CHAPTER VI

DATA ANALYSIS AND INTERPRETATION

To obtain data on various aspects of the Indian repositories, the questionnaire was distributed amongst all the 24 repositories listed in Table 6.0 below. Out of these 18 repositories has responded.

S.No.	Repository name	Response
1	DRS, National Institute Of Oceanography (NIO), Goa.	√
2	Dspace, Cochin University of Science & Technology (dyuthi@CUSAT), Kerala .	√
3	Dspace, IBS, Ahmedabad.	√
4	Dspace, Indian Institute of Management Kozhikode (IIMK), Kerala.	X
5	Dspace, National Chemical Laboratory (NCL), Pune, Maharashtra.	√
6	Dspace, NCRA, Pune, Maharashtra.	√
7	Dspace, Vidyanidhi, Mysore.	X
8	DSpace@IITB, Mumbai.	√
9	DSpace@INFLIBNET, Ahmedabad.	√
10	ePrints@Catalysis repository National Centre for Catalysis Research (NCCR), IIT Madras.	√
11	DKR@CDRI, Digital Knowledge Repository of Central Drug Research Institute, Lucknow .	X
12	DSpace@NITR, Rourkela, Orissa.	√
13	DSpace@TU, Patiala, Punjab.	√
14	Electronic Theses and Dissertations at IISc and Open Access Repository of IISc Research Publications, Bangalore.	√
15	Eprints@IITD, Delhi.	√
16	ICRISAT Open Access Repository, Patancheru, Andhra Pradesh.	√
17	CSIR Explorations, URDIP, Pune.	√
18	IMSc Eprint Archive, Chennai, Tamil Nadu.	X
19	DSpace@IIAP (Indian Institute of Astrophysics Repository), Bangalore.	X

20	Mahatma Gandhi University Theses Online (MGU), Kerala.	√
21	National Aerospace Laboratories Institutional Repository (NAL), Bangalore.	√
22	Raman Research Institute Digital Repository, Bangalore.	√
23	EPrints@MDRF (Madras Diabetes Research Foundation), Chennai.	√
24	NISCAIR Online Periodical Repository (NOPR), New Delhi.	

Table 6.0 Universe or population (finite)

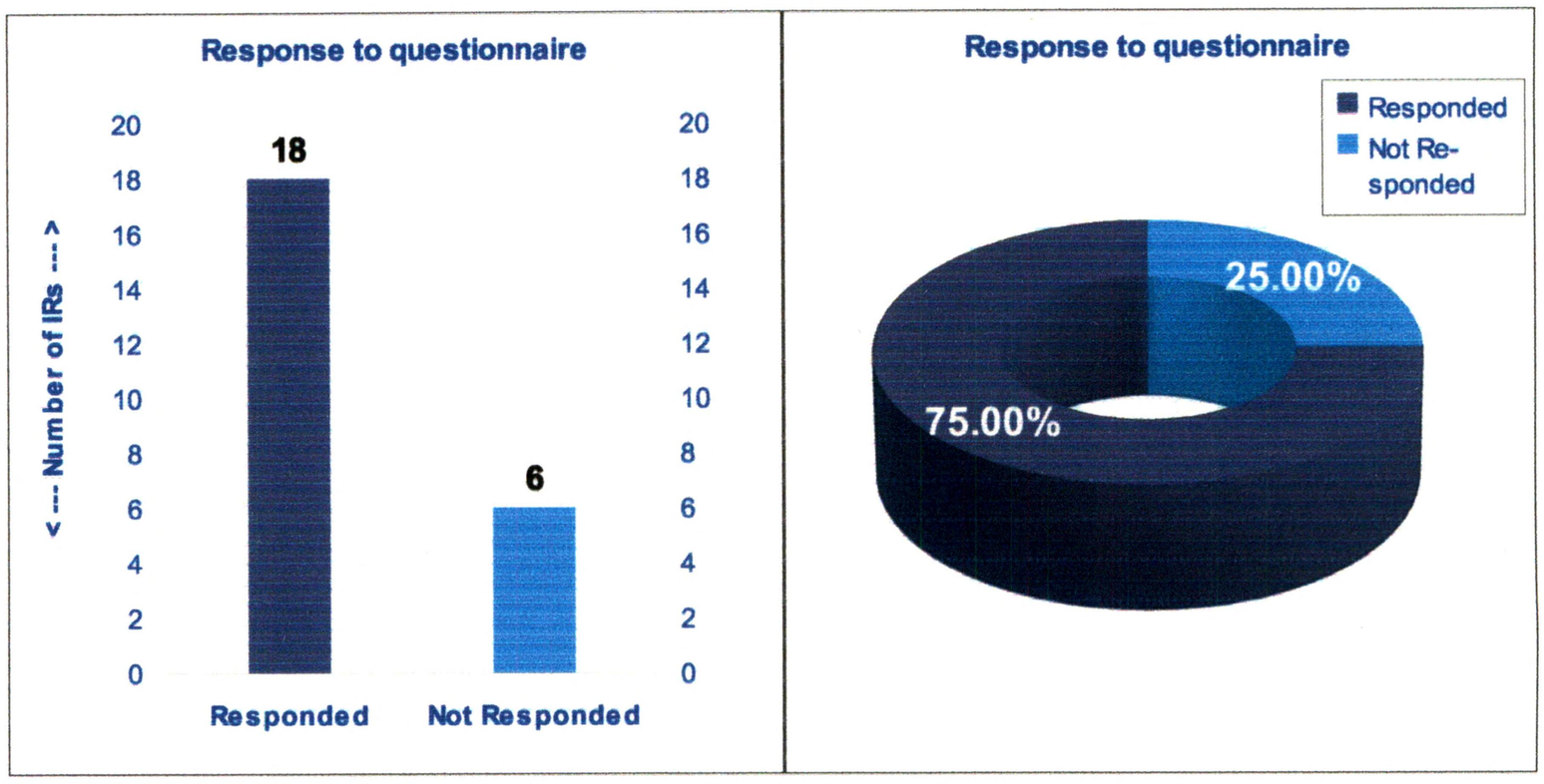


Figure 6.0 Response Rate

Figure 6.0 indicates that about 75% Indian repositories provided data for the questionnaire whereas about 25% repositories did not fill the questionnaire. The data analysis given below is based upon the data received from these 75% Indian IRs.

6.1 Documents hosting, IR launch, Pilot testing and Needs assessment survey:

S.no.	Repository	Needs Assessment	Plan year	Launch year	Doc. hosting prior to IR	Pilot survey	Pilot test duration (months)

		Survey			launch		
1	LDL-DRTC	X	2003	2003	√	X	—
2	ePrints@IISc	X	2001	2002	√	√	< 6
3	NAL Repository	X	2004	2005	√	√	< 6
4	DSpace@IITB	X	2008	2008	√	√	< 6
5	EPrints@IITD	X	2002	2002	√	X	—
6	DSpace@INFLIBNET	X	2005	2005	√	√	< 6
7	DSpace@IBSA	√	NR	NR	X	√	< 6
8	ePrints@NCCR	X	2006	2008	X	√	< 6
9	DRS@nio	√	2005	2006	√	√	< 6
10	DSpace@NITR	X	2005	2005	X	√	< 6
11	OpenMED@NIC	X	2004	2005	X	√	6 to 12
12	DSpace@TU	X	2005	2005	X	√	< 6
13	MGU Theses Online	X	2008	2008	√	√	< 6
14	DSpace@RRI	X	2006	2006	X	√	6 to 12
15	ePrints@CSIR	X	2009	2009	X	√	< 6
16	DSpace@ICRISAT	√	2009	2009	√	√	< 6
17	EPrints@MDRF	√	2009	2009	√	√	< 6
18	DSpace@CUSAT	X	2006	2007	X	X	—

Table 6.1 Planning and launching of IR

Table 6.1 contains data pertaining to needs assessment survey, year of planning and launch of the Indian IRs, document hosing status prior to the launch of IRs and pre-launch pilot testing and its duration. Need assessment survey is important as it helps in planning the IR project in a realistic manner and ensures greater user satisfaction. Table 6.1 indicates that assessment survey was done in 4 IRs only, i.e., DSpace@IBSA, DRS@nio, DSpace@ICRISAT and EPrints@MDRF and all of them found it helpful in planning the repositories. While EPrints@IITD started planning their IR in 2002, LDL-DRTC took the initiative in 2003. Both the repositories were able to launch their respective IRs in the same year itself. In 2005, 5 IRs were launched whereas in 2008 and 2009, 3

IRs each were established. This figure also reveals that the difference between planning and launching of repositories is not much in majority of the cases (i.e., about 78%). It is one year in four cases, two years in one case while in rest of the cases the difference is negligible. It shows that if the planning is proper, IRs services can be started without much delay. It also reveals that 10 Indian IRs were using some method of document hosting prior to the launch of IR, while 8 others had no such arrangement.

Pilot testing is done to test the working of the IR and its services so as to rectify it before opening it for general use. Repositories were asked to provide details regarding the pilot testing of the IRs. The table suggests that 15 of the Indian IRs had conducted such preliminary tests before their actual launch whereas in case of 3 IRs, no such test was conducted. The IRs which have not conducted the pilot test are - LDL-DRTC, EPrints@IITD and DSpace@CUSAT. The table also indicates that a majority of the repositories i.e., 13 IRs have done the pilot testing for less than 6 months. The table also depicts that OpenMed@NIC and DSpace@RRI have done the pilot testing ranging between 6 to 12 months.

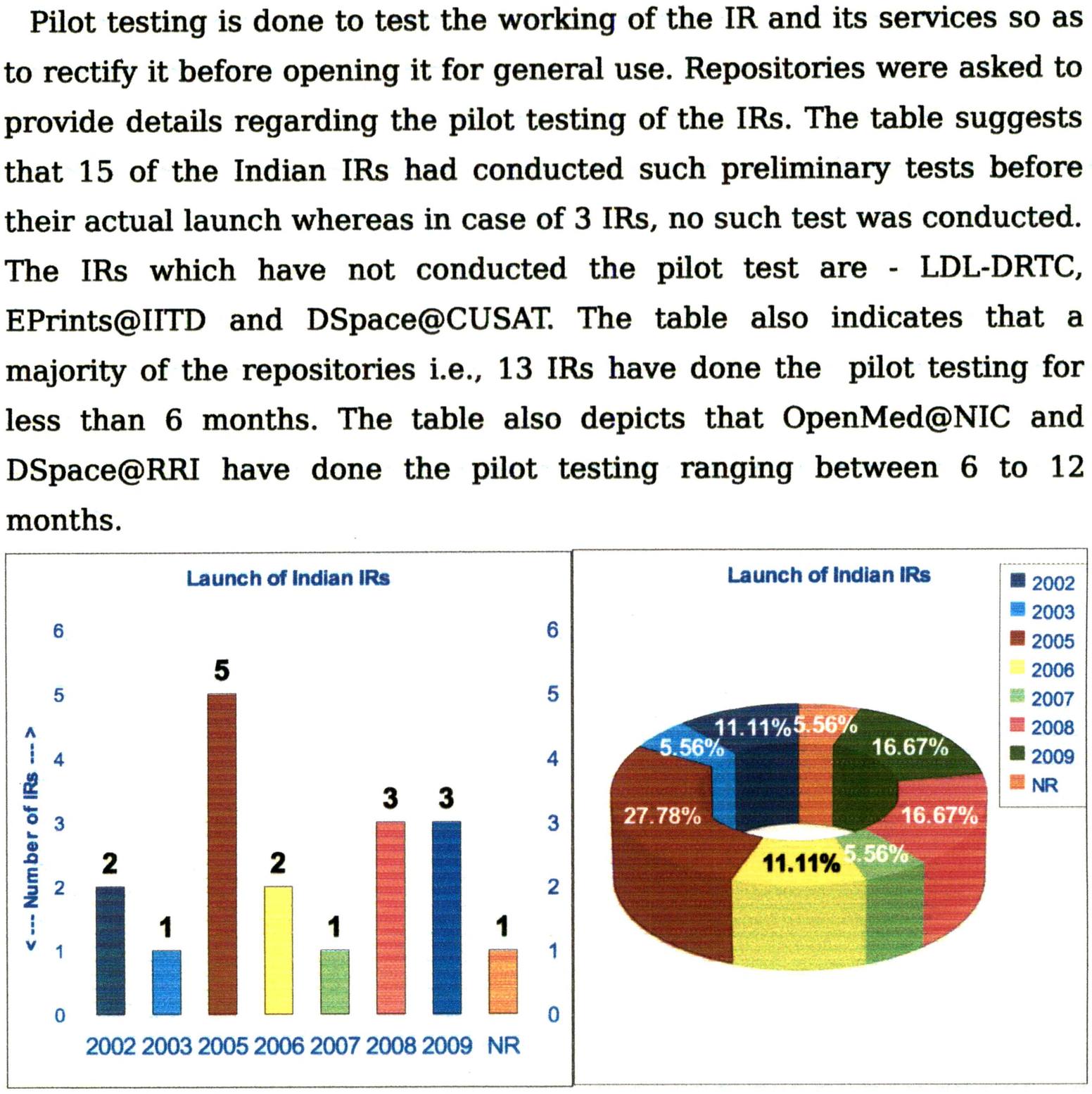


Figure 6.1a Launch of Indian IRs

According to Figure 6.1a establishing of Indian repositories started in

2002. It reveals that about 28% of repositories were established in 2005 followed by about 17% IRs in 2008 and 2009 which is a positive sign as we can expect more repositories being established in the coming years.

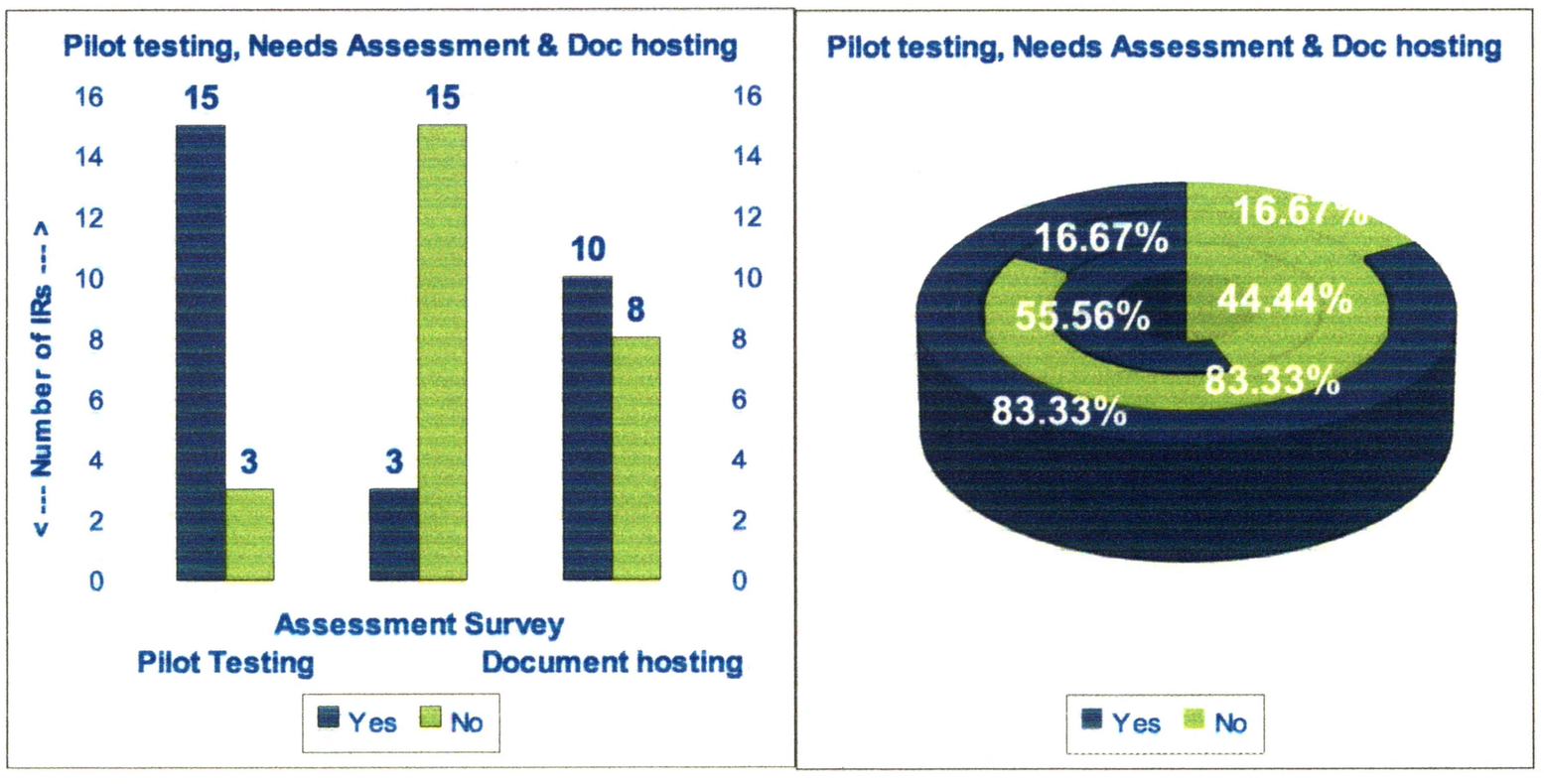


Figure 6.1b Pilot testing, Needs Assessment and Doc hosting

Figure 6.1b indicates that about 83% the repositories had conducted pre-launch pilot testing while in about 17% IRs no such testing was conducted. The figure also reveals that only about 17% IRs have done needs assessment survey prior to the actual launch of the IR and all of them have found it helpful in the successful implementation of the IR. The remaining about 83% IRs have not conducted any such survey.

Figure 6.1b also presents statistics regarding document hosting methods prior to the launch of Indian IRs. It indicates that about 56% institutions repositories (IRs) surveyed were having some mechanism for document hosting prior to the launch of their IR while about 44% IRs had no such mechanism for managing their knowledge output.

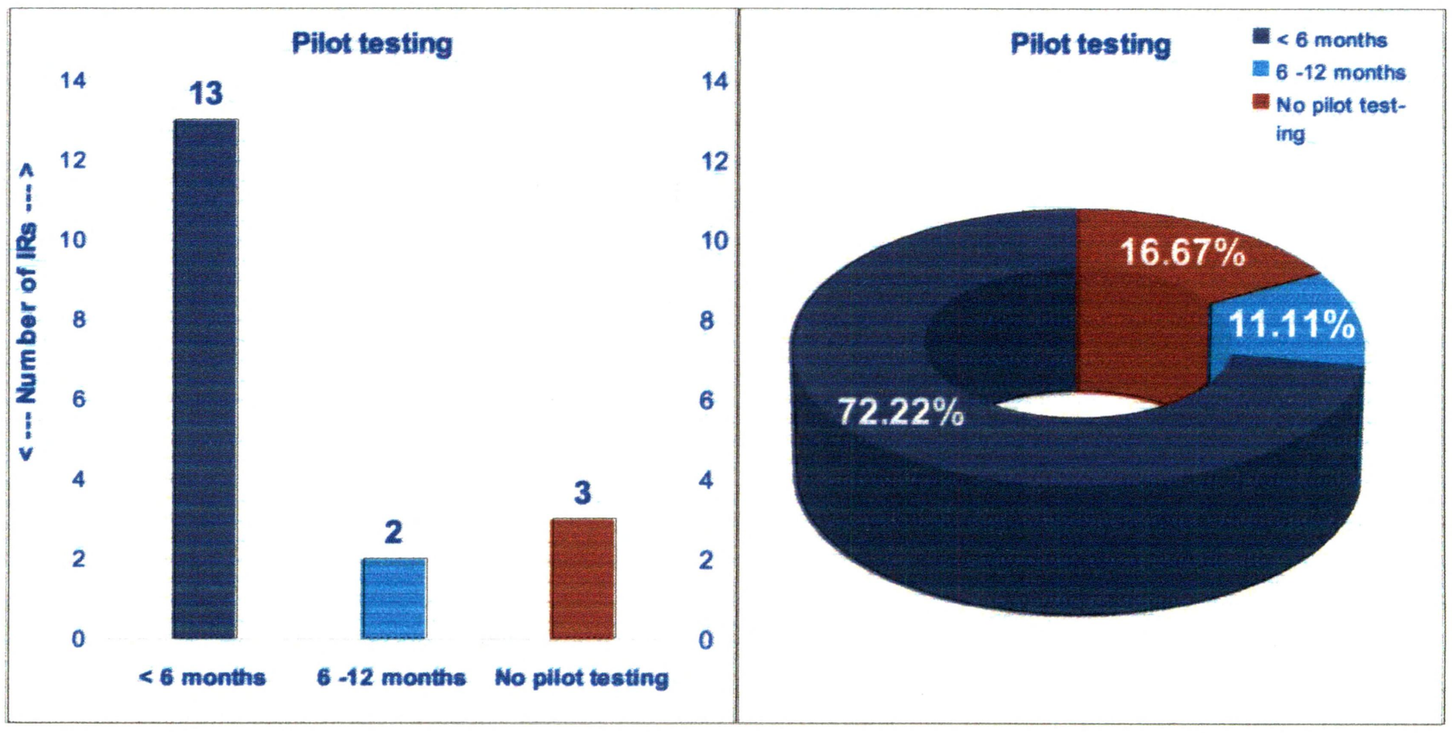


Figure 6.1c Duration of pre-launch pilot testing

As per Figure 6.1c, about 72% IRs have carried out the pre-launch pilot testing for less than 6 months, whereas about 11% have done testing for 6 months to 1 year. It also suggests that about 17% have not conducted any such pilot testing before the actual launch of the IR.

6.2 IR initiative:

S.no.	Repository	Teaching Depart.	Library	Institutional policy	Request by the scientists and researchers.
1	LDL-DRTC	√ (LIS)			
2	ePrints@IISc		√		
3	NAL Repository		√		
4	DSpace@IITB		√		
5	EPrints@IITD		√		
6	DSpace@INFLIBNET			√	
7	DSpace@IBSA		√		
8	ePrints@NCCR				√
9	DRS@nio		√		

[redacted]

10	DSpace@NITR		√		
11	OpenMED@NIC		√		
12	DSpace@TU		√		
13	MGU Theses Online			√	
14	DSpace@RRI		√		
15	ePrints@CSIR			√	
16	DSpace@ICRISAT			√	
17	EPrints@MDRF		√		
18	DSpace@CUSAT		√		

Table 6.2 IR initiative

According to the Table 6.2, in 12 IRs, the IR was the outcome of the efforts of the library of that institution. In 4 other IRs, viz., DSpace@INFLIBNET, MGU Theses Online, ePrints@CSIR and Dspace@ICRISAT, the initiative was taken by the institutional authorities. At LDL-DRTC and ePrints@NCCR, academics were involved in initiating the IR project.

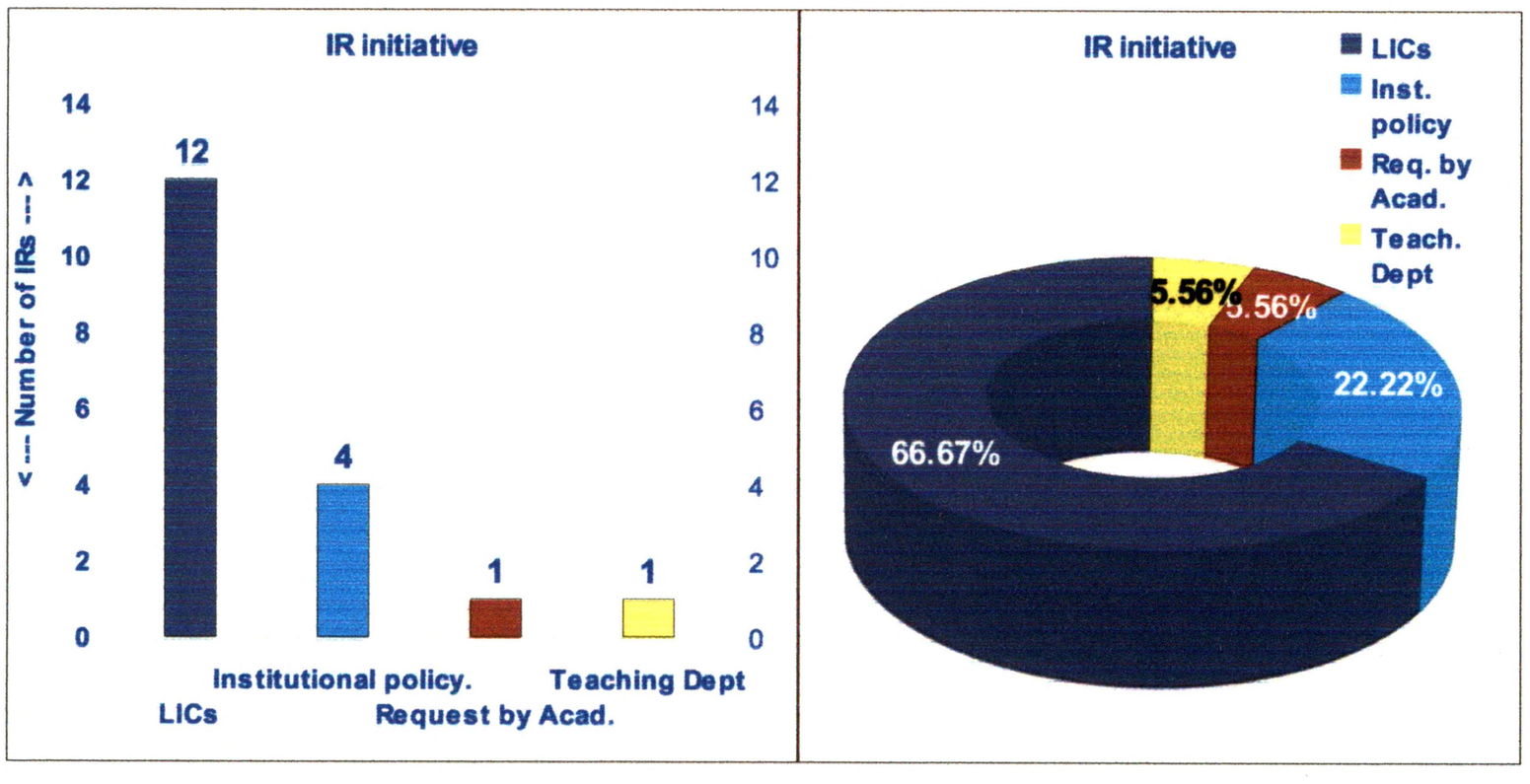


Figure 6.2 IR Initiative

Figure 6.2 above indicates that about 67% Indian repositories were

[redacted]

established because of the initiatives taken by the library or information centre whereas about 22% IRs were established as a result of the institutional policy. Teaching departments (LIS) and requests by academics have contributed in the establishment of IRs in 5.56% IRs each. It is very clear from these results that libraries play a vital role in the establishment of IRs. University libraries in India should take initiatives to establish IRs of their respective universities.

6.3 IR contents:

S.no.	Repository	Pre-prints	Post-prints	Conference papers	Theses and Diss.	Presentations	Administrative documents-reports, etc.
1	LDL-DRTC	√	√		√		
2	ePrints@IISc		√		√		
3	NAL Repository	√	√		√	√	√
4	DSpace@IITB	√	√	√	√	√	√
5	EPrints@IITD	√		√	√	√	√
6	DSpace@INFLIBNET		√	√	√	√	√
7	DSpace@IBSA	√	√			√	
8	ePrints@NCCR		√		√		
9	DRS@nio	√	√	√	√	√	√
10	DSpace@NITR	√	√	√	√	√	
11	OpenMED@NIC	√	√	√		√	
12	DSpace@TU		√	√	√	√	√
13	MGU Theses Online			√	√		
14	DSpace@RRI		√	√	√	√	√
15	ePrints@CSIR				√		
16	DSpace@ICRISAT	√	√	√		√	
17	EPrints@MDRF	√	√	√	√	√	√
18	DSpace@CUSAT		√	√	√	√	√

Table 6.3 IR contents

Table 6.3 shows the type of IR contents including pre-prints, post-prints, conference papers, theses and dissertations, presentations,

administrative documents including reports, etc. Administrative documents form a very useful part of IR collection. The table depicts that such documents are being hosted by 9 of the Indian IRs while there are 3 repositories,i.e., DSpace@IITB, DRS@nio and EPrints@MDRF which host all types of documents.

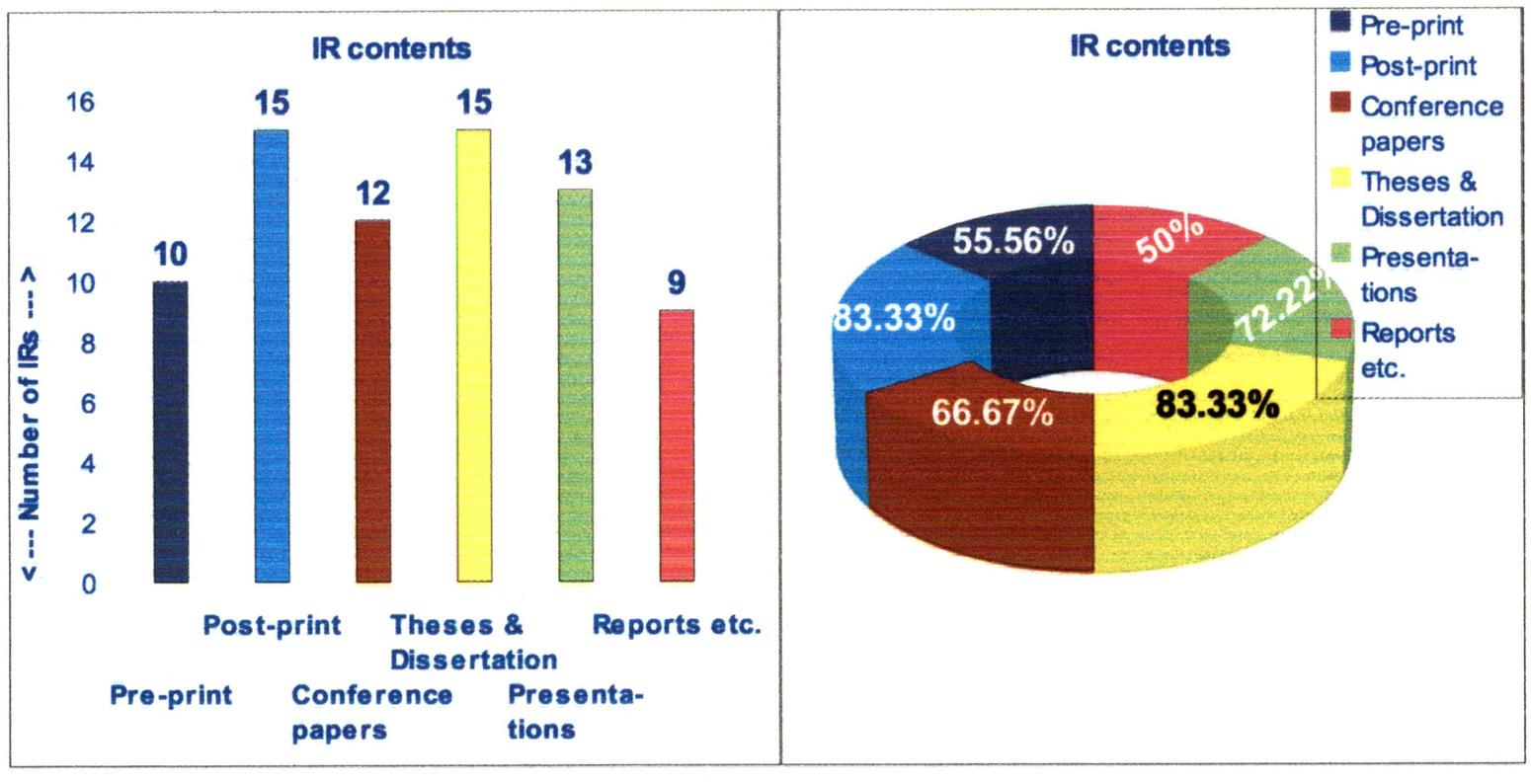


Figure 6.3 Distribution of IR contents

Figures 7.3 above indicates that about 56% Indian IRs contain pre prints, about 83% contains post prints and thesis and dissertations each, 72% IRs contain presentations, about 67% contain the conference papers. The figure also suggests that 50% IRs contain reports, etc. It is clear from the figure that Indian IRs possess multiple collection type with theses and dissertation and post-print constituting a major part of it.

6.4 Document level

S.no.	Repository	Document level	PhD programme	Theses fulltext/ metadata
1	LDL-DRTC	Fulltext always	√	fulltext
2	ePrints@IISc	Fulltext always	√	do
3	NAL Repository	Started with metadata only, now fulltext	√	do

4	DSpace@IITB	Fulltext always	√	metadata
5	EPrints@IITD	do	√	do
6	DSpace@INFLIBNET	do		√ (aggregated)
7	DSpace@IBSA	do		metadata
8	ePrints@NCCR	do	√	√
9	DRS@nio	do	√	√
10	DSpace@NITR	do	√	√
11	OpenMED@NIC	do		fulltext
12	DSpace@TU	do	√	√
13	MGU Theses Online	do	√	√
14	DSpace@RRI	do	√	√
15	ePrints@CSIR	Metadata only		√ (aggregated)
16	DSpace@ICRISAT	Fulltext always	√	√
17	EPrints@MDRF	do	√	√
18	DSpace@CUSAT	Started with metadata only, now fulltext	√	√

Table 6.4 Document level

Table 6.4 contains data regarding the level of documents like metadata, full-text, etc. NAL Repository and DSpace@CUSAT have started with metadata initially and now provide full-text also. Fifteen IRs provide full-text access to their documents from their initial stages.

It also contains data regarding PhD programme being offered by their parent institutions. Fourteen IRs responded affirmatively while 4 IRs do not contain such material as PhD programme is not being offered by their institutes. According to this table, 15 IRs are offering full-text access to such resources while only metadata is available in 3 IRs. Theses and dissertations at DSpace@INFLIBNET and ePrints@CSIR are being submitted by various institutions of India.

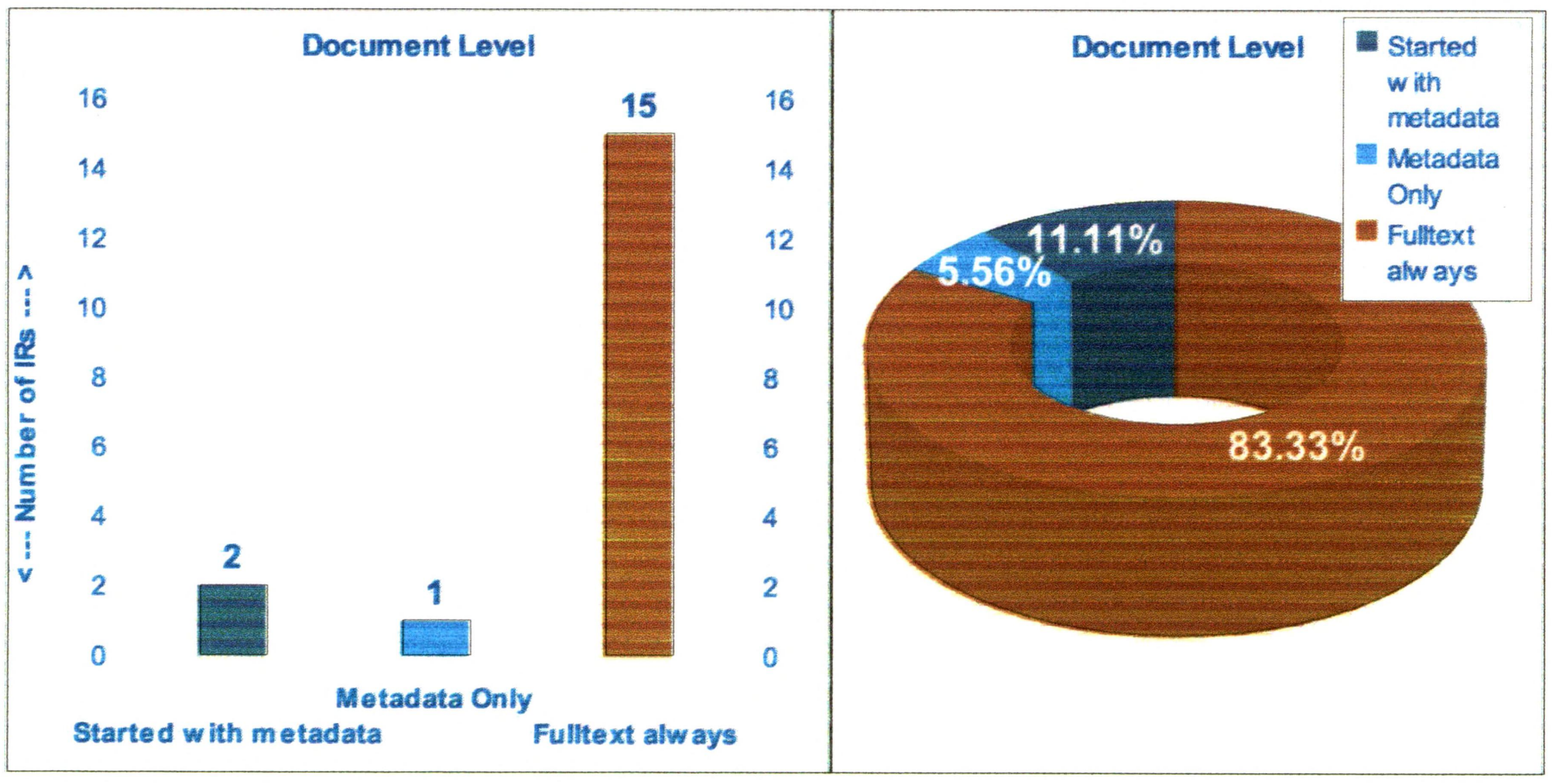


Figure 6.4a Document level

Figure 6.4a above indicates that about 11% IRs started the document level with the metadata and later on switched over to the full text. Over 5% of IRs host only metadata whereas about 83% IRs have the full text data from the launching stage. At present, a very substantial percentage, i.e. 94% (83%+11%) IRs provide open access to full-text of their institutional scholarly output.

