

**BACKLINKS ANALYSES OF INSTITUTES OF NATIONAL IMPORTANCE AND
PREMIER MANAGEMENT INSTITUTIONS LIBRARY WEBSITES**

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ABSTRACT

The purpose of this paper is to examine the extent of backlinks to different category of web pages of the library websites belonging to institutes of national importance and premier management institutions. This is a longitudinal study started from 2009 and finished in 2013 including five rounds of data collection having one year gap between each round. For getting the primary data, four search engines have been selected for the backlinks study of library websites. The study concludes that index page/home page of library websites attracts highest number of backlinks than any other category of library web pages. Seven categories of library web pages have been identified. Further, it has been found that search engine Yahoo Site Explorer is good for webometric research particularly for backlinks study. The hyperlink for index pages/home pages of library websites are generally not found in the index pages/home pages of their hosting institutions. The backlinks study for library websites have not been conducted earlier; as many webometric studies are based on institutions websites only. This study mainly focuses on the extent of backlinks for seven categories of library web pages including four search engines which have not been studied earlier in the sense.

KEYWORDS: Webometrics; Sitation; Backlinks; Inlinks; Webpage Categories

INTRODUCTION

Internet and World Wide Web (WWW) has widespread accessibility in the world. Nowadays, for the dissemination of information and creating awareness and advertisement among public, websites are one of the ideal medium. These days every academic and research institutions have their own websites through which they are trying to attract students to join them for running their academic and research programs. These academic and research institutions' websites become rich source of information for displaying their available courses of studies, education centers, scholarships, job positions and other facilities. Libraries and information centers are the basic requirement of every academic and research institute. Hence, libraries and information centers use their websites for disseminating information about their variety of collection & services. Many a times library websites link (hyperlink) to resources (available on the Web), similarly many a times external (Web) resources link to library

website through hyperlinks. The medium which connects two or more hypertext is known as links (or hyperlinks). The linking behavior largely depends upon the content richness of websites depending upon library's collection, services, facilities etc. This linking (hyper-) among websites is referred as backlinks pointing behaviour. Backlinks are as similar as "citation" to any document also known as "situation" (McKiernan, 1996) in terms of Web.

According to Web Design Glossary of Terms a hyperlink, more commonly called a link, is an electronic connection between one webpage to either (1) other webpages on the same website, or (2) webpages located on another website. More specifically, a hyperlink is a connection between one page of a hypertext document to another. Links are of three types – outgoing links, self links & incoming links. Links going to outside from the website is outgoing (outlinks) links, links coming into a website is known as inlinks (backlinks) and links within the website is known as self links (Noruzi, 2006). Outlinks are used to pointing external sources and also known as outbound links. Self links are used within the website for navigational purposes of the same website. More the backlinks to a website reveals the impact of the website in that field.

Review of Literature

Almind and Ingwersen (1997) coined the new term "Webometrics" for the scientific study of Web. Basically webometrics is based on the theories of Informetrics, Scientometrics and application of Bibliometrics. In webometrics, outgoing links from the website are known as outlinks, and the links pointing to the website are called inlinks. The counting and analysis of links can be seen similar to citation analysis (Björneborn & Ingwersen, 2001). Further, Björneborn (2004) elaborated webometrics and stated its areas of research i.e. web page content analysis; web link structure analysis; web usage analysis; and web technology analysis. Successively Thelwall, Vaughan and Björneborn (2005) reviewed the webometric literature and elaborated various types of link analysis. In their study, they realized, the quantitative methods that originally designed for bibliometric analysis of citation patterns of scientific journal articles, could be applied to Web by using various search engines to provide the raw data. McKiernan (1996) for "backlinks" coined the term "situation" to make it different from the term "citation" because backlinks are originated from the Web. In a study, Rousseau (1997) analyzed the distribution patterns of websites, site backlinks and site self-links. After giving the term webometrics, Ingwersen (1998) defined the concept of "external web impact factor" (which is also known as revised WIF) for a given website. In academic web domain, studies related to interlinking of web domains are carried out to identify the

correlation of backlinks count and ranking of academic departments within a scientific domain. In this area, first time Thomas and Willett (2000) studied library and information science (LIS) departments of UK and found that there is no any significant correlation between backlinks counts of LIS departments websites and their research ratings. There was significant difference found between backlinks counts and US newspaper rankings for US LIS schools (Chu et al., 2002). Further, in different studies, significant research ratings and backlinks count correlations have been found for UK computer science departments (Li et al., 2003), US Psychology and US Chemistry departments (Tang & Thelwall, 2003). Universities' network within the country has been the focus of study to analyze interlinking pattern among universities and institutions of a single country domain. Firstly Ingwersen (1998) analyzed the online impact of six (6) university websites; Noruzi (2005) calculated the WIF for Iranian universities and concluded that Iranian universities have low inlink WIFs and significant correlation between English language pages and backlinks counts. In a study, inter relationship between UK University websites by link analysis was explored by Thelwall (2002a) and concluded that there are lack of techniques to extract all the links. To understand the structure of web links of university websites, in a study, Thelwall (2002c) analyzed the backlink structure of the top 100 linked-to pages on UK university websites, and characterized the page types of these 100 pages. In the same kind of study for universities of Israel, Bar-Ilan (2004), explored the nature of links of academic institutes to characterize the links and the sources and the target pages.

Since from the beginning, academic spheres are centre for education and research. The scholarly productivity of academic spheres is centered with their research activities which has much influence on the World Wide Web. In a study, Thelwall (2001a) attempted to assess the correlation between research productivity of UK universities and link counts, and found significant correlation. The study had given first concrete evidence of a real association between research productivity and link counts. Further, similar study was also repeated for Australia (Smith & