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Promoting the Educational Research through an Open Access Institutional Repository of Shanghai Cooperation Organisation (SCO) Countries: An Analytical Study

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Abstract

The present study proposed to focus on the current status of SCO countries Open Access Institutional Repositories. Nowadays, institutional repositories play a vital role in promoting higher education systems and research and development. Data were obtained from the Directory of Open Access Institutional Repositories (DOAR) website. Then collected data have been analysed and represented in graphical formats to clearly understand the study results. The researchers also assessed the SCO countries' contribution to various parameters such as type of repository, disciplines, languages interface, and software used to build institutional repository. The study's findings revealed that out of 214 repositories, the highest number of registration of repositories was took place in the year 2011 and 2019, i.e., 36 (16.82%) 34 (15.89%), respectively. It shows that majority used Dspace software 131(61.21%), followed by EPrints 35 (16.36%). Most of the repository preferred the English language158 (52.15%) interface to develop institutional repositories, followed by Russian languages 56(18.48%). The country-wise distribution shows that India has the highest number of institutional repositories, 94(43.93%) registered under open access. The majority of 108(23.08%) intuitional repositories are multidisciplinary, followed by Science General 69(14.74%).

Keywords: Institutional Repositories, Open Access, SCO Countries, DOAR, OAIR, Software, Dspace, EPrints

Introduction

Nowadays, institutional repositories play a vital role in promoting higher education systems and research and development. The term "Institutional repository (IR)" consists of a collection of digitally managed and managed digital content produced by teachers, staff and students in an institution (Velmurugan, 2010). Institutional repositories are emerging technologies for knowledge sharing and management in academic and research institutions (Doctor, 2008). An Institutional Repository (IR) is a Digital Library specialization (Adewumi & Ikhu-Omoregbe, 2010). Institutional repositories are "digital collections" of intellectual production that capture and preserve in single or multi-university communities (Crow, 2002;

Hockx-Yu, 2006)". It has responsibility for the long-term preservation, organization and distribution, and access to digital materials produced by the institution (Lynch, 2003; Joo et al., 2019). Institutional repositories will help academic institutions and repository administrators to bring about improved investment decisions (Wirba Singeh, 2013). The building of open institutional archives repositories is a new approach to disseminating research findings in many developed countries (Ezema, 2011).

Open DOAR (The Directory of Open Access Repositories) is a global Directory of Open Access Repositories developed and maintained by the University of Nottingham (UK) in association with the University of Lund (Sweden). It is a free access repositories directory project to promote open access repositories and was launched in 2005. Open DOAR facilitates searching, finding, and retrieving country-based lists of repositories, and it also acts as a tool for repository administrators to get the statistics. Being a quality-assured global directory, Open DOAR provides an opportunity for all the countries to get into the registry of their institutional repositories. Each of the repository records has been carefully reviewed by a panel of experts of its editorial team, hosts all the registered institutional repositories, and provides free, open access to the academic community (Kuri & Singh, 2020). An open access repository is a collection of full-text documents available online in an online database that can be accessed for free and directly. IR are maintained by research institutes to accommodate the work of their authors (Pinfield, 2005). Open access IR has been found to play an essential role in the preservation and dissemination of institutional research outputs (Ezema, 2011).

About Shanghai Cooperation Organization (SCO)

The Shanghai Cooperation Organization (SCO) is a permanent intergovernmental organization declared by the Republic of Kazakhstan, the People's Republic of China, the Kyrgyz Republic, the Russian Federation, and the Republic on June 15, 2001, in Shanghai (China), Tajikistan and the Republic of Uzbekistan. The Shanghai Cooperation Organization Charter was signed at the SCO Head of State Summit in St. Petersburg in June 2002 and entered into force on September 19, 2003. It is a basic legal document that describes its purpose and principles, structure, and necessary activities. The historic meeting of the heads of state of the Shanghai Cooperation Organization was held from June 8 to 9, 2017, in Astana. The full members of the Organization at the meeting were the Republic of India and the Islamic Republic of Pakistan. The main objectives of the SCO are to strengthen mutual trust and neighborhood between the Member States; promote their practical cooperation in the fields of politics, trade, economics, research, technology, and culture, as well as in the areas of education, energy, transport, tourism, environmental protection and the other; make joint efforts to maintain and guarantee peace, security and stability in the region; and towards the creation of a new international political and economic order that is democratic, fair and rational (http://eng.sectsco.org/about_sco/).

Literature review

Several researchers have conducted similar studies in different years on institutional archives, growth trends, and the role of libraries in promoting these activities and their implications in an open-access forum. The author evaluates and analyses some selected studies to support these. Singh et al. (2020) studied the current status of open access institutional repositories of SAARC countries. The study revealed that out of 128 institutional repositories, the highest number of (14.06%) institutional repositories are registered in 2013 and 2019 and belong to the institutional category. Das & Singh (2017) conducted a case study focusing on assessing Chinese Open Access Institutional Repositories' status and its contribution to a global knowledge base. It was observed that the Chinese Academy of Sciences (CAS) was a significant contributor 25(64.10%) in Chinese open access IRs than others. Singh (2017) examined the open-access IRs developed in Australia by selecting the database of Directory of Open Access Repositories (DOAR) and observed that the majority 42(76.36%) of the IRs belong to Universities, followed by 13(23.64%) research institutions. Singh & Verma (2017) studied the current status of open access institutional repositories of Asian countries under various parameters such as the number of records archived, subjects and core contents, language interface for sharing of information, different software used to create open access IRs and their operational issues.

Dhanavandan & Tamizhchelvan (2015) analysed the growth and development of Institutional Repositories available in BRICS Countries. The study found that among the 242, 84 (34.71%) repositories are from Brazil, 39 (16.12%) from China, 68 (28.10%) repositories from India, 22 (9.109%) repositories from Russia, and 29(11.98%) repositories from South Africa. Ganaie et al. (2014) carried out a study on the status of Open Access (OA) repositories in the field of Library and Information Science (LIS) worldwide. It was found that 74.75% of the repositories have the English language, followed by German and Spanish (9.09% each). Ali et al. (2013) presented the status of open access repositories globally. It indicated that U.S.A. leads with 409 (18.86%) repositories, followed by U.K. 208 (9.59%), Germany 152 (7.01%), and Japan 136 (6.27%), respectively. Roy et al. (2012) identified an overview of Open Access Repository (OAR) initiatives taken in Asian Countries with particular reference to SAARC Countries. The study analysed that the SAARC countries possess only 78 repositories, whereas India has 70 (89.74%) repositories.

Scope and Limitations of the study

This study focused on open access institutional repositories registered in the Directory of Open Access Repositories (DOAR). To know the research contributions of developing seven countries, the authors have limited the study only to the institutional repositories registered by the South Asian Association for Regional Cooperation (SCO) countries. Those institutional repositories available in OpenDOAR up to August 2020 has been considered for the study and analyzed.

Objectives of the study

The following objectives of the study are:

- To find out the current status of the Open Access IRs of the SCO countries;
- To examine the Open Access IRs in terms of types, discipline, and collection;
- To identify the type of software and language interface used for the building of IRs

Methodology

In this study, the researchers have explored the open access institutional repositories of SCO countries. Data were obtained from the Directory of Open Access Institutional Repositories (DOAR) website. The researchers also assessed the SCO countries' contribution to various parameters such as type of repository, disciplines, languages interface, and software used to build institutional repository. The Directory of Open Access Repository website (available at https://v2.sherpa.ac.uk/opendoar) accessed during July and August 2020. Then collected data have been analyzed and represented in graphical formats to clearly understand the study results.

Results and discussion

Based on the data collected, the authors have performed the analysis under different segments with required tables, figures, and graphical representations, which are as follows.

Year-wise Growth Pattern

Authors have collected all the institutional repositories added by the SCO countries' members to the DOAR and categorized them under the year they have been created, starting from 2005 to 2020. Figure 1 depicts the year-wise growth of institutional repositories in the DOAR repository with its cumulative percentage.

