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Journal of Intellectual Property Rights: A Bibliometric Analysis of Cited References

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ABSTRACT

The aim of this study is to examine the time lag between the receipt of paper and its subsequent publication in the journal, the structure of the IPR literature, type of documents cited by the papers and identification of core journals in the field of IPR using Bradford's law. The study also identifies the place of origin of the cited journals and the disciplines with which these dealt. The analysis indicates that the average time lag between receipt and its consequent publication is about 4 months. Highest number of papers is published in the sub-discipline of intellectual property rights and its related aspects. Nearly 40 journals constitute the core of the cited journals. Most of the cited journals are published from USA, UK and India. It is observed that most of the cited journals belong to the disciplines of law, economics and management.

Keywords: *Journal of Intellectual Property Rights*, bibliometrics, cited references, time gap, Bradford's law

1. INTRODUCTION

Journal of Intellectual Property Rights (JIPR), a peer reviewed bi-monthly journal, was started in 1996 by CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR), New Delhi. It was the first journal in the area of Intellectual Property Rights (IPR) from India. The main objectives of this journal are: (i) to enhance IPR related communication among policy makers, organisational agents, academics, and managers for the critical understanding and research on intellectual property; and (ii) to promote the development of this newly cultivated research field. The journal publishes contributed and invited research articles, case studies, laws and reviews on different aspects of IPR, newly emerging trends, policies and treaties adopted at national and international level, technical notes on current IPR issues, national and international IPR related hot topics, book reviews, and conference reports. At present the journal is abstracted & indexed by Scopus, EBSCO host Electronic Journals Services (EJS), Directory of Open Access Journal (DOAJ), Library and Information Science Abstracts Database (LISA).

National Bureau of Plant Genetic Resources (New Delhi) has included 14 articles from various issues of the journal as the study material for its course PGS-503 on intellectual property and its management in agriculture. Jawaharlal Nehru University's MPhil/PhD's foundation course on IPR also has included some articles from the journal as essential reading material.

In an earlier study, Garg & Anjana[1] analysed papers published in the *Journal of Intellectual Property Rights* since its inception in 1996 up to 2012 and found that the inflow of papers has increased considerably during the period of study, indicating its popularity among the scientific community as well as the policy makers. About three-fourth of the papers published in the journal originated from India and the rest from abroad. Among papers from abroad, US was the largest contributor. Among the performing sectors, academic institutions were the largest contributors to the journal followed by research institutions of the Council of Scientific and Industrial Research (CSIR). Several prolific institutions and authors were also from CSIR. However, this study did not examine the time lag between receipt and

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consequent publication of the papers in the journal, types of documents cited by the articles published in the journal, and country of origin and discipline of the various cited journals. The present study is an attempt to fill these gaps and thus an extension of the above quoted study.

2. LITERATURE REVIEW

Studies relating to the citations appended to different journals are reported by Mete & Deshmukh[2] who analysed 1824 references appended to 202 articles published in *Annals of Library Science and Documentation* during 1984-1993. They found that the journals were the most cited literature in the area of library and information studies (LIS). Similar, results were obtained by Deshmukh[3] in another study for articles published in *Annals of Library and Information Studies* during 1997-2010. They also found that self citations to the journal were highest. Dixit & Katore[4] examined 3521 references appended to 327 articles published in the *Journal of Indian Society for Cotton Improvement Research* also found that journals were cited more than any other document type and also the source journal is ranked first among all the cited journals. However, there is no study reported which deals with the citations appended to *Journal of Intellectual Property Rights*.

3. OBJECTIVES

The objectives of the study are to:

- Examine the time lag in months between receipt of paper and its consequent publication in the journal during 1996-2014
- Examine the structure of intellectual property right literature as seen by the content analysis of papers published in the journal during 1996-2014
- Identify types of sources, cited by the published papers during 1996-2012
- Examine the different journals that were cited in these papers and to identify the core cited journal using Bradford's law of scattering; and
- Analyse country of origin and subjects of the cited journals.

4. METHODOLOGY

The source journal is an open access journal, available on the CSIR-NISCAIR website (http://nopr.niscair.res.in/handle/123456789/45). Each issue of the journal, from volume 1(1996) to volume 17(2012), was scanned for the types of references cited in the article and name of the journals cited. The country of origin and the subject, with which the cited journal dealt, was examined from SCIMAGO journal and country rank, and World Cat available at (www.scimagojr.com) and (https://www.worldcat.org) respectively. The time lag between receipt of the paper and its subsequent date of publication was also recorded for each publication for 1996-2014. A database was created in MS Excel for analysis.

5. RESULTS AND DISCUSSIONS

5.1 Time Tag between Receiving of Paper and Publication

There are several indicators to judge the quality of a journal, such as its timely publication, regular schedule of publication, inclusion in indexing and abstracting services, particularly in the Web of Science of the Thomson Reuters (USA). Besides these the time lag between receipt and its consequent publication is also a measure of the quality of a journal.

Table 1 presents the data for the receipt and consequent publication of 593 articles appeared in volume 6 (2001) to volume 19 (2014) as the data for 1996-2000 has not been provided in the published papers. It indicates that the average time between receipt of the paper and its publication is about 3.6 months. Of the total 593 papers published

Table 1. Time gap between receiving of paper and publication

Year (Volume)	No. of contributions	Total time in months between receipt and publication	Average time (in months)	No. of papers with time gap more than 4-months
1996 (1)	15	NA	NA	NA
1997 (2)	14	NA	NA	NA
1998 (3)	36	NA	NA	NA
1999 (4)	28	NA	NA	NA
2000 (5)	24	NA	NA	NA
2001(6)	29	100	3.5	8
2002 (7)	32	134	4.2	9
2003 (8)	32	100	3.1	8
2004 (9)	29	112	3.9	8
2005 (10)	46	160	3.5	16
2006 (11)	37	110	3.0	8
2007 (12)	44	157	3.6	10
2008 (13)	52	185	3.5	16
2009 (14)	41	143	3.5	16
2010 (15)	37	101	2.7	3
2011 (16)	53	170	3.2	10
2012 (17)	56	218	3.9	20
2013 (18)	58	307	5.3	37
2014 (19)	47	154	3.3	14
Total	**710**	**2151**	**3.6**	**183**

NA: Not available

in the journal during 2001-2014, the time gap for 183 (31 %) papers was more than the average. Among all the years, the time gap between receipt of the paper and its publication was more than average for 2002, 2004, 2012 and 2013. It was highest for the year 2013. Number of papers with time lag more than four months was also highest for 2013 and 2012. Authors examined the reason for a large number of papers with time lag more than four months in receipt and publication of the papers for these years. It was found that the delay in most cases was on the part of authors and reviewers. Bjork & Solomon[5] examined the time lag in publishing in 135 peer reviewed journals in different fields of science, technology and medicine (STM), social sciences and humanities. Authors found that the longest time delay (18 months) was in the discipline of business and economics and shortest in STM. This indicates that the time lag in publishing papers in *Journal of Intellectual Property Rights* is much less as compared to the discipline of business and economics. This also reflects on the better quality of the journal.

5.2 Structure of IPR Literature

Using the content analysis of papers published in the journal during 1996-2014 authors examined the structure of the IPR literature. The papers published in the journal can be broadly classified into six different sub-fields of IPR. These fields are measurement of patenting activity in different fields of science and technology; patent infringement; copyright protection and various laws enacted for the same; various aspects of trademark laws; geographical indications; impact of IPR at different levels, IPR management, and intellectual property protection at national and international level. The highest number of papers (164) were published in the sub-discipline of intellectual property rights and related aspects followed by patent and patenting 76 papers, measurement of patenting activity 56 papers closely followed by copyright laws 54 papers, geographical indications 24 papers and trade mark laws 19 papers. About 200 papers could not be classified into these six categories and were treated as miscellaneous.

5.3 Different Types of Sources Cited by Published Articles

Scientists cite different types of documents to justify their research results in his/her scientific communication. These can be books, conference papers, theses, websites, journals, etc. An analysis of data in the present study indicates that 605 papers published during 1996-2012 cited 13,738 document sources (Table 2). The average rate of documents cited was 23 per article. The distribution of different types of sources cited is given in Table 2. Data presented in Table 2 indicates that the citation of websites ranked first in order of citations followed by case laws and journal papers. These three types of sources constituted about three-fourth of citations and the rest one-fourth were books, conference papers and patents. In studies reported in literature in other areas, journal articles are commonly ranked first. As the field of IPR is different from other fields here case laws are also cited prominently. Recently novel information is also available on websites and hence the citation of web links topped the list of cited documents.

