e-Library Science Research Journal

MAPPING THE RESEARCH OUTPUT OF 'e-LIBRARY SCIENCE RESEARCH JOURNAL': A SINGLE JOURNAL BIBLIOMETRIC STUDY
PART 1 : QUANTITATIVE ANALYSIS

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ABSTRACT

Quantitative studies / Metric studies are popular forms of research in Library and information Science. The present study is a bibliometric study of e-library Science Research Journal covering 521 articles published in the journal from Jan. 2013-Dec. 2015. The study reveals that: Maximum numbers of 210 articles (40.31%) were published in the year 2014 and a minimum of 114 articles in the year 2013 (21.88%). The Average article per year is 173.67. Volume No. 2(9), 2014 has the highest number of total articles (31, 5.95%). The highest number of publications (112, 21.50%) was published in the 3rd half yearly period (January – June, 2014). The GR showed a positive trend in 2nd half (1), 3rd half (0.47) and 5th half (0.10). The GR showed a negative trend during 4th half (-0.12) and 6th half (-0.16). RoG witnessed an increasing trend of 1.44 in the 3rd half-yearly period from 1.0 in the 2nd half-yearly period. RoG for 12 quarters calculated for the journal exposes a fluctuating growth. The Dt has increased from 26.28 in 2014 to 28.73 in 2015. The RGR shows almost a declining trend over the period of time.

KEYWORDS: Bibliometrics, e-library science research journal, growth rate, doubling time, ratio of growth, relative growth rate

INTRODUCTION:

Information managers have adopted a number of quantitative methods in recent year in order to evaluate library resources and services more objectively and effectively. Bibliometrics is one of the quantitative techniques applied by information managers to measure the records of human communication. It is used to identify the pattern of publication, authorship; citations used for a subject etc over a period of time and there by offering insight into the dynamics of the area under a particular study.

Bibliometrics has attained significance in recent years because of its practical application in the evaluation of library operations and services. As a statistical technique, it has extensive application in library and information field in identifying the research trends in a subject, trends in author productivity, core journals, obsolescence and scattering

of literature. It is also useful in libraries in formulating need based collection development policy, weeding and stacking policy and science policy studies. Bibliometrics studies provide objective data to information managers to take timely decisions.

REVIEW OF LITERATURE

Maity and Teli (2015) identified the growth and authorship pattern of productivity in the "Malaysian Journal of Library and Information Science 2010 to 2014". The study covers 114 articles published during the period 2010 to 2014. The findings revealed that: the maximum number of articles (28) was published in 2011. There has been slight decrease in the number of articles published from 2012 to 2014. Maximum numbers of contributors (48) are joint authored. The highest (72) contributions are from Malaysia and. Zainab Awang Ngah has published maximum no. of articles (13) in the journal.

Padma and Ramasamy (2015) undertook a bibliometric study of contributions found in the 'Malaysian Journal of Library and information science' during the years 2007-2012. Findings indicate that year 2011 has the most number of articles i.e. 28 (23.73 %) and the year 2007 has the least number of articles i.e. 14 (11.86 %). 27.5 % of the articles were single authored, 42.5% of the articles were two authored and 22% of them were three authored. The overall degree of collaboration for the period 2007-2012 is 0.725. 44 (36.67 %) articles were in the page range of 16-20 followed by 43 articles within the page range of 11-15. 45% (54) of the articles used 21-40 references and 37.5% of the articles used up to 20 references.. University of Malaysia tops with 28 articles constituting 23.33 % of articles published, followed by Bhabha Atomic Research Centre and Islamic Azad University with 6 articles each (5.0 %).

Verma, Sonkar and Gupta (2015) did a bibliometric study of the E-Journal, 'Library Philosophy and Practice' for the period 2005 to 2014. 1177 no. of articles was taken up for the evaluation. In all with an average 117 articles were published each year. Single authorship is leading authorship trend but also two authored articles have shown good number of contribution with the 0.51 rate of degree of collaboration. The study recommended that it is helpful for libraries, researchers, readers for scholarly communication to choose right journal for research, study etc.