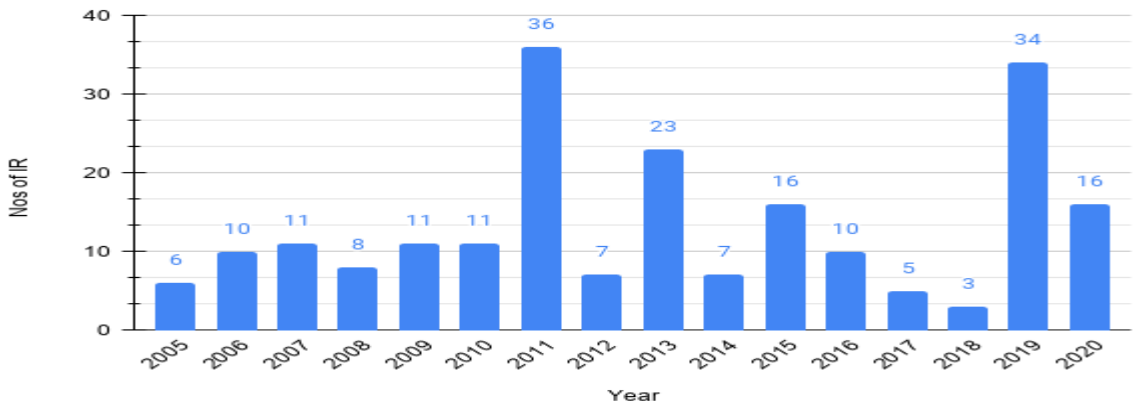

Fig.1: Year-wise Growth pattern of Institutional Repository

It has been observed from the data collected that there are 214 institutional repositories available in the OpenDOAR contributed by SCO countries. Figure 1 indicates that out of 214 repositories listed, the year 2011 and 2019 witnessed the highest number of repositories registration, i.e., 36 (16.82%), followed by 34 (15.89%), 23 (10.75%) in the years 2011, 2019 and 2013 respectively. Further, less than twenty repositories were established and registered during different years, as indicated in the figure.

Nature of IRs

Institutional repositories are of different types. However, based on the Institute's nature in which they have created, it can be categorized under four significant heads: Governmental, Aggregating, Disciplinary, and Institutional. The authors have collected the details about the type of institutional repositories added during the study period based on these categories. Its corresponding cumulative percentage is also recorded under each category. Detailed statistics are provided in figure 2.

