

Bibliometric Study of Scholarly Productivity of Library and Information Science Research in Bangladesh from 1971 - 2020

Md. Anwarul Islam^{#,*} and Prodip Kumer Roy[§]

[#]*Department of Information Science and Library Management, University of Dhaka, Bangladesh*

[§]*Monographs and Digital Collections, RMIT University Library, RMIT University, Australia*

^{*}*E-mail: anwar@du.ac.bd*

ABSTRACT

This paper aims to measure the extent to which Bangladesh-based Library and Information Science (LIS) researchers have published in leading LIS journals indexed by Web of Science (WoS) and SCOPUS. To answer this question, bibliographic information from LIS publications published in leading bibliographic databases from 1971 to 2020 were examined. Data from 266 LIS publication were collected, compiled and cleaned. VOSviewer software was used to carry out the science mapping of bibliometric networks. From the data it was evidenced that joint authorship and international collaboration have been increasing during this time frame. Authors from 20 countries have published in collaboration with Bangladeshi LIS researchers. Faculty members and the Department of Information Science and Library Management (ISLM) of Dhaka University became the most prolific authors and LIS Department in Bangladesh. The data compiled and findings will benefit current Bangladeshi LIS researchers and practitioners to assess areas of focus by highlighting, what they have, what they lack, and how they could grow to get direction for future research.

Keywords: Scholarly productivity; Bibliometrics; Library and information science; Journal analysis; Bibliographic database; Bangladesh

1. INTRODUCTION

Over the last two decades, publishing trends of Library and Information Science (LIS) publications in Bangladesh have shown positive growth. LIS Faculty members, practitioners and researchers have published widely in many international LIS journals and conferences¹. LIS communities benefitted by sharing the findings through various publishing channels. In 1959, the first formal LIS education offering of a one-year, postgraduate diploma in Bangladesh (previously known as East Pakistan) was offered by the Department of Library Science in Dhaka University. In 1966 The Eastern Librarian (EL), became the first professional periodical publication in the region. In 1998, the regions second mainstream LIS journal, Bangladesh Journal of Library and Information Science (BJLIS), published by the Department of Information Science and Library Management (ISLM) at the University of Dhaka. Both journals were irregular and neither of them were indexed by SCOPUS, nor were they listed in Scimago journal ranking (SCImago, n.d)²⁻⁴. Since the independence of Bangladesh in 1971, four public and eight private universities provided LIS education programs under five categories, ranging from Diploma to PhD.⁵ In 2019, fifteen Bangladeshi scholarly journals were listed in the SCImago journal ranking and we found only twenty-two LIS publications under the publications of different disciplines⁶. LIS publications are generally low in quantity compared to the

other disciplines publications in the SCOPUS database. LIS faculties, researchers and practitioners in Bangladesh do not know the ratio of scholarship visibility in the leading database. At the time of this research, there are two current studies, e.g., the bibliometric study of LIS literature in Bangladesh and author productivity of LIS research in Bangladesh found in the context of Bangladesh⁷⁻⁸. Therefore, an analysis is needed to look back at the historical growth during the past five decades. In this paper, in order to understand the LIS publications of Bangladesh better and how it is evolving, we have analysed the research and publication trends from the leading bibliographic databases. This is the first time an attempt has been made to analyse the LIS publications of Bangladeshi researchers in the global context. To examine the LIS publications from 1971 to 2020, we have come up with a few research questions:

- How many LIS publications have been published by the Bangladeshi LIS researchers during 1971-2020?
- What are the authorship and collaboration patterns of LIS researchers?
- What authors have the highest number of citations, publications and which ten papers were the top-cited papers?
- Which are the most productive LIS schools? Where do the Bangladeshi LIS researchers publish the most?
- What are the major research topics represented in the publications?

Bangladeshi LIS researchers and professionals to identify what they have, what they lack, and how they could grow. It would also help to understand the patterns in what has been published in recent years in LIS and what are the latest research areas. This study would give us a holistic picture of the evolution of LIS research in Bangladesh.

2. LITERATURE REVIEW

Bibliometrics is a widely accepted method that can bring promising areas of research to the fore. Analyzing the bibliographic information of scientific publications can assist with identifying the relationships among documents,

Table 1. Number of LIS publications (1971-2020)

Year	NP	NP %	CC	Year	NP	%	CC
2020	14	5.26	14	1995	0	0	245
2019	22	8.27	36	1994	3	1.13	248
2018	14	5.26	50	1993	1	0.38	249
2017	18	6.77	68	1992	1	0.38	250
2016	15	5.64	83	1991	0	0	250
2015	19	7.14	102	1990	3	1.13	253
2014	23	8.65	125	1989	3	1.13	256
2013	20	7.52	145	1988	2	0.75	258
2012	21	7.89	166	1987	0	0	258
2011	16	6.02	182	1986	1	0.38	259
2010	12	4.51	194	1985	0	0	259
2009	13	4.89	207	1984	1	0.38	260
2008	6	2.26	213	1983	1	0.38	261
2007	6	2.26	219	1982	1	0.38	262
2006	11	4.14	230	1981	2	0.75	264
2005	5	1.88	235	1980	1	0.38	265
2004	2	0.75	237	1979	0	0	265
2003	1	0.38	238	1978	0	0	265
2002	0	0	238	1977	1	0.38	266
2001	1	0.38	239	1976	0	0	266
2000	2	0.75	241	1975	0	0	266
1999	0	0	241	1974	0	0	266
1998	3	1.13	244	1973	0	0	266
1997	1	0.38	245	1972	0	0	266
1996	0	0	245	1971	0	0	266

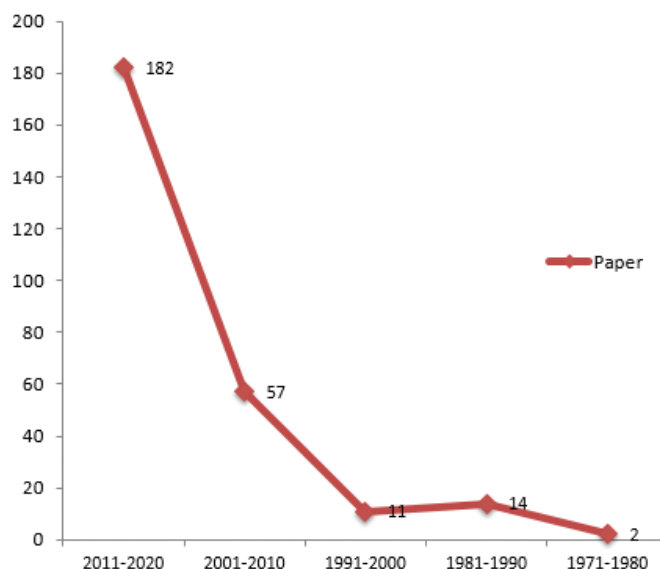


Figure 1. Number of LIS publications by decade (n=266)