Table 2. Different type of cited sources

S. No.	Type of document cited	No. of citations (%)
1	Websites	3669 (26.7)
2	Case laws	3524 (25.6)
3	Journal papers	3365 (25.4)
4	Books	2467 (17.9)
5	Conference papers	470 (3.4)
6	Patents	229 (1.6)
7	Ph D theses	14 (0.1)
	Total	**13738**

5.4 Bradford's Law of Scattering and Identification of Cited Core Journals

During 1996-2012 the journal published 605 papers which cited 13,738 document sources. Of these, 3365 (25.4%) citations were of journal articles. These journal articles were scattered among 910 journal titles published from different parts of the globe and covered different subjects. Using the Bradford's law of scattering[6] authors identified core journals in the field of IPR. The law describes a quantitative relationship between the journals and the papers they publish. Two widely recognised formulations of the law are: (i) the verbal formulation, derived from the verbal statement of Bradford's conclusions, and (ii) the graphical formulation, derived from the graph of distribution of papers over periodicals. According to verbal formulation of the law "If scientific periodicals are arranged in order of decreasing productivity of articles on a given subject, they may be divided into three parts, each containing the same number of articles: (a) a core or nucleus of journals on the subject, relatively few in number, that produces approximately one-third of all the articles, (b) a second or middle zone, containing the same number of articles as the first, but a greater number of journals, and (c) a third zone, containing the same number of articles as the second, but a still greater number of journals'. Based on this, Bradford stated that the number of periodicals in the nucleus and succeeding zones will be $1: n: n^2$. The graphical formulation is obtained by

plotting a curve in a plane where coordinates are the cumulative number of articles (in the y-axis) and the logarithm of the cumulative number of journals of the collection (in the x-axis), where journals are cumulated from most to least productive. The curve has invariably an ascending shape which after a certain point, approaches to a straight line.

To apply the Bradford's law of scattering in the present study, a list of journals and the number of articles published in each was prepared. Table 3 shows the scatter of articles in journals.

Table 3. Scatter of articles in journals in the field of IPR

No. of journals (A)	No. of articles (B)	Total articles C = (A*B)	Cumulation of C	Rank	Log (rank)
1	227	227	227	1	0.0000
1	105	105	332	2	0.3010
1	66	66	398	3	0.4771
1	60	60	458	4	0.6020
1	57	57	515	5	0.6989
1	36	36	551	6	0.7781
1	31	31	582	7	0.8451
1	25	25	607	8	0.9030
2	21	42	649	10	1.0000
1	20	20	669	11	1.0413
6	19	114	783	17	1.2304
3	18	54	837	20	1.3010
1	17	17	854	21	1.3222
4	16	64	918	25	1.3979
6	15	90	1008	31	1.4913
2	14	28	1036	33	1.5184
2	13	26	1062	35	1.5440
5	12	60	1122	40	1.6020
2	11	22	1144	42	1.6232
1	10	10	1154	43	1.6334
21	9	189	1343	64	1.8061
8	8	64	1407	72	1.8572
14	7	98	1505	86	1.9344
24	6	144	1649	110	2.0413
30	5	150	1799	140	2.1460
57	4	228	2027	197	2.2944
130	3	390	2417	327	2.5144
365	2	730	3147	692	2.8400
218	1	218	3365	910	2.9589

For testing the applicability of the law, the 3365 articles were divided into three zones. In the present data set 40 journals published 1122 articles, next 157 journals published 905 articles, and in the next zone 753 journals published 1338 articles. This indicates that almost one third of the articles have been published in each zone. The reason for choosing three zones was that the percentage error in distribution of articles, among the three zones is least (calculations shown below$). These identified zones form a geometric series approximately in the form $1: n: n^2$. Here, the observed distribution is 40:157:753 = 910 and expected distribution is $40:40*4.35:40*(4.35)^2$. Here, 4.35 is the average of the Bradford's multiplier obtained by dividing the number of journal titles of a particular zone by its preceding zone (here 157/40 = 3.9) and (753/157= 4.8).