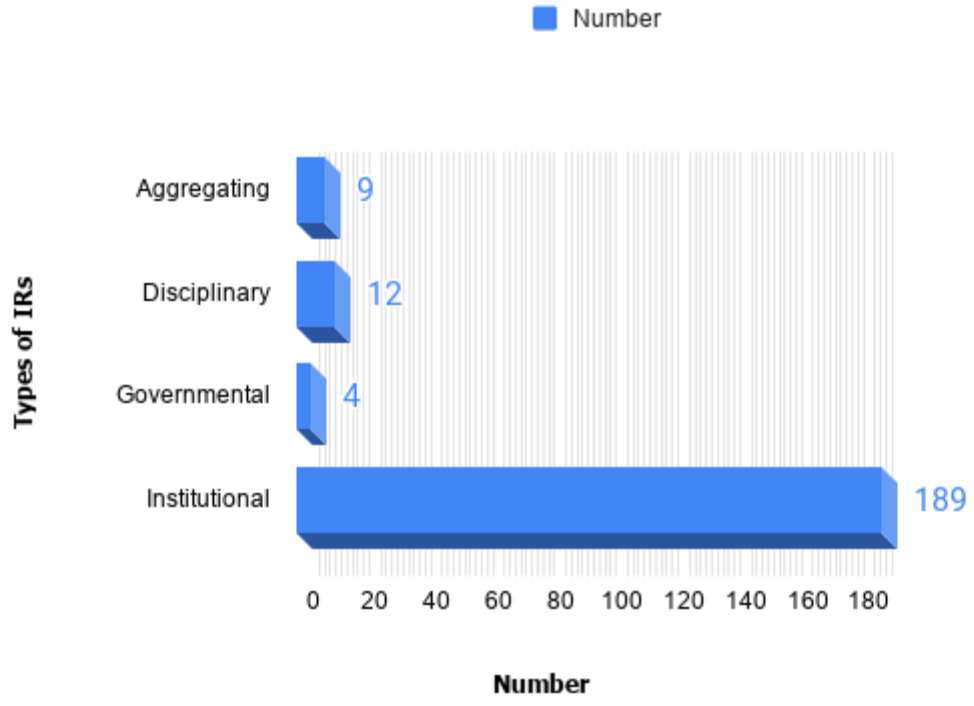

Fig.2: Types of Institutional Repository

Figure 2 reveals that among the total 214 institutional repositories, the majority, i.e., 189 (88%) of them belong to the institutional category, followed by disciplinary 12 (6%), aggregating 9 (4%), and governmental 4 (2%). The study identified that the highest number of IR's are Institutional, and a few are government-owned.

Software used for the building of IRs

Nowadays, software and hardware have become the most integral part of the organization to effectively and efficiently run the organization system. There are different software tools available under free/open source or commercial/proprietary streams to create institutional

repositories (Kuri, 2014). Authors have collected each repository's attributes with the names of the software they have been developed with its percentage of usage. The details are depicted in figure 3.

