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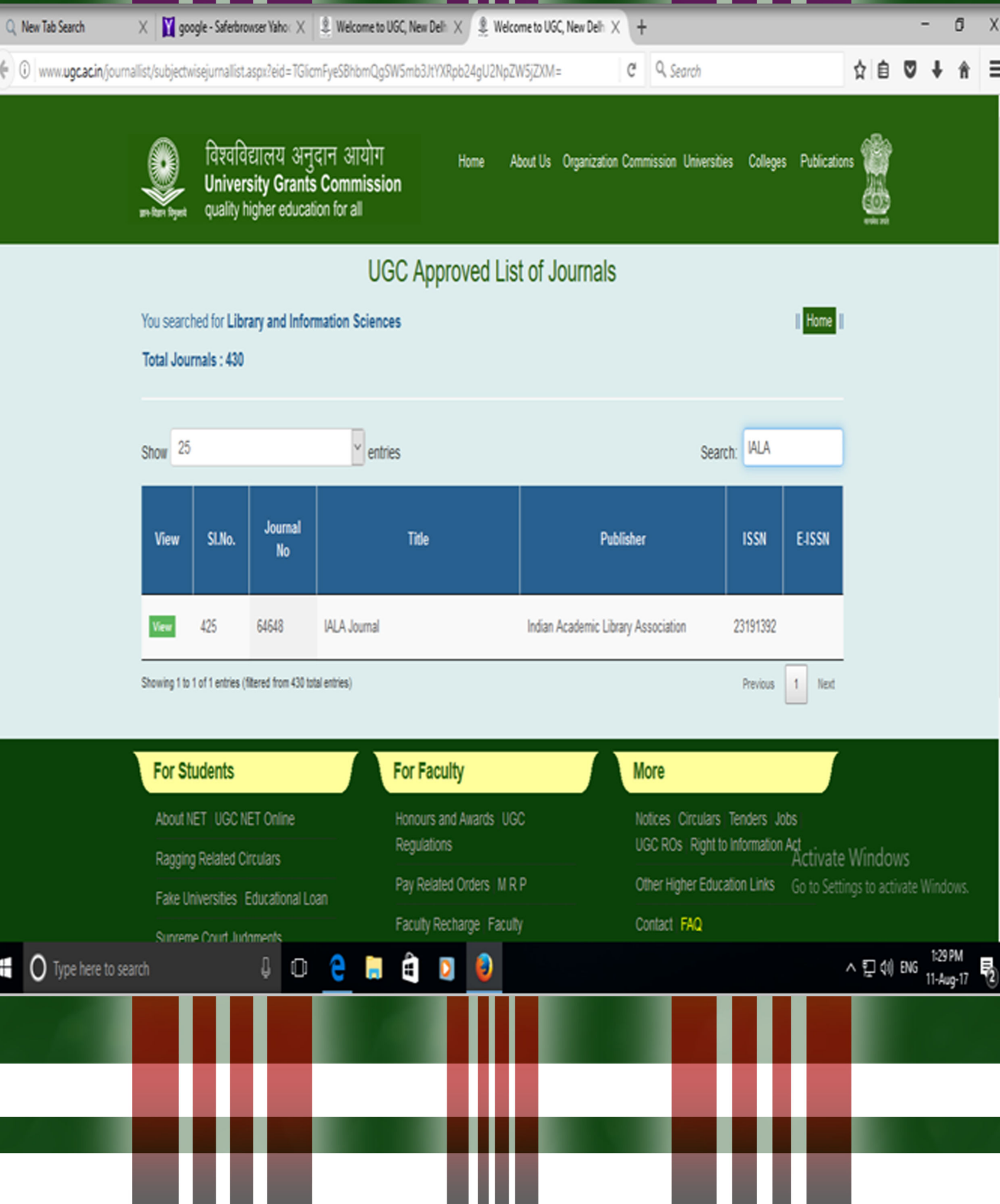
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From the Editors' Desk.....

Envisioning the Academic Libraries

Happy Librarians' Day.

Greetings from Academic Library Association (ALA) to the Library Professionals and Library Science students. At the juncture of celebrating Dr.S.R.Ranganathan's 125th Birth Anniversary we are glad to inform you that IALA Journal is listed among the recommended journals of UGC in Library and Information Science

Right information to right person to right time in a right personal way as advocated by S.S.Ranganathan, the father of Indian Library Science is evergreen paradox of visioning the library users and services, as the statement has wider dimensions with a range of options to connect the information to the needy. Ever fast growing pace of the developments with internet and digital technologies have made tremendous changes as witnessed in recent times in terms of knowledge growth, organization and dissemination between the stakeholders. At the same time it throws great challenges, particularly academic libraries to identify the right scholarly information and leverage authorized sources of knowledge to the user community warranted the librarian as more of academic and researcher than mere information manager. It is imperative to the present library community to completely thorough with trends of the academic and research dimensions of knowledge domains. It is also equally importance for the library community in higher academic environment to reach the user community in a more personalized and customized manner rather generic way of disseminating information and also serve them on anticipation rather on demand.

It emphasis the libraries to design and deliver new forms of services such as information and knowledge analytics, research data services, RSS feeds, the use of webinars and enable the user to access webinars of learned societies, research organizations and academic publishing houses, metadata management services highlighting the trends in scholarly communication, open access and on publication ethics, research profile management system such as VIVO, Pure, Incites, the Reference Management Systems such as Mendeley, End Note, Repository services, e-content development and course materials, access to archives and protocols, access to PDAs, Wi-Fi and distribution of e-book readers to the users and so on to reach the contemporary user communities.

The library should be a happening place where users can meet, interact and watching media programmes with optimum moving space, comforts, garden and modern outlook with good ambience which attracts the present user to the library. The LIS education and research needs to much emphasis on involving the classical library principles and ideologies of Information Management, Knowledge Classification and Information Retrieval System to integrate with modern approaches of digital world and incorporating and customizing such tools and technologies, particularly open access to suit a set of heterogeneous library environment balancing the socio, economic and cultural readership to provide the possible solution for the academic libraries to cope with the changes in knowledge access and usage which prevailed among the user community with tailor-made frequently changing, interacting and online enabled information systems and services is the need of hour.

We are greatly indebted to Associate Editors, Assistant Editors and Review Panel Members and Editorial board members who have nicely performed their responsibilities and our special thanks to Dr.A. Baladhandayutham, Assistant Professor, Madurai Kamaraj University Dr.C.S.Venkatarama Reddy, Librarian, Government First Grade College, Karnataka and Mrs.A.Rosaline Mary, Kalaikaveri College of Fine Arts Tiruchirappalli who gave their precious time to make this successful and appreciable attempt to list the IALA Journal in the UGC recommended list of journals.

Editors

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Research on "Western Ghats": A Scientometric Analysis

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Abstract

Older than the Himalaya mountains, the mountain chain of the Western Ghats represents geomorphic features of immense importance with unique biophysical and ecological processes. The site's high mountain forest ecosystems influence the Indian monsoon weather pattern. This mountain chain is recognized as one of the world's eight 'hottest hotspots' of biological diversity along with Sri Lanka. The forests of the Western Ghats include some of the best representatives of non-equatorial tropical evergreen forests in the world. At least 325 globally threatened (IUCN Red Data List) species occur in the Western Ghats. The globally threatened flora and fauna in the Western Ghats are represented by 229 plant species, 31 mammal species, 15 bird species, 43 amphibian species and many reptile species. Of the total 325 globally threatened species in the Western Ghats, 129 are classified as Vulnerable, 145 as endangered and 51 as critically endangered (UNESCO).In this context it is relevant to assess the global research outcome of this natural significance and to reveal the human efforts to sustain this potential resource. Present study aimed at identify and analyse the quality research output on "Western Ghats" and its Geographical, Social, Geological, Political, and Natural importance. Internationally recognized indexing, analytical and citation database of research publications known as Web of Science chosen as source of this study to measure the research in terms of quantity and quality.

Keywords: Research Productivity, Research Funding Pattern, visualizing bibliometric networks, Western Ghats, Asia.

Introduction

It is always good to integrate the significant concepts and subjects into Library and Information Science practices. Hence, the applications of Library and Information Sciernce (LIS) principles contribute further for the growth of the subject domain. In this relevance, the present study aimed at identify and analyse the quality research output on "Western Ghats" and its Geographical, Social, Geological, Political, and Natural importance. Internationally recognized indexing, analytical and citation database of research publications known as Web of Science has been chosen as source of this study to measure the research in terms of quantity and quality. The study reveals that there are 2,204 publications on Western Ghats are indexed for the study period of 28 years. There are 618 journals published the research on "Western Ghats" written by

4304 authors affiliated to 1508 research institutions and organizations from 73 countries.

It is found that more number of research articles are sponsored by the funding agencies across the globe, of which the research organizations from India contributed major stake, which is followed by National Science Foundation (NSF) (0.54 %), Royal Society of England (0.36 %). India as the top most country contributed 86 % of the total research output which is followed by USA (12.16 %) and England (5.7 %). The publication on "Western Ghats" research scored 20,088 times cited with h-index of 57 for the time span. With regard to the productivity of the institutions, Indian Institute of Science, Bangalore (7.1 %), and Council of Scientific Industrial Research (CSIR) (5.7 %) are the top major institution in which the "Western Ghats" research outcome is documented.

Methodology

The present study is to investigate the research performance of Western Ghats scholarly publications. It aims to identify the distribution of research output on the basis of research papers contributed by Scientists. The study examines the authorship pattern, prolific authors and continent wise distribution during the study period. The author productivity, degree of collaboration was also brought under the purview of the study and it is also analytical innature with the suitable statistical tools applications in strengthening the experimental validity.

Data Collection

There are various sources contributing to the research output of Western Ghats research by overall scientists. For this study the researcher has taken the secondary sources from online database. The necessary data was collected from the database of Science Citation Index (SCI), Social Science Citation Index (SSCI) and Arts & Humanities Citation Index (ACHI) which is available via the Web of Science (WoS). The WoS is the search platform provided by Thomson Reuters (the former Thomson Scientific emerged from the Institute for Scientific Information (ISI) in Philadelphia). SCI and SSCI database is one of the very complete databases covering all aspects of science. The study period 1989 to 2016 is selected in the available database. The researcher has used the search string Western Ghats in the address field for the study period of 1989 to 2016 (totally twenty eight years) downloaded the records based on the above strings. A total of 2204 records were downloaded in the form of Notepad and used the Histcite, and MS Excel packages for tabulation.

Objectives of the Study

- To identify year wise distribution of publications.
- To examine the authorship pattern.
- To study the continent/country wise distribution of publications.
- To examine Subject domain wise distribution
- To identify the funding pattern.

Analysis and Interpretation

Sample Data of Western Ghats

Table 1: Detailed Information of Sample Data of Western Ghats during 1989-2016

Sl. No	Details about the Sample	Observed Values
1	Duration	1989- 2016
2	Time Span	28 Years
3	Total Records	2204
4	Total Number of Authors	8170
5	Total Number of Journals	618
6	Document Types	11
7	Contributing Countries	73
8	Contributing Institutions	1508
9	Total Local Citation Scores	4571
10	Total Global Citation Scores	20027
11	Total Cited Reference	87002

The table 1 has revealed that the sample details from the web ofscience database; such that, time span is 1989- 2016, totally 28 years sample data of 2204 records were downloaded. Total number of contributing authors 4304; total number of journals 618; 11 types of documents; 73 countries from various continents; 1508 institutions from 73 countries; 4571 Total Local citation scores; 20027 Total Global citation scores;and totally 87002 were cited reference of the whole sample.

Year Wise Distribution of Publications

Table 2: Year wise distribution of records with GCS, CR and NA

Year	Records	GCS	CR	NA	Year	Records	GCS	CR	NA
1989	3	4	7	6	2004	55	1016	1427	201
1990	3	21	0	5	2005	75	1039	2421	242
1991	8	211	175	18	2006	88	1340	2964	299
1992	9	186	246	14	2007	112	1535	4014	411
1993	17	276	335	40	2008	126	1735	5034	408
1994	21	443	453	57	2009	125	1149	4530	416
1995	9	323	274	33	2010	145	1336	6191	562
1996	20	325	581	57	2011	159	943	7118	621
1997	32	566	724	69	2012	187	1204	8329	774
1998	29	512	839	70	2013	172	601	7057	659
1999	29	616	1156	75	2014	231	488	10245	1109
2000	38	1173	1603	101	2015	260	215	11058	1053
2001	43	1032	1552	124	2016	115	17	5739	482
2002	42	785	1188	122					
2003	51	936	1742	142	**Total**	**2204**	**20027**	**87002**	**8170**

GCS-Global Citation Score; CR-cited Reference; NA-No. of Authors

According to table 2, year wise distribution of Western Ghats research analysis, the year 2015 has highest number of publications, 260 (11.79%) with 215 (1.07%) TGCS values were scaled and being a first position among the output. The year of 2014 has 231 (10.48%) records and it stood in second position of publishing records with 488 (2.43%) TGCS scaled. Followed by the year 2012 has 187 (8.48%) of records with 1204 (6.0%) TGCS; the year of 2011 has 159 (7.2%) of publications in the selected subject with 943 (4.7%) TGCS scaled measured; the above mentioned years were having above 100 records.

Examined by TGCS (Total Global Citation Scores) for the study period, it has 20027 citation scores measured. The year of 2008 has 1735 (8.66%) of citations with first rank position, followed by the year of 2007 and 2006 were having next highest global citation scores of 1535 (7.66%) and 1340 (6.69%) respectively. Remaining year's publications were earned minimum number of global citation scores.

From the above table, it is noticed that total 2204 records were produced by 4304 authors were contributed in different disciplines during the sample period and its mean value is 153.71 per year and 2015 has highest contributors. Totally 87002 times Cited references measured by other scientists and its mean value are 3107.21 for every year of sample periods, 2015 having highest times cited references. Totally 20027 TGCS values measured and its mean value is 715.25 for every year of sample period. It concludes from this analysis, highest Cited References of 11058 times cited by others at the year of 2015 and also the year 2014 has contributed highest number of authors.

Degree of Collaboration

The degree of collaboration is defined as the ratio of the number of collaborative research papers to the total number of research papers in the discipline during a certain period of time.

The formula suggested by Subramanyam (1983) is used. It is expressed as

C= Nm/Nm+Ns ; 2035/2035+169=0.92

Where,

C is the degree of collaboration in a discipline.

Nm is the number of multi-authored research papers in the discipline published during a year.

Ns is the number of single authored papers in the discipline published during the same year.

Table 3: Year Wise Distribution of Records/Articles

Year		1	2	3	4	5	6	7	8	9	10 & above	Total
1989	Articles	-	3	-	-	-	-	-	-	-	-	**3**
1990	Articles	1	2	-	-	-	-	-	-	-	-	**3**
1991	Articles	2	4	1	-	1	-	-	-	-	-	**8**
1992	Articles	4	5	-	-	-	-	-	-	-	-	**9**
1993	Articles	5	8	1	-	2	1	-	-	-	-	**17**
1994	Articles	3	7	6	4	-	1	-	-	-	-	**21**
1995	Articles	-	-	7	-	1	-	1	-	-	-	**9**
1996	Articles	4	7	4	2	2	-	-	-	1	-	**20**
1997	Articles	10	12	5	5	-	-	-	-	-	-	**32**
1998	Articles	9	7	8	2	3	-	-	-	-	-	**29**
1999	Articles	5	14	4	4	-	1	-	1	-	-	**29**
2000	Articles	5	18	9	3	1	-	1	-	1	-	**38**
2001	Articles	8	16	10	3	1	2	2	-	-	1	**43**
2002	Articles	6	13	11	5	5	2	-	-	-	-	**42**
2003	Articles	8	17	11	11	2	1	1	-	-	-	**51**
2004	Articles	3	15	19	6	4	4	1	1	-	2	**55**
2005	Articles	6	27	16	15	5	3	-	1	1	1	**75**
2006	Articles	7	28	24	11	6	3	4	3	1	1	**88**
2007	Articles	6	35	26	15	11	8	4	2	1	4	**112**
2008	Articles	11	40	27	26	12	6	-	2	-	2	**126**
2009	Articles	8	41	32	25	6	3	5	1	1	3	**125**
2010	Articles	7	34	45	16	16	12	2	6	2	5	**145**
2011	Articles	5	39	38	34	17	11	7	3	1	4	**159**
2012	Articles	6	37	47	34	20	19	10	3	5	6	**187**
2013	Articles	11	46	43	21	18	14	9	4	3	3	**172**
2014	Articles	12	43	65	39	32	25	6	4	-	5	**231**
2015	Articles	12	62	47	58	32	22	15	7	3	2	**260**
2016	Articles	5	21	18	28	19	12	6	1	1	4	**115**
Total	**Articles**	**169**	**601**	**524**	**367**	**216**	**150**	**74**	**39**	**21**	**43**	**2204**

The degree of collaboration is determined. Using this formula based on this study, the result of degree of collaboration C = 0.92. i.e., 92percent of collaborative author's articles are published in this study.

Continent wise Collaboration

Table 4: Continent wise Collaboration of Literature

S. No	Continent	Count	No. of Countries	Total Citations	S. No	Continent	Count	No. of Countries	Total Citations
1	Asia	2104	22	16457	**4**	South America	19	7	121
2	Europe	436	21	6853	**5**	North America	297	5	4415
3	Africa	40	16	312	**6**	Australia	29	2	309
Total					**73**				

In the continent wise analysis the 73 countries publications, were categorized by their continents. The above analysis has shown that the countries for particular continents, such as Asia, Europe, Africa, South America, North America, and Australia. Totally 73 countries were contributed with Asian and other continents along with Western Ghats research output. From Asia 22 countries were associated with India having 2104 records; 21 countries from European countries with 436 records; 7 countries from South American continents with 19 records; 5 countries from North America with 297 records; 16 countries form Africa with 40 records and 2countries from Australia with 29 records were collaborated with the Asian countries.

Table 5: Asian Country wise Collaboration of Literature

Sl. No	Country	Continent	Records	Percent	TLCS	TGCS
1	India	Asia	1855	84.2	3780	14236
2	Peoples R China	Asia	55	2.5	70	395
3	Unknown	Asia	46	2.1	61	516
4	Sri Lanka	Asia	31	1.4	47	131
5	Japan	Asia	22	1.0	33	332
6	Indonesia	Asia	12	0.5	23	67
7	Saudi Arabia	Asia	12	0.5	9	84
8	Singapore	Asia	10	0.5	78	238
9	South Korea	Asia	10	0.5	3	101
10	Thailand	Asia	10	0.5	12	92
11	Nepal	Asia	9	0.4	5	45
12	Malaysia	Asia	8	0.4	17	46
13	U Arab Emirates	Asia	5	0.2	6	15

14	Taiwan	Asia	4	0.2	2	85
15	Bangladesh	Asia	3	0.1	5	22
16	Iran	Asia	3	0.1	0	7
17	Pakistan	Asia	3	0.1	0	26
18	Brunei	Asia	2	0.1	1	2
19	Israel	Asia	1	0.0	0	2
20	Kuwait	Asia	1	0.0	0	12
21	Oman	Asia	1	0.0	0	0
22	Vietnam	Asia	1	0.0	0	3
Total			**2104**	**95.3**	**4152**	**16457**

From Asian continent, Peoples R China has contributed the highest number of articles. Srilanka holds third with 31 records having 47 (TLCS) and 131 (TGCS) were scaled, followed by Japan with 22 records and so on.

Table 6: European Country wise Collaboration of Literature

Sl. No	Country	Continent	Records	Percent	TLCS	TGCS
1	UK	Europe	134	6.1	514	2599
2	France	Europe	90	4.1	248	1616
3	Germany	Europe	51	2.3	63	453
4	Belgium	Europe	28	1.3	260	772
5	Netherlands	Europe	24	1.1	21	246
6	Switzerland	Europe	22	1.0	38	269
7	Sweden	Europe	17	0.8	19	140
8	Italy	Europe	16	0.7	55	253
9	Norway	Europe	11	0.5	22	235
10	Spain	Europe	10	0.5	3	35
11	Austria	Europe	6	0.3	8	42
12	Finland	Europe	6	0.3	14	31
13	Ireland	Europe	4	0.2	3	24
14	Russia	Europe	4	0.2	3	23
15	Denmark	Europe	3	0.1	0	3
16	Portugal	Europe	3	0.1	10	14
17	Czech Republic	Europe	2	0.1	0	62
18	Poland	Europe	2	0.1	0	1
19	Estonia	Europe	1	0.0	0	14
20	Hungary	Europe	1	0.0	0	21
21	Serbia	Europe	1	0.0	0	0
Total			**436**	**19.8**	**1281**	**6853**

Next to Asian continent, European countries had contributed highest number of articles. United Kingdom holds first with 134 records with 514 (TLCS) and 2599 (TGCS) were scaled, followed by France with 90 records. Remaining countries have below 50 articles.