Table 2. Authorship in publications by decade

SL	Decade	1	2	3	4	5	5>	Total
D5	2011-2020	40	87	28	18	4	5	182
D4	2001-2010	13	26	13	3	0	2	57
D3	1991-2000	6	3	1	1	0	0	11
D2	1981-1990	12	1	1	0	0	0	14
D1	1971-1980	1	1	0	0	0	0	2
D1-D5	1971-2020	72	118	43	22	4	7	266

journals, authors, countries or other channels of scholarly communication⁹. For the purpose of this study, we reviewed some of the recent bibliometric studies on Library and Information Science (LIS)/Information Science (IS) journals, disciplines and countries. We found there have been some recent bibliometric studies on the cited reference of a particular journal, e.g., a bibliometric analysis of Library Review from 2007 to 2011; bibliometric study of JASIS&T's (2000-2020) publications and bibliometric analysis of DESIDOC Journal of Library and Information Technology during 2001-2010¹⁰⁻¹². There are some bibliometric studies found in the literature to examine the publications and growth of a particular discipline and interdisciplinary relationship e.g., a bibliometric study of literature on digital libraries¹³. There are some recent bibliometrics studies of LIS research on the country level. For example, analyzing LIS publications from WoS during 2014-18 in India, LIS publication growth between 2009 to 2019 in Sri Lanka and bibliometrics study of LIS publication in Pakistan¹⁴⁻⁶. In South Asia, India has more studies on LIS bibliometrics e.g., bibliometrics of LIS research in India during

2004-2015¹⁷ and an empirical analysis of the research trends in the field of LIS in India-2004-2015¹⁸.

To date, there have been two bibliometric studies on LIS literatures in Bangladesh. The first study, which covered publications from 1966 to 1997 and analysed 308 articles from 37 periodicals. Problems of LIS research in Bangladesh were identified, and recommendations were put forward⁴. The second study examined the validity of Lotka’s law for the authorship of LIS research in Bangladesh and Lotka’s law, for author productivity is supported for the LIS researchers in Bangladesh⁸. However, none of these studies examined the leading indexing and abstracting database, recent research trends of Bangladeshi LIS publications, the productivity of organisations, productive authors, LIS schools and others. These studies had restricted scope, did not collect data from scientific databases and covered the period from 1966 to 1997

which was more than two decades ago. Since then, there has not been a comprehensive study of LIS publications of Bangladeshi researchers.

3. METHODOLOGY

3.1 Data Collection

Authors collected the bibliographic information of all LIS publications from SCOPUS and WoS databases. Then, we compiled a list of LIS journal and conference articles published from these databases. For the present study, we did not consider articles of other types published, e.g., such as opinion papers, book reviews, brief communication and letters to the editors. We used ‘Bangladesh’ and ‘Library’ as search keywords for all databases to ensure a large number of results. We retrieved 280 publication records from SCOPUS which covers the period from 1975 to 2020 and 67 records from WoS which ranges from 1973 to 2020.

We retrieved a total of 347 records from two databases. The data from these respective databases were imported in comma-separated values (CSV) format on the 24 September 2020. In the data cleaning stage, record’s title’s and the author’s name were carefully checked, duplicates and irrelevant records were deleted from our final sample. A total of 266 records relevant to LIS publications were considered for analyzing.

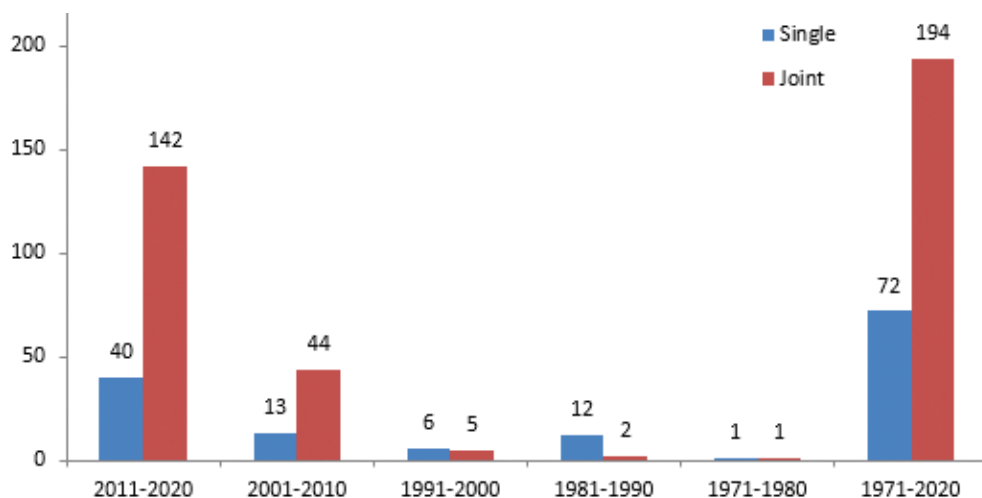


Figure 2. Single vs. joint authorship by decade.

