

Prospect of Institutional Repositories in Universities of Bangladesh

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Abstract

Institutional Repositories are getting attention of the researchers and their institutions to showcase their own works to others. These are becoming popular specially for unpublished items. Universities are pioneers to initiate establishment of institutional repositories to preserve their faculty and students works. Institutional repositories are playing an important role in World University ranking, as it makes easy access to other researchers. Though, the faculty members of the universities of Bangladesh are regularly contributing to knowledge through their research works and many universities are offering research degrees like, MPhil, PhD, very few universities of the country have such initiatives. Bangladeshi universities need to come forward to establish institutional repositories to showcase their own volume of research from one place.

Keywords

Institutional Repository, Research, Publications, University Ranking, Libraries, Bangladesh

Introduction

The concept of "Institutional Repository" or IR has been receiving considerable attention of the librarians of the western world for the last two decades. The Asian history for establishing IR is almost the same. The libraries of Japan, China, and India are the pioneers in this regard. Universities are playing a vital role for introducing this service in their libraries. The current form of IR, which is getting popularity, is in the

digital form. The definition of IR, which is accepted by the current librarians focuses mainly on the digital format. Easy accessibility of the resources of IR is treated as one of the essential criteria of IR. The internet provides easy accessibility. The resources of digital IR can be accessed throughout the world if it is connected with the internet. The digital IR helps the universities to showcase their scholarly activities. The open access IRs help the authors getting high citations. Many researchers do not have access to required contents due to their inability to subscribe or purchase those. Such researchers may have a copy through the Open Access IRs. Naturally, the authors will have more opportunity to have more citations. Moreover, there is a good number of unpublished items which are regularly producing in universities and mostly those are not appearing to the public in the official forms, like books, journal articles, etc. Theses, dissertations, working papers, etc. are the prominent unpublished items. These unpublished items can be showcased through the current form of IRs. Some universities believe that the IRs would enhance the prestige of the universities through showcasing their faculty's research works. Stepping to establishing digital IRs the universities of Bangladesh can have a platform which can help disseminate their scholarly works and make those accessible to the researchers all over the world.

Objectives

This paper aims to present a brief overview of the 'Institutional Repository' in the context of practices in the world libraries and to give an understanding of its prospect in Bangladesh, specially in this country's university libraries.

Methodology

A sample survey was conducted to understand the position of some leading public and private universities of Bangladesh. Six public and six private university libraries were asked about the collection status of their own research works and publications. Five public and six private universities answered the questions. On the basis of their responses, surfing websites related to institutional repositories, researching SCOPUS and reviewing the literatures on the 'Institutional Repository' helped to shape the understanding of the prospect of institutional repositories in Bangladesh. This paper is the outcome of such understanding.

Definition of IR

The most popular definition of IR is given by Clifford A. Lynch (2003). He defined it as "a university-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members." He also

mentioned, "It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution." The statements of Lynch addressed to some important issues, such as, institutional community, organizational commitment, long-term preservation, and services to researchers.

Some essential characteristics of an institutional repository were identified by Crow (2002) in a position paper developed for the Scholarly Publishing and Academic Resources Coalition (SPARC). He mentioned some essential elements of IRs, which were: (i) institutionally defined, (ii) scholarly content, (iii) cumulative and perpetual, and (iv) interoperability and open access.

The institutional repositories preserve the original research, scholarly works, and other intellectual property generated by the own institutions or by their constituent population. In an organization various people are active various areas and contributing. Some of them may develop new dimensions in the process and they usually share it through developing papers. Such papers may come out in different formats, such as, journal articles, working papers, books, thesis, dissertations, etc. sometimes these are sponsored by the own organization, sometimes these are developed for other organizations or published outside their own organization. Wherever they contribute, the institutional repositories try to capture their own people's new and original outputs. This concept is termed as "Institutionally defined" by Crow and "Institutional Community" by Lynch.