Table 7: African Country wise Collaboration of Literature

Sl. No	Country	Continent	Records	Percent	TLCS	TGCS
1	South Africa	Africa	15	0.7	30	189
2	Cameroon	Africa	4	0.2	2	31
3	Kenya	Africa	4	0.2	2	4
4	Ghana	Africa	3	0.1	0	16
5	Ethiopia	Africa	2	0.1	0	0
6	Nigeria	Africa	2	0.1	0	2
7	Algeria	Africa	1	0.0	0	0
8	Burkina Faso	Africa	1	0.0	0	1
9	Dem Rep Congo	Africa	1	0.0	0	1
10	Eritrea	Africa	1	0.0	0	0
11	Gabon	Africa	1	0.0	0	1
12	Madagascar	Africa	1	0.0	10	19
13	Malawi	Africa	1	0.0	2	3
14	Mauritius	Africa	1	0.0	0	28
15	Tanzania	Africa	1	0.0	2	17
16	Togo	Africa	1	0.0	0	0
Total			**40**	**1.4**	**48**	**312**

Followed by European Countries, 16 countries from Africa had contributed 40 publications; among them South Africa ranks first with 15 records having 30 TLCS; 189 TGCS followed by Cameroon, Kenya, Nigeria,Madagascar, and Algeria has only publication.

Table 8: North American Country wise Collaboration of Literature

Sl. No	Country	Continent	Records	Percent	TLCS	TGCS
1	USA	North America	253	11.5	833	3897
2	Canada	North America	36	1.6	46	414
3	Mexico	North America	5	0.2	5	38
4	Panama	North America	2	0.1	0	17
5	Costa Rica	North America	1	0.0	0	49
Total			**297**	**13.4**	**884**	**4415**

Next to African Countries, 5 countries from North America had contributed 297 publications; among them USA ranks first with 253 records having 833 TLCS; 3897 TGCS followed by Canada, Mexico, Panama and Costa Rica.

Table 9: South American Country wise Collaboration of Literature

Sl. No	Country	Continent	Records	Percent	TLCS	TGCS
1	Brazil	South America	11	0.5	4	95
2	Colombia	South America	2	0.1	0	3
3	Peru	South America	2	0.1	2	9
4	Bolivia	South America	1	0.0	0	1
5	Chile	South America	1	0.0	0	0
6	Ecuador	South America	1	0.0	0	4
7	Venezuela	South America	1	0.0	1	9
Total			**19**	**0.7**	**7**	**121**

Seven countries from South America had contributed 19 publications; among Brazil ranks first with 11 records having 4 TLCS; 95 TGCS followed by Colombia, Peru, Bolivia, Chile Ecuador and Venezuela.

Table 10: Australian Country wise Collaboration of Literature

Sl. No	Country	Continent	Records	Percent	TLCS	TGCS
1	Australia	Australia	25	1.1	49	275
2	New Zealand	Australia	4	0.2	2	34
Total			29	1.3	51	309

From Australian Continent, two countries Australia and New Zealand has contributed 29 records with 49; 2 (TLCS) and 275; 34 (TGCS) respectively.

Subject Domain wise distribution

Among various subject domains; Environmental Sciences and Ecology have 497 records followed by Science Technology other topics with 360 records. Plant sciences, Zoology, Geology have good number records.

Table 11:
Subject Domain wise Distribution

Research Areas	Records
Environmental Sciences Ecology	497
Science Technology other topics	360
Plant Sciences	323
Zoology	302
Geology	268
Biodiversity Conservation	154
Agriculture	117
Meteorology Atmospheric Sciences	107
Mycology	96
Pharmacology Pharmacy	90

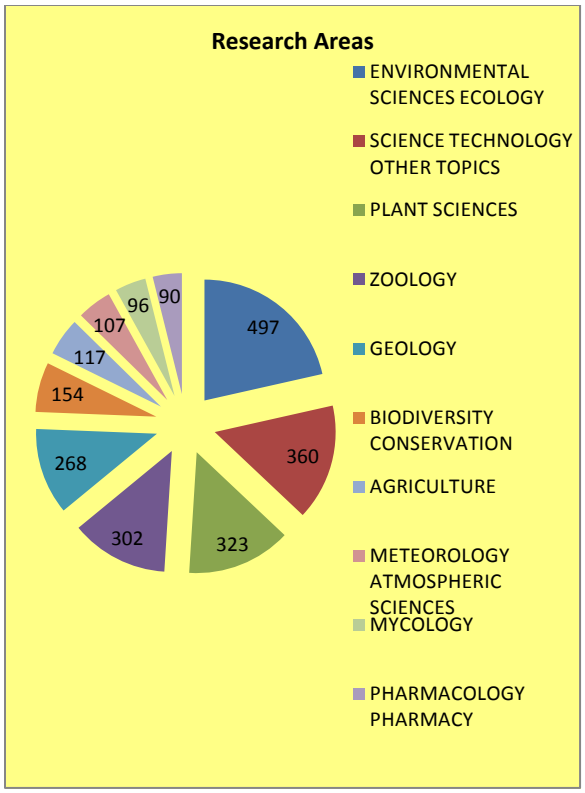

Figure 1.
Shows Subject Domain Wise Distribution

Funding Agencies

Most of the research on Western Ghats were funded both national and international funding agencies. Ministry of Environment and Forests, Government of India stands first among the national level funding agencies. National Science Foundation (Virginia (U.S)) stands first among the international level funding agencies.

Table 12: Funding pattern among the Literature

Funding Agencies	Records	Funding Agencies	Records
Ministry of Environment and Forests Government of India	34	National Science Foundation	13
Department of Biotechnology Government of India	33	Department of Science & Technology	11
Department of Science and Technology Government of India	32	National Natural Science Foundation of China	10
University Grants Commission	39	National Science Foundation	9
Council of Scientific and Industrial Research	19		

Findings and Suggestions

There is no much variation in the early output up to 2000 but from 2002 onwards there is significant development in the research output. Contribution of multiple authors is dominating with major contribution of double and three authors; so there is a need of promoting further collaboration.

Conclusion

Research Productivity in the Western Ghats is significantly high.Though the study started in recent decade there is really an optimistic growth in the research productivity. Scientific publication productivity is the real asset for any nation but as compared to USA; still India needs to improve the research performance in the long run.

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Use Pattern of E-Resources among the Research Scholars in the Autonomous Colleges Affiliated to Bharathiar University: A Study

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Abstract

This paper investigates the use of e-resources by research scholars doing research in the autonomous colleges affiliated to Bharathiar University, Coimbatore. The purpose of the study is to determine the knowledge and use of e-resources; users' skills in handling e-resources; problems faced by the respondents and to provide effective solutions to the problems encountered. The survey was conducted through a structured questionnaire distributed among 120 research scholars , out of which 110 dully filled in questionnaires were received back giving an overall response rate of 91.67 per cent. The study found that more than 50 percent of the respondents used Google Chrome (57.3%) and Mozilla Firefox (55.5%) web browsers. e-books and e-catalogues were the most used electronic resources by the respondents.

Keywords: e-resources, research scholars, autonomous colleges

1. Introduction

Library which are attached to the higher education institutions are helping the users in teaching, learning process and research. For this purpose, these libraries purchase and subscribe many information sources. Now- a- days, electronic resources are an integral part of the library and information sources. Librarian should know about the users demand for electronic sources is very essential in the present digital environment. User studies are very useful tools to know the user demand. User studies, user research and use studies of different information, material or environment sufficiently contribute to the required inputs for the development of libraries in all dimensions. In 1970, Dr.S.R. Ranganathan gave a frame work and foundation for user- behaviour studies, when he discussed the psychology and the nature of the work of users (Universities Handbook, 2006). In 1982, Krishna Kumar stressed the need for user studies and development of expertise and also presented a programme for determining the information needs of health science users. LIS professionals and researchers adopt several methodologies such as circulation transactions, table counts, visitor registers, interviews, distribution of questionnaires to obtain the objective data for conducting the aforementioned studies, yet the survey method is prominently used for both qualitative and quantitative assessments in user research. This survey was also conducted through the well developed questionnaire for knowing the usage pattern of electronic resources among the research scholars.

2. Review of Literature

Numerous studies were carried out to assess the use of electronic resources and search pattern by research scholars in the higher education institutions across the countries. Brief accounts of some studies carried out during the last two years are presented here. Vithal (2015) investigated the "Information use pattern of Agricultural Faculty members working in Andhra Pradesh". The research population comprises of 235 faculty members working in Acharya N.G. Ranga Agricultural University, A.P. Findings revealed that nearly 50% of the faculty members are visiting library once in a week, 34.0% of the faculty members are spending 1-5 hours per week for collecting the required information, most of the faculty members (82.1%) are maintaining personal libraries for their information requirements,.Three-fourths of the faculty members (77.5%) are aware of e-journal portals. Siridevi and Ramamurthy (2016) conducted a survey on "Use and Search Patterns of Electronics Resources among the Faculty Members of Autonomous Engineering Colleges in Chittoor District, A.P". The study reveals that majority of the respondents prefer getting information in both the formats (i.e. Electronic and Print) and result of the usage of search engines shows that out of 175 respondents, 107(61.14%) respondents are using Google, 35(20.00%) respondents are using Yahoo, 15(8.57%) respondents are using MSN, 11(6.28%) respondents are using Alta Vista, 5(2.85%) respondents are using Bing, The remaining HotBot and Lycos search engines, respondents are using below 1(0.57%). Deepa and Abdul Azees (2016) conducted the case study on "use of web-based information services by research scholars of Calicut University" . The survey shows that majority of the research community are not aware of the services provided by the library. The researchers demanded for awareness programmes about the web services.

3. Methodology

The structured questionnaires have been distributed among the randomly selected sample of research scholars in the autonomous colleges affiliated to Bharathiar University, Coimbatore. One hundred and twenty questionnaires were distributed to research scholars in the autonomous college in and around Coimbatore. One hundred and ten filled up questionnaires have been collected from the respondents for the data analysis and interpretations. On the basis of filled up questionnaire the data has been analyzed and tabulated using MS Excel. Statistical tools used in this study are percentage and weighted index. On the basis of the weighted index, ranks were assigned.

4. Objectives

- To assess the awareness of e-resources among the research scholars;
- To find out the frequency of usage of e-resources by the research scholars;
- To find out the effective usage of e-resources ;
- To determine the amount of time spent for accessing e- resources ;
- To identify the problems faced by researchers while using electronic resources.

- **Results and Discussions**

Information collected from the research scholars through questionnaires were analysed systematically, tabulated, interpreted and presented in the following paragraphs.

Table 1
Gender - wise distribution of the respondents

Gender	M.Phil.	%	Ph.D.	%	Total	%
Male	25	**38.5**	20	**44.4**	45	**40.9**
Female	40	**61.5**	25	**55.6**	65	**59.1**
Total	**65**	**100**	**45**	**100**	**110**	**100**

Table 1 indicates that 40.9 percent of the respondents belong to male category and 59.1 percent belong to the female category. Majority of the respondents belong to the female category.

Table.2.
Frequency of Library Visit

Frequency	Male	%	Female	%	Total	%
Daily	21	46.7	25	38.5	46	41.8
Alternative Days	15	33.3	17	26.2	32	29.1
Twice a Week	5	11.1	11	16.9	16	14.5
Once in a Week	4	8.9	12	18.5	16	14.5
Total	45	100.0	65	100	110	100

It is evident (table 2) that 41.8 % percent of respondents visited the library daily, 29.1 percent of respondents visited alternative days and each 14.5 percent of the respondents visited twice in a week and once in a week. The sex- wise analysis indicates 46.7 percent of the males visited daily; on the other hand 38.5 percent of females visited daily.

Table 3
Usage of Web Browser

Web Browser	Male	%	Female	%	Total	%
Google Chrome	20	50.0	43	61.4	63	57.3
Internet Explorer	6	15.0	29	41.4	35	31.8
Mozilla Firefox	14	35.0	47	67.1	61	55.5
Opera	10	25.0	12	17.1	22	20.0
UC Browser	5	12.5	4	5.7	9	8.2

Table 3 reveals that more than 50 percent of the respondents used the Google Chrome (57.3%) and Mozilla Firefox (55.5%) web browsers ; 31.8 percent used Internet Explorer ; 20 percent used the Opera web browser and the rest (8.2 percent) used US Browser. The sex- wise analysis indicates that a majority (50.0%) of the males used the Google Chrome web browser and 35 percent and 25 percent of the male respondents used Mozilla Firefox and opera web browsers respectively. More than 60 percent of the female respondents used the Google Chrome (61.4%) and Mozilla Firefox (67.1%) web browsers and 41.4 percent of the female respondents used the Internet Explorer.

Table. 4.
Usage of Search Engine

Search Engine	Male	%	Female	%	Total	%
Google	31	77.5	45	64.3	76	69.1
Yahoo	8	20.0	23	32.9	31	28.2
Ask.com	6	15.0	14	20.0	20	18.2
Bing	5	12.5	5	7.1	10	9.1
MSN	4	10.0	6	8.6	10	9.1
Rediff'	2	5.0	8	11.4	10	9.1
Alta Visa	2	5.0	6	8.6	8	7.3
Web Crawler	2	5.0	3	4.3	5	4.5

The table 4 shows that 69.1 percent of the respondents used the Google ; Yahoo (28.2 %) and 18.2 percent used Ask.com search engine. Bing (9.1%), MSN (9.1%), Rediff (9.1%), Alta Visa (7.3%) and Web Crawler (4.5%) search engines were used by less than 10 percent of the respondents. The sex- wise analysis indicates that a majority (77.5 %) of the males used the Google search engine and 20 percent and 15 percent of the male respondents used Yahoo and Ask.com search engine respectively. Other search engines were used by 10 and less than 10 percent of the male respondents. More than 60 percent of the female respondents used the Google (64.3%) search engine. Yahoo (32.9%), Ask.com (20.0%) and Rediff (11.4%) search engines were used 32.9, 20.0, and 11.4 percent of the female respondents respectively. Less than 10 percent of the female respondents were used the remaining search engines.

Table. 5.
Usage of Different Types of E-Resources

Types of E-Resources	Mostly	Moderately	Rarely	Not Used	WI	Rank
E-Journals	75	25	8	2	**2.57**	**1**
E-Books	60	32	10	8	**2.31**	**2**
E-Catalogues	60	29	16	5	**2.31**	**2**
E-Magazines	62	24	12	12	**2.24**	**4**

E-Databases	55	33	14	8	**2.23**	**5**
E-Dictionaries	55	28	12	15	**2.12**	**6**
E-Thesis	45	35	15	15	**2.00**	**7**
E-Newspapers	40	30	20	20	**1.82**	**8**
E-Reports	20	34	11	45	**1.26**	**9**

Table 5 shows the usage of different types of electronic resources by the respondents. To verify the usage of different types of electronic resources in a scientific way, weight ages were given to the factors by giving scores and the Weighted Index was arrived. Ranks were assigned on the basis of the weighted Index. First rank was assigned to the e-journals and second rank was occupied by the e-books and e-catalogues. E-magazines, e-databases, e-dictionaries, e-thesis, e-newspaper and e-reports were got third, fourth, fifth, sixth, seventh, eighth and ninth ranks respectively.

Table. 6.
Usage of Different Types of Online Databases

Online Databases	**Mostly**	**Moderately**	**Rarely**	**Not Used**	**WI**	**Rank**
Google Scholar	62	22	18	8	**2.25**	**1**
INFLIBNET / NLIST	52	23	12	23	**1.95**	**2**
Current Contents Connect	28	36	16	30	**1.56**	**3**
Emerald	40	18	12	40	**1.53**	**4**
Dissertation Abstract	26	30	24	30	**1.47**	**5**
Science Direct	30	22	15	43	**1.35**	**6**
Biological Abstract	20	28	10	52	**1.15**	**7**
ACM Digital Library	12	32	10	56	**1.00**	**8**
Social Science Full Text	24	12	4	70	**0.91**	**9**
Wiley Online library	18	17	12	63	**0.91**	**9**
Springer Link	26	6	8	70	**0.89**	**11**
Web of Science	20	10	6	74	**0.78**	**12**
Indian Science Abstract	16	8	20	66	**0.76**	**13**
IEEE Xplore	14	12	8	76	**0.67**	**14**
EBSCO	12	10	12	76	**0.62**	**15**
.Jstor	10	12	8	80	**0.56**	**16**
Engineering Village	6	10	14	80	**0.47**	**17**
World cat	8	12	4	86	**0.47**	**18**
Pro Quest	8	10	2	90	**0.42**	**19**
Scopus	8	4	8	90	**0.36**	**20**
MathSciNet	6	4	5	95	**0.28**	**21**

Table 6 indicates the usage of different types of online databases by the respondents. To verify the usage of different types of online databases in a scientific way, weight ages were given to the factors by giving scores and the Weighted Index was arrived. Ranks were assigned on the basis of the weighted Index (Table 6). First eight ranks were occupied by the Google Scholars, NLIST, Current Contents Connect, Emerald, and Dissertation Abstract, Science Direct, Biological Abstract and ACM Digital Library respectively. Other items were lesser usage and got below 1 weight ages score.

Table 7.
Time Spent for Accessing E-Resources in a Week

Frequency	Male	%	Female	%	Total	%
Less than a hour	2	4.4	6	9.2	8	7.3
1-2 hours	10	22.2	15	23.1	25	22.7
2-4 hours	18	40.0	16	24.6	34	30.9
4-6 hours	5	11.1	12	18.5	17	15.5
6-8 hours	6	13.3	10	15.4	16	14.5
more than 8 hours	4	8.9	6	9.2	10	9.1
Total	45	100	65	100	110	100

Table.7. indicates that the time spent for accessing e-resources by the respondents in a week. Among the total respondents, thirty one and twenty three percent of the respondents spent two to four hours and one to two hours for accessing resources in a week respectively. The sex- wise analysis indicates that a forty percent and twenty two percent of the male respondents spending time for accessing e-resources per week was two to four hours and one to two hours respectively. On the other hand, twenty five and twenty three percent of the female respondents spending time for accessing e-resources per week were two to four (24.6%) and one to two hours (23.1%) respectively.

Table 8.
Barriers in Using e-Resources

Barriers	Male	%	Female	%	Total	%
Lack of IT Knowledge	20	**10.00**	38	10.86	58	**10.55**
Difficult in finding relevant information	25	**12.50**	46	13.14	71	**12.91**
Lack of Subject Coverage	14	**7.00**	25	7.14	39	**7.09**
Lack of Training	26	**13.00**	39	11.14	65	**11.82**
Lack of Time	25	**12.50**	40	11.43	65	**11.82**
Slow access speed	22	**11.00**	37	10.57	59	**10.73**
Information Overload	25	**12.50**	38	10.86	63	**11.45**
Easy and convenient to Print Media	21	**10.50**	45	12.86	66	**12.00**
More Expensive	22	**11.00**	42	12.00	64	**11.64**
Total	200	**100.00**	350	100.00	550	**100.0**

Table 8 indicates that the barriers faced at the time of using e-resources. Among the listed nine barriers, ten to thirteen percent of the total respondents were facing all the barriers except lack of subject coverage. Lack of subject coverage barrier was faced by seven percent of the total respondents. Male and female respondent's responses also coincide to the above result.

Findings

- Majority of the respondents belong to the female category.
- 41.8 percent of the respondents visited the library daily, 29.1 percent of respondents visited alternative days and each 14.5 percent of the respondents visited twice in a week and once in a week.
- More than 50 percent of the respondents used the Google Chrome (57.3%) and Mozilla Firefox (55.5%) web browsers ; 31.8 percent used Internet Explorer ; 20 percent used the opera web browser and rest of the 8.2 percent used US Browser.
- 69.1 percent of the respondents used the Google ; Yahoo (28.2 %) and 18.2 percent used Ask.com search engine. Bing (9.1%), MSN (9.1%), Rediff (9.1%), Alta Visa (7.3%) and Web Crawler (4.5%) search engines were used by less than 10 percent of the respondents.
- Among the usage of different types of electronic resources, First rank was assigned to the e-journals and second rank was occupied by the e-books and e-catalogues. E-magazines, e-databases, e-dictionaries, e-thesis, e-newspaper and e-reports were got third, fourth, fifth, sixth, seventh, eighth and ninth ranks respectively.
- Among the usage of different types of online databases, first eight ranks were occupied by the Google Scholars, NLIST, Current Contents Connect, Emerald, and Dissertation Abstract, Science Direct, Biological Abstract and ACM Digital Library respectively. Other items were lesser usage and got below 1 weight ages score.
- Among the total respondents, thirty one and twenty three percent of the respondents spent two to four hours and one to two hours for accessing resources in a week respectively.
- Among the listed nine barriers, ten to thirteen percent of the total respondents were facing all the barriers except lack of subject coverage. Lack of subject coverage barrier was faced by seven percent of the total respondents. Male and female respondent's responses also coincide to the above result.

