METADATA TAGGING OF LIBRARY AND INFORMATION SCIENCE THESES: SHODHGANGA (2013-2017)

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Abstract: Electronic Theses and Dissertations (ETDs) poses the challenge of managing and extraction of appropriate knowledge for decision making. To tackle the same, topic modeling was first applied to Library and Information Science (LIS) theses submitted to Shodhganga (an Indian ETDs digital repository) to determine the five core topics/tags and then the performance of the built model based on those topics/tags were analyzed. Using a Latent Dirichlet Allocation based Topic-Modeling-Toolkit, the five core topics were found to be information literacy, user studies, scientometrics, library resources and library services for the epoch 2013-2017 and consequently all the theses were summarized with the presence of their respective topic proportion for the tags/topics. A Support Vector Machine (Linear) prediction model using RapidMiner toolbox was created and showed 88.78% accuracy with 0.85 kappa value.

Keywords: Electronic Theses and Dissertations (ETDs), Latent Dirichlet Allocation (LDA), Prediction Modeling, Shodhganga, Text Mining, and Topic Modeling

INTRODUCTION

Apart from journal articles and e-prints, Electronic Theses and Dissertations (ETDs) are the most frequent type of educational resource which is consulted by the scientific community. With the enormous growth of textual data including ETDs over the web, the issue of organizing, managing and disseminating information has attracted attention and led to many efforts, including Knowledge management, Content analysis, Text analysis, Text classification, Text categorization, Search strategy, Linked Data, and Semantic Web, to enhance the information retrieval of the systems and their performance for decision making. Some of the selected studies existing in literature on topic modeling with respect to ETDs are Sugimoto et al. (2011); Morgan et al. (2008); Brook and Oppenheim (2014); Schöpfel et al. (2016); Nanni and Ponzetto (2017); and Nanni and Paci (2017). The present study (i) discovers the hidden topical pattern, (ii) annotates the theses according to these topics, (iii) applies annotations to organize, search and summarize text, and (iv) presents a best fitted predictive model for Library and Information Science (LIS) theses submitted to Shodhganga (an Indian ETD digital repository) during 2013-2017. This study will address the gap in the literature of LIS by providing a novel way of utilizing a technique which explores electronic theses and tagging them. This work will have a broad application to those interested in information retrieval of electronic theses and dissertations. The findings of the study will help the users in faster information retrieval from Shodhganga website. Even though Shodhganga is offering a service based on searching by subject, title, relevance, keyword, year of completion of the thesis, and language yet the overall experience to recall the documents was not satisfactory. Furthermore, the repository should maintain uniformity by allowing theses to be submitted in PDF format with OCR feature and to

cross-check if all the bibliographical details which are filled as metadata during the submission are correct and complete as such theses ultimately cause a problem during text mining and retrieval.

METHODOLOGY

A total of 108 theses were retrieved in the English language under the keyword library and information science from Shodhganga for the years 2013-2017 but only 98 theses were used for the study. 10 of the theses were excluded from the study because 4 of them were found in a different language than English; 2 of them were found to be in a different subject than LIS; 1 was repetitive of the already retrieved thesis; and rest 3 of them were found to be scanned and did not have OCR feature. Moreover, 1 thesis was found which was without guide's name and 13 theses were found which were without the year of completion but were still included the study (Appendix-1) as those incomplete bibliographic details did not compensate topic and prediction modeling directly. The study is divided into two phases. In the first phase, the 98 LIS theses submitted to Shodhganga in the period of 2013-2017 were downloaded and converted to text format, followed by the analysis of the text corpus according to LDA probabilistic topic modeling method with the help of Topic-Modeling Toolkit. For the 5 years period, 5 topics were identified for the epoch. Each topic contained a probability value, that is, the likelihood that the topic identified should be associated. These topics were ranked by probability values and these top five topics were selected as being most representative. Similarly, a probability of each word was calculated to represent the association between a word and the given topic and the top 5 words were chosen as the most representative of the topic. The values of the hyper-parameters α and β were 10 and 0.01 respectively for the study. In the second phase, prediction analysis was performed with the help of a text mining tool called RapidMiner to evaluate the performance of the constructed model for the test dataset against the training dataset.

