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Open Access Repositories in Asia: From SAARC to Asian Tigers

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Abstract

This paper provides an overview of Open Access Repository (OAR) initiatives taken in Asian Countries with special reference to SAARC Countries. The purpose of this study is to take a broad look at the current state of deployment of OARs in the Asian countries. It also compares selected OARs against a set of carefully crafted criteria. Key findings have been highlighted along with suggestions for further development of OARs in global context.

Keywords: Digital repositories, Open source software, digital archive, institutional digital repositories OAI-PMH.

Introduction

Open Access Repository (OAR) has become a hot topic in academic libraries in the past few years. All the continents are now maintaining OARs, but major share holders are in Europe and North America. Asia emerges as the third largest contributor. Few years ago, Institutional repository initiatives were initiated only in some developed countries. But now it has become an area of research in developing countries. Many developing countries have set up institutional repository through open source software like DSpace, EPrints etc.

Several studies have been conducted on the topic institutional repositories in order to provide current situation and state of the institutional repositories of that particular country. Many researcher and open access advocates have highlighted the development of institutional repositories initiatives under taken by different countries such as the USA (Lynch & Lippincott, 2005; Markey et al., 2007; van Westrienen & Lynch 2005; Rieh et al., 2007); UK (Pinfield, 2003; Markland, 2006); Canada (Shearer, 2006); Australia (Kennan & Kingsley, 2009); Greece (Chantavaridou, 2009); India (Ghosh & Das, 2007; Swan, 2008; Alexander & Gautam, 2006; Venkadesan, 2009; Nazima & Devib, 2008); Japan (Mukarami & Adachi, 2006); China (Zhong, 2009); Taiwan (Chen & Hsiang, 2008); Hongkong (Chan, 2009); Turkey (Tonta, 2008); and South African (Deventer & Pienaar, 2008).

In Europe, Institutional repository movement was started in 2001 and is gaining momentum and new initiatives are emerging around the country. The study (Van Westrienen & Lynch, 2005) reported the development of institutional repositories in ten European countries. Another study (Melero, et al, 2009) reported the current state of Spanish open-access institutional repositories and described their characteristics. The other researcher (Bravo & Díez, 2007) described role of science repositories in the development of e-Science in the same country. Another study (Henty, 2007) reported development of institutional repositories mainly in Australian universities.

Though Asia started relatively late but the situation is quite satisfactory. Many Asian countries are now in a good position in terms of number of repository developed in the country. Wani, Gul and Rah (2009) conducted a study on the growth and development of institutional repositories in Asia using the data from the OpenDOAR (Directory of Open Access Repository) database. Another study (Kiran & Chia, 2009) reported that the adoption of institutional repositories in Malaysia. Another study (Matsuura, 2008) reported that Japan has been placed as the fourth biggest contributor by counts of institutional repositories in OpenDOAR and ROAR (Registry of Open Access Repository). Another study (Lee, 2008) showed the growth and development of institutional repository systems in Japan and Korean universities.

On the other hand, Fernandez (2006) pointed out that the lack of infrastructure is a major barrier to the growth of institutional repositories India. Another study (Prabhat & Gautam 2010) placed India as the second in the Asian region as a contributor to the world institutional repositories.

About SAARC

The South Asian Association for Regional Cooperation (SAARC) is an organization of South Asian nations, founded in December 1985 and dedicated to economic, technological, social, and cultural development emphasizing collective self-reliance. Its seven founding members are Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. Afghanistan joined the organization in 2005.

The knowledge management movement of the 1990's influenced the development of institutional digital repositories in a number of significant ways. Today there are near about two thousands interoperable Open Access Repositories (OAR) in the world (ROAR (Registry of Open Access Repository), 2011; DOAR (Directory of Open access Repository), 2011). But the growth rate of OARs per year of SAARC countries except India is not satisfactory in compare to other Asian Countries. Though the number of repositories is growing fast worldwide mainly in developed countries.