Conclusion

The present study examines the use pattern of e-resources among the research scholars in the autonomous colleges affiliated to Bharathiar University. The result indicated that more awareness should be created among researchers about the availability of the electronic resources and electronic services offered by the library and information centres. . In the present digital environment, electronic resources are playing a vital role in teaching, learning process and research hence the user

awareness programme should be conducted periodically

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Cloud Computing Research output: A Scientometric Study

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Abstract

The present study is Scientometric study of scholarly publications of Cloud Compuing Subject published in the sources of data indexed by Web of Science online database. A sum of total of 7243 publications spanned from 2007 to 2017 covering a period of 11 calendar years were obtained, organised, sorted out by choosen specific field in records and analysed. All publications of data on Cloud Computing in topic field were downloaded from Web of Science database. *The data were exported and processed in the HistCite to find out the contribution of Authors, Citations in the field of Cloud Computing research including open access publications (702) during years 2007–2017. The year of publication, Citations, journals and authors were analyzed and displayed in tables. The Global Citation Scores and Local Citation Scores are examined to identify the pattern of research contribution on Cloud Computing.*

1. Introduction

Scientometrics is a type of research method used in Library and Information Sciences. It is a quantitative study of various aspects of literature on a topic and is used to identify the pattern of publication, authorship and Cloud Computing journals coverage. It helps in getting an insight into the dynamics of growth of knowledge in the area under consideration. In the present day Scientometrics has attained sophistication and complexity of national, international and interdisciplinary character. The evaluation of the use of library collections is a fundamental tool for the development of a relevant and cost effective collection. Scientometrics offers several methods to measure the level of use of collections.

Objectives of the Study

The following are the important objectives of the study:

- To find out year-wise distribution of Publications.
- To recognize the source wise and year wise distribution of Cloud Computing research output of Scientists.
- To ascertain the authorship and collaboration pattern of scientists.
- To find out country-wise distribution of articles.
- To find out most prolific authors, most productive institutions
- To determine the degree of collaboration.

Methodology

All publications of data on Cloud Computing in topic field were downloaded from *Web of Science database*. The data were exported and processed in the HistCite to find out the contribution of Authors, Citations in the field of Cloud Computing research including open access publications during years 2007–2017. The year of publication, Citations, Self Citations, journals and authors were analyzed and displayed in tables using HistCite. The Global Citation Scores and Local Citation Scores are examined to identify the pattern of research contribution on Cloud Computing.

Data Analysis and Interpretations

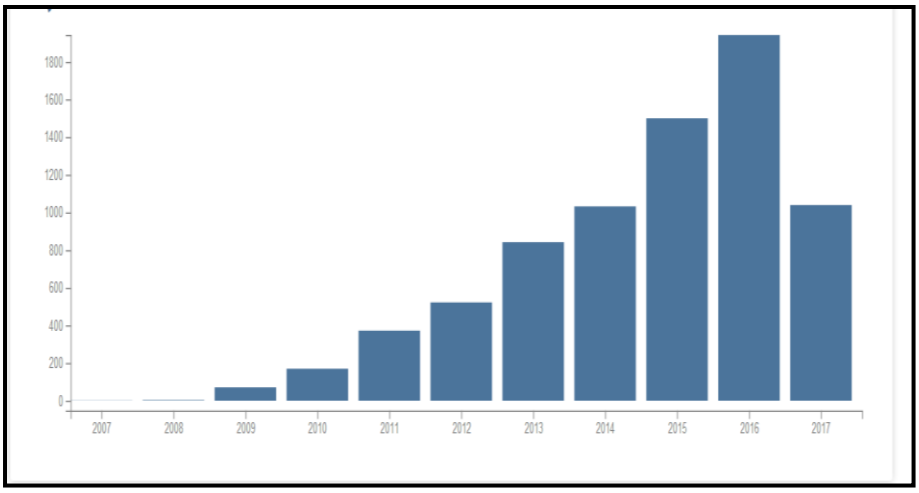
Year wise distribution of Publications and Citations

The table shows year-wise distribution of research productivity in Cloud Computing for a period of 11 years from 2007 to 2017. The total publication Records is found to be 7243 and the maximum output occurred in the year 2016 numbering 1930 and this formed 26.65 percent of the total output. The least records of the total output were in the year 2007 with 0.01 percent.

Table – 1 Year wise distribution of Research Literature with Citations

S. No	Publication Year	Records	TGCS
1.	2007	1	5
2.	2008	2	321
3.	2009	70	10522
4.	2010	170	7706
5.	2011	372	8909
6.	2012	522	9014
7.	2013	842	13133
8.	2014	1032	10033
9.	2015	1496	6759
10.	2016	1930	2726
11.	2017	806	234
Total		**7243**	**100.00**

It is inferred that the Cloud Computing oriented articles are slightly increased year by year.



It could revealed that the growth particularly from 2010 have got more than 100 publications covered by the source database. The year 2016 registered highest number of publications as 1930, which is followed by 2015 (1496 publications), and 2014 (1032 publications). It is also interesting to note that the numbers of increase of publications are related as to the reverse chronological order during the study period. The citation scores achieved by the Cloud Computing research publication is noteworthy as an evidence to the significant importance of Cloud Computing research as years 2007 to 2017 have got 69362 Total Global Citation Scores. The year 2013 has got maximum number of Total Global Citation Scores as 13133, which is followed by 2009 as 10522 and the year 2014 with Total Global Citation Scores 10033. The average citation score for an individual research while a Cloud Computing research during the study period is 11.86.

Authorship Pattern

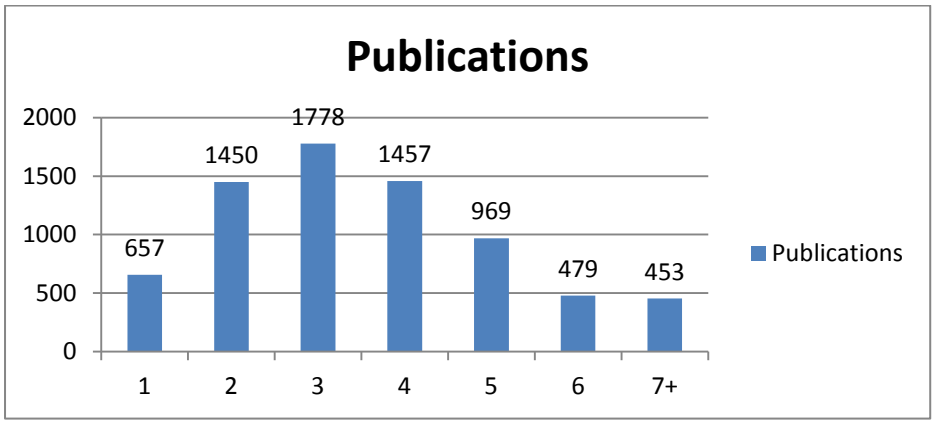
Year wise distribution of author groups and their publication records over a period of eleven years revealed interesting results. Single authored papers shows growing trend from the year 2007 to 2017 the maximum productivity was 169 in the year 2016. Regarding three authored publications, the maximum output recorded was 469 with performance during 2016 followed by double author with 409 publications in the years 2016.

Table – 2 shows Authorship Pattern and Year wise Distribution

Year	Number of Authors							Total
	1	2	3	4	5	6	7+	
2007	00	01	00	00	00	00	00	1
2008	00	01	01	00	00	00	00	2
2009	09	15	12	11	10	06	07	70
2010	15	42	45	30	16	12	10	170
2011	34	64	82	62	48	30	52	372
2012	60	85	124	92	55	52	54	522

2013	69	185	184	164	145	66	29	842
2014	75	185	265	234	185	73	15	1032
2015	129	351	398	314	119	79	106	1496
2016	169	409	469	365	272	117	129	1930
2017	97	112	198	185	119	44	51	806
Total	657	1450	1778	1457	969	479	453	7243
Percent	9.07	20.02	24.55	20.12	13.38	6.61	6.25	100.00

Publications by category of three authors showed a maximum output of 1778, followed by four and double authors scored 1457 and 1450 publications.



The above table displays in a linear order the categories of number of authors, grouping in a contribution. The authorship in Cloud Computing research publications ranged from single author to more than seven plus authors. The category of three author papers ranked first (24.55 percent), the category of four and double authored publications ranked second and third forming 20.12 percent and 20.02 percent. Publication Records by the category of first author, ranking fifth place had a share of 9.07. The inference is that three authors were found to have produced more than the productivity of remaining authors. Other words, multiple author publications, while compared to Single and Joint authorship strength was found to be more.

Degree of Collaboration

The analysis of data for single and collaborative authored papers revealed the fact that single authored papers suffered a declining trend while collaborative authored papers recorded an increasing trend. In recent decades there has been an increasing trend towards collaboration in research in almost all pure as well as applied sciences. Subramaniam deduced a formula for calculating the degree of collaboration as.

Table – 3. Shows Degree of Collaboration

S.No	Year	Single Authored	Collaborative Authorship	Degree of Collaboration
1.	2007	00	1	1.00
2.	2008	00	2	1.00
3.	2009	09	61	0.87
4.	2010	15	155	0.91
5.	2011	34	338	0.91
6.	2012	60	462	0.88
7.	2013	69	773	0.92
8.	2014	75	957	0.93
9.	2015	129	1367	0.91
10.	2016	169	1761	0.91
11.	2017	97	709	0.88
Total		**657**	**6586**	**0.91**

C = Nm / Nm + Ns

where C = extent of collaboration

Ns = number of single authored papers

Nm = number of multi authored papers

Thus the percentage of collaboration can be arrived at by applying the formula C= Nm/ (Nm + Ns) x 100.

The analysis of the extent of collaboration of Cloud Computing research reveals the following facts.

- Degree of collaboration had an initial value of 0.87 per cent in the years 2009and this increased to 1.00 in the years 2007 and 2008 respectively.
- There was a decline in the single authored papers and an increase in multi authored papers.
- This could be taken as an evidence to the effect that scientists in Cloud Computing research intended to take a collaborative participation in research problem solving activities and there by the publications.
- The result evidenced in the application of *Subramanian's formula* corroborated the results obtained in this investigation through regression analysis.

Trend Analysis for Single Author

The below table reveals a Trend Analysis of the Single authored publications in Cloud Computing research by applying the straight line equation formula

Table – 4.
Shows Single Authored Publications – Trend Analysis

S.No	Year	Count (Y)	X	X2	XY
1.	2007	00	-5	25	0
2.	2008	00	-4	16	0
3.	2009	09	-3	9	-27
4.	2010	15	-2	4	-30
5.	2011	34	-1	1	-34
6.	2012	60	0	0	0
7.	2013	69	1	1	69
8.	2014	75	2	4	150
9.	2015	129	3	9	387
10.	2016	169	4	16	676
11.	2017	97	5	25	485
	Total	**657**	**0**	**110**	**1676**

Straight Line eqn $Yc = a + bX$; Since $\sum x = 0$
$a = \sum Y/N = 657/11 = 59.73$; $b = \sum XY/\sum x2 = 1676/110 = 15.24$
Estimated literature in 2025 is when $X = 2011 – 2025 = 14$
$= 59.73 + 15.24 * 14 = 59.73 + 213.36 =$ **273.09**

From the results of the calculations, it is found that Single authored publications showed a negative result and as such the inference is that this category may seize to exist by the year 2025.

Trend Analysis for Collaborative Authors

The below table reveals a Trend Analysis of the Collaborative authored publications in Cloud Computing research by applying the straight line equation formula

Straight Line eqn $Yc = a + bX$; Since $\sum x = 0$
$a = \sum Y/N = 6586/11 = 598.73$; $b = \sum XY/\sum x2 = 16533/110 = 150.30$
Estimated literature in 2025 is when $X = 2011 – 2025 = 14$
$= 598.73 + 150.30 * 14 = 598.73 + 2104.20 =$ **2702.93**

Table – 5.
Collaborative Authored Publications – Trend Analysis

S.No	Year	Count (Y)	X	X2	XY
1.	2007	1	-5	25	-5
2.	2008	2	-4	16	-8
3.	2009	61	-3	9	-183
4.	2010	155	-2	4	-310

5.	2011	338	-1	1	-338
6.	2012	462	0	0	0
7.	2013	773	1	1	773
8.	2014	957	2	4	1914
9.	2015	1367	3	9	4101
10.	2016	1761	4	16	7044
11.	2017	709	5	25	3545
	Total	**6586**	**0**	**110**	**16533**

From the results of the calculations, it is found that Collaborative authored publications showed a negative result and as such the inference is that this category may seize to exist by the year 2025.

Document wise distribution of Publications

The below table revels that number of items published has been the items, Articles (6523) are well ahead of all other types of articles followed by Editorial Material (254), Reviews (203) and Article; Proceedings Paper (159).

Table – 6.
Document Wise Distribution of Literature Output

S. No	Document type	Records	Percentage	Cumulative %
1.	Article	6523	90.06	90.06
2.	Editorial Material	254	3.51	93.57
3.	Review	203	2.80	96.37
4.	Article; Proceedings Paper	159	2.20	98.57
5.	Meeting Abstract	35	0.48	99.05
6.	Book Review	25	0.35	99.40
7.	News Item	17	0.24	99.64
8.	Article; Book Chapter	9	0.13	99.77
9.	Letter	6	0.08	99.85
10.	Correction	5	0.07	99.92
11.	Review; Book Chapter	3	0.04	99.96
12.	Retracted Publication	1	0.01	99.97
13.	Reprint	1	0.01	99.98
14.	Retraction	1	0.01	99.99
15.	Software Review	1	0.01	100.00
Total		**7243**	**100.00**	

The above table revels that number of items published has been the items, Articles (90.06 percent) are well ahead of all other types of articles followed by Editorial Material (3.51 percent), Review (2.80 percent) and Article; Proceedings Paper (2.20 percent). These categories constitute more than 90 percent of the articles.

Source Title wise distribution of Publications

The below table revels that the citation for the Cloud Computing articles published journals in the global level. The International Journal of Escience: Future Generation Computer Systems has contributed 198 publications with the Total Global Citation Score was 2768 and the Total Global Citation Score test value was 676.77, followed by Concurrency and Computation-Practice & Experience has contributed 174 publications with the Total Global Citation Score was 900 and the Total Global Citation Score test value was 187.18.

Table-7.

Shows Top 25 Journal and Citations on Cloud Computing

S. No	Journal	Records	TGCS	TLCR
1.	Future Generation Computer Systems-The International Journal Of EScience	198	2768	714
2.	Concurrency And Computation-Practice & Experience	174	900	497
3.	Journal Of Supercomputing	165	1281	492
4.	Ieee Transactions On Parallel And Distributed Systems	162	3086	343
5.	Future Generation Computer Systems-The International Journal Of Grid Computing And Escience	129	4724	259
6.	Journal Of Network And Computer Applications	120	1780	797
7.	Cluster Computing-The Journal Of Networks Software Tools And Applications	117	545	325
8.	Journal Of Internet Technology	90	312	163
9.	Ieee Transactions On Services Computing	80	913	164
10.	Journal Of Systems And Software	78	431	288
11.	Journal Of Grid Computing	74	663	267
12.	Ieee Access	69	312	298
13.	Computer Networks	63	498	162
14.	Journal Of Parallel And Distributed Computing	58	911	67
15.	Ieee Transactions On Computers	57	632	129
16.	Computer Journal	57	357	132
17.	Ieee Network	55	870	69
18.	Computer	53	876	14
19.	Information Sciences	53	824	228
20.	Ieee Internet Computing	48	1497	29

It is inferred that most of the journals available in the subject of Computer science.

Country wise distribution of Publications

The below table present the country wise publications in Cloud Computing research. It is found that the results of research originated from 99 countries. Of which Peoples R China ranked first forming 28.60 percent of the total publication Records, the Total Global Citation Score was 13930 and the Total Local Citation Score was 3694. Second in the ranked order was United States of America with 22.90 percent, the Total Global Citation Score was 28781 and the Total Local Citation Score was 5455 and Australia occupied the third rank with 7.00 percent, the Total Global Citation Score was 10282 and the Total Local Citation Score was 3069.

Table -9.

Shows Ranking of Authors based on Publications

Author	Records	TGCS	TLCR	Author	Records	TGCS	TLCR
Buyya R	89	5953	380	Jin H	35	304	40
Li J	86	1183	178	Zomaya AY	35	497	85
Gani A	46	899	450	Li KQ	33	182	79
Chen JJ	41	549	167	Ranjan R	33	1207	105
Li Y	40	407	128	Wang C	32	1168	74
Zhang Y	40	233	126	Liu L	31	235	58
Liu X	39	367	117	Yang Y	31	359	72
Chen XF	38	224	78	Zhang J	31	531	48
Vasilakos AV	38	843	199	Yang LT	30	339	94
Khan SU	37	846	183	Chen M	28	558	69

Table – 10.

Institution Wise Distribution of Publications

S.No	Institution	Records	%	TGCS
1.	Chinese Academy of Science	148	2.0	1845
2.	Tsinghua University	120	1.7	1416
3.	Beijing Univ Posts & Tele commun	116	1.6	867
4.	Huazhong Univ Sci & Technol	113	1.6	1194
5.	Univ Melbourne	111	1.5	6294
6.	Xidian University	109	1.5	531
7.	University Malaya	85	1.2	1299
8.	King Saud University	81	1.1	528
9.	Shanghai Jiao Tong University	66	0.9	726
10.	Beihang University	64	0.9	820
11.	Wuhan University	64	0.9	649

12.	Natl University Def Technology	63	0.9	365
13.	University Elect Science & Technology China	62	0.9	388
14.	University Sydney	59	0.8	925
15.	Nanjing Univ	53	0.7	291
16.	University Technology Sydney	52	0.7	520
17.	Kyung Hee University	51	0.7	372
18.	Nanyang Technology University	51	0.7	1063
19.	Guangzhou University	46	0.6	442
20.	Korea University	46	0.6	182

The above table provides the types of institutions in the global, where from the contributions originated. It is found from the above table that, 148 contributions were from Chinese Academic Science institution and the total Global Citation Score was 1845, the total local citation score was 318, followed by 120 contributions from Tsinghua University and the total Global Citation Score was 1416, the total local citation score was 375.

Findings and Conclusion

The present study is Scientometric Analysis of scholarly publications of Cloud Compuing Subject published in the sources of data indexed by Web of Science. A sum of total of 7243 publications spanned from 2007 to 2017 covering a period of 11 calendar years were obtained, organised, sorted out by choosen specific field in records and analysed. Scientometric data provide precise and accurate observation. The researcher suggest that the Scientometrician is to continue to develop the techniques which will be more reliable and useful for evaluation and prediction, because Scientometric data mirror the actual published results of the work of researchers. Based on the analysis undertaken by the present study, the following findings are drawn.

- The study found that 3 Papers received 1000 and above citations. The Range of Citations are 1287-6748
- The study found that 90 papers received 100 and above citations
- I10 index is 1303. It mean 1303 papers received 10 and above Citations.
- 4511 paper are only cited by others and remaining 2760 papers does not get citations.
- 702 are published in Open Access Journals and remaining 6569 papers published in subscribed Journals.

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Publication productivity in Veterinary Science: A Scientometric Analysis

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Abstract

The present study is a scientometric analysis based on the database web of science with the records related to the discipline of veterinary science for the period of 1989 to 2016. Scientometrics is the application of metric analysis to the scientific data in veterinary science. Veterinary science is pertaining to the art of healing or treating the disease of domestic animals.

Keywords: Publication Productivity, Research Trends, Veterinary Science, Scientometric Analysis

Introduction

In the age of Information explosion, research and development is not only progressing in pure science but also in the applied sciences. Majority of publications are in collaborative nature to gain knowledge through the experts. The present study is a scientometric analysis based on the database web of science with the records related to the discipline of veterinary science for the period of 1989 to 2016. Scientometrics is the application of metric analysis to the scientific data in veterinary science. Veterinary science is pertaining to the art of healing or treating the disease of domestic animals.

Review of Literature:

Falagas, Papastamatakim and Bliziotis (2006) studied the research productivity of different world regions in the field of parasitology. Using the PubMed database, they collected information for the period of 1995-2003. Research Productivity was evaluated based on a methodology and used in other bibliometric studies by analysing the total number of publications, the mean impact factor of all papers, and the product of the above two parameters. The research productivity was also evaluated in relation to gross domestic product of each region and in relation to gross national income per capita and population of each region. They found that more help should be provided by the developed nations to the developing areas for the improvement of research infrastructure.

He, Luo and Lu (2009) in their study said that biological invasion is an important barriers for biodiversity conservation and sustainable development of global agriculture and forestry. The performed, bibliometric study on biological invasion literature indexed by the Web of Science in the period of 1991-2006. They observed that of all nations, the United States had the largest number of publications. They also analyzed the average impact factor of the top 10 journals, most important and popular journals related to this field, and institutions with a higher number of publications.

Codron, Bedu and Cibenel (1995) discussed about major countries publishing on fruit and vegetable economics. There were interested in research on how scientific concerns

are connected with economic activities. Their paper aimed at answering these questions through an analysis of the references produced by the Commonwealth Agricultural Bureau International (CABI) data base from 1975 to 1989.