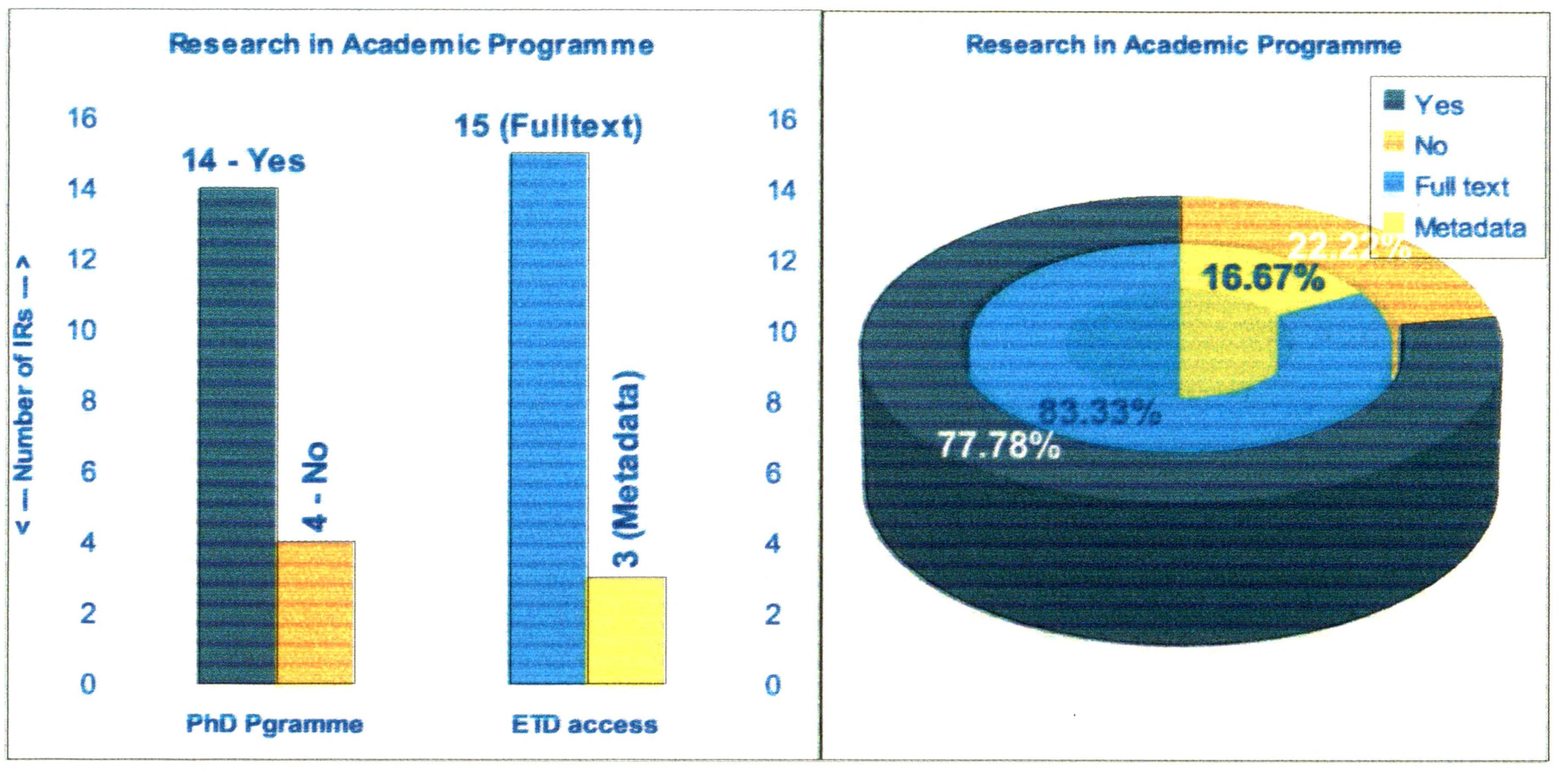


Figure 6.4b PhD as academic programme

Figure 6.4b above indicates that about 78% institutions having IRs offer research (PhD) as the part of the academic programmes. It also suggests that over 83% Indian IRs provide access to the full text of the theses and dissertations, whereas about 17% repositories provide access upto metadata level only.

6.5 Preferred file format and conversion policy:

S.no.	Repository	Preferred file format					File conversion policy
		PDF	DOC	Application (postscript, rtf, ppt, zip)	Image (gif, jpeg, tiff, png)	Audio/ Video	
1	LDL-DRTC	√					X
2	ePrints@IISc	√					√
3	NAL Repository	√		√	√		X
4	DSpace@IITB	√		√			√
5	EPrints@IITD	√					X
6	DSpace@INFLIBNET	√	√		√		X
7	DSpace@IBSA	√					X
8	ePrints@NCCR	√					X
9	DRS@nio	√					√
10	DSpace@NITR	√					X
11	OpenMED@NIC	√		√			√
12	DSpace@TU	√			√		
13	MGU Theses Online	√	√		√		√
14	DSpace@RRI	√			√		√
15	ePrints@CSIR	√			√		
16	DSpace@ICRISAT	√			√		√
17	EPrints@MDRF	√		√			√
18	DSpace@CUSAT	√		√	√	√	√

Table 6.5 Preferred file format

Table 6.5 presents the preferred file format of the IR documents including PDF, DOC (document) and PNG (Portable Network Graphics). While PDF is the most popular amongst the Indian IRs, DSpace@INFLIBNET is using all the file formats. MGU Theses Online is

using both PDF and DOC file formats. It also present the responses received by Indian IRs relating to the file format used for the documents. All the IRs are invariably using text as their preferred file format. DSpace@CUSAT is the only repository which is using all the file formats. The data pertaining to file conversion policy is also specified in the above table. It suggests that 9 Indian IRs have file conversion policy, whereas other 9 IRs have no such policy.

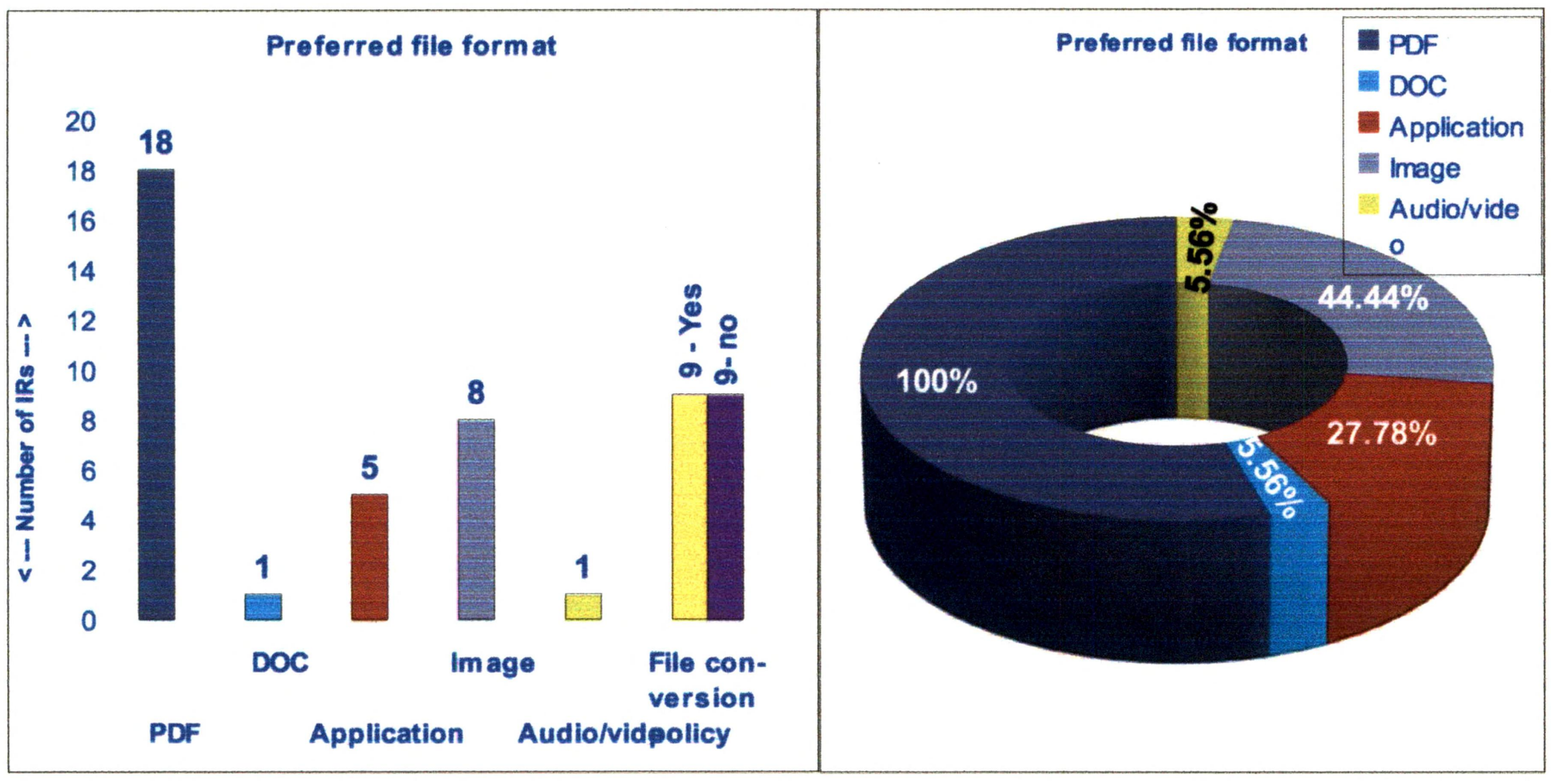


Figure 6.5 Preferred file format

Figure 6.5 above indicates that all Indian IRs (i.e., 100%) use PDF as their preferred file format while 5.56% Indian IRs use DOC, 27.78% use application, 44.44% use image and another 5.56% Indian IRs use multimedia file format. It becomes clear from these statistics that PDF is the most preferred file format for hosting of documents in the repositories. The figure also indicates that while 50% Indian IRs have file conversion policy, the remaining 50% IRs do not have any such policy.

6.6 Difficulties faced:

S.no.	Repository	lack of inst. policy	funding	lack of skilled HR	lack of infrastructure	lack of interest shown by authorities	No difficulty

1	LDL-DRTC						√
2	ePrints@IISc						√
3	NAL Repository						√
4	DSpace@IITB	√				√	
5	EPrints@IITD	√					
6	DSpace@INFLIBNET						√
7	DSpace@IBSA	√	√	√	√	√	
8	ePrints@NCCR			√			
9	DRS@nio						√
10	DSpace@NITR					√	
11	OpenMED@NIC	√	√				
12	DSpace@TU						√
13	MGU Theses Online		√	√	√		
14	DSpace@RRI						√
15	ePrints@CSIR						√
16	DSpace@ICRISAT						√
17	EPrints@MDRF				√		
18	DSpace@CUSAT	√					

Table 6.6 Difficulties while establishing the IR

Table 6.6 presents data regarding the difficulties faced by institutions in establishing the IR. The probable problems were categorised as lack of institutional policy, funding, lack of skilled HR(human resource), lack of necessary infrastructure and lack of interest shown by authorities. LDL-DRTC, ePrints@IISc, NAL Repository, DSpace@INFLIBNET, DRS@nio, DSpace@TU, DSpace@RRI and DSpace@ICRISAT have mentioned that they did not face any such problem in establishment of IR is clear from the table that funding is not the major issue in the creation of an IR. Only three repositories, viz., DSpace@IBSA, OpenMED@NIC and MGU Theses Online have mentioned that they did face the problem of financial constraints.

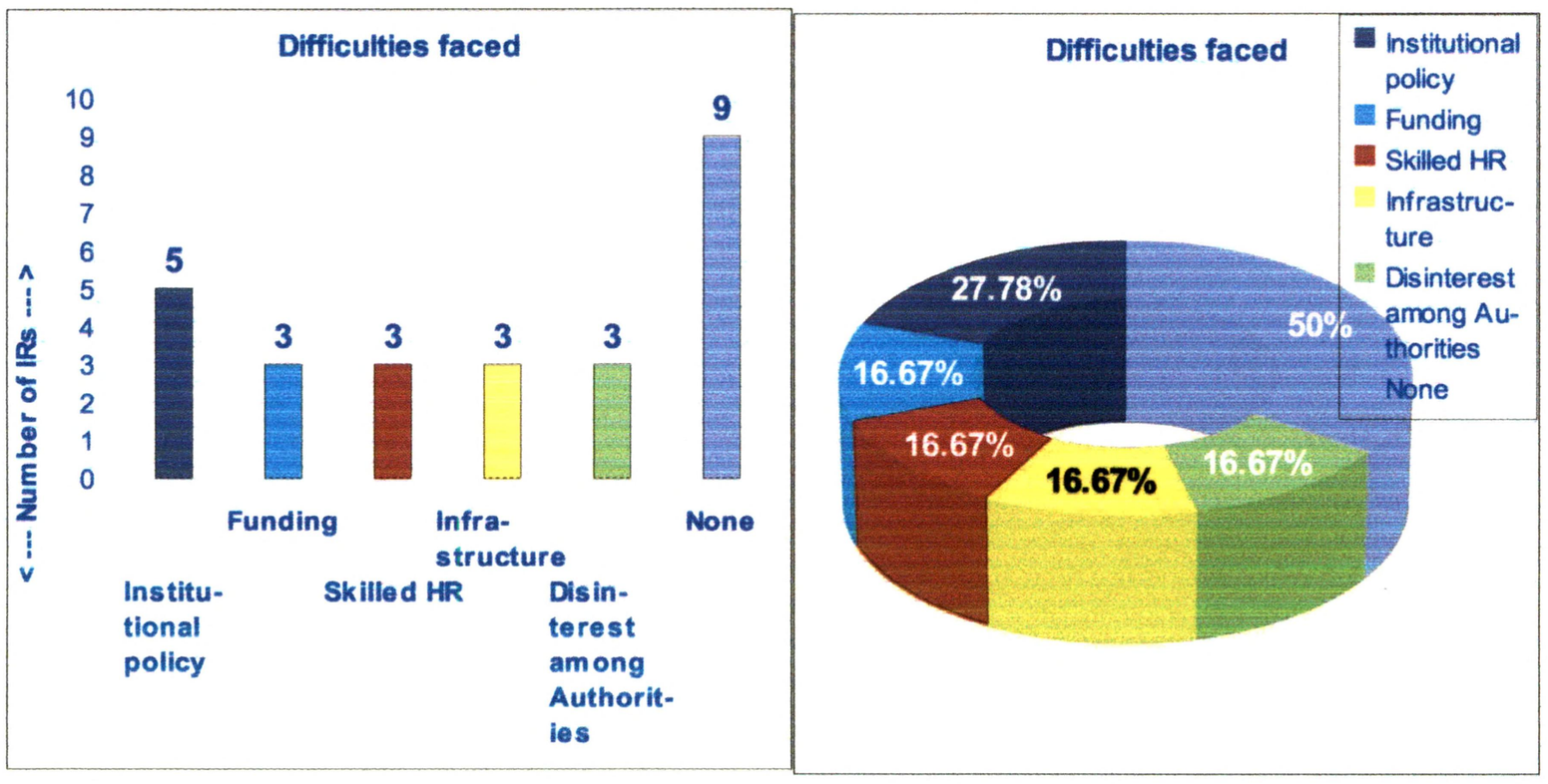


Figure 6.6 Types of difficulties in establishing the IRs

Figure 6.6 presents the nature of problems faced by the Indian IRs. It indicates that 50% Indian IRs did not face any difficulty in establishing their IR. 5 Indian IRs (i.e., about 28%) faced problem pertaining to lack of institutional policy, 3 IRs (i.e., 16.67%) had problems related to funding, 3 IRs (i.e., 16.67%) faced the the problem of shortage of skilled HR. Lack of Infrastructure was the main problem in another 3 IRs (i.e., 16.67%) whereas disinterest among the authorities was the problem in 3 other Indian IRs (i.e., 16.67%).

Apart from this, 4 IRs including ePrints@NCCR, OpenMED@NIC, MGU Theses Online and EPrints@CSIR have mentioned individual issues faced by them while establishing their respective IRs. ePrints@NCCR indicated lack of cooperation and interest. OpenMED@NIC which is an aggregating repositories had to rely on non-institutional scientists. EPrints@CSIR has some difficulty in creating subject categories as the IR hosts theses from different institutes relating to various disciplines. They needed a multi-domain expert for the categorization and also for uploading theses. They also found limitations in the EPrints manual and its FAQ section.

6.7 IR software: trial, update, change

S.no.	Repository	IR software			Soft. Testing	Soft. Update	Soft. change
		DSpace	EPrints	Other	Yes	Yes	Yes
1	LDL-DRTC	√			√	√	
2	ePrints@IISc		√			√	
3	NAL Repository		√		√		
4	DSpace@IITB	√		Green stone	√	√	
5	EPrints@IITD		√		√	√	DSpace
6	DSpace@INFLIBNET	√			√	√	
7	DSpace@IBSA	√			√		
8	ePrints@NCCR		√				
9	DRS@nio	√			√	√	
10	DSpace@NITR	√					
11	OpenMED@NIC		√		√		
12	DSpace@TU	√					
13	MGU Theses Online			Nitya	√		
14	DSpace@RRI	√			√	√	
15	EPrints@CSIR		√		√		
16	DSpace@ICRISAT	√					
17	EPrints@MDRF		√		√		
18	DSpace@CUSAT	√				√	

Table 6.7 IR software implemented

Table 6.7 contains information regarding the choice of softwares used for building the Indian IRs. It reveals that DSPace and EPrints are the two major open source softwares used by Indian repositories for establishing their IRs. As per this table, 10 IRs are running on DSpace while Eprints is being implemented at 7 IRs. DSpace@IITB is using Greenstone for managing ETD repository, whereas MGU Theses Online is using Nitya as the software platform.

[redacted]

It also represents responses of Indian IRs regarding the testing of several softwares to select the most suitable one. According to this table, 12 IRs have evaluated more than one software to finalize the one they are currently using. According to this table, 10 Indian IRs have updated their software, while 8 Indian IRs are continuing with the installed version.

IRs were asked regarding their choice of software if they have to setup the IR afresh. Table 6.7 suggests that 17 IRs do not want to change the software they have originally selected. Only one IR, i.e., EPrints@IITD would have preferred DSpace given a choice.

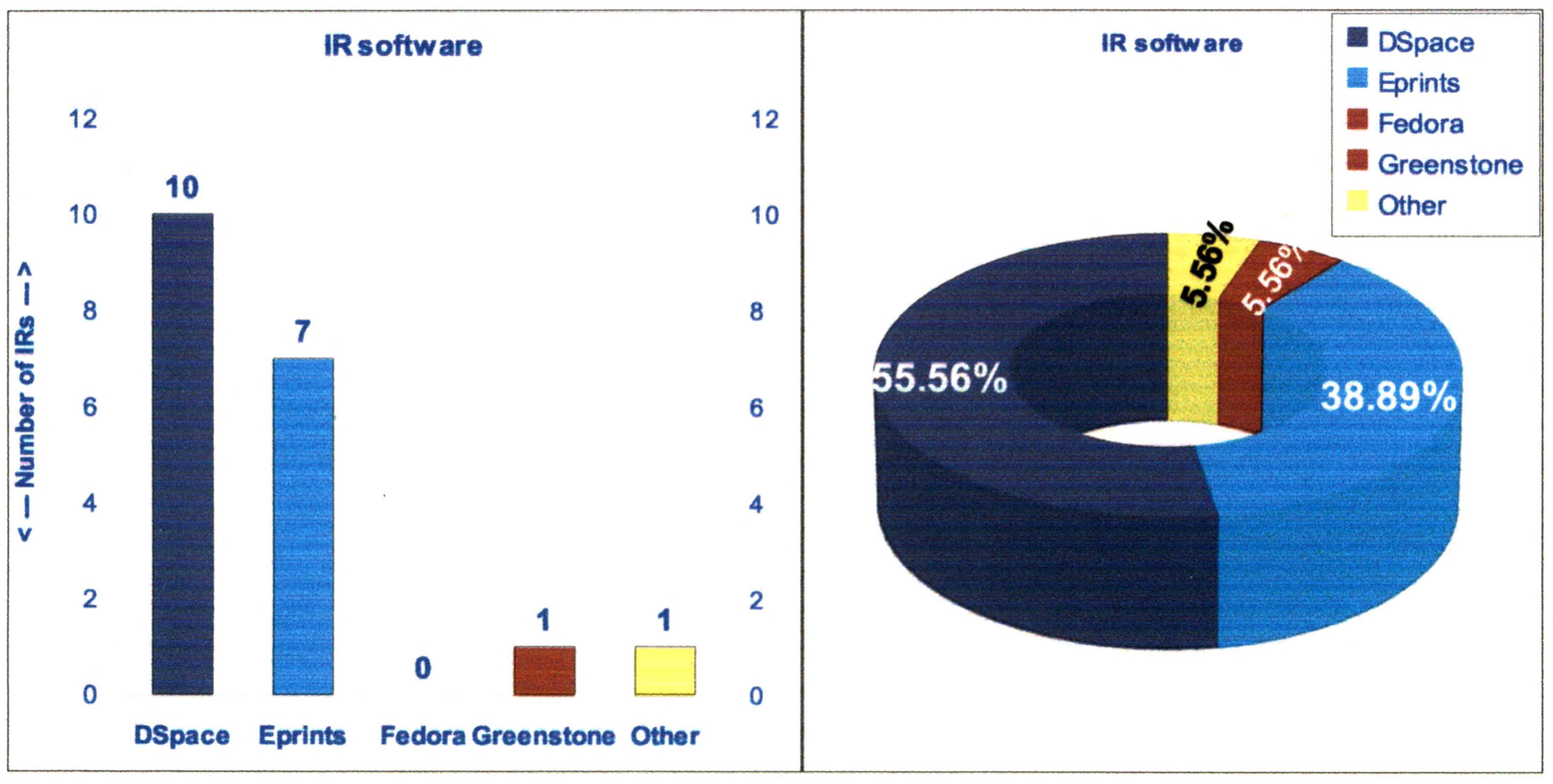


Figure 6.7 IR software implemented

As per Figure 6.7 above, about 53% Indian IR use the D-Space software, about 37% use the E-prints, about 5% IRs use Greenstone and the same percentage of IRs use Nitya as the IR software. It is clear that D-space software is being used more for establishing IRs followed by EPrints in comparison to other softwares.

[redacted]

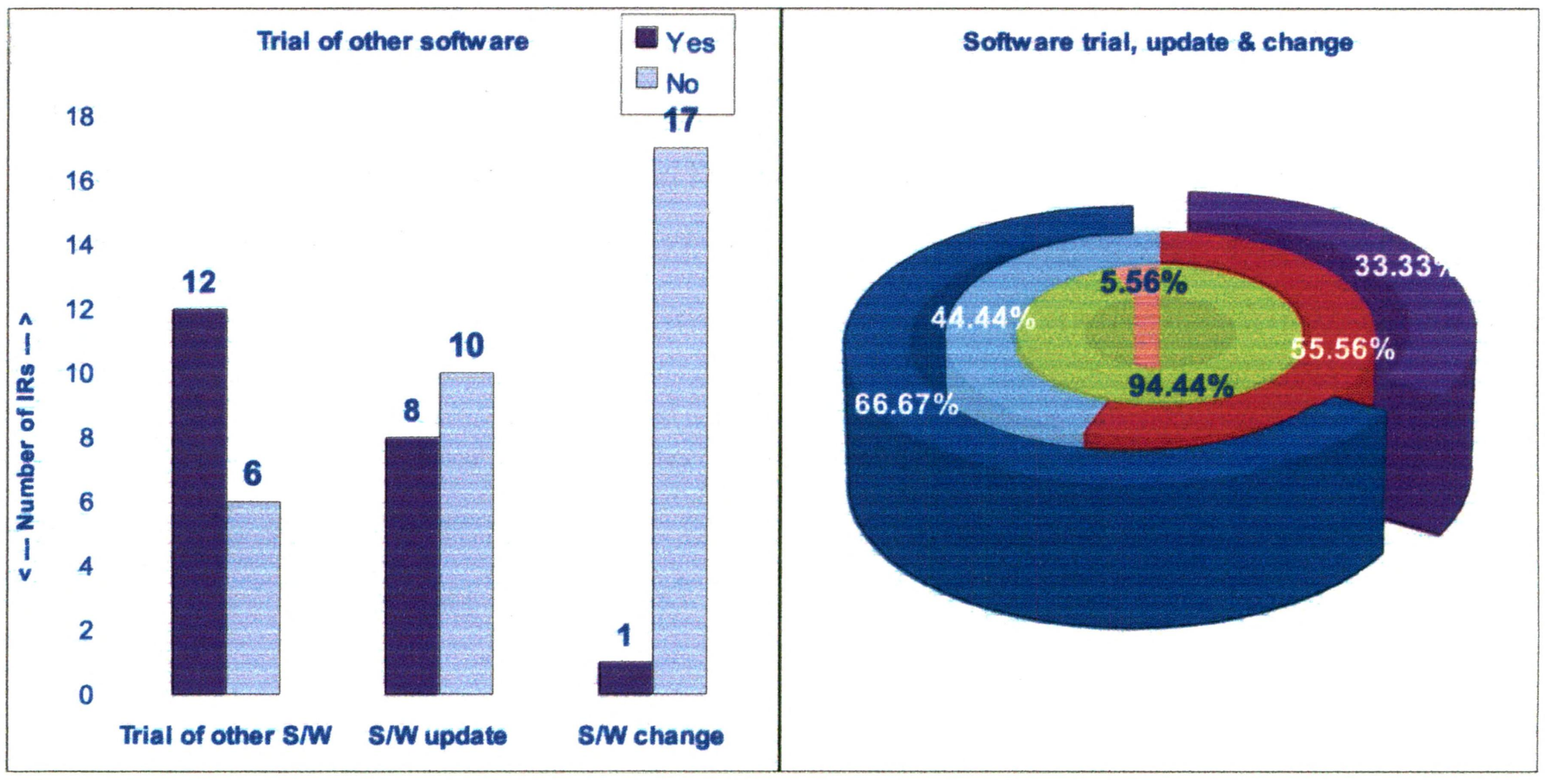


Figure 6.7 Testing of other IR softwares

Figure 6.7 above shows that about 67% IRs in India have tested some software before selecting the present software, while no comparative evaluation of softwares was done in about 33% IRs. Software evaluation is a good practice as universities can select the software which meets their requirements. Switching of softwares becomes very difficult once collection building gathers momentum.

It also reveals that nearly 56% IRs have updated the IR software since its installation, while about 44% have not considered software upgrade. Software upgrades are essential as they not only remove the bug in older versions but also provide enhanced features and utilities. It also suggests that 94% IRs don't want to change their IR software and only 6% wish to switch over to DSpace from EPrints.

6.8 Software features:

Table 6.8 indicates the criteria on the basis of which IRs have selected the software. The software features include greater functionality, easy installation and maintenance, adequate support available, security user

S. no.	Repository	Greater functionality	Easy installation & maintenance	Adequate support	Secure	User friendly	Easy Customization	Scalability & stability	Open Source	Ongoing project	updates released frequently
1	LDL-DRTC	√									
2	ePrints@IISc	√	√	√	√	√	√	√	√	√	√
3	NAL Repository	√	√	√	√	√	√	√	√	√	√
4	DSpace@IITB	√	√	√	√	√	√	√	√	√	√
5	EPrints@IITD	√			√						
6	DSpace@INFLIBNET	√	√	√	√	√	√	√	√	√	√
7	DSpace@IBSA	√									
8	ePrints@NCCR	√									
9	DRS@nio	√	√	√	√	√	√	√	√	√	√
10	DSpace@NITR		√								
11	OpenMED@NIC		√	√	√	√		√			
12	DSpace@TU										
13	MGU Theses Online	√		√	√	√	√		√√	√	
14	DSpace@RRI	√		√	√	√	√		√	√	√
15	ePrints@CSIR	√				√			√	√	√
16	ICRISAT			√	√	√	√		√		
17	EPrints@MDRF	√	√	√	√	√	√	√	√	√	√
18	DSpace@CUSAT	√	√	√	√	√	√	√	√	√	√

Table 6.8 Software Features

friendly, easy customization, scalability and stability, open source,ongoing project, frequency of updates, etc. Almost all IRs have valued a combination of these features to decide upon their IR software.

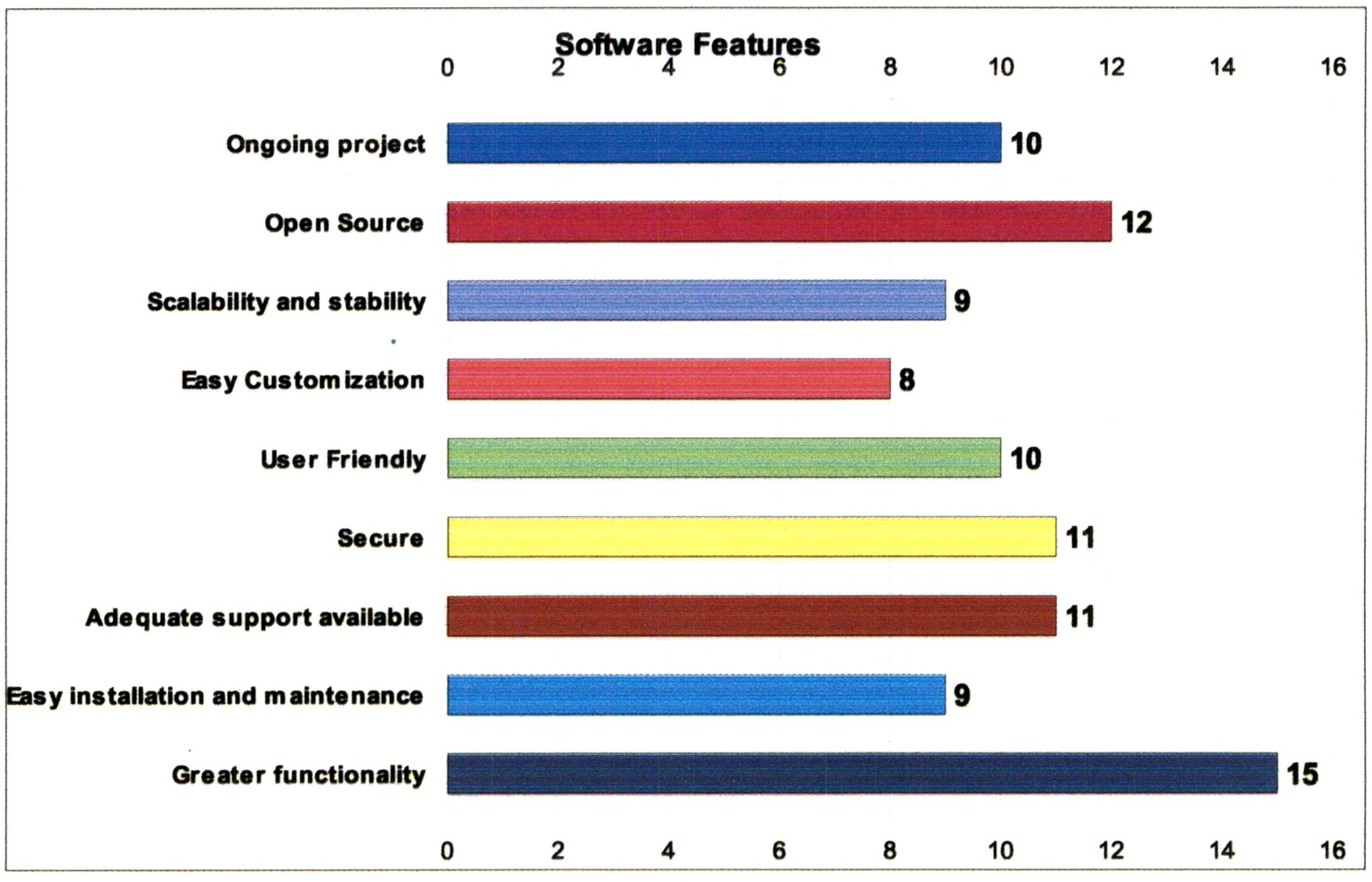


Figure 6.8a Features of the chosen software

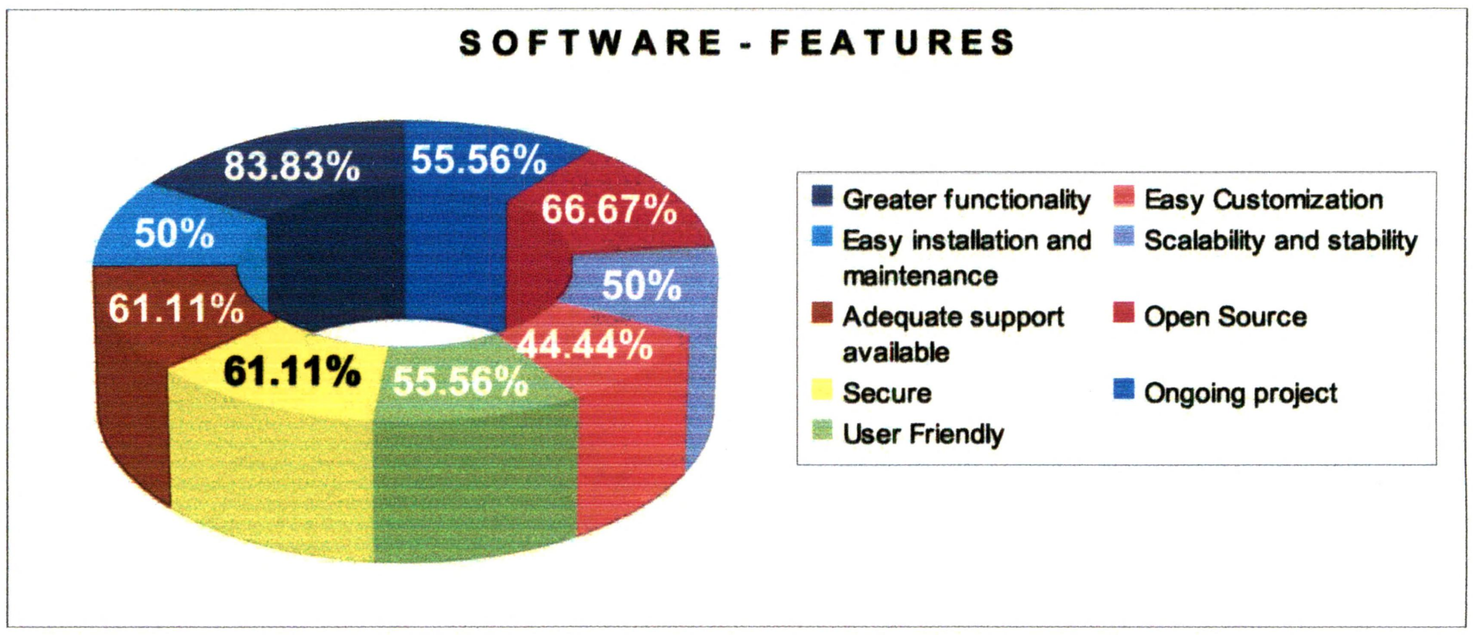


Figure 6.8b Features of the chosen software

Figures 7.8a and 7.8b above indicates that about 83.33% IR selected the software due to its greater functionality, about 67% selected the

software because it was open source software, about 61% due to availability of adequate support and security point of view, user friendliness accounted for about 56%, another 56% selected the software as the software development was an ongoing project, about 9% IRs preferred the software owing to its easy installation and maintenance, 50% selected the software due to its scalability and stability and 44% due to the facility of easy customization. It is clear from the above two figures that software functionality and availability as open source software are the major criteria for software selection by the Indian IRs.

6.9 Solution to software related problems:

S.no.	Repository	Local expertise	Software manual	Mailing List /discussion group	No Response
1	LDL-DRTC	√			
2	ePrints@IISc	√	√	√	
3	NAL Repository	√	√	√	
4	DSpace@IITB	√		√	
5	EPrints@IITD		√		
6	DSpace@INFLIBNET		√		
7	DSpace@IBSA				√
8	ePrints@NCCR				√
9	DRS@nio	√		√	
10	DSpace@NITR	√			
11	OpenMED@NIC	√		√	
12	DSpace@TU			√	
13	MGU Theses Online	√			
14	DSpace@RRI	√	√	√	
15	ePrints@CSIR	√	√		
16	DSpace@ICRISAT	√			
17	EPrints@MDRF	√		√	
18	DSpace@CUSAT	√			

Table 6.9 IR software related problems

Quite often, repository administrators face problems while establishing IRs. In a commercial solution, they may get support from the system vendor but in case of open source softwares, which most of the Indian IRs surveyed are using, solution to a problem can be obtained through local expertise available, software manual or mailing list /discussion groups. Table 6.9 reveals that while local expertise was of help in 13 Indian IRs, software manual and discussion forum provided the help in 6 and 8 Indian IRs respectively.

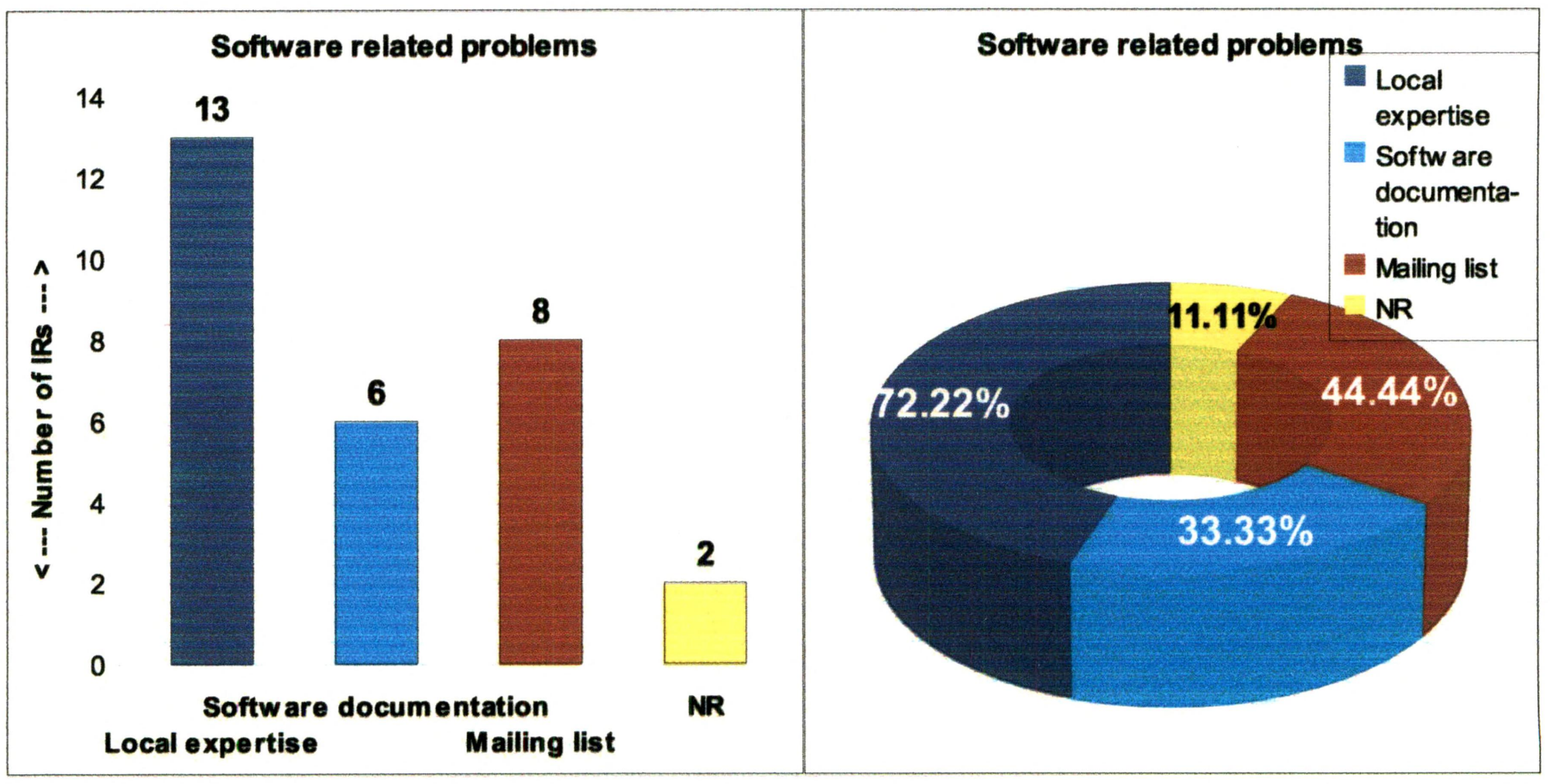


Figure 6.9 IR software related problems

Figure 6.9 above reveals that in about 72% Indian IRs, the problems were solved through local or in-house expertise. In about 33% IRs, the software documentation provided the help. Mailing list was used for handling problems in about 44% Indian IRs. It also becomes evident from the above figures that an IR has adopted several methods to solve the issue depending upon the nature of the issue.