Table 3. Share of countries in authorship

Name of country	Number of publications	Per cent	Name of country	Number of publications	Per cent
Bangladesh	221	64.43	Switzerland	2	0.58
Japan	30	8.75	Australia	2	0.58
USA	26	7.58	Nigeria	2	0.58
India	15	4.37	Sweden	1	0.29
Belgium	14	4.08	China	1	0.29
UK	8	2.33	Germany	1	0.29
Thailand	4	1.17	RSA	1	0.29
Finland	3	0.87	Tallinn	1	0.29
Canada	3	0.87	South Korea	1	0.29
Malaysia	3	0.87	Singapore	1	0.29
Norway	3	0.87		343	100.00

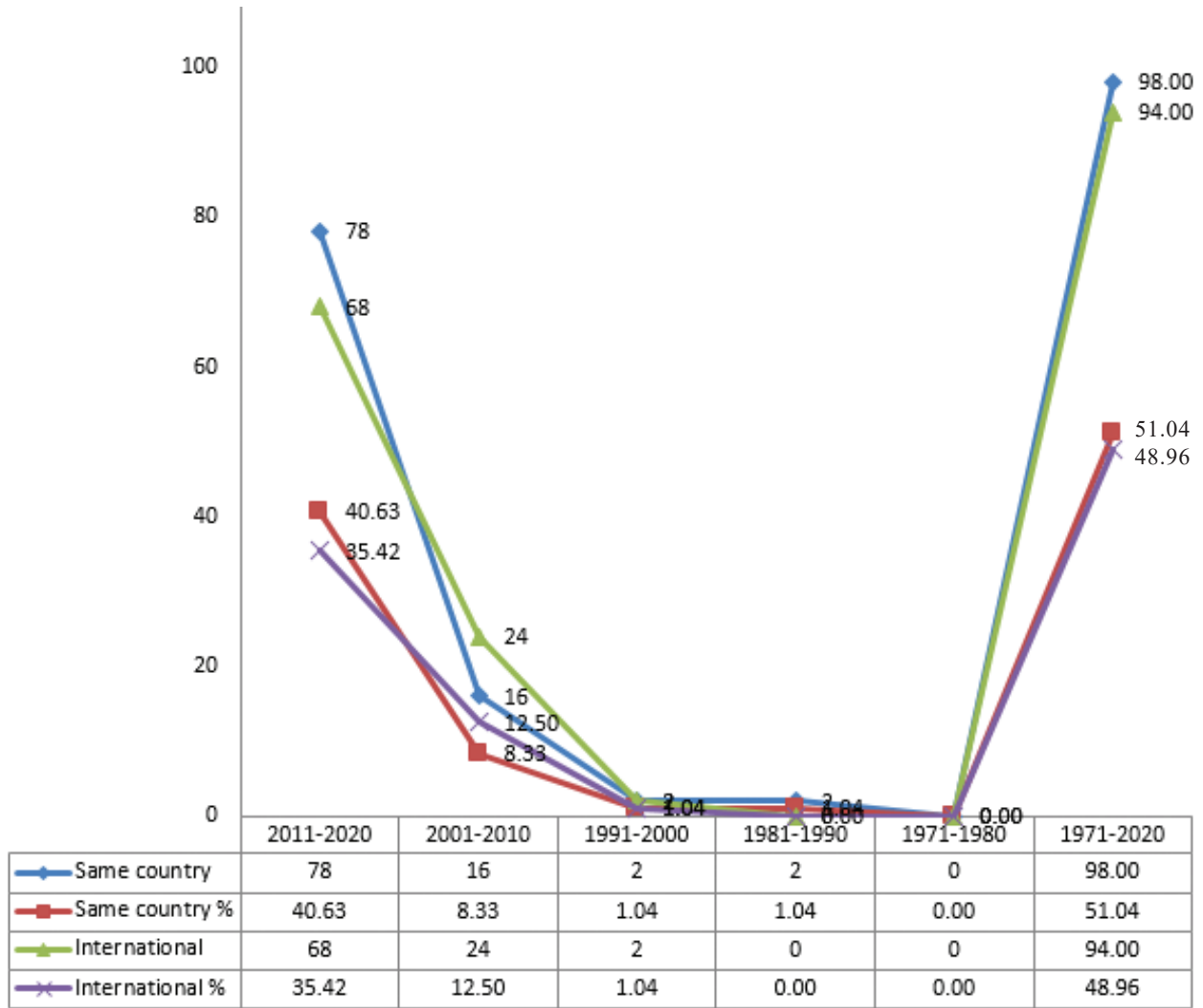


Figure 3. Authors collaboration from the same country and international (n=192).

Table 4. Author frequency distribution

Number of contributions (X)	Number of authors (Y)	Number of contributions (X)	Number of authors (Y)
1	202	10	2
2	37	11	1
3	12	12	2
4	11	13	1
5	8	15	1
6	2	23	1
7	2	31	1
8	1	36	1
9	1		

3.2 Visualisation of Bibliometric Networks

Once relevant records were imported from databases, they were exported into Excel and CSV file format. VOSviewer software was used for the visualisation of bibliographic data. This software helps to visualise relations based on bibliographic coupling, co-citation, or co-authorship relations¹⁹.

4. DATA ANALYSIS

We selected 266 LIS-related publications from the two bibliographic databases published by the Bangladeshi LIS professionals. Over the 49 years, we found many exciting trends addressing the research questions. We analysed data for each question below.

4.1 Growth and Number of LIS Publications

During 1971-2020, the total numbers of publications by the Bangladeshi LIS professionals are 266 where 222 are research articles, 28 conference papers, 7 book chapter and 9 of these are review papers. Table 1 lists the year, number of publications (NP) in each year and cumulative count (CC) of total publications from the year 1971 to 2020. Table 1 shows that 2014 was the most productive year, where 23 publications published.

We further categorised the years and number of publications under five decades (Fig. 1). This categorisation makes a comparison of productivity among different decades. In the second decade of the 21st century from 2011-2020, we

identified 182 publications which represent a historical peak period for LIS publications.

4.2 Authorships Pattern of LIS Researchers

For analyzing authorship, publications were categorised into single author, 2 authors, 3 authors, 4 authors, 5 authors and more than 5 authors (Table 2). Table 2 shows the authorship pattern from 1971 to 2020 by decades. From the total column, we can see that of the 266 publications published from 1971-2020, single author was 72 which is followed by 2 authors (118), 3 authors (43), 4 authors (22), 5 authors (4) and more than 5 authors (7).

Later, we further categorised the authorship into two groups, e.g., single and joint authors. The number of articles with more than one author coded as joint authors. We made this for easy comparison with a single author. Figure 2 shows that from 1971 to 2020, 194 publications had joint authors, surpassing the 72 publications with single authorship by more than double.

4.3 Authorship by Countries and Collaboration

Table 3 analyses the authorship of publications by countries where the author's institutions are based. From Table 1, we found that 266 LIS publications were published from 1971-2020. In Table 3, countries are ranked based on the authorship count from that country. However, the total counts for articles from different countries are listed as 343 (Table 3).