Table 4 provides Bradford zones and their calculations for research output in IPR during 1996-2012. Journals in the first zone constitute the core journals of the field of IPR. Figure 1 depicts the Bradford's bibliograph. This indicates that there is no 'Groos Droop' which shows completeness of the bibliography, i.e., the field of IPR has matured. Table 5 lists core journals of the field of IPR. Of

Table 4. Bradford's zones for research output in IPR during 1996-2012

Zones	No. of publications	% of publications	No. of journals	% of Journals	Bradford multipliers
1	1122	33.3	40	4.40	
2	905	26.9	157	17.25	3.9
3	1338	39.8	753	82.75	4.8
Total	**3365**	**100.00**	**910**	**100.00**	**Average=4.35**

$ % error = ((971-910) / 910)*100=6.7 %.

The error is less than 10 %, so it is a good approximation.

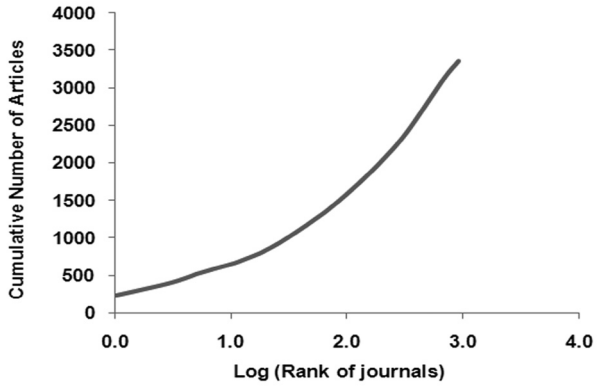

Figure 1. Bradford's bibliograph for scatter of literature of IPR during 1996-2012.

Table 5. Core journals referred by scientists

S. No.	Name of the Journal	Country	No. of papers
1.	*Journal of Intellectual Property Rights*	India	227
2.	*Research Policy*	Netherlands	105
3.	*World Patent Information*	Switzerland	66
4.	*European Intellectual Property Review*	UK	60
5.	*Current Science*	India	57
6.	*Journal of World Intellectual Property*	Switzerland	36
7.	*Nature*	UK	31
8.	*Harvard Journal of Law and Technology*	USA	25
9.	*Marquette Intellectual Property Law Review*	USA	21
10.	*Stanford Law Review*	USA	21
11.	*Science*	USA	20
12.	*Harvard Law Review*	USA	19
13.	*Journal of Law and Technology*	USA	19
14.	*Nature Biotechnology*	UK	19
15.	*Scientometrics*	Netherlands	19
16.	*Technovation*	UK	19
17.	*Trademark Reporter*	USA	19
18.	*Journal of International Economic Law*	UK	18
19.	*Journal of International Economics*	Netherlands	18
20.	*Journal of Patent & Trademark Office Society*	USA	18
21.	*Berkeley Technology Law Journal*	USA	17
22.	*Fordham Intellectual Property Media and Entertainment Law Journal*	USA	16
23.	*Southern California Interdisciplinary Law Journal*	USA	16
24.	*Technological Forecasting and Social Change*	USA	16
25.	*Wall Street Journal*	USA	16
26.	*Journal of Intellectual Property Law and Practice*	UK	15
27.	*Proceedings of National Academy of Sciences of the USA*	USA	15
28.	*RAND Journal of Economics*	USA	15
29.	*Richmond Journal of Law and Technology*	USA	15
30.	*TIBTECH Innovations*	France	15
31.	*University of Pennsylvania Law Review*	USA	15
32.	*Fordham Law Review*	USA	14
33.	*Vanderbilt Journal of Transnational Law*	USA	14
34.	*Columbia Law Review*	USA	13
35.	*Journal of Internet Law*	USA	13
36.	*International Legal Materials*	USA	12
37.	*Journal of Law and Economics*	USA	12
38.	*Journal of Nano Particle Research*	Netherlands	12
39.	*Journal of Scientific and Industrial Research*	India	12
40.	*Vanderbilt Law Review*	USA	12
	Total		**1122**

the 40 core journals listed in Table 5, several of these are prestigious journals of basic sciences like *Nature (UK), Science (USA), Proceedings of the National Academy of the Sciences of the USA (USA) and Current Science* (India). This indicates that the field of IPR also cites literature from basic sciences. However, highest number of cited journals was from the discipline of law.

5.5 Distribution of Cited Journals by Disciplines

The 910 journals that were cited during 1996-2012 belonged to 20 disciplines of science, technology, business studies, management, law, intellectual property law and trade. Table 6 shows the distribution of cited journals by disciplines in descending order of citations.

Table 6 indicates that the highest number of cited journals were from the discipline of law, which constituted about one-third (31.3 %) of all cited journals. The journals from the discipline of economics and business studies and management together constituted about 16 % of all cited journals. Rest (52.7 %) journals were from other 17 disciplines. This indicates that the journals from the disciplines of law, economics and business studies and management are cited heavily by the researchers working in the field of IPR and related issues. This is because the roots of IPR research lies in these disciplines.

5.6 Country of Origin of Cited Journals

An analysis of data of the 910 journals cited by the researchers indicates that these journals originated from 32 different countries of the globe is shown in Table 7. Of these, highest number of cited journals originated from the USA followed by journals from the UK and India, the host country of the journal. The proportion of journals originating from these countries was about 76 % of the total cited journals. Remaining 24 % cited journals originated from other 29 countries. Among them the Netherlands topped the list. One of the possible reasons for large number of cited journals from the US may be

Table 6. Distribution of cited journals by disciplines

S. No.	Disciplines	No. of journals
1.	Law	285
2.	Economics	73
3.	Business studies and management	72
4.	International property law	42
5.	Medicine	42
6.	Chemical sciences	39
7.	Agricultural sciences	37
8.	Computer science and communication	32
9.	Genetics	27
10.	Library and information science	19
11.	Pharmaceutical sciences	18
12.	Environmental sciences	17
13.	Engineering and technology	17
14.	Biotechnology	15
15.	Physical sciences	13
16.	Patent and patenting	11
17.	Trade	10
18.	Mathematical sciences	7
19.	Biological sciences	6
20.	Copyright issues	5
	Others journals	123
	Total	**910**

Table 7. Distribution of cited journals by country of origin of journals

S. No.	Country	No. of journals
1.	USA	450
2.	UK	166
3.	India	74
4.	The Netherlands	45
5.	Australia	13
6.	Switzerland	11
7.	Germany	10
8.	Canada	7
9.	Japan	6
10.	China	6
11.	South Korea	5
12.	Iran	4
13.	Italy	4
14.	Other 19 countries	27
	Journals for which countries were not available	82
	Total	**910**

that the IPR research like other areas of research is concentrated in the US.

6. CONCLUSIONS

The analysis of data indicates that the *Journal of Intellectual Property Rights* is becoming a promising journal as about one fourth of the articles published in the journal are from abroad[1]. The time gap between receipt of articles and their consequent publication is about four months and much less than the time lag in publishing of papers in the discipline of business and economics. Based on the content analysis of the papers published it is observed that the field of IPR and its management is multidisciplinary and highly fragmented.

Based on the pattern of citation of different types of document sources it indicates that three fourth of these were constituted by websites, case laws and journal articles; share of each being almost equal. Reference analysis of cited journals indicates that about one-third of the cited journals were from 40 journals only and rest two third were scattered over 870 journals. Analysis of cited journals by discipline indicates that the field of IPR research integrates knowledge mainly from law, economics and business and management as a large number of cited journals were from these three fields. Journals originating from the US were referred highest number of times.

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Ms Joohi Srivastava obtained her masters in Biotechnology from All India Institute of Medical Sciences (AIIMS), Delhi in 2011. After completion of the course, she stepped into the field of Intellectual Property Law. She has also obtained PG Diploma in Intellectual Property Law followed by courses from WIPO and then LLB. She gained practical knowledge of working in this area during her stay at Innovation Protection Unit of the Council of Scientific and Industrial Research (CSIR) in 2012. Currently, she is working with Foundation for Innovation & Technology Transfer, Indian Institute of Technology (IIT), New Delhi as an Associate Consultant.

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