Gudodagi and Manjunatha (2014) evaluated the publication and reference patterns in the PEARL - A Journal of Library & Information Science from 2007-2013. The findings revealed that: Only few research papers were published by the foreign authors. Andhra Pradesh contributed maximum number of papers followed by Karnataka and Tamil Nadu. These three south Indian states contributed 66% of the total papers. The maximum numbers of contributors are two authors with 42.12 %. The average length of the research papers is 7 pages. The study reveals that the average number of 10 references per paper indicates that the authors review a significant amount of literature before writing a paper. The study also shows that almost all research papers include a brief abstract.

Mamdapur, Rajgoli and Chavan (2014) analyzed articles published in SRELS Journal of Information Management during the years 2004-2013 covering 10 volumes containing 48 issues. 499 articles are published with 6224 citations appended to them. Authors have mainly depended on journals (44.49%) and books (22.51%) as their preferred choice of information sources. The shift from print to electronic and the authors' choice of electronic resources has made Web Pages (15.60%) as other important source of information. Nearly 51.00% of articles have a page range of 6-10 pages. The highest contributions are two-authored (51.70%) followed by single authored (34.70%).

Pandita (2014) carried out a bibliometric study on 366 scholarly research articles published in 'DESIDOC Journal of Library and Information Technology, during the period 2003-2012. Maximum of 147 articles contributed in the journal are on two author pattern, followed by 139 articles as single author. New Delhi since being the host state of the journal emerged the single largest contributing state with 199 out of 627 contributors from India. On average 6.20 articles were published by the journal in each issue during the period of investigation with total references 5063, thereby making average 13.83 references each article.

Thanuskodi (2014) made a study on the bibliometric analysis of the journal titled "D-Lib Magazine" for the period 2003 - 2012. The result showed that out of 361 articles, joint authors contributed 241 (66.75%)

articles while the rest 120 (33.25%) articles were contributed by single author. The highest contributions were from universities (147, 40.73%) followed by research institutions (82, 22.71%) and Colleges (65, 18.00%). The remaining 67 articles (18.56%) were contributed by other agencies like public organizations etc. Majority of the contributors preferred journals as the source of information which occupied the top position with the highest number of citations (3656, 49.36%) of the total 7407 citations followed by Seminar / Conference Proceedings with 1315 (28.68%) citations

Barik and Jena (2013) made a bibliometric analysis on 'Journal of Knowledge Management Practice'. The study covers the 180 articles of 21 volumes in 5 years from 2008-2012. The study revealed that: In the year 2011, highest 42(23.3%) articles were published out of 180 articles in 5 years. Single author contribution is predominant with 42.7%. Average numbers of citations per article are 19. In geographical distribution of articles, USA has contributed 34 articles with 18.8% and highest 69.4% articles are published with page range of 11-20.

Das (2013) analyzed the journal "Library Trends" with an aim to analyse the contributions of the author and the citations cited by various articles appeared in it. The study comprised of 206 articles published from 2007-2012. Highest number (51) of articles is published in 2007-08. Majority of authors preferred to publish their research results in individual authorship mode (122, 59.22%). The majority of articles 63 (30.58%) have the length of 16- 20 pages. The highest number of contributions have citations between 11to 20 is 48 (23.30%).

Edeworr (2013) evaluated the 'Journal of Information and Knowledge Management (IIJIKM)' over a four year period of 20110-2013. The study reveals that journal is the most preferred source of citation in LIS research. Library Philosophy and Practice, an e-journal topped the list of journals most cited in IIJIKM. Use of Internet resources is fast gaining ground amongst scholars and academics in Nigeria. Information technology was the most researched subject. There was clear absence of international collaboration among authors published in the journal. Majority of the authors prefer multiple authorship.

Padma and Ramasamy (2013) carried out a bibliometric study of the journal "Journal of Information Literacy" (2007-2012) and the findings reveal that : Single authors contributed 37 papers in Type I publication. The degree of collaboration is 0.51 indicating the domination of multiple authors over the single authors. On an average, 26.31% of the articles used 10-20 references. 63.30% of the articles were contributed by UK followed by 19.42 from USA. Loughborough University has contributed a maximum of 5 articles. 28 articles have 11-15 pages. There is an inter-institutional research to the extent of 23.07%.

Pareek (2013) carried out a bibliometric study of the literature of the IFLA journal during 2001-2010. 283 articles were published during the period of study. The year 2001 shows the maximum number of contributions (34 articles; 12.01 percent) to the IFLA journal. Almost 99 percent articles are written in English language. The majority of the articles were contributed by single authors (214 articles; 75.62 percent); and most authors were librarians, faculty members or researchers affiliated with academic or research institutions. Similarly most of the contributions are from USA with (71 articles; 18.35 percent), while Indian contribution is very less. The study revealed that maximum number of citations accounted in the period 2008 (12.01 percent). And maximum lengths of the citations are 11-20 citations.

