What to do when my Parental Organization does not Own a Digital Repository?: A Case of Aggregating Repositories with a Slant to India

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ABSTRACT: The institutional repositories play a vital role in disseminating the intellectual output of the incumbents of the institutions. The study reports the functioning of aggregating repositories as registered in OpenDOAR. OpenDOAR website and the websites of selected individual institutional repositories were browsed to collect the required data. The study reveals that : There are 107 open access aggregating digital repositories (IRs) which are registered in OpenDOAR as on 21st, November 2017. Europe tops with 48 IRs (45%) followed by North America with 31 IRs (29%). There are 46 repository organisations in Europe running 48 IRs. Maximum number of repositories i.e. 27 IRs (25 %) are in United States followed by France with 10 (9%) repositories. There are 24 repository organizations in United States which host 27 open access IRs. 96 % (103) of the open access IRs registered in openDOAR are operational. 67 (62%) IRs have journal articles, 47 IRs (43 %) contain theses and dissertations and 29 (27%) IRs have books, chapters and Sections. 72 (67%) have contents in English language. While 25 IRs (23%) have contents in Spanish, 15 IRs (14%) have digital contents in French. 24 IRs (22 %) use Dspace and 13 of them (12 %) use SciELO software. 65 IRs (60 %) are multi-disciplinary in nature viz they have contents on many subjects. While 22 IRs have contents on health and medicine, 5 IRs have contents on History and Archaeology. A majority of aggregating repositories have not explicitly defined their preservation, content, submission, data re-use and metadata use policies. Only 40 IRs were registered till 2006. By the end of 2010, the number doubled to 80. The numbers reached 100 by 2013. Dialnet of Spain has more than 4 crore items followed by Internet Archive with 2.2 crore items. Out of top 20, three IRs each are from US and Spain and 2 are from France. It also compares the functioning of three aggregating repositories of India.

Keywords: Aggregating Repositories, OpenDOAR, Content Types, Repository Software, Preservation Policy, Growth Rate, Types of IR, Operational Status

Received: 15 September 2018, Revised 29 November 2018, Accepted 5 December 2018

DOI: 10.6025/jitr/2019/10/1/17-30

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1. Institutional Repository

Institutional repository is the preferred space for publishing the preprints and other scholarly communications. In the simplest sense of the term, an institutional digital repository is an electronic archive of the scholarly output of an institution, stored in a digital format, where search and recovery are allowed for its national or international use. The general idea is to store, manage, and preserve a university's born-digital and digitized assets, making them freely available via the internet.

According to Clifford Lynch "a university-based institutional repository is a set of services that a university 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."

2. Aggregating Repository

Aggregating repository is a digital repository that collects the contents from various institutions and serves them all. This is a boon for those institutions which don't own a repository of their own. This works a compiler and aggregator for a group of institutions.

3. Literature Review

The uptake of institutional repositories around the world has received much attention in the literature. A comprehensive study by Lynch and Lippincott (2005) to investigate the deployment of institutional repositories in the United States (USA) up to the year 2005, reported that, out of the 97 universities categorized as 'doctoral universities', 40% had already operated Institutional repositories, whereas, among the non-implementers, 88% were in the planning stage of institutional repository deployment. Another survey undertaken in 2005 at ten European countries – Belgium, France, the United Kingdom (UK), Denmark, Norway, Sweden, Finland, Germany, Italy and the Netherlands by Van Westrienen and Lynch (2005) found that the number of Institutional repositories varies from as low as 1.5% (Finland), to as high as 100% (Germany, Norway and the Netherlands). The focus was on acquisition of content almost exclusively on faculty publications. Henty (2007) reported that by mid 2006, all Australian universities had established Institutional repositories. The main purpose was to provide researchers with a vehicle to enhance the availability of their publications. In comparison to USA, UK and other European countries, the promotion and development of institutional repositories in Asia started relatively late.

Several Asian studies have reported isolated findings of institutional repository growth on a broad spectrum, such as in India (Fernandez 2006), Japan (Mukarami and Adachi 2006), China (Zhong 2009), Taiwan (Chen and Hsiang 2008), and Malaysia (Kiran and Chia 2009), and they reported a slow progress. Mukarami and Adachi (2006) reported the growth of institutional repositories in Japan to be increasing as much as three times a year since 2004. A more comprehensive study by Chen and Hsiang (2008) found that the number of institutional repositories in Japan, India, Australia, Korea, Russia and Taiwan are more than in other Asian countries. Kiran and Chia (2009) reported that the adoption of institutional repositories in Malaysia is rather low, even in the country's top four research-intensive universities. Zhong (2009) used data from the Registry of Open Access Repositories (ROAR) and found only 27 Chinese institutional repositories, listed separately under China mainland (15), Hong Kong (3), and Taiwan (16).