6.10 IR server:

S.no.	Repository	Shared/ dedicated	RAM (in GB)	HDD	Upgrade policy	Anti-Virus	Fire wall	Backup
1	LDL-DRTC	shared	8	1 TB		X	√	Weekly
2	ePrints@IISc	dedicated	4	2 TB		X	√	Daily
3	NAL Repository	do	0.5	80 GB		X	X	Weekly
4	DSpace@IITB	do	3	1 TB		X	X	Daily
5	EPrints@IITD	do	2	160 GB	√	√	√	Weekly
6	DSpace@INFLIBNET	do	4	NR	√	√	√	Weekly
7	DSpace@IBSA	do	0.25	40 GB		X	X	Only once as yet
8	ePrints@NCCR	shared	NR	NR		X	X	Never
9	DRS@nio	shared	NR	NR		X	X	Daily
10	DSpace@NITR	dedicated	2	80 GB		X	X	Bi-monthly
11	OpenMED@NIC	do	4	80 GB	√	√	√	Daily
12	DSpace@TU	do	1	160 GB		X	X	Monthly
13	MGU Theses Online	shared	NR	NR		√	√	Monthly
14	DSpace@RRI	dedicated	16	500 GB		X	√	Daily
15	ePrints@CSIR	do	4	>1 TB	√	√	√	Daily
16	DSpace@ICRISAT	do	4	500 GB	√	√	√	Daily
17	EPrints@MDRF	shared	NR	NR		√	√	Daily
18	DSpace@CUSAT	do	NR	NR		√	X	alternate days

Table 6.10 IR Server type

According to Table 6.10, 12 Indian IRs are being hosted using shared server, whereas dedicated server is being used in 6 IRs. The table also suggest that all of the 18 Indian IRs surveyed are accessible over the Internet instead of restricted intranet availability. They were also asked

about their server configuration in terms of RAM and Hard Disc. Five of the Indian IRs have 2-4 GB RAM, while 4 IRs have RAM ranging from 1-2 GB. LDL-DRTC and DSpace@RRI have 8 GB and 16 GB of RAM respectively. Two IRs are have less than 1 GB RAM. Five IRs did not provided this information. According to Table 6.10, only 5 of the Indian IRs surveyed have Software migration and server upgrade policy, whereas 13 IRs have no such well defined policy. It also indicates that 10 IRs have antivirus software installed for the safety of the IR servers while firewall is also being used at 10 IRs. The Table also reveals that Eprints@IITD, DSpace@INFLIBNET, OpenMED@NIC, MGU Theses Online ePrints@CSIR, DSpace@ICRISAT and EPrints@MDRF are the 7 repositories which are using both antivirus software as well as firewall for server security while 7 other IRs have no such provision software implemented. It suggests that 17 IRs (94.44%) are taking backup of the data hosted on them while ePrints@NCCR has mentioned that no backup is taken. The table also presents data regarding the backup frequency. While 8 IRs are taking daily backup, weekly backup is taken at 4 IRs, 2 IRs take monthly backup. Bi-monthly backups is taken at DSpace@NITR. At Dspace@CUSAT, backup is taken every alternate day. Three IRs are using a backup software for this purpose.

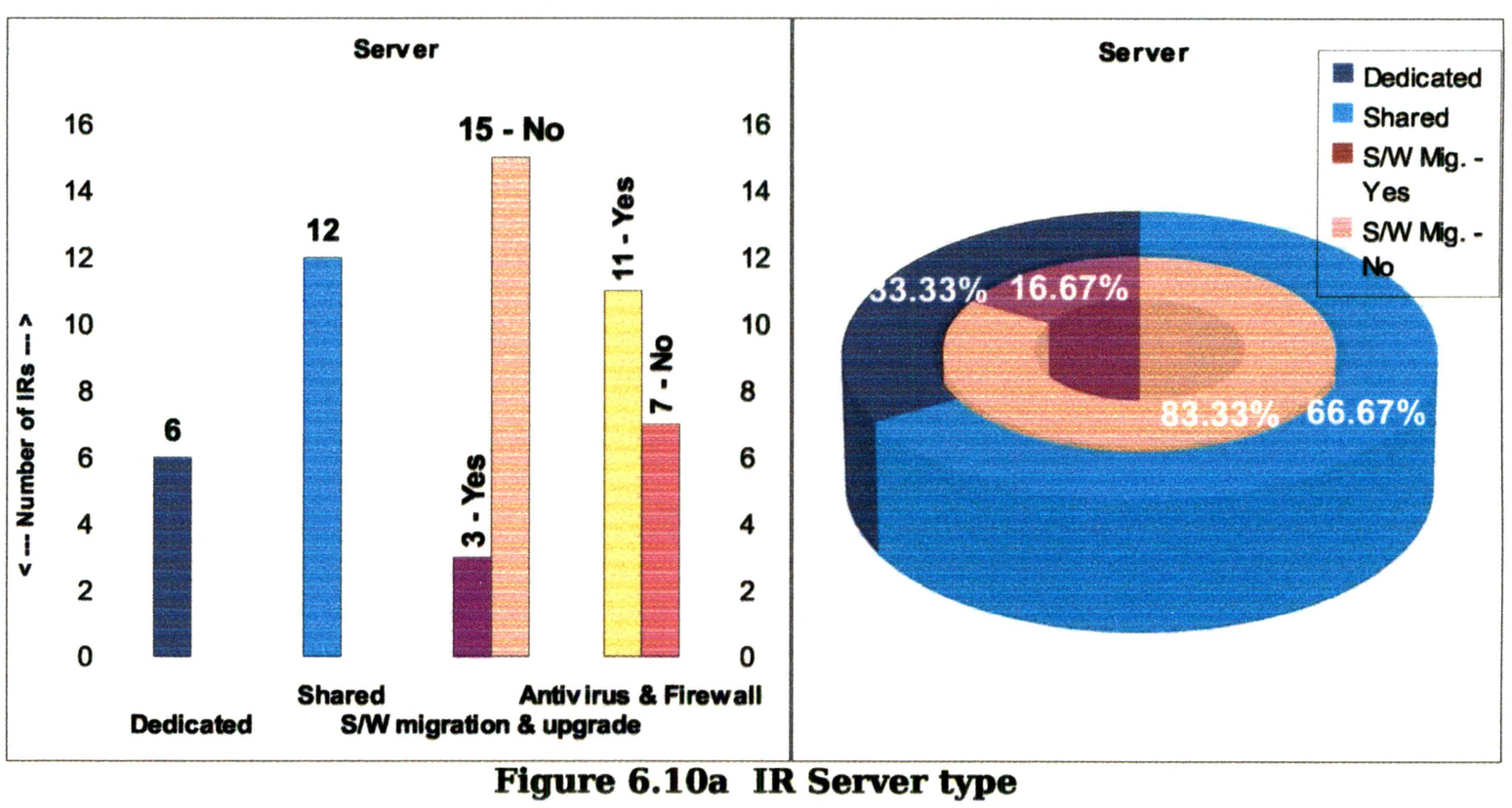


Figure 6.10a IR Server type

[redacted]

Software migration and server upgrade policy needs to be discussed with the vendor at the time of pre-purchase demonstrations. As per Figure 6.10a, about 67% IRs are running on shared servers instead of dedicated servers as in case of about 33% IRs. Over 83% IRs have not implemented any software migration and server upgrade policy and only about 17% have done that. It also indicates that 61.11% Indian IRs have installed either antivirus or firewall including 39% IRs who have installed both for server security and data safety. Another 39% IRs are not using such softwares.

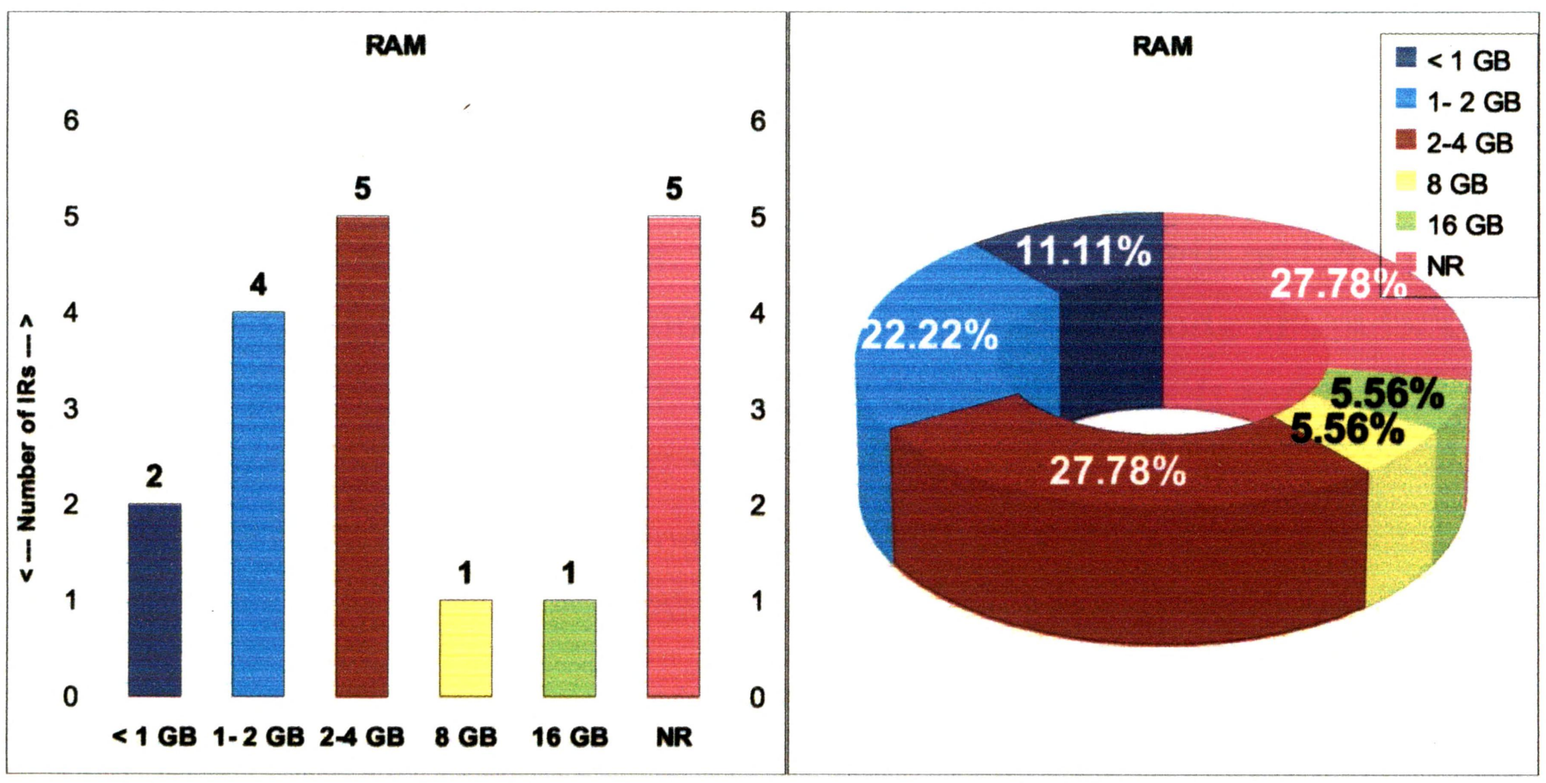


Figure 6.10b IR Server configuration – RAM

Figure 6.10b above indicates that about 28% Indian IR servers are having 2-4 GB RAM, about 28% IR uses the 1-2 GB RAM, about 6% IR servers have 8 GB and the same number of IRs, i.e., 6% have 16 GB RAM. About 28% Indian IRs did not respond to this query.

[redacted]

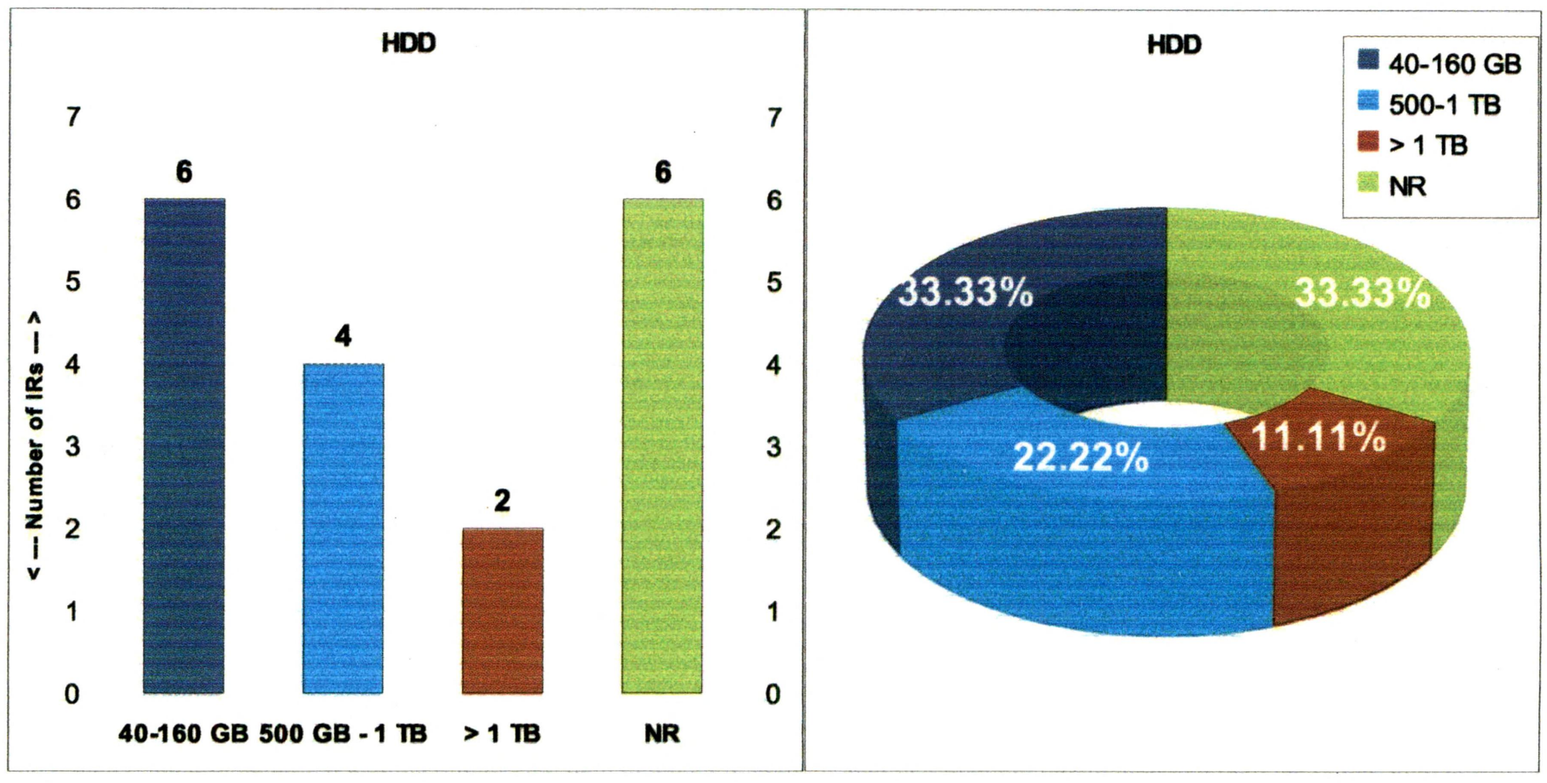


Figure 6.10c IR Server configuration – HDD

Figure 6.10c above indicates that over 33% IR servers have 40-160 GB HDD whereas about 22% servers have 500 GB – 1 TB of HDD. About 11% IRs have more than 1 TB of HDD. About 33% IRs did not respond to this query. The figure also suggests that over 94% IRs have the policy to take the data-back up software. Only one repository, i.e., ePrints@NCCR has replied that data-backup is not a routine feature.

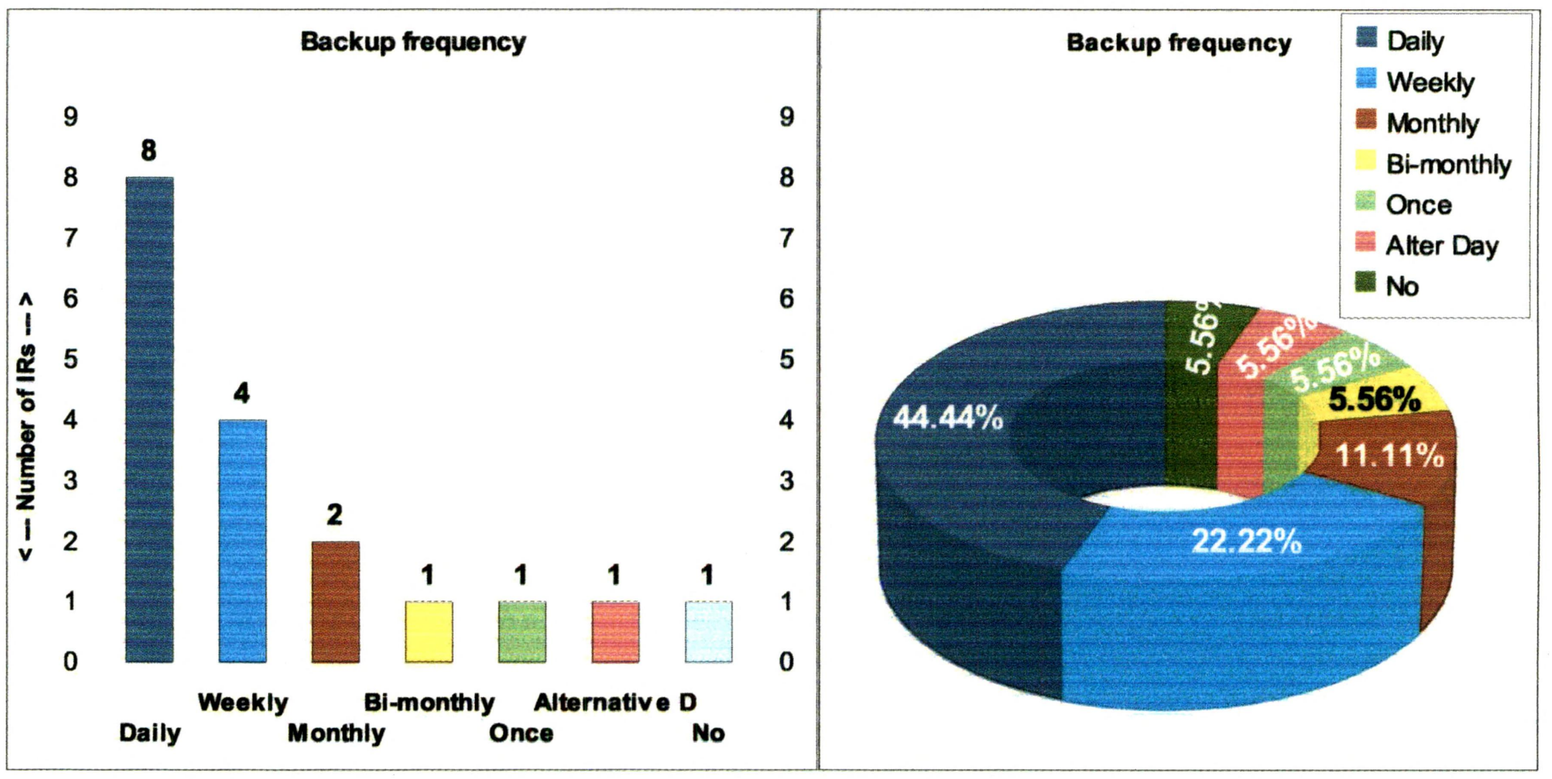


Figure 6.10d Backup details - file format, software

From Figure 6.10d, it is clear that about 44% IRs backup their data on daily basis whereas about 22% take backup on weekly basis and about 11% take backup on monthly basis. The backup frequencies including for bi-monthly, alternate day, only once and no backup accounts for about 6% each.

6.11 Support and collaboration:

S.no.	Repository	Collaboration with Computer Centre		Help from previous ICT infrastructure	
		Yes	No	Yes	No
1	LDL-DRTC		X	√	
2	ePrints@IISc		X	√	
3	NAL Repository	√		√	
4	DSpace@IITB		X	√	
5	EPrints@IITD		X		√
6	DSpace@INFLIBNET	√		√	
7	DSpace@IBSA	√		√	
8	ePrints@NCCR	√			√
9	DRS@nio	√		√	
10	DSpace@NITR	√		√	
11	OpenMED@NIC	√		√	
12	DSpace@TU		X	√	
13	MGU Theses Online		X	√	
14	DSpace@RRI	√		√	
15	ePrints@CSIR	√		√	
16	DSpace@ICRISAT	√		√	
17	EPrints@MDRF		X	√	
18	DSpace@CUSAT	√			√

Table 6.11 Collaboration with computer centre

Table 6.11 reveals that 11 IRs are collaborating with the IT department or computer centre of their institution for technical support while there is no such collaboration in 7 Indian IRs. It also suggests that 15 IRs were

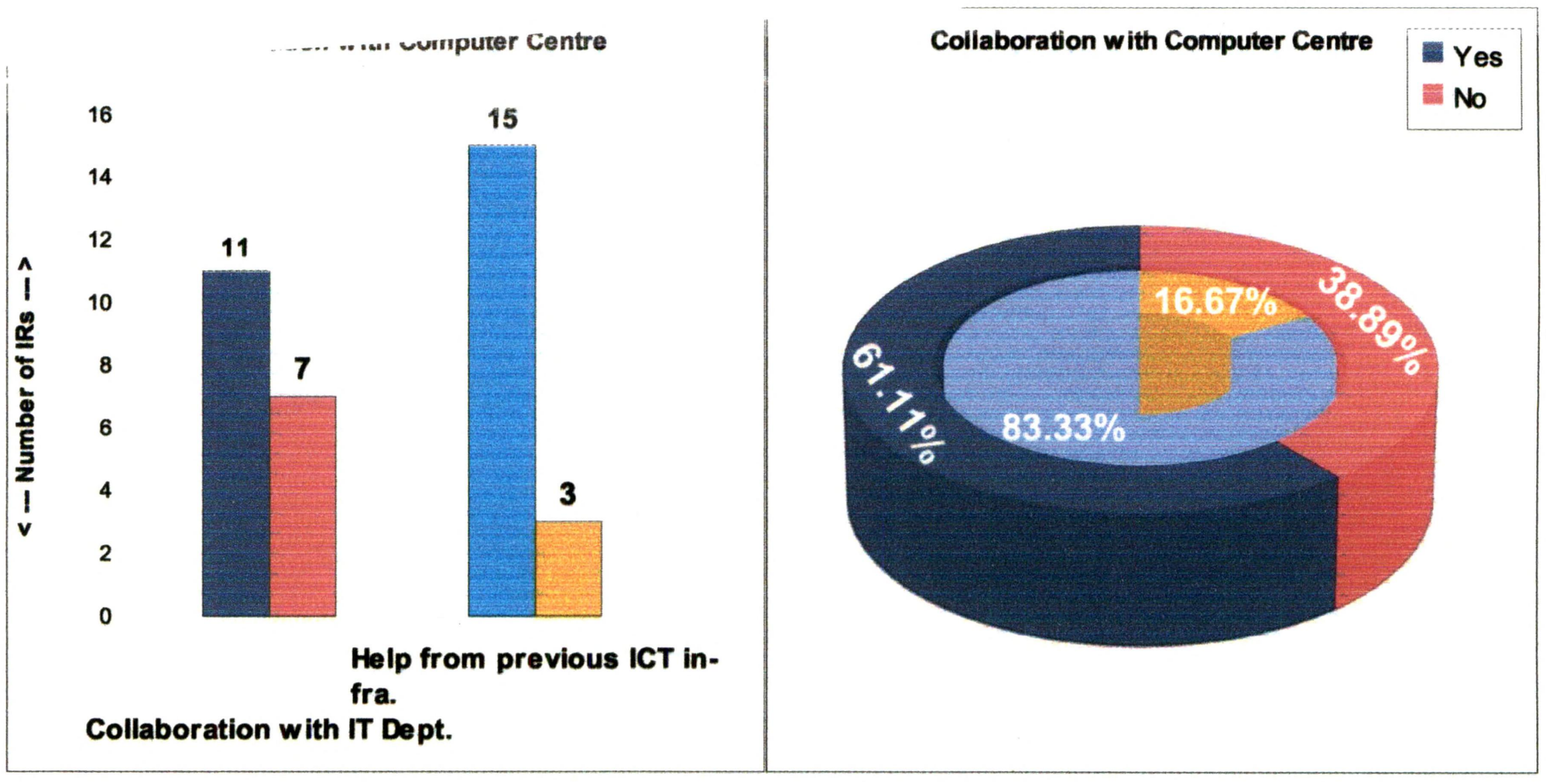


Figure 6.11 Collaboration with computer centre

Figure 6.11 above indicates that about 61% Indian IRs collaborate with the computer or IT centre for the IR related activities, whereas about 39% manage the IR tasks independently. It also indicates that about 83% Indian IRs were able to utilize the existing ICT infrastructure including hardware and network resources, whereas for the other 17% Indian IRs the ICT infrastructure was not adequate enough to lower the cost incurred in the establishment of the IR.

6.12 IR Budget:

S.no.	Repositories	Separate Budget	Need for additional funding
1	LDL-DRTC	X	X
2	ePrints@IISc	√	X
3	NAL Repository	X	X
4	DSpace@IITB	X	X

5	EPrints@IITD	√	X
6	DSpace@INFLIBNET	X	X
7	DSpace@IBSA	X	X
8	ePrints@NCCR	X	√
9	DRS@nio	X	X
10	DSpace@NITR	X	X
11	OpenMED@NIC	X	X
12	DSpace@TU	X	√
13	MGU Theses Online	√	X
14	DSpace@RRI	X	X
15	ePrints@CSIR	√	X
16	DSpace@ICRISAT	√	X
17	EPrints@MDRF	X	X
18	DSpace@CUSAT	X	√

Table 6.12 IR Budget

According to Table 6.12, 13 Indian IRs do not have a separate budget head for the maintenance and sustenance of the IR, while 5 IRs have mentioned that they do have a separate budgetary allocation earmarked for their IRs. It also indicates that only 3 IRs, viz., ePrints@NCCR, DSpace@TU and DSpace@CUSAT have mentioned that additional funding is required for the smooth functioning of the IRs, whereas additional funding is not required in case of 15 Indian IRs.

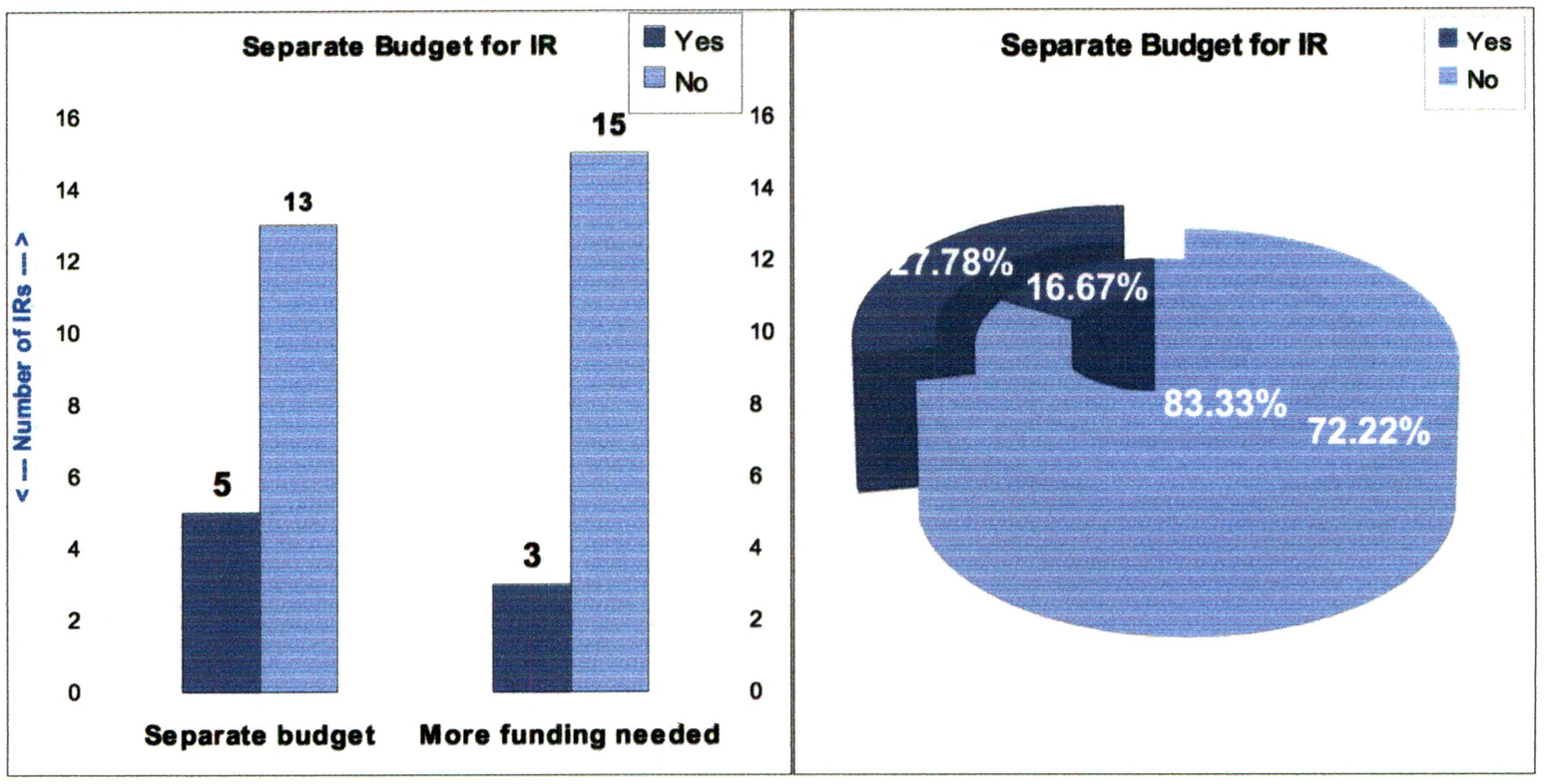


Figure 6.12 IR Budget

Figure 6.12 above indicates that about 72% Indian IRs do not have the dedicated budgetary allocation for the effective maintenance and sustenance of the IR, while about 28% do have separate budget for IR. It also reveals that about 83% IR are of the view that additional funding is not required for running the IR smoothly while about 17% Indian IRs need additional financial support.

6.13 IR cost:

S.no.	Repository	Help from existing ICT	Mode rate	Financial Burden	Utilized existing Resources	HR followed by S/W and H/W	S/W and H/W followed by HR
1	LDL-DRTC	√			√		
2	ePrints@IISc	√				√	
3	NAL Repository	√					√
4	DSpace@IITB	√				√	
5	EPrints@IITD		√				√
6	DSpace@INFLIBNET	√				√	
7	DSpace@IBSA		√				√
8	ePrints@NCCR		√				√

9	DRS@nio	√				√	
10	DSpace@NITR	√					√
11	OpenMED@NIC		√				√
12	DSpace@TU	√				√	
13	MGU Theses Online		√			√	
14	DSpace@RRI	√				√	
15	ePrints@CSIR	√				√	
16	DSpace@ICRISAT	√				√	
17	EPrints@MDRF	√					√
18	DSpace@CUSAT		√			√	

Table 6.13 Cost as a deterrent

As per Table 6.13, the cost involved in planning and building the repository was moderate in 6 Indian IRs. This table also reveals that existing ICT infrastructure helped the institutions in 9 Indian IRs as it saved money by lowering the cost. None of the IRs have mentioned that IR establishment was a financial burden. It presents data regarding the major cost factor as observed by the IRs. According to this table, HR followed by Software(S/W) and Hardware (H/W) was the major cost factor in 10 cases, while S/W and H/W followed by HR was considered as major cost factor in 7 IRs. LDL-DRTC utilized the resources already available to them and thus there was no major cost factor as such.

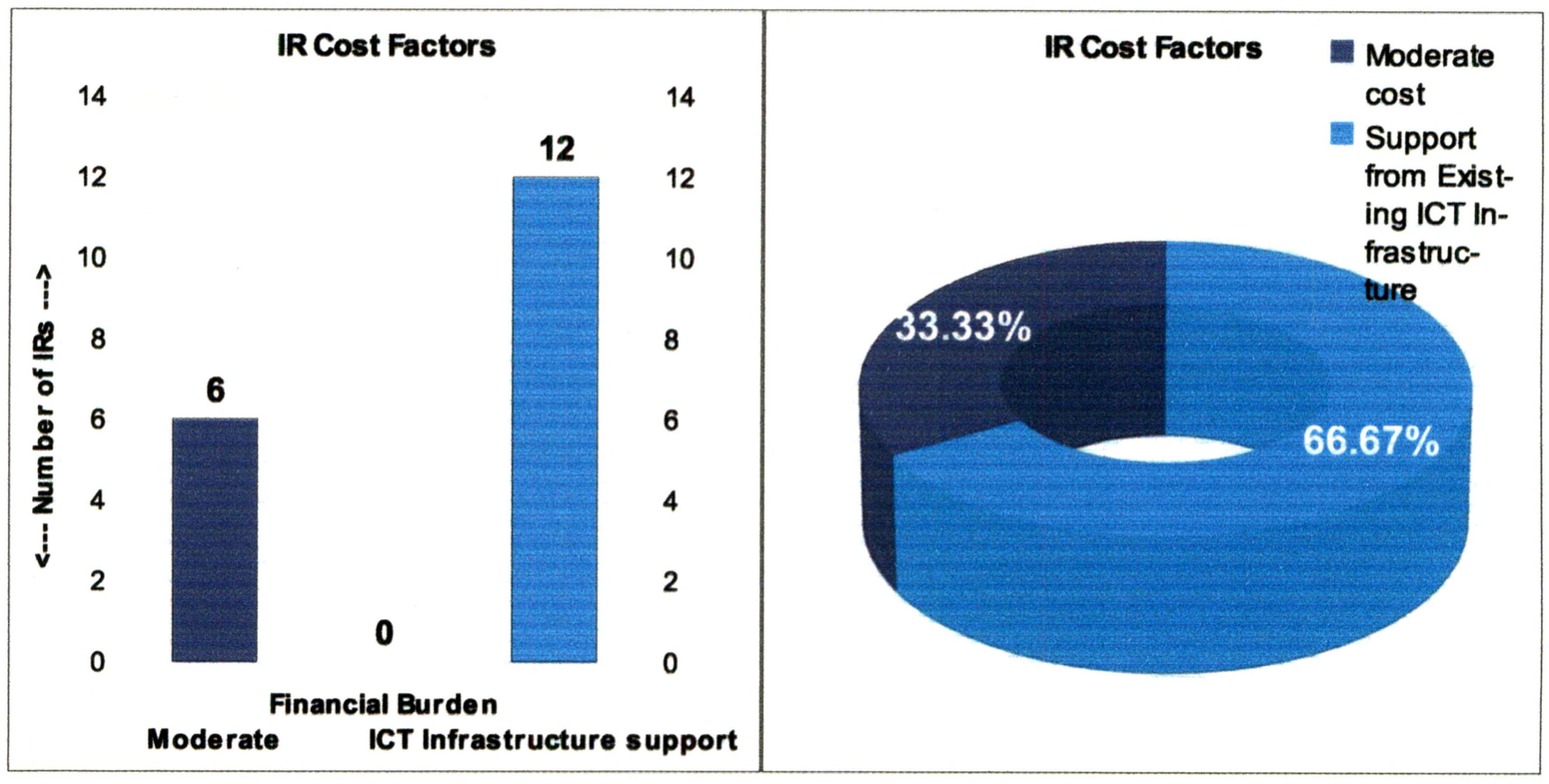


Figure 6.13a Cost incurred in establishing the IR

As per Figure 6.13a, the expense involved in the establishment of IR was moderate in about 33% Indian IRs, while 67% Indian IRs got support from the existing ICT infrastructure as it helped lowering the cost incurred in establishing the IR. But none of the IRs found the establishment work a financial burden.

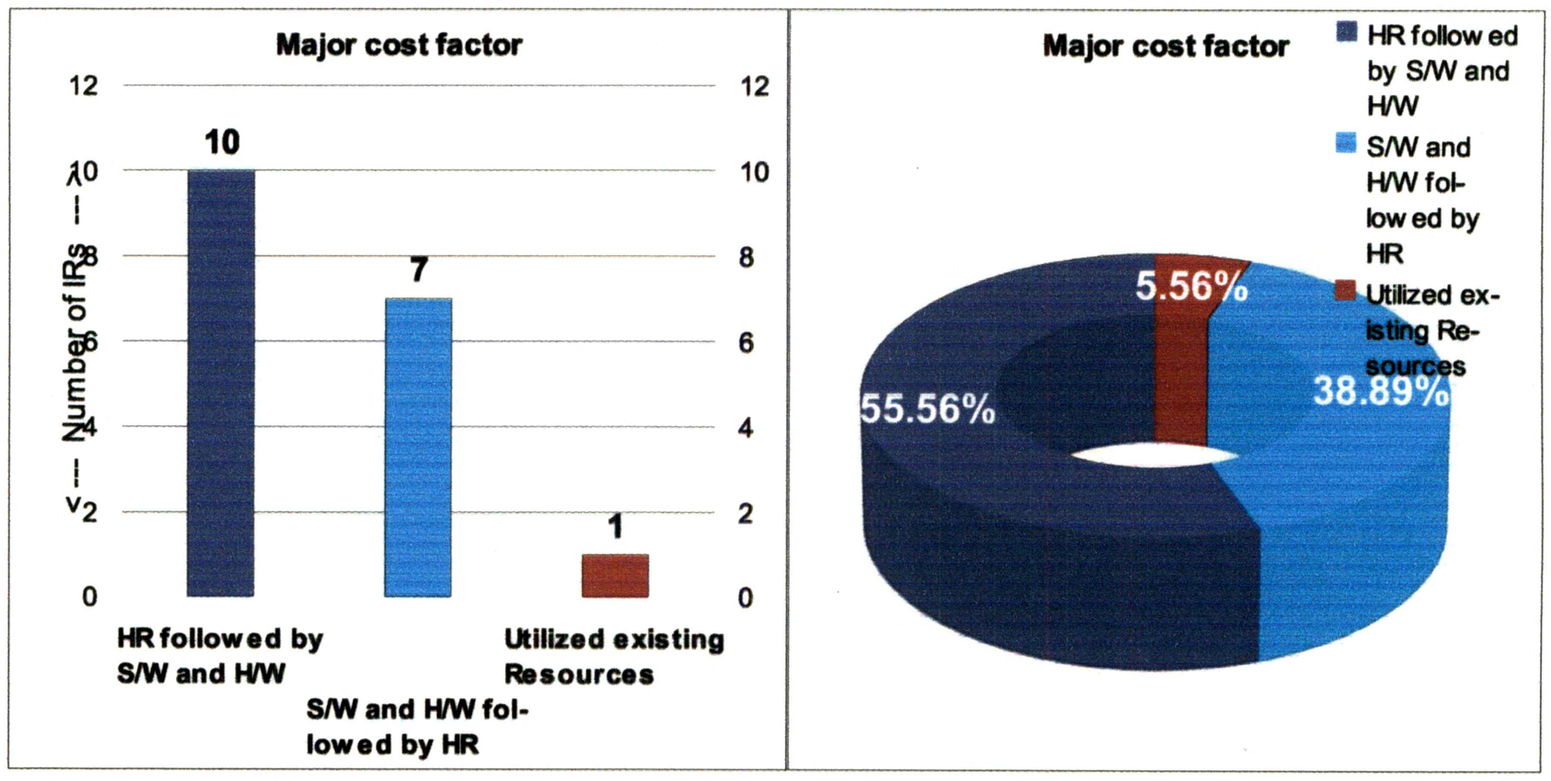


Figure 6.13b Major cost factor

According to Figure 6.13b, in about 56% Indian IRs, the major cost involved was on HR followed by software and hardware, whereas in about 39% Indian IRs, more investment was done in software and hardware than in HR. About 6% IR were able to utilize the existing institutional resources.