Latent Dirichlet Allocation (LDA)

This paper focuses on the use of LDA (David, Ng, and Jordan 2003), which is based on Dirichlet distribution to model the topics from the corpus of LIS theses. In this study, each thesis gets represented as a pattern of LDA topics making every thesis appear. LDA automatically infers the topic discussed in a collection of theses and these topics can be used to summarize and organize theses. LDA is based on probabilistic modeling and the observed variables are the bags of words per thesis whereas hidden random variables are the topic distribution per thesis. "The main goal of LDA is to compute the posterior of the hidden variables given the value of the observed variables" (Mehdi et al. 2017). The assumptions of LDA for the study are (i) Theses with similar topics will use similar groups of words, (ii) Theses are a probability distribution over latent topics, and (iii) Topics are probability distributions over words.

FINDINGS

Various output files generated by Topic-Modeling-Toolkit (TMT) are summarized under modeled topics/tags and topic proportion subheadings whereas the performance analysis of the prediction model using RapidMiner Toolbox is summarized under prediction performance subheading.

Modeled Topics/Tags

Table 1 summarizes the LDA results generated by the TMT toolkit. The topics, *a* through *e* for the five years period, are organized in descending order according to their probability values (*a* having the highest probability value). Evidence from the high-loading keywords in Table 1 reveals that *Topic-a* is about *information literacy* with an emphasis on health and research. *Topic-b* is about *user studies*. *Topic-c* shows a focus on bibliometrics with an emphasis on *scientometrics*. *Topic-d* displays a focus on *library resources* and *Topic-e* is on *library services* with a focus on universities and its collection.

Table 1. Latent Dirichlet Allocation results for the period 2013-2017 (98 theses)

Topic-a	*Topic-b*	*Topic-c*	*Topic-d*	*Topic-e*
information	student	research	information	library
health	responses	information	resources	libraries
research	teachers	science	library	university
literacy	tourism	journal	respondents	services
table	kerala	articles	research	collection

Topic Proportion

Appendix -1 shows the percentage composition of all the 98 theses mined from Shodhganga under the modeled topics. It shows that a thesis can be composed of a single topic or a mixture of topics. But the core topic is decided on the basis of the highest value of the topic proportion of the modeled topic. Users can study different theses at a glance according to different modeled topics and choose the desired thesis for reading related to his/her research interest instead of looking through all the theses one-by-one in Shodhganga for the studied period. The theses on the basis of topic proportion using Appendix-1 can be searched in two ways: *(i) based on the core topic*, with this approach all the similar theses on a particular topic are placed together and can be easily retrieved in spite of ambiguous title names, and; *(ii) based on the thesis published in Shodhganga for the period 2013-2017*. For instance, one can either see theses on scientometrics by directly scanning through the *Topic-c* column using Appendix-1 with a value of ≥0.5 or can straightaway go to the topic composition of a thesis of interest. Meta-tagging of the theses using modeled topics, not only saves the time of the users but also helps in organizing and management of the ETDs.

Prediction Performance

A prediction model using Support Vector Machine (Linear) was created and tested in RapidMiner. The model was created with 98 articles with the modeled topics/tags, where 70% data was allocated to the training set and 30% was allocated to test set randomly using split validation. Once the parameters of the model were finalized, the testing set was run through the model. The actual test class was compared to the predicted class to determine the accuracy, precision, and recall for each model. Figure 1 shows the result of the tested dataset against the trained dataset from the predictive model with 88.78% accuracy with 0.85 kappa value.

accuracy: 88.78%

	true Topic a	true Topic b	true Topic c	true Topic d	true Topic e	class precision
pred. Topic a	11	0	0	0	1	91.67%
pred. Topic b	0	6	1	2	2	54.55%
pred. Topic c	1	0	16	0	0	94.12%
pred. Topic d	1	0	2	23	0	88.46%
pred. Topic e	0	1	0	0	31	96.88%
class recall	84.62%	85.71%	84.21%	92.00%	91.18%	