Objectives of the study:

The present study is made with the following objectives.

- To examine the authorship pattern and degree of collaboration in veterinary science
- To study the growth of literature by its trend analysis and doubling time in veterinary science.
- To understand the document type and languages used for publishing the records.
- To know the publication pattern of different countries in veterinary science

Methodology:

Data related to Veterinary science for the years 1989 to 2016 were downloaded from the Web of Science. The extracted information were tabulated with the help of Histcite programming software.

Analysis of Data: 1. Trend Analysis and Doubling Time

S. No.	Publication Year	Recs	Percent	W1 Natural Log	W2 Natural Log	RGR	Mean	Doubling Time	Mean DT
1	1989	9	0.4	-	2.19	2.19	0.69	0.32	
2	1990	24	1.0	2.19	3.17	0.98		0.70	
3	1991	22	0.9	3.17	3.09	0.08		8.66	
4	1992	24	1.0	3.09	3.17	0.08		8.66	
5	1993	27	1.1	3.17	3.29	0.12		5.77	4.8
6	1994	38	1.6	3.29	3.36	0.34	0.298	2.04	
7	1995	34	1.4	3.36	3.52	0.11		6.3	
8	1996	53	2.2	3.52	3.97	0.45		1.54	
9	1997	91	3.8	3.97	4.51	0.54		1.28	
10	1998	96	4.0	4.51	4.56	0.05		13.86	5.0
11	1999	119	5.0	4.56	4.77	0.21	0.192	3.3	
12	2000	138	5.8	4.77	4.9	0.13		5.33	
13	2001	147	6.2	4.9	4.99	0.09		7.7	
14	2002	199	8.4	4.99	5.29	0.3		2.31	
15	2003	158	6.6	5.29	5.06	0.23		3.01	4.3
16	2004	51	2.1	5.06	3.93	2.03	0.508	0.34	
17	2005	57	2.4	3.93	4.04	0.11		6.3	
18	2006	76	3.2	4.04	4.33	0.29		2.38	
19	2007	76	3.2	4.33	4.33	0		0	
20	2008	85	3.6	4.33	4.44	0.11		6.3	3.6
21	2009	98	4.1	4.44	4.58	0.14	0.096	4.95	
22	2010	95	4.0	4.58	4.55	0.03		23.1	
23	2011	102	4.3	4.55	4.62	0.07		9.9	
24	2012	99	4.2	4.62	4.59	0.03		23.1	
25	2013	122	5.1	4.59	4.80	0.21		3.3	12.8
26	2014	117	4.9	4.80	4.76	0.04	0.120	17.32	
27	2015	124	5.2	4.76	7.82	0.06		11.55	
28	2016	96	4.0	7.82	-	0.26		2.66	10.2

The relative growth rate of the publications of veterianary science articles during the period of study was analysed in this table alongwith the doubling time. It is found that the relative growth rate was 2.19 in the year 1989 and it was reduced to 0.26 in 2016. The mean relative growth rate was 0.69 during the period of 1989-94 and it was reduced to 0.120 in the period of 2014-16. It was increased from 0.192 in the period of 1999-2003 to 0.508 in the period of 2004-2008. But in the case of doubling time of the publication of veterinary science was in the increasing trend. It was 0.32 in the year 1999 and increased to 17.32 in the year 2014. With regard to the mean doubling time, it is a drastic change from 4.8 during 1999-2003 to 12.8 in the period of 2009-2013. It is inferred from the table that the research productivity in terms of doubling time is in an increasing trend.

2. Most Prolific Authors in Veterinary Science

Author	Recs	TLCs	TGCs
Health TJ	10	43	175
Akram M	9	2	9
Javed K	9	2	9
Meszaros J	9	0	14
Necas A	9	10	75
Jatoi AS	8	2	8
Mills PC	8	18	49
Sahota AW	8	2	8
Brown K	7	14	56
Carpernter TE	7	14	236
Mehmood S	7	2	7
Reid SWJ	7	2	137
Babiuk La	6	1	247
De Brabander HF	6	0	303
Gasser RB	6	6	226
Hussain J	6	2	7
Jaspal MH	6	2	8
Jernigan AD	6	5	104
Kogan LR	6	2	18

During the period of study 1999-2016, Web of Science covers the papers published in the subject of veterinary science. It was published by 6777 authors from various academic and research institutions. Among the authors, it is viewed that Health, TJ published the maximum number of 10 articles which claimed the Total Global Citation scores of 175 and Total Local Citation scores of 43. Next to him, four authors viz., Akram, M, Javed K. Meszaros, J and Necas A., published 9 articles each. Six articles published by De Brabender HF, claimed the maximum of Total Global Citation scores of 303.

3. Degree of Collaboration in Veterinary Science Research:

Number of Authors	Records	Percentage
Single authors	176	7.40
Two authors	426	17.92
Three authors	914	38.45
Four authors	275	11.56
Five authors	1190	50.06
Six authors	144	6.05
Seven authors	98	4.12
Eight authors	51	2.14
Nine authors	32	1.34
Ten authors	26	1.09
More than 10 authors	45	1.89
Total	2377	100.00

It is found from the table that the maximum of 1190 records were published by collaborative work of five authors (50%) Next to this, 38% of the publications were made by three authors. Only 176 articles (7.4%) were published by the solo researchers.

Degree of Collaboration:

Analysis on Collaboration of author was done by Subramaniyan formula to find out the degree of collaboration. The degree of collaboration in the publication of veterinary

science during the study period was calculated as follows:

DC = Nm / Nm + Ns

Nm = Number of multiple authors' publications

Ns= Number of Single authors' publications.

DC= 2201/2201+176 = 2201/2377 = 0.9259

The degree of collaboration for the period of study was 0.92. It shows that the share of the multi authored publications were at 92%. This shows that the collaborative research is more effective than the solo research, which is less than 10%.

4. Most Productive Journals In Veterinary Science:

Journal	Recs	TLCs	TGCs
Journal of veterinary Medical Education	153	160	665
Preventive veterinary medicine	102	49	2874
Veterinary Parasitology	92	43	3101
Australian Veterinary Journal	49	53	233
Veterinary Record	48	3	80
Veterinary Microbiology	39	4	1263
Veterinary Immunology and Immuno pathology	33	5	1208
Vaccine	32	13	1348
Veterinary Journal	32	6	1092
Revue Scientific technique –office international des epizooties	27	3	53
International journal for Parasitology	25	10	1285
Applied animal Behaviour science	24	16	694
Advanced Drug delivery Reviews	22	12	1210
Analytical Chemical Acta	21	1	668
Journal of Animal and Plant Sciences	18	2	13

Table 4 shows the top fifteen productive journals in veterinary science. The Maximum of 153 records were published in the journal of veterinary medical education with the Total Local Citation scores of 160 and Total Global Citation scores of 665. Next to this, 102 articles were published in the journal of productive of journal of preventive veterinary medicine with the local citation scores of 49 and Total Global citation scores of 2874.

5. Most occurred Keywords in Veterinary Research

Word	Recs	Percentage
Veterinary	835	35.11
Science	339	14.26
Animal	238	10.01
Medicine	154	6.47
Sciences	134	5.63
University	122	5.13
Health	120	5.04
Research	113	4.75
Students	88	3.70
Analysis	86	3.61
Education	83	3.49
Dogs	82	3.44

Disease	81	3.40
Use	81	3.40
Development	74	3.11
Based	73	3.07
Clinical	73	3.07
New	70	2.94
Animals	67	2.81
Welfare	66	2.77

Table 5 shows that Web of Science covers the most occurred keywords in Veterinary Research in the subject of Veterinary Science. It is found from the table that a maximum of twenty keywords were identified in veterinary Research most preferably and repeatedly occurred in the publication of the research articles. The Maximum number of 835 articles used the keyword "Veterinary " ranked in the first place with 35.11 percentage. Next to this, "Science" is the keyword used in 339 articles published with 14.26 percentage.

6. Most Preferred type of document to Publish in Veterinary Sciences:

Document Type	Recs	Percentage
Article	1645	69.20
Article ; Proceedings Paper	239	10.05
Review	237	9.97
Editorial Material	144	6.05
News item	36	1.51
Letter	35	1.47
Biographical item	7	0.29
Meeting Abstract	6	0.25
Note	6	0.25
Article; Book Chapter	4	0.16
Review; Book Chapter	4	0.16
Bibliography	3	0.12
Book Review	3	0.12
Correction, Addition	2	0.08
Reprint	2	0.08
Correction	1	0.04
Discussion	1	0.04
Item about an individual	1	0.04
Main Cite	1	0.04

Table 6. shows the details about the preferred document type of Research articles in Veterinary Sciences. Out of the nineteen document type were used to publish the articles in Veterinary Sciences, the highest number of contribution of a journal article placed in the first rank with 1645 records with 69.2 percentage. Next to this, proceeding papers were placed in the second rank with 239 articles with 10.05 percentage. Review articles were placed in the third position with 9.97percentage.

7. Languages used in Veterinary Research

Language	Recs	TLCs	TGCs
English	2026	646	39971
Hungarian	90	1	41
German	87	7	129
Spanish	39	3	36
Portuguese	33	1	58
Polish	30	2	11
Dutch	29	0	16
French	22	0	14
Lithuanian	8	0	5
Czech	6	3	6
Turkish	2	1	1
Italian	1	0	0
Japanese	1	0	3
Korean	1	0	0
Russian	1	0	0
Slovak	1	0	0

Research literature on Veterinery Science has been published in different journals in various languages. Table 7 shows that sixteen languages were used in Veterinary Research. Among them the maximum number of Veterinary sciences articles were published in English language ranks first place occupying more than 86 percentage of the total output. Next to this, Hungarian and German are being used publish the articles.

8. Collaborative Institutions in Publishing Veterinary Science Research

Institution	Recs	TLCs	TGCs
University Queensland	53	76	599
University Calif Davis	46	30	1465
University Guelph	40	20	802
University Sydney	38	33	726
University Utrecht	38	0	1081
University Pretoria	35	8	418
University Bristol	29	22	675
Cornell University	28	5	350
University Glasgow	27	10	389
Texas A&M University	25	6	274
USDA ARS	23	8	692
Michigan State University	22	16	204
University Melbourne	22	17	524
University Minnesota	21	3	317
Colorado State University	19	7	151
University Liverpool	19	7	289
University &Pharmaceutical Science	19	11	108
N Carolina State University	18	3	405
Purdue University	18	12	589

Table 8 shows collaborative Institutions in publishing Veterinary Science research. In this study the highest number of articles i.e. 53 was published by University Queensland with the Total Local Citation scores and 599 as Total Global Citation scores. Next to this, University Calf Davis, published 46 articles with the Total Local Citation Scores of 30 and the maximum Total Global Citation Scores of 1465.

9. Countries Engaged in Publishing Veterinary Research

Country	Recs	TLCs	TGCs
USA	516	208	12894
UK	296	117	6509
Australia	183	170	3809
Germany	121	30	3519
Canada	108	44	1977
Netherlands	85	14	1896
Italy	75	10	1630
Spain	75	18	2380
Brazil	70	2	570
France	66	12	1862
India	65	5	246
Belgium	63	7	2140
South Africa	50	11	479
Switzerland	44	12	1280
Denmark	43	17	1249
Poland	43	6	385
Hungary	41	2	136
Czech Republic	36	13	541

Publication of Veterinary Science research articles from various countries are displayed in the above table. It shows the nineteen countries engaged in publishing Veterinary Research during the period of study. . The study reveals that American countries contribute the majority of the research in Veterinary science with 516 articles obtained the Total Local Citation scores of 208 and Total Global Citation scores 12,894. Next to this, UK published 296 articles during the period with the Total Local citation scores of 117 and Total Global Citation scores of 3809.

Conclusion:

The study results revealed that among various countries involved in the publication of Veterinary Sciences, United States has the maximum publication count. A look at the statistics of records on the publication count reveals that there is a gradual and linear increase in research productivity of veterinary science during the study period with regard to the Doubling time of its productivity. English language ranks first occupying more than 86 percentage of the total output. In general, the developing countries like India must take positive steps in filling up the research gap in veterinary research.

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Using E-Resources Offered By Library of Arts and Science Colleges in Tirunelveli District

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Abstract

The electronic resources are defined as "systems in which information is stored electronically and made accessible through electronic systems and computer networks. Electronic resources are the electronic representation of information. These are available in various forms like e-books, digital libraries, on line journal magazine, e-learning tutors and on line test. Because of the effective presentation with multimedia tools, these e-resources have become the source of information Electronic resources delivers the collection of information as full text databases, e-journals, image collections, multimedia in the form of CD, tape, internet, web technology and so on. The research scholars and the students, both PG and Lecturers/scholars, are quite aware of the fact that ICT products and its use are important. This has been known through their (the students) response.

Keywords: E-resources, User studies, ICT

Introduction

The electronic resources are defined as "systems in which information is stored electronically and made accessible through electronic systems and computer networks. Electronic resources are the electronic representation of information. These are available in various forms like e-books, digital libraries, on line journal magazine, e-learning tutors and on line test. Because of the effective presentation with multimedia tools, these e-resources have become the source of information Electronic resources delivers the collection of information as full text databases, e-journals, image collections, multimedia in the form of CD, tape, internet, web technology etc. E-resources may include e-journals, e-discussions, e-news, (e.g.: USE NET), data archives, e-mail, on line chatting, etc can be called as an e-resources.

Review of Literature:

Masoumeh (2011) this study was to determine users dependency on electronic and print journals by the most frequently users of journals-research scholars and faculty in Iran. A total of 118 faculty members and research scholars were selected. The results showed that the majority of users had high dependency on electronic journals.

Omotayo (2011) finds that majority of respondents prefer electronic journals than print journals. All respondents were of

the opinion that use will continue to increase. It showed that only 35% of the respondents had published in electronic journals.

Mishra and Reshmi Rekha (2010) in their study reveal that the use of e-resources among the students of the library under study is primarily to update knowledge. The teachers of the university under study use UGC-Infonet and INDEST Consortium to find the latest information in their own subject and constitute the highest percentage for using the e-journals. It is also surprising to note that a good number of respondents are not used to e-resources of the library due to the lack of their awareness.

Chandra, et al. (2014). Surveyed the A Study on Use Pattern E-Resources among Faculty Members in Arts and Science Colleges in Chennai. The study is an attempt to investigate the awareness of e-resources, experience level in using eresources, time spent on using e-resources, purpose of using e-resources, use of various online sources and the most preferred place for accessing eresources by the Associate Professors and Assistant Professors of Arts and Science Colleges in Chennai. The result of this study has revealed that most of the respondents are aware of e-resources available in their college library. They have accessed e-resources for their study and research purpose. Majority of the respondents opine that e-resources are useful.

Objectives:

To find out the users' level of familiarity on E-resources in Arts and Science Colleges in Tirunelveli District, the following objectives are set forth.

- To know the users' purpose of using E-Resources
- To analyse the frequency of using E-Resources
- To study the use of various online sources
- To determined the usefulness of e-resources

Research Design

The researcher has applied the non-probability sampling method to collect the primary data. Consequently, he has applied the convenience sampling method to obtain the responses from students and scholars. A sample size of 550 respondents was selected on the convenience sampling method. Out of 550 respondents chosen for the study, 518 of them were found usable. The samples of this study encompass all types of students/lecturers and it works out to 518. The study has been done on the basis of both primary as well as secondary sources of data. The data collected among the employees through survey constitute primary and information gathered through books, journals, magazines, reports, dailies consisting of secondary data. The data collected from both the sources were scrutinized, edited and tabulated. Further, the processed data were analysed using statistical package for social sciences (SPSS 20.) and other computer packages.

Data Analysis and Findings:

Table-1
Cross Table between Familiarity of ICT Products and Locality Wise Classification

Familiarity of ICT products Vs locality		Rural		Urban		Semi Urban	
		Familiar	Unfamiliar	Familiar	Unfamiliar	Familiar	Unfamiliar
1	Computer / laptop	417 (80.50)	101 (19.50)	497 (95.95)	21 (4.05)	466 (89.96)	52 (10.04)
2	Internet	392 (75.68)	126 (24.32)	441 (85.14)	77 (14.86)	452 (87.26)	66 (12.74)
3	E – Resources	369 (71.24)	149 (28.76)	428 (82.63)	90 (17.37)	419 (80.89)	99 (19.11)
4	Word	487 (94.02)	31 (5.98)	518 (100.00)	0 (0.00)	518 (100.00)	0 (0.00)
5	PowerPoint	312 (60.23)	206 (39.77)	483 (93.24)	35 (6.76)	432 (83.40)	86 (16.60)
6	Excel	301 (58.11)	217 (41.89)	438 (84.56)	80 (15.44)	407 (78.57)	111 (21.43)
7	SPSS / Similar	98 (18.92)	420 (81.08)	157 (30.31)	361 (69.69)	136 (26.25)	382 (73.75)
8	Scanner	289 (55.79)	229 (44.21)	472 (91.12)	46 (8.88)	433 (83.59)	85 (16.41)
9	Printer	329 (63.51)	189 (36.49)	511 (98.65)	7 (1.35)	498 (96.14)	20 (3.86)
10	DVD / CD / Pen drive	466 (89.96)	52 (10.04)	518 (100.00)	0 (0.00)	518 (100.00)	0 (0.00)

Source: Primary Data (Inside the parentheses are percentages of respondents.)

This table is about the familiarity of ICT products among the rural, urban and semi-urban areas. To our surprise, 80% of rural people have responded that they are familiar with ICT's computer and laptops while 19.50% of people have said that they are unfamiliar with the above-mentioned product. The case is much better with the people belongs to urban and semi-urban areas. While 95.95% of urban are familiar, 89.96% of semi-urban have responded that they are familiar with the ICT product. Only 4.05% and 10.04% have said that they are unfamiliar about the ICT products.

With regard to the familiarity of the internet, 75.68% of rural people have responded positively while 24.32% of rural people have said that they are unfamiliar with ICT products. The case is by and large similar with regard to the familiarity of internet by the urban and the semi-urban people and their percentage of familiarity is 85.14% and 87.26% respectively. 14.86% of urban and 12.74% of semi-urban have responded negatively towards the familiarity of internet.

E-resources are familiar to 71.24% of rural people and unfamiliar to 28.76% while 82.63% of urban and 80.89% of semi-urban are familiar with e-resources. 17.37% urban and 19.11% of semi-urban are unfamiliar with the above-mentioned product. 94.02% of rural, 100% of urban and semi-urban people are familiar with Word while only 5.98% of the lone rural are unfamiliar with Word.

The familiarity of PowerPoint has caught the 60.23% of rural people while 39.77% of them are unfamiliar with it. A huge 93.24% of urban are familiar with PowerPoint; a meagre 6.76 are unfamiliar with it. Semi-urban area has 83.40% of familiar and 16.60% of unfamiliar people towards PowerPoint.

Excel sees 58.11% of rural people familiar with it and 41.89% unfamiliar with it. Urban people are 84.56 in percentage in familiarity side while 15.44 are unfamiliar with it. 78.57% of semi-urban take side with familiarity of Excel and 21.43 % are with unfamiliarity category.

The familiarity with SPSS/Similar has meagre respondents in all three areas i.e. rural, urban and semi-urban. With 18.92% of rural, 30.31 of urban and 26.25 of semi-urban are familiar, a huge turn of people i.e. 81.08% of rural, 69.69% of urban and 73.75% of semi-urban are unfamiliar with it.

A balanced 55.79% of rural people are familiar with Scanner as against the 44.21% of people who are unfamiliar with it. 91.12%, a good turnaround, of urban are familiar with Scanner and a scanty 8.88% are unfamiliar with it. The semi-urban has 83.59% of people who are familiar with Scanner and 16.41% are unfamiliar with it.

A near balanced percentage of 63.51 of rural people are familiar with Printer as against the 36.49% of unfamiliar people towards Printer. The urban people's familiarity percentage of Printer is 98.65 and a least 1.35% is unfamiliar with it. Likewise, the semi-urban has 96.14% who are familiar with Printer and 3.86% is unfamiliar with it.

The familiarity of DVD/CD/Pen drive is evident that 89.96% of rural and 100% of urban and semi-urban people. Only 10.04% of rural people are unfamiliar with DVD/CD/Pen drive.

Table. 2
Garrett Ranking Table Shows the Purposes of using ICT products

SL. No.	ICT PRODUCTS	GARRETT SCORE	MEAN SCORE	RANK
1	For accessing E – Resources	43170	83.34	1
2	Communication (E-Mail)	40176	77.56	4
3	To locate, collect data using internet	29930	57.78	7
4	Preparing Presentations, preparing manuscripts and proposals	36928	71.29	6
5	To update knowledge	42134	81.34	2
6	Social media	41046	79.24	3
7	Discussion forums	38306	73.95	5

Source: Primary Data

It could be observed that the respondents who are using ICT resources for the purpose of "Accessing E-resources" with Garrett score of 43170 points were recorded for first rank. It is followed by the second and third rank occupied by the purpose "to update knowledge" and "using social media" with Garrett scored as 42134 and 41046 points. The fourth and fifth purposes are "communication (E-mail)" and "participate in discussion forum" with Garrett scored as 40176 and 38306 points. The sixth and seventh purposes are "Preparing Presentations, preparing manuscripts and proposals " and "To locate, collect data using internet " with Garrett scored as 36928 and 29930 points.