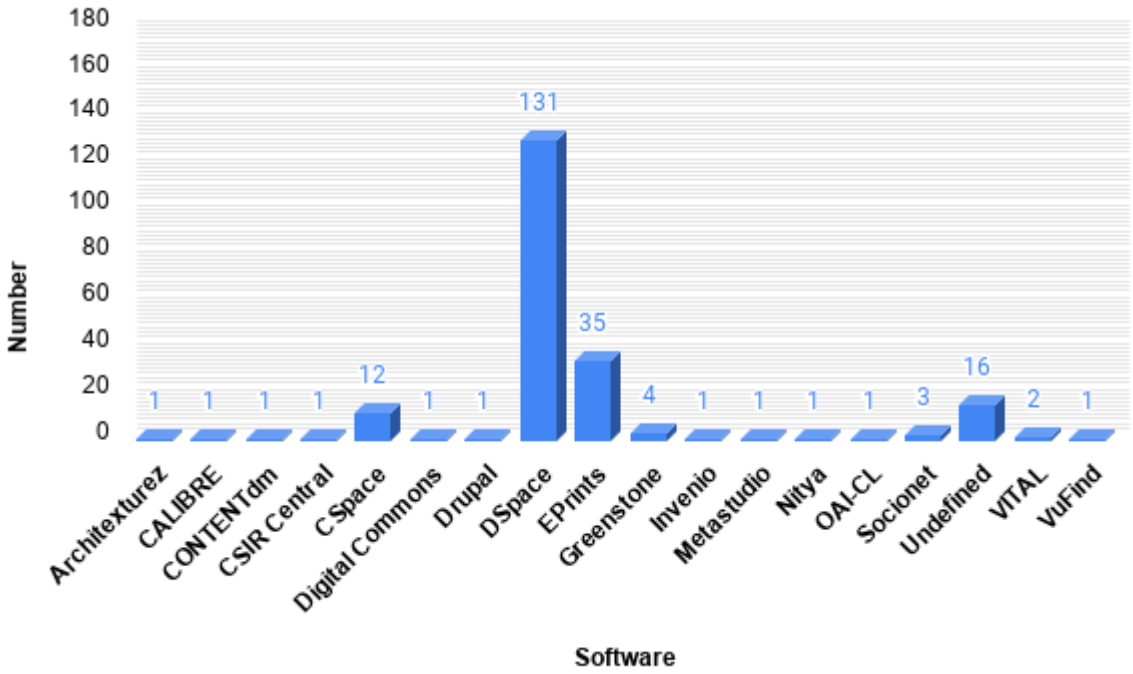

Fig.3: Software-wise distribution of IRs

Figure 3 depicts the categorization of different software used to create institutional repositories among SCO organizations. Out of 214 institutional repositories, most of them, i.e., 131 (61.21%), used DSpace software to build their institutional repositories, followed by EPrints software with 35 (16.36%) repositories. The study conducted by Melero et al. (2009), Wani et al. (2009), Abrizah et al. (2010), Singh (2016), Das & Singh (2017), Singh & Verma (2017), Singh et al. (2020), Swaraj & Singh (2017) found in their study that Dspace was widely used software. It is observed from the data shown in the figure that the majority of the institutional repositories have preferred open-source software for archiving their intellectual works. In contrast, a few institutions used proprietary software also. However, authors could not identify the names of software used for building few repositories as they have not been given any name, hence categorized under undefined.

Language-wise distribution of IRs

Language is used as a medium of communication to share ideas, information, views, and experiences. It allows humankind to access information and data contents, draw inferences, accomplish defined goals, and understand and communicate**.** The authors have identified and categorized language-wise contents of institutional repositories distributed in DOAR, and they are shown in figure 4.

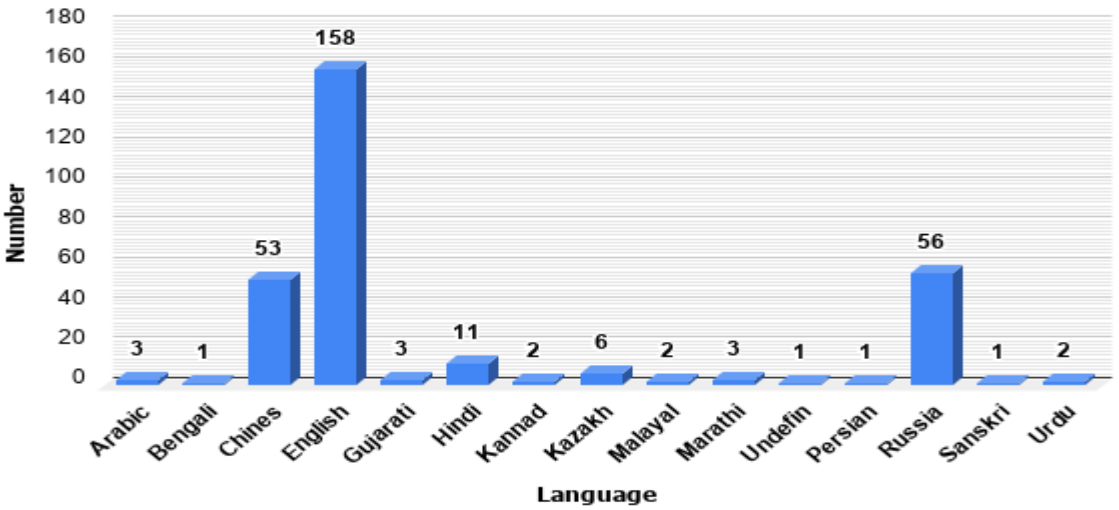

Fig.4: Language-wise distributions

It is clear from the analysis that the language in which the majority, i.e., 158 (52.15%) of the repositories are created in the English language, followed by the languages such as Russian56 (18.48%), Chinese53 (17.49%), and Hindi 11 (3.63%). Research studies conducted by Wani et al. (2009), Abrizah et al. (2010), Singh (2016), Das & Singh (2017), Singh & Verma (2017), Kuri & Maranna (2018), Bashir et al. (2019), Singh et al. (2020) disclose that English as the most widely used language interfaces for building IRs. A few numbers of the institutional repositories consist of other regional languages, as shown in the figure.

Content-wise distribution of IRs

The nature of contents being added to the repository distributions is recorded under its numbers with a cumulative percentage. The details are indicated in figure 5.