Figure 1. Screenshot of performance output by Support Vector Machine (SVM) model

CONCLUSION

The study attempts to apply topic modeling by tagging the corpus of LIS theses submitted to Shodhganga for the epoch 2013-2017. On the basis of the theses submitted to Shodhganga, the core topics (tags) for the period 2013-2017 are found to be information literacy, user studies, scientometrics, library resources, and library services. Furthermore, each thesis which is published in Shodhganga during the period 2013-2017 is broken down into various topic proportions of percentage probabilities. Thus, all the 98 articles for the studied period are segregated on the basis of the five modeled topics. These findings can be mentioned on the Shodhganga website which can ultimately help the user in faster information retrieval. The major reason for less number of theses in Shodhganga may be because of embargo period and copyright issues that restrict the universities in India to upload the full-text theses in the repository. The major limitation of topic modeling in the study will be that one must identify an appropriate number of topics for the data in advance before performing the LDA. The second limitation which is inherent in LDA analysis is the manual interpretation and labeling of "topics". The present study further applies prediction modeling to the theses and tries to accurately predict the placement of future theses going to be submitted to Shodhganga under the five modeled topics on the basis of performance of the predictive model. Hence, the results from the prediction analysis showed that the Support Vector Machine (SVM) performed can be used to provide a successful future automated classification of LIS theses submitted to Shodhganga under the five modeled topics/tags (*a* to *e*). One problem with prediction modeling for the study is that the data set is not truly representative of LIS theses of Shodhganga. The training of the model to learn and fit the parameters could be done perfectly if more data is taken into account. Thus, this study can be extended to perform probabilistic topic modeling of all the theses submitted to Shodhganga so far, so that the result output of the prediction model can be relied upon with total confidence.

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Appendix 1. Percentage proportion for Modeled topics

S. No.	Year	Title of the Theses	Researcher's Name	Guide's Name	Topic-a Information Literacy	Topic-b User Studies	Topic-c Scientometrics	Topic-d Library Resources	Topic-e Library Services
1.	2013	Library and information science blogs: a content analysis	Gala, Bhakti	Shyama, Rajaram	0.723	0	0.176	0	0.070
2.	2013	Collection management of electronic information resources: an analytical study of selected university libraries in Andhra Pradesh	Dharani Agrapu	Varalakshmi, R S R; Sasikala, C	0	0	0	0.365	0.560
3.	2013	Growth of research output in science and technology institutes in Assam and the role of libraries	Goswami, Tarini Dev	Lahkar, Narendra	0	0	0.549	0.123	0.263
4.	2013	Bibliometrics and webometrics analysis of open access electronics journals of library and information science	Dattatraya, Tukaram Satpute	Chavan, Subhash P	0.124	0	0.723	0.084	0.061
5.	2013	Automation in university libraries of Gujarat state An empirical study	Sharma, Narendra Kumar	Trivedi, Mayank J.	0.069	0	0.176	0.058	0.687
6.	2013	Studies on the information seeking users behaviour of few selective government public and private funded R D libraries information	Sahu, Anjani Kumar	Choudhury, B K	0.071	0	0.168	0.594	0.161

		centres in Jharkhand							
7.	2013	A study of information sources and services of architecture college libraries in Maharashtra	Balasaheb Bhagwat Aher	Subhash Pundlikrao Chavan	0	0	0	0.319	0.598
8.	2013	Relevance of library and information science education in the Indian job market: A study of Indian universities and corporate libraries	Baruah Bobby Goswami	Hangsing, P	0.499	0	0.083	0.139	0.271
9.	2013	Use and applications of open source software in libraries	Bhavsar, Sandeep Ashok	Deshmukh, Shamkant J	0.160	0	0.614	0.084	0.135
10.	2013	An investigation in to the impact of e resources in modern Library and Information Centers	Velumani, KV	Chinnasamy, K	0.268	0	0	0.587	0.092
11.	2013	Information resources and their use in the engineering college libraries of Dakshina Kannada and Udupi districts - A study	Lewis, Felcy	Mallaiah, T Y	0.053	0	0	0.737	0.189
12.	2013	Literature on Public Finance (1986-2010): a bibliometric analysis based on EBSCO database	Lalitha Bai	Dominic J	0.072	0	0.841	0	0.053
13.	2013	Performance evaluation and social cultural contribution of public libraries in south region Ahmednagar district (M.S.)	Ghule, Rajkumar Pandharinath	Dahifale, Vikram Uttamrao	0.114	0.107	0.053	0	0.681
14.	2013	Professional attitudes of librarians towards information and communication technology: a survey of engineering college libraries in north coastal Andhra Pradesh	Medepalli Venkatasubbarao	Valasayya, G	0.070	0	0	0.693	0.209
15.	2013	A bibliometric study of indian journal of engineering and materials sciences 2008 to 2012	Rahul Ramrao Dhuldhule	Prashant P. Deshmukh	0.078	0	0.803	0	0.076
16.	2013	Information seeking behaviour of users of management institute libraries in Pune	Khandare, Dhanishtha	Dahibhate, N B	0.066	0	0.131	0.520	0.276
17.	2013	Use of library classification schemes in the ICT environment in selected libraries in national capital region : a study	Gulati, Dipti	Singh, K P	0.581	0	0.156	0	0.211
18.	2014	Use of information resources and services of district central libraries and their branches in Karnataka state : a study	Reddy, Shanker	N, Parvathamma	0.106	0.098	0.071	0	0.687
19.	2014	Design and development of children's national science	Kumbar, Rashmi T	Patil, S K	0.108	0	0.304	0.260	0.305