Table 5. List of top ten authors by the number of publications (SCOPUS)

Rank (1)	Author & 1 st year of publication (2)	Total articles (3)	Year since publication (4)	Avg. article / Year (5)	Total citations (6)	Avg. citations/ article (7)
1.	Ahmed S.M.Z. (1997)	36	23	1.57	327	9.08
2.	Islam M.A. (2009)	31	11	2.81	222	7.16
3.	Islam M.S*. (2005)	23	15	1.53	106	4.61
4.	Siddike M.A.K. (2011)	15	9	1.67	39	2.60
5.	Roknuzzaman m. (2007)	13	13	1.00	95	7.31
6.	Hossain M.J. (2008)	12	12	1.00	64	5.33
	Islam M.S** (2007)	12	13	0.92	55	4.58
7.	Rahman AIMJ (2008)	11	12	0.92	20	1.82
8.	Mezbah-ul-Islam (2006)	10	14	0.71	14	1.40
	Shuva N.Z. (2005)	10	15	0.67	39	3.90
9.	Islam, M.M. (2010)	08	10	0.80	41	5.12
10.	Mahbuba, D. (2009)	07	11	0.63	88	12.57

Note: * Dhaka University, ** Rajshahi University

Table 6. Ten most cited publications

Rank	Author	Title	Year	Citations (Scopus)
1.	Islam, M. A & Tsuji, K (2012)	Evaluation of Usage of University Websites in Bangladesh	2012	67
2.	Ahmed S.M.Z., Shoeb M.Z.H (2009)	Measuring service quality of a public university library in Bangladesh using SERVQUAL	2009	52
3.	Bari, S., <i>et al.</i> , (2006)	Trends in use of referral hospital services for the care of sick newborns in a community-based intervention in Tangail District, Bangladesh.	2006	32
4.	Ahmed S.M.Z.	Use of electronic resources by the faculty members in diverse public universities in Bangladesh	2013	30
5.	Jahan I., & Ahmed S.M.Z.	Students' perceptions of academic use of social networking sites: A survey of university students in Bangladesh	2012	29
6.	Roknuzzaman M., & Umemoto K.	How library practitioners view knowledge management in libraries: A qualitative study	2009	29
7.	Roknuzzaman M., Kanai H., & Umemoto K	Integration of knowledge management process into digital library system: A theoretical perspective	2009	28
8.	Guns, R., Liu, Y. X., & Mahbuba, D.	Q-measures and betweenness centrality in a collaboration network: a case study of the field of informetrics	2011	25
9.	Agarwal N.K.& Islam M.A.	Knowledge management implementation in a library: Mapping tools and technologies to phases of the KM cycle	2014	24
	Shoeb Z.H.	Identifying service superiority, zone of tolerance and underlying dimensions: Service quality attributes in a private university library in Bangladesh	2011	24
	Islam, M. A., & Hoq, K.M.G.	Community Internet Access in Rural Areas: A study on Community Information Centers in Bangladesh	2010	24
	Ahmed S.M.Z. McKnight C., & Oppenheim C	A user-centered design and evaluation of IR interfaces	2006	24
	Islam M.A., Agarwal N.K., Ikeda M.	Effect of knowledge management on service innovation in academic libraries	2017	22
10.	Islam M.A., Tsuji K.	Assessing information literacy competency of Information Science and Library Management graduate students of Dhaka University	2010	22
	Nasir Uddin, M., Janecek, P.	Faceted classification in web information architecture A framework for using semantic web tools	2007	22
	Khan, M.S.I., Ahmed, S.M.Z., Munshi, N.M., & Akhter N.	Library and information science literature in Bangladesh: A bibliometric study	1998	22

It is because of international collaboration among the author countries (multiple authors and countries in one paper). For example, in a publication where the authors collaborated from Bangladesh, USA and Japan would increase the count of each country by 1 each, even though the article itself is only one.

From 1971 to 2020, Bangladeshi LIS professionals published articles with the authors from 20 countries.

4.4 National and International Collaborations

Under the collaboration, we wanted to see the geographical

affiliations of all contributing authors in a publication. For this reason, we did not include the single author papers in Fig. 3. We only counted joint authors publications. Figure 3 that of the total of 192 joint-author publications 98(51.04%) are published by authors from the same country, while 94 (48.96 %) publications are contributed by authors from two or more countries. International collaboration was at its highest peak in the decade of 2011-2020, underlining the trend of a growing internationalisation in authorship constellation.

Table 7. Most productive organisations of LIS research publication

Rank	Name of organisation	Number of publications
1	Dept. of Information Science & Library Management, University of Dhaka	131
2	Dept. of Information Science & Library Management, University of Rajshahi	28
3	Japan Advanced Institute of Science and Technology (JAIST), Japan	28
4	University of Antwerp (Belgium)	14
5	Independent University of Bangladesh (IUB)	12
6	East West University (EWU), Bangladesh	11
	Simmons University (USA)	11
7	International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)	10
8	Noakhali Science and Technology University	6
9	Loughborough University, UK	5
10	Asian University for Women (AUW)	4
	Islamic University of Technology (IUT)	4

4.5 Author Productivity, Prolific Authors and Citations

Data for the number of authors and their number of publications were imported using VOSviewer software. Table 4 shows the frequency distribution of author productivity among the LIS researchers in Bangladesh. The mean number of contributions per author was 2.04, and both the median and the mode were 1. Majority of the authors have only one publication. To see the authorship productivity of 285 authors, 266 publications were tabulated in ascending order (Table 4).

A list of top ten authors who have published seven or more than seven publications between 1971 and 2020 are shown in Table 5. Table 5 shows the top ten prolific authors of LIS publications in Bangladesh. Prolific authors are ranked based on the number of publications (column 1). Many international authors fall under the prolific authors lists, but we did not count them. The second column of this table shows the authors name and the year of their first publication, while the third column presents the number of the publication. The fourth column lists the year since publication (2020- the year of publication). The fifth column shows the average article written by the author per year (no. of articles / no. of years), and the sixth column shows the total citations of all publications of a given author. The last column shows the average citations per article. The rank will be different if it is categorised by average article per year.

Table 6 presents the ten most cited papers published from 1971 to 2020. This list includes all journal articles. The number in the first column shows the rank based on citations and publications are arranged based on the number of citations.