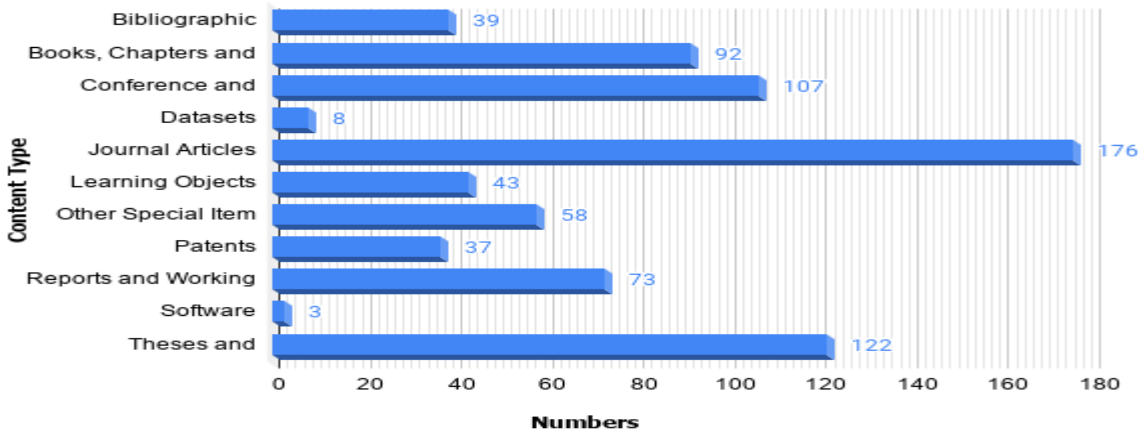

Fig.5: Content-wise distribution

Figure 5 represents the content-wise distribution of Institutional Repositories in DOAR. Out of 214 Institutional repositories, the majority, i.e., 176 (23.22%) of repositories consists of journal articles followed by Theses and Dissertations 122 (16.09%), Conference and Workshop Papers 107 (14.12%), Books, Chapters and Sections 92 (12.14%), and Reports and Working Papers 73 (9.63%). Research studies of Matsuura's (2008), Wani et al. (2009), Abrizah et al. (2010), Kuri et al. (2014), Singh (2017), Das & Singh (2017), Singh & Verma (2017), Singh et al. (2020) revealed that the 'journal articles' are the most well-known types of contents obtainable in institutional repositories. Further, a few IR's consists of other sources of contents like Other Special Item Types 58 (7.65%), Learning Objects 43 (5.67%), Bibliographic References 39 (5.15%), Patents 37 (4.88%), Datasets 8 (1.06%) and Software 3 (0.40%).

Discipline wise distribution of IRs

Discipline helps every academician decide the pedagogic approaches and understand the relationship between knowledge nature. The below figure 6 indicates the discipline wise distribution of IR.

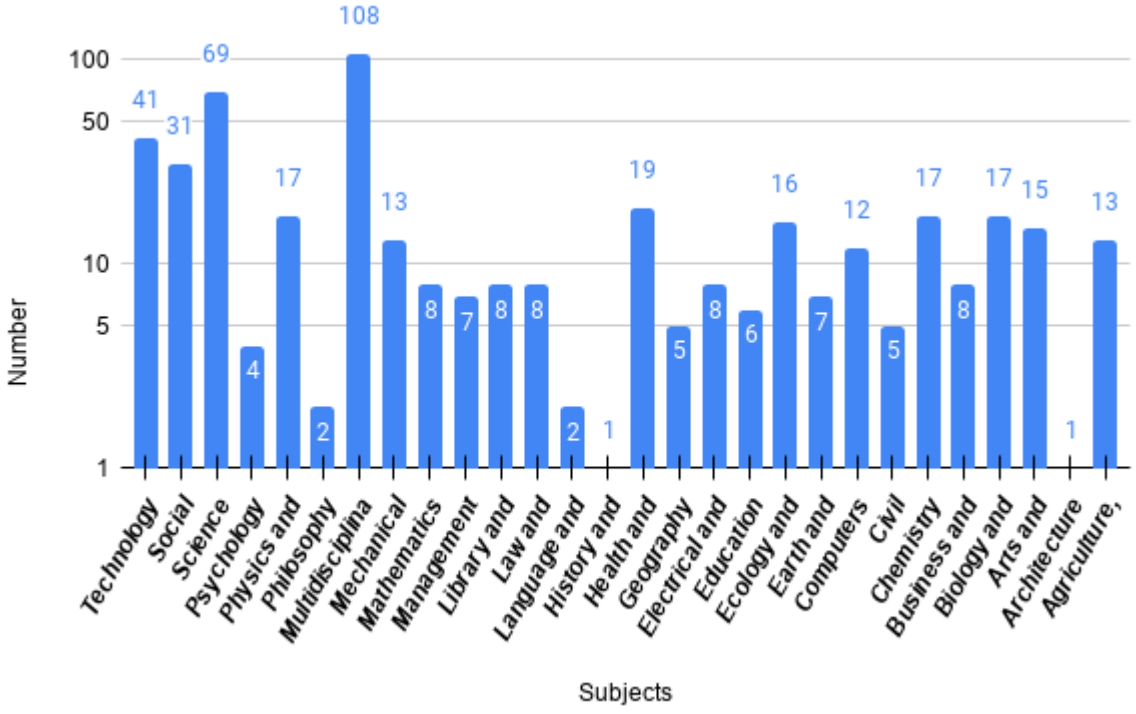

Fig.6: Subject-wise distribution

Figure-6 indicates the discipline-wise distribution of institutional repositories in DOAR. The majority, i.e., 108 (23.08%) of IR's are grouped under Multidisciplinary, followed by Science General 69 (14.74%), Technology in General 41 (8.76%), Social Science General 31 (6.62%), Health and Medicine 19 (4.06%), Biology & Biochemistry and Chemistry & Chemical Technology 17 (3.63%) each, Ecology and Environment 16 (3.42%), Arts and Humanities Genera 15 (3.21%), Further, some IR's consist of other subjects, as shown in the above figure.

Country-wise distribution of IRs

The Shanghai Cooperation Organisation (SCO) is a permanent intergovernmental international organisation. Its member states are India, China, Russian Federation, Kazakhstan, Pakistan, Kyrgyzstan, Tajikistan, and Uzbekistan. The authors have collected data on the country-wise distribution of IR and are represented in figure 7.