		digital library for India							
20.	2014	Quality library services in the department of library and information science of universities of the Maharashtra state : a study	Manisha Sagar Dandgawhal	Daya Sridhar	0.146	0	0	0.116	0.706
21.	2014	Recency pattern of citations an analytical study of citations of articles published in Library and Information Science	Khan, Swapan	Bhattacharya, Udayan	0.147	0.065	0.720	0	0
22.	2014	Attitude of library professionals towards the use and acceptance of information technology in library activities: a study of academic college libraries under the jurisdiction of Mumbai university	Sagar Nathu Dandgawhal	Daya Sridhar	0.058	0.060	0	0.504	0.344
23.	2014	An Investigation into Information Needs and Information Behaviour of Tourists and Design of a Tourist Information System for Kerala	Majeed H	Humayoon Kabir S	0.223	0.401	0.074	0.151	0.148
24.	2014	Effectiveness of library and information services to the researchers of Visvesvaraya Technological University: a study	Chandrashekara, J.	Adithya Kumari, H.	0.361	0	0	0.335	0.286
25.	2014	Patterns of Information Resources Library Services and Information Seeking Behaviour of Users of Libraries and Information Centres of Academic and R and D Institutions Located at Delhi : A Study	Singh, Payal	Vyas, S.D.	0.089	0	0.145	0.616	0.143
26.	2014	An evaluative study of digital resources and services of agriculture university libraries of Uttarakhand and U.P.	Jagdambika Prasad	C. K. Sharma	0	0	0.241	0.399	0.333
27.	2014	Impact of information communication technology on the administration and functioning of libraries affiliated to madurai kamaraj university area	Virumandi, M	Chellappandi, P	0.076	0	0	0.533	0.366
28.	2014	Doctoral research in library and information science in India_ a critical study	Ghatol, Swati Kusumakar	Pange, B M	0.187	0	0.482	0.090	0.232
29.	2014	Collection development policy and procedures in under graduate college libraries affiliated to Karnataka university Dharwad : a study	Kotur Mrutyunjaya Basappa	Ningappa N.Arabagonda	0.102	0	0.068	0.109	0.696
30.	2014	Networking of Law libraries with special	Biradar, Dattappa B.	Kumbar, Mallinath	0.057	0	0.176	0.247	0.510