"Long-term Preservation", mentioned by Lynch and "Cumulative and Perpetual" identified by Corw both convey the same idea. Lynch gave more importance to this concept by identifying "Organizations Commitment" as an essential issue. In fact without the "Organization Commitment" long-term preservation cannot be achieved. Merely librarians' initiative in the universities cannot ensure "Cumulative and Perpetual" access to the resources. The appropriate authorities' approval is essential. This has to reflect the goals and objectives of the organization.

All these efforts are for ensuring service to the researchers. The extent of service needs to be determined. Recently, Open Access (OA) is getting considerable popularity. Open access IRs ensure higher accessibility to the resources. Making IRs open access also needs organizational commitment. The current form of IRs demand at least a part of resources will be open to all. OA activists are mostly in favour of complete open access IRs. In their view this is the most effective way to ensure maximum access to the scholarly works (Harnad, 2001). Harnad (2001) strongly opined to keep open all works at least which are publicly funded.

Growth of Repositories

Preservation of own scholarly works of the universities is not a recent trend. Since medieval period university faculty members have been playing an important role in this regard (Brichford, 1971). But those were useable only inside the libraries. At best, materials could be borrowed under the inter-library loan system. Preserving resources in digital form brought about a revolution. Information Technology (IT) has played an instrumental role in ensuring easy access to these scholarly items.

The use of information technology earned popularity in the 1980s (Paul, 2014). Librarians mostly used IT to replace their card catalogues. Some libraries were able to introduce circulation by using IT. Digitization started receiving attention in the 1990s. Even in 1994, the digitization was a new phenomenon to the libraries of USA (Waters and Garrett, 1996). National Science Foundation (NSF) of USA identified the digital libraries as an important research area and provided support throughout 1990s (Fox, 1999). In this decade, IT services extended in many folds, especially the internet and World Wide Web made a tremendous progress in the arena of information delivery and accessing. In this period subject based repositories were grown. The most popular subject based repository was established in 1991. It was arXiv which was established for preserving digital version of papers in particles and high-energy physics and later expanded its scope by including mathematics, computer science, nonlinear sciences, quantitative biology and statistics (arXiv.org). The arXiv was established initially at Los Alamos National Laboratory and later shifted to Cornell University Library. The popularity of arXiv motivated other professionals to develop repositories on their own subject areas. The prominent subject repositories are: RePEc (Research Papers in Economics) for economics, CogPrints for cognitive science, NTRS (NASA Technical Reports Server) and ADS (Astrophysics Data System) for astronomy, astrophysics and geophysics, AgEcon Search, AEI (Archive of European Integration), NCSTRL (Networked Computer Science Technical Reference Library) for computer science, Organic EPrints, PubMed for Health Science, Social Science Research Network (SSRN), etc.

The initiatives for establishing centralized repository for preserving Electronic Theses and Dissertations (ETD) was seen in mid 1990s. Virginia Tech University, University of Michigan and two small software companies decided in meeting held in 1987 in Michigan, USA, to establish a centralized ETD and the output of the meeting was the Networked Digital Library of Theses and Dissertations (NDLTD) which was established in 1996 (Ahmed et al., 2014; NDLTD, n.d.). Ahmed, Alreyaee, and Rahman (2014) found that forty universities of the USA and hundred institutions from

the rest of the world were contributing to NDLTD. Later some countries had given effort to establish nationwide centralized ETP repository. It can be mentioned that in Asia, China, Japan and South Korea established such national repositories. It was also observed that some universities initiated to maintain their repository for ETD and some of them made students mandatory theses and dissertations submission to their institutional repositories, such as Cranfield University in the UK (Bevan, 2005).

Researchers found difficulties in subject based or centralized repositories. These repositories were not controlled by the researchers of those subjects. A repository serves the organizations better of which the repository is a part. However, there were distrust and fear among the researchers of losing control over their works. Due to that, participation of researchers in the centralized system of repository was very low.

Researchers looked for more dependable repositories and eventually "Institutional Repositories" emerged. The researchers found it more dependable because this is the part of their own organization or institution and they can have better control over it. Release of two software, Eprint in 2001 and DSpace in 2002, both open sourced software, have high influence in expanding repositories in the institutions individually. The sharp increase of the repositories started after these two software were released. Many universities those had required infrastructure started to establish their own repositories using these software. According to Open DOAR, over 50% repositories of the world are using DSpace and Eprint is used over 27% repositories.

Alongside, Open Access (OA) concept received attention of the researchers. In fact researchers raised their voices against the high prices of journals. The high price of journals hinders many researchers to get access to the research contents. As a result the authors were not getting adequate citations. Harnad (2001) wrote extensively in popular scientific journal 'Nature' on this issue. He strongly advocated that the authors wrote for citations and high pricing of journals were the impediment to get citations. He advised to make active the alternative channels for scholarly communication. He tried to motivate researcher to publish their works through the gold channel, i.e., Open Access Journals and initiate for green channel, i.e., establishing institutional repositories. Many researchers of the world also had the same feelings. The reflection of such researchers' attitude was found in the Budapest declaration on Open Access (OA) initiatives in 2002. The Budapest Open Access Initiative (BOAI) is the bench mark of OA movement. The purpose of this movement is to take the advantage of the internet and make literature availability free to all. That is researchers should be able "to read, download, copy, distribute, print, search, or link to the full text of the articles, crawl them for indexing, pass them as data to software, or use them for any other

lawful purpose, without financial, legal or technical barriers other than those inseparable from gaining access to the internet itself" (Krishnamurthy and Kemparaju, 2011). It is also the foundation of open access institutional repositories. Institutional repositories along with ETDs started to collect other items, such as faulty works.

Bailey (2006) mentioned top three reasons for implementing an IR in universities. These were: 1) to increase global visibility, 2) the free, open and timely access to institution's scholarship, and 3) preservation of and long term access to institutional scholarship (Woodberry and Bailey Jr, 2008).

A good number of universities made their faculty members and students compulsory placement of their research outputs into their respective institutional repositories. Sometimes final products cannot be submitted due to embargo of publishers. In such situation pre-prints can be kept into IRs. Other than research papers, researchers can submit data sets, images, multimedia content, etc. All contents of IRs can be searchable from the library's Online Public Access Catalog (OPAC) in addition to Google Scholar. The IR managers provide required metadata to ensure appropriate access to items through Online Public Access Catalog (OPAC) or Google Scholar. This service is emerging as a clearinghouse for the institution's scholarly works.

Repository Establishment by Department

The modern institutional repositories are mainly in digital form. To organize, establish and running a successful institutional repository needs involvement of various stakeholders. Its digital nature demands obviously the involvement of information technology personnel. It is true that establishment of IR needs help of IT staff members of the university. To run it the manager of IR needs skills which are fully related to skills of librarians. Libraries are known as repositories of knowledge. Libraries preserve knowledge/information items for long time survival. Librarians take necessary initiative for collecting and preserving knowledge/ information items. They are experts in selecting required information items for the benefit of their users. Libraries have long history of storing and managing information items. They organize the collected information items for their logical dissemination. They are dealing regularly with the knowledge users. They can evaluate the performance of collection and make decisions relating to access, conservation, and preservation (Chan et al., 2005). They are utilizing information technology for the improvement of service. The introduction of technical infrastructures of libraries enables long-term sustainability of resources (Kretzschmar and Potter, 2010; Kutay, 2014). To adapt with the new technological demands librarians are continuously trying to update their own access systems to resources preserved (Balnaves, 2005).

Librarians' skills may be related to print materials. But many of their skills related to print collections can be transferable to the digital environment (Rao, 2007). Moreover, librarians showed their enthusiasms to prepare themselves for the digital world (Allard et al., 2005; Hirko and Ross, 2004). In view of Allard et al (2005), librarians were qualified for managing institutional repositories. They mentioned, "Librarians have kept pace with the dynamic information environment and have adapted collection manager responsibilities to address issues related to the introduction of digital materials which have changed the very character of the collections (Branin et al., 2000; Lee, 2000; Pettijohn and Neville, 2003)".