Rabindra and Das (2013) analysed the publication trends of Malaysian Journal of Library and Information Science (MJLIS) for the period 2007-2011. The findings reveal that: The range of papers published per volume during the period under study is 14-28 with an average 20 papers in each volume. Majority of two authored papers (48 nos.) published during the studied period, followed by single author, three authors' etc. The author productivity is 0.47 and average number of authors per paper is 2.15. The degree of collaboration ranges from 0.5 to 0.9 and the average degree of collaboration is 0.73 8.The Pattern of Co-authorship (CAI) ranges from 39-222 during the entire period under study. More numbers of papers (38%) are published in between 11-15 pages. contributed a total of 100 papers, 75 (34.9 %) papers are geographically affiliated to Malaysia.

Roy and Basak (2013) conducted a Bibliometric study on 'Journal of Documentation'. The degree of collaboration is found to be 0.51. The contribution by United Kingdom is the highest. The average citations per paper are 43. The average number of contributions per volume is 41. Most of the contributions are on Information Retrieval (22.76%). Information Science (philosophy and theory) (11.78%) , Cataloguing and Classification (10.16%) , Knowledge & Information Management with (8.94%) and ICT, Digital libraries & Web

Technologies (8.52%). Most of the contributions in this journal are from United Kingdom (32.11%) followed by USA, Finland, Australia, etc All the contributions are with a good number of citations and 6.21% of citations are self-cited by the respective authors.

Watti and Tiwari (2013) evaluated the articles published in SRELS Journals of Information Management from 2006-2011 revealed that: The degree of collaboration is found to be 0.60. Karnataka contributes the highest number of published articles in India. Out of 288 articles, highest numbers of articles i.e. 62 were published in the year 2010 & 2011. The lowest number of publications i.e. 35 was in year 2006. The majority of publications are of multiple authored articles which constitute 52.08% out of the total papers followed by 34.37% and 09.72% by single authors and by three authors, respectively. Out of 288 articles, 73 articles (25.34%) have more than 15 citations, 3 articles have no citations, 68 (23.61%) articles had 7-10 citations and 67 (23.26%) articles had 4-6 citations. Maximum numbers of papers (32) were related to Bibliometric study, followed by Internet (22), Library management (18) and Consortia (17).

SOURCE JOURNAL

e-Library Science Research Journal (LSRJ) is a peer-reviewed journal. The journal took birth in 2012. The first issue of first volume was published in November. It is published by Laxmi Book Publication and indexed at the Directory of Research Journal Indexing (DRJI).

OBJECTIVES OF THE STUDY
The objectives of the study are, inter alia:
- To list Year-wise, Volume-wise, Issue Wise, Half-yearly and Quarterly distribution of articles
- To rank the contributors
- To identify solo Vs collaborative contributors
- To show the Growth Rate and Growth Ratio
- To present the page length of articles
- To showcase the authorship patterns and Year-wise authorship pattern
- To trace out the prolific authors with their productivity count.
- To find out the prolific authors top-20 and potential prolific authors top-20 contribution and ranking
- To show the geographical research productivity
- To identify the most productive institutions
- To calculate the Science Production Index
- To explore the availability of Abstract, Key word, tables and figures in the articles
- To know the range of key words, references, tables and graphs
- To know Year-wise Print and web references
- To find out the authorship pattern of references
- To measure the yearly, half-yearly and quarterly 'Degree of collaboration' and
- To know the trend of collaboration among productive authors

RESEARCH METHODS
Research Type

The study undertaken by the researcher is a quantitative study. It is a bibliometric study of research productivity of authors as reflected in the articles included in the journal (e-Library Science Research Journal) from Jan. 2013 to Dec.2015.

Sample size

521 articles published in the journal 'e-Library Science Research Journal' during the study period from the sample of the study.

Data collection and Data Entry

The researcher himself goes through each and every article individually and personally. An Excel sheet was prepared with relevant variable in rows, to collect the required data from 521 articles.