		reference to Law colleges affiliated to Karnataka state Law University Hubli							
31.	2014	Evaluation of ICT Skills of Library and Information Professionals Working in the Engineering College Libraries in Karnataka State: A Study	Shivaputrappa F.Kattimani	Ramesh R. Naik	0.099	0	0.066	0.624	0.203
32.	2014	Use of web information resources by researchers in the disciplines of biological sciences in Universities of Karnataka : a study	Giddaiah, D.	Sarasvathy, P.	0.141	0	0.098	0.682	0.070
33.	2014	Impact of E resources on collection development in Special Libraries in Karnataka	Selvaraja, A.	Sarasvathy, P.	0.052	0	0.082	0.576	0.284
34.	2014	Application of total quality management in management college libraries in Bangalore : a study	David, Johnson	Adithya Kumari, H.	0	0.520	0	0.109	0.358
35.	2014	Quality library services in the department of library and information science of universities of the maharashtra state : a study	Manisha Sagar Dandgawhal	Daya Sridhar	0.148	0	0	0.116	0.706
36.	2014	Attitude of library professionals towards the use and acceptance of information technology in library activities : a study of academic college libraries under the jurisdiction of mumbai university	Sagar Nathu Dandgawhal	Daya Sridhar	0.055	0.060	0	0.502	0.348
37.	2014	Technical study of the dictionaries published in Sanskrit language since 1800 A D	Karambelkar, Manjiri	Dahibhate, N B	0.056	0.762	0.095	0	0.071
38.	2014	Use of information resources and Services in libraries of horticultural Universities in India : a study	Uplaonkar, Shilpa	Lalitha, K S	0.066	0	0.113	0.666	0.145
39.	2015	Use of online journals by the faculty members working at the medical institutions in Bangalore city : a study	Rajanikanta, S T	Ramasesh, C P	0.120	0	0.058	0.715	0.097
40.	2015	Development of prototype model of centralized library system for Sinhgad Institutes Higher Education Libraries using open source software for enhancing library services	Kulkarni, Shirish Sharad	Shewale, Nanaji	0	0	0.543	0.078	0.344
41.	2015	Role of oriental libraries in India with special reference to Deccan	More, Trupti Dattatraya	Rajendra, Aparna	0	0.538	0.106	0	0.319

42.	2015	Staffing pattern for Digital libaries in comparison with the traditional staffing pattern	Sonawane, Ajit S	Rath, Prabhash N	0	0	0.063	0.422	0.462
43.	2015	Application of information technology in the deemed university libraries in maharashtra an evaluative study	Kshirsagar,Sugriv Gyanobarao	Veer,D.K.	0	0	0.053	0.285	0.623
44.	2015	A study of library and information services for agriculture universities researcher of Gujarat state	Patel, Bharat Kumar D	Bhavsar, Vaishaliben L	0	0	0.450	0.196	0.297
45.	2015	Design and development of network based model for management college libraries in Pune city with special reference to network securities	Naik, Sheetal Deepak	Dahibhate, N. B.	0	0	0.353	0.320	0.297
46.	2015	Resource sharing and networking btisnet libraries in india	Nageswaran, N.	Rath, P.N.	0	0	0.397	0.286	0.291
47.	2015	A user study of chemical industry libraries in Maharashtra	Patil, Anita Vijay	Dahibhate, N. B	0	0	0.449	0.284	0.214
48.	2015	Design And Development Of Networking Model For Agricultural Library And Information System In India	Hans Raj	Kamble,V.T	0	0	0.448	0.226	0.306
49.	2015	Use of digital information resources and services in libraries of select IITs in India : a study	Gupta, Sanjay Kumar	Sharma, Sanjeev	0	0	0	0.952	0
50.	2015	Development of College Libraries in the Jurisdiction of Solapur University: An Evaluative Study	Jagtap Alka Ganpat	Divtankar N. I.	0	0	0	0.106	0.801
51.	2015	Role of University Grant Commission in Development of College Libraries in Vidharbha Region	Avinash Uttamrao Jadhao	Mohan G. Kamble and Prashant P. Deshmukh	0	0.055	0	0.094	0.758
52.	2015	Information communication technology skills among the library professionals of Engineering Colleges in Karnataka an analytical study	Jerry Arokyamary, R.	Ramasesh, C. P.	0.161	0	0.583	0	0.234
53.	2015	Feasibility study of library consortium for pharmaceutical science academic institutes in Western India	Vyas, Meghna	Trivedi, Mayank	0	0	0.173	0.504	0.280
54.	2015	A study of nba accredited engineering college libraries in maharashtra with relevance to marketing of library and information product	Sontakke Dnyandev Manik	Dattatraya Tukaram Satpute	0.093	0	0.054	0.200	0.637