Librarians found that their expertise of information management matches with the various works of information technology related jobs. Acquiring skills related to repository running, librarians initiated to capture scholarly outputs of the universities available on the web and established institutional repositories to put those (Hanlon and Ramirez, 2911) and the academic community takes these initiatives positively. Many literature shows that librarians are the pioneer in establishing IRs. A study found that 71.1% institutional repository personnel of Australia had background of library and information management (Kennan and Kingsley, 2009; Simons and Richardson, 2012). The Indian library science professionals' association in establishing and maintaining institutional repositories is also very high (Sawant, 2011). Half of the members of the Association of Research Libraries (ARL) of United States of America (USA) were found, by Bailey et al. (2006), to either have or plan to implement institutional repositories soon. This indicates that librarians are playing a vital and leading role in the growth of institutional repositories (Simons and Richardson, 2012).

Research Publishing Trends in Bangladesh

Several organizations were established to conduct research in various subject areas. We can mention few organizations on an specific field. In agriculture research organization are functioning are: Bangladesh Atomic Energy Commission (BAEC), Bangladesh Agriculture Research Council (BARC), Bangladesh Agriculture Research Institute (BARI), Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh Fisheries Research Institute (BFRI), Institute of Child and Mother Health (ICMH), Bangladesh Institute of Development Studies (BIDS), Bangladesh Institute of Nuclear Agriculture (BINA), Bangladesh Livestock Research Institute (BLRI), Bangladesh Rice Research Institute (BIRI), International Centre for Diarrhoeal Disease Research Bangladesh (ICDDR,B), National Institute of Preventive and Social Medicine (NIPSOM) and many more.

In addition to teaching, universities have a responsibility to conduct research. Bangladeshi universities also are regularly contributing in research. Students are working under the supervision of the faculty members, producing theses and dissertations. Moreover, the faculty members are also pursuing research and their research works outputs are publishing in various forms, such as an article of a journal, or as a book, etc. SJR (SCImago Journals & Country Rank) is a database which maintains records of world journals based on Scopus, a service of Elsevier for ranking research of the world, and ranks journals. It was checked in May 2016 to understand the position of Bangladesh. We found that SJR recorded around twenty seven thousand publications which were published between 1996 and 2014 where Bangladeshi researchers were associated. These documents were either journal articles or conference papers on various disciplines. Table 1 shows the year-wise coverage of subjects of Bangladeshi research outputs recorded in SJR during 1996 to 2014.

Table 1: Year-wise subject coverage of publications of Bangladeshi researchers

Subjects	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Agricultural and Biological Sciences	131	121	99	112	121	132	121	131	149	193	257	297	291	353	441	469	481	547	537
Arts and Humanities	4	4	6	8	5	4	7	6	7	11	15	13	15	23	28	35	46	40	110
Biochemistry, Genetics and Molecular Biology	44	33	41	32	39	49	48	59	61	72	98	132	133	148	190	214	258	310	379
Business, Management and Accounting	2	5	4	2	3	3	6	1	4	9	10	19	21	27	28	50	48	51	56
Chemical Engineering	14	12	11	15	19	14	20	30	21	40	29	37	41	65	109	100	109	90	111
Chemistry	39	41	43	70	33	71	54	62	84	89	82	115	90	105	96	150	160	157	172
Computer Science	10	15	29	15	29	14	23	28	41	72	93	319	378	363	352	357	491	536	713
Decision Sciences	1	5	6	1	2	3	5	3	-	2	5	6	5	10	19	24	16	14	19
Dentistry	1	2	-	1	3	-	1	1	-	-	-	1	1	1	1	1	2	4	3
Earth and Planetary Sciences	13	18	23	15	28	24	28	28	35	23	46	41	58	67	67	82	95	112	112
Economics, Econometrics and Finance	3	9	6	2	3	6	1	5	3	13	9	13	21	33	29	44	51	57	68
Energy	12	16	13	13	22	29	9	23	18	20	26	36	33	85	42	62	106	75	241
Engineering	56	75	85	62	79	69	89	86	115	153	180	323	382	285	532	393	767	711	825
Environmental Science	27	38	46	43	57	53	78	81	93	100	122	142	145	181	216	211	270	287	323
Health Professions	1	-	1	3	2	4	1	-	1	2	3	2	9	1	12	17	11	13	5
Immunology and Microbiology	26	14	17	19	29	20	22	28	41	46	65	68	56	95	100	106	125	130	137