6.14 IR Human Resource:

S.no.	Repository	Presently associated	Additional HR needed	HR Positions well defined
1	LDL-DRTC	5	X	X
2	ePrints@IISc	2	X	X
3	NAL Repository	2	X	√
4	DSpace@IITB	5	X	√
5	EPrints@IITD	2	X	√
6	DSpace@INFLIBNET	2	X	X
7	DSpace@IBSA	1	X	X
8	ePrints@NCCR	1	X	√
9	DRS@nio	1	X	X
10	DSpace@NITR	1	X	√
11	OpenMED@NIC	2	X	√
12	DSpace@TU	5	X	√
13	MGU Theses Online	1	X	X
14	DSpace@RRI	2	X	X
15	ePrints@CSIR	3	X	√
16	DSpace@ICRISAT	2	X	√
17	EPrints@MDRF	2	X	√
18	DSpace@CUSAT	1	√ (3)	√

Table 6.14 Human Resource involved

Table 6.14 reveals that the staff strength in Indian IRs range from 1 to 5. There are 4 Indian IRs with 5 persons involved, whereas number of Indian IRs with only one person are five. As per this table, there are 8 Indian IRs with 2 persons and one IR, i.e., ePrints@CSIR, with 3 persons

working for it. It also reveals that 17 IRs surveyed are satisfied with the number of IR staff made available to them, while 1 IR, i.e., DSpace@CUSAT needs 3 more staff for its proper operations and services. Above table also suggests that the positions of IR Administrator and IR Managers are well defined in 11 IRs while it is not designated as such in 7 of the repositories.

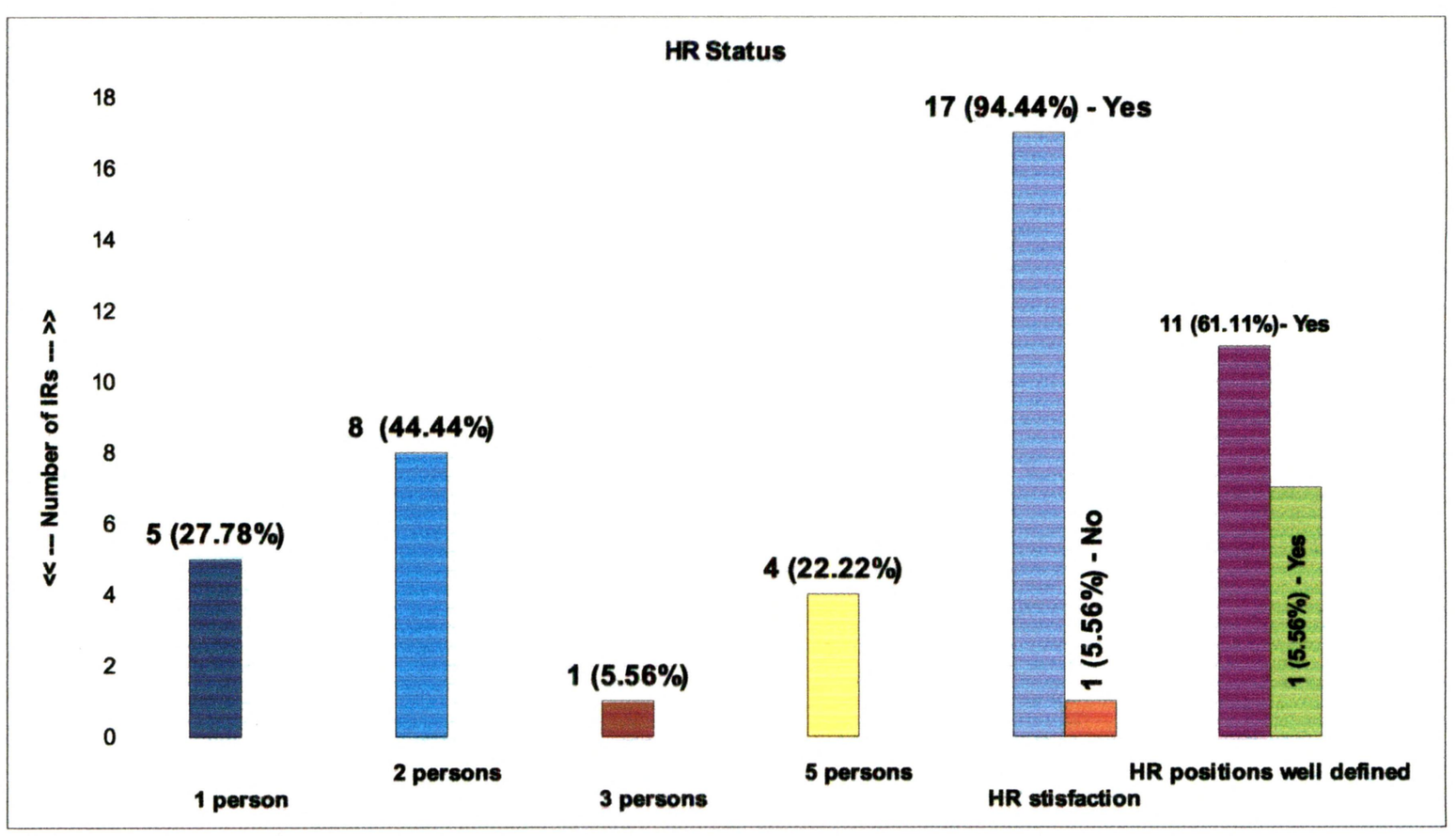


Figure 6.14 Human Resource Status

Figure 6.14 reveals that about 28% Indian repositories are running with only one staff member, 44% with two staff, 22% are having four staff and about 6% IRs are working are with 3 persons. It also suggests that 17 Indian repositories, i.e., about 94% are satisfied with the HR made available to manage their IRs and only 1 IR, namely DSpace@CUSAT, which constitutes 6% total IR surveyed, needs 3 additional staff members. The figure also indicates that about 61% IRs have got the HR designation well defined while in about 39% cases, the positions are not well defined.

6.15 Training for Staff, Users and Participation in workshops:

S.no.	Repository	Training for staff		Training for users		Participation is workshops	
		Yes	No	Yes	No	Yes	No
1	LDL-DRTC	√		√		√ (O)	X
2	ePrints@IISc		X	√		√	
3	NAL Repository	√		√		√	
4	DSpace@IITB	√		√		√	
5	EPrints@IITD	√		√		√	
6	DSpace@INFLIBNET	√		√		√ (O)	X
7	DSpace@IBSA	√		√		√	
8	ePrints@NCCR	√		√		√	
9	DRS@nio		X		X	√	
10	DSpace@NITR	√		√		√	
11	OpenMED@NIC		X	√		√	
12	DSpace@TU	√		√			X
13	MGU Theses Online	√			X	√	
14	DSpace@RRI	√		√		√	
15	ePrints@CSIR	√			X	√	
16	DSpace@ICRISAT		X	√		√	
17	EPrints@MDRF	√			X	√	
18	DSpace@CUSAT	√		√		√	

Table 6.15 HR training needs

Table 6.15 suggests that a need is felt for the training of the IR staff in 14 Indian IRs whereas 4 Indian IRs believe that IR staff can manage the IR effectively and efficiently without any formal training. It also indicates that 14 IRs feel that training is required by the IR users to enhance IR usage and user convenience. Four IRs namely, DRS@nio, MGU Theses Online, ePrints@CSIR and Eprints@MDRF, are of the opinion that training is not needed for their users.

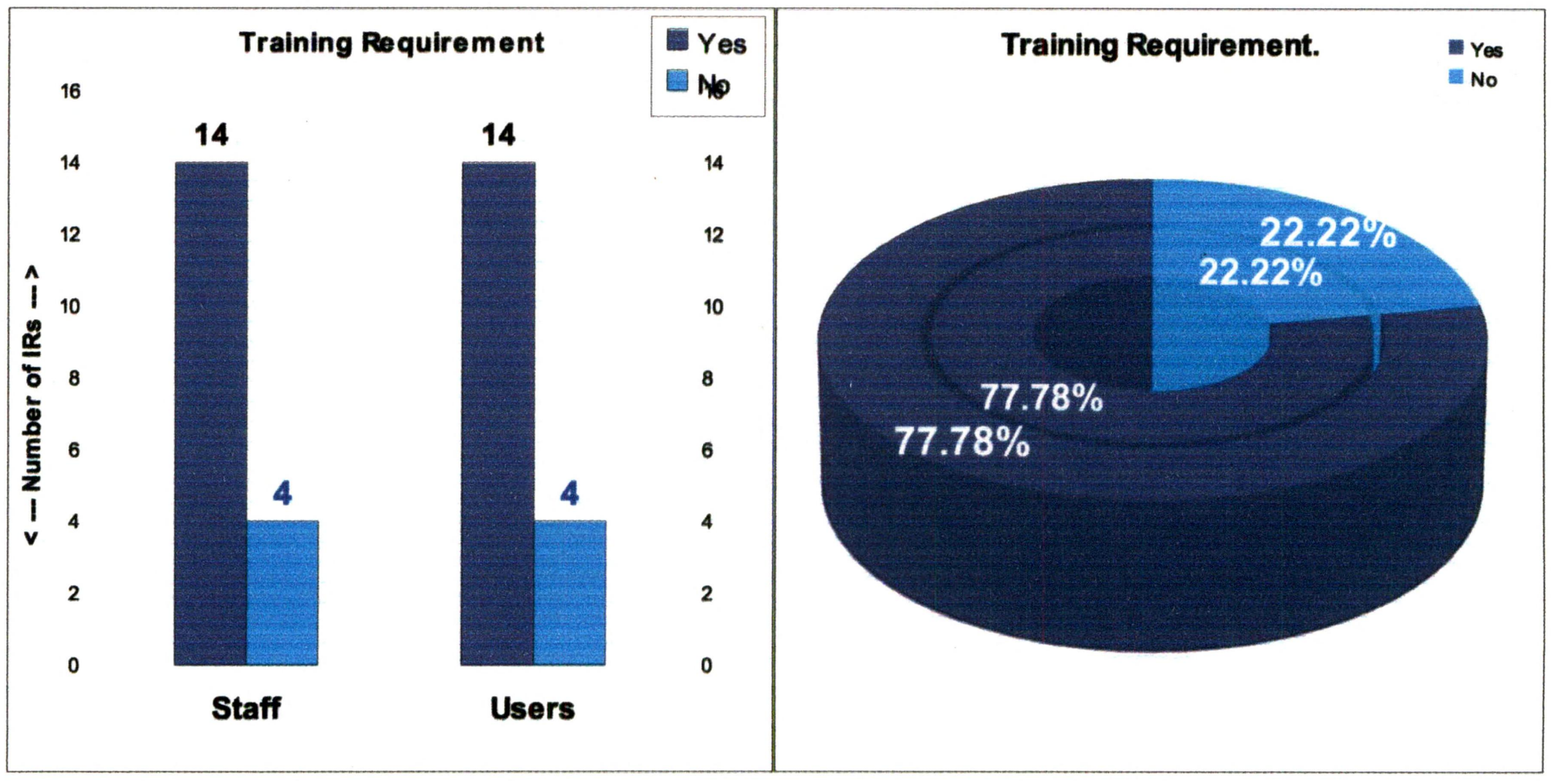


Figure 6.15a HR training needs

Figure 6.15a above indicates that about 78% Indian IRs are of the view that training is essential for the HR as well as for the users of the IRs. The IR Staff may require training for metadata creation and content uploading, etc. Training of users is essential for the effective use of IRs. The figure also reveals that 22% Indian IRs do not feel the need for such training either for the IR staff or for the IR users or content depositors.

Workshops play a major role in the growth and future development of repositories. The repositories were asked regarding their participation or organization of IR related workshops. According to Figure 6.15a, staff of 15 Indian IRs have participated in such workshops. Two IRs including LDL-DRTC and DSpace@INFLIBNET have conducted workshops covering various facets of IR establishment and maintenance.

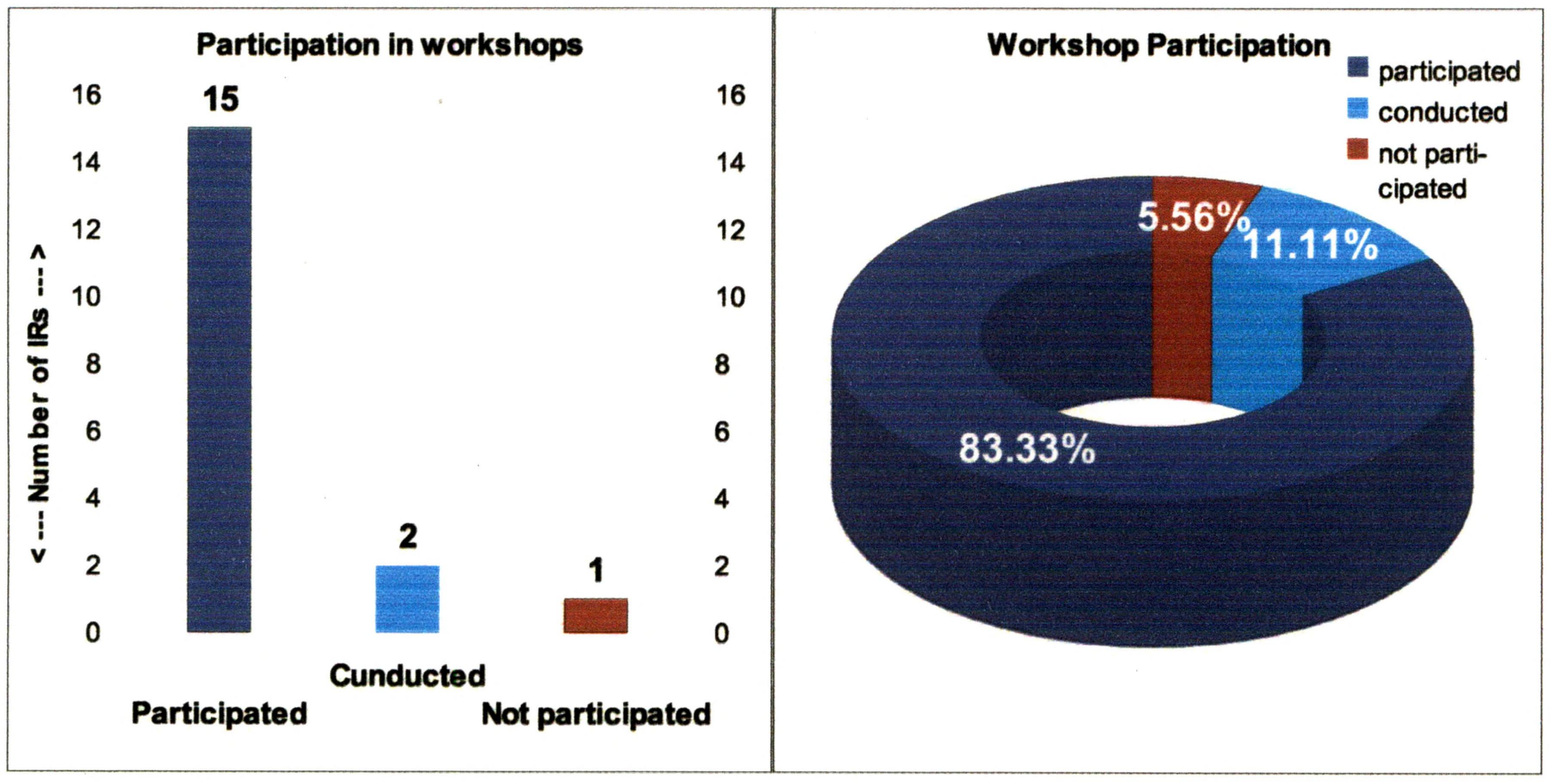


Figure 6.15b Participation in workshops

Figure 6.15b indicates that a majority of IR staff, i.e. 83.83% have attended workshops related with IR issues and new developments, whereas about 11% have imparted training themselves and about 6% IR staff have not attended any IR related workshop.

6.16 Registration with Open Archives Initiative (OAI):

S.no.	Repository	Registered with OAI	
		Yes	No
1	LDL-DRTC	√	
2	ePrints@IISc	√	
3	NAL Repository	√	
4	DSpace@IITB	√	
5	EPrints@IITD	√	
6	DSpace@INFLIBNET	√	
7	DSpace@IBSA	√	
8	ePrints@NCCR		√
9	DRS@nio	√	
10	DSpace@NITR		√
11	OpenMED@NIC	√	

[redacted]

12	DSpace@TU	√	
13	MGU Theses Online		√
14	DSpace@RRI	√	
15	ePrints@CSIR	√	
16	DSpace@ICRISAT	√	
17	EPrints@MDRF	√	√
18	DSpace@CUSAT	√	√

Table 6.16 Registered with the Open Archives Initiative (OAI)

As per Table 6.16 there are 13 Indian IRs which have registered with Open Archive Initiative (OAI) while 5 others have yet not registered themselves with OAI.

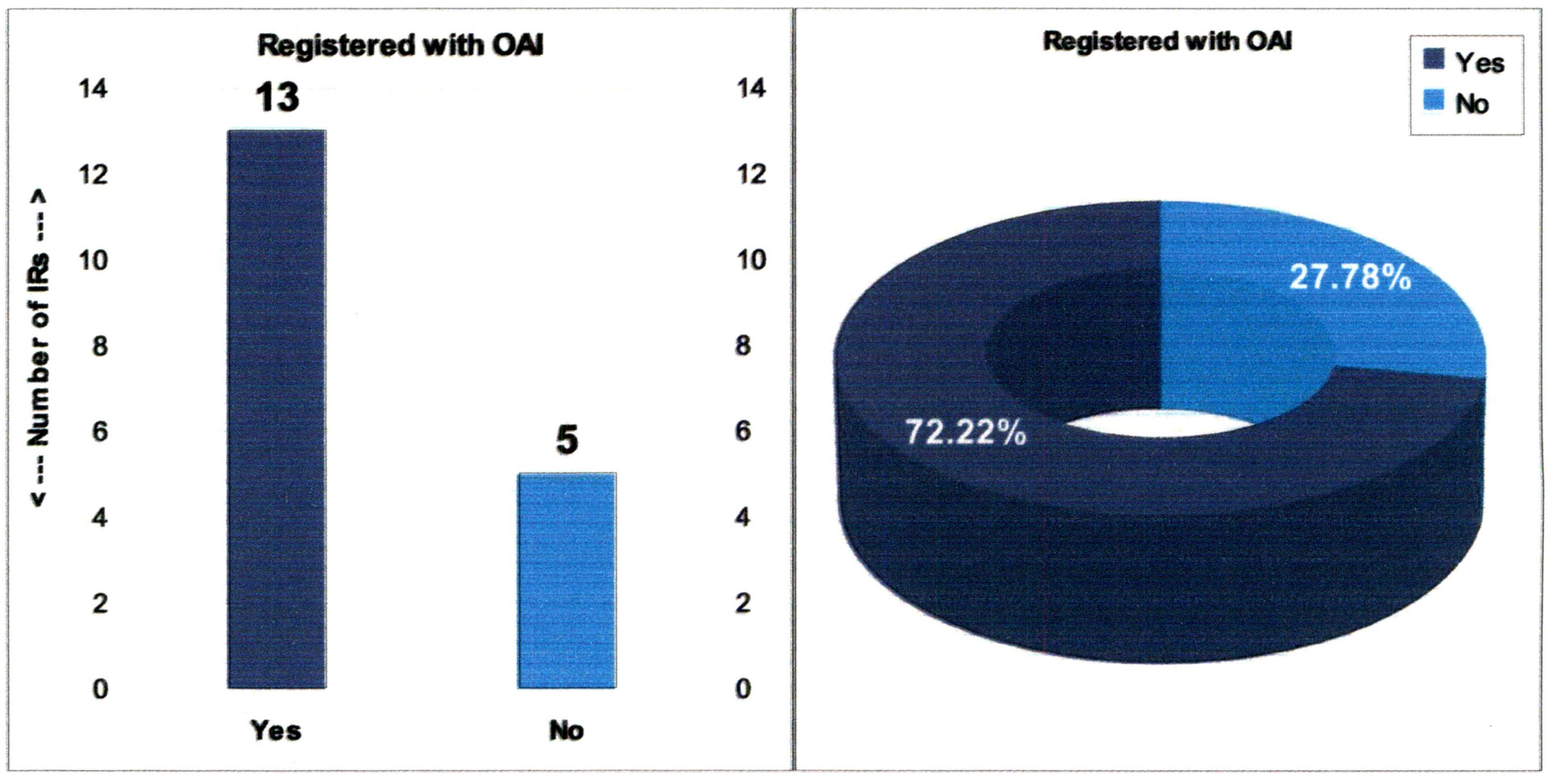


Figure 6.16 Registered with the Open Archives Initiative (OAI)

Figure 6.16 above suggests that about 72% IRs are registered with OAI (Open Archives Initiative) and the remaining about 28% IRs are not registered with OAI. This means that about 72% IRs are compliant with the OAI-PMH (protocol for metadata harvesting) whereas 28% IRs do not adhere to it.

[redacted]

6.17 IR customization, Subject headings, Usage statistics and user guide:

S.no.	Repository	Customization		Subject Heading	Download statistics	User guide
1	LDL-DRTC	Done	Difficulty level	Yes	√	√
2	ePrints@IISc	√	Easy		√	√
3	NAL Repository	√	Easy		√	X
4	DSpace@IITB	√	Easy		√	√
5	EPrints@IITD	√	Easy		X	√
6	DSpace@INFLIBNET	√	Very Easy		√	√
7	DSpace@IBSA	√	Easy		X	X
8	ePrints@NCCR	√	NR		X	X
9	DRS@nio	√	Easy		√	√
10	DSpace@NITR	√	Easy		√	√
11	OpenMED@NIC	√	Easy		X	√
12	DSpace@TU	√	Difficult	√ (MeSH)	√	√
13	MGU Theses Online	√	Easy		√	√
14	DSpace@RRI	√	Easy		√	√
15	ePrints@CSIR	√	Easy		X	√
16	DSpace@ICRISAT	√	Easy	√ (agrovoc)	√	X
17	EPrints@MDRF	√	Very Easy		√	√
18	DSpace@CUSAT	√	Easy		√	√

Table 6.17 IR customization

Table 6.17 depicts that customization of the IR interface and other components were done in Indian IRs. According to this table, the customization process was easy for 13 Indian IRs, it was very easy for 2 IRs and difficult or 2 IRs. As per this table, browsing by subjects is available in 14 IRs, whereas this service is not available in 4 IRs. It also reveals that only 3 Indian IRs are using standard tool for assigning subject headings to the content submitted in the IRs for vocabulary

control, whereas 15 IRs are not using any such device. The Indian IRs which are using vocabulary control tools including OpenMED@NIC, DSpace@ICRISAT and DSpace@CUSAT.

Usage statistics includes the download statistics of the IR contents. As per Table 6.17, IR usage statistics is maintained in 13 IRs, whereas it is not maintained in 5 IRs. The table also suggests that provision of user documentation or manual for user information and convenience is available in 14 Indian IRs, while 4 IRs, i.e., NAL Repository, DSpace@IBSA, ePrints@NCCR and DSpace@ICRISAT do not provide any user guide.

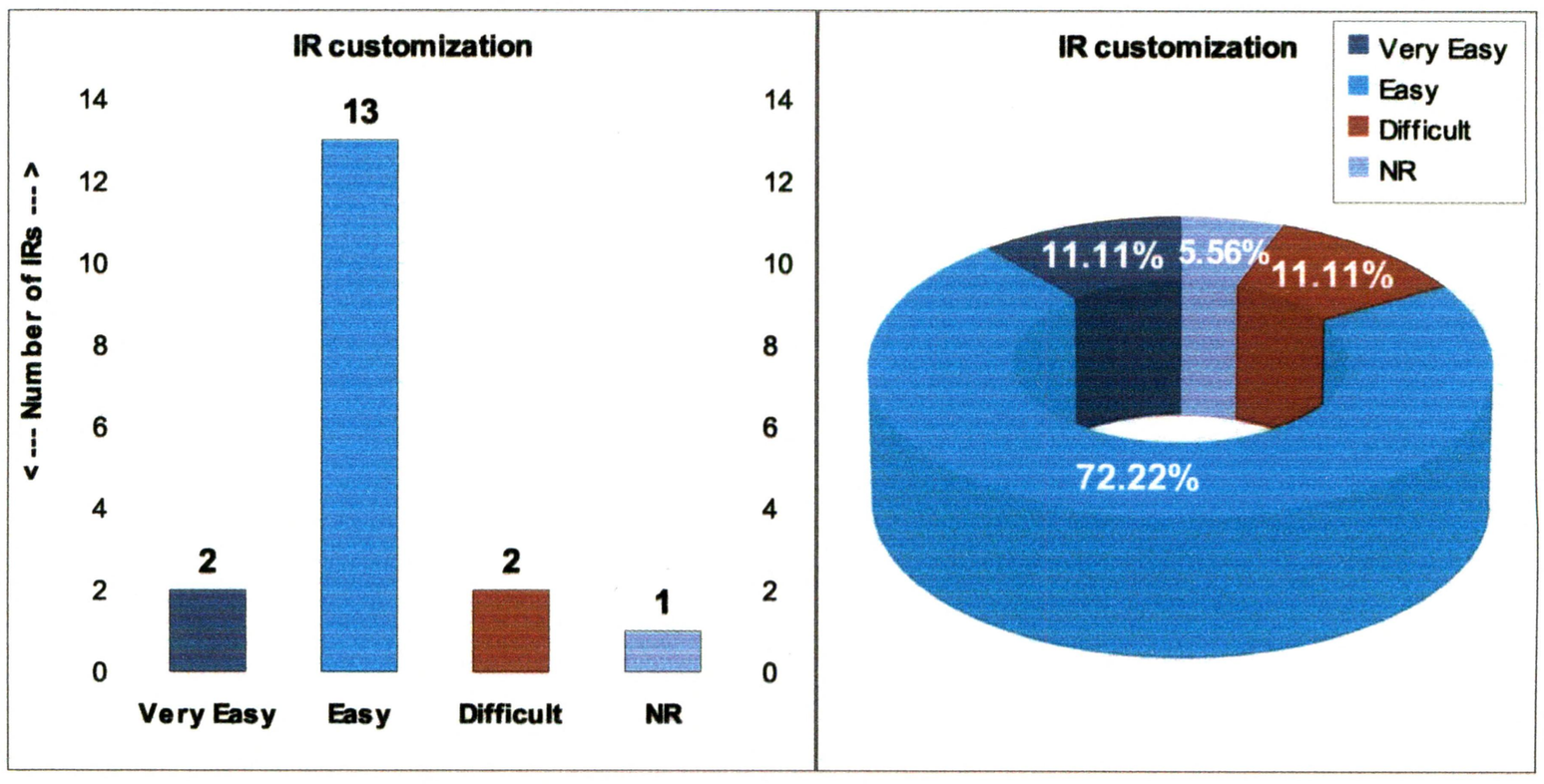


Figure 6.17a IR customization

As per Figure 6.17a, all IRs have done some kind of customization activity of the IR interface. It also reveals that about 72% IRs found the customization process as an easy task, 11% found it very easy. The percentage of repositories finding the customization process difficult is only 11%.

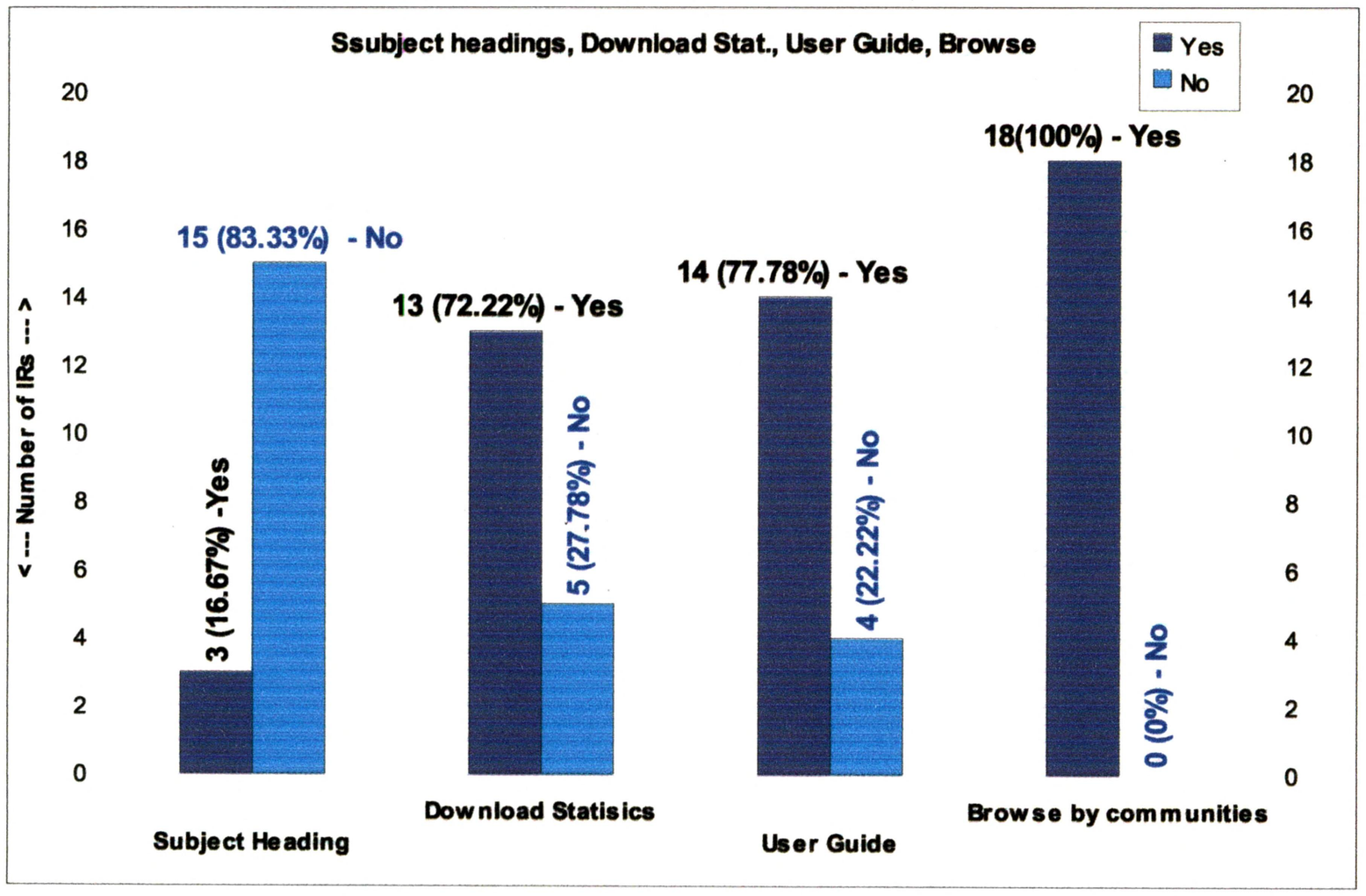


Figure 6.17b Vocabulary control tool

According to Figure 6.17b above, about 83% IRs don't use any standardised subject heading tool for the vocabulary control while only about 17% IRs use subject heading tool for vocabulary control. OpenMED@NIC has implemented MeSH (Medical Subject Heading) and DSpace@ICRISAT is using AGROVAC as a subject heading tool. It also indicates that in all the Indian IRs, i.e., 100% users can browse the contents by communities or subjects

The figure also reveals that about 78% IRs maintain the IR usage/download statistics, while about 22% do not maintain the same. It also shows that about 78% IRs provide documentation or user guide for the convenience of the user community so that they are aware of the rules, provisions and services of the IRs for maximum use.

6.18 IR workflow:

S.no.	Response	Repositories	Nos.
1	User => Administrator => IR	LDL-DRTC, NAL Repository, DRS@nio, DSpace@NITR, OpenMED@NIC, DSpace@RRI, DSpace@ICRISAT, EPrints@MDRF	8
2	User => Administrator => Reviewer => Administrator => IR	ePrints@IISc, DSpace@IITB, Eprints@IITD, DSpace@TU, MGU Theses Online, DSpace@CUSAT	6
3	User => Reviewer => IR Admin	DSpace@INFLIBNET	1
3	User => IR	DSpace@IBSA, ePrints@NCCR	2
4	User(sends soft copy)=>Reviewer(review + deposit).	ePrints@CSIR	1

Table 6.18 IR workflow model

Table 6.18 provides data regarding the IR workflow model. The table revelas that 8 IRs follow User => Administrator => IR, User => Administrator => Reviewer => Administrator => IR is followed in 6 IRs whereas User => Reviewer => IR Admin, User => IR is followed at DSpace@INFLIBNET, IRs, DSpace@IBSA and ePrints@NCCR follow the workflow while User(sends soft copy)=>Reviewer(review + deposit) is being practised at ePrints@CSIR. ePrints@CSIR has also mentioned that it is very complex job for the reviewer to review and put theses under suitable subject category.

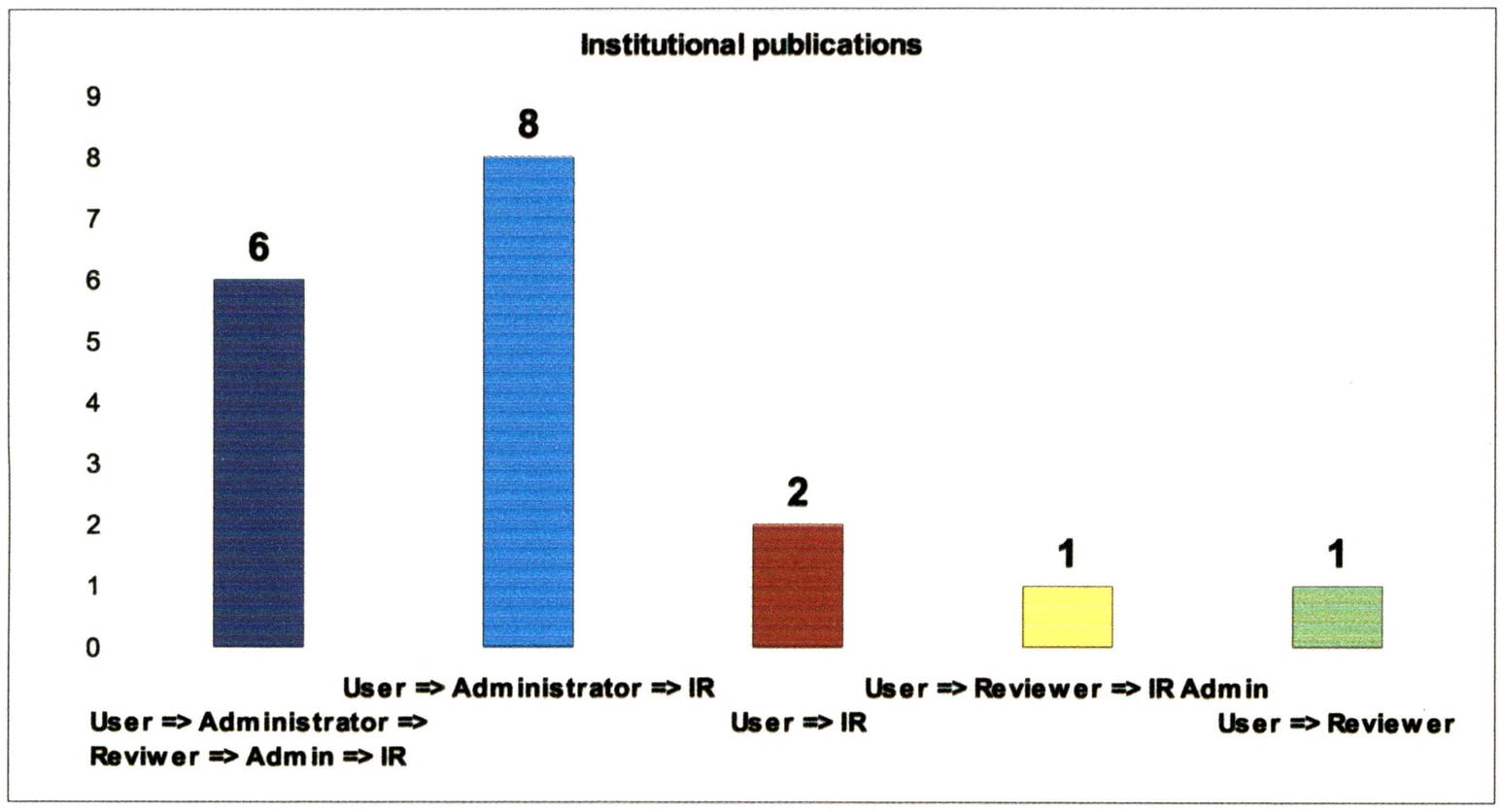


Figure 6.18a IR workflow model

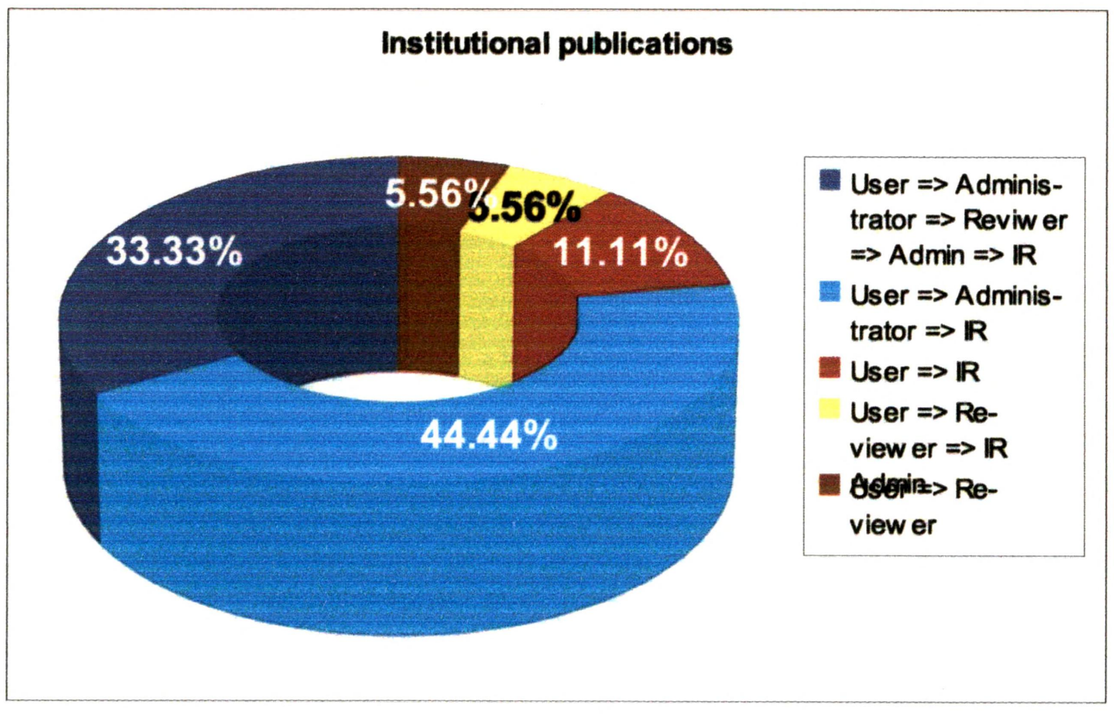


Figure 6.18b IR workflow model

Figure 6.18(a-b) suggests about 44% IRs follow the "User => Administrator => IR" work-flow , whereas 33% follow "User =>Administrator => Reviewer => Administrator => IR" method, 11% have adopted "User => IR" and about 6% IRs have implemented the "User => Reviewer => IR => Admin" and "User => Reviewer" model each.