The information that will help the research to fulfill the objectives, set for the study, are collected through this worksheet. The spreadsheet contains necessary variables to collect data about the articles. Example of variables: number of articles, number of volumes, number of issues, year, name of the author, authorship pattern, title, designation, name of the institution, place, abstract, key words, length of article, tables, graphs and charts, references etc.

The variables, called for as above, are keyed in by the researcher in MS Excel Sheet directly by collecting information from each and every article.

Bibliometric Indicators

The following bibliometric indicators were used in the study to analyse the data collected from the journal.

1 Quantitative Analysis
- Year-wise distribution of articles
- Issue-wise distribution of articles
- Half-yearly-wise distribution of articles
- Quarter-wise distribution of articles
- Growth Rate (Half-yearly and Quarterly)
- Growth Ratio (Half-yearly and Quarterly)

2 Authorship Pattern Analysis
- Authorship Pattern
- Year-wise Authorship Pattern
- Designation-wise distribution of articles
- Most Prolific authors
- Dominant Authors

3 Geographical Analysis
- India Vs. Foreign
- Country-wise distribution of articles
- Indian State-wise distribution of articles
- Most productive institutions
- Science Production Index

4 Collaborative Analysis
- Year-wise degree of collaboration
- Half-yearly-wise degree of collaboration
- Quarter-wise degree of collaboration
- Trend of collaboration among Indian states

5 Content Analysis
- Length of the articles,
- Availability of abstracts, keywords, tables, graphs and charts
- Range of keywords, range of tables, , range of charts and graphs
- Year-wise number of tables, graphs and charts.

6 Reference Analysis
- Availability of references
- Range of references
- Year-wise print and web references
- Age of references
- Authorship pattern of references

SCOPE AND LIMITATIONS

✦ The present study has the following scope and limitations within its operating purview.
✦ This is a single journal bibliometric study
✦ The study is confined to the articles published between 2013 and 2015 only
✦ The study is limited to the articles published in English Language. Out of 525 articles published in the journal during 2013-2015, 521 articles are included for the study and 4 articles are excluded, Out of those 4, two are Hindi articles and the remaining two could not be accessed by the researcher via internet.
✦ Bibliometrics laws like Bradford's law, Zipf's law, Lotka's law etc were not used, as the study is limited to the articles published in a single journal.
✦ Certain bibliometric indicators are used with 'Principle of Local Variation'.

REFERENCING STYLE

American Psychological Association (APA, 2010), (6th edition) is used for providing bibliographical references and in-text citations.

DATA ANALYSIS AND INTERPRETATION
1 Year Wise Distribution of Articles

Table 4.1: Year Wise Distribution of Articles

S:No	Year	Volume	No. of Contribution	Year-wise Contribution	Percentage
1	2013	1	83	114	21.88%
		2	31		
2	2014	2	185	210	40.31%
		3	25		
3	2015	3	167	197	37.81%
		4	30		
Total		04	521	521	100%
Average article Per Year - 521/3= 173.67					

(Source: Primary Data)

Table 4.1 indicates the year-wise distribution of articles published in the journal 'e-Library Science Research Journal'. The journal published 521 research papers during the period of study i.e. from 2013 to 2015. Maximum numbers of 210 articles (40.31%) were published in the year 2014 and a minimum of 114 articles in the year 2013 (21.88%). The Average article per year is 173.67.

2 Issue-wise Distribution of Articles

Table - 4.2: Issue-wise Distribution of Articles

S:No	Year	Volume No	Issue No	No. of Contribution	Percentage	Cumulative Total	Cumulative %
1	2013	1	3	06	1.15	6	1.15
2	2013	1	4	07	1.34	13	2.50
3	2013	1	5	**01**	0.19	14	2.69
4	2013	1	6	05	0.96	19	3.65
5	2013	1	7	07	1.34	26	4.99
6	2013	1	8	12	2.30	38	7.29
7	2013	1	9	13	2.50	51	9.79
8	2013	1	10	10	1.92	61	11.71
9	2013	1	11	13	2.50	74	14.20
10	2013	1	12	09	1.73	83	15.93
11	2013	2	1	14	2.69	97	18.62
12	2013	2	2	17	3.26	114	21.88
13	2014	2	3	16	3.07	130	24.95
14	2014	2	4	21	4.03	151	28.98
15	2014	2	5	14	2.69	165	31.67
16	2014	2	6	**24**	**4.61**	189	36.28
17	2014	2	7	17	3.26	206	39.54
18	2014	2	8	20	3.84	226	43.38
19	2014	2	9	**31**	**5.95**	257	49.33
20	2014	2	10	16	3.07	273	52.40
21	2014	2	11	18	3.45	291	55.85
22	2014	2	12	08	1.54	299	57.39
23	2014	3	1	12	2.30	311	59.69
24	2014	3	2	13	2.50	324	62.19
25	2015	3	3	17	3.26	341	65.45
26	2015	3	4	16	3.07	357	68.52
27	2015	3	5	16	3.07	373	71.59
28	2015	3	6	19	3.65	392	75.24
29	2015	3	7	21	4.03	413	79.27
30	2015	3	8	19	3.65	432	82.92
31	2015	3	9	16	3.07	448	85.99
32	2015	3	10	20	3.84	468	89.83
33	2015	3	11	11	2.11	479	91.94
34	2015	3	12	12	2.30	491	94.24
35	2015	4	1	13	2.50	504	96.74
36	2015	4	2	17	3.26	521	100.00
Total		4	36	521	100		