Materials Science	57	45	52	58	68	63	77	83	89	94	112	136	107	146	182	202	205	223	181
Mathematics	23	19	30	19	22	19	35	34	42	26	46	40	63	95	102	102	135	127	111
Medicine	145	149	137	180	194	189	146	213	218	241	307	336	397	461	487	601	723	719	766
Multidisciplinary	8	9	15	18	8	9	7	24	15	21	29	30	16	36	33	30	32	74	52
Neuroscience	-	4	2	3	1	-	1	6	2	3	6	3	5	7	7	6	15	14	21
Nursing	10	10	9	11	9	10	16	24	15	13	19	25	27	31	41	42	42	30	35
Pharmacology, Toxicology and Pharmaceutics	17	15	15	26	18	28	23	29	37	31	46	67	85	110	135	224	198	156	168
Physics and Astronomy	63	58	70	71	82	78	73	108	101	104	98	103	139	134	146	213	235	264	247
Psychology	1	1	1	2	4	2	1	3	2	5	1	6	7	4	12	10	13	12	18
Social Sciences	32	38	41	43	39	44	38	62	58	61	75	74	93	109	161	159	178	188	232
Veterinary	9	6	9	8	6	13	9	15	20	15	19	14	20	23	35	33	53	52	50

Recently, Scopus was searched with the term "AFFILCOUNTRY(Bangladesh)" to know the status of Bangladesh too. We found 45,678 documents in the record of SCOPUS.

Figure 1: Number of publications of public universities and colleges of Bangladesh in Scopus

Figure 2 : Number of publications of private universities of Bangladesh in Scopus

We found sixty one organizational affiliations from Bangladesh. Two thirds of those organizations were universities. Twenty six of them were public universities and colleges; thirteen were private universities and one international university. Figure-1 and Figure-2 show the documents listed in Scopus for public and private universities and colleges of Bangladesh respectively. Public universities' documents listed in Scopus are much higher than that of private universities; though the number of private universities is around three times than the public universities. Private university is a recent phenomenon in Bangladesh. It started its function from 1993. Note that, the first public university was established in 1921. Undoubtedly time is a great factor for such huge difference. At the same time private universities are not getting permission to offer research degrees like, MPhil, PhD degrees. Universities which offer such degrees have the better opportunity to produce research works in a regular basis. However, there is a trend to publish research papers by the people working in private universities.

Scopus indexed very old documents too. A publication where D G Crawford was associated along with other authors published in British Medical Journal (BMJ), was found to be the earliest document from Bangladesh in the Scopus. It was published in

BMJ, Volume 1, Issue 1374, 30 April 1887. Mr. Crawford was affiliated with Mymensingh, Bangladesh (no organization mentioned).

Two documents published in 1925 in proceedings of the Edinburgh Mathematical Society were found as the earliest document associated with Bangladeshi universities in Scopus. Jyotirmaya Ghosh was associated as author of both the documents. Mr. Ghosh was affiliated with the University of Dhaka.

The two oldest documents found in Scopus for private universities of Bangladesh were of 1997. One author was affiliated to Independent University, Bangladesh (IUB) and the other was affiliated to North South University (NSU).