6.19 Peer-reviewing:

S.no.	Repository	Peer-reviewing	
		Optional	Mandatory
1	LDL-DRTC	√	
2	ePrints@IISc		√
3	NAL Repository	√	
4	DSpace@IITB		√
5	EPrints@IITD	√	
6	DSpace@INFLIBNET	√	
7	DSpace@IBSA	√	
8	ePrints@NCCR	√	
9	DRS@nio		√
10	DSpace@NITR	√	
11	OpenMED@NIC	√	
12	DSpace@TU		√
13	MGU Theses Online		√
14	DSpace@RRI	√	
15	ePrints@CSIR	√	
16	DSpace@ICRISAT		√
17	EPrints@MDRF	√	
18	DSpace@CUSAT		√

Table 6.19 Peer-reviewing

According to Table 6.19, peer-reviewing is optional in 7 Indian IRs, while it is mandatory in the rest of 11 IRs.

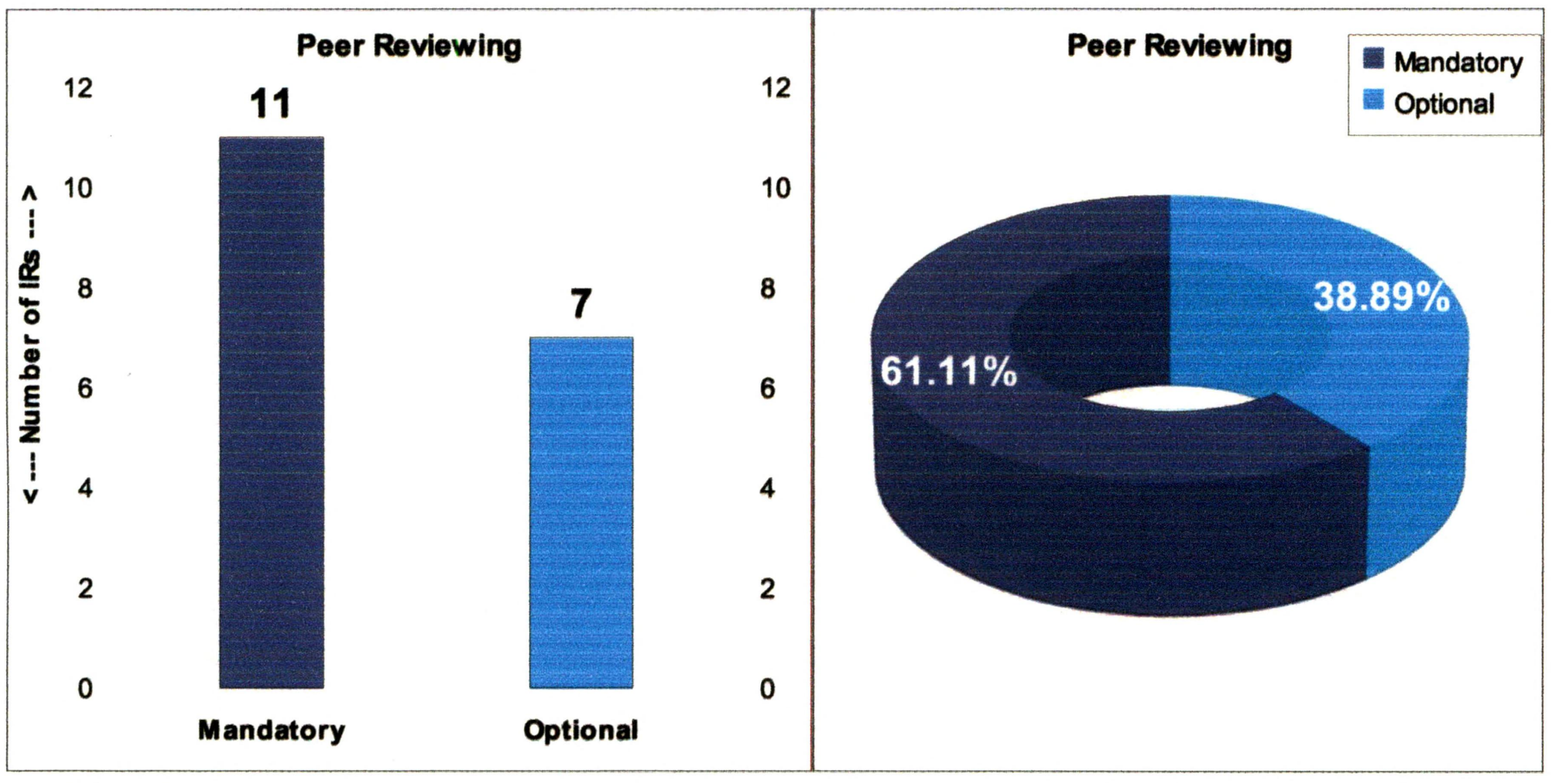


Figure 6.19 Peer-reviewing

Figure 6.19 above indicates that about 61% Indian IRs have mandatory peer reviewing policy, whereas in about 39% IRs peer-reviewing is optional.

6.20 Eligible content depositors:

S.no.	Repository	Eligible content contributors	Actual contributors	Major difference
1	LDL-DRTC	100-500	100-500	
2	ePrints@IISc	>1000	100-500	√
3	NAL Repository	<50	100-500	
4	DSpace@IITB	100-500	100-500	
5	EPrints@IITD	100-500	100-500	
6	DSpace@INFLIBNET	>1000	<100	√
7	DSpace@IBSA	<50	<50	
8	ePrints@NCCR	50-100	<100	
9	DRS@nio	100-500	<100	
10	DSpace@NITR	>1000	<100	√
11	OpenMED@NIC	>1000	>500	√
12	DSpace@TU	100-500	100-500	
13	MGU Theses Online	>1000	-	

14	DSpace@RRI	50-100	<100	
15	ePrints@CSIR	500-1000	>500	
16	DSpace@ICRISAT	100-500	100-500	
17	EPrints@MDRF	100-500	100-500	
18	DSpace@CUSAT	100-500	<100	

Table 6.20 Eligible content contributors

It is clear from Table 6.20 that not all the IR users who are eligible have actually registered for the IR services. There are four repositories, viz., ePrints@IISc, DSpace@INFLIBNET, DSpace@NITR and OpenMED@NIC where we find significant difference between the eligible contributors and actual contributors. In the remaining 14 IRs, the difference is not much.

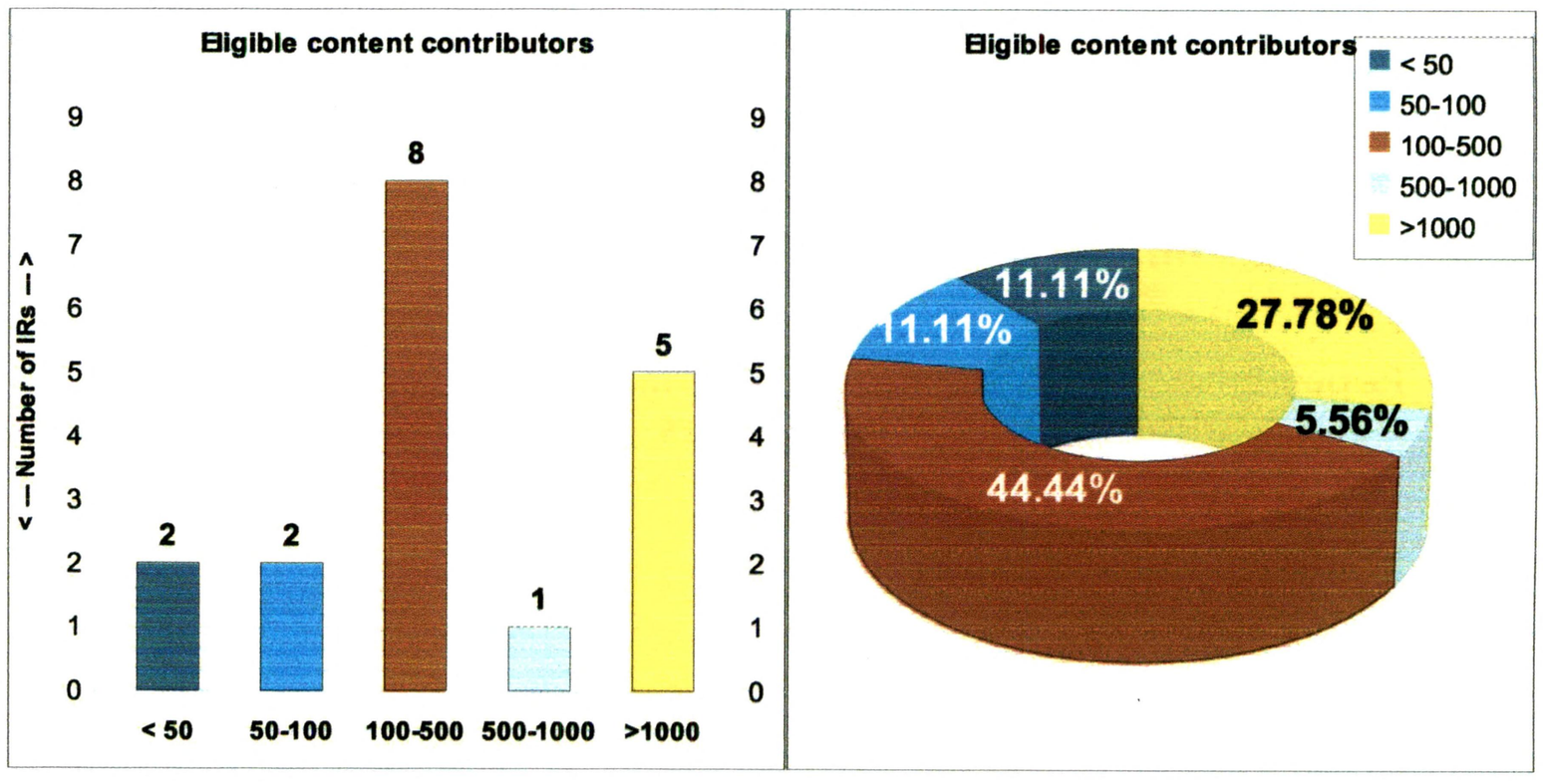


Figure 6.20 Eligible content contributors

Figure 6.20 above indicates that about 44% Indian IRs have 100 to 500 eligible content contributors, while about 28% IRs have more that 1000 eligible depositors. The percentage of IRs with less than 50 contributors as well as 50 to 100 contributors is 11% each. The figure also reveals that about 6% repositories have eligible content contributors ranging from 500 to 1000.

6.21 Archiving, Eligibility, Document deposit:

S. no.	Repository	Metadata + Full text/Metadata only	Self-archiving	Institutional members only	Voluntary/ Mandatory	Centralized /Decent.
1	LDL-DRTC	Met. + Full text	√		Voluntary	De-cent.
2	ePrints@IISc	do	√	√	do	do
3	NAL Repository	do	√	√	do	do
4	DSpace@IITB	do	√	√	do	Cent.
5	EPrints@IITD	do	√	√	do	De-cent.
6	DSpace@INFLIBNET	do			do	do
7	DSpace@IBSA	do	√	√	do	Cent.
8	ePrints@NCCR	do	√		do	De-cent.
9	DRS@nio	do	√	√	do	Cent.
10	DSpace@NITR	do		√	Mandatory	De-cent.
11	OpenMED@NIC	do	√		Voluntary	do
12	DSpace@TU	do	√	√	do	Cent.
13	MGU Theses Online	do		√	Mandatory	Cent.
14	DSpace@RRI	do	√	√	Voluntary	De-cent.
15	ePrints@CSIR	Metadata only	√		do	Cent.
16	DSpace@ICRISAT	Met. + Full text	√	√	Mandatory	do
17	EPrints@MDRF	do	√	√	do	do
18	DSpace@CUSAT	do	√	√	Voluntary	do

Table 6.21 Item deposit: full-text vs metadata

Table 6.21 reveals that 17 repositories provide full text of the scholarly works along with the metadata. ePrints@CSIR is the only repository that has mentioned that users can access only the metadata of the documents. It also suggests that 15 IRs surveyed follow self-archiving for document submission while mediated deposit is practised in 3 Indian repositories. It also contains data regarding the eligible document submitters according

to which in 5 Indian IRs the submission is open to all, whereas in 13 Indian IRs it is restricted to the institutional members only. The table indicates that the document deposit is voluntary in 14 IRs while it is mandatory in 4 IRs namely, DSpace@NITR, MGU Theses Online, DSpace@ICRISAT and Eprints@MDRF.

Repositories were also asked to comment upon the document submission process being followed at their institution. As per Table 6.21, document submission is centralized in 9 IRs whereas it is decentralized in other 9 IRs.

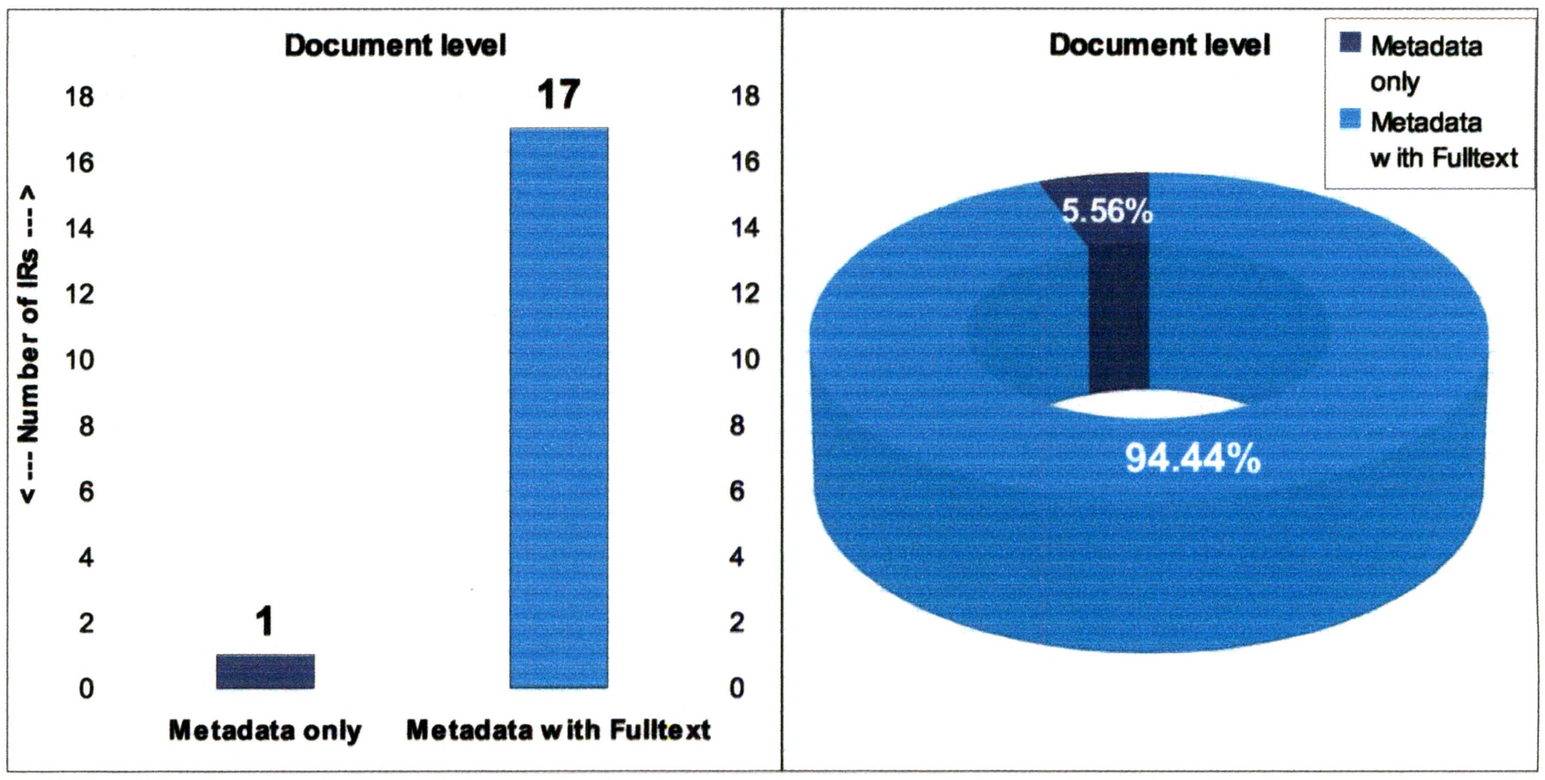


Figure 6.21a Full-text vs metadata submission.

Figure 6.21a above indicates that users in over 94% Indian IRs have deposited the metadata along with the full text of the documents, whereas in only about 6% IRs, they have preferred to submit metadata only and not the full text.

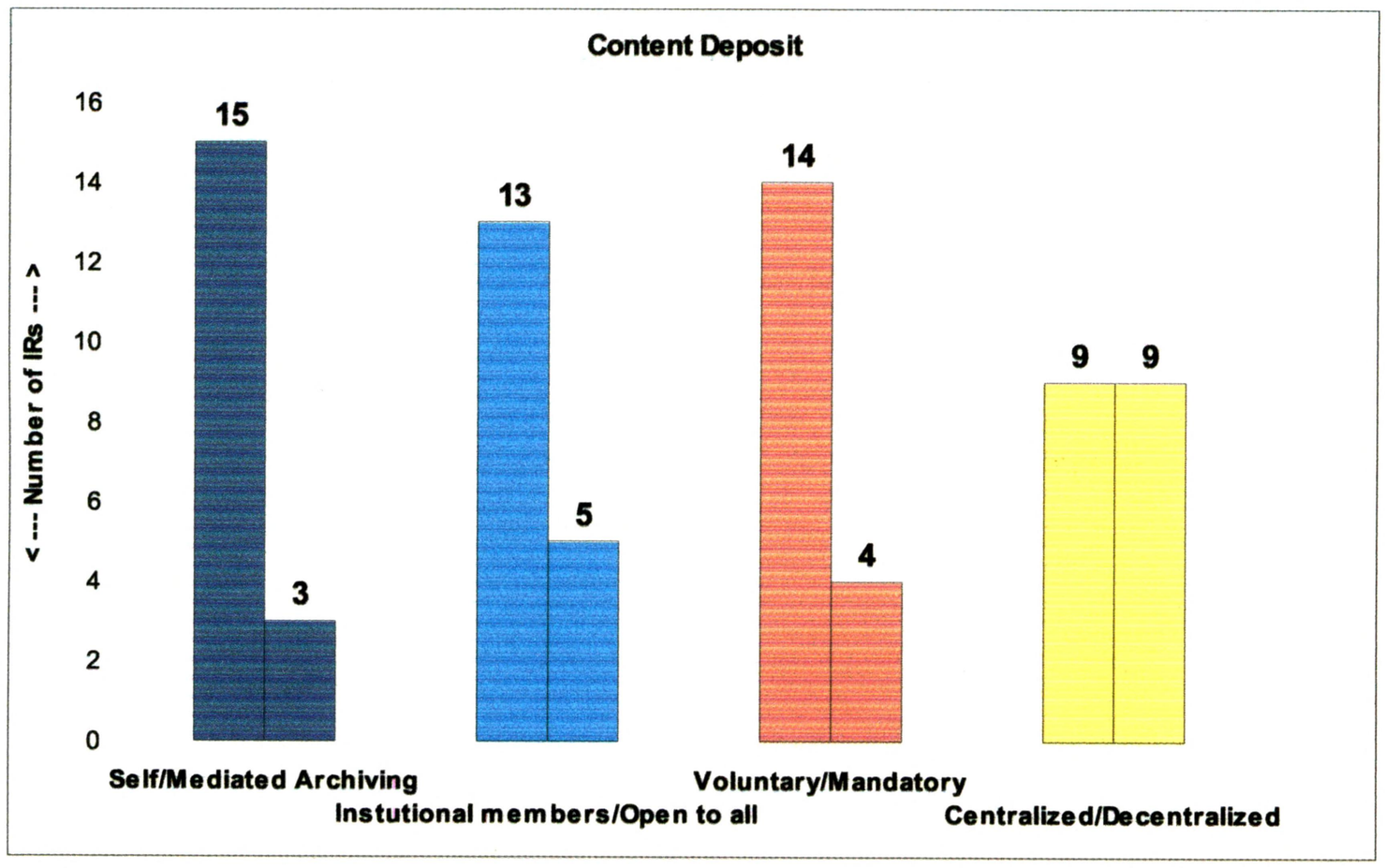


Figure 6.21b Archiving Facets

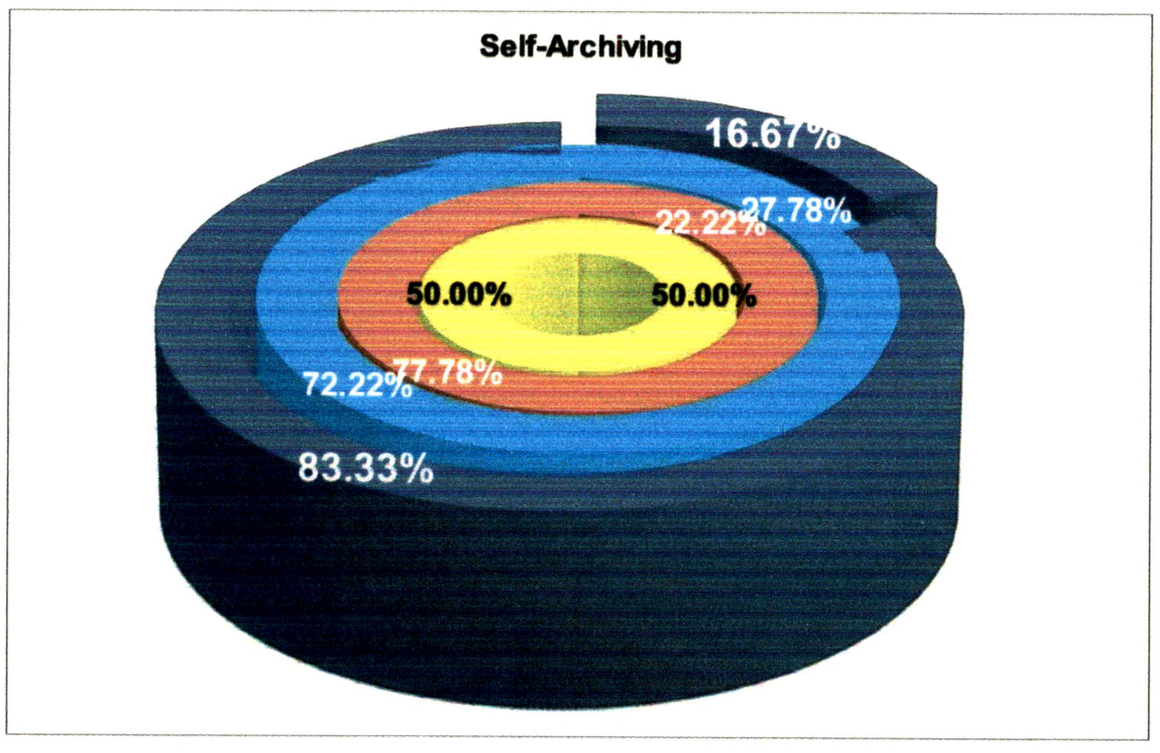


Figure 6.21c Archiving Facets

Figure 6.21(b-c) above reveals that a majority of the Indian IRs, i.e. about 83%, have adopted the practice of self-archiving while about 17% IRs are following the mediated deposit. The figure also shows that in about 72% Indian IRs, only institutional members can submit their works whereas in about 28% IRs the submission of scholarly works is opened

for all. It indicates that in about 78% Indian IRs, the submission of scholarly works is voluntary whereas in 22% cases only it is mandatory for the scholars to deposit their works. Above figure also shows that the content submission is centralized in 50% IRs surveyed while de-centralized in the remaining 50%.

6.22 Dublin Core (DC) for metadata creation:

S. no.	Repository	Dublin Core	Metadata creation	Metadata reuse policy
1	LDL-DRTC	X	Item depositors	
2	ePrints@IISc	X	Created by depositors, verified by IR admin.	√
3	NAL Repository	√	do	
4	DSpace@IITB	√	IR administrator/ HR associated with IR	
5	EPrints@IITD	√	Created by depositors, verified by IR admin.	
6	DSpace@INFLIBNET	√	do	
7	DSpace@IBSA	√	Item depositors	
8	ePrints@NCCR	X	Created by depositors, verified by IR admin.	
9	DRS@nio	X	IR administrator/ HR associated with IR	
10	DSpace@NITR	√	do	
11	OpenMED@NIC	√	Created by depositors, verified by IR admin.	√
12	DSpace@TU	X	Item depositors	
13	MGU Theses Online	√	IR administrator/ HR associated with IR	
14	DSpace@RRI	√	Created by depositors, verified by IR admin.	
15	ePrints@CSIR	X	IR administrator/ HR associated with IR	
16	DSpace@ICRISAT	X	do	√
17	EPrints@MDRF	X	Created by depositors,	

[redacted]

			verified by IR admin.	
18	DSpace@CUSAT	√	IR administrator/ HR associated with IR	

Table 6.22 Use of unqualified Dublin Core (DC) for metadata creation

According to Table 6.22, unqualified Dublin Core is being used for metadata creation in 10 Indian IRs while 8 IRs do not use Dublin-core as metadata standard. The table suggests that the metadata essential for information retrieval from the IRs, is being created by depositors then verified by repository administrator in 8 IRs whereas in 7 IRs it is responsibility of the IR staff including IR administrator. In 3 Indian IRs, metadata is created by the content depositors.

It also contains data regarding metadata reuse policy of the Indian repositories. According to this table 15 Indian IRs do not have such policy whereas metadata reuse policy exists in remaining 3 IRs.

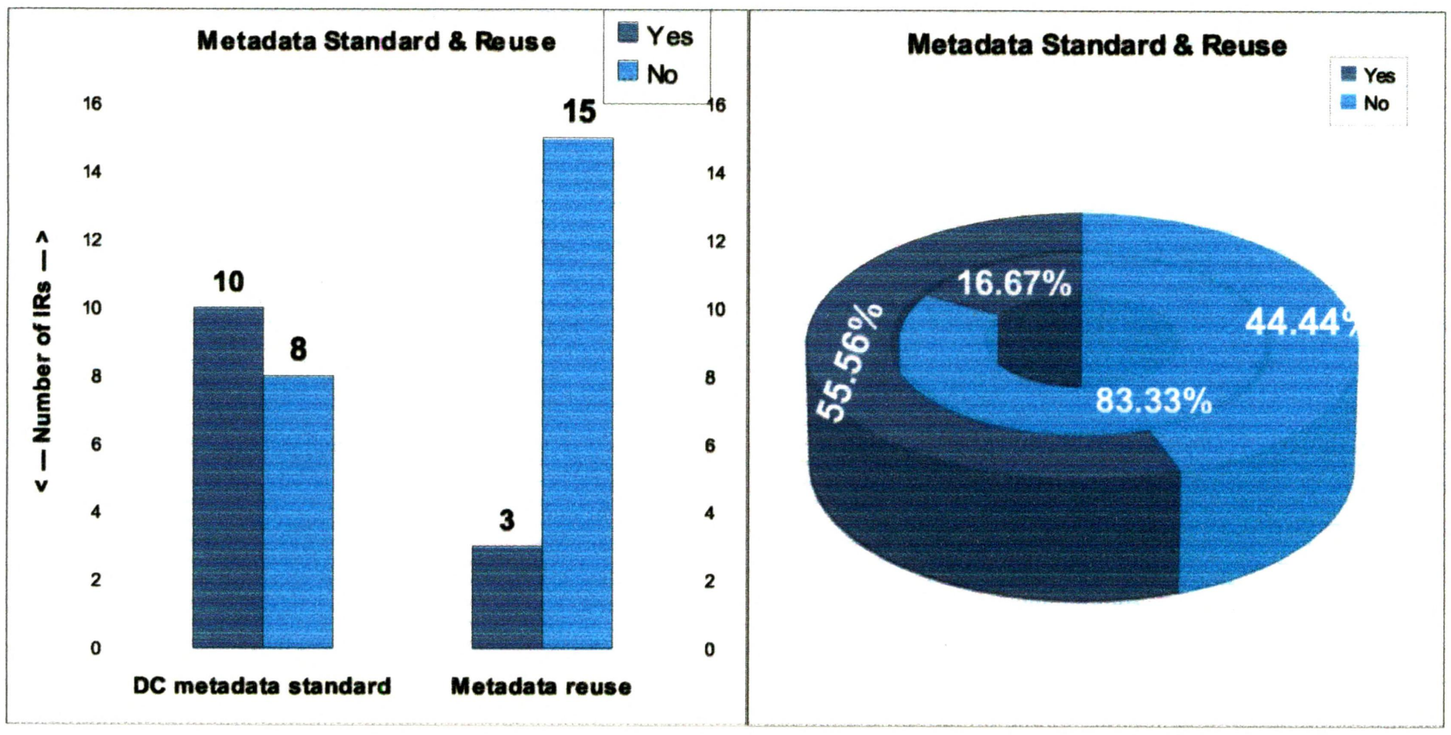


Figure 6.22a Use of unqualified Dublin Core (DC) for metadata creation

As per Figure 6.22a above, approximately 56% Indian IRs use the unqualified/simple Dublin-core for metadata creations whereas about 44% IRs uses some other metadata schema. The above figure also reveals

[redacted]

that 83% IRs do not have explicit metadata reuse policy to make fuller utilization of the resources whereas about 17% have well defined metadata reuse policy.

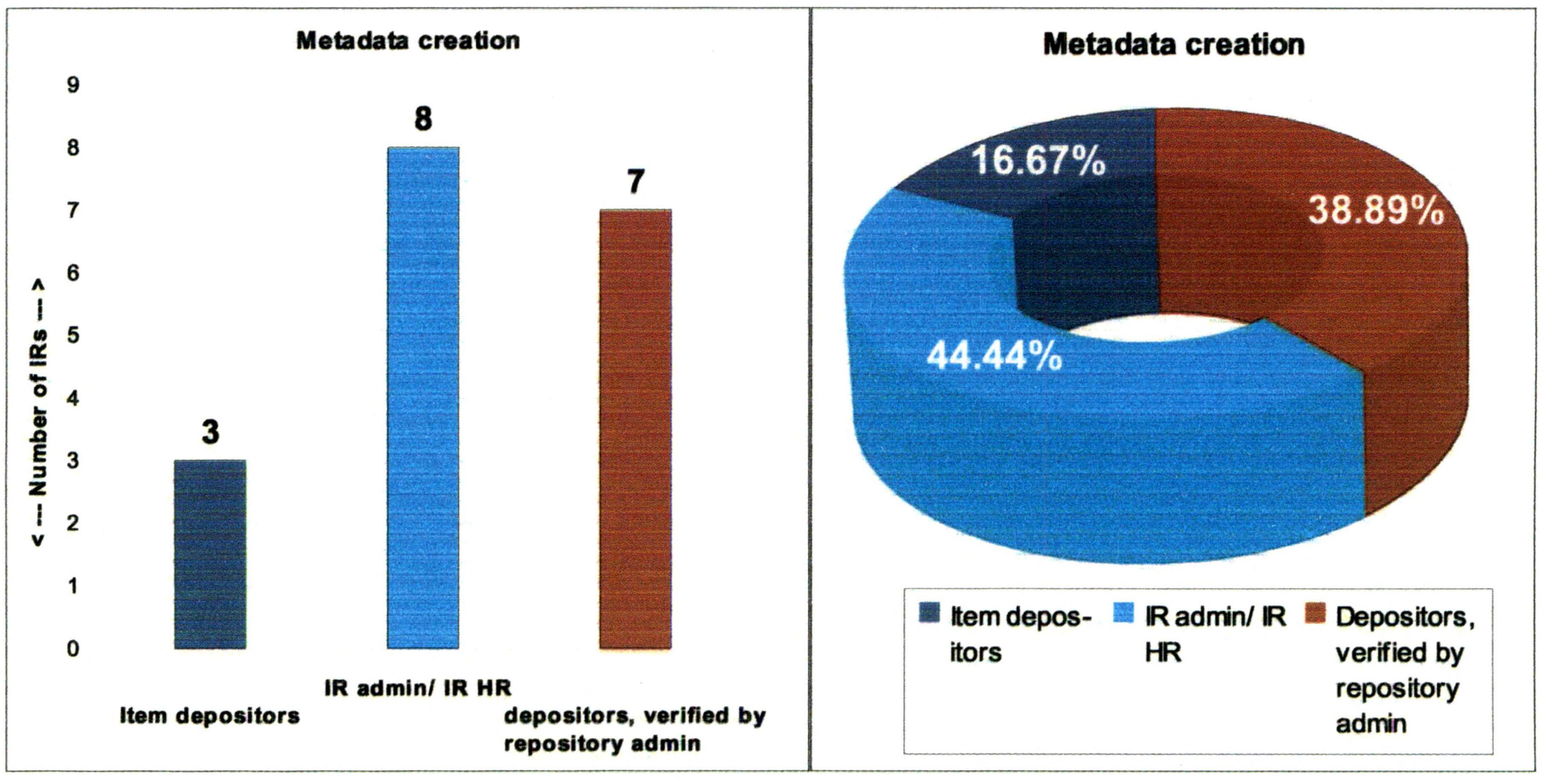


Figure 6.22b Metadata creation work

Figures 7.22b above indicates that in about 44% IRs the metadata is created by the content depositors which is subsequently being verified by the repository administrator whereas in about 39% IRs, the IR administrator or the HR associated with IR creates the metadata. In about 17% IRs surveyed, the task of metadata creation is done by the depositors which is cross verified by the IR administrator.

6.23 Verification of the publishers' policy regarding self-archiving:

S. no.	Repository	Author/ Disclaimer from the author	IR staff	Author then by IR staff	Not verified by IR staff
1	LDL-DRTC	√			X
2	ePrints@IISc			√	
3	NAL Repository			√	
4	DSpace@IITB	√	√		

5	EPrints@IITD			√	
6	DSpace@INFLIBNET	√			
7	DSpace@IBSA				X
8	ePrints@NCCR	√			X
9	DRS@nio		√		
10	DSpace@NITR		√		
11	OpenMED@NIC	√			
12	DSpace@TU	√	√		
13	MGU Theses Onlin.				X
14	DSpace@RRI			√	
15	ePrints@CSIR	√			X
16	DSpace@ICRISAT		√		
17	EPrints@MDRF	√		√	
18	DSpace@CUSAT		√		

Table 6.23 Publishers' policy

According to the Table 6.23, publishers' policy regarding self-archiving is verified in 9 Indian IRs whereas it not verified in 5 IRs. In 5 Indian repositories, disclaimer is sought from the author that he has the right to submit the work in the repository and it will not involve any copyright infringement. It also indicates that publishers' policy regarding self-archiving is verified by the IR staff in 6 Indian IRs and by authors in 3 IRs. In 5 IRs , viz, ePrints@IISc, NAL Repository, Eprints@IITD, DSpace@RRI and Eprints@MDRF, it is verified by both the repository staff as well as the depositors.

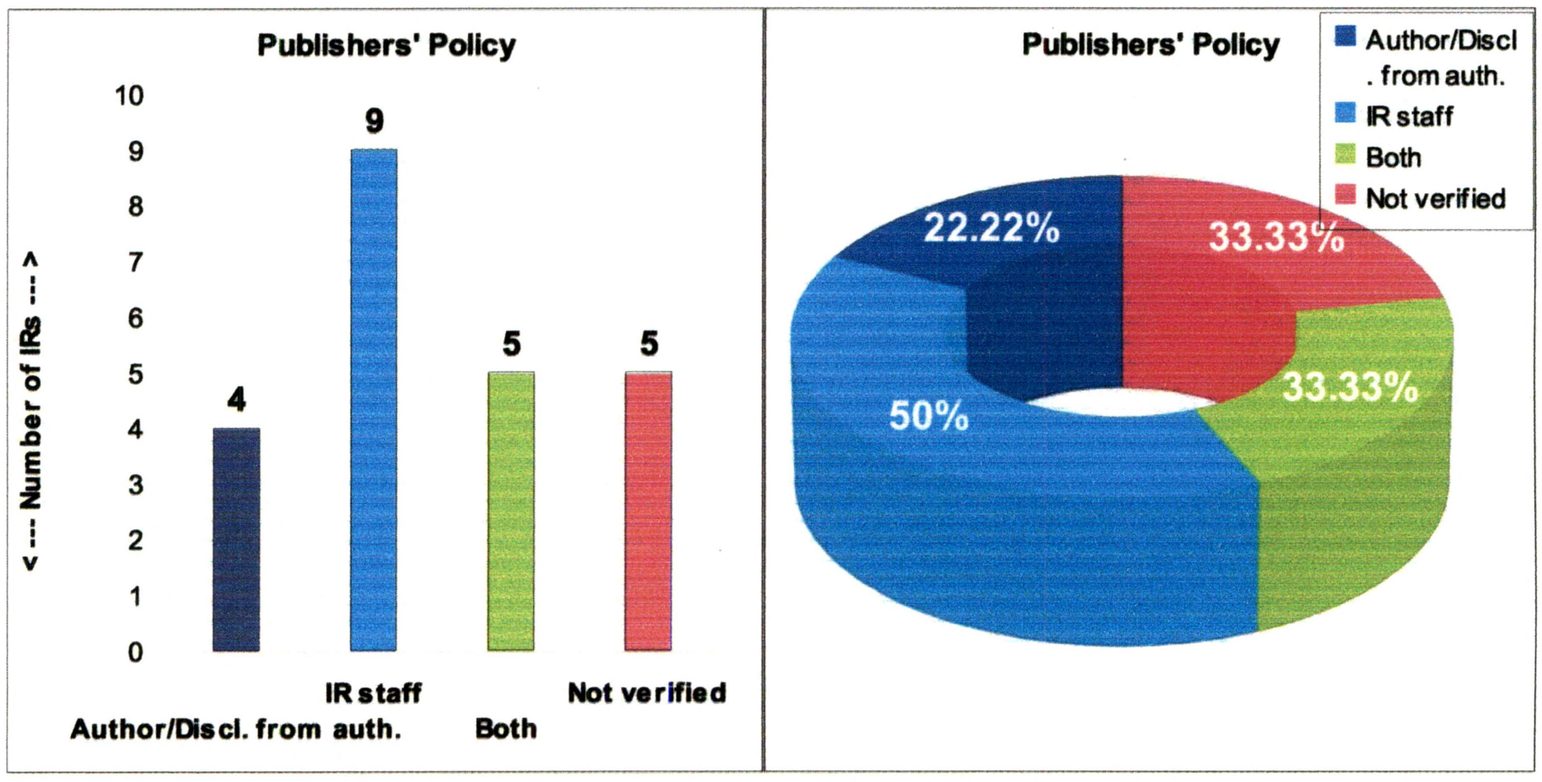


Figure 6.23 Publishers' policy

Figure 6.23 above indicates that the publishers' policy is verified by the repository IR administrator/staff in 50% Indian IRs and by the authors/depositors in about 22% IRs. Thus, the total percentage of Indian IRs where publishers' policy regarding self-archiving is verified is 72% (22%+50%). In 33% Indian IRs, the self-archiving policy of the publisher is verified both by the authors as well as by the repository administrators/managers.