4.6 Most Productive Organisations and Journals

Table 7 shows the top-10 most productive universities and organisations contributing to LIS research publications. The Department of Information Science and Library Management (ISLM) at the University of Dhaka appeared as the most productive ISLM Department with 131 publications. Under the productive organisations, all are universities in home and abroad except icddr,b which is an international health research organisation.

4.7 Most Productive LIS Journals and Conferences

Table 8 lists the top journals and conferences where Bangladeshi LIS researchers publish. Library Philosophy and Practice is in the top list of journals with 31(11.65 %) which is followed by International Information and Library Review 24(9.02 %), IFLA 16(6.02 %), The Electronic Library 15(5.64%)andGlobalMemoryKnowledgeandCommunication & Malaysian Journal of Library and Information Science 12(4.51 %) for each. Most of the journals in this list are from the UK (11) followed by USA (5), Netherlands (3), India (2) and others one each from Malaysia, China, South Korea and Germany. However, most of these journals fall under quartiles 2(Q2). Q2 is occupied by journals in the top 25 per cent to 50 per cent group (Q2) category.

Apart from that, we tried to identify the leading publishers with a number of journals published (Fig. 4). We found that Emerald published highest 24.81 per cent journals where the Bangladeshi LIS researchers published their research publication. Next to Emerald, Sage has 23.31 per cent LIS

Table 8. Top ten journals/conferences where LIS publications are published (n=266)

Rank	Name of journal	Total articles	Per cent	SJR-Scopus
1	Library Philosophy and Practice	31	11.65	Q3(USA)
2	International Information and Library Review(IILR)	24	9.02	Q2(USA)
3	IFLA Journal	16	6.02	Q1(UK)
4	The Electronic Library	15	5.64	Q2(UK)
5	Global Knowledge Memory & Communication	12	4.51	Q2(UK)
	Malaysian Jr. of Library &Information Science	12	4.51	Q2(Malaysia)
6	Annals of Library Information and Studies	7	2.63	Q3 (India)
	Scientometrics	7	2.63	Q1(Netherlands)
7	Digital Library Perspectives	6	2.26	Q2(UK)
	Information Development	6	2.26	Q1(UK)
	Business Information Review	6	2.26	Q1(UK)
	Proceedings of ASIS&T Annual Meeting	6	2.26	Q3 (USA)
	Lecture notes in Computer Science	6	2.26	Q2 (Germany)
8	VINE Journal of Information and KM Systems	5	1.88	Q2 (UK)
	Information and Learning Science	5	1.88	Q2 (UK)
	Performance Measurement and Metrics	5	1.88	Q1 (UK)
	Knowledge Management and E-Learning	5	1.88	Q2 (China)
	Library High Tech News	5	1.88	Q3 (UK)
	Journal of Information Science Theory and Practice	5	1.88	Q3 (S. Korea)
9	DESIDOC Journal of Library and Information Tech.	4	1.50	Q2 (India)
	Journal of Information and Knowledge Management	4	1.50	Q3 (USA)
	Education for Information	4	1.50	Q2 (Netherlands)
10	Library Management	3	1.12	Q1 (UK)
	Journal of Information Science	3	1.12	Q1 (USA)
	Journal of Informetrics	3	1.12	Q1(Netherlands)

journals which is followed by Springer (5.64 %) and Elsevier (3.01 %).

4.8 Frequently Used Author Keywords

We analysed the 10 most used author keywords from the publications (Table 9). As a keyword, Bangladesh appears 84

times in the publications and ranked the most used keyword used by the researcher. Information literacy, user satisfaction and bibliometrics each appear 5 times in the publications.