TABLE. 3.
Cross Table between Frequency Levels of using E – Resources and Their Pursuing Degree Wise Classification

SI. No.	E – RESOURCES	UG		PG		LECTURERS/ SCHOLARS	
		Mean	SD	Mean	SD	Mean	SD
1	E – Journals (Both free and Payment)	2.75	1.02	3.69	0.81	4.01	0.71
2	E – Books	3.76	1.03	3.81	0.91	4.19	0.61
3	Online and Offline databases	3.01	1.30	3.28	0.82	3.33	0.96
4	Technical Reports	1.98	0.98	3.71	0.93	4.38	0.75
5	E-Conference Proceedings	2.19	1.24	3.66	0.94	3.91	0.99
6	E – Theses	1.97	0.97	3.84	0.95	4.63	0.67
7	E – Newspaper	3.21	1.01	3.88	0.75	3.76	1.02
8	E – Research Reports	2.10	1.08	4.11	0.68	4.58	0.83
9	E –Bibliographic Database	1.32	1.41	3.90	0.95	4.26	0.64

Source: Primary Data

The table gives information about the frequency level of use of the e-sources by the UG students and PG and lecturers/scholars. The frequency level of use has been given a mean value as mentioned above.

The mean value of use of e-journals by the UG students is 2.75. This suggests that they do not use the e-journals often. The PG and Lecturers /scholars use the e-journals, with the mean value of 3.69 and 4.01 which means that the PG scholars use it sometimes and the LECTURERS scholars use it often.

With regard to e-books, the UG students and the PG scholars range, by and large, equally with the mean value of 3.76 and 3.81 which means that both of them use it more than sometimes if not often. The Lecturers/ scholars use e-books, with the mean value of 4.19, more than often if not very often.

The UG students' use/access of technical reports gets the mean value 1.98 which means that they do not use or depend on this source if not never. On the other hand, the PG, with the mean value 3.71, and the Lecturers/scholars, with the mean value 4.38, scholars use or access the technical reports more than sometimes and more than often respectively.

UG students show their poor interest towards the use e-thesis with the mean value of 1.97. This shows that they do not use it at all. On the other hand, the PG and the Lecturers/ scholars' use of e-thesis suggest that they use it more than sometimes and more than often with the mean value of 3.84 and 4.63 respectively.

The UG students rarely use the e-research reports with the mean value of 2.10. However, the PG and the Lecturers/ scholars, with the mean value of 4.11 and 4.58, use it more than often if not very often.

E-bibliographic database is not at all used by the UG students whose mean value is 1.32. However, the PG and the Lecturers/ scholars depend on the E –bibliographic database more than sometimes with the man value of 3.90 and more than often with the mean value 4.26 if not very often.

Suggestions and Conclusion:

Most of the scholars and students, as per our study, are not familiar with statistical software's or any other research software's such as SPSS, AMOS and "R" programming. With regard to the unfamiliarity here, the ball is in the library's court. The libraries, either department libraries or individual / private libraries, can pave the way for the students to learn about all these by conducting workshops and seminars frequently. This may help students acquire the necessary skill to enhance the use of scholarly e-resources.

All said and done, the research scholars and the students, both PG and Lecturers/scholars, are quite aware of the fact that ICT products and its use are important. This has been known through their (the students) response. With ICT products have become an important ones,

the colleges may concentrate more on expanding the infrastructure in all the departments including the library. It goes without saying, this would benefit the student community, and the students, in turn, bear the fruit of such benefits.

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Patron Assessment of Print Resources in Kannur University Central Library: An Evaluative Study

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Abstract

The study examines the users'assessment and evaluation of print resources in Kannur University Central Library. Kannur University Central Library is still in its initial stages of growth and development and greater efforts are needed to build a quality collection in the library. Though there is an increasing demand for electronic resources, the importance of print collection cannot be neglected. A survey was conducted among the users to find out their opinion regarding the use of university library resources. Findings revealed that though collection is limited, majority of users rated it as good.

Keywords: Patron, Assessment, Print resources, Evaluation.

1. Introduction

Academic libraries are established to meet the specific educational, instructional and research needs of the institute's academic community. Developing a balanced collection is necessary to meet the curricular needs and to facilitate teaching, learning and research activities. To build an efficient and live collection, it is necessary to understand the strengths and weaknesses of the existing collection. Evaluation helps to understand whether the collection is adequate and which areas need to be improved. It also helps to find out whether the existing collection meets the needs of the user community and missions of the institution. Quantitative statistics and qualitative approaches can be used to evaluate collections. A user satisfaction survey using a questionnaire is one of the methods of collection analysis. This method is employed in this study to assess the print resources of the Kannur University Central Library situated in Kerala State.

2. Literature review

(Kuo, 2000) conducted a survey about faculty book selection in a university library. The survey revealed that faculty with 1-5 years' of experience were the most active in book selection and they ordered books mainly for undergraduate students and teaching. (Singh, 1999) in her case study of evaluation of collection development and reader's services at IIT Library Bombay discussed the acquisition, use and adequacy of library collection and provided users' and librarian's suggestions about collection and services.(Gyeszly & Ismail, 2003) did a systematic evaluation of the collection to ensure that the curriculum and research needs of the university were met and the standards set by comparable US universities were achieved. As a result,

faculty involvement in collection development increased, collection policies developed, periodicals collection was improved, retrospective collection development was implemented and unique materials to the region and gap subjects were identified.(Agee, 2005) encouraged librarians to be more informed about the value of collection evaluation as it informs about what already exists, what is needed and whether collection development goals are being achieved. He suggested simpler tools like core curriculum guides and standard documents of professional organizations as an indicator of collection's effectiveness in support of special interest subjects. (Henry, Longstaff, & Kampen, 2008) illustrated the result of a collection analysis done by a small academic library using an online analysis tool combined with a physical inventory of the collection. As a result of the data collected, the strengths, weaknesses and imbalances in the collection and the value of the library's print and electronic book collections could be determined. (Teel, 2008) discussed about the results of an inventory project conducted in the East Carolina University Teaching Resources Centre that improved the reliability, accuracy, relevancy and circulation of the collection. (Hussain, A. & Abalkhail, 2013) in their case study of King Saud university conducted a survey among the engineering students to collect information about the level of usage of library collections, services and the satisfaction of users. Findings of the study revealed that research scholars consulted reference books and current research works and other students used library to issue and return books.

3. Kannur University Central Library: A Brief Profile

Kannur University Central Library was established in 1998 and is functioning at the headquarters of Kannur university at Thavakkara. The Central library is a recognised research centre of the university and has a collection of books, periodicals, theses, non-book materials, bound volumes of periodicals, question paper collection, e-journals etc. The library has a proficiency corner which is a special collection for users who are preparing for competitive examinations. Access to DELNET bibliographical databases are provided through which inter library loan is available. Access to journals and databases is also available through UGC-Infonet. The library also has a question paper collection of all previous examinations conducted by the university.

5. Objectives of the study

Following were the objectives of the study

- To find out the use of university library resources by the respondents of the surveyed universities.
- To assess the rating of print resources by users and consider their opinion regarding the availability of print resources in their subject area.
- To know the users preference for resources and their opinion about the areas of collection which needs improvement.

Methodology

The study is based on survey method. 100 questionnaires were distributed to Research Scholars and students to find out their opinion regarding the print resources of the university library. 70 duly filled questionnaires were received back indicating a response rate of 70%.

6. Survey Analysis

6.1 Gender-wise Distribution of respondents

Table 6.1.1 Gender-wise distribution of respondents

Gender	No. of Respondents	Percentage
Male	10	14.29
Female	60	85.71
Total	70	100.00.00

The above table shows that out of total 70 respondents, 60 (85.71%) constitute female respondents and only 10 (14.29%) constitute male respondents.

6.2 Qualification-wise distribution of respondents

Table 6.2.1 Qualification - Wise Distribution of Respondents

Qualification	Number of Respondents	Percentage (%)
PG	61	87.14
M. Phil	5	7.14
Ph.D.	4	5.71
Total	70	100

From the table it is understood that majority of the respondents 60 (87.14%) were post graduates, 5 (7.14%) were M.Phil scholars and 4 (5.71%) have Ph.D. Hence, majority of the respondents were having PG qualification.

6.3. Discipline-Wise Distribution of Respondents

Table 6.3.1 Discipline-wise distribution of respondents

Discipline	Number of Respondents	Percentage (%)
Arts	28	40.00
Science	20	28.57
Humanities	11	15.71
Social Science	11	15.71
Total	70	100.00

The above table shows that highest number of the respondents 28 (40.00%) were from Arts faculty followed by 20 (28.57%) from Science faculty, and Humanities and Social Sciences have an equal representation of 11(15.71%). Thus, majority of the respondents were from Arts and least response from Humanities and Social Sciences disciplines.

6.4 Purpose of using the Library

Table 6.4.1 Purpose of using the Library

Purpose	Number of Respondents	Percentage (%)
Study/Teaching	25	35.71
Research	19	27.14
Reference	35	50.00
General Reading	15	21.43
Internet Facility	8	11.43
Total	70	100.00

It is understood that half 35 (50.00%) of the respondents visited the library for reference purpose, 25 (35.71%) for study and teaching, 19 (27.14%) for research work, 15(21.43%) for general reading and only 8(11.43%) for availing internet facility. Overall, it is found that majority of the respondents were visiting the library for reference purpose and very less number of respondents were visiting for Internet facility.

6.5 Preference of resource

Table 6.5.1 Preference of Resource

Resource	Number of Respondents	Percentage (%)
Print only	8	11.43
Electronic only	2	2.86
Both	60	85.71
Total	100	100

It is understood that out of the total 70 respondents, 8 (11.43%) preferred print resources and only 2 (2.86%) have preferred electronic resources only and also noted that majority of the respondents 60(85.71%) have preferred both print and electronic resources.

6.6. User's role in collection building

Table 6.6.1 User's role in Collection Building

User's role	Number of Respondents	Percentage (%)
Yes	15	21.43
Suggestion	8	11.43
Point weak areas	6	8.57
Report non-availability	6	8.57
Total	70	100

The above table shows that out of total respondents, 15 (21.43%) only indicated that they have role in collection building, again, 8 (11.43%) provided suggestions and requests for purchase and an equal percentage of 6 (8.57%) of respondents pointed weak areas and reported non-availability of necessary documents.

6.7 Rating on Print Resources

Table 6.7.1 Rating on Print Resources

Print Resource	Excellent	Very Good	Good	Average	Poor
Books	9(12.86)	25(35.71)	25(35.71)	6(8.57)	5(7.14)
Journals	5(7.14)	18(25.71)	31(44.29)	11(15.71)	5(7.14)
Theses	3(4.29)	10(14.29)	32(45.71)	20(28.57)	5(7.14)
Reference	8(11.43)	20(28.57)	20(28.57)	14(20)	8(11.43)
General material	7(10)	13(18.57)	31(44.29)	13(18.57)	6(8.57)

Highest number of respondents each i.e. 25 (35.71%) rated books as very good and good, 9 (12.86%) rated excellent where as more or less same percentage rated average and poor. Print journals were rated as good by more respondents with 31 (44.29%), very good by 18 (25.71%), average by 11 (15.71%) and excellent and poor by 5(7.14%) respondents each. For theses, more respondents 32(45.71%) rated theses as good, 20 (28.57%) rated as average, 10 (14.29%) rated as very good and 5(7.14%) rated poor. Reference collection was rated as very good and good by a more respondents 20 (28.57%) whereas 14 (20%) rated as average and 8 (11.43%) rated as excellent and poor respectively. Regarding general materials, the highest percentage 31(44.29%) rated as good, second highest 13 (18.57%) with very good and average, 7 (10.00%) rated as excellent and 6 (8.57%) rated as poor. It is to be noted that an equal percentage of 5(7.14%) respondents rated books, journals and theses as poor. Overall, it is understood that highest number of respondents rated print resources as good.

6.8 User's opinion on print resources

Table 6.8.1 User's opinion on print resources

Print Resource	Excellent	Very Good	Good	Average	Poor
Core Books	7(10)	19(27.14)	20(28.57)	18(25.71)	6(8.57)
Document Range	3(4.29)	16(22.86)	25(35.71)	19(27.14)	7(10)
Core-Journals	2(2.86)	14(20)	27(38.57)	15(21.43)	12(17.14)
Current documents in subject	3(4.29)	10(14.29)	25(35.71)	21(30)	11(15.71)
Relevant titles	2(2.86)	10(14.29)	21(30.00)	23(32.86)	14(20)

Regarding their opinion on the resources related to their subject, more or less same percentage 20 (28.57%) and 19 (27.14%) rated as good and very good respectively whereas 18 (25.71%) rated as average. In the case of range of documents for background study in discipline, 25(35.71) rated as good whereas 19(27.14) rated as average.For core journals in subject 27(38.57%) of the respondents rated as good whereas 15(21.43%) rated as average.

For opinion on current documents in subjects, 25(35.71%) of them rated as good followed by 21(30.00%) rated as average and 11(15.71%) rated as poor. With regard to relevant titles in subject, highest percentage 23 (32.86%) rated as average followed by 21(30.00%) rated as good and 14 (20.00%) as poor. Overall, it can be concluded that highest number of respondents rated as good for core books, document range, journals and current documents, whereas highest respondents rated as average for relevant titles in subject.

6.9. Improvement of print resources

Table.6.9.1. Improvement of Print Resources

Print resource	No. of Respondents	Percentage (%)
Academic	30	42.86
Reference	27	38.57
Print journals	10	14.29
General material	9	12.86
All	24	34.29

With regard to improving print resources, highest percentage 30 (42.86%) wished to improve academic collection, 27 (38.57%) wanted to improve reference collection, 24 (34.29%) opted for improving all collection whereas 10 (14.29%) and 9 (12.86%) wished for improving print journals and general material respectively.

7. Satisfaction with Print Collection

Table 7.1

Satisfaction Level	No. of Respondents	Percentage (%)
Highly satisfied	2	2.86
Satisfied	40	57.14
Less satisfied	25	35.71
Very less satisfied	4	5.71
Total	70	100.00

Regarding satisfaction with print resources of University library, highest percentage 40 (57.14%) reported that they were satisfied, second highest 25 (35.71%) were less satisfied, 4 (5.71%) were very less satisfied and only 2(2.86%) were highly satisfied. Overall, majority seemed satisfied with print collection.

8. Findings

Following are the findings drawn from analysis

- Female respondents constitute 60 (85.71%) whereas male respondents comprise only 10 (14.29%).
- Majority of the respondents 60 (87.14%) are post graduates, 5(7.14%) are M.Phil scholars and 4 (5.71%) have Ph.D.
- Most of the respondents 28(40.00%) are from Arts faculty, 20 (28.57%) are from Science faculty, and Humanities and Social Sciences have an equal representation of 11(15.71%).
- Half of the respondents 35(50.00%) visited the library for reference purpose, 25 (35.71%) for study and teaching, 19 (27.14%) for research work, 15 (21.43%) for general reading and only 8 (11.43%) for availing Internet facility.
- Among the total respondents, 8 (11.43%) preferred print resources, 2 (2.86%) preferred electronic resources only whereas 60 (85.71%) preferred both.
- Out of the total 15 (21.43%) indicated their role in collection building, 8 (11.43%) provided suggestions and request for purchase and an equal percentage of 6 (8.57%) pointed weak areas and reported non-availability of necessary documents.
- Majority of the respondents rated print resources as good.

- Core books, document range, journals and current documents were rated as good by majority, whereas highest respondents rated as average for relevant titles in subject.
- Highest percentage 30 (42.86%) wished to improve academic collection, second highest 27 (38.57%) wanted to improve reference collection and only (12.86%) wished for improving general material.
- Regarding satisfaction with print collection, highest percentage of respondents 40 (57.14%) reported that they were satisfied whereas second highest 25 (35.71%) were less satisfied.

Conclusion

User satisfaction survey is one of the methods of conducting evaluation of library collection. Assessing requirements of users is very important in developing a qualitative collection. Even though the collection and resources of the central library is very limited, majority of users have rated it as good and their opinion regarding documents in their subject area is good and average. Earnest efforts have to be initiated by the central library in improving the academic and reference collection of the library.

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Journal of Rural Development: A Bibliometric Study

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Abstract

This study critically analyse two hundred and thirty one scholarly articles published in the last seven volumes of the Journal of Rural Development. It examines the growth of literature, type of authorship pattern, collaboration trend etc. Findings reveal that an average of thirty three articles was published per year and an article contains twenty references on an average. Majority of the articles length falls in between 10 and 20 pages. The highest contributions were made by single author and double authors. Majority of the contributions were made in the subject field of Agricultural Economics and Rural Development during the study period.

Keywords: Bibliometrics, Rural Development, Authorship Pattern.

1. Introduction

Nowadays, enormous numbers of bibliometrics and scientometrics studies are conducted by research scholars and library professionals. These studies are helpful to the librarians for use of their meager resources in judicious selection of journals and other periodicals useful to their users.. According to W.S. Potter bibliometric is "The study and measurement of the publication pattern of all forms of written communication and their authorship." The basic aim of bibliometric study is to assist the users in locating the existing information or identifying books or any other materials, which may be an interest to him. It helps to avoid duplication in research and also serves as a tool for book selection, identification and utilization in terms of place of publication, subject and also various forms.

2. Genesis of the Source Journal

The National Institute of Rural Development and Panchayat Raj (NIRD&PR), an autonomous organization under the Union Ministry of Rural Development, is a premier national centre of excellence in rural development and Panchayat Raj. The Institute is located in the historic city of Hyderabad in Telangana state. The NIRD&PR celebrated its Golden Jubilee Year of establishment in 2008. In addition to the main campus at Hyderabad, this Institute has North-Eastern Regional Centre at Guwahati, Assam to meet the NE-regional needs. Journal of Rural Development is scholarly publication of National Institute of Rural Development and Panchayat Raj. The journal is a quarterly publication. Issues are published in the month of January, April, July and October

every year. It aims to publish research paper, review articles and book reviews in the field of rural development and panchayat raj. It attempts to promote research and scholarly discussion on problem and policies concerning the growth and development of rural sector.

3. Review of Literature

Number of bibliometric studies has been conducted by research scholars and library and information professionals across the world to understand the publication distribution pattern of a particular journal related to different subject fields. Studies related to Library Progress (International) Journal and Library Herald is reviewed here. Naheem, K.T. (2016) in his study on "Library Progress (international) : A Bibliometric study" indicated that total 131 articles were published in the 12 issues pertaining to the six volumes of the journal. Authorship pattern reveals that majority of the articles are authored by two authors. It constitutes alone 70 (53.44%). It is followed by single 41 (31.30%) and three author articles 18 (13.74%). Collaborative Index, Degree of Collaboration and Collaborative Coefficient were calculated from the data and the following mean values were found 0.54, 0.69 and 0.37 respectively. Finally this study reveals the prominence of joint authorship, which indicates trend of collaborative research in Library and Information Science field. Parameshwar et.al (2016) in their study on " Publication Trends in Library and Information Science : A Bibliometric Analysis of Library Herald ". This study analyzed bibliometric characteristics of 224 articles that were published in the Library Herald during from 2006 to 2015. Trend shows some fluctuation from 2006-2015 and 70 citations were recorded for the articles with an average of 0.314 per article. A total of 392 authors contributed with an average of 1.75 authors per articles. Majority of the articles were contributed by the joint authors. Most of the articles prepared by consulting 1 – 10 references and majority of the articles page length are between 6-10 pages. University of Delhi is the most contributing organization and most contributing State of India with 58 contributions. Iran, Nigeria, Nepal, Malaysia, Bangladesh and France also contributed to the journal during the period. Top ten highly cited articles analysis indicates that most of the articles were concerned with information communication technology field of study in library and information science.

4. Objectives

The objectives of the present study were:

- To find out the year – wise distribution of contributions;
- To examine the authorship pattern of the contributions;
- To find out the average number of references per articles,
- To examine the average length of the articles;
- To find out the subject-wise distribution of the articles.

5. Methodology

The methodology employed in the current study is a bibliometric, which is used

to analyse in detail, the bibliographic attributes of the articles and reference appended at the end of each article published in the Journal of Rural Development. Data were collected from Journal of Rural Development published during period from 2010 to 2016 (Vol.23 to 35). Data are collected from the print edition and missing issues data are collected from the online edition of the above mentioned journal. The web address of the journal is http://www.nird.org.in. Seven volumes, 28 issues, 231 articles, 3862 References and 119 book reviews have been taken up for the data analysis. The study analyzes year – wise distribution of articles, authorship patterns, citation count, length of articles and year – wise distribution of book reviews. The collected data are organized, tabulated and calculated by using simple statistical methods with the help of MS – Excel. Apart from the general statistical analysis, some of the important bibliometric indicators like Degree of Collaboration, Relative Growth Rate and Doubling Time are calculated.