6.24 Copyright management

S.no.	Repository	Copyright permission from the author	Declaration that the author is copyright holder	Disclaimer by the IR
1	LDL-DRTC	√		√
2	ePrints@IISc	√	√	√
3	NAL Repository	X	√	√
4	DSpace@IITB	√	√	√
5	EPrints@IITD	√	X	√
6	DSpace@INFLIBNET	√	√	
7	DSpace@IBSA	X	X	X
8	ePrints@NCCR	X	X	√

9	DRS@nio	√	√	
10	DSpace@NITR	√	√	
11	OpenMED@NIC	√	√	√
12	DSpace@TU	√	√	
13	MGU Theses Online	√	√	√
14	DSpace@RRI	√	√	
15	ePrints@CSIR	√	√	
16	DSpace@ICRISAT	X	X	
17	EPrints@MDRF	√	√	
18	DSpace@CUSAT	√	√	

Table 6.24 Copyright management provisions

To manage the copyright issues and avoid any dispute, the IRs may adopt measures like displaying copyright Information, adding disclaimer by the repository and declaration from the author regarding the ownership of the intellectual property. Table 6.24 indicates that while 14 Indian IRs take copyright permission from the author, 13 Indian IRs give declaration that the author is copyright holder. Disclaimer is provided in 8 IRs. The table also reveals that DSpace@IBSA has not implemented any discrete copyright management strategy.

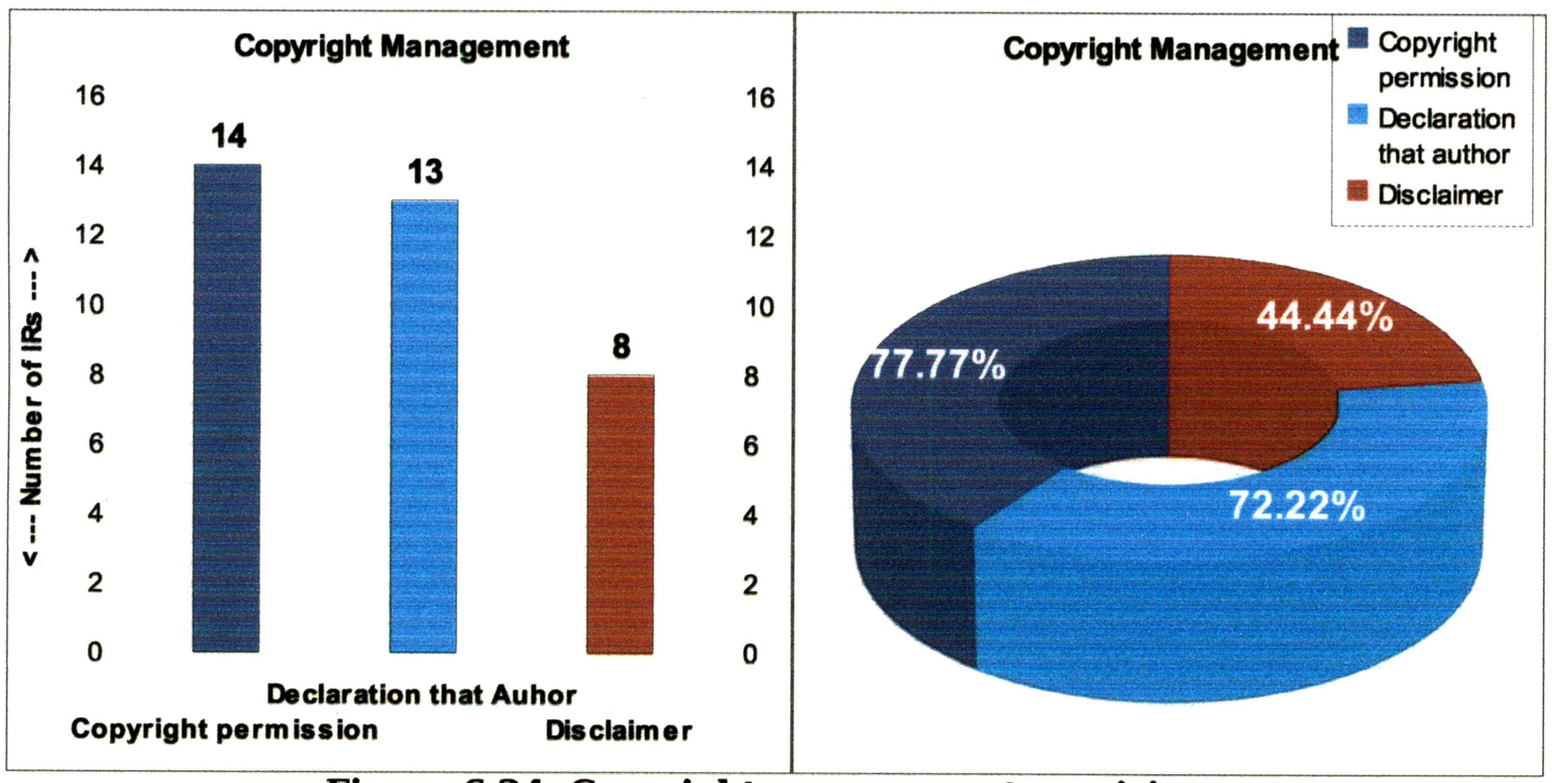


Figure 6.24 Copyright management provisions

Figure 6.24 above indicates that copyright permission is sought from the authors at the time of document submission in about 78% Indian IRs, while in about 72% IRs, declaration is made that the author is the genuine copyright holder. Disclaimer, disowning any responsibility in case of copyright infringement is mentioned on the IR portal in 44.44% Indian IRs.

6.25 Satisfaction with document submission:

S.no.	Repository	Yes	No
1	LDL-DRTC	√	
2	ePrints@IISc		X
3	NAL Repository	√	
4	DSpace@IITB	√	
5	EPrints@IITD	√	
6	DSpace@INFLIBNET		X
7	DSpace@IBSA		X
8	ePrints@NCCR		X
9	DRS@nio	√	
10	DSpace@NITR	√	
11	OpenMED@NIC		X
12	DSpace@TU	√	
13	MGU Theses Online	√	
14	DSpace@RRI		X
15	ePrints@CSIR	√	
16	DSpace@ICRISAT	√	
17	EPrints@MDRF		X
18	DSpace@CUSAT		X

Table 6.25 Rate of document submission

Repositories were asked to give their view regarding the overall satisfaction of IR managers with document submission rate. As per Table 6.25, 10 Indian IRs were found to be satisfied with the rate of document submission by the authors while 8 IRs are of the view that the present

rate is slow and needs to be accelerated.

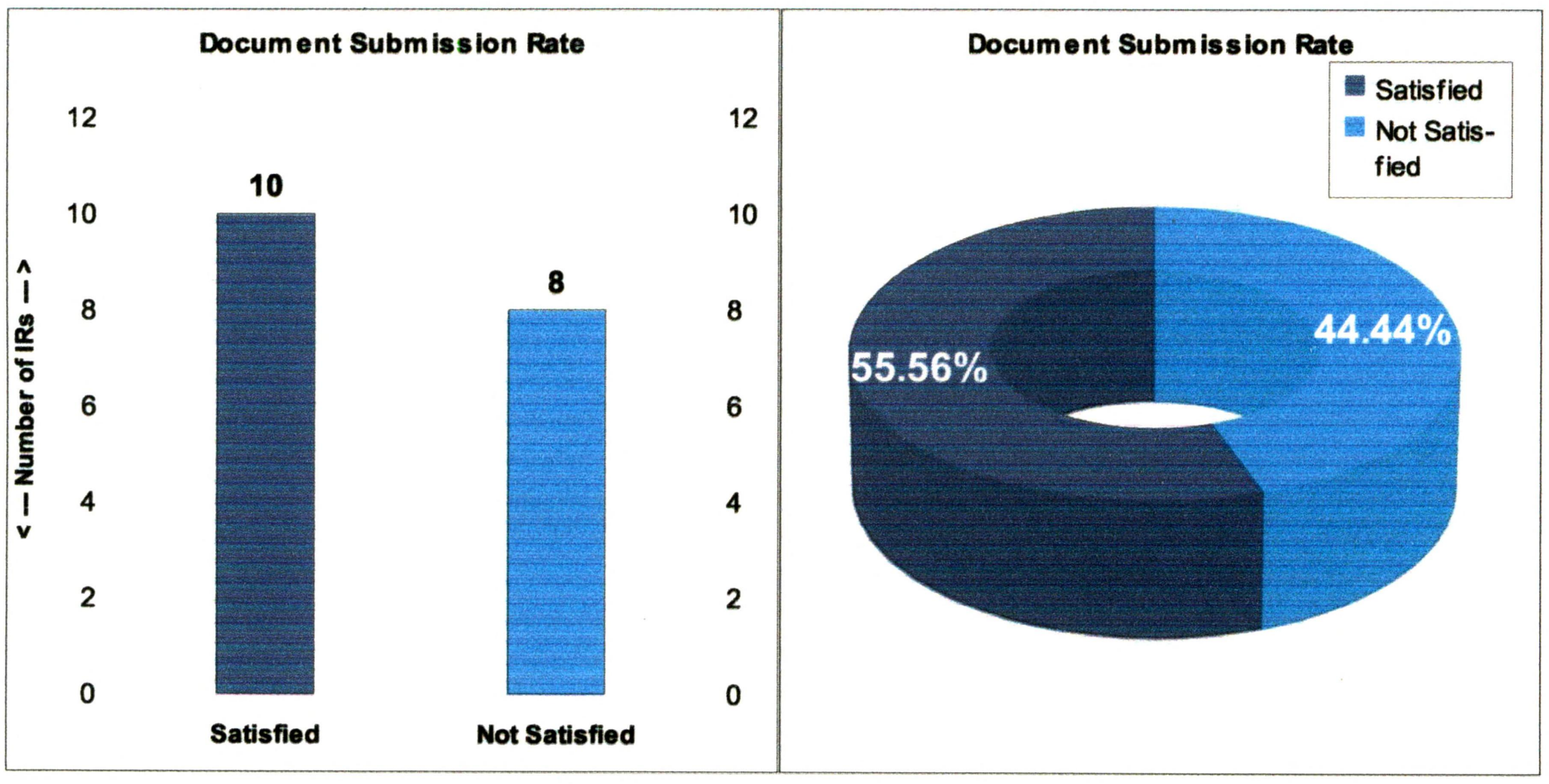


Figure 6.25 Rate of document submission

Repositories were asked to give their view regarding the overall satisfaction of IR managers with document submission rate. According to Figure 6.25, 10 Indian IRs, i.e., about 56%, were found to be satisfied with the rate of document submission by the authors while 8 IRs (i.e., about 44%) are of the view that the present rate is slow and needs to be accelerated.

6.26 Document submission issues:

According to the Table 6.26 and Figure 6.26(a-b), 7 Indian IRs (i.e., 39%) have mentioned that the major bottlenecks in self archiving faced by them was disinterest on the part of institutional members while 6 Indian IRs (i.e., 33%) have cited inadequate marketing of IRs as major reason for lack of self-archiving. Nine IRs (i.e., 50%) consider self-archiving is slow as it has not being made mandatory.

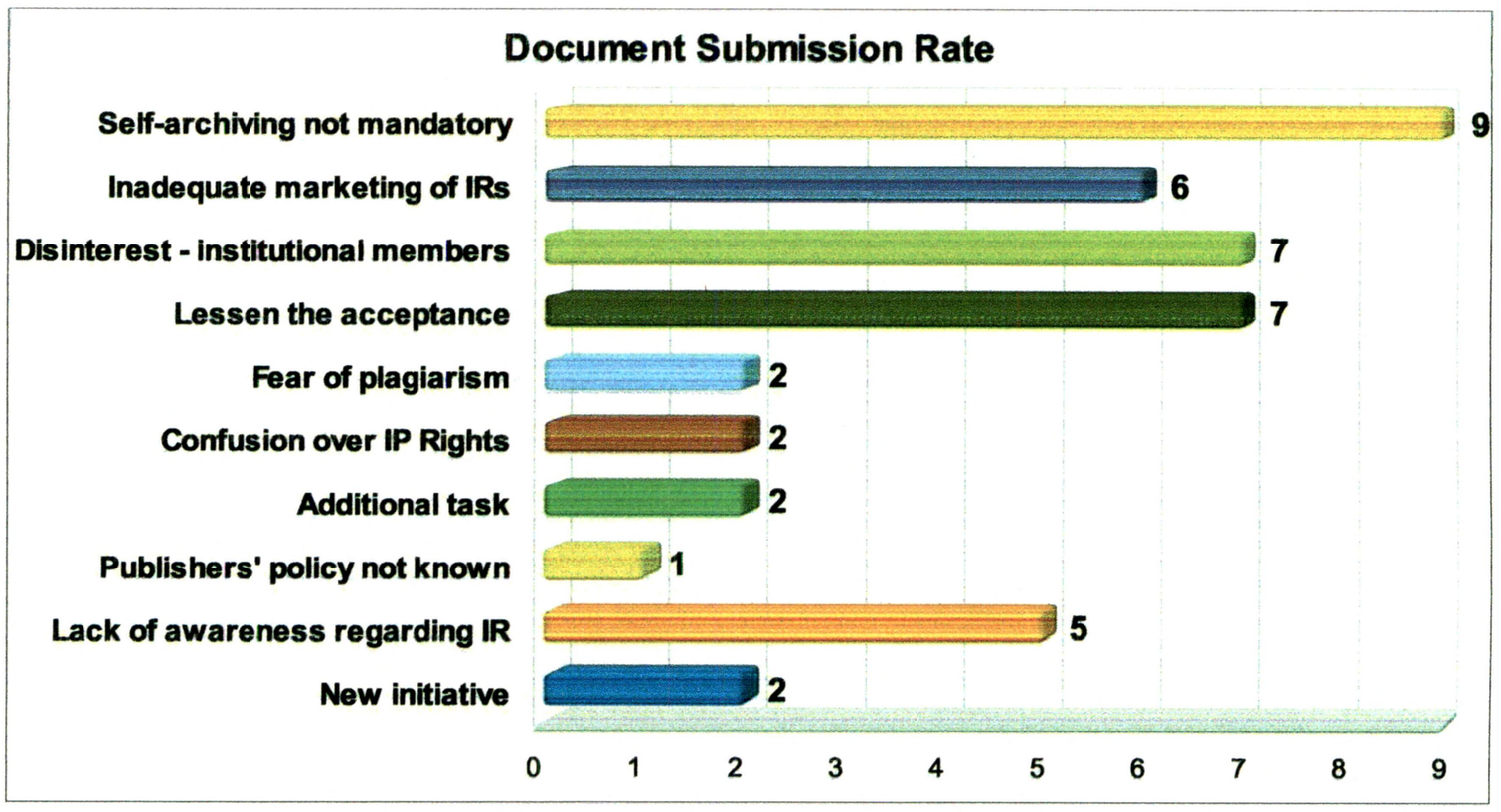


Figure 6.26a Reasons for slow submission rate

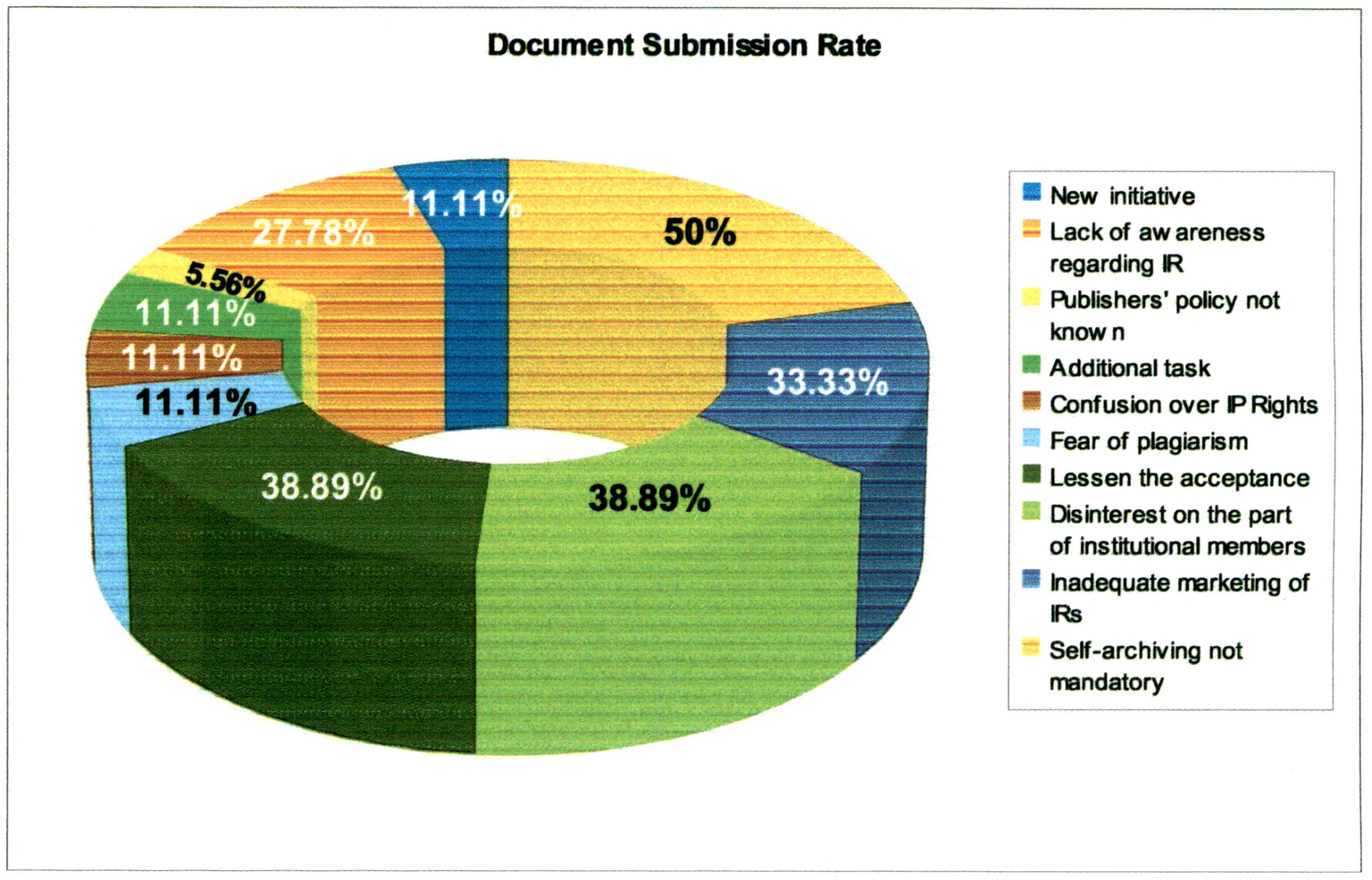


Figure 6.26b Reasons for slow submission rate

Recent launch of the IRs was considered as the reason for this by 4 (i.e., 22%) Indian IRs, lack of awareness regarding IR and open access, low publication rate, considering submission process an additional task,

S. no.	Repository	New initiative	Lack of awareness regarding IR	Publishers' policy not known	Additional task	Confusion over IP Rights	Fear of plagiarism	Lessen the acceptance	Disinterest on the part of institutional members	Inadequate marketing of IRs	Self-archiving not mandatory
1	LDL-DRTC							√		√	
2	ePrints@IISc		√					√		√	
3	NAL Repository										√
4	DSpace@IITB										√
5	EPrints@IITD								√		
6	INFLIBNET	√	√							√	
7	DSpace@IBSA	√	√		√				√		√
8	ePrints@NCCR							√			√
9	DRS@nio										√
10	DSpace@NITR		√			√	√	√	√		
11	OpenMED@NIC							√			√
12	DSpace@TU							√	√	√	√
13	MGU Theses Online							√	√		
14	DSpace@RRI		√	√	√	√	√		√		√
15	ePrints@CSIR									√	
16	ICRISAT									√	
17	EPrints@MDRF								√		
18	DSpace@CUSAT										√

Table 6.26 Reasons for slow submission rate

confusion over IP Rights and fear of plagiarism by others account for slow submission rate in 6 IRs each (i.e., 33% Indian IRs). Lack of awareness regarding publishers policy, lack of training to newly recruited faculty and prior submission (DSpace@RRI) in the global archive (arXiv) are the factors effecting submission in 5% Indian IRs. It also reveals that 7 Indian IRs (i.e., 39%), have mentioned that their users fear that submitting in IR may affect their publication chances adversely.

Three IRs have mentioned other reasons which they consider responsible for slower self-archiving rate. At OpenMED@NIC, lack of awareness regarding open access and institutional repositories and dependency on outside scientist to deposit articles, were the two main hurdles. Lack of clear regulations related to inclusion of PhD theses, etc. in the IR was the issue at MGU Theses Online while at EPrints@CSIR dependency on external students to submit their theses was responsible for low self-archiving rate.

6.27 Item withdrawal:

S. no.	Repository	Item Retention policy		Item withdrawal policy		
		Indefinitely	No policy	Deleted entirely	Remove them from public view	No policy
1	LDL-DRTC		√			√
2	ePrints@IISc		√			√
3	NAL Repository	√				√
4	DSpace@IITB		√			√
5	EPrints@IITD		√		√	
6	DSpace@INFLIBNET		√		√	
7	DSpace@IBSA		√			√
8	ePrints@NCCR		√	√		
9	DRS@nio		√		√	
10	DSpace@NITR	√			√	
11	OpenMED@NIC	√			√	
12	DSpace@TU		√	√		

13	MGU Theses Online		√			√
14	DSpace@RRI	√		√		
15	ePrints@CSIR	√			√	
16	DSpace@ICRISAT	√				√
17	EPrints@MDRF		√		√	
18	DSpace@CUSAT		√		√	

Table 6.27 Item withdraw from IR

Table 6.27 reveals that 11 Indian IRs have the document withdrawal policy, whereas 7 Indian IRs do not have such policy. It also suggests that 6 Indian IRs, viz, NAL Repository, DSpace@NITR, OpenMED@NIC, DSpace@RRI, ePrints@CSIR, DSpace@ICRISAT have decided to retain the documents once submitted into the IR, whereas 12 IRs have no such document retention policy. It also reveals that in 3 IRs, works decided to be withdrawn from the IR are deleted permanently, whereas items are removed from public view in 9 IRs.

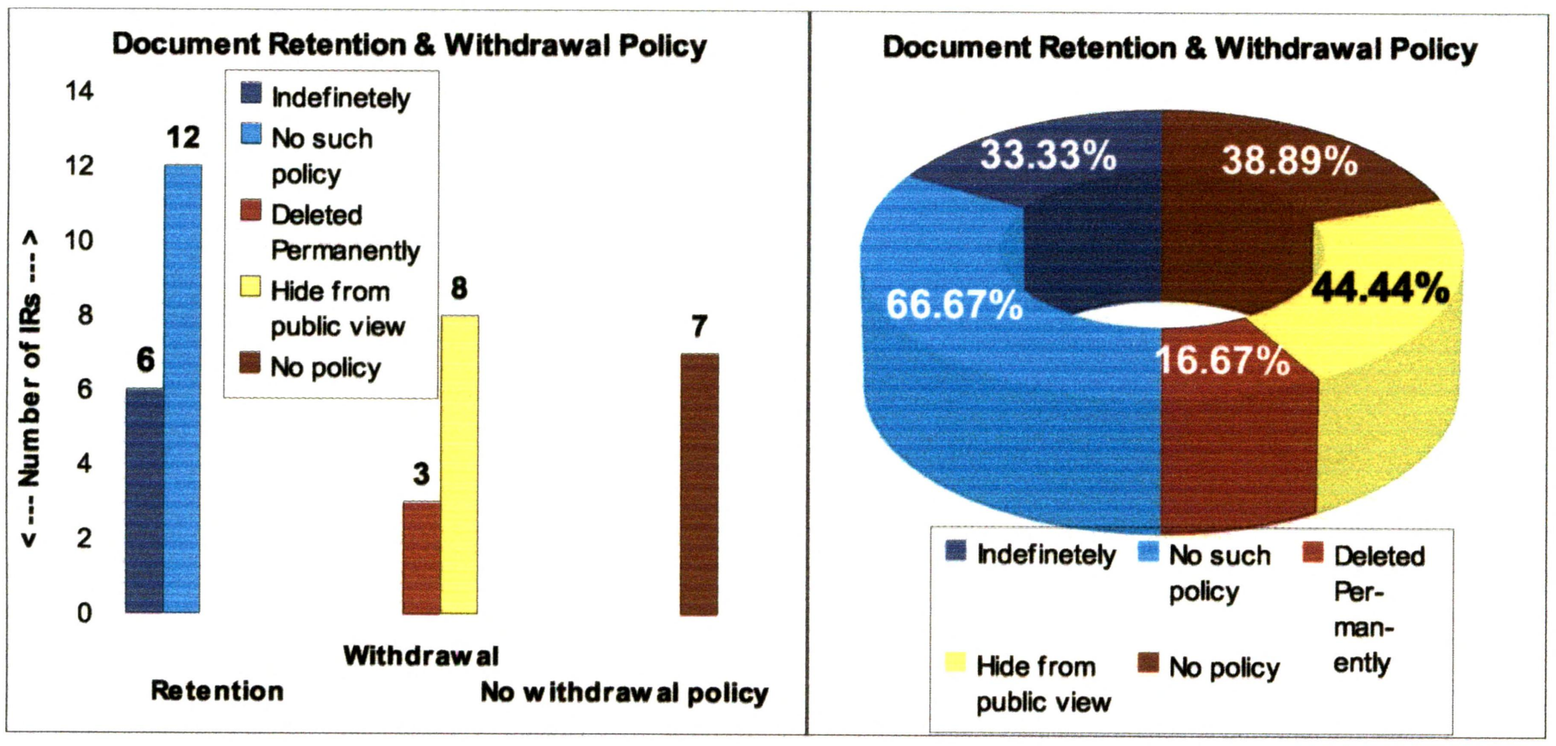


Figure 6.27 Document Retention Period

Figure 6.27 above indicates that about 67% IRs have no policy of document retention, whereas about 33% IRs have the policy to retain the documents submitted indefinitely. It also indicates that about 44% Indian

IRs have the policy to remove the data from the public view while about 17% IRs permanently delete the document. Thus, withdrawal policy exists in 61% (44.44%+16.67%) Indian IRs while 39% IRs do not allow withdrawal of the documents once submitted.

6.28 Journal publication:

S.no.	Repository	Response
1	LDL-DRTC	nil
2	ePrints@IISc	1
3	NAL Repository	nil
4	DSpace@IITB	nil
5	EPrints@IITD	3
6	DSpace@INFLIBNET	nil
7	DSpace@IBSA	nil
8	ePrints@NCCR	nil
9	DRS@nio	nil
10	DSpace@NITR	nil
11	OpenMED@NIC	nil
12	DSpace@TU	nil
13	MGU Theses Online	2
14	DSpace@RRI	nil
15	ePrints@CSIR	nil
16	DSpace@ICRISAT	1
17	EPrints@MDRF	more
18	DSpace@CUSAT	nil

Table 6.28 Journal publication

As per Table 6.28, only 5 institutions publish their own journal including ePrints@IISc, Eprints@IITD, MGU Theses Online, DSpace@ICRISAT and Eprints@MDRF. There are two institutions which publish 2 journals, one institution having more than 3 publications, one institutions with two publications and another one having three publications.

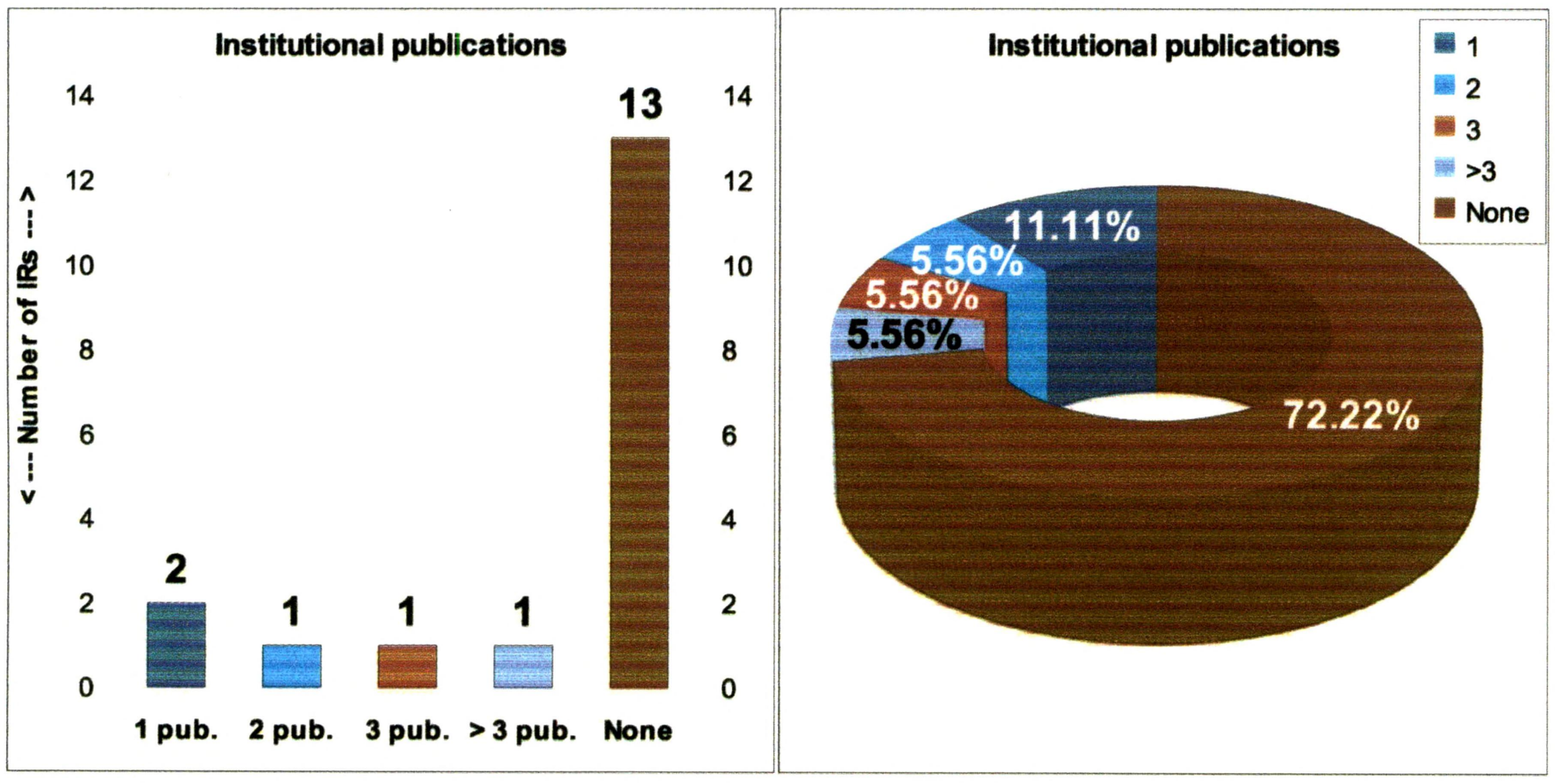


Figure 6.28 Journal publication

According to Figure 6.28 above, about 76% Indian IRs do not publish any journal while about 11% Indian IRs publish one journal only. The figure reveals that the percentage of institutions publishing two and three journals is about 6% each.

6.29 Digital preservation:

S.no.	Repository	Bit-stream Copying	Durable, Persistent Media	Migration	Standards	Emulation	Encapsulation	Preservation Metadata
1	LDL-DRTC	-	-	-	-	-	-	-
2	ePrints@IISc	√						
3	NAL Repository	-	-	-	-	-	-	-
4	DSpace@IITB			√	√			√
5	EPrints@IITD							
6	DSpace@INFLIBNET	√	√	√	√	√	√	√
7	DSpace@IBSA	-	-	-	-	-	-	-
8	ePrints@NCCR	-	-	-	-	-	-	-
9	DRS@nio	√	√					√
10	DSpace@NITR	-	-	-	-	-	-	-

11	OpenMED@NIC	-	-	-	-	-	-	-
12	DSpace@TU			√				
13	MGU Theses Online		√					
14	DSpace@RRI	-	-	-	-	-	-	-
15	ePrints@CSIR		√					
16	DSpace@ICRISAT		√					
17	EPrints@MDRF				√			
18	DSpace@CUSAT	-	-	-	-	-	-	-

Table 6.29 Digital preservation strategy

As per Table 6.29, 11 Indian IRs (i.e., about 61%) have preservation policy for the content submitted in the repositories while 7 Indian IRs (i.e., 39% IRs) have no such policy.

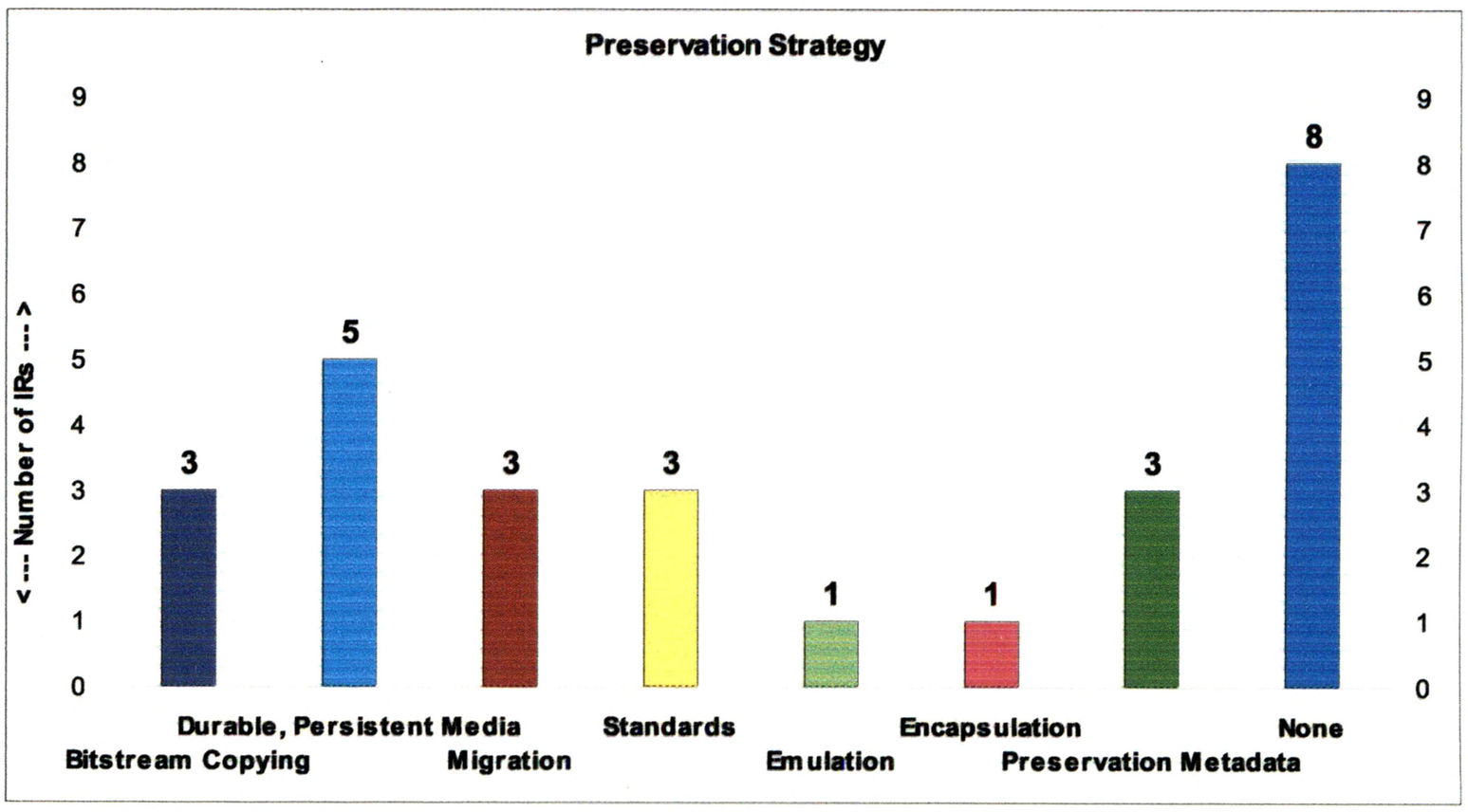


Figure 6.29a Digital preservation strategy

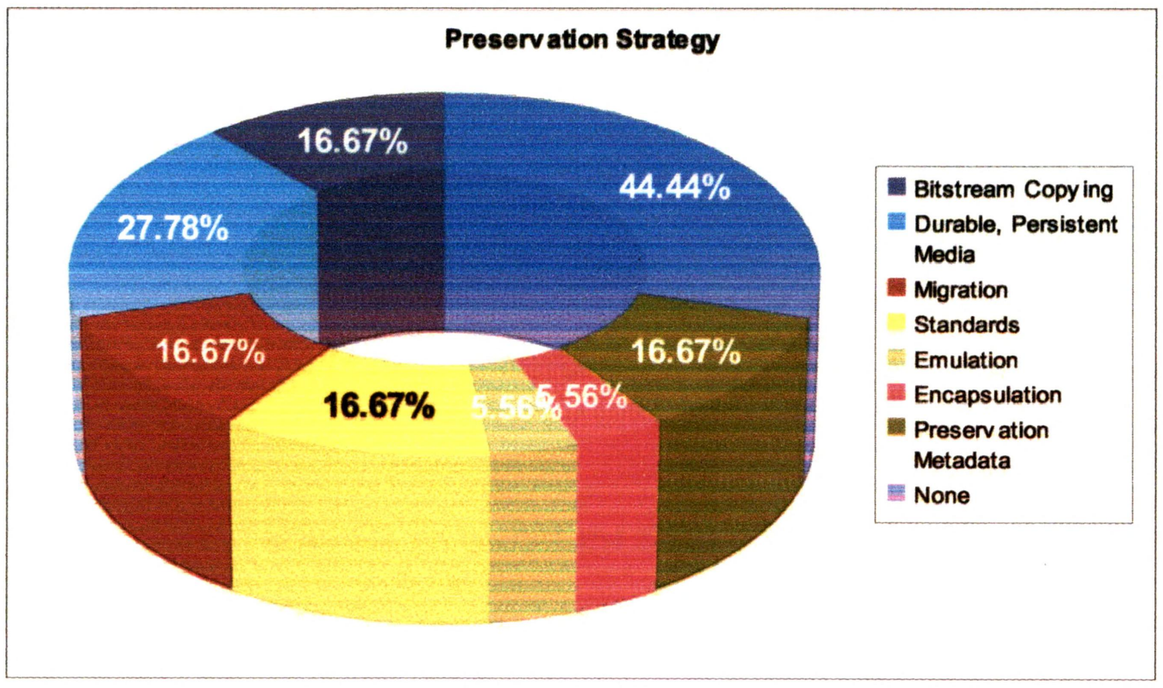


Figure 6.29b Digital preservation strategy

As per figures 7.29(a-b) above, about 17% Indian IRs have preservation strategies including bit-stream copying, migration, standards and preservation metadata each. Durable persistent media is used as preservation method in about 28% Indian IRs while emulation and encapsulation accounts for about 6% each.

6.30 Content indexing, Data availability to aggregator or service providers:

S.no.	Repository	content indexing by Google	data provider for any content aggregator (service provider)
1	LDL-DRTC	√	√
2	ePrints@IISc	√	√
3	NAL Repository	√	√
4	DSpace@IITB	√	X
5	EPrints@IITD	X	√
6	DSpace@INFLIBNET	√	√
7	DSpace@IBSA	X	X
8	ePrints@NCCR	√	X
9	DRS@nio	√	√
10	DSpace@NITR	√	√
11	OpenMED@NIC	√	√

12	DSpace@TU	X	X
13	MGU Theses Online	√	X
14	DSpace@RRI	√	X
15	ePrints@CSIR	√	√
16	DSpace@ICRISAT	√	√
17	EPrints@MDRF	√	√
18	DSpace@CUSAT	√	√

Table 6.30 IR indexing by Google

Indian IRs were asked regarding the indexing of their respective IR content by Google. As per Table 6.30, 15 Indian IRs have mentioned that their IR content is indexed by Google while indexing is not done in 3 IRs. It also reveals that 12 IRs provide data to data-aggregators or service providers while 4 IRs, viz., DSpace@IITB, DSpace@TU, MGU Theses Online and DSpace@RRI do not provide data to them.

