

**IMPLEMENTATION STRATEGIES AND SUSTAINABILITY
OF REPOSITORIES IN THE AUTONOMOUS INSTITUTIONS OF
DEPARTMENT OF SCIENCE AND TECHNOLOGY, MINISTRY OF
SCIENCE AND TECHNOLOGY, GOVERNMENT OF INDIA: AN
EVALUATIVE STUDY**

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ABSTRACT

Introduction

Technologies have made it possible to fill the knowledge gap while helping the institutions of developing countries that are exclusively engaged in research and development and disseminate their works. An institutional repository is an archive where the intellectual output of an institution can be gathered, preserved, and shared. A repository is a hub where data is gathered and preserved, and many databases or files are located for dissemination throughout a network. The sharing of resources is more effective in teaching and learning, an exchange of best practices, better consistency, and increased community growth. Institutional repositories offer scientists, faculties, researchers, and others a single platform to develop their digital collections and also access the digital collections created by others.

Statement of the Problem

The statement of the problem of the research is entitled as **“Implementation Strategies and Sustainability of Repositories in Autonomous Institutions of Department of Science and Technology, Ministry of Science and Technology, Government of India: An Evaluative Study.”** This study shows the need for the implementation of repositories in any type of institution whether it is academic or research institute. In this study, there are 15 institutions which have created their own repositories for the benefit of users along with the institutions. This study starts with the factor influenced to make repositories and goes forward with the selection of documents and publication for inclusion as content into the repositories. This study also lights on challenges and issues for sustainable repositories.

Significance of the Study

The institutional repositories are vital and support scholarly communication including grey literature and other relevant institutional documents. The well-established institutional repositories always provide a proper direction and support marketing and executing their respective policies and plans.

The present study analyses the steps taken before the implementation of the repositories i.e., contributors, content, criteria for selection of documents, software use, disaster management, etc., and also users' satisfaction level towards repositories. This study helps parallel institutions to implement the repositories or the rest of the institutions have not implemented the repositories. Users' study helps to know the users' opinions', satisfaction level, and problems faced while using the repository. The study fills the gap between the literature found related to the topic.

Objectives of the Study

These objectives are:

- To know the policy of making Repositories.
- To identify major factors involved in the development of a sustainable platform and process for repositories.
- To know infrastructural and technological requirements for repositories.
- To determine selection of documents and publication for inclusion as content into the repositories.
- To identify challenges and issues for sustainable repositories.
- To identify the plan for disaster management and back-up as well as funding.
- To know the satisfaction level of users.

Hypotheses of the Study

- **H1:** Institutions do not face any issues like manpower, funding etc during implementation of repositories.
- **H2:** Most of the users satisfy with repositories.

Methodology of the Study

Out of 15, the 14 institutions' librarians/library in- charges have responded. So, further analysis was done on only 14 institutions' librarians/library in-charges. The studied institutions have a total number of 5,281 registered users. Based on 10% of the population (Connelly, 2008), a total number of 528 users were supposed to approach/collect data. Considering this fact, the researcher kept sending the questionnaires continuously till the required number of responses was received, i.e. 528. To proceed further, the shorting and filtering of data were started. After data screening/ shorting/ filtering, only 420 were found eligible for further analysis. Henceforth, finally, the depth study of data was analysed/conducted with the 420 users.

It is further clarified that the initial data were analysed with 528 users. However, the users (i.e. 108) who were not aware and did not use the IR at all were excluded from the depth analysis of data /study. Therefore, the depth study was conducted out of 420 users ($528-108 = 420$).

Data analysis

The collected data were compiled and analyzed using Excel and SPSS version 20. The collected data were imported into SPSS. Data screening was carried out, instrument reliability was found to show internal consistency with Cronbach's alpha value was greater than >0.70 (Griethuijsen, et al., 2015), thus fulfilling the required alpha value. The analysis of collected data is presented with the help of tables, figures and graphs.

Reference style

A referencing style is a consistent way to cite information sources both in the main part of writing and in the reference list. The American Psychological Association (APA) is one of the referencing styles that researchers used. In this study, the researcher also used the 7th edition of the APA referencing style to create and manage references and bibliographies.