(Source: Primary Data)

The table 4.2   reveals issue-wise distribution of articles. Volume No. 2(9), 2014 has the highest number of total articles (31, 5.95%). Volume No. 2(6), 2014 has published 24 articles (4.61%). The least number of articles was published in Volume 1(5), 2013 with 1 article. Fig. 4.2 shows the cumulative total of articles published from Vol. 1.3 to Vol. 4.2.

3 Half-Year –wise Distribution of Articles

Table – 4.3: Half-Year –wise Distribution of Articles

Year	Half yearly	Period	No. of article	Percentage	Cumulative	Cum. %
2013	1st half	January – June	38	7.29 %	38	7.29 %
	2nd half	July – December	76	14.59 %	114	21.88 %
2014	3rd half	January – June	112	21.50 %	226	43.39 %
	4th half	July – December	98	18.81 %	324	62.19 %
2015	5th half	January – June	108	20.73 %	432	82.92 %
	6th half	July – December	89	17.08 %	521	100 %
	Total		521	100 %		

(Sources: Primary data)

Table 4.3 depicts the half yearly wise distribution of publications in the e-Library science research journal. The highest number of publications (112, 21.50%) were published in the 3rd half yearly period (January – June, 2014) followed by 108 articles in 5th half-yearly period (January – June, 2015) constituting 20.73% of total publications of the journal during the study period. The least number of 38 journals were published in the 1st half yearly period (January -June, 2013) constituting just 7.29% of total. While first three half-yearly periods contributed 43.39% of articles, the remaining 3 half-yearly periods contributed 56.61% of total publications.

4 Growth Rate

The formula for Annual Growth Rate (AGR) is:

AGR = (Ending Value – Beginning Value) / Beginning value

AGR for the year 2014 = 0.84

AGR for the year 2005 = -0.06

The AGR growth rate of the journal was 0.84 in 2014. But it shows a negative growth rate for the year 2015.

The same formula may be applied for calculating the half yearly growth rate too.

HYGR = (Ending Value – Beginning Value) / Beginning value

Table-4.4: Half Yearly Growth Rate

S:No	Half yearly GR	Period	No. of Articles	Growth Rate
		2013		
1	1st half	January - June	38	0
2	2nd half	July - December	76	1
		2014		
3	3rd half	January - June	112	0.47
4	4th half	July - December	98	-0.12
		2015		
5	5th half	January - June	108	0.10
6	6th half	July - December	89	-0.16
Total			521	

(Sources: Primary data)

Table 4.4 shows the half yearly growth rate of e-Library science research journal. The GR showed a positive trend in 2nd half (1), 3rd half (0.47) and 5th half (0.10). The GR showed a negative trend during 4th half (-0.12) and 6th half (-0.16). Thus, we could see a fluctuating growth rate of publications in the journal during the study period. The year 2013 2nd half yearly period showed the highest positive growth rate. The average growth rate was .055.

5 Ratio of Growth (RoG)

Changes in the size of literature over a specific period may be termed as growth of literature. The annual ratio of growth rate is calculated by the formula,

Ratio of Growth (RoG)   = Publications of year Y / Publications of year (Y- 1)

RoG for 2014 = 210/114 = 1.84 : 1

RoG for 2015 = 197/210 = 0.94 : 1

The same formula may be applied to calculate RoG for half-yearly periods too.