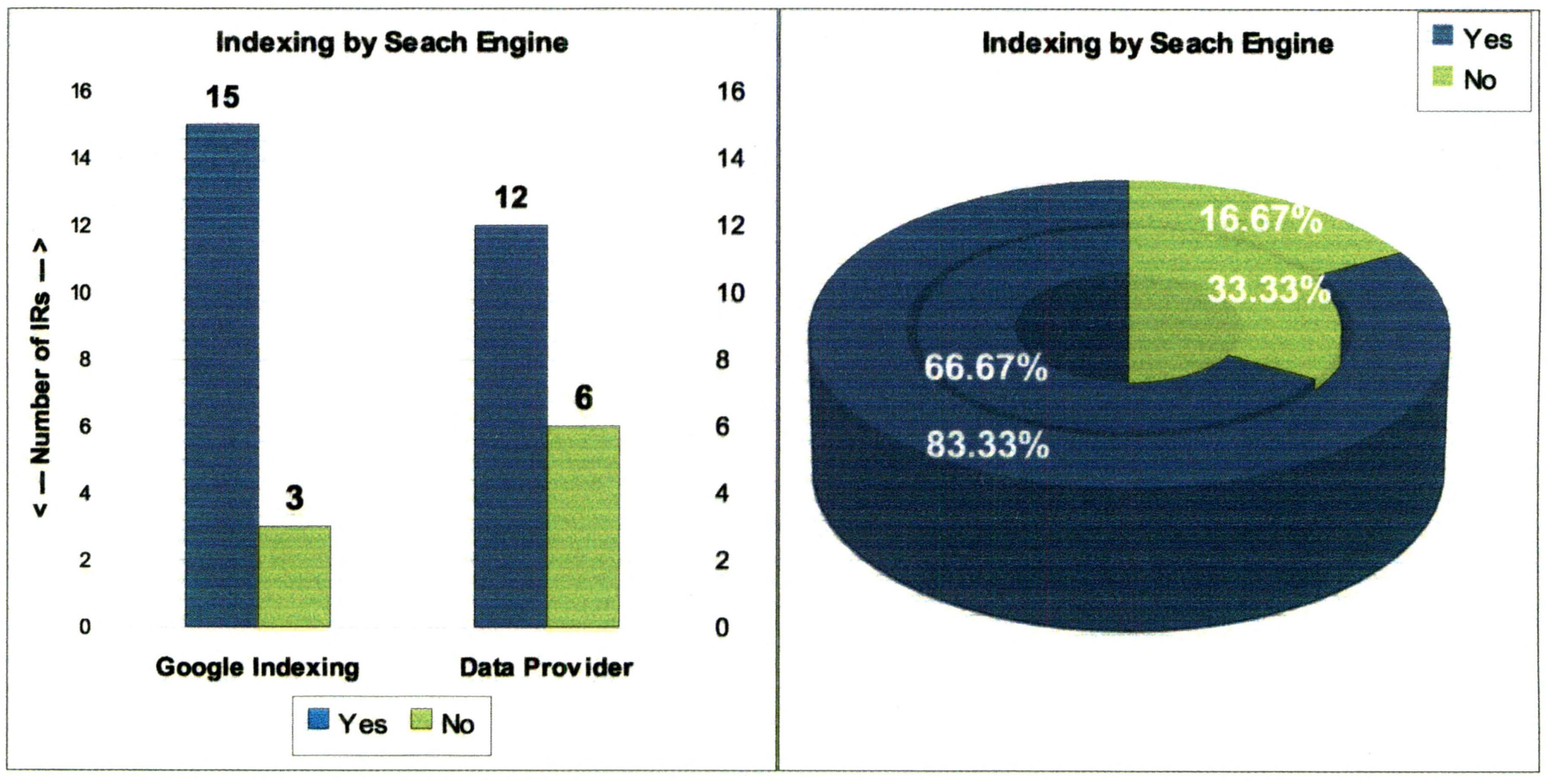


Figure 6.30 IR indexing by Google

According to Figure 6.30, about 83% Indian IRs have indicated that their content is being indexed by Google search engine whereas about 17% IRs have mentioned that their IRs are not being indexed by it. From

Figure 6.30 above, it is also evident that about 67% IRs serves as data provider for content aggregators or service providers, whereas about 33% IRs don't serve as data provider.

6.31 IR Promotion strategies and their impact:

S. no.	Repository	Promotional website	Email	Brochures etc.	Publication	Demonstrations	Meetings, etc.
1	LDL-DRTC						√
2	ePrints@IISc			√	√		
3	NAL Repository	√	√	√			√
4	DSpace@IITB	√	√			√	√
5	EPrints@IITD	√	√	√			
6	DSpace@INFLIBNET	√	√				
7	DSpace@IBSA	NR					
8	ePrints@NCCR	NR					
9	DRS@nio		√				
10	DSpace@NITR		√	√	√	√	√
11	OpenMED@NIC		√		√		√
12	DSpace@TU		√			√	√
13	MGU Theses Online	√	√	√	√	√	√
14	DSpace@RRI		√				√
15	ePrints@CSIR	√		√			√
16	DSpace@ICRISAT		√				
17	EPrints@MDRF	√	√		√	√	√
18	DSpace@CUSAT	√	√	√	√	√	√

Table 6.31 IR Promotion strategies

Table 6.31 shows that 8 Indian IRs have used their website for the promotion of their IR services. Email was used for promotion in 13 IRs. Brochures were found effective in 7 IRs whereas publications in newsletters, journals etc., and demonstrations were used as a promotion strategy in 6 IRs each respectively.

The IRs were asked regarding the effect of promotional activities they have carried out in their respective institution. Table 6.31 also contain data pertaining to impact of such campaign. In reply to this query, 8 Indian IRs have mentioned that the impact of the promotional activities have substantial impact on the user community. Six Indian IRs believe that it has little impact whereas 4 Indian IRs are not sure about its influence on users.

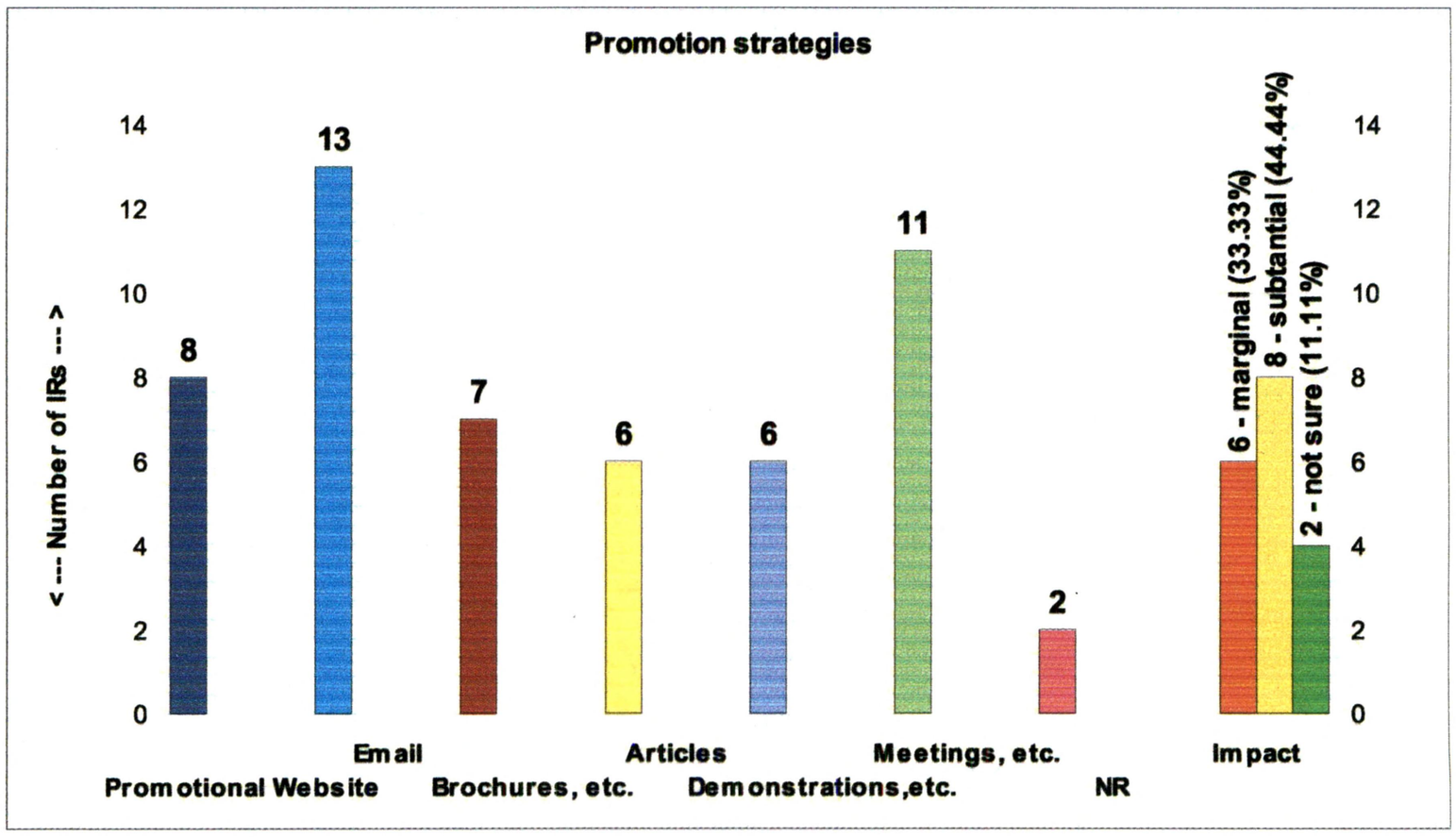


Figure 6.31a IR Promotion strategies

Figure 6.31a indicates that the effect of promotional activities has been substantial in 44.44% Indian repositories, whereas 33.33% repositories have observed marginal impact of such advocacy campaigns. However, about 11% repositories have not assessed the impact of promotion on the users.

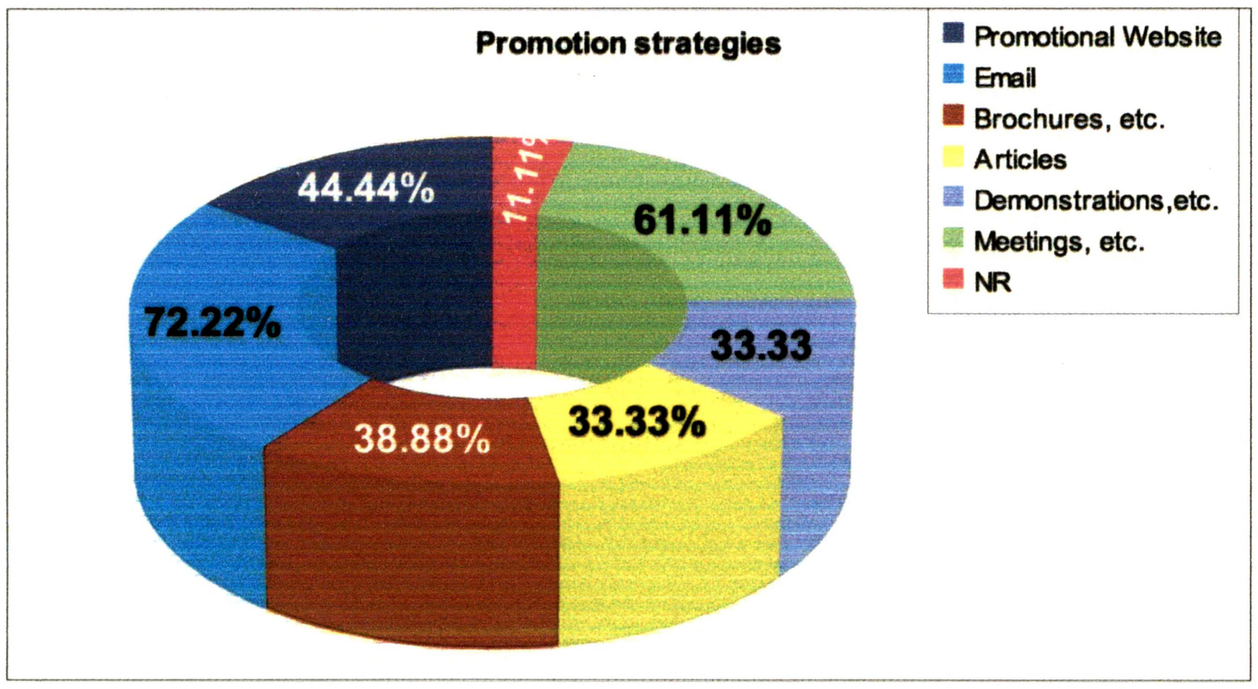


Figure 6.31b IR Promotion strategies

Figures 7.31(a-b) reveals that email is the most used means, i.e., about 72% for the promotion of the of the Indian IRs. Meetings and discussions amongst the user community is used as a promotional strategy in 61.11% IRs while publicity through website accounts for 44.44% cases. Indian IRs also rely upon other advocacy measures like publications of brochures, etc. (39%). Publication of articles on IRs and demonstrations before targeted audience are being used in 33.33% IRs each.

TENABILITY OF HYPOTHESES

Hypotheses (H1): ***Indian authors are not getting their due acknowledgement or recognition for their scholarly contribution.***

This hypothesis has been framed in the light of the fact that open access offers citation advantage as indicated by several studies. Hypothesis 1 (H1) was tested on the basis of data derived/extracted from the database "SCImago Journal & Country Rank" (SJR), Essential Science Indicator (ESI) and "Research Trends".

S.No.	Years	Citable Documents	Cited Docs.	Uncited Docs
1	1996	20019	15326	4693
2	1997	20540	15338	5202
3	1998	21134	15998	5136
4	1999	22133	16637	5496
5	2000	22541	17073	5468
6	2001	23402	17492	5910
7	2002	24901	18679	6222
8	2003	28282	21312	6970
9	2004	29706	21672	8034
10	2005	33927	23658	10269
11	2006	39451	25008	14443
12	2007	43503	23246	20257
13	2008	46389	14149	32240
	Total	**375928**	**245588**	**130340**

Table 6.32 Country Citation Status: India

According to Table 6.32 based on SJR data from 1996 to 2008, out of 3,91,687 published documents, 3,75,928 are citable documents like articles, reviews and conference papers. The number of documents cited

at least once is 2,45,588, while 1,30,340 documents have never been cited.

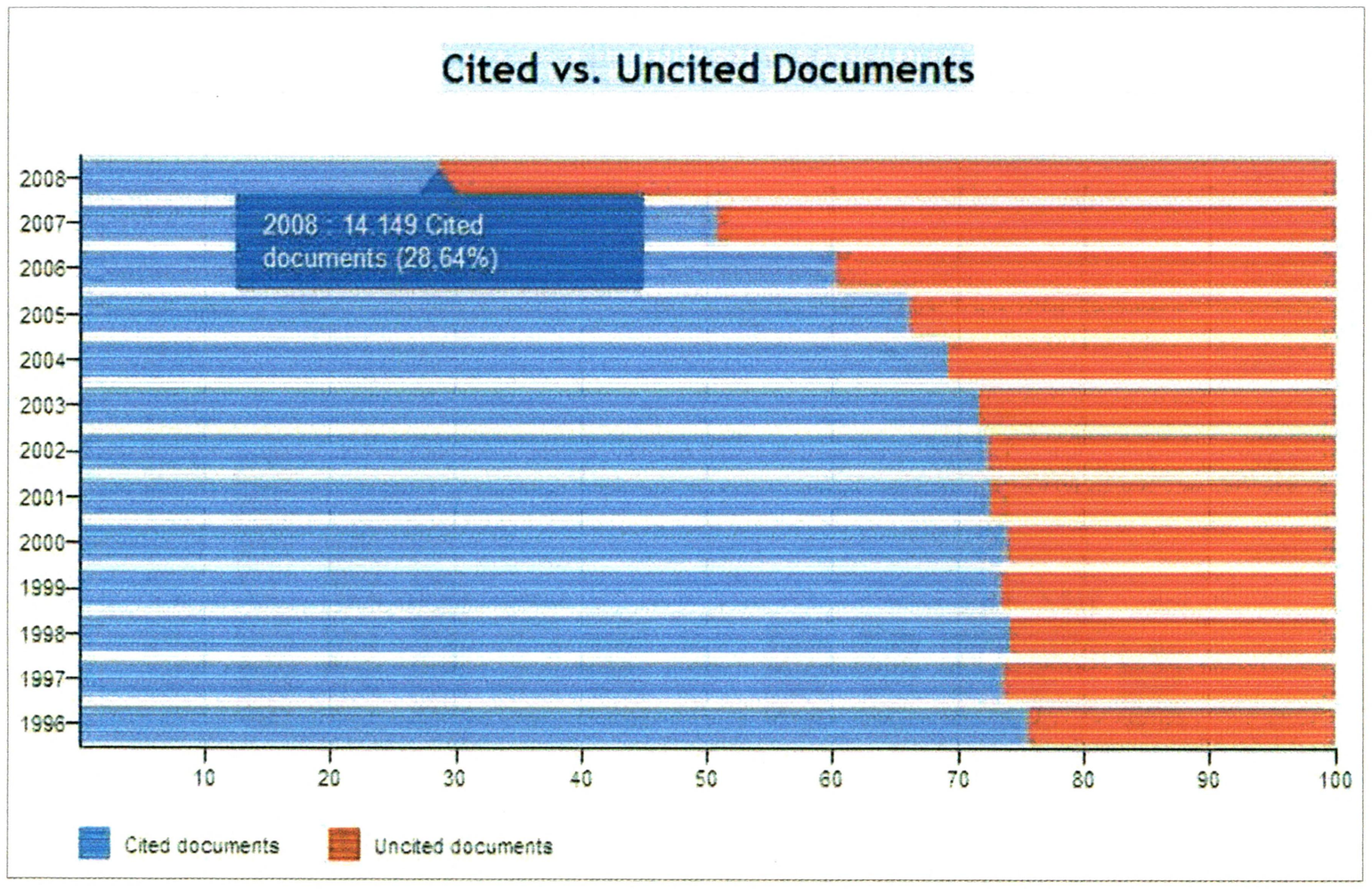
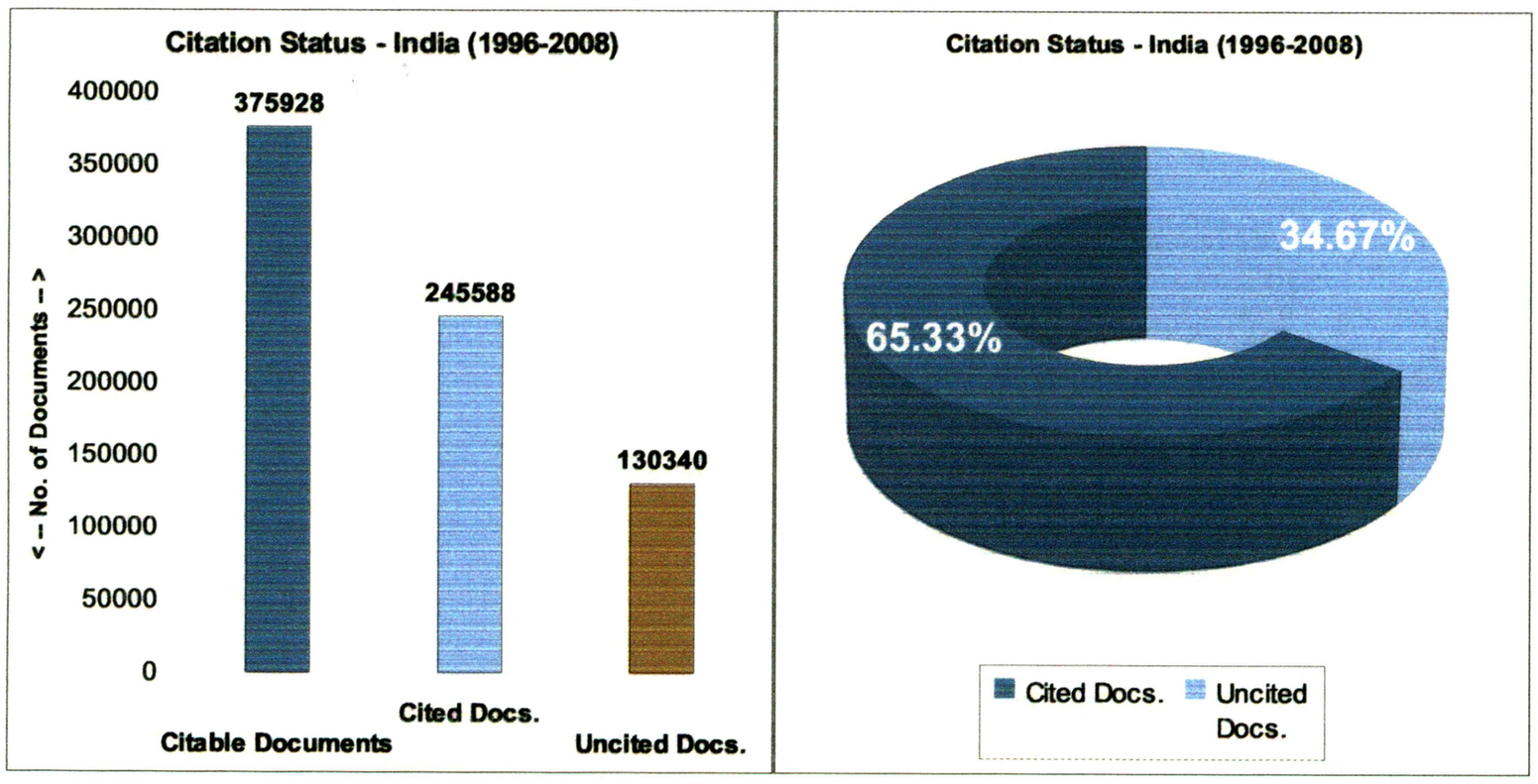


Figure 6.32a Proportion of documents cited and non-cited[1]



[1]. SCImago. (2007). SJR — SCImago Journal & Country Rank. Retrieved August 07, 2010, from http://www.scimagojr.com

[redacted]

Figure 6.32b Proportion of documents cited and non-cited

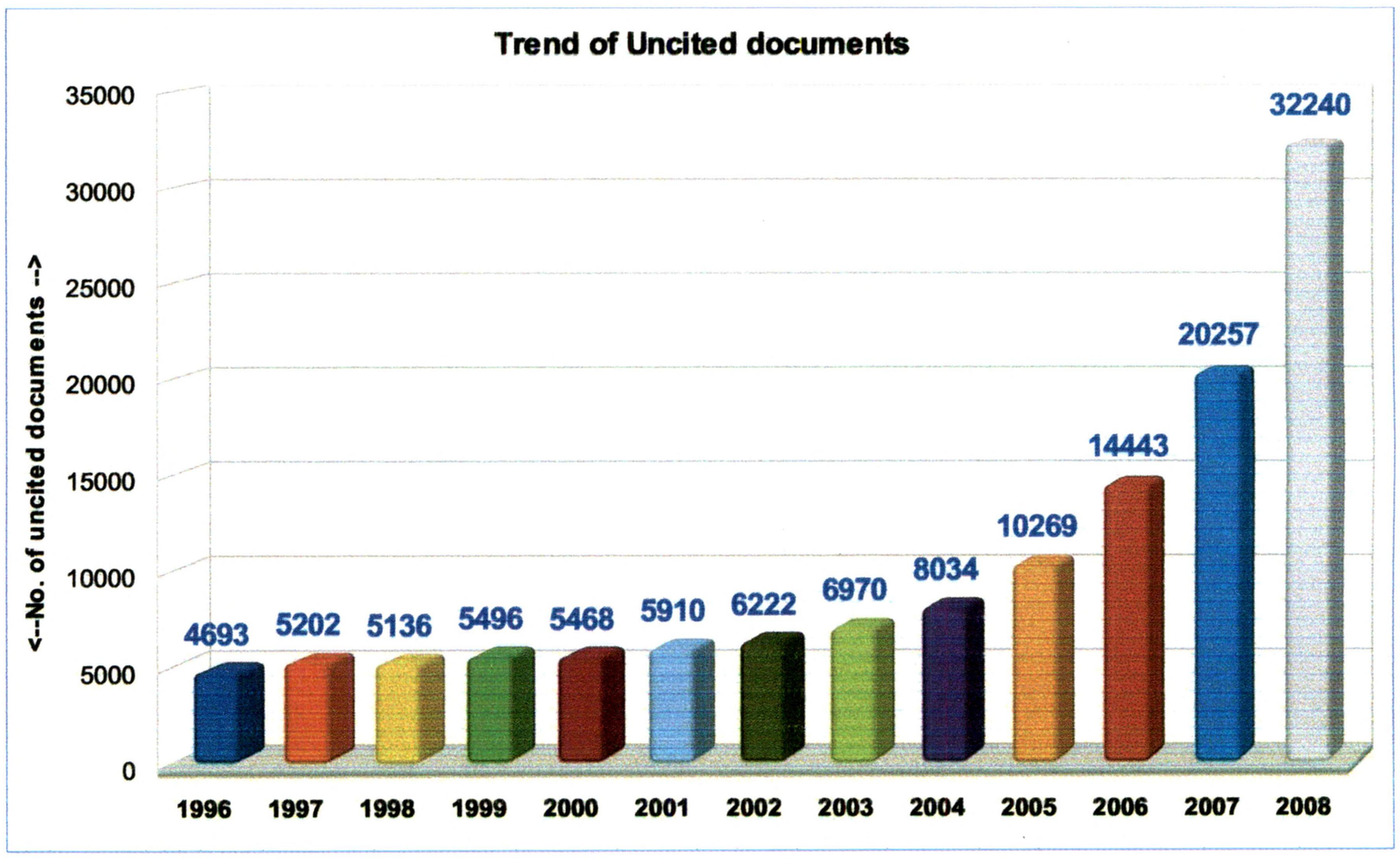


Figure 6.32c Rate of of non-cited documents

Figures 6.32(a-c) present the citation status of Indian authors. The figures reveals that Indian scholars are not receiving due acknowledgement in the form of citations of their published work.

Essential Science Indicators (ESI) of Thomson Reuters is based on journal article publication counts and citation data from Thomson Scientific databases like Web of Science, etc. According to ESI database, the average citations per paper for India is 4.94 (figure 6.32d below), which is very low in comparison to countries like USA (14.68) and UK (13.45). Japan has 9.41 citations per paper whereas Israel has 11.48.

[redacted]

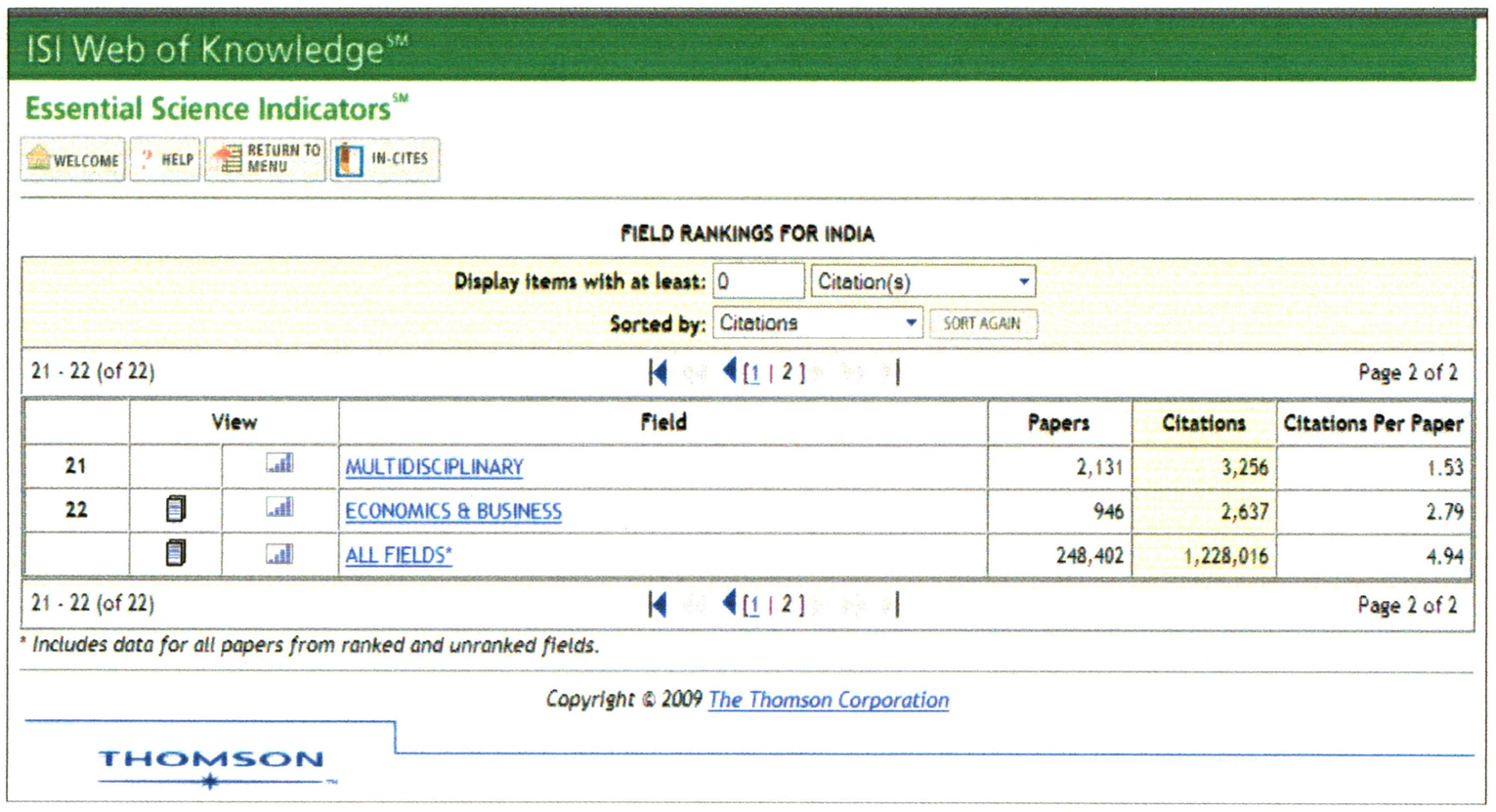


Figure 6.32d Citation status for Inda[2]

Figures 6.32(a,b &c) suggest that the percentage of non-cited is increasing every year and not all the citable documents authored by Indian scholars works receive due acknowledgement in form of citations. Moreover, the report entitled "Geographical trends of research output" published in Research Trends of Elsevier based upon bibliometric analysis of Scopus data mentions that the percentage citation of Indian papers is 0.9% which is quite low.

The above analysis based upon data from SJR, ESI and Research Trends proves H1 to be true.

Hypothesis 2 (H2): ***There exists no uniform mechanism for management and access to PhD theses being produced by Indian universities.***

Till recently only Vidyanidhi project was the single ETD resource providing access to electronic theses and dissertations submitted to

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[2]. ISI Web of Knowledge [v4.6]. (n.d.). *ISI Web of Knowledge* [v4.6]. Retrieved August 2, 2010, from http://esi.isiknowledge.com/rankdatapage.cgi?option=C&search=INDIA&searchby=N&currpage=2

various Indian universities. But no record has been submitted in this database after 20 August 2007. However, a new initiative has been taken by INFLIBNET which facilitates submission of ETDs in the centralized repository, called iETD. As per the UGC Notification (Minimum Standards & Procedure for Award of M.Phil./ Ph.D Degree, Regulation, 2009) dated 1st June 2009, the responsibility of maintaining the repository of Electronic Theses and Dissertation (ETDs) has been assigned by MHRD to the INFLIBNET Centre, Ahmedabad for hosting the soft copy of the M.Phil./ Ph.D Electronic Theses and Dissertations(ETDs) for access to all the institutions/ universities.

Subsequently, to accomplish this ambitious project, INFLIBNET set-up Shodhganga@INFLIBNET (Shodhganga: a reservoir of Indian Theses) by using Dspace which Indian universities the opportunity to host their ETDs on the INFLIBNET server. This will also ease the data load on the individual IR servers as theses need more data storage space than other scholarly publications like pre-prints or post-prints. Although it is a relatively new project, we can say that this new initiative offers uniform mechanism for management and access to PhD theses being produced by Indian universities.

This disproves H2 that there exists no uniform mechanism for management and access to PhD theses being produced by Indian universities.

Hypothesis 3 (H3): ***Very few Indian universities are having their own IR.***

Higher education institues (HEIs) in India include 20 Central Universities, 215 State Universities, 100 Deemed Universities, 5 institutions established under State Act and 13 institutes of national importance apart from about 17,000 colleges including 1800 women's colleges. As far as the functional Indian repositories of these institutions

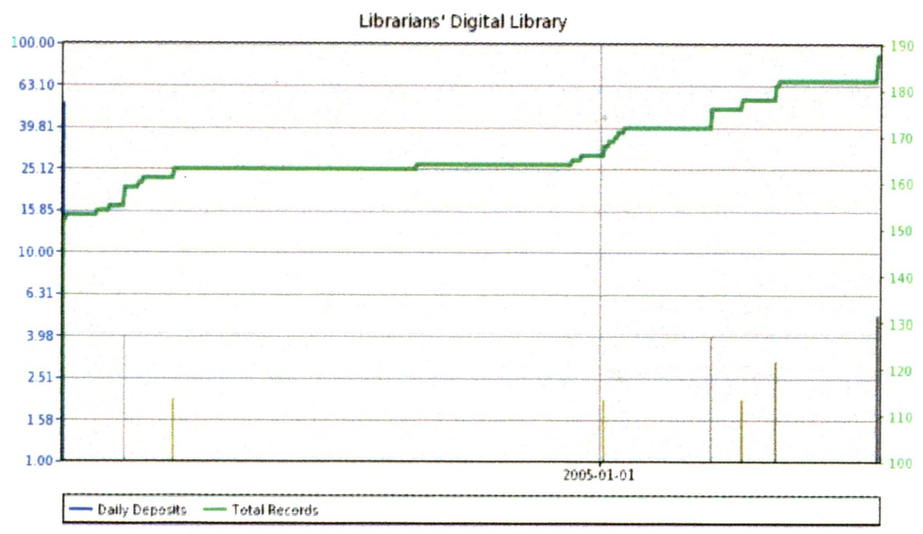
are concerned, only 3 belong to the universities. A comparision of this figure with the total number of universities proves H3 that "Very few Indian universities are having their own IR".