Scope and Limitations of the Study

The present study is limited to autonomous institutions of the Department of Science and Technology, Ministry of Science and Technology, Government of India. In this study, the researcher collected data from the Librarians/Library in-charges to know the implementation strategies and sustainability of repositories. The registered users are also examined for their awareness and usage of the repositories. There are a total number of 15 institutions, out of 20 which have institutional repositories. The researcher distributed/sent questionnaires in offline/online modes. The following are the 15 autonomous institutions under DST:

Autonomous Institutions of DST

S. No.	Name of the Institution	Place	Registered Users
1.	Agharkar Research Institute	Pune	150
2.	Aryabhatta Research Institute of Observational-Sciences	Nainital	148
3.	Birbal Sahni Institute of Palaeobotany	Lucknow	1200
4.	Bose Institute	Kolkata	180

5.	Indian Association for the Cultivation of Science	Kolkata	300
6.	Indian Institute of Astrophysics	Bangalore	1164
7.	Indian Institute of Geomagnetism	Mumbai	250
8.	Institute of Nano Science and Technology	Mohali	110
9.	Jawaharlal Nehru Centre for Advanced Scientific Research	Bangalore	Not Responded
10	Raman Research Institute	Bangalore	250
11.	Sree Chitra Tirunal Institute for Medical Sciences and Technology	Thiruvananthapuram	400
12.	S.N. Bose National Centre for Basic Sciences	Kolkata	500
13.	The Institute of Advanced Study in Science & Technology	Guwahati	100
14.	Wadia Institute of Himalayan Geology	Dehradun	500
15.	Vigyan Prasar	New Delhi	29
Total			5,281

Findings of the Study

- It is found that some institutions have given library charges to scientists.
- It is found that out of 14 institutions, 8 implemented the repositories till 2010 when the concept of the repository was introduced, while 2 institutions implemented the repository in 2015 and 2017 and 2 institutions implemented the repository after 2020.
- It is found that 57.14% of repositories are fully implemented while 42.86% of respondents responded that the repositories of the institutions are in process.

- The most influential factors in creating repositories are observed that the repositories ‘promote online study’ followed by protecting intellectual works, global visibility of the collections, users’ friendliness, the opportunity to access certain materials, more access to scholarly works, etc.
- It is observed from the study that most institutions have taken permission from top management followed by experts’ advice, discussed security-related issues, and budget analysis before implementing the repositories.
- It is found that only 6 institutions drafted the policy at the time of implementing the repositories and 8 institutions have not responded.
- It is found that the policies regarding repositories are not full fledged drafted by the studied institutions.
- Findings show that faculties and research scholars contribute maximum number of scholarly products followed by staff, students, alumni, and external contributors.
- It is observed from table 5.2.11 that the majority of the institutions consist of reports followed by journal articles/ research papers, theses and dissertations, archival collection, institutional publications, and miscellaneous, etc.
- It is also observed from table 5.2.11 that IASST is the highest scholarly products contributing institution followed by IIA, ARI, INST, IACS, RRI, and BOSE Institute etc.
- The opinion of the respondents on the selection of the documents revealed that most of the respondents ‘strongly agreed’ and agreed that collection should

follow copyright laws, it should be intellectual, it should be in rare and fragile condition, it should be in the prescribed format, etc.

- The 12 (92.31%) number of institutions are using D-Space software while 1 institution uses E-Prints and 1 institution uses e-Granthalaya for managing the repositories.
- Majority of the respondents' opined on the selected software that they 'strongly agreed' with software chosen by them because the software is affordable, Scalable, Reliable, User Friendliness, Open and inter-operable, Modular, usability and secure but undecided with robustness.
- It is observed from table 5.2.13 that PDF is the most preferred format in text while JPEG in image, MP3 in audio and MPEG and AVI in video but very less in number.
- 12 (85.71%) of respondents used Dublin core metadata standard while 1 respondent use METS (Metadata Encoding and Transmission Standard) and 1 respondent use MARC21.
- It is found that most of the respondents are highly satisfied with the 'digital infrastructure' and 'satisfied' with the digital cameras.
- Majority of the respondents have planned for disaster management such as fire and smoke alarms, emergency power supply, temperature control, data backup, regular training of the staff, Ensuring and maintaining the authenticity, integrity, and usability of digital objects, etc.
- Out of 14 institutions only 5 (35.71%) faced problems during implementing and managing repositories on copyright issues followed by technological failure,

lack of skill staff, lack of awareness of open access, mission change/policy change, identifying the collection, and excess of workload, etc.

- The 100% of respondents have prepared long-term life span plans for the repositories in their respective institutions.
- The 35.71% of respondents responded that efficiency of users in using repositories is 'below average' followed by 21.43% 'very high' same as 21.43% of respondents responded that it is 'above average' and 21.43% of respondents responded that it is 'average'.
- Majority of the respondents do not update their respective repository software, model of hardware equipment, and Withdrawal policy, however, a few of them update their repositories from time to time.
- The searching, browsing, displaying facilities are being offered by all the studied institutions followed by Metadata Standard and Interface, Memberships/login, alert system, and feedback facility, etc. rest of the services are offered moderately or very few.
- The IACS and IASST are providing the maximum number of services followed by INST and RRI, IIA, BSIP, etc.
- Majority of respondents promote the repositories through the library website followed by an orientation program, meetings, seminars/symposiums/workshops, etc.
- Most of the respondents always encourage other institutions to create repositories.