Half-Yearly RoG = Publication of Half-yearly Period Y/ Publications of Half-yearly Period(Y-1)

Table-4.5: Half-yearly RoG

Year	Half yearly	Period	No. of Articles	RoG
2013	1st half	January - June	38	0
	2nd half	July - December	76	1:1
2014	3rd half	January - June	112	1.47:1
	4th half	July – December	98	0.87:1
2015	5th half	January - June	108	1.10:1
	6th half	July - December	89	0.82:1
Total			521	

(Sources: Primary data)

Table 4.5 depicts the RoG of the journal during the study period in terms of its half-yearly productivity. RoG witnessed an increasing trend of 1.44 in the 3rd half-yearly period from 1.0 in the 2nd half-yearly period. But then it decreased to 0.87 in the 4th half but again increased to 1.10 in the 5th half. Thus, there is a fluctuation in the RoG of publications of the journal during the study period.

6 Quarter-wise Distribution of Articles

Table- 4.6: Quarter-wise Distribution of Articles

Year	Quarters	Period	No. of	Percentage	Cumulative	Cum-
	1stQ	Jan – March	14	2.69 %	14	2.69 %
	2ndQ	April – June	24	4.61 %	38	7.29 %
2013	3rdQ	July – September	36	6.91 %	74	14.20
	4thQ	October – December	40	7.68 %	114	21.88
	5thQ	Jan – March	51	9.79 %	165	31.67
	6thQ	April – June	61	11.71 %	226	43.38
2014	7thQ	July – September	65	12.48 %	291	55.85
	8thQ	October – December	33	6.33 %	324	62.19
	9thQ	Jan – March	49	9.40 %	373	71.59
	10thQ	April – June	59	11.32 %	432	82.91
2015	11thQ	July – September	47	9.02 %	479	91.94
	12thQ	October – December	42	8.06 %	521	100%
Total			521	100		

(Sources: Primary data)

Table 4.6 depicts the quarter-wise distribution of publications in the e-Library science research journal. The highest number of publications was published in the 7th quarter (July – September, 2014) that is 65 constituting 12.48 % of total publications. The second highest number of articles that is 61 was published in the 6th quarter (April-June, 2014) which constitutes 11.71% of the total articles. The least number of papers that is 14 was published in 1st quarter (January-March, 2013) constituting 2.69% of total publications.

Table 4.6 reveals that first four quarters contributed 21.88% of total articles published in the journal. While first six quarters contributed 226 articles (43.38%), the remaining six quarters contributed 56.62 % of publications. First eight quarters have contributed 62.19 % (324) of total articles whereas the last four quarters have contributed 37.81% of publications.

7 Quarterly Growth Rate (QGR)

Table- 4.7: Quarterly Growth Rate (QGR)

S:No	Quarters	Period	No. of Articles	QGR
2013	1stQ	January – March	14	0
	2ndQ	April – June	24	0.71
	3rdQ	July – September	36	0.50
	4thQ	October – December	40	0.12
2014	5thQ	January – March	51	0.27
	6thQ	April – June	61	0.20
	7thQ	July – September	65	0.06
	8thQ	October – December	33	-0.49
2015	9thQ	January – March	49	0.48
	10th Q	April – June	59	0.20
	11thQ	July – September	47	-0.20
	12thQ	October – December	42	-0.10
Total			521	

(Sources: Primary data)

Table 4.7 show the Quarterly growth rate of e-Library science research journal. The declining trend in the publications is evident during 8th quarter, 11th quarter and 12th quarter. The 2nd quarter showed the maximum positive growth rate of 0.71. The least positive growth was seen in 7th quarter (0.06).

8 Quarterly Ratio of Growth (RoG)

Table- 4.8: Quarterly Ratio of Growth (RoG)

S:No	Quarter	Period	No. of Articles	RoG
2013	1stQ	January – March	14	0
	2ndQ	April – June	24	1.71:1
	3rdQ	July – September	36	1.5:1
	4thQ	October – December	40	1.11:1
2014	5thQ	January – March	51	1.27:1
	6thQ	April – June	61	1.19:1
	7thQ	July – September	65	1.06:1
	8thQ	October – December	33	0.50:1
2015	9thQ	January – March	49	1.48:1
	10thQ	April – June	59	1.20:1
	11thQ	July – September	47	0.79:1
	12thQ	October – December	42	0.89:1
Total			521	

(Sources: Primary data)

MAPPING THE RESEARCH OUTPUT OF 'e-LIBRARY SCIENCE RESEARCH JOURNAL': A SINGLE.......