4.9 Author Productivity, Prolific Authors and Citations

The previous part of this study analysed the bibliographic

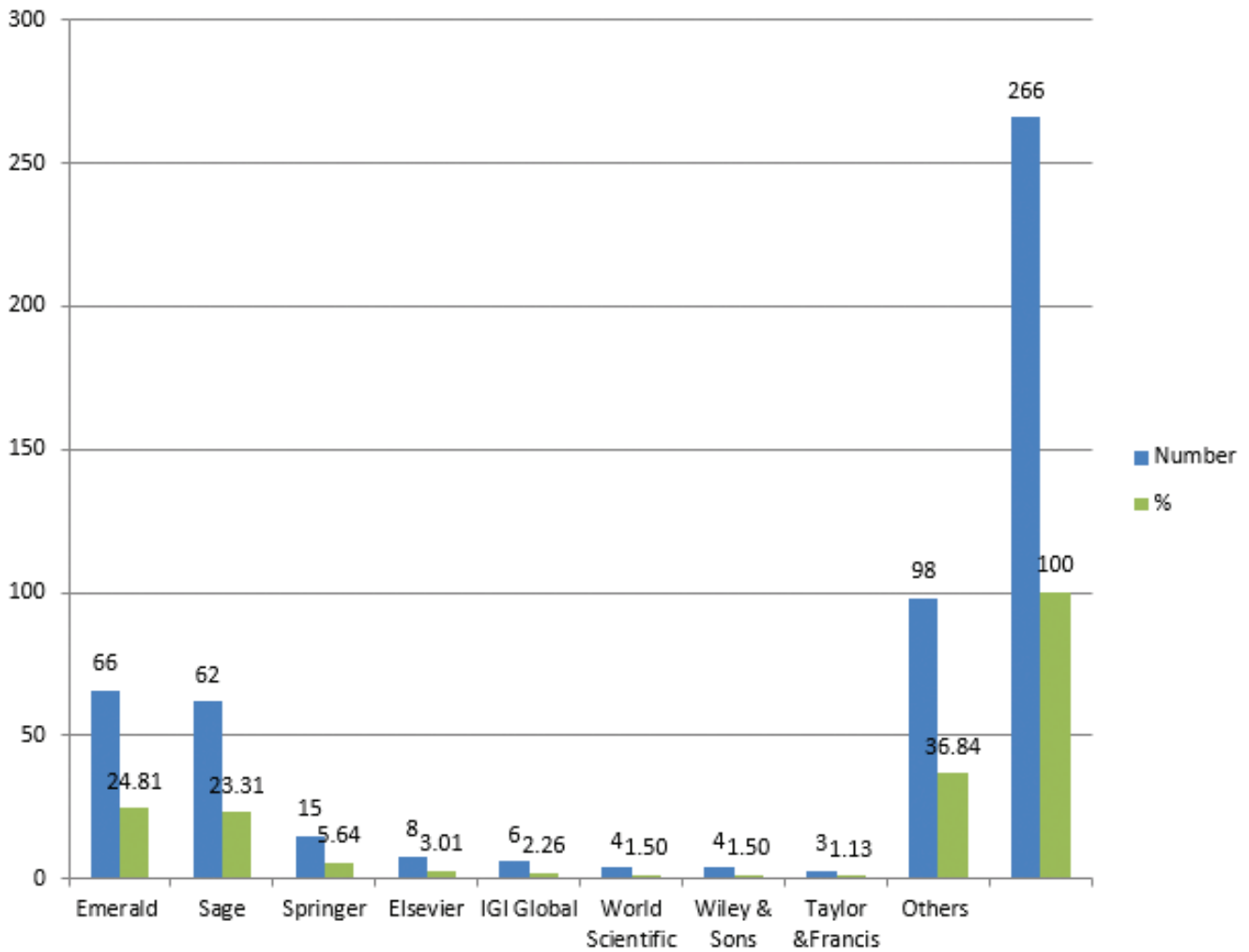


Figure 4. Leading LIS journal publishers.

Table 9. Author keywords (1971-2020)

Rank	Keyword	Occurrences
1	Bangladesh	84
2	Knowledge management	15
3	Academic libraries	14
4	Libraries	12
5	Dhaka university	10
	Servqual	10
6	Developing countries	9
7	Digital libraries	8
	University libraries	8
8	Internet	7
	Library services	7
	Service quality	7
9	Electronic resources	6
10	Information Literacy	5
	User satisfaction	5
	Bibliometrics	5

information of publications, and to continue characterizing this publication; we carried out a science mapping analysis, e.g., bibliographic coupling. Bibliographic coupling occurs when two works reference a common third work in their bibliography.²⁰ For example, paper A and B are bibliographically coupled if they cited papers C, D and E in their reference list. We used VOSviewer to analyse this coupling process. Different types of networks can be constructed by using this process. Here, we present the bibliographic coupling of publications, see Fig. 5.

The total strength of bibliographic coupling links with other documents is calculated. The size of the label and the circle of an item is determined by Total Link Strength (TLS). The TLS attribute indicates the total strength of the co-authorship links of a given researcher with other researchers. For example, Hossain, M.J ‘s (2013) publications have 143 TLS which is the top among all the publications. In case of co-citation of cited authors (Fig. 6), if we consider minimum number of citations of an author 1, we found 4992 authors. For each of the 4992 authors, the TLS is 135100 where Parasuraman, a. has the highest 4229 TLS.

In case of co-occurrence of author keywords, we would see the TLS of the most used author keywords, see Fig. 7. We could see from the backend data that Bangladesh appears 85 times and it has 362 TLS.

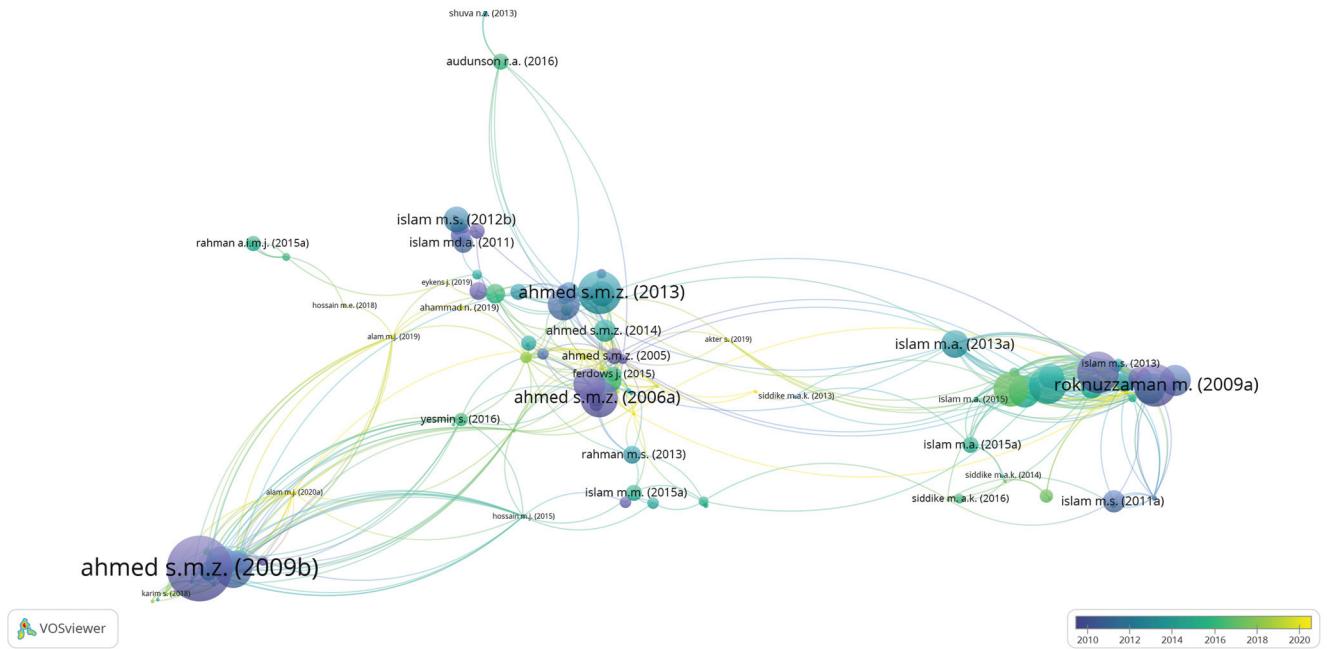


Figure 5. Bibliographic coupling of publications.