- 92.86% of respondents responded that the repository of an institution is very important while 7.14% of respondents responded that it is 'important'.
- Most of the respondents are researchers followed by scientists, master students, bachelor students, faculties, and others(diploma) involved in this study.
- A total number of 85.98% of respondents are aware of the repository while 14.02% of respondents are not aware of the repository.
- Findings show that most of the respondents are aware of repositories, 'moderately' followed by 'somewhat aware', 'slightly aware', and very few respondents are 'extremely aware'.
- Majority of the respondents are aware of the repository through library staff followed by library websites, friends/colleagues, faculties, institutional webpage, etc.
- It is found from the study that the majority of respondents 'sometimes' use the repository followed by 'often' and 'rarely'.
- Most of the respondents use repositories to 'retrieve the materials' followed by 'submission and retrieval of materials', and very few respondents use repositories for submission of materials only.
- Findings show that respondents mostly 'submit' reports, theses & dissertations, and journal articles/ research papers, 'access' theses & dissertations, journal articles/ research papers, conference proceedings, archival collections, reports, etc.
- Most of the respondents use repositories from the library while some respondents use outside from the library and very few respondents use outside from the institutions.

- Most of the respondents responded that it is an important library facility followed by providing global visibility of institutions' intellectual, easy and quick access of the content, content availability, preservation and dissemination of rare and fragile materials, etc.
- Majority of the respondents are satisfied with the features of the repositories but some respondents are also 'undecided' about the features like content provided in the repository followed by the user's interface, file formats, guidelines for submission, etc.
- Most of the respondents face problems in using the repositories like lack of awareness, electricity problems, lack of devices, awareness about searching techniques, restriction in submission and access, etc.

Suggestions and Recommendations

- It is suggested that institutions should appoint Librarians/ Library Professionals to manage the respective libraries. The library professionals should be given the responsibility of library management instead of giving charges to the scientists from the other disciplines so that the libraries can be managed professionally.
- Institutions should also be permitted to submit the intellectual outputs of other than the scientific community like project fellows, non-teaching employees, contractual/outsourced staff, etc. to enrich the IRs.
- Copyright laws should be clearly defined and described to the users as well as the scientists.
- Institutions should take strict action when copyright violations are observed among the stakeholders as per the applicable copyright laws and their amendment from time to time.

- Institutions should have well-prepared policies or concerned constituted committees to take care of changes, additions, deletions, etc. in the repositories.
- It is suggested that institutions should add other materials also like project reports, important meeting minutes, statutes, ordinances, leave applications format, medical benefits facilities, etc. so that users can access these kinds of materials from one location.
- However, it is observed that very few respondents face problems while handling repositories, but libraries should ensure to reduce this also.
- Institutions should encourage users the maximum utilization of the repositories
- Institutions should inspire the users to not only maximum access but also submit content.
- Users should also deposit more intellectual work other than theses & dissertations, journal articles/ research papers, conference proceedings, archival collections, reports, etc. like the grey literature, etc.
- Institutions should work on the users' satisfaction with the repository features like content provided, the user's interface, file formats, guidelines for submission, etc.
- It is suggested that the institutions should develop the kind of mechanism to solve the problems faced by the users immediately.

Conclusion

The current study is focused on the implementation strategies and sustainability of the repositories. It is concluded that the majority of the respondents have fully

implemented repositories. However, most of the institutions do not have policies on repositories. Scientists, faculties, research scholars, and staff are the major contributors and they mostly contribute reports, journal articles, theses and dissertations, etc. D-space is used for managing repositories by many respondents and they are also satisfied with the digital infrastructure provided by the institutions. Very few respondents are facing problems at the time of implementation and managing repositories and they responded that repositories are very important. Most of the users are aware of the repositories but they use 'sometimes' and 'rarely'. Despite this, users have given positive responses regarding the benefits and satisfaction level of the repositories.

Areas for Further Research

- Strategies for improving the IRs in the Department of Science and Technology in India
- Enhancing Institutional Repositories in the context of a User-Centered Approach: with a special reference to TQM.
- A study of IR in relation to Sustainable Development Goals (SDGs).
- Adoption of D-space to create an Institutional Repository/Digital Repository