OAR in SAARC Countries

Though people in SAARC countries are somewhat similar in social, economic and political condition but all the SAARC countries (except India) are not in a position to compare with other Asian counties in terms of number of repositories. Over the last five years there is a significant amount of open access (OA) advocacy and awareness by way of workshops, seminars, conferences, etc in the western world. It needs to be geared up in SAARC countries. SAARC Documentation Centre (SDC) hosted presently by NISCAIR, New Delhi is working in full swing to spread open access movement in SAARC countries. The following table shows the number of repositories in SAARC countries.

Table 1: Number of OARs in SAARC Countries

Country	Number of OARs	
	DOAR	ROAR
Afghanistan	1	1
Bangladesh	2	2
Bhutan	NA	NA
India	51	70
Maldives	NA	NA
Nepal	1	NA
Pakistan	2	2
Sri Lanka	1	2

Highest value have been considered and overlapping is avoided

It is clear from the table (Table 1) that the SAARC countries possess only 78 repositories whereas out of these repositories, India possesses 70 (89.74%) repositories (Table 1). Member countries of SAARC (excluding India) report (in ROAR and DOAR) a total of only eight (8) repositories (10.26%). It is clear from the study that India is the key player in this repository movement within SAARC Countries. So, the picture is not quite satisfactory and surely there is a scope for raising awareness about OA publishing and OA repository in order to achieve success in this open knowledge movement. The open access movement in this part of Asia started in 2003 and is in steady progress as many new institutes are contributing regularly in open access scholarly resource organization processes. In some member countries of SAARC, OAR movement is still in early stages, though countries like Bangladesh, Pakistan and Sri Lanka are now familiar with the term and are trying to develop policy and institutional frameworks to cope with the open access initiatives.

OAR in India

Today open Access movement in India is acknowledged worldwide. India is playing a key role in open access repository movement mainly in SAARC countries. India is the most prominent member country of SAARC in terms of its success in open access and digital library initiatives. India has been at the forefront of the open access movement since 2003 with more than seventy nation-wide repositories built to date.

Many institutions have developed institutional policy facilitate innovative solutions for increasing international visibility and accessibility of scholarly literature and documentary heritage in this country. A number of workshops and training events are being organized and professionals are being provided training in open source software for building open access repositories. Many library schools have included open source digital archiving software in their curricula. Moreover, almost all the Indian IRs is based on open standards and open source software like DSpace, EPrints, and Greenstone etc. As per Cybermetrics Lab, research groups based in Spain, eleven (11) repositories from India were listed out of 800 world's repositories (https://mallikarjundora.wordpress. com/2010/07/07/ranking-web-of-repositories-july-2010/).

OAR in Asia

The following table shows total number and the percentage (%) of OAI-PMH complaint repository of all Asian countries as per ROAR and DOAR databases. It is found that DOAR has recorded 328 repositories from 25 countries whereas ROAR has recorded 356 repositories from 23 countries. Though the number

varies as many organizations have not registered in ROAR or DOAR databases and some of the institutional repositories do not have their own exclusive IP address or domain name system.

Table 2: List of Asian countries and number of OARs

Country as per ROAR	Number of OARs	Country as per Doar	Number of OARs	OAI-PMH support (no.)
Armenia	2	Afghanistan	1	
Azerbaijan	2	Azerbaijan	1	
Bangladesh	2	Bangladesh	2	
China♦	13	China	10	7
Hong Kong	5	Georgia	1	
India♦	70	India	48	
Indonesia♦	34	Indonesia	17	27
Iran	3	Iran	2	
Israel	1	Israel	2	
Japan♦	88	Japan	134	102
Kazakhstan	1	Kazakhstan	1	
Kyrgyzstan	2	Korea	6	
Malaysia♦	20	Kyrgyzstan	2	14
Pakistan	1	Malaysia	12	
Philippines	1	Nepal	1	
Saudi Arabia	2	Pakistan	2	
Singapore	5	Philippines	2	
South Korea	5	Qatar	1	
Sri Lanka	2	Saudi Arabia	5	
Syria	1	Singapore	2	
Taiwan♦	59	Sri Lanka	1	53
Thailand	4	Taiwan	56	
Turkey♦	33	Thailand	7	31
		Turkey	11	
		Viet Nam	1	

♦Selected countries for study

***** Highest value have been considered and overlapping is avoided

As per DOAR databases, near about 2000 repositories were registered through out the world at the time of writing this article (September 2011). Europe and North America contributed as much as 920 and 470 repositories respectively whereas Asia contributed only 330 repositories. So it is evident that growth rate of repositories of Asian Countries is quite low in compared to other developed countries. It is clear from the study that Asia possesses 3rd position in terms of number of repository after Europe and North America in global scenario (ROAR, 2011; DOAR, 2011). The summary data in Table 3 shows that after almost a decade of open access movement only seven Asian countries have more than 10 open access repositories. This study has selected only those seven (7) countries having ten (10) or more repositories for the next level of study. The top seven Asian countries which have maximum contribution in terms of number of repositories are listed below in Table 3.

Table 3: Ranking of Countries as per total number of Repository

Ranking	Country	No. of IDRs
1	Japan	134
2	**India**	**70**
3	Taiwan	59
4	Indonesia	34
5	Turkey	33
6	Malaysia	20
7	China	13

The table (see Table 3 & 4) shows position of India in respect of number of repository and highlights the percentage of repositories in respect of OAI-PMH verb amongst selected Asian Countries under study. India shares 2nd position after Japan in terms of number of repositories registered and Japan having maximum number of repositories possesses 1st position in Asian context. Though as per DOAR (DOAR, 2011**)** and ROAR (ROAR, 2011) databases India possesses 12th and 6th position respectively in the global context. But picture varies if we compare all seven (7) countries in respect of percentage (%) of OAI-PMH compliant repository. It is found that Turkey possess 1st position (but ranks 5th as per number of repositories registered) having 94% OAI-PMH compliant repository. Taiwan and Indonesia possesses 2nd and 3rd position, whereas India possesses 4th position.

Table 4: Ranking of Countries as per OAI-PMH Compliant Repository

Ranking	Country	No. of IDRs	OAI-PMH support (no.)	Percentage (%)
1	Turkey	33	31	94
2	Taiwan	59	53	90
3	Indonesia	34	27	79
4	**India**	**70**	**54**	**77**
5	Japan	134	102	76
6	Malaysia	20	14	70
7	China	13	7	54

OAR and Asian Tigers

This section of the study attempts to go for an analytical study of major Asian contributors in open access repository movement. For this phase, a total of twenty repositories have been selected for evaluation against the following three criteria/conditions -

Parameter	Condition
Number of objects uploaded	Ten thousand and above
Support for OAI-PMH	Available for metadata harvesting
Type of software used	Distributed architecture

A total of twenty open access repositories from Asian countries have been identified against the criteria/conditions given above. Table 5 gives us information (such as total objects, software used, content type and subject coverage, language etc.) about top twenty repositories under study. The details are given below.

Table 5: List of selected top twenty (20) repositories from Asian Countries

S.L. No.	Country	Name of the Repository	OAI-PMH	Objects	Software	Subjects	Contents	Language
1	Taiwan	National Chung Hsing University Institutional Repository (NCHUIR)	http://nchuir.lib.nchu.edu.tw/ir-oai/request	51001 items (2010-10-21)	DSpace	Multidisciplinary	Articles; Theses; Unpublished; Books; Learning Objects; Multimedia	Chinese; English
2	Taiwan	National Taiwan University Repository (NTUR)	http://ntur.lib.ntu.edu.tw/dspace-oai/request	45479 items (2010-02-22)	DSpace	Multidisciplinary	Articles; Theses; Unpublished; Learning Objects	Chinese; English
3	Taiwan	Tamkang University Institutional Repository	http://tkuir.lib.tku.edu.tw:8080/dspace-oai/request	41520 items (2011-09-14)	DSpace	Multidisciplinary	Articles; Conferences; Unpublished; Books	Chinese; English
4	India	Indian Academy of Sciences: Publications of Fellows	http://repository.ias.ac.in/cgi.oai	39024 items (2011-06-28)	EPrints	Science General; Health and Medicine; Technology General	Articles	English
5	Taiwan	National Sun Yat-sen University Institutional Repository	http://140.117.120.62:8080/dspace-oai/request	35931 items (2010-01-13)	DSpace	Multidisciplinary	Articles	Chinese; English
6	Japan	Saga University Institutional Repository	http://portal.dl.saga-u.ac.jp/dspace-oai/request	31129 items (2008-09-29)	DSpace	Multidisciplinary	Articles; Theses; Learning Objects	Japanese; English
7	Taiwan	National Central University Library Institutional Repository (NCULR)	http://ir.lib.ncu.edu.tw:8081/ir-oai/request	23655 items (2010-03-01	DSpace	Multidisciplinary	Theses	Chinese; English
8	Japan	KOARA (KeiO Academic Resource Archive	http://koara.lib.keio.ac.jp/xoonips/modules/xoonips/oai.php	21160 items (2010-03-04)	XooNIps	History and Archaeology; Business and Economics; Law and Politics	Articles; Books; Multimedia	Japanese; German; Latin; English
9	India	Open Access Repository of IISc Research Publications (ePrints@iisc)	http://eprints.iisc.ernet.in/perl/oai2	18949 items (2010-02-04)	EPrints	Chemistry and Chemical Technology; Mathematics and Statistics; Physics and Astronomy	Articles; References; Conferences; Unpublished; Books; Patents; Special	English
10	Japan	Osaka Kyoiku University Repository	http://ir.lib.osaka-kyoiku.ac.jp/dspace-oai/request	18301 items (2010-06-09)	DSpace	Multidisciplinary	Articles	Japanese; English
11	Taiwan	National Taiwan University of Science and Technology Institutional Repository	http://ir.lib.ntust.edu.tw/dspace-oai/request	18290 items (2011-09-07)	DSpace	Multidisciplinary	References; Theses; Patents; Special	Chinese; English
12	Taiwan	National Chiao Tung University Institutional	http://ir.lib.nctu.edu.tw/dspace-oai/request	17549 items (2008-08-27)	DSpace	Multidisciplinary	Articles; Theses; Special	English; Chinese

		Repository						
13	Taiwan	Kun Shan University Digital Resource Repository	http://drr.lib.ksu.edu.tw/ir-oai/request	17510 items (2010-11-24)	DSpace	Multidisciplinary	Articles; Conferences; Unpublished; Multimedia; Special	Chinese; English
14	Taiwan	National Kaohsiung Normal University Institutional Repository	http://ir.lib.nknu.edu.tw/ir-oai/request	14982 items (2011-07-27)	DSpace	Science General; Technology General; Arts and Humanities General; Business and Economics	Articles; Conferences; Theses; Unpublished; Books	Chinese; English
15	Taiwan	Southern Taiwan University Institutional Repository	http://ir.lib.stut.edu.tw/dspace-oai/request	13788 items (2010-06-23)	DSpace	Multidisciplinary	Articles; References; Conferences; Theses; Unpublished	Chinese; English
16	Japan	Tsukuba Repository (Tulips-R)	http://dspace.tulips.tsukuba.ac.jp/dspace-oai/request	11122 items (2009-01-05)	DSpace	Multidisciplinary	Articles; Theses; Unpublished	Japanese; English
17	Taiwan	National Tsing Hua University Institutional Repository	http://nthur.lib.nthu.edu.tw/dspace-oai/request	10734 items (2009-06-27)	DSpace	Multidisciplinary	Articles; Conferences; Theses; Unpublished; Learning Objects	Chinese; English
18	Taiwan	Chia Nan University of Pharmacy & Science Institutional Repository	http://ir.chna.edu.tw/dspace-oai/request	10531 items (2010-06-23)	DSpace	Multidisciplinary; Science General	Articles; Theses	Chinese; English
19	Japan	Oita University Institutional Repository	http://ir.lib.oita-u.ac.jp/dspace-oai/request	10504 items (2010-04-16)	DSpace	Multidisciplinary	Unpublished	Japanese
20	Taiwan	Kun Shan University Institutional Repository	http://ir.lib.ksu.edu.tw/dspace-oai/request	10290 items (2010-11-24)	DSpace	Multidisciplinary	Articles; Learning Objects	Chinese; English