In October 2008, Wani, Gul and Rah (2009) conducted a study on the growth of institutional repositories in Asia using the data from the OpenDOAR. Their findings indicate that the total number of institutional repositories in Asia is 138, with Japan as the biggest contributor (69) followed by India (30), while other countries in Asia contributed between 1 to 6 institutional repositories each. Matsuura's (2008) study reported that Japan has been placed as the fourth biggest contributor by counts of institutional repositories in OpenDOAR and ROAR. Kiran and Chia (2009) studied the success of institutional repositories in Malaysia from the end-users point of view. They reported that in 2009 Malaysia was the 4th largest contributor of institutional repositories in Asia based on ROAR data. There were a total of 12 institutional repository initiatives, all of which are universities. Another recent study (Prabhat and Gautam 2010) placed India as the second in the Asian region as a contributor to the world institutional repositories. The authors explored the Indian institutional repositories registered in ROAR as at February 2010. Out of the 221 Asian institutional repositories, they found 49 (22.2%) deployed by India. India has shown a steady growth in this phenomenon from 4 institutional repositories established in 2004 to a total of 49 in 2009, an average increase of about 9 new institutional repositories per year.

4. Objectives of the Study

The objectives of the present study are to study the open access aggregating repositories registered in OpenDOAR in terms of

- Operational status
- Country-wise IRs and proportion of repository organisations
- Type of open access repositories
- Repository software used
- Content types
- Subjects
- Most frequently used languages
- Institutional repositories with >1.2 lakh records
- Availability of content, preservation and full-text re-use policy and
- Growth rate

5. Methodology

The modus operandi of our study underwent the following phases.

1. First of all, the OpenDOAR directory was browsed to find out the aggregating repositories which were registered therein.
2. Institutional repository statistics was done to get required data to answer the objectives of the study.
3. Then, the URLs of the selected IRs were browsed for cross checking and verification
4. Figures were used to show the output of the study.

The screenshot displays the OpenDOAR website interface. At the top, the 'OpenDOAR' logo is on the left, and the title 'Directory of Open Access Repositories' is on the right, followed by navigation links: Home | Find | Suggest | Tools | FAQ | About | Contact Us. Below the header, the main heading is 'Search or Browse for Repositories'. To the right of this heading are links for 'Recent Additions' and 'RSS1 Feed'. The central part of the interface is a search form with a large text input field at the top. Below it are several dropdown menus: 'Any Subject Area', 'Any Content Type', 'Any Country', 'Any Language', and 'Any Software'. There is also a dropdown for 'Aggregating (107)'. A 'Search' button is located to the right of the 'Any Software' dropdown. At the bottom of the form, there are options for 'Table' and '20 per page', and a 'Sort by: Num. of Items (desc.)' dropdown with a 'New Query' button.

Findings

1. Proportion of Repositories by continent

There are 107 open access aggregating digital repositories (IRs) which are registered in OpenDOAR as on 21st, November 2017. Europe tops with 48 IRs (45%) followed by North America with 31 IRs (29%). While South America gets third rank with 12 IRs (11%), Asian continent has 11 IRs (10%). Africa, Caribbean and Central America cover just 5% of IRs registered in openDOAR.

Figure 1. Proportion of Repositories by continent

2. Proportion of repository organisations by continent

Figure 2. Proportion of repository organisations by continent

Figure 2 and 4 disclose that there are 46 repository organisations in Europe running 48 IRs registered in openDOAR. While Asia has 11 organisations hosting 11 IRs, we could see just 28 repository organisations in North America running 31 IRs. In South America, there are 12 repository organisations which run 12 IRs. In toto, there are 102 organisations running 107 IRs registered in openDOAR.

3. Proportion of repositories by Country

Figure 4 shows that maximum number of repositories i.e. 27 IRs (25 %) are in United States followed by France with 10 (9%) repositories. While Spain has 6 IRs (6 %), Argentina, UK and Japan have 5 (5%) IRs each. While Germany and Netherlands have 4 IRs (4%), 28 other countries have 41 (38%) IRs. Thus 62 % of total IRs registered in openDOAR are hosted in just 8 countries.