		sources and services							
55.	2015	Information sources and services in The arts and science college Libraries of Kanyakumari district	Paulson, C	Manickavasagam, C	0	0	0	0.446	0.491
56.	2015	Authorship pattern amongst library and information science professionals	Bhedekar,Sanjay Laxman	Sonawane, S.S.	0.094	0	0.792	0	0.059
57.	2015	Role of a grade public libraries in Mumbai district and suburaban	Roopa Gokhale Shahade	Daya Sridhar	0.104	0.061	0	0.053	0.746
58.	2015	A comparative study of citation analysis among Five online journals in library and Information science a scientometric study	Khillare, Vijay Hanmantrao	Khaparde,Vaishali S.	0.075	0	0.839	0	0
59.	2015	A study of library automation and networking in district public libraries of Maharashtra government	Sangle Sandip Nanasaheb	Dattatraya Tukaram Satpute	0.076	0	0.097	0.088	0.725
60.	2016	College library effectiveness study with special reference to the Tinsukia and Dibrugarh district	Nath Sadananda	Sharma Narendra Nath	0	0.391	0	0.055	0.511
61.	2016	Library Resources And Services Of All India Radio : A Study	Kumar, Rakesh	Kamble, V .T	0.124	0	0.148	0.448	0.264
62.	2016	Prospects of using open source library management software in college and university libraries of Assam	Sarma Gautam Kumar	Lahkar Narendra	0	0	0.600	0.078	0.289
63.	2016	Evaluation of university library websites of west Bengal : a study from librarians perspectives	Bose Sharmila	Lahkar Narendra	0.320	0	0.121	0.109	0.436
64.	2016	Information literacy of management students in Mumbai metropolitan area	Sadlapur, Shivanand	Patil, Vinay	0	0.403	0	0.386	0.160
65.	2016	Content Analysis of Library Services in Library Through Library Website with Special Reference to Mumbai Region: A Study	Jain Vinita	Daya Sridhar	0.692	0	0	0.085	0.195
66.	2016	An Evaluative Study of E-Journal Collection Management Transition Trend and Technology: A Survey of University Libraries of Delhi	Chauhan Sharsti	C.K. Sharma / Ramvir Singh Yadav	0.060	0	0.134	0.464	0.330
67.	2016	Information search and information literacy skills of faculty of polytechnic colleges in Karnataka in utilizing information resources an analytical study	Mahadeva Prasad, M. S.	Kumbar, Mallinath	0.610	0	0	0.324	0.051

68.	2016	Impact of organizational climate on library professionals commitment towards development of university libraries in Kerala	Sujatha, R	Ganesan, P	0.565	0	0	0.123	0.275
69.	2016	Study the attitude of B.Ed Student teachers towards digital library and e resources of jalgaon District m s	Borse Yogesh Madhavrao	Tushar Patil	0	0.817	0	0.115	0.050
70.	2016	Impact of electronic resources on engineering college libraries in pune city : a study	Khatik Rashid	Ramveer Singh Yadav and VijayKumar T. Kamble	0.083	0	0.137	0.213	0.552
71.	2016	Need and impact of continuing education programmes for LIS professionals of academic libraries in Mumbai	Deodhar, Madhura	Powdwal, Sushama	0.365	0	0	0.364	0.251
72.	2016	Developing neural network architecture based SDI model for libraries and information centres	Adhikari, Saumen	NGN*	0.093	0	0.631	0.186	0.077
73.	2016	Challenges and realities of children libraries of assam an analytical study	Kalita Kishore	Sharma Narendra Nath	0	0	0	0	0.911
74.	2016	Job analysis of library professionals in science and technology institutes of assam an evaluative study	Duarah Barsha Rani	Sharma Narendra Nath	0.267	0	0.207	0.107	0.405
75.	2016	College library effectiveness study with special reference to the tinsukia and dibrugarh district	Nath Sadananda	Sharma Narendra Nath	0	0.392	0	0	0.515
76.	2016	User Behaviour In Digital Library Environment : A Study With Special Reference To Engineering College Libraries In North Maharashtra and Pune University	Bhakt Vaishali Umakant	Revati R. Khokale	0.295	0	0.077	0.315	0.299
77.	2016	Impact of accreditation on engineering college libraries in mumbai	Fernandes, Janice	Patil, Vinay	0.085	0	0.060	0.360	0.487
78.	2016	A critical study and review of libraries of engineering colleges and polytechnics in beed district of maharashtra	Gaikwad Umesh Vithalrao	ramveer singh yadav and Ghogare Govind Suryabhan	0.076	0	0.080	0.361	0.457
79.	2016	Human Resource Development in Non Agricultural university libraries in Maharashtra state	Junnare Varsha	Dalve (Patil), Daya	0.126	0	0	0.150	0.681
80.	2016	Development of E content on traditional knowledge and folk wisdom of hyderabad karnataka region	Amoji, Dundappa	Kamble,V T	0.154	0.692	0.079	0	0.053