An analytical study on different selected IDRs is performed on the basis of the following parameters -

Number of objects

It is found that repositories from Taiwan have strong collections whereas others have uploaded minimum number of objects. Out of twenty (20) repositories the first three repositories in terms of number of objects uploaded are from Taiwan and only one repository from Indian possesses 4th position.

Out of twenty (20) repositories, thirteen repositories (13) are from Taiwan. Only two (2) repositories are from India. And the rest five (5) repositories are from Japan. So it is clear from the study that Taiwan holds 1st position here in terms of number of objects uploaded as well as number of repositories. Japan holds 2nd position and India possesses 3rd position respectively.

Type of objects

The selected IDRs of the three countries considered for this study contains a wide variety of digital objects ranging from journal papers to learning materials. As far types of the digital objects are concerned, this study groups the digital objects in the following broad groups -

- Published papers (preprints, post prints, conferences, articles)
- Theses
- Unpublished documents
- Multimedia objects
- Learning objects
- Special items etc.

It is found that three (3) repositories (serial no. 4, 5 &10) hold only articles whereas one (1) repository each holds theses (serial no. 7) and unpublished (19) objects.

Special items

It is found that out of twenty (20) repositories, only 5 (five) repositories (serial no. 9, 11, 12, 13 & 19) hold special items are mentioned below-

- Links;
- Previous Test Questions;
- Previous exam papers;
- Administrative documents; and
- Items are not available as full-text.

Disciplinary coverage

All the repositories under study contain different type of subjects. So it is difficult to keep them in same discipline. Most of the repositories contain all type of subjects in their repositories and therefore are categorized as 'Multidisciplinary' in nature. On the contrary, few specialist institutions (mainly science and engineering institutions) covering a few specialized subjects belong to 'Science and Technology'. The another category is 'Humanities and Social Sciences' holds subjects like Law, Politics, History, Archaeology etc.

Here it is found that sixteen (16) repositories are 'Multidisciplinary' in nature. Two (2) repositories (serial no.4 & 9) belong to 'Science and Technology' and one (1) repository (serial no. 8) belong to 'Humanities and Social Sciences'. It is also found that only one (1) repository (serial no.14) covers both science and arts subjects.

Software used

It appears that the DSpace software has the most installations and used by seventeen (17) repositories. All the repositories from Taiwan use DSpace software whereas EPrints is used by two Indian repositories (serial no. 4 & 8). Only one (1) repository from Japan (serial no. 9) uses XooNIps software.

Language Diversity

It is observed that English as an international language is used by all the repositories (except serial no.19). Other than English, Chinese and Japanese are the common language. Even German and Latin have been used by one of the repositories (serial no. 8).

Findings

After through study the major findings are identified as follows.

1. Repositories from Taiwan and Japan have no policy;
2. Repositories from India have their policy except preservation;
3. Five (5) repositories hold special items;
4. Repositories hold documents in Chinese and Japanese languages other than English;
5. One repository holds documents in German and in Latin language other than English;
6. Repositories from India hold only English languages; and
7. One repository covers Japanese language.

Conclusion

The analysis showed that there is a need for raising awareness within the community about the IDR and encourage wider contribution of content to the IDRs. As a developing country, India has a long way to go, but the beginning is promising and it is hoped that Asian OA researcher would take vigorous awareness programmes to strengthen the movement among the masses and the Government should come forward to pass the legislation in parliament for enabling open scholarship. And every educational and R&D institution should adopt it and make it mandatory for every author from their institute to self-archive the articles accepted for publication in their Institutional Repository.

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