6. Result And Discussions

Two hundred and thirty one articles were published during the study period i.e.2010-2016. Apart from the articles, one hundred and nineteen book reviews were published in the journal of rural development during the study period.

Table 1

Year-Wise Distribution of Articles

Year / Volume	Jan. - March	April - June	July - Sept.	Oct. - Dec.	Total	%
2010 / 29	9	9	9	9	36	15.58
2011 / 30	10	9	9	8	36	15.58
2012 / 31	8	8	7	8	31	13.42
2013 / 32	7	8	8	8	31	13.42
2014 / 33	8	8	8	8	32	13.85
2015 / 34	9	8	8	8	33	14.29
2016 / 35	8	8	8	8	32	13.85
Total	59	58	57	57	231	100.00

Mean = 33 articles

Table 1 shows the details regarding the distribution of 231 articles published from 2010 to 2016. Maximum number of articles 36 (15.58%) were published in 2010 and 2011 and minimum number of articles 31 (13.42%) in 2012 and 2013. An average number of articles published per year are thirty three and an average percentage of articles published per year falls in between thirteen and sixteen.

Table.1-A
Relative Growth Rate and Doubling Time of Articles

Year	No. of Articles	Cumulative No. of Articles	W1	W2	RGR	Doubling Time
2010	36	36		3.58		
2011	36	72	3.58	4.28	0.69	1.00
2012	31	103	4.28	4.63	0.36	1.94
2013	31	134	4.63	4.90	0.26	2.63
2014	32	166	4.90	5.11	0.21	3.24
2015	33	199	5.11	5.29	0.18	3.82
2016	32	231	5.29	5.44	0.15	4.65

The analysis of data on the literary output in rural development has also been done with parameters such as relative Growth Rate (RGR) and Doubling Time (DT). It is seen from Table 1A that relative growth rate has been decreasing from 2011 (0.69) to 2016 (0.15) and doubling time of rural development articles increases from 1.00 to 4.65.

Table. 2
References Cited in the Articles

No. of References	2010	2011	2012	2013	2014	2015	2016	Total	%
Nil	0	1	2	0	0	0	0	3	1.30
1 - 10	19	17	6	9	11	7	9	78	33.77
11 - 20	12	11	13	13	12	13	13	87	37.66
21- 30	4	6	5	4	4	9	5	37	16.02
above 30	1	1	5	5	5	4	5	26	11.26
Total	36	36	31	31	32	33	32	231	100.00

Table 2 shows that the detail of the references cited in articles published from 2010 to 2016. Out of 231 articles, three articles had no reference and one hundred and sixty five (71.43%) articles cited reference per article was up to 20 and remaining sixty three articles cited reference per article was above 20. Up to 20 references were cited per article during the study period.

Table.3
Length of the Articles

No. of Pages	2010	2011	2012	2013	2014	2015	2016	Total	%
Less than 10	11	7	2	3	4	3	1	31	13.42
10 - 15	16	20	12	18	13	11	4	94	40.69
16 - 20	6	8	12	7	11	14	12	70	30.30
above 20	3	1	5	3	4	5	15	36	15.58
Total	36	36	31	31	32	33	32	231	100.00

Table 3. indicates that the length of the articles published during the study period. Out of 231 articles, one hundred and sixty four articles (70.99 %) length falls in between 10 to 20 pages. Thirty six articles (15.58 %) length was above 20 pages and remaining thirty one articles (13.42 %) length was below ten pages. Majority of the articles (70.99%) length falls in between 10 to 20 pages.

Table.4
Authorship Pattern

No. of Authors	2010	2011	2012	2013	2014	2015	2016	Total	%
Single	13	12	18	10	14	19	15	101	43.72
Double	11	14	9	12	14	9	10	79	34.20
Three	10	8	3	7	1	3	3	35	15.15
Four and above	2	2	1	2	3	2	4	16	6.93
Total	36	36	31	31	32	33	32	231	100.00

Table 4. shows that the details about the authorship pattern. Majority of the articles (180 Nos.) were contributed by single author (43.72%) and double authors (34.20%). Remaining fifty one articles (22.08%) were contributed by three and above authors. Single (43.72%) and double authors (34.20%) have made the major contributions during the study period.

Table 4A
Degree of Collaboration

Year	Single Author	Multiple Authors	Total	Degree of Collaboration
2010	13	23	36	0.64
2011	12	24	36	0.67
2012	18	13	31	0.42
2013	10	21	31	0.68
2014	14	18	32	0.56
2015	19	14	33	0.42
2016	15	17	32	0.53
Total	101	130	231	0.56

The Degree of Collaboration of author's year –wise is shown in the Table 4A. The extent of degree of collaboration in rural development research has been measured with the help of the formula (C =Nm/Nm =Ns) devised by K.Subramaniam. The collaborative authorship is a well recognized feature today. Mallinath Kumbar and N.Girish Kumar reveal that intellectual sharing took place by two or more authors. It is true for our study also. Single author's contributions are 101. At the same time multiple authors' contributions are 130. The year –wise degree of collaboration falls in between 0.42 and 0.68. The degree of collaboration for any subject ranges from 0.01 to 0.99 and it is always below 1.

Table.5
Subject Wise Analysis of the Articles

S.No.	Subject	No. of Articles	%
1	Agricultural Economics	74	32.03
2	Rural Development	41	17.75
3	Rural Development Programmes	25	10.82
4	Agricultural Finance	22	9.52
5	Rural Women	20	8.66
6	Self Help Group	13	5.63
7	Rural Industry	13	5.63
8	Rural Poverty	10	4.33
9	Panchayat Raj	7	3.03
10	ICT Application for Rural Development	6	2.60
	TOTAL	231	100.00

Table 5 shows that the subject wise distribution of the articles during the study period. Out of the 231 articles, 74 articles (32.03%) dealt with the agricultural economics ; 41 articles (17.75 %) dealt with the rural development; 25 articles (10.82 %) dealt with rural development programmes; 22 articles (9.52 %) dealt with agricultural finance and 20 articles (8.66 %) dealt with rural women. Remaining 49 articles dealt with subjects namely self help groups 13 articles (5.63%); rural industry 13 articles (5.63%); rural poverty 10 articles (4.33 %); panchayat raj 7 articles (3.03%); and ICT application for rural development 6 articles (2.60%).

Table.6

Year-Wise Distribution of Book Reviews

Year	Jan. - March	April - June	July - Sept.	Oct. - Dec.	Total	%
2010	4	1	6	2	13	10.92
2011	7	3	5	3	18	15.13
2012	7	8	6	8	29	24.37
2013	6	5	5	4	20	16.81
2014	4	4	4	4	16	13.45
2015	1	3	7	6	17	14.29
2016	2	2	2	0	6	5.04
Total	31	26	35	27	119	100.00

Mean = 17 articles

Table 6 indicates that the year - wise distribution of the book reviews published from 2010 to 2016. Maximum number of book review were 29 (24.37 %) published in 2012 and minimum number of book review 6 (5.04 %) in 2016. An average number of book reviews published per year is seventeen.

Findings

- An average number of articles published per year are thirty three and an average percentage of articles published per year falls in between thirteen and sixteen;
- Relative Growth Rate has been decreasing from 2011 (0.69) to 2016 (0.15) and the doubling time of rural development articles increases from 1.00 to 4.65;
- Up to 20 references were cited per an article during the study period;
- Majority of the articles (70.99%) length falls in between 10 to 20 pages;
- Single (43.72%) and double authors (34.20%) have made the major contributions during the study period;
- The collaborative authorship is a well recognized feature today. Mallinath Kumbar and N.G.Kumar reveal that intellectual sharing took place by two or more authors. It is true for our study also. Single author's contributions are 101. At the same time multiple authors'

contributions are 130. The year –wise Degree of Collaboration falls in between 0.42 and 0.68;

- Out of the 231 articles, 74 articles (32.03%) dealt with the agricultural economics ; 41 articles (17.75 %) dealt with the rural development; 25 articles (10.82 %) dealt with rural development programmes; 22 articles (9.52 %) dealt with agricultural finance and 20 articles (8.66 %) dealt with rural women;
- On an average number of book reviews published per year is seventeen.

Conclusion

As per the study, Journal of Rural Development has been published thirty three articles yearly and an article contains averagely up to twenty references. The highest numbers of the papers have been contributed by single and double authors . The journal is purely concentrated on the research contributions related to the rural sector. Journal of Rural Development is one of its kinds as a rural development and panchayat raj journal as no other Indian journal is being published on these topics.

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Journal of Rural Development: A Bibliometric Study

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Abstract

The present study aimed to find out the User Behaviour in Arts and Science College Libraries of Perambular District. The sample of 100 library users were selected randomly. Primary data were collected by using a structured questionnaire.. ANOVA, t-test and correlation analysis were applied to test the hypotheses. The result found that there is a significant and positive correlation between users demographic variables and user behaviour.

Keywords:- (User behaviour,Arts and Science College Libraries, Perambalur).

Introduction

In an information system, user is an important component. Access to relevant information is highly essential, particularly in industrial research and development sectors. In the modern world, information is a fifth need of human being. Right information to the right user can pave the way to new direction to research and development.

Information plays a very important role in every aspect of human life it is especially true in the context of fast pace of today's life, where information becomes obsolete too soon. The value of information as a crucial factor in the social and economic development and progress of a nation is increasingly recognized. To a remarkable extent, information is a source of power. It consists of statements made by individuals or group of individuals about ideas, which they assimilated, into their knowledge store. Information is an elements of knowledge that is publicly available which can be shared and pass through the world.

In this cyber age, information plays a pivotal role in different spheres of human endeavors such as education, research and development, decision and policy making. The role of library and information centers in providing information for these endeavors is well documented. The generators and users of information play a key role in information transfer and utilization process. The information required by the users is available in a variety of sources, primary, secondary and tertiary sources and in different formats.

Information in particular becomes more meaningful when it is transferred and communicated. The information "explodes" into power only when it is transferred and communicated. In other words, information

is activised by communication. The purpose of transfer and communication of information is "use" without the intention on the part of the ultimate receiver or beneficiary of information to use it, the whole exercise of transfer and communication become carry and information transferred becomes redundant. On the other hand seeking and communicating information are two sides of the same coin from the view point of individuals concurred. Both have the same purpose and use. Information, which has no use, is no information. Thus the central thread of the whole range of activities relating to information transfer and communication is "use". Hence the emphasis is on use and user orientation to communication and information whether from a formally designed and operated information systems or from a formally source. A wide range of research works are centered around use and use of information called use and user studies have cropped up in the last four decades.

The user community in an academic library system constitutes the faculty, students, from the view point of the user whether he is the student, he needs variety of information.

Statement of the problem:

In this study attempt to analyze the user behaviour from the library and how the faculty members and students utilizing the library resources in their needs so this study was conducted to analyze the User Behaviour in Arts and Science College Libraries of Perambular District.

Need of the Study

Today information is an important part of our community life. It is essential for the teachers and students especially teachers is considered as one of the important agents for communication of knowledge. Knowledge and socio-economic development are inseparable. In the post industrial society, information and knowledge are truly signified as the very life-blood and serve as the basic fuel, driving the society for further advancement. The support of information centre and information service is increasingly becoming basic requirement for any work in the field of education, research and profession. Contemporary research activity has to be adequately supported by information centres and information services to achieve good results. So the information centre is the heart of development and knowledge.

Objectives of the Study

- To identify the different use of access pattern of Arts and Science college Library users
- To elicit user preference and use of different kinds of information Sources available in the library.
- To identify user preference to use of mass media.
- To identify the user perceptions about different services of the Library.

- To identify the different kinds of information search methods employed by the users.
- To measure the satisfactory levels of the users towards the services of the library.

Review of literature

Anuradha Guptha (2014) conducted a study on selected group of officials of civil servants attached with ministers and departments of Government of India. This study aims to identify the use of libraries and information of these officials for their day today official needs. The results of study indicates that majority the officials were regular users of their departmental libraries. They were, however, not fully depending upon their departmental library alone and also they were using other libraries. Most of the users were interested in the aspects of social sciences. Books and periodicals literature both were equally in use. Officials used library resources for their officials and recreational needs. Some of them had special interest in studying specific subjects. They were found to be generally satisfied with the collection and services of the departmental libraries. However, most of the users favored comprehensive collection, and better physical facilities. Users awareness about the specialized library services needs had been taken care of. The study stresses the need for providing assistance to potential users through interaction, library orientation and manuals. It also suggests for organized collection development, congenial physical facilities and resource sharing.

Ashu Shokeen and Sanjay K. Kausik (2014) investigated the information seeking behaviour of social scientists working in the Universities located in Harayana. The data was collected through a structured questionnaire. The results of the study showed that periodicals are the most used and important sources of information.

Vijayalaxmi, Maheswarappa (2014) studied information use pattern of PG lady students in Gulbarga University library Gulbaraga. This study made an attempt to study the behavioural pattern of Post Graduate lady students. Further this study also made an attempt to study the types of information required, purpose of using information methods used for keeping up to date, awareness, use and usefulness of information sources, information searching undertaken and the methods used for searching, use, frequency of the sources, purpose of using and the successes in getting information from the University library etc. The data were collected through questionnaires from 73 PG students. The major findings of the study is that for effective and efficient use of library resources the students must be educated.

Ann Irving (2014) describes the main findings of a British Library Research and Development Department research project, based at Liverpool Polytechnic, The project aimed to establish a detailed register of methods used in British secondary schools to educate library users. Information was gathered by interviewing teachers and librarians in a selection of schools in

Cheshire and Nottingham shire, and by direct observation of library instruction sessions. The implications of the research findings are discussed and suggestions put forwards for librarians and teachers who are planning library use programs.

Heeks and Kinnel (2015) Reports on a British Library funded project which investigated the state of school library services in the UK following the implementation of the Education Reform Act. Studies the structures, policies, service range and level, and the relationships between school library services and their funding department and with public library services to children. Gives an overview of the school library services and their current environment and assesses new service patterns up to 1991. Examines strategies for managing change processes in school library services, and suggests new directions.

Craver (2015) Presents a comprehensive review of the literature. 3 types of literature are identified: descriptive articles outlining problems or benefits related to the use of academic libraries by high school students; research studies examining specific aspects of high school students' use of academic libraries; and questionnaire data referring to secondary school students' use of academic libraries. Discusses methods employed in various studies and the applications of results. Also examines neglected aspects of the literature, e.g. the absence of studies concerning the impact of technology and the potential for student use of multi type networks.

Taylor (2015) Performance at a university or other tertiary institution is not predictable. Success is not a mere product of student effort and entrance qualifications. It seems that the background for success and failure at tertiary institutions is dependent upon the training in study skills and library use gained in secondary school. Every student must be given the means to succeed. It is essential that all resources required by students for study should be available. General awareness of the school library's effectiveness depends on cooperation between the staff and the librarian. Improvement in the effectiveness of school libraries (e.g., the appointment of qualified librarians instead of seconded teachers) would mean an improvement in the performance of tertiary students.

Clarke (2015) The staff of the Consultancy and Research Unit, University of Sheffield (CRUS) completed a survey of regional variations in demand for and supply of information by manufacturing firms in 1986. One conclusion was that public sector business libraries needed closer examination in terms of user motivations and perceptions of the significance of these sources. Some 564 interviews with users of business libraries were conducted in the central public libraries of Birmingham, Manchester and Nottingham during the period July-Oct. In addition, 1,277 telephone calls were monitored. Results regarding library use are reported in terms of work-related and personal forms of use. User motivations, demands, satisfaction rates and the users'

assessments of the value of business libraries are presented.

Methodology

A questionnaire was designed for the purpose of collecting the required data from the chosen sample user population. The questionnaire comprehensively includes broadly all the aspects regarding library, with on ultimate objective to reflect the user's opinion on the library. The survey collected data to describe respondent's information seeking behaviour and to relate this behaviour to a number of variables. The survey form included questions about characteristic of the respondents that might influence their information seeking behaviour.

Sample selection

The study population consisted of users of Arts and Science colleges libraries in Perambalur district. The data was collected from the respondents through the questionnaire. In this study in all 100 questionnaires were distributed among the students in the disciplines Arts and Science colleges libraries in Perambalur District.

Limitation of the study

The present study is confined to the arts and science college libraries situated in Perambalur district. Only the users who are visiting to the libraries are taken into consideration for the present study.

Statistical tools

After collecting the data from the respondents, the data were checked and analysed according to the objectives and hypotheses stated already. Each data recorded on the data sheets was fed into the computer personally. The data had been tested with the statistical tool of simple statistics such as One-way Anova, t-test and correlation analysis for this study.

Analysis and Discussions

Table 1 Showing the t-test for user behaviour on the basis of gender

Demographic variable	N	Mean	SD	t-value	LS
Male	135	78.89	5.79	3.48	Sig
Female	65	75.89	3.97		

Hy: There is a significant difference in user behaviour on the basis of gender.

The table shows that the calculated t-value (3.48), which is significant, proves that there is a significant difference regarding the user behaviour on the basis of gender. Hence it is concluded that male and female group have differ in their user behaviour.

Table.2 Showing the t-test for user behaviour on the basis of marital status.

Demographic variable	N	Mean	SD	t-value	LS
Married	35	73.89	3.96	3.97	Sig
Unmarried	65	76.94	5.45		

Hy: There is a significant difference user behaviour on the basis of marital status.

The table shows that the calculated t-value (3.97), which is significant, proves that there is a significant difference regarding the user behaviour on the basis of marital status. Hence it is concluded that married and unmarried group have differ in their user behaviour.

Table 3 Showing the One way ANOVA for user behaviour on the basis of age.

Demographic variable	**N**	**Mean**	**SD**	**F-value**	**LS**
Below 25	30	73.98	2.29	3.54	Sig
26 to 35	50	76.58	5.45		
Above 35	20	74.64	3.42		
Total	100	74.94	5.12		

Hy: There is a significant difference regarding user behaviour on the basis of age.

The table shows that the calculated F-value (3.54) which is significant proves that there is a significant difference user behaviour on the basis of age. Hence the stated hypothesis is accepted.

Table 4 Showing the One way ANOVA for user behaviour on the basis of qualification

Demographic variable	**N**	**Mean**	**SD**	**F-value**	**LS**
HSc	24	71.57	3.78	4.29	Sig
Graduate	21	75.46	4.79		
Post-Graduate	55	76.87	5.75		
Total	100	74.94	5.12		

Hy: There is a significant difference regarding user behaviour on the basis of qualification.

The table shows that the calculated F-value (4.29) which is significant proves that there is a significant difference in user behaviour on the basis of education qualification. Hence the stated hypothesis is accepted.

Table 5 Showing the One way ANOVA for user behaviour on the basis of experience.

Demographic variable	N	Mean	SD	F-value	LS
Below 5 years	53	70.95	2.45	3.78	Sig
5 to 10 years	27	72.14	5.89		
Above 10 years	20	74.48	4.17		
Total	100	74.94	5.12		

Hy: There is a significant difference regarding user behaviour on the basis of experience.

The table shows that the calculated F-value (3.78) which is significant proves that there is a significant difference user behaviour on the basis of experiencce. Hence the stated hypothesis is accepted.

Table 6: Showing the simple correlations for user behaviour on the basis of demographic variables.

Demographic variable	r value
Sex	.042
Marital status	.145
Age	-.252**
Education	.274**
Service	-.235*

**. Correlation is significant at the 0.01 level

The correlation result shows that there is a significant and positive correlation between users education (0.274) and their level of user behaviour. It is also significant and negative correlation between users age (0.252), service (0.235) and their level of user behaviour. A very low correlation between users gender (0.042), marital status (0.145) and their level of user behaviour.

Suggestion

- It is important to suggested to increase the use of library collection, on orientation programme may be initiated on regular basis for newly admitted students.
- To revamp the reading environment of the library, it is suggested to restructure and refurbish the existing environment to provide over compatible and conducive environment.
- It is suggested that to attract more number of users to the library, the course administration may display the new arrivals to the library.
- To make their users as regular visitors to the library, and awareness programme may be initiated like orientation.
- It is suggested to enhance more number of general and subject encyclopedias, handbooks, dictionaries, directories, manuals and back volumes. It is also suggested to increase the availability of electronic information sources such as CD-ROM databases, on-line databases, e-books and e-journals also.
- It is suggested that to enhance the reference service by appointing more number of dedicated professionals.
- The Reprographic services of the library has to be enhanced by the way of reducing percent Xerox rates and providing more number of machines in many part of the library.
- The library professionals of these libraries have to impress the authority about the importance and usefulness of electronic sources so as to enhance the electronic collection in the library. Since it is observed no library has the electronic document collection.
- The library professionals of the library have to take steps to organize regular orientation program to their users about classification, cataloguing and arrangement patterns of the library.
- It is suggested to provide guide cards in the stack area of the library as it is observed by the researcher they are not available in the libraries under study.