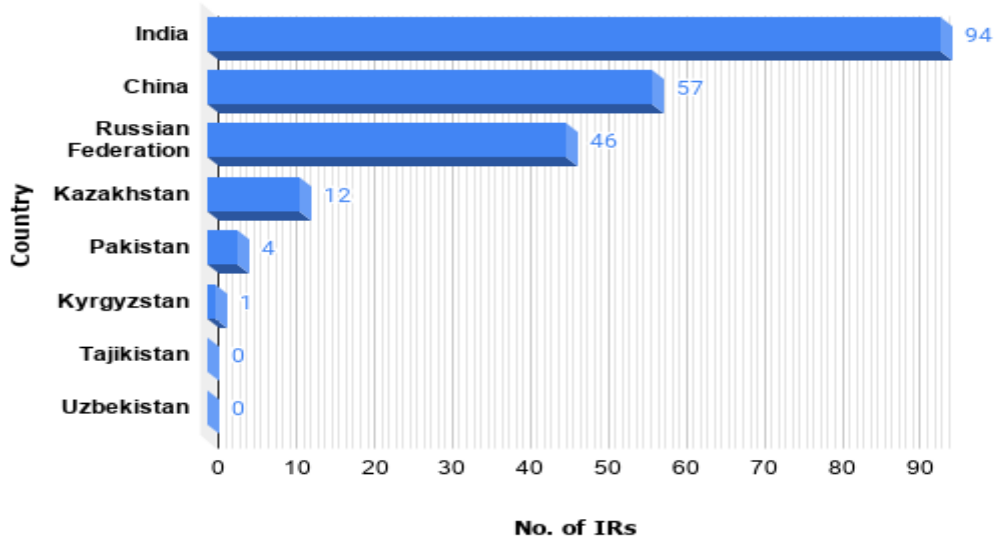

Fig.7: Country-wise distribution

Figure7 reveals the country-wise distribution of Institutional repositories. Among the SCO countries, India contributes the highest, i.e., 94 (43.93%) number of institutional repositories, followed by China 57 (26.64%), Russian Federation 46 (21.5%), Kazakhstan 12 (5.61%), Pakistan 4 (1.87%) and Kyrgyzstan 1 (0.47%). Further, it is surprising to know that none of the IR's, which represent Tajikistan and Uzbekistan countries.

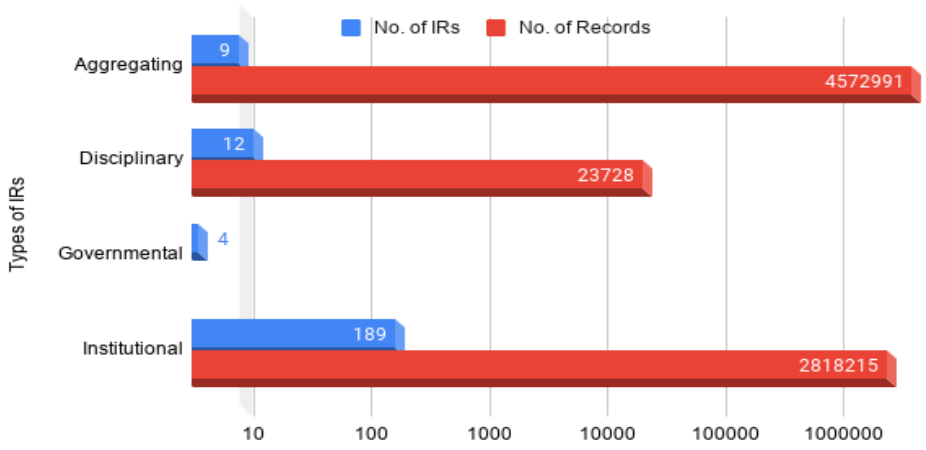

Fig.8: Types of IRs and Records

Type of IRs with their total number of Records

Figure 8 presents the number of IR's created and the corresponding records deposited. It is observed that the highest number, i.e., 4572991 records contributed from 9 Aggregating types of repositories, followed by 2818215 records from 189 Institutional kinds of repositories, 2818215 records from 12 disciplinary types of repositories, and o records from 4 Government type of repositories. Ali et al. (2018) also found that most of the scientific repositories are institutional.

Major findings

- It indicates that out of 214 SCO countries IR's, the year 2011 observed the highest number (i.e., 16.82%)) of IR registration with DOAR.
- It is found from the observation that out of 214 IR's, the majority of (88%) IR's are Institutional type repositories.
- The analysis also observed that the highest 61.21% numbers of institutional repositories have developed using DSpace software. It is evident from the study that most of the SCO countries opt for open-source software as they are economically feasible.
- It is found from the analysis that the highest numbers of (52.15%) of IRs are developed in the English language.
- The analysis found that the highest (i.e.,23.22%) number of repositories registered by the SCO under DOAR consists of source content 'journal articles' as discipline-wise institutional repositories.
- It is evident from the analysis that the Aggregating type of repositories stands top rank by contributing the highest number of 4572991 records.
- It is noticed from the analysis that Countries like Tajikistan and Uzbekistan countries are yet to make contributions to DOAR.

Conclusion

DOAR is an open international platform for every world nation to showcase their scientists' intellectual works by creating an Institutional Repository. The study found less interest in creating institutional repositories by the SCO countries than Western countries. It may be due to the lack of awareness about the institutional repositories' scope and purpose and the advantages of open access to the institutions' intellectual contents. The contribution of India is remarkable and is the highest among the other SCO countries. However, countries like Tajikistan and Uzbekistan are yet to make contributions to DOAR. Authors appeal that these countries have to create their institutional repositories and to be part of the DOAR.

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