Figure 3 : Publishing trend of Bangladesh from 2003 to 2017 based on Scopus

The Scopus showed an upward trend in publishing research output among the Bangladeshi researchers. Figure 3 shows the last fifteen years trend of Bangladeshi works indexed in Scopus. The figure clearly shows that the publishing trend of Bangladesh is upward. Except one year, every year the number of documents increased. The figure only represents the documents indexed in Scopus. Scopus does not index all publications. They have their own policy to include a document for indexing.

It is important to note that these figures are made based on Scopus database. Scopus database does not include all published materials. They have their own criteria to include publications in their database. In reality, there will be more research outputs by the Bangladeshi researchers. Every year not only researchers are publishing, there are many researches being conducted in universities by the students which were not published anywhere.

Along with published research outputs, a good number of unpublished materials are being produced in the universities of Bangladesh. Each of the universities should showcase their research to the global community. The authors of Bangladesh should be more alert for receiving more citations from other authors. One hundred sixty sources were found in SCOPUS where the writings of Bangladeshi authors were found. A large number of sources, i.e, journals, proceedings, etc., were originated outside Bangladesh. If the authors of Bangladesh do not try to keep their copyright to themselves, a day may come when Bangladeshi researchers will not get access to their own resources due to high prices. To address this issue, the universities can provide their authors a platform to preserve their own research papers or any research related items, such as data sets, etc.

Prospect of Institutional Repositories in Universities of Bangladesh

Bangladesh has 45 public universities, 103 private universities and three international universities (University Grants Commission of Bangladesh, 2019). Trends of establishment of institutional repositories in the universities of Bangladesh are not yet clear enough, although public universities have high chances to establish successful institutional repositories. It is assumed that most of the universities of Bangladesh do not have institutional repositories. Possibly, most of the librarians of these universities are not aware of the technology available for the establishment of institutional repositories. Old public universities are offering research degrees like MPhil, PhD, etc. These universities have high prospect for establishing institutional repositories.

There are two registries which register institutional repositories. These are OpenDOAR (Directory of Open Access Repositories) and ROAR (Registry of Open Access Repositories). Websites of the both registries were surfed on May 5, 2018 to know the existence of IRs in Bangladesh. Among university repositories of Bangladesh, only seven registered in OpenDOAR and eight in ROAR (Table-2).

Table-2 : Institutional repositories of Bangladesh in DOAR and ROAR

DOAR	ROAR
--	Bangabondhu Sheikh Mujib Medical University
BR BRAC University	BRAC University
D Daffodil International University	Daffodil International University
East West University	East West University
Eastern University, Bangladesh	Eastern University
B Independent University, Bangladesh	Independent University, Bangladesh
Islamic University of Technology	Islamic University of Technology
University of Dhaka	University of Dhaka

Among the public universities, only the University of Dhaka registered its repository in both the sites. There is one more public university which was registered only in ROAR. One international university, i.e., Islamic University of Technology, also registered in both the sites. All other repositories are of private universities. All five private universities' repositories have appearance in both the registries.

Zillur Rahman (2013) in his PhD thesis mentioned about the initiatives of some universities for establishing IRs under HEQEP (Higher Education Quality

Enhancement Program), a project of University Grants Commission of Bangladesh. He found seven universities. These were: Bangladesh University of Engineering and Technology, Bangladesh Agricultural University, Bangabandhu Sheikh Mujib Medical University, Khulna University of Engineering and Technology, Sher-e-Bangla Agricultural University, Chittagong Veterinary and Animal Science University, Department of Information Science and Library Management of the University of Rajshahi, and Sylhet Agricultural University.

Selected six public and six private university librarians or library-heads were asked about the status of unpublished items in their libraries to get an idea in mid 2016. It was found that university libraries were receiving various unpublished documents like theses, dissertations, reports, etc., (Table-3).