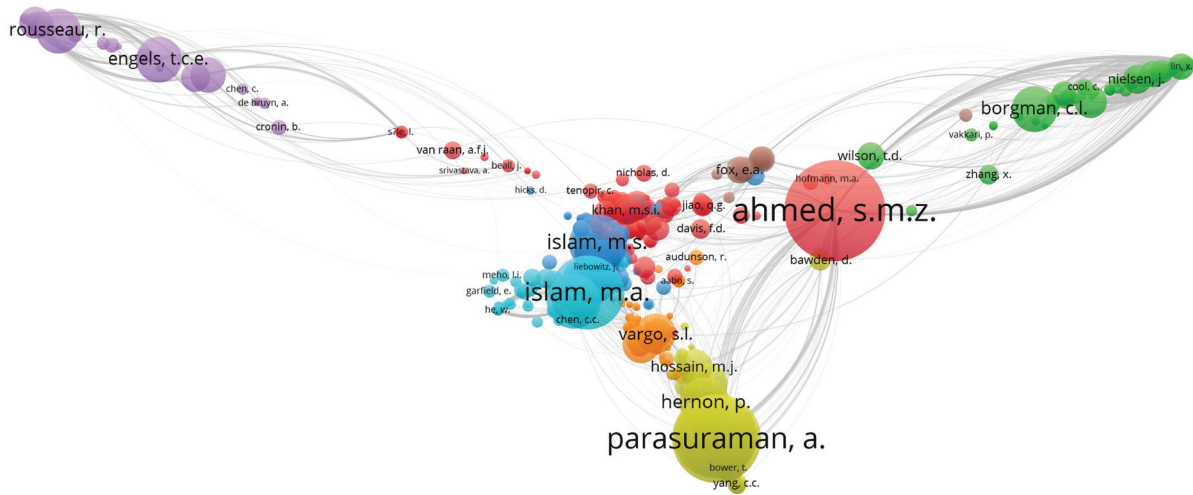


Figure 6. Co-citations of cited authors.

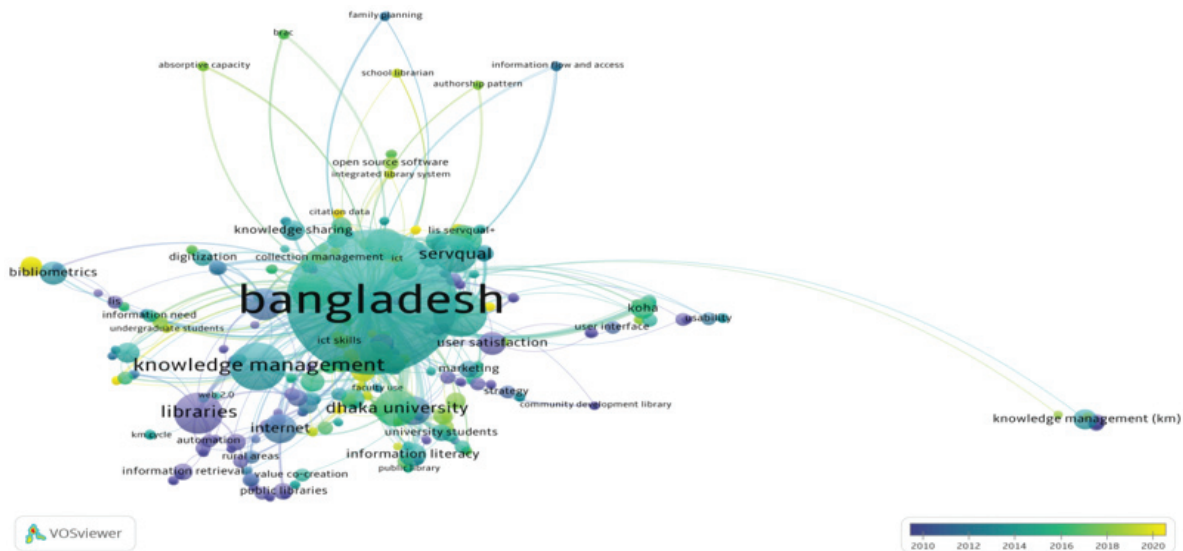


Figure 7. Co-occurrence of author keywords.

5. FINDINGS AND DISCUSSION

The present study brings forth a wide set of findings which are very significant for uncovering the research patterns of published LIS publications between 1971 and 2020. Under (RQ1), we found that Bangladeshi LIS researchers published more than two hundred and fifty LIS research articles in five decades. Even though the number of LIS publications was growing, the ratio was low compared to the number of LIS publications in neighboring countries. For example, a study from Pakistan found that Pakistani LIS researchers have published 1305 LIS publication in 62 years¹⁶ and 3,396 LIS publications in India for the periods between 1967 to 2004.²¹ Both of these studies examined the LIS publications of respective countries in the leading research databases, e.g., SCOPUS, WoS and LISA. A possible reason why Bangladesh does not have any LIS journals which are listed in the leading databases. Both India and Pakistan have SCOPUS listed LIS journals, e.g., *Annals of Library Information and Studies (ALIS)*; *DESIDOC Journal of Library & Information Technology (India)* and *Pakistan Journal of Information Management and Libraries*. It is interesting to note that the result might be different if Bangladeshi LIS researchers could get the opportunity to publish in SCOPUS listed journals published from Bangladesh.

Under the (RQ2), we analysed the authorship pattern and research collaboration during 50 years. It is noticed that from 1971 to 2000, single authorship was high while joint authorship was not a popular idea among LIS researchers. Since 2000 the joint authorship was increasing and continues to grow. We found that joint authorship has more than doubled for publications compared to single authorship. Nowadays, the growth of co-authorship is increasing and expected due to the increasing competitions, opportunities to collaborate, growing multidisciplinary research fields and growth of technology as a whole. It is evident that co-authorship supports more productivity and collaboration. There is a strong relationship between collaboration and productivity. If the number of collaborations is increased, it would increase author productivity⁸. Under the collaboration areas, we found that Bangladeshi LIS researchers published research articles with the authors from twenty countries. Japan was ranked first with almost 9 per cent share of authorship. An explanation for this may correlate with the fact that many prolific LIS researchers in Bangladesh got their PhD from Japan (Table 5). The increasing international research collaborators in the publications show positive trends of the internationalisation of LIS research in Bangladesh. Moreover, due to the synchronous communication tools, e.g., Google meet, Zoom, GoToMeeting, Skype and some other communication software has made it easier for the geographically distant collaborators to get connected with each other for collaboration^{20,22-23}.