Figure 3. OpenDOAR Map – Aggregating Repositories

Figure 4. Country-wise repositories

4. Proportion of repository organizations

It is clear from Figure 5 that there are 24 repository organizations in United States which host 27 open access IRs. While 10 repository organisations in France 10 IRs, 5 organisations host 5 IRs in each in Argentina, UK and Japan. 6 IRs are run by 4 repository organisations in Spain and 4 IRs in Netherlands and Germany are run by 4 repository organisations. Thus, just 8 countries have 60 % of total repository organisations which have registered their IRs in OpenDOAR.

5. Operational Status of open access IRs

Figure 6 shows that 96 % (103) of the open access IRs registered in openDOAR are operational. While 1 Open Access IR is technically malfunctioning, 3 of them (3%) are the trial repositories.

Figure 5. Proportion of Repository organizations by Country

Figure 6. Operational Status

6. Content Types in IRs

The IRs registered in openDOAR possess different kinds of materials namely journal articles, conference and workshop papers, theses and dissertations, book, chapters and section, patents, working papers multi-media and audio-visual materials and some learning objects. 67 (62%) IRs have journal articles, 47 IRs (43%) contain theses and dissertations and 29 (27%) IRs have books, chapters and Sections. While 34 IRs (31%) possess unpublished reports and working papers, 29 IRs (27%) have conference and workshop papers. While Multimedia and audio-visual materials are found in 24 IRs, learning objects in 16 IRs and data sets in 8 IRs (Figure 7).

Figure 7. Content types

7. Language content

Figure 8 shows that out of 107 open access IRs, 72 (67%) have contents in English language. While 25 IRs (23%) have contents in Spanish, 15 IRs (14%) have digital contents in French. While 9 IRs have contents in French and German, 5% of IRs have materials in Japanese. The other language materials are bare minimum in OpenDOAR IRs.

Figure 8. Language of the contents

8. Repository Software

Figure 9 depicts that Dspace software has emerged as the most used open access repository software among the IRs registered in openDOAR. 24 IRs (22 %) use Dspace and 13 of them (12 %) use SciELO software. While 5 IRs (5%) use HAL, 4 IRs use Eprints and Greenstone. While Fedora and Digital Commons are used by 3 IRs (3%), 27 other softwares are used by 31 (29%) IRs.

Figure 9. Use of Repository Software

9. Subjects of open access IRs

Figure 10 shows that 65 IRs (60 %) are multi-disciplinary in nature viz they have contents on many subjects. While 22 IRs have contents on health and medicine, 5 IRs have contents on History and Archaeology. 13% of total IRs registered in OpenDOAR have contents on general science and 14% of them have contents on social sciences general. 8% IRs have contents on business and economics while 7% IRs have contents on biology and biochemistry. Just 1 IR has materials on electrical and electronic engineering, mechanical engineering, philosophy & religion and management & Planning.

Figure 10. Subjects in IRs registered in openDOAR

10. Availability of Recorded Policies

Preservation policies

Figure 11 shows that only 5 (5%) institutional repositories have defined their preservation policies and made it available in their IR portal. 65 (66 %) of them have not defined their preservation policies explicitly.

Figure 11. Availability of preservation policies

Data re-use policies

Figure 12. Definition of full-text re-use policies

Figure 12 shows that a majority of 79 open access IRs (81 %) have not explicitly defined their full data item re-use policies. 7 (7%) IRs have permitted the re-use of full data items for not-for-profit purposes. The right of re-use varies in case of 5 (5 %) IRs.

Content policies

Figure 13 depicts that 77 IRs (79%) have not defined their content policies. 17 (17%) of them have clearly defined their content policies and provided the same in their IR portal.

Submission policies

Figure 14 shows that 77 IRs (79 %) have not defined their submission policies. Only 17 % of them (17 IRs) have clearly defined their submission policies in their IR portal.

Figure 13. Recorded content policies

Figure 14. Recorded Submission policies

Metadata Re-Use Policies

Figure 15 shows that a majority of 86 IRs (88%) have not defined their metadata re-use policies. While 5 IRs have permitted the commercial use of metadata, 4 of them have permitted non-profit use of their metadata.

Figure 15. Recorded Submission policies

11. Growth of open access IRs in OpenDOAR Database

Figure 16 shows the growth of aggregating repositories in OpenDOAR database from 2005 to till date. The registration of IRs in OpenDOAR took place just in the first decade of 2000. Only 40 IRs were registered till 2006. By the end of 2010, the number doubled to 80. The numbers reached 100 by 2013. There is a steady growth during 2007-2011. We could see a very slow progress in the growth of aggregating IRs in OpenDOAR after 2012 may be because of the establishment of individual IRs by various institutions.