Table-3 : Unpublished contents received in the libraries

	Maximum	Minimum	Sum	Missing	Total
PhD Theses/Dissertations	2047	84	2869	8	11
MPhil Theses/Dissertations	2500	150	2650	9	11
Masters Theses/Dissertations	15467	194	25351	5	11
Internship reports	7000	193	12585	6	11
Project reports	3000	183	6003	7	11
Other reports	1300	1300	1300	10	11

PhD, MPhil and Master Theses or Dissertations were received by three, two and six university libraries respectively. Five universities received internship reports of the students and four university libraries received project reports. A good number of other reports (not specified) were also received by one university library.

These unpublished items were mostly in hard copies (Table-4). All libraries received hard copies. Around one third of those libraries had provision for digital submission. However, two thirds of those libraries received unpublished items on CD-ROM.

Table 4 : Forms of Unpublished Items Collection

		Count	Total N %
Collection of Unpublished Items	Hard copy	11	100.0%
	CD-ROM	7	63.6%
	Digital submission	4	36.4%
	Total	11	100.0%

Analysis

Universities of Bangladesh are regularly contributing to different field of knowledge. Faculty members as well as students are producing scholarly materials. Faculty works are usually published in journals, sometimes as books, conference papers, working papers, etc. Their works would be useful to the Bangladeshi researchers. Bangladesh does not have good number of libraries which can provide access to adequate resources. As a result, they are possibly losing citations. Students' works are mostly unpublished, such as, theses and dissertations. Placing students' works in the institutional repositories will increase volume of scholarly works of the universities. Additionally, the absence of their own IRs their scholarly works cannot be identified exclusively as their institutions own works. The exclusive showcasing of the scholarly works of the universities would help to get better place in the ranking.

Literatures showed that all over the world mostly librarians were in the forefront to establish institutional repositories, being librarians are trained in collecting, preserving and disseminating information materials. Institutional Repositories have been establishing for around two decades to collect, preserve and disseminate research outputs of the respective institutions. Research outputs are usually come out in several formats. All of those forms are collectable in the libraries as information sources. Current trend of institutional repositories is to collect all of those information materials in digital form. Due to its digital nature librarians may need to take help of Information Technology (IT) personnel. IT personnel can help the librarians in several stages of IR establishment and running. Such as, to choose hardware and software at the initial stage; to keep running the software and hardware including networks; and to keep all of these up-to-date. But day to day works would be done by the librarians. Librarians works related to IR running would be like, training the users, i.e., faculty, researchers and students in case of universities; marketing of IR service; taking care of metadata and control vocabulary to ensure uniform practice and accurate dissemination of the collected materials, etc.

Conclusion

Universities are playing an important role to generate knowledge. These days, Western universities are emphasizing on showcasing their knowledge outputs. It is influencing the university rankings too. Out of six metrics for world university ranking done by QS (Quacquarelli Symonds Limited), one is citations per faculty. One fifth of the score depends on this particular criterion (Methodology, 2018). Times Higher Education (THE) World University Rankings also consider citations per faculty as an indicator for university ranking (World University Ranking 2018, 2018). Research is

considered as one of the major group of indicators by RUR (Round University Rankings) (Round University Rankings Methodology, 2018) and US News Global Universities Rankings (Morse and Krivian, 2017). IRs can help the universities to increase the citations of their authors. Very few universities of Bangladesh are maintaining IRs. As per registries, less than 10% of Bangladeshi universities have IRs. It is assumed that other libraries need a guidance to develop their IRs. All universities have thrust to see themselves at the top of rankings. Without showcasing the research works of the universities it will be a difficult task. IRs are not only meant for showing-up scholarly works generated in a university, it can also help to get better or higher citations of their researchers if open access IRs can be maintained. University Grants Commission (UGC) of Bangladesh is running UGC Digital Library (UDL). The UDL is currently assisting the universities in purchasing electronic books and subscribing electronic journals. These digital resources are originated in foreign countries. The libraries of Bangladesh can only serve as access points to reach those resources. The true digital library can be built if the repositories can be established with own resources. The naming of UDL will be more meaningful if it can contribute to motivate universities to develop their own institutional repositories and provide necessary support in terms of technical assistance and funding.

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