In RQ3, we analysed of authors that have the highest number of publications and which 10 papers were the most cited in the LIS publications. Authors' productivity is defined by the number of papers published by authors within a given period. We found that Ahmed, S.M.Z occupies the top position with a contribution of 36 publications where most of his publications came under joint authorship. It is because of Ahmed is well known Professor and researcher in Bangladesh who has variant

experience as a faculty member and acting librarian of Dhaka University Library. Ahmed has the experience of consultant for different digital library projects, editorial board members and chief editor of many LIS journals. The second most prolific author was Islam, M. A., who is followed by Islam, M.S. It might be coincidence that these three researchers are serving at the ISLM Department in the University of Dhaka. Under the most cited publications and authors, Islam & Tsuji (2012) 's study 'Evaluation of Usage of University Websites in Bangladesh' conquers the highest citations 67 with an average of 7.44 citation per year. It is followed by Ahmed & Shueb's (2009) study on "Measuring service quality of a public university library in Bangladesh using SERVQUAL". Both of these research areas fall under the broad category 'Usability' which is one of the most promising research areas for many researchers in Bangladesh. However, high citation counts may not necessarily indicate quality as some research fields cite papers more than others.

In RQ4, we found that Department of Information Science and Library Management (ISLM) at the University of Dhaka got the highest position with 131, the largest number of LIS publications (131) and is followed 28 publication each from the Department of Information Science and Library Management (ISLM), Rajshahi University & JAIST. The ISLM Department from Dhaka University ranked the top position as it is the oldest LIS School in Bangladesh, and many faculty members are the prolific authors of this school. For publishing in the journals, we found that most of the LIS researchers published in the LPP, which is followed by IILR, IFLA, TEL, GKMC and MJLIS. It might be the reason that LPP offers Open Access (OA), moderate reviewing criteria compare to other impact factor journals, first reviewing process, high rate of acceptance and ranked Q3 category.

Under the RQ5, we analysed the title of the research publications and keywords systematically to examine the evolution and distribution of LIS research topics at 10-year increments from 1971 to 2020 for title and keywords for the 50 years. For example, in 2011-2020, "library", "knowledge", "public" and "digital" are among the top words used in the title of LIS research articles. These changes in top words in the paper titles for 50 years demonstrate the changes in research towards greater emphasis on information access, digital library, knowledge management and library services. Under the frequency of keywords during the 50 year period, it is interesting to see that how some new keywords, e.g., "Bangladesh", "knowledge management", "Dhaka University", "Servqual" and "digital libraries" are taking over the top places compared to other keywords used by the researchers. These are the keywords that have a significant shift in subtopics.

6. CONCLUSION AND FUTURE STUDY

An analysis of LIS publications listed in the leading two databases show that Bangladesh has low research visibility in the area of LIS in the global outlet. Even across the country, this visibility is much lower compared to the other disciplines in social sciences. For example, in 2019, Geography has 181 publications listed, while LIS has only 22 publications in the SCOPUS listed journals⁶. The other indicators like the

total number of publications, papers published by the prolific authors and LIS as a discipline is not promising like other disciplines. However, a significant findings of this study is that an adequate number of Bangladeshi LIS faculty members, professionals and students who are expatriates are helping to internationalise LIS education and research publications in the scholarship platform. Even though Bangladesh does not have any SCOPUS listed LIS journals, the spike in the number of LIS publications during the last two decades shows a positive shift. These findings suggest that Bangladesh needs to pay attention for improving the research visibility in the SCOPUS and WoS listed publications.

This study has several limitations. First, data sources are limited to SCOPUS and WoS and data collected and analysed up to 24 September 2020. Importing and analyzing data from other data sources might give a different result. In addition, there are lots of inconsistencies for search strings in SCOPUS and WoS. The search terms “Library” and “Bangladesh” can miss relevant data which may fall in LIS research areas but not use the keyword “library” or “libraries” e.g., “information retrieval”, “knowledge management” etc.

Second, we do not know how many Bangladeshi LIS researchers or practitioners are working and studying abroad. We largely depend on snowball techniques to locate them. Third, in case of the name of authors and their family names, there were lots of duplication, e.g., Islam, S. Fourth, for the updated issue, once SCOPUS receives an article, it is usually indexed within four days, and we do not know how many articles enlisted after 24 September 2020. For the future studies, we will invite other LIS researchers to come forward and examine these limitations and to aid in cross-comparison. A follow up study with other keywords using Boolean Operators ‘OR’ related to LIS field and publications from both SCOPUS and non-SCOPUS listed LIS journals would bring the entire publication scenario of the Bangladeshi LIS researchers.

This study has some implications. University Grants Commission (UGC), an apex body for the universities of Bangladesh, should come forward with certain policies for the faculty members. Policies should formulate so that faculty members must publish in the high impact journals for promotion and tenure expectations. Department of ISLM, University of Dhaka should come forward to include ‘EL’ and ‘BJLIS’ in the SCOPUS or WoS list. There are some content policy and selection guidelines set by the Elsevier (SCOPUS is Elsevier’s abstract and citation database) to include journals in SCOPUS. LIS Faculty members and professionals of Bangladesh could follow the guidelines. They could invite other Bangladeshi LIS researchers from abroad for submitting paper, inviting prominent professors for becoming members of editorial board and start collaborations with the neighboring countries to lesson learned. These findings would help academic leaders and policymakers to step up and take necessary actions for enlisting journals from different disciplines in the leading citation databases. In the Scimago (SCImago is an alternative measure based on a different citation universe provided by SCOPUS) journal ranking, we found that there are only 15 journals listed from Bangladesh. For acquiring more weight under research and citation areas, the universities should work

to include more journals on the list. It is because of university ranking organisations, e.g., ‘The Times Higher Education World University Rankings’ collect data from the SCOPUS database, a bibliometric data supplier of Elsevier. Enlisting journals in the SCOPUS database would help to increase the visibility of publications and gain more weight (research, citations) for better ranking of universities. Will the academic leaders step up for improving the research visibility when Bangladesh is going to celebrate its 50th independence in 2021?

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CONTRIBUTORS

Md Anwarul Islam is an Associate Professor at the Department of Information Science and Library Management, University of Dhaka, Bangladesh. He received his PhD in 2016 from the School of Knowledge Science, Japan Advanced Institute of Science and Technology (JAIST). His primary research areas are knowledge management, information seeking behavior, information literacy and informetrics. His recent research also includes cloud computing and cognitive assistants in social life.

He helps to conceptualise the current study, write literature review, methodology and write the data analysis and discussion part.

Mr Prodip Kumer Roy AALIA (DCP) is a Library Officer at RMIT University. He is existing executive member for Creative Commons Australia Chapter and leads responsible for Open Ed (Tertiary).

He contributed to collect data from the SCOPUS database from the RMIT university library. Later he also helps to cleaning, coding and editing data for the analysis purposes.