Figure 16. Growth of the European OpenDOAR Database

12. IRs with > 1.2 lakh records

Table 1 lists 20 aggregating IRs which are registered in openDOAR possessing more than 1.2 lakh items in their repository for the online users. Dialnet of Spain has more than 4 crore items followed by Internet Archive with 2.2 crore items. There are 5 IRs having contents ranging from 14 lakhs to 42 lakhs. The other 13 IRs have 1.2 lakhs to 4.3 lakhs. Out of top 20, three IRs each are from US and Spain and 2 are from France.

Sl.No	Repository Name	Country	No. of Records	Position
01	DIALNET	Spain	41169467	I
02	Internet Archive	United States	22939799	II
03	Open Access Library (Repository)	China	4231219	III
04	OSF Preprints	United States	2097029	IV
05	LAReferencia - Red Federada de Repositorios Institucionales de Publicaciones Científicas Latinoamericanas	Argentina	1431703	V
06	Thèses en Ligne	France	1402459	VI
07	Hyper Article en Ligne	France	1402126	VII
08	Open Thesis	United States	432282	VIII
09	Revistes Catalanes amb Accés Obert	Spain	370128	IX
10	Digitala Vetenskapliga Arkivet - Academic Archive On-line	Sweden	322741	X
11	ZENODO	Switzerland	316225	XI
12	Biblioteca Digital Brasileira de Teses e Dissertações	Brazil	267864	XII

13	Redalyc	Mexico	250400	XIII
14	University of Groningen Research Database	Netherlands	226756	XIV
15	Hrèak - Portal of scientific journals of Croatia	Croatia	178674	XV
16	ShodhGanga: A reservoir of Indian theses	India	170509	XVI
17	MPGPuRe	Germany	154717	XVII
18	Red Mexicana de Repositorios Institucionales	Mexico	142151	
19	Theseus	Finland	128814	
20	Research Repository of Catalonia	Spain	125113	

Table 1. IRs with > 10 lakh records

13. Aggregating Repositories in India

A total of 3 aggregating repositories from India are found in OpenDOAR. A description of these three IRs are give in Table 2.

Aggregating Repository / Details	Krishikosh	KNoor Knowledge Repository Open Network	ShodhGanga: A reservoir of Indian theses
URL	http://krishikosh.egranth.ac.in/	http://dspace.uok.edu.in:8080/jspui/	http://shodhganga.inflibnet.ac.in/
Organization	Indian Council for Agricultural Research (ICAR)	Department of Library & Information Science University of Kashmir	Information and Library Network Center (INFLIBNET)
Description	This is an Institutional Repository of Indian National Agricultural Research System. The interface is available in English.	This site provides access to the research output from research institutes of the J&K (viz. S.K Institute of Medical Sciences, S.K University of Agricultural Science & Technology and University of Kashmir). The interface is available in English. Many items are available as abstracts only. Users may set up RSS feeds to be alerted to new content.	This site provides users with access to the student research of several institutions within India. Users may set up RSS feeds to be alerted to new content. The interface is available in English.
Type	Operational	Operational	Operational
Size	109034 items (2017- 11-16)	1099 items (2017-11-16)	170509 items (2017-11- 16)
Software	DSpace Ver.6	DSpace, Version: 1.8.2	DSpace, Version: 1.8.2

Subjects	Agriculture, Food and Veterinary	Science General; Agriculture, Food and Veterinary; Health and Medicine; Technology General	Multidisciplinary
Content:	Articles; Conferences; Theses; Unpublished; Books; Learning Objects; Multimedia	Articles; Conferences; Theses	Theses
Languages	English	English; Hindi; Arabic; Persian	English; Hindi; Gujarati
Metadata Policy	Metadata re-use policy explicitly undefined	Metadata re-use policy explicitly undefined	Metadata re-use policy explicitly undefined
Data Policy for full-text	Full data item policies explicitly undefined	Full data item policies explicitly undefined	Full data item policies explicitly undefined
Content Policy	Content policies explicitly undefined	Content policies explicitly undefined	Content policies explicitly undefined
Submission Policy	Submission policies explicitly undefined	Submission policies defined	Submission policies explicitly undefined
Preservation Policy	Preservation policies explicitly undefined	Preservation policies explicitly undefined	Preservation policies explicitly undefined

Table 2. Indian Aggregating Repositories

14. Conclusion

The aggregating repositories play a vital role as a centralized agency and a resources pooling agent in mobilizing the internal research output of selected institutions. The aggregating repositories act as a store house and common dissemination centres for a select group of institutions which have not developed a repository of their own. Though we appreciate the functioning of aggregating repositories both in India and abroad, we strongly suggest that the institutions which don't have an online digital repository should start building their own repositories at the earliest.

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