Conclusion

It is observed from the study that the provision of services is far from satisfactory. These need to be extended so as to optimize the use of the library. Reference and information service should be strengthened. Reprographic service on subsidized rates are expected by the users.

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Cognitive Science: A Scientometric Analysis of Web of Science during 2000–2015

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Abstract

This study analyzed the records retrieved from the Web of Science in the field of 'Cognitive Science' during 2000- 2015. Cognitive science is the study about mind. 4062 records have been founded related to Cognitive Science from the database. Psychology is an important research area. The Journal articles are highly published records in the Cognitive Science .This study also assessed the year wise publication, Author research productivity, Institutions involved in Cognitive science research and Area wise publications in Cognitive Science.

Keywords: Cognitive Science, Scientometric, Web of Science

1. Introduction

Cognitive science has made new in roads into the understanding of mind. It is the science of cognition, which includes such things as: perception, action, learning, memory, attention, reasoning, decision making, and language use. It is the study of mind, but these minds can be human minds, animal minds, computer minds, robot minds, alien minds, group minds.

2. Objectives of the Study

- To examine the research areas of Cognitive Science in Web of Science.
- To identify the authors' productivity related to Cognitive Science.
- To trace the country-wise and the institution-wise contribution in Cognitive Science.
- To identify the year wise contribution in the field of Cognitive Science.0

• 3. Methodology

In this study, Documents are retrieved from Web of Science provided by Thomson Reuters (the former Thomson Scientific emerged from the institute for Scientific Information (ISI) in Philadelphia). Documents published with the word "Cognitive Science" in title, abstracts, and keywords from 2000-2015 were downloaded from the database and analyzed with the help of scientometric techniques in the current study. VOS Viewer was also used to create a picture.

4. Review of Literature

Bhardwaj (2016) studied that 2446 papers had been published on Ebola virus in 159 journals, originating from 84 countries till December 31, 2013. 69,960 citations were received until March 1, 2015. The

maximum literature published in the form of articles and review, 2040 (83.40%), highest number of papers was published in 2012, i.e., 198 (8.1%). The average citation per publication on papers in the area is 28.6 citations per paper. The majority of papers published in English language. Overall, 157 journals produced the Ebola virus research and "Journal of Virology" had published 257 (10.5%) of the papers. The world over 160 institutions were contributed in Ebola virus research.

5. Results and Discussion

5.1 Total publication output of Cognitive Science (2000-2015)

Table1.

Format of the term Cognitive Science

S. No	Items	Result
1	Results found	4062
2	Sum of the times cited	68328
3	Sum of times cited without self-citations	65459
4	Citing articles	58700
5	Citing articles without self-citations	55359
6	Average citations per item	1682
7	h index	116

Table 1 shows that during 2000-2015, 4062 records were found related to the field of Cognitive Science from the Web of Science, Average citations per item is 1682 and h index value of the term Cognitive science is 116.

5.2 Publication output –break up in " Cognitive Science"

Table 2.

Item wise distribution of Cognitive Science

S. No	Items	Result
1	Records	4062
2	Authors	4800
3	Journals	1095
4	Cited References	106540
5	Words	5067

Table2 shows that comprised information of total number of authors (4800), journals (1095)and references (106540) in the field of Cognitive Science from the Web of Science database. It is found that good number of authors are published in good number of journals in the field of Cognitive Science.

5.3 Distribution of Research Areas

Table 3

Research Areas wise distribution of Cognitive science

S. No	Research Areas	Records (4062)	Percentage of 4062
1	Psychology	1670	41.113
2	Computer science	598	14.722
3	Philosophy	433	10.660
4	Neurosciences, Neurology	402	9.897
5	Social sciences and other topics	248	6.105

6	Behavioral sciences	225	5.539
7	Linguistics	203	4.998
8	Education, Educational research	179	4.407
9	Religion	164	4.037
10	Engineering	145	3.570
11	History philosophy of science	143	3.520
12	Science technology and other topics	113	2.782

Table 3 predicts that Cognitive Science research work during 2000-2015 in Web of Science covered twelve research areas. Highest number of records are published in Psychology (41.11%) area followed by Computer Science (14.72 %) and least area is Science Technology (2.78%).

5.4 Distribution of records according to the type of documents:

Table 4.

Records according to the type of documents:

S. No	Document Type	Records	TLCS	TGCS
1	Article	2108	1085	26652
2	Review	283	407	15583
3	Editorial Material	211	72	1152
4	Proceedings Paper	200	167	3720
5	Book Review	197	2	47
6	Letter	13	8	94
7	Book Chapter	12	2	128
8	Meeting Abstract	10	0	0
9	Biographical-Item	9	0	0
10	Review of Book Chapter	8	7	649
11	Correction	5	0	9
12	News Item	4	0	0
13	Editorial Material of Book Chapter	1	0	2
14	Reprint	1	0	2

TLCS - Total local citation score; TGCS - Total Global Citation Score

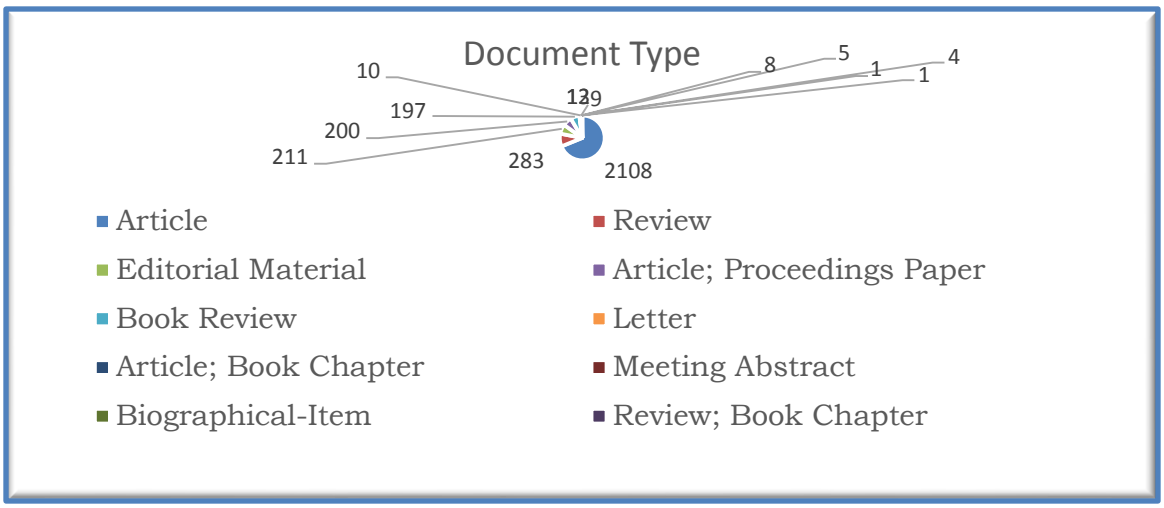

Figure.1. Document type wise distribution of Cognitive science

The table 3, Identified 14 document types in a total of 4062 publications during the 15 year study period. Majority of the records (2108) are available in the type of Journal article followed by reviews related to Cognitive Science. It is inferred from the above table that the word 'Cognitive Science' in Web of Science is available as article type.

5.5 Year wise distribution of Publications

Table 5
Year wise distribution of Cognitive Science

S. No	Publication Year	Records	TLCS	TGCS
1	2000	97	154	2893
2	2001	120	165	5406
3	2002	150	66	4160
4	2003	163	166	5604
5	2004	162	121	5063
6	2005	141	69	2944
7	2006	149	129	3640
8	2007	164	91	2497
9	2008	193	133	2538
10	2009	213	185	4319
11	2010	223	156	2531
12	2011	187	99	1862
13	2012	260	125	1605
14	2013	259	59	2015
15	2014	290	26	750
16	2015	291	6	209

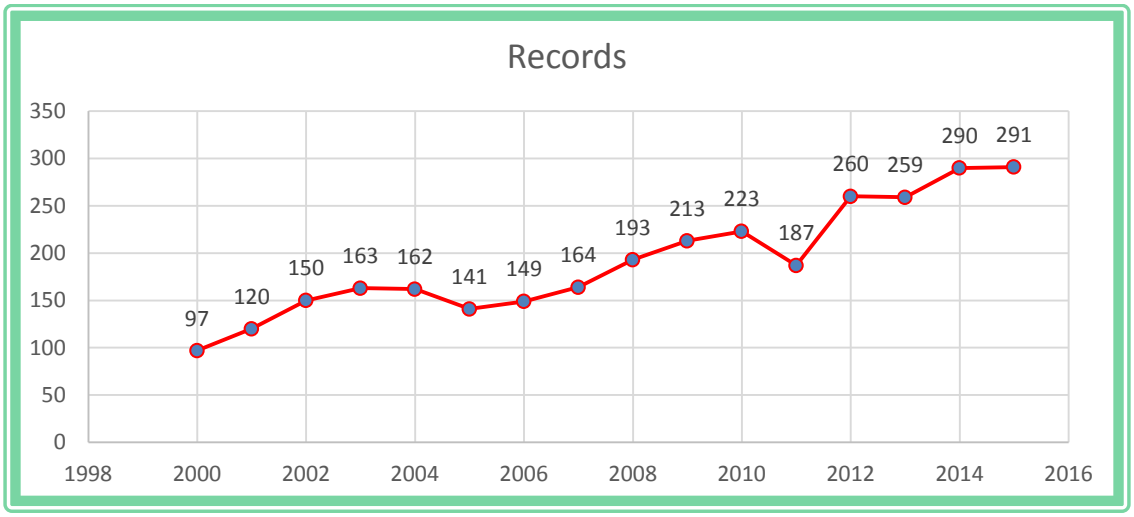

Figure 2 Year wise distribution of Cognitive science

Table 5 analyzed the year wise publication of research on Cognitive science. During the period 2000 – 2015, a total of 4062 publications were published. It is noted that high number of records in the field of Cognitive Science are published in Web of science at 2015 (291) and 2014 (290). Increase in the number of articles published since 2001 and found which is decrease in the year 2011.

5.6 Distribution of words used in Cognitive Science

Table 6. Word Wise Distribution of Cognitive Science

S.No	Word	Records	TLCS	TGCS
1	Cognitive	981	747	9801
2	Science	780	578	5523
3	Cognition	173	143	3081
4	Theory	151	67	2492
5	Mind	149	74	1236
6	Learning	124	56	2762
7	Human	114	47	2633
8	Language	109	80	1887
9	Based	103	31	1974
10	Approach	99	34	1515

The table 6 and figure 3 reveal that 5067 different words are occurred in Cognitive Science research in Web of Science database. The word 'Cognitive' appeared 981 times, 'Science' appeared 780 times and 'Cognition' appeared 173 times. Top ten words are listed in the table 6.

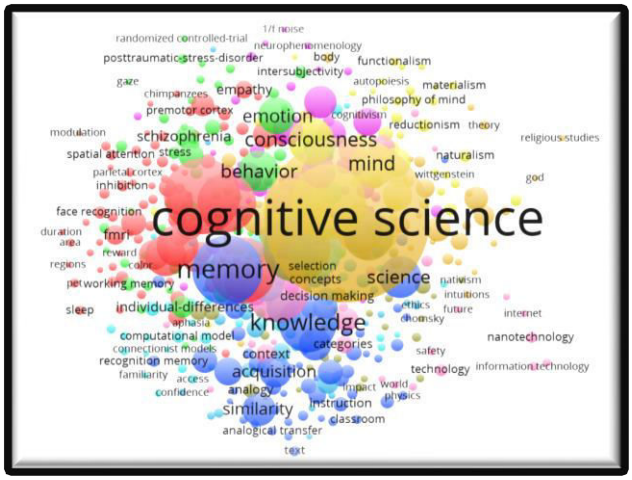

Figure.3. Word wise distribution of Cognitive Science

5.7 Country wise distribution

Table 7.
Performance of Cognitive Science in various Countries

S. No	Country	Records	TLCS	TGCS	Percentage
1	USA	1237	961	28071	40.4
2	Unknown	438	151	3718	14.3
3	UK	432	350	8561	14.1
4	Canada	206	122	3509	6.7
5	Germany	134	97	3337	4.4
6	Australia	127	61	2167	4.1
7	Netherlands	102	66	1309	3.3
8	Italy	77	52	1153	2.5
9	Japan	77	39	946	2.5
10	France	71	34	967	2.3

USA – United States of America; UK – United Kingdom.

Table 7 reveals that 65 Countries contributed their research output on Cognitive Science during 2000 - 2015. Among the 65 countries, USA has contributed 1237 records, UK 432, Canada 206, Germany 134, Australia 127, Netherlands 102, Italy 77, Japan 77, France 71, Spain 70 etc.. The USA has the highest research productivity in the field of Cognitive Science followed by UK.

5.8 Institution list

Table 8. Institution wise distribution of Cognitive Science

S.No	Institution	Records	TLCS	TGCS
1	Indiana University	51	45	947
2	University of Oxford	47	44	501
3	Harvard University	46	31	994
4	University Edinburgh	42	41	1162
5	Carnegie Mellon University	39	49	1049
6	Columbia University	36	31	841
7	UCL	36	45	1224
8	University Calif San Diego	33	62	694
9	University Calif Berkeley	31	43	750
10	Rutgers State University	29	9	774

The table 8 shows that 200 institutions have contributed 4086 articles of Cognitive Science research and the top Ten institutions are listed. It reveals that 51 papers were produced by Indiana University, University of Oxford produced 47 records, Harvard University 46 records, and University of Edinburgh 42 records. It seems that there is only a small difference in contribution to the Cognitive Science research among Institutions.

5.9 Distribution of papers by Language

Table 9
Language wise distribution of Cognitive science

S. No	Language	Records	TLCS	TGCS	Percentage
1	English	2925	1750	47956	95.5
2	Spanish	28	0	18	0.9
3	French	20	0	12	0.7
4	Russian	20	0	3	0.7
5	German	19	0	39	0.6
6	Czech	9	0	4	0.3
7	Slovak	9	0	1	0.3
8	Polish	8	0	2	0.3
9	Italian	7	0	0	0.2
10	Chinese	6	0	0	0.2
11	Portuguese	3	0	0	0.1
12	Dutch	2	0	0	0.1
13	Japanese	2	0	0	0.1
14	Croatian	1	0	0	0.05
15	Estonian	1	0	0	0.05
16	Swedish	1	0	1	0.05
17	Turkish	1	0		0.05

Table 9 shows the language wise publication of Cognitive Science research. The cognitive science research has been published in seventeen languages. A maximum number of papers have been published in English 2925 (95.5%), followed by Spanish (28 records), French and Russian 20 records, German 19 (0.6%).It is predicted that English is the most dominate language and Spanish is the next top in the field of Cognitive Science.

5.10 Authors productivity

Table. 10. Author wise distribution of Cognitive Science

S. No	Author	Records	TLCS	TGCS
1	Chater N	20	45	694
2	Dale R	15	40	221
3	Froese T	15	49	186
4	Patel VL	13	6	375
5	Barrett JL	11	71	324
6	Bender A	10	33	58
7	Ziemke T	9	20	131
8	Beller S	8	17	40

The contribution of articles for Cognitive science in Web of Science is estimated on authors wise. Chater N contributed the highest number of articles (20) in the field of Cognitive Science followed by Dale R (15), Froese T (15), Patel VL (13), Barrett JL (11). Seven records have been contributed by nine authors, six records have been contributed by nine authors, Five records have been contributed by twenty eight authors, four records have been contributed by nine authors , Three records have been contributed by ninety four authors.

6. Findings

The major findings of this study are :

- It is found from the study that there are 4062 records in the field of Cognitive Science in Web of Science, citing articles are 58700 and Average citations per item is 1682.
- Psychology is the major research area and out of sixteen years, highest number of articles were published in the year 2015.
- 4062 records have been published as fourteen types of documents and highest number of records have been published in the format of Journal article.
- 65 different countries have contributed research work in the field of Cognitive Science and USA has contributed highest number of records.
- Two hundred institutions are contributed in the field of Cognitive Science during 2000- 2015 in Web of Science database and The Indiana University has contributed more research work.
- English is the most dominant language and Spanish is the next top in the field of Cognitive Science.
- Chater N. is the top contributor with 20 articles to his credit related to the Cognitive Science in Web of Science.

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Information Needs in Engineering College Libraries

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Abstract

Academic institutions are playing an important role in society by preparing future generation to use the acquired knowledge to fulfill their responsibilities more effectively. The ancient Libraries preserved and circulated the information sources in the printed or written form. Today's development of science and technology have modernized the information sources. It is available as digital resources. Hence impact of Information and Communication Technology has its own impact on users of Engineering Colleges in the use pattern of libraries. This paper focused on information needs of Engineering college Libraries.

Keywords: Information needs, Engineering Library and Digital Library.

Introduction

In modern world information is the backbone of everyone. It is an important need for everybody. It can be acquired by reading several documents. The need for information sources and services has been increasing for research and development at every walks of life at global level. Information is the centre of all activities and progress.. Engineering College Libraries are playing a vital role in information transfer and sharing of them towards research and development in reengineering the national development. Libraries attached to the engineering colleges are developing its infrastructural facilities and enhancing the services to access the information at 24 x 7 globally through various network environment.

Engineering College Libraries:

Today libraries attached to the Engineering colleges are functioning dyanamically with technically changing environment and face a variety of complex challenges like information explosion, IT revolution, network revolution, shrinking library budgets with high level user's expectations and to meet the challenges with the availability of information resources in diverse media storage devices both offline and online and so on. New and advanced technologies brought significant changes in education system. Thus, it is important to provide opportunity to make use of these newer technologies by the user to find out the information quickly and instantly through digital resources..

Information's need of Engineering College:

Information need is an individual and groups desire to locate and obtain information to satisfy conscious and unconscious need. The information and need in information needs are inseparable interconnection..

The objectives of studying information needs are

1. The explanation of observed phenomena of information use or expected need
2. The prediction of information uses
3. The control and there by improvement of the utilization information manipulation of essential condition

Assessment of user information needs:

All expected services are provided by the Engineering libraries. Technical libraries has sufficient knowledge of their library services, facilities and resources, organization of these materials in a systematic manner but also to be provided with easy access to these information. And information is used when it unambiguously responds to the users' needs and requirements. Good knowledge of the users' profile and information requirement assists an information service seeker in the following ways:

- Determining the kinds of materials that should be acquired for building the collection or the scope of the collection.
- Identifying the kinds of information services to be offered
- Determining the types of material to be disseminated to specific users.
- Developing a mailing list of names and addresses of users indicating the best method for distributing these

Factors affecting User's Information Need:

- Academic Situations of an Engineering College.
- Updating Developments.
- Budget shortage and increasing prices of books and periodicals.
- Increase in Strength of the Students
- Changes in Course Design.
- Changes in Teaching and Learning Methods.
- Decrease in Personal Book Purchasing.
- Obsolescence of information.
- User Community facilities.

Functions of Engineering College Libraries:

- Circulation takes place through Barcode system.
- A modern digital library network with high speed internet access is also placed in the premises.
- E – Journal is available in many Engineering colleges.
- Reprographic facilities with printer, CD writers are provided for the purpose. Separate Sections for reference materials, Book Bank, Periodicals, and Project Reports are provided for easy access.
- DDC Coding, bar coding, Software facilitate for faster processing.
- Inter Library loan facility is arranged through DELNET, NIT Tiruchi, for acquiring urgently required references.

Digital Library Development in Engineering Colleges:

Recent development in Engineering Library technology and practice has helped to bring some of Lancaster's paperless society to reality. Digital Library collection contain permanent documents. The Digital environment will enable quick handling and ephemeral information. Digital Libraries are based on digital technologies. The assumption the Digital Library will contains only digital material may be wrong Digital. It is often used by individuals working alone. The physical boundaries have been eliminated. Support for communication and collaboration is as important as information seeking

Function of Digital Library:

- Access to large amount of information to users wherever they are and whenever they need it.
- Access to primary information sources.
- Support multimedia content along with text
- Network accessibility on Intranet and Internet
- User-friendly interface
- Hypertext links for navigation
- Client-server architecture
- Advanced search and retrieval.
- Integration with other digital libraries.

Purpose of Digital Library:

- Expedite the systematic development of procedures to collect, store, and organize, information in digital form.
- Promote efficient delivery of information economically to all users.
- Encourage co-operative efforts in research resource, computing, and communication networks.
- Strengthen communication and collaboration between and among educational institutions.
- Take leadership role in the generation and dissemination of knowledge.