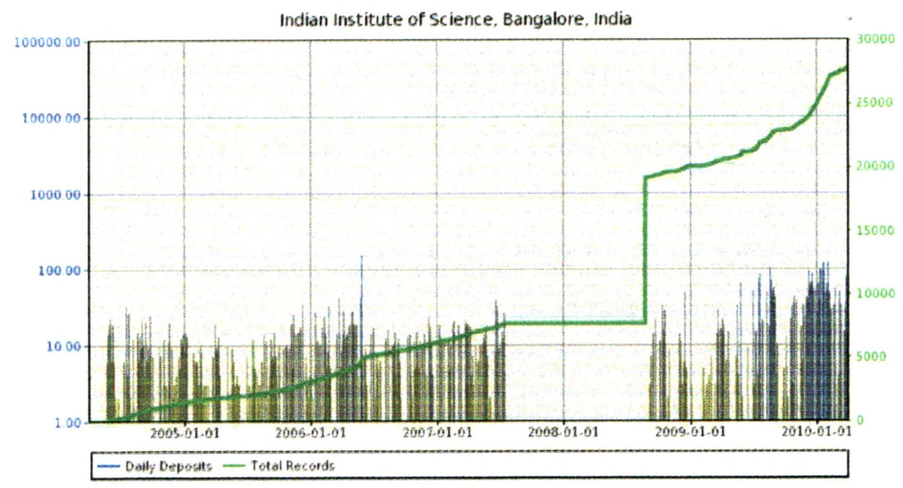
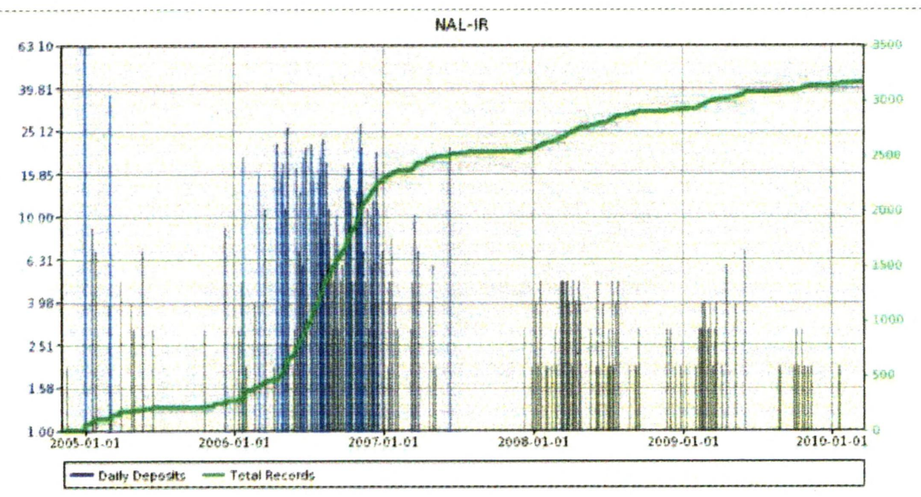
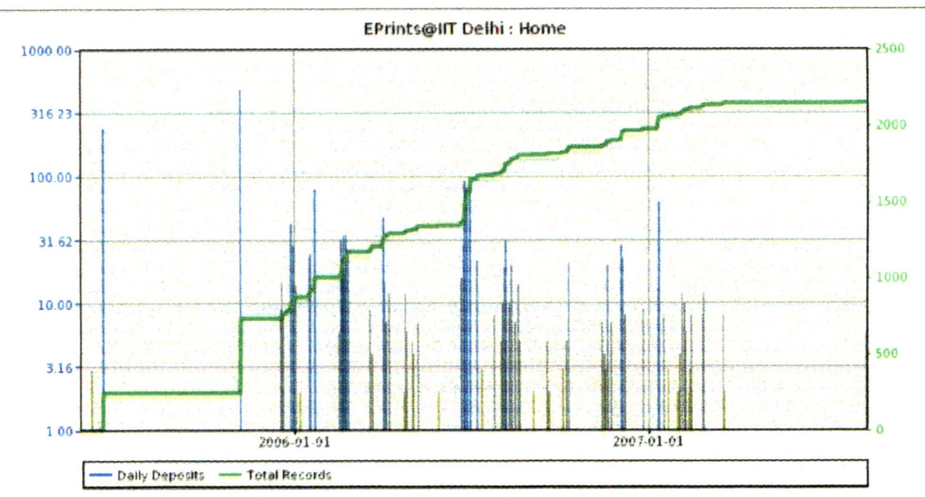
Hypothesis 4(H4): ***Indian IRs provide access and usage statistics.***

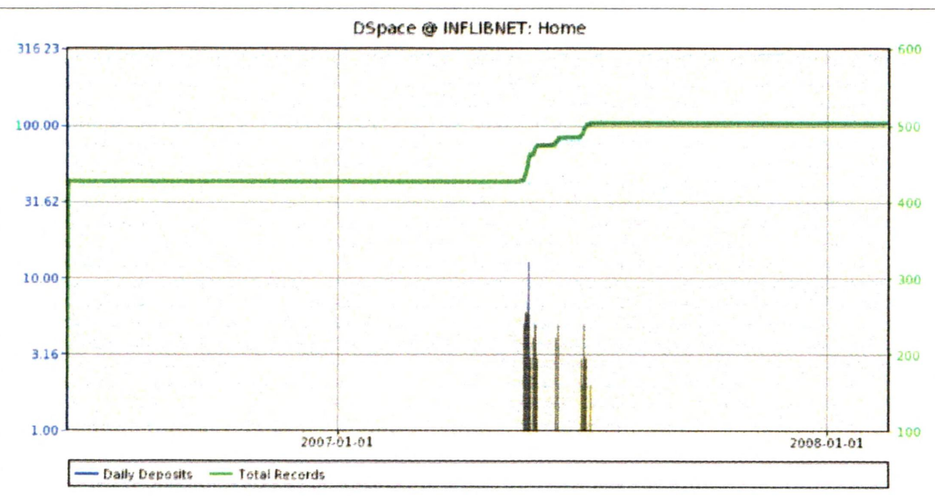
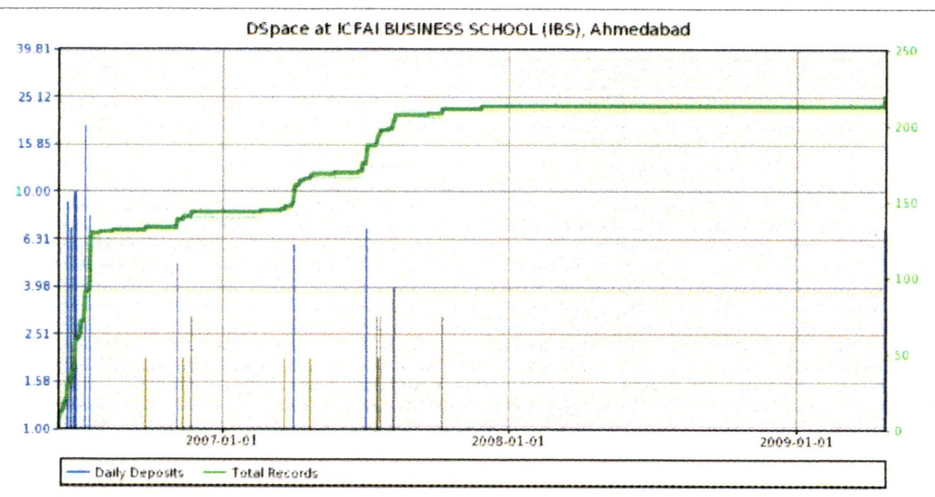
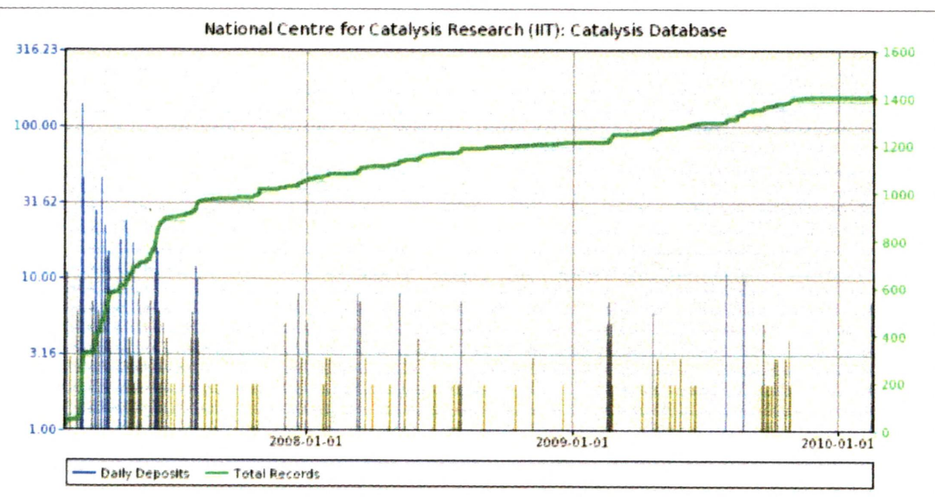
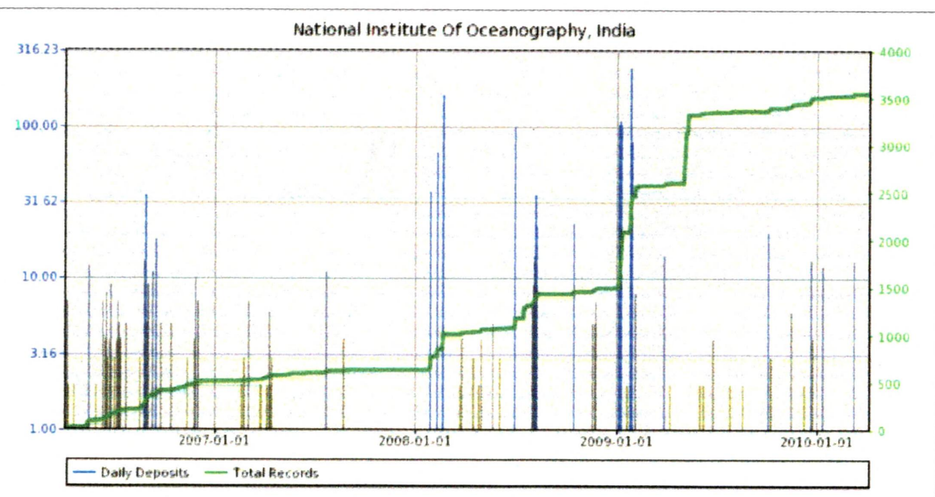
According to table 6.17 (p. no. 248), 72% Indian IRs maintain the IR usage/download statistics while about 28% do not maintain the same. This proves the H4 that Indian IRs do provide access and usage statistics.

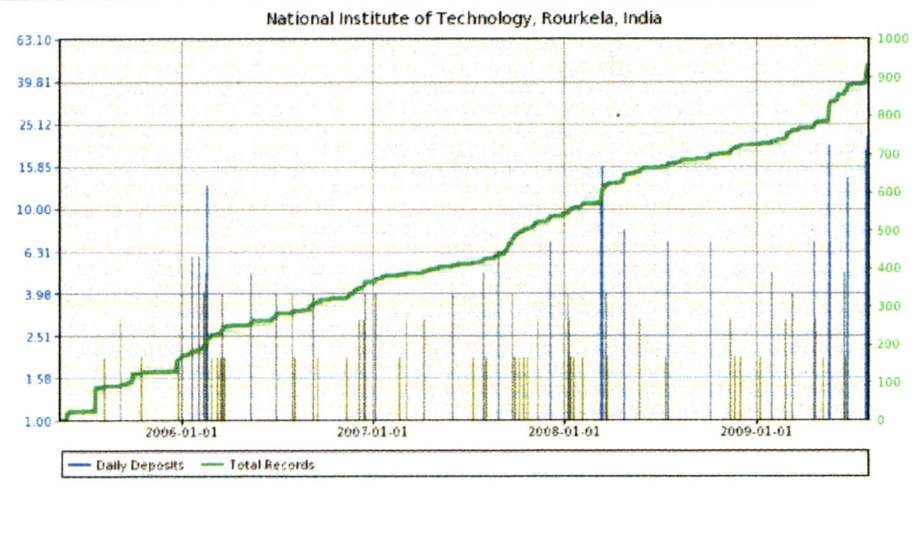
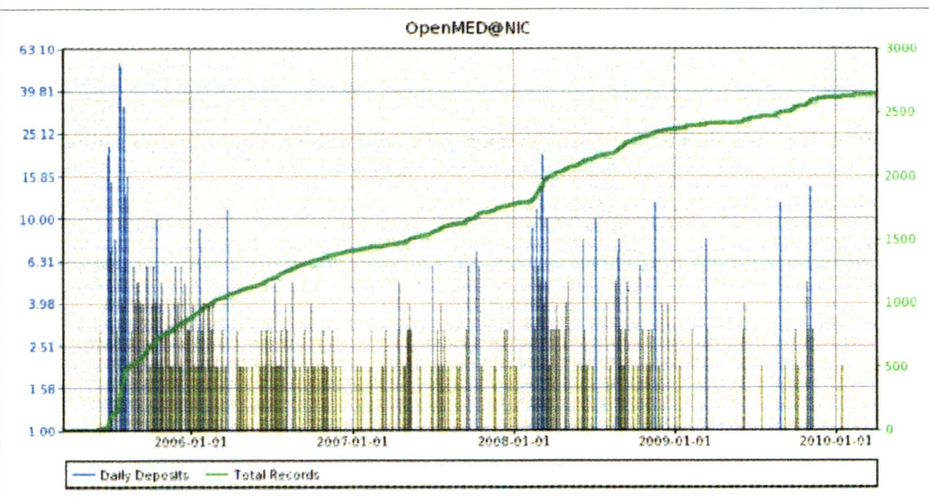
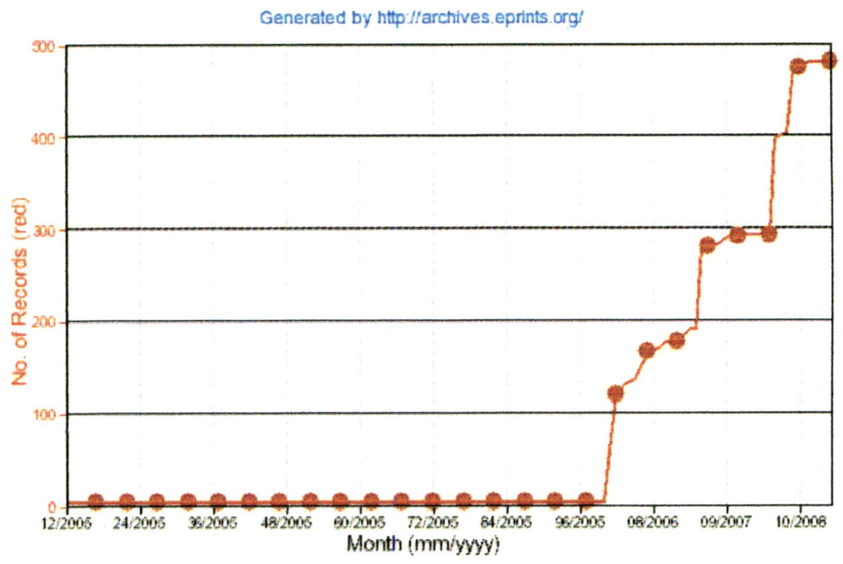
Hypothesis 5(H5): ***Indian IRs have satisfactory document submission rate.***

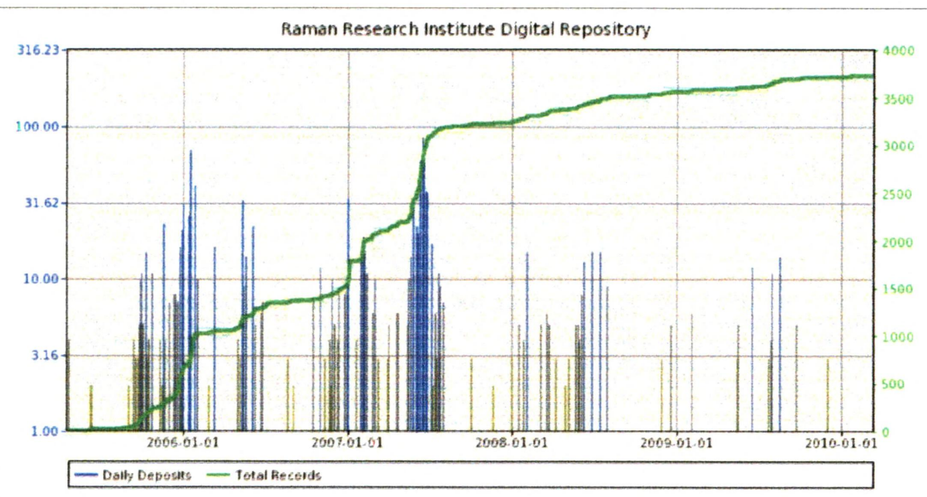
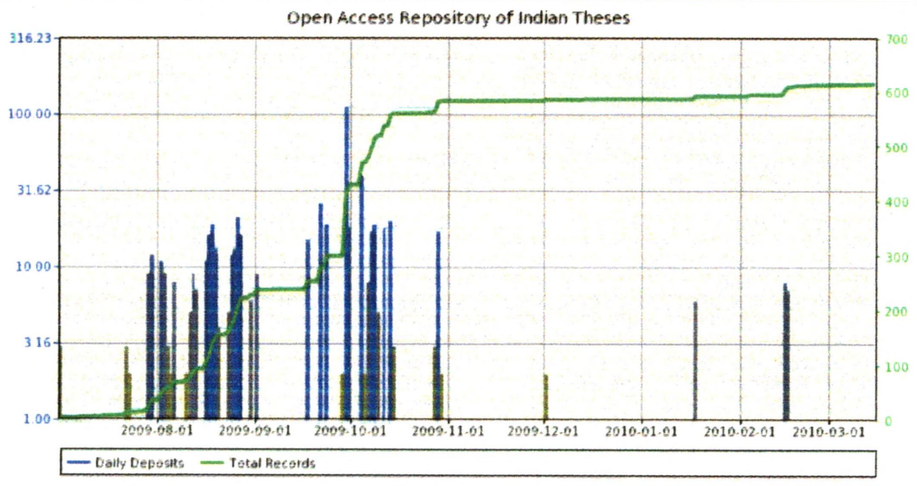
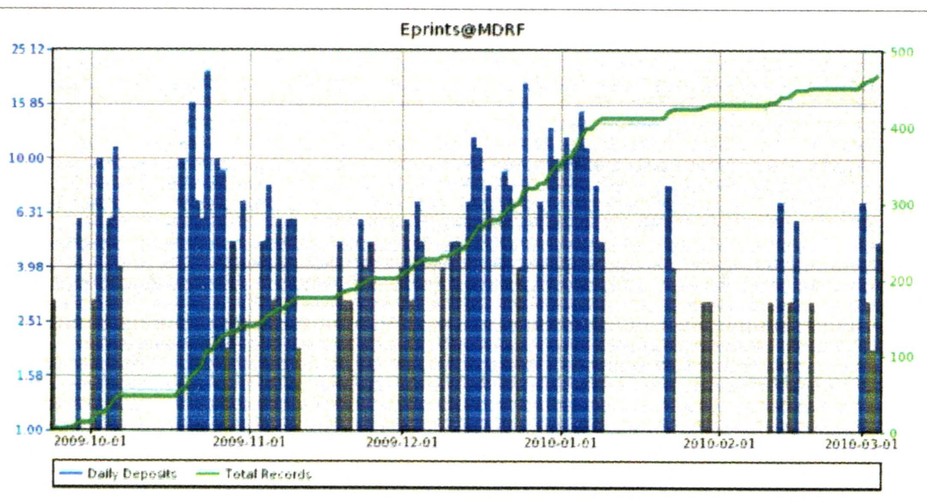
Figure 6.25 (p. no. 268) suggests that about 56% IRs are satisfied with the response and document submission rate of their content contributors whereas about 44% IRs are dissatisfied with the submission rate. To further analyse, the global database "Registry of Open Access Repositories" (ROAR) was consulted. The graphs below represent the growth rate of the Indian repositories.

S. no.	Repository	Document submission rate	Pattern
1	LDL-DRTC		▲

2	ePrints@IISc		▲
3	NAL Repository		▲
4	DSpace@IITB	Data not available	
5	EPrints@IITD		▲

6	DSpace@INFLIBNET		▲
7	DSpace@IBSA		▲
8	ePrints@NCCR		▲
9	DRS@nio		▲

10	DSpace@NITR		▲
11	OpenMED@NIC		▲
12	DSpace@TU		▲
13	MGU Theses Online	Data not available	

14	DSpace@RRI		▲
15	ePrints@CSIR		▲
16	DSpace@ICRISAT	Data not available	
17	EPrints@MDRF		▲

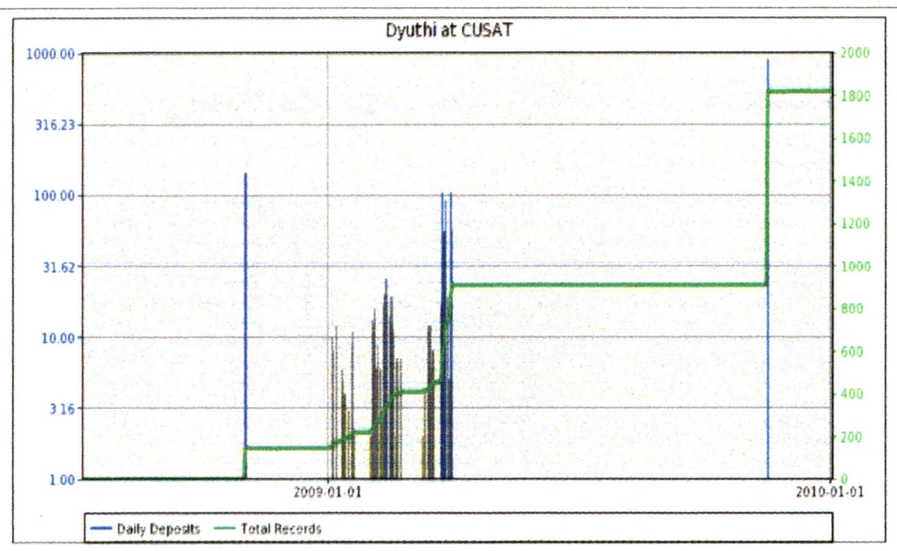
18	DSpace@CUSAT	

Table 6.33 Growth rate of Indian IRs[3]

Table 6.33 based on ROAR data strongly indicates that 14 Indian IRs (data was not available for 4 IRs) have increasing growth rate of document submission thus proving H5 that "Indian IRs have satisfactory document submission rate."

Hypothesis 6(H6): ***Peer-reviewing is mandatory for inclusion in the IRs of India.***

Figure 6.19 (p. no. 255) indicates that about 61% IRs have mandatory peer reviewing policy, whereas in 39% IRs peer-reviewing is optional. Thus, H6 is found to be true.

Hypothesis 7(H7): ***Indian IRs offer both self-archiving as well as of mediated deposit facility.***

Figure 6.21c (p. no. 260) indicates that a majority of the IRs, i.e. about 83% have adopted the practice of self-archiving while about 16% IRs are following the mediated deposit. This proves the H7 that "Indian IRs offer both self-archiving and the facility of mediated deposit."

[3]. Country matches any of "India" - Registry of Open Access Repositories. (n.d.). Retrieved August 7, 2010, from http://roar.eprints.org/cgi/roar_search/advanced?location_country=in&software=&type=&order=-recordcount%2F-date

Hypothesis 8(H8): ***Publishers' copyright policy is verified before accepting any submission.***

Figure 6.23 (p. no. 265) indicates that the publishers' policy is verified by the repository IR administrator/staff in 50% Indian IRs and by the authors/depositors in about 22% IRs. Thus, the total percentage of Indian IRs where publishers' policy regarding self-archiving is verified is 72% (22%+50%). In 33% Indian IRs, the self-archiving policy of the publishers' is verified both by the authors as well as by the repository administrators/managers. Further, as per Figure 6.24 (p. no. 267), declaration on behalf of the authors (72%) and disclaimer by the IRs (44%) also strengthens the argument that Publishers' copyright policy is verified before accepting any submission.

Thus H8 i.e., "publisher copyright policy is verified before accepting any submission" is proved to be true.

Hypothesis 9(H9): ***Most of the Indian IRs have deployed DSpace for establishing IR for their institution***

As per figure 6.7 (p. no. 224), about 53% Indian IRs use the D-Space software, about 37% IR use the E-prints, one IR (5% appx.) uses Greenstone and one IR (5% appx.), i.e., MGU Theses Online is using Nitya as the IR software. It becomes clear that DSpace software is being implemented in majority of IRs in comparison to EPrints or any other software.

This proves the H9 that "most of the Indian IRs have deployed DSpace for establishing IR for their institution".

Hypothesis 10(H10): ***Most of the internationally reputed commercial publishers do not allow authors for self-archiving of the pre-print or post-print of their work.***

Publisher's copyright and self-archiving policies are being consolidated by SHERPA RoMEO. It has assigned different colours (Table 6.34) for the categorization of publisher's archiving policies.

S.No.	RoMEO colour	**Archiving policy**	**Publishers**
1	green	can archive pre-print and post-print	201
2	blue	can archive post-print (ie final draft post-refereeing)	176
3	yellow	can archive pre-print (ie pre-refereeing)	73
4	white	archiving not formally supported	267
		Total	717

Table 6.34 Publisher Archiving Rights[4]

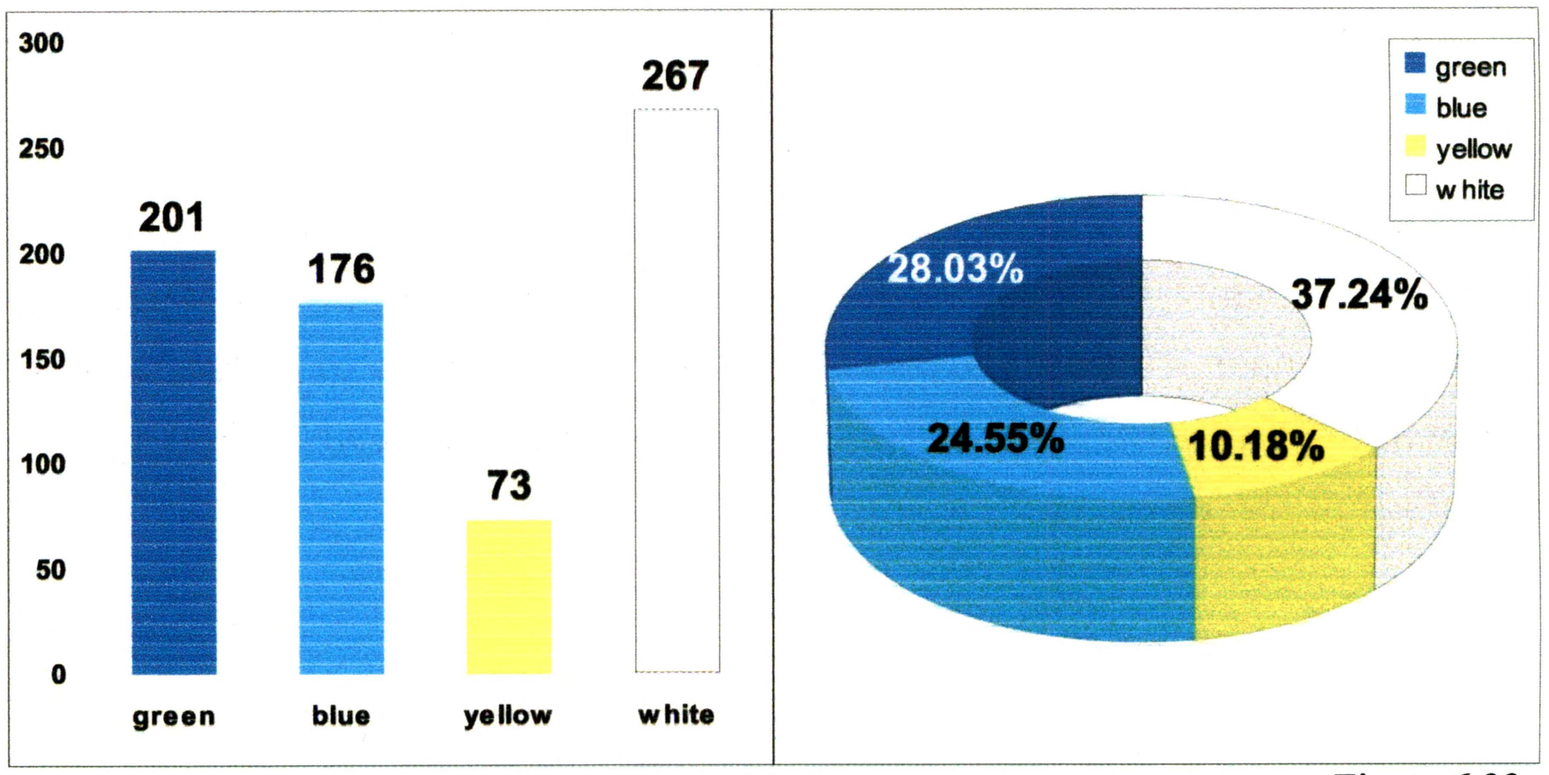


Figure 6.33a

Statistics of Publishers and their archiving colours

[4]. SHERPA/RoMEO Home - Publisher copyright policies & self-archiving. (n.d.). Retrieved August 7, 2010, from http://www.sherpa.ac.uk/romeo/

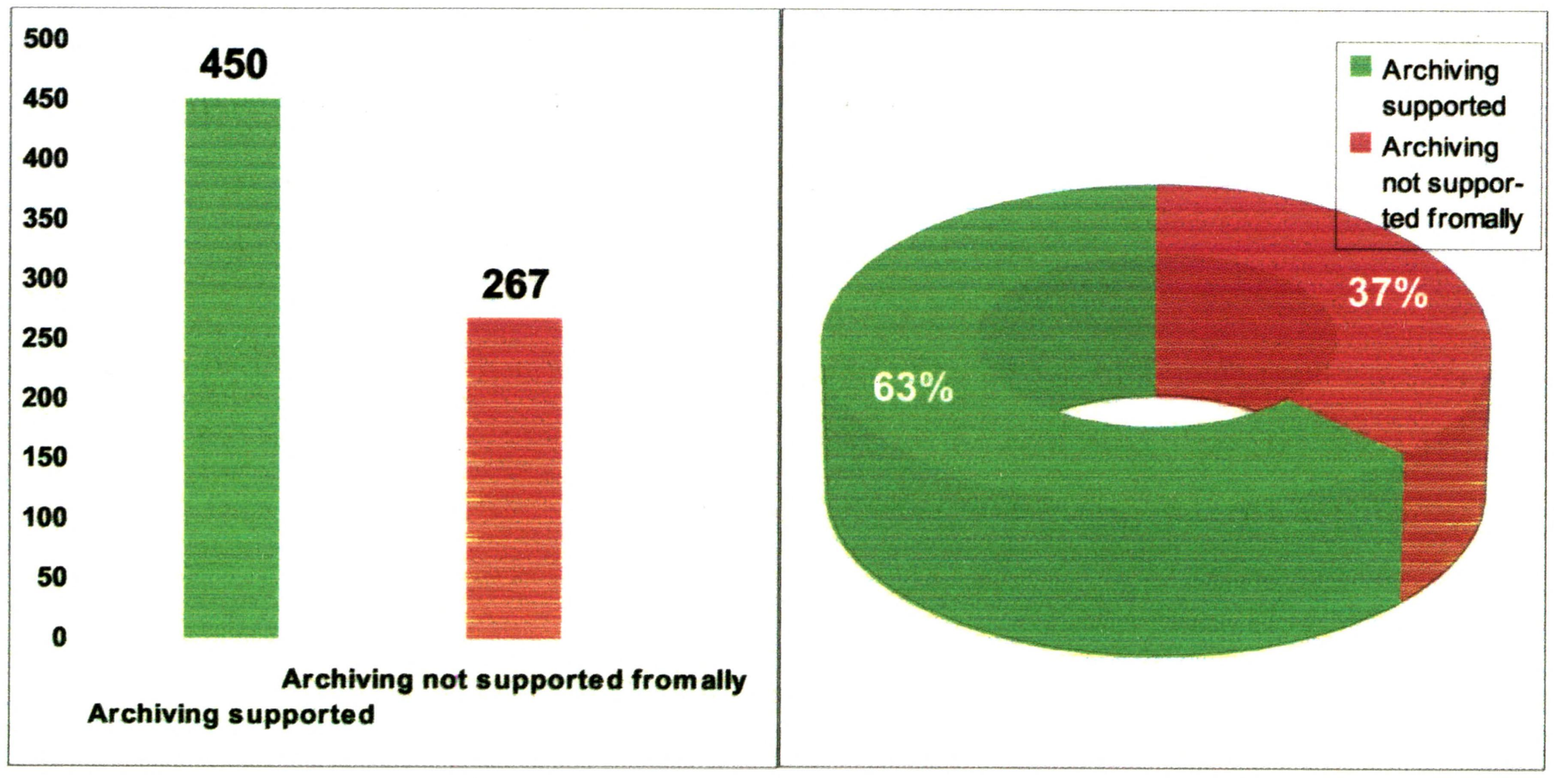


Figure 6.33b Statistics of Publishers and their archiving colours

Figures 6.33(a-b) above indicates the percentage of publishers according to their publishing colours. According to this figure, 63% (28% +25%+10%) of publishers on this list formally allow some form of self-archiving. This contradicts hypothesis 10 that most of the internationally reputed commercial publishers do not allow authors for self-archiving of the pre-print or post-print of their work.

Some publishers also allow deposition of the published version/PDF of authors papers in institutional repositories. Permission to deposit published version of the paper may be granted by the publisher with or without embargo period as restriction before they can be openly accessible. Table 6.35 below presents the current status of deposit condition of the publishers.

S.No.	Deposit Condition	No. of Publishers
1	Embargos Required ■ 3 months ■ 6 months ■ 12 months ■ 18 months ■ 24 months	 1 8 8 2 5

	■ 4 years	1
	■ 5 years	1
	■ Various embargo lengths	1
	■ Permission required	14
	■ Payment of a fee and an embargo period	4
	-------	-----
	Total	**45**
2	Publishers with Paid Options for Open Access	**80**

Table 6.35 Embargo period and Paid option for Open Access

Above table suggests that apart from 63% publishers which allow self-archiving in repositories, there are 45 more publishers which do permit self-archiving after the embargo period (ranging from 3 months to 1 -2 years) is over. There are 80 more publishers which provide open access to the full text of their articles through paid options in which research funding body pays on behalf of the authors.

The ultimate benefit in both the cases, whether embargo period or paid option, goes to the end users thus strengthening the argument contradicting the hypothesis that most of the internationally reputed commercial publishers do not allow authors for self-archiving of the pre-print or post-print of their work. Thus, H10 is disproved.

Hypothesis 11 (H11): ***Europe and America have more number of repositories as compared to Asia and Africa.***

The number of repositories is maximum in Europe followed by US which include North America (409 repositories) and South America (67 repositories). Asia and Africa have far less number of repositories. Table 6.36 shows the statistics regarding the number of repositories in these continents.

SN	Geographical Location	No. of Repositories
1	Asia	200
2	Africa	38

3	Europe	783
4	USA	521

Table 6.36 Population of repositories (continents-wise)[5]

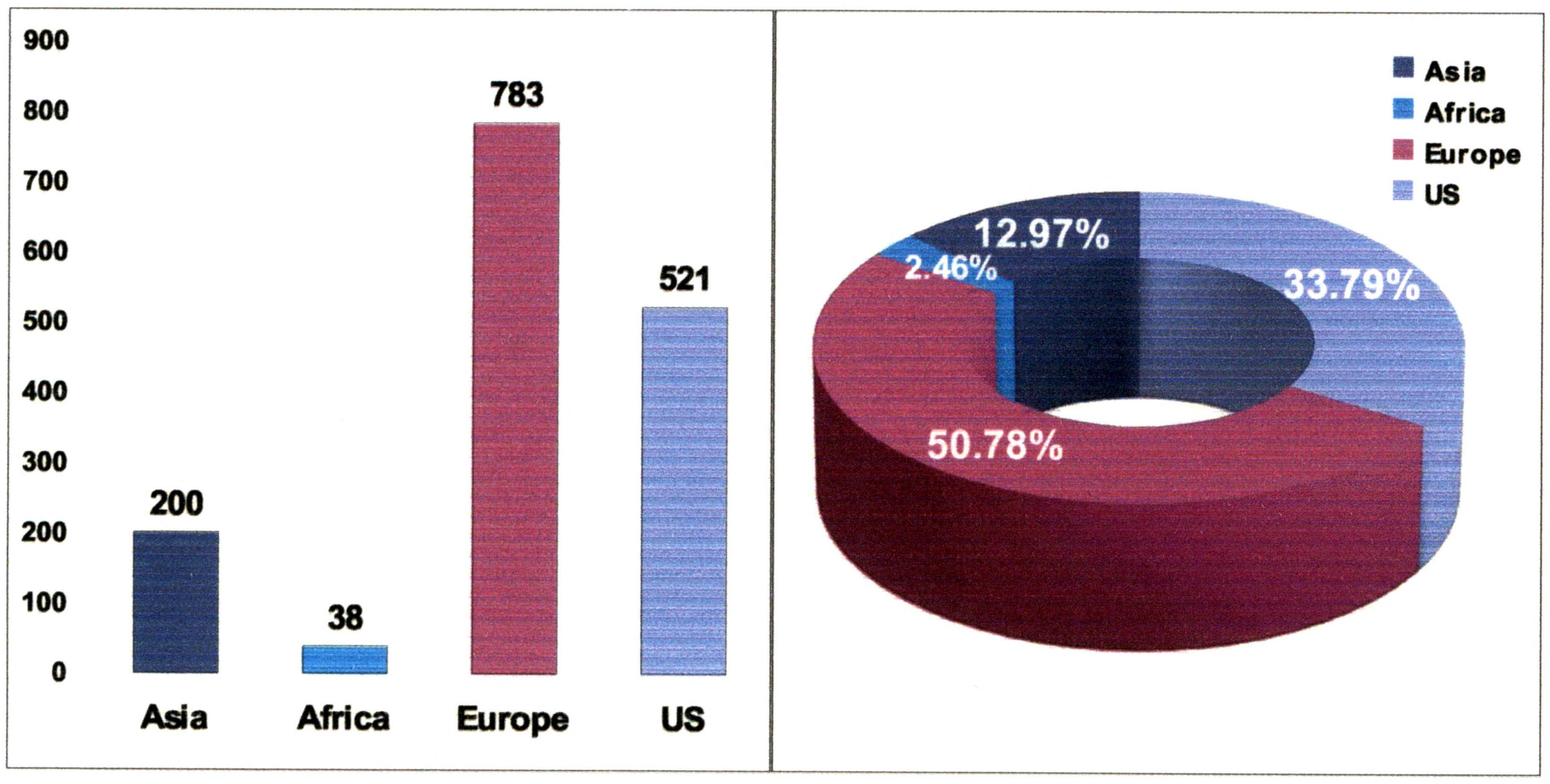


Figure 6.34a. Population of repositories (continent-wise)

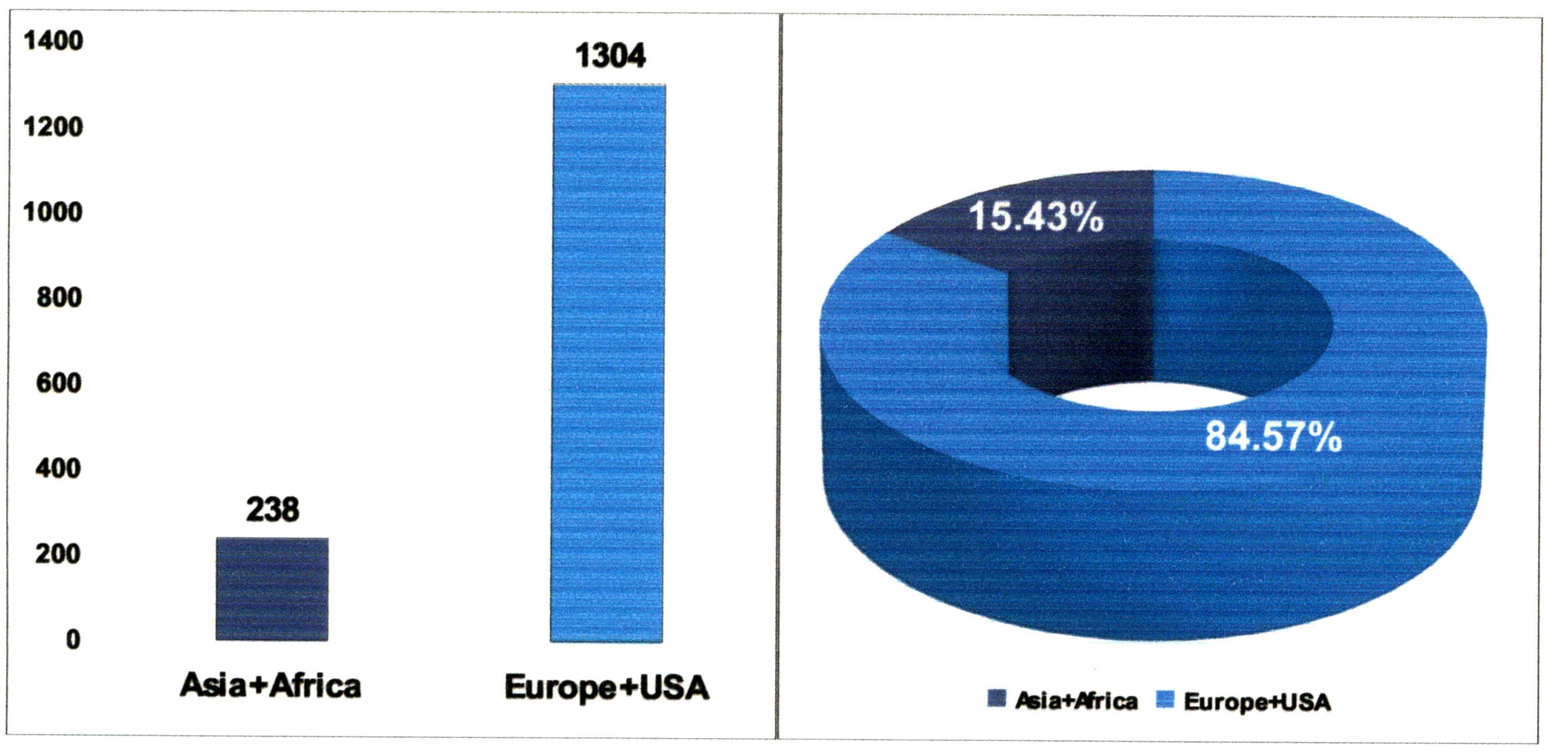


Figure 6.34b Population of repositories (continent-wise)

Figures 6.36(a-b) above indicates that Europe and America account for

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[5]. OpenDOAR - Home Page - Directory of Open Access Repositories. (February 03, 2010). Retrieved September 5, 2010, from http://www.opendoar.org/

about 85% IRs as compared to Asia and Africa which account for only 15%. This proves H11.

Hypothesis 12 (H12): ***Libraries can play a vital role in taking initiation and setting up of IRs.***

Figure 6.2 (p. no. 214) indicates that about 67% repositories were established because of the initiatives taken by the library or information centre. LDL-DRTC (teaching and research in the domain of Library and Information Science) was the outcome of the initiative taken by LIS teachers which accounts for 5.56% IRs. It is very clear from these results that libraries do play a vital role in the establishment of IRs. Thus, H12 is proved.

Hypothesis 13 (H13): ***It will be difficult for the libraries to setup IRs as it will be a financial burden.***

As per Figure 6.11 (p. no. 237), about 83% IRs are satisfied with the previously existing hardware and network resources for IR implementation and it helped lowering the cost incurred in establishing the IR. Figure 6.12 (p. no. 236) indicates that about 72% Indian IRs don't have the dedicated budgetary allocation for the IR and about 83% Indian IRs are of the view that additional funding is not required.

Figure 6.13a (p. no. 241) indicates that the expense involved in the establishment of IR was moderate in about 33% Indian IRs, while 67% Indian IRs got support from the existing ICT infrastructure as it helped lowering the cost incurred in establishing the IR. But none of the IRs found the establishment work a financial burden. Hence, H13 is found to be false.