that of providing adequate staffing support. The libraries have to recruit librarians who possess advanced skills like digital collection management and OAI's management skills. Training the faculty and students to use OAI's, helping them prepare their digital products involving them in institution-wide policy making and setting repository goals would be some of the new tasks that libraries will face. The librarians should be aggressive in lobbying for project funding that should deliver important benefits to a university or an institution.

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