81.	2017	Information seeking habits of software professionals in western India	Patil, Hitendra Janardan	Patil, Dalve, Daya T		0.337	0	0.076	0.440	0.129
82.	2017	Preception Awareness Knowledge Information needs and source use behaviour of general public A case study with references to health Information	Bhadrashetty Arvindkumar	Maheshwarappa B S		0.854	0	0	0.057	0
83.	2017	Design and Development of Collaborative Model of Health Information Literacy in Jammu Division	Reenu Arti Thakur	Prof. I.V. Malhan and Prof. Sangita Gupta		0.776	0	0	0.077	0.108
84.	2017	Use and user study of e resources in medical and engineering college libraries in Goa	Dhuri, Keshav Ramesh	Dahibhate, N. B.		0	0	0.091	0.684	0.165
85.	2017	A study of web 2 technology adoption by librarians working in academic colleges in maharashtra	Rathod Kashinath Rama	Paithankar Rajiv R		0.125	0.107	0.076	0.338	0.352
86.	ND[*]	Organisation administration and utilisation of DRDO libraries	M. Santha Kumari	Rosamma Joseph		0	0	0.144	0.195	0.604
87.	ND[*]	Impact of information technology on the collection development in university libraries of assam : a study	Pathak Alok Kumar	Lahkar Narendra		0	0	0.091	0.236	0.645
88.	ND[*]	College library services a quality assessment	Abdul Majeed K. C.	M. Bavakutty		0.074	0.255	0	0	0.611
89.	ND[*]	A study of the application of information technology in tribal medicine in Kerala with regard to forest medicinal plants	Asha B.	Raju M Mathew		0.176	0.603	0.077	0	0.125
90.	ND[*]	A survey of organization administration and utilization of university libraries in Kerala with special reference to Calicut university library	M.C.K. Veeran	Rosamma Joseph		0.078	0	0	0.142	0.753
91.	ND[*]	The impact of IT on the organisation and services of the libraries in christian congregations and seminaries in Kerala	Sr. Merciamma Mathew T.	Rosamma Joseph		0.078	0.081	0	0.189	0.615
92.	ND[*]	Information literacy of research scholars of universities in Kerala	Vasudevan T. M.	Jalaja V		0.682	0	0.050	0.168	0.084
93.	ND[*]	Intellectual property information and its role and importance in knowledge generation and industrial development in India	Thakur, Janmejay	Sain, Chitta Ranjan; Tripathi, Tridib		0.076	0.059	0.677	0	0.159

94.	ND[*]	A study of the scientific productivity and information use pattern of scientists in the context of new information technology with special reference to universities in Kerala	Soman K.N.	Raju M Mathew	0.323	0	0.412	0.128	0.114
95.	ND[*]	Study of the application of information technology in the treatment and preparation of medicine in ayurveda with special reference to Kerala	Hemachandran Nair. G	Raju M Mathew	0.171	0.563	0.090	0.105	0.068
96.	ND[*]	Marketing orientation of the university libraries in Kerala in information dissemination	Vinod V M	Jalaja V	0.198	0	0	0.071	0.652
97.	ND[*]	Inflibnet programme and its impact on university research scholars and teaching faculty in Tamilnadu an analytical study	Ramesh S	Kanthimathi S	0.179	0	0.087	0.545	0.173
98.	ND[*]	User awareness and use of electronic journals in technical university libraries of Punjab, Haryana, Chandigarh and Delhi	Parmar, Seema	Joshi, Manoj K	0	0	0.233	0.701	0.051

NGN[*] = No Guide Name; ND*=No Date