Volume - 5 | Issue - 1 | November - 2016

Table 4.8 shows that the RoG for 12 quarters calculated for the journal exposes a fluctuating growth. While it is more than 1 in 8 quarters, it is less than 1 in 3 quarters. It means that only during those three quarters, the number of articles published was less than the previous quarters. 8 quarters which had RoG of more than 1 means that during those quarters number of articles published were more than that of near previous quarter.

9 Relative Growth Rate

Relative growth rate is a tool to measure the information growth when the growth rate of a function is always proportional to the function's current size. Such growth is said to follow an exponential law. The mean Relative Growth Rate (RGR) over the specific period of interval can be calculated from the following equation:

$$1\text{-}2 \ \overline{R} = \left(Log_e \ _2W - log_e \ _1W \right) / \left(_2T - _1T \right)$$

Whereas, $1\text{-}2 \ \overline{R} =$ mean relative growth rate over the specific period of interval

$log_{e1}W$ = log of initial number of articles

$log_{e2}W$ = log of final number of articles after a specific period of interval

$_2T - _1T$ = the unit difference between the initial time and the final time

The year can be taken here as the unit of time. Therefore,

$1\text{-} 2 \ \overline{R}$ (aa–1 year –1) can represent the mean relative growth rate per unit of articles per unit of year over a specific period of interval.

10 Doubling Time (Dt)

Doubling time is the amount of time it takes for a given quantity to double in size or value at a constant growth rate. There exists a direct equivalence between the relative growth rate and the doubling time. If the number of articles of a subject doubles during a given period then the difference between the logarithms of numbers at the beginning and end of this period must be the logarithms of number 2. If natural logarithm is used this difference has a value of 0.693. Thus the corresponding doubling time for each specific period of interval can be calculated by the following formula:

$$\text{Doubling time (Dt)} = \frac{0.693}{\overline{R}}$$

Table 4.9: Relative Growth Rate and Doubling Time

Year	No. of Records	Cumulative	W1	W2	RGR	Doubling Time
2013	114	7858	0	8.969287	8.97	0.08
2014	210	8068	8.969287	8.995661	0.03	26.28
2015	197	8265	8.995661	9.019785	0.02	28.73
Total	521					

Table 4.9 shows that the RGR has decreased from 0.003 in 2014 to 0.02 in 2015. The Dt has increased from 26.28 in 2014 to 28.73 in 2015.

Table 4.10   : Half-Yearly Relative Growth Rate and Doubling Time

Year	No. of Records	Cumulative	W1	W2	RGR	Doubling Time
I HY	38	38	0	3.64	3.64	0.19
II HY	76	114	3.64	4.74	0.22	3.14
III HY	112	226	4.74	5.42	0.14	5.04
IV HY	98	324	5.42	5.78	0.07	9.58
V HY	108	432	5.78	6.07	0.06	11.99
VI HY	89	521	6.07	6.26	0.04	18.42
	521					

Table 4.10 discloses the RGR and Dt for six half-yearly periods under the study. The RGR shows almost a declining trend over the period of time. RGT decreased from 0.22 in 2nd half-yearly period to 0.14 in 3rd half-yearly period, to 0.07 in 4th half-yearly period and to 0.04 in the 6th half-yearly period. But the doubling time keeps on increasing. It increased from 3.14 in the second half yearly period to 9.58 in 4th half yearly period, to 11.99 in 5th half yearly period and to the peak of 18.42 in the 6th half-yearly period

CONCLUSION

This small study on bibliometric analysis of articles published in e-Library Science Research Journal during the period 2013-2015 made use of some bibliometric indicators like Relative Growth Rate, Doubling Time, Annual Growth Rate, Growth Ratio, degree of collaboration, co-authorship index, collaborative co-efficient, science production index etc to bring out certain solid inferences useful to the LIS researchers and the journal publishing authorities. This study will help them to underpin the issues behind the publication of quality journal articles for the benefit of LIS academic community. The ELSRJ, though, started in 2012 has made a vast impact among the LIS researchers. Both hard copy and soft copy of the volumes are available and the articles are indexed in reputed databases. The LIS professionals and the researchers should make use of such journals either for their research, academic preparations or publication.

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