Conclusion:

LIS and Computer science professionals face challenges that will lead to improved systems. Today's Library is power house where information is stored, generated and transferred to fulfill the user's need. Nowadays Engineering Colleges are also developing the Library with digital content. The Digital Libraries will satisfy the information needs of Engineering students

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Digital Resources Usage and Services in the Engineering College Libraries of Tamil Nadu: With Special Reference to Islamic Management Colleges

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Abstract

This article discusses the usage of Digital resources in the Engineering college libraries of Tamil Nadu, with reference to Isalmic managed colleges. All India council for technical education (AICTE) framed certain regulations for the all the engineering college libraries that they have to subscribe specified Digital resources for their institutions. According to that this study conducted to analyse the details of usage of Digital resources in the colleges under study. There were many number of engineering colleges in Tamil Nadu, among them selected colleges managed by Muslim Management is taken in to account for the study.
***(Keywords:** Digital Resources. Islamic Management colleges, Tamil Nadu)*

1. Introduction

Over the past few years libraries has witnessed tremendous development in the field of information and communication technology. The services of the library and users expectation has been fulfilled by the information centres. The trend is that digital resources are gradually replacing the traditional print journals, books, etc., that exists over decades, due to ease of accessing, retrieving and serving the information in electronic medium (Digital format). In recent years digital resources play an important role in Engineering education. Under this study a separate questionnaire has designed and distributed to the engineering colleges for the study in order to know the level of usage and services provided in the engineering college libraries.

Scope of the Study:

This study is primarily aimed with an interest to know the usage and services of Engineering colleges in providing the digital resources to the students studying in the engineering colleges through their libraries. It discusses the usage of different types of digital resources in the libraries, types of resources available and the level of satisfaction of the digital resources and library services.

Review of literature:

Gulati,Anjali (2004) discussed in her paper the status of information and communication technologies usage in Indian libraries with special reference to special libraries and the efforts made by various institutions to propagate e-information products and services and also discussed the consortia efforts in India like JCCC

consortium, INDEST Consortium, CSIR e-journals consortia, and UGC Infonet. **Sunitha (2017)** the research habits of users are changing and the researchers expect all the information to be found online. To meet the over increasing demand from users, libraries are investing a major portion of their budget for subscribing to electronic resources. A variety of e-resources are penetrating into the libraries. As the number of e-resources and e-services have sky rocketed, providing hassle free and uninetrupted access to these resource, have become the major challenge for the libraries.

Objectives:

The main objectives of this study is to examine the impact of digital resources by the students, research scholars and faculty members of the engineering colleges.

- To identify the frequency of accessing digital resources
- To identify the purpose of using digital resources
- To know the usage of search engines
- To understand the barriers of using e-resources

Analysis and Discussion:

1. Distribution of Questionnaires and responses

S. No.	Name of the Institution(s)	No. of Questionnaire Distributed	No of Questionnaire Received	Percentage
1	Dhanish Ahmed College of Engineering, Kanchipuram	100	72	72
2	C.Abdul Hakeem College of Engineering & Technology, Vellore	100	86	86
3	As-Salam College of Engineering & Technology, Tanjore	100	69	69
4	Annai College of Engineering & Techynology, Kumbakonam	100	78	78
5	M.A.R.College of Engineering & Technology, Trichy	100	65	65
6	M.A.M College of Engineering & Technology, Trichy	100	71	71
7	Dhanish Ahmed Institute of Technology, Coimbatore	100	77	77
8	Mohamed Sathak Engineering College, Kilakarai	100	66	66
9	Syed Ammal Engineering College, Ramanathapuram	100	69	69
10	National College of Engineering , Tirunelveli	100	67	67
Total		**1000**	**720**	**72%**

A systematic questionnaire has prepared for the data collection and sent to the engineering colleges. Total 1000 questionnaires were distributed to 17 Engineering colleges, among this 10 engineering colleges were selected and 720 questionnaires were received back. Total 720 respondents filled the questionnaires and they taken in to account for the data analysis. Hence the response rate is 72 percent. It is observed that among the ten colleges, 4 colleges viz., Dhanish Ahmed college of the libraries. As the number of e-resources and e-services has sky rocketed, providing hassle free and uninetrupted access to these resource, have become the major challenge for the libraries.

2. Frequency of visit to your Library

Frequency	No. of Respondents	Percentage
Every day	520	72.2%
Once in a week	100	13.8%
Twice a week	55	7.6%
Once in a Month	30	4.16%
Rarely	15	2.08%

3. Purpose of Visiting the Library

Purpose	No. of Respondents	Percentage
To Borrow Books	460	63.88%
To consult Reference Books	110	15.27%
To Browse Internet	110	15.27%
To Make D/Print/ Photocopy	20	2.77%
To use e-mail	20	2.77%

4.Usage of e-Resources:

Usage pattern	No. of Respondents	Percentage
Almost every day	525	72.9%
Once in a week	85	11.80%
Twice a week	65	9.02%
Once in a fortnight	20	2.77%
Once in a month	15	2.08%
Rarely/Never	10	1.38%

5. Search Engines Preferred to Use:

Search Engines Used	No. of Respondents	Percentage
Google	575	79.85%
Yahoo.com	85	11.80%
AskJeeves.com	10	1.38%
Bing.com	15	2.08%
Alta vista.com	15	2.08%
Lycos.com	10	1.38%
Excite.com	5	0.69%
Iwon.com	5	0.69%

6. Digital Resources available in the Libraries:

Digital Resources	No. of Respondents	Percentage
DELNET	112	15.5%
INFLIBNET	120	16.6%
PROQUEST	45	6.2%
SCOPUS	54	7.5%
MEDLINE	12	1.6%
SPRINGER	20	2.7%
ELSIEVIER	15	2.0%
IEEE	19	2.6%
NPTEL	125	17.3%
OTHERS	211	29.3%

7. Knowledge about the availability of Digital Resources:

Source of Information	No. of Respondents	Percentage
Institute's Website	85	11.8%
Library Portal	225	31.2%
Print Circular /Newsletter	245	30.0%
Intranet	25	3.4%
Bulletin Board	65	9.0%
Faculty Members	45	6.2%
Collegues	30	4.1%

9**. Use of Digital Resources and Online Searching Helped my Study, Research Activity & Publication**

Statement	SA	A	NA/NDA	DA	SDA	Total
Keeps me abreast of latest knowledge	82	23	5	13	12	135
Time saving	176	34	10	8	7	235
Facilitate to Publish more papers/Increased Publication productivity	65	8	2	-	-	75
Facilitate to obtain more information related to my research	90	37	7	6	4	144
Able to access the related articles on the searched item	43	12	1	-	-	56
Journal alert helped me a lot	22	9	6	5	1	43
It enables me to contact the authors directly through email.	12	7	-	8	5	32

(SA = Strongly agree A = Agree NA/NDA= neither agree nor disagree DA = Disagree SDA = Strongly disagree)

Discussions:

It is observed from the above tables, that 72.2 percent of the respondents are visiting to their college libraries daily. While enquiring about their visit to the library more than 63 percent of them are to borrow books and 15 percent of them are make use of their library for reference work. It is found from the table that 72 percent of the respondents are accessing the e-resources almost every day and more than 79 percent of them are accessing these resources

through Google. It is known from the facts that 17 percent of the respondents are searching through NPTEL for their subject information. The maximum of 31 percent of the respondents are getting knowledge about the availability of latest e-resources through library portals and printed newsletters available. Need more equipment and internet access points is the main barrier mentioned by 29 percent of the respondents in accessing the e-resources. While replying about the importance of digital resources and online resources for their academic pursuit, more than 175 respondents are strongly agreed the fact that it is a time saving one.

Conclusion:

With reference to Dr.S.R.Ranganathan, save the time of the reader while searching the information from the huge collection of documents is still suitable for the global digital information explosion too.. Web Technologies and application of Mobile technologies are much more useful for the engineering students to know the latest inventions and they want to make use of the invention with innovative ideas. It is possible through the initiatives and support of the library professionals working in the engineering colleges.

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Research output of Manonmaniam Sundaranar University: A Study based on JCCC Database

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Abstract

Bibliometrics aimed to quantify and monitor the importance of published research by analysing the number of publications by researchers, preference of source title, subject domains and year wise distribution. Individual articles can be analysed by the number of times they are cited. Journals can also be given an impact factor based on the number of citations made to articles within them. Comparisons of publications from different institutions can also be made. This paper examines the publication output of Manonmaniam Sundaranar University.

(Keywords: Bibliometrics, Manonmaniam Sundaram University*)*

1. Introduction

The history of education dates back to Vedic era. And, since then the legacy of education system is passed on to us. Education system has witnessed many upheavals. There are many alterations and modifications in its structure. At times it has completely changed and had taken a new form. After independence systematic efforts are being changes in education structure so that it meets the needs of masses. We are already in the second decade of 21st Century. Pressing challenges of this era have once again brought us at cross roads, education and especially higher education needs to be critically evaluated in the light of its objectives. An African proverb rightly says, "If you wonder which direction to take, look at where you are coming from". Introspecting higher education will help us device suitable policies for future. Higher education has grown tremendously in post-independence period. The increase in number of universities and affiliated colleges is a great achievement. Teacher education has also increased during this period. It has also increased during this period. It has progressed in terms of quality. This paper reviews the journey of research and development of higher education in post-Independence era by pointing out the policies and considering various perspectives

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Objectives of the Study

- To find the subject wise distribution of Publcation
- To calculate the year wise distribution of Publication.
- To identify the dominent journals

- To identify the ranked authors based on publications

Methodology

The required data was collected from JCCC database through UGC Shodhganga for the period 1992-2017. It can be seen that nearly 1076 bibliographic records contributed by MS Universtiy Scholars. The researcher applied the search strings "Manonmaniam Sundaranar University" that has used for the data extraction from the JCCC database using address field for our study. The study aims to analyze the thrust areas of research concentration of M. S. University researchers.

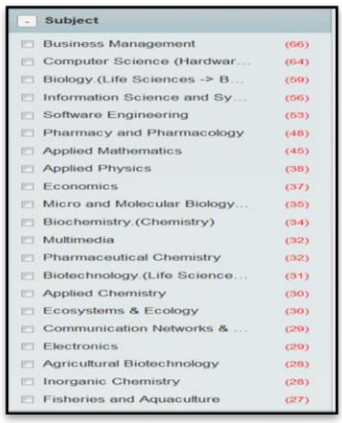
Manonmaniam Sundaranar University:

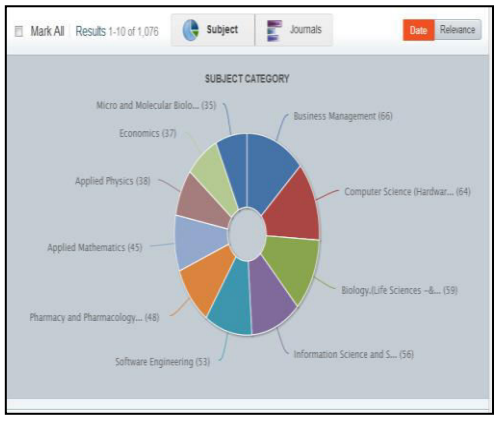
Manonmaniam Sundaranar University (MSU), Tirunelveli was established on 7th September, 1990 by the Government of Tamil Nadu as a Teaching cum affiliating University. The University is named after the Tamil poet laureate Prof.P.Sundaram Pillai (1855-1897) who is the author of the famous verse drama MANONMANIAM. The University caters to the needs of the three southern districts of Tamil Nadu viz. Tirunelveli, Tuticorin and Kanyakumari. The university is located in a campus of 550 acres at Abishekapatti (on Tirunelveli Tenkasi Road) at a distance of 8 kilometers from Tirunelveli Junction. The University has under its jurisdiction 62 affiliated colleges, 6 University colleges and 4 Constituent colleges with 76, 000 students on rolls. These colleges amongst which four are over 100 years old (St. Xavier's College, St.John's College, M.D.T.Hindu College, Sarah Tucker College the oldest women's college in the state) have contributed creditably to the cause of higher education of this region. There are 27 academic departments in the University. The University department offers post-graduate, M.Phil. and Ph.D programmes (Full time and Part time).

Subject wise distribution of Publications

M. S. University publications have been categorized into different subjects based on Jgateplus themes. Ranking order of the publications is used to compute the different subject. The most dominant subject are Business Management with 66 publications followed by (Computer Science Hardware) with 64 Publications, Life science with 59, Information science and System with 56 and other subjects are listed in the below diagrammatic representation.

Table 1 shows that subject wise distribution of Publications





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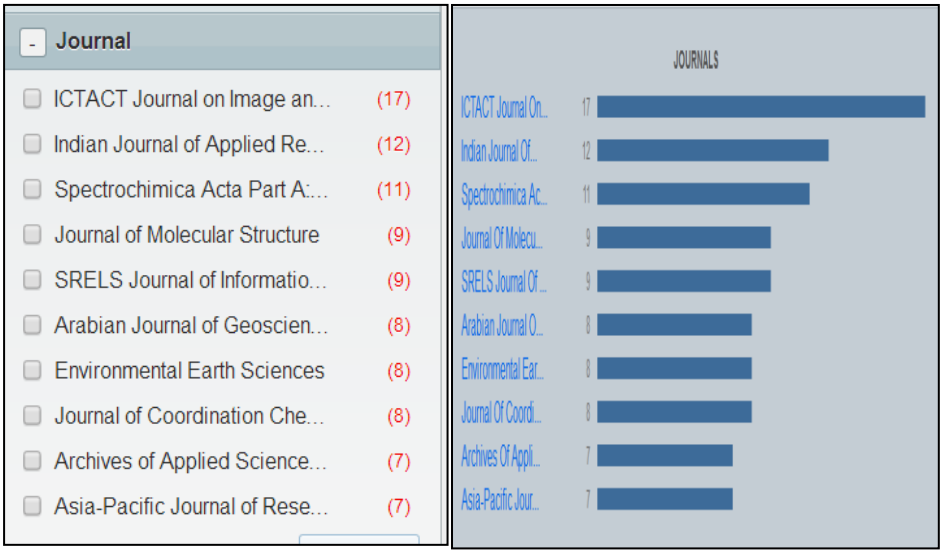
Journal wise distribution of Publications

The publication literature is spread over different source journals. The rank list of top 10 source titles is listed in the below Table. It reveals that ICTACT Journal of Image Record tops the list with the highest number of publications 17, followed by Indian Journal of Applied Research with 12 publications, Spectrochimca Acta Part A with 11 and remaining journals are having less than 10 Publications.

Table 2 shows that journal wise distribution of publications



Particulars about the total number of articles in the journals;

Sl. No	Name of the journal	No of articles
1	ICTACT Journal on Image an….	17
2	Indian Journal of Applied re…	12
3	Spectronchimica Acta Part A…	11
4	Journal of Molecular Structure…	9
5	SRELS Journal of Geoscienc…	9
6	Arabian Journal of Geoscien…	8
7	Environmental Earth Sciences..	8
8	Journal of Coordination C he…	8
9	Archives of Applied Science…	7
10	Asia-Pacific Journal of Rese..	7

Year wise distribution of publications

Table reveals that during the period 1992-2017, a total of 1076 publications were published by M. S. University. The highest number of publication is 193 in 2014 followed by 215 papers in 2015 with 189, 2013 with 158, 2012 with 134. Before 2000 their contribution is single digit. 2012

onward enrich the publication with more than 100 for each year.

Table Shows that Year Wise Distribution of Publications

Year	
2017	(3)
2016	(119)
2015	(159)
2014	(193)
2013	(158)
2012	(134)
2011	(71)
2010	(54)
2009	(34)
2008	(14)
2007	(24)
2006	(8)
2005	(11)
2004	(15)
2003	(17)
2002	(7)
2001	(16)
2000	(10)
1999	(4)
1998	(3)
1997	(7)
1996	(4)
1995	(7)
1994	(2)
1993	(1)
1992	(1)

Author wise distribution of Publications

Table presents the rank list the top 10 authors and their publications are taken into account to avoid a long list. It reveals that D. Pathinettam pandian is the most productive author contributing 47 articles followed by N. Chandrasekar with 46 articles, A G Murugesan with 34, S Gopalakrishnan with 25 and total of 9 authors are contributed more than 20 article during the study period.

Authors	
D Pathinettam Padiyan	(47)
N Chandrasekar	(46)
A G Murugesan	(34)
S Gopalakrishnan	(25)
G Sivakumar	(23)
E Subramanian	(22)
K Mohanraj	(22)
N S Magesh	(21)
T Tamizh Chelvam	(21)
M Sivasankaran Nair	(19)

Findings

- The study found that social science is dominating compare with science.
- The study found that publication are scattered in different subject domain
- The study found that 41 authors are contributed more 10 publications.

It is to conclude that JCCC database covered more social science journal compare with Web of Science and Scopus database. Since, the database found contributions only from 1992, that the research begins during the period.

Conclusion

Though many education commission have pointed out the need for improvement and policies were brought out to strengthen research in education in the country; the journey of higher education in post-independence era cannot be said to be very promising. There is definitely raise in number of higher education institutions but the quantitative increase is not accompanied by qualitative improvement. When we look at this journey one thing repeatedly strike that most of the corrective steps taken for improving higher education and research are modeled on and crafted on lines of policies adopted in western world or by United Nations. Is this an appropriate strategy? India has a unique socio-cultural realities which is unlikely to be found elsewhere. So naturally the questions arises regarding adequacy and suitability of corrective steps taken earlier in higher education and research arena. If the problems are different can the solutions be same? So it is the time

to rethink about our approach towards higher education and the research activities.

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Author(s) should give at least six to seven keywords

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References to already published literature should be numbered consecutively in order of their citation in the text and should be placed at the end of the paper. In the text, they should be indicated by superscripts. References to personal communication and unpublished literature should not be placed under references, but should be cited in the text in parentheses. Explanatory material may be cited in the text in parentheses. Explanatory material may be given as an appendix rather than as footnote. Example of citations to different types of documents are given below:

(i) Journal Article.

Moyo, Lesley M. reference any time anywhere: towards virtual reference services at Penn State. The Electronic Library, 2002, 20(1), 22-28.

Brwon, S.J. & Duguid, P. Balancing act: How to capture knowledge without killing it. Harvard Business Review, 2000, 78(3), 73-80.

Standard abbreviations as per the international standards should be used for the title of periodicals. However, single and double word journal titles should be given in full.

(ii) Book/Monograph

Lancaster, F.W.&Warner, Amy, Intelligent technologies in library and information service applications. Information Today, Inc, Medford, NJ 2001.

(iii) Chapter from a Book

Gupta, Dinesh K. A focus on customers: Imperative for managing quality in library and information service. In delivering service quality: Managerial challenges for the 21st century, edited by M. Raghavachari & K.V. Ramani, Macmillan, New Delhi, 2000, 40-06.

(iv) Conference Paper

Lad, AT. Academic libraries and access to Internet and Intranets. In CALIBER-99: Academic Libraries in Internet Era, edited by P.S.G. Kumar & C.P. Vashisht. Paper Presented at the Sixth National Convention for Automation of Libraries in Education and Research. 18-20 February 1999, Nagpur. Information and Library Network Centre, (INFLIBNET), Ahmedabad, 1999. Pp.78-81.

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Birkler, John; Smith, Giles; Kent, Gleen A. & Johnson, Robert V. An acquisition strategy, process, and organization for innovative systems. National Defence Research Institute, RAND, USA, 2000. RAND-MR 1098-OSD.

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Fintel, Robert P; Julian. C.; karlsen, Dag & Osnes, Laila Rabe. Methods for displaying an IT (information Technology) architecture visual model in a symbol-based decision national table. USA patent 5, 903,478. 11 May 1999.47p.

(vii) Standard

Bureau of Indian Standards. Quality management and quality assurance standards, Part 3: Guidelines for the application of 180 9001:1994 to the development. Supply, installation and maintenance of computer software. (first revision). BIS, New Delhi, 1997.32 p.18/ISO:9000-3 (Part3)-1997.

(viii) Thesis / Disertation

Khandare, Pravin M. Characterisation of mesophase pitch materials from petroleum and coal – derived precursors: Kinetics and rtheology at clevated temperatures. The College of Engineering and Mineral Resources, West Virginia University, November 1995. PhD Thesis 235p.

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Channels	50 (applicable to 902.5-927.5MHz frequency range)
Channel spacing	500KHz (applicable to 902.5-927.5MHz frequency rang
RF Power	0 to +31dBm
Receive Sensitivity	-80dBm
Antennas	4 High Performance, 7dBi Circular polarized antennas
Detection Range	2 - 3 meters

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Processor	ARM CORTEX M3 100M
Memory	RAM 16Kbits + FRAM 32Kbits.
Reliable firmware upgrade	Web Management -based firmware upgrade capability; CommPort based firmware upgrade capability
API Support	.NET
Theft Indication	Audible Sound Alarm & Visible LED light

CONNECTIVITY

Communications	10/100 BaseT Ethernet (RJ45); RS-232 (DB9), RS-485
GPIO	2 inputs, TTL compatible, 0-5V, 2 outputs, TTL compatible, 0-5V, 3channel relay output control 0-250V AC
Power Supply	+9V to +15V DC, external universal power supply with locking connector

ENVIRONMENTAL & PHYSICAL CHARACTERISTICS

Operating Temperature	-20°C to +60°C (-4°C to +140°C)
Storage Temperature	-40°C to +80°C (-40°C to +176°C)
Humidity	5-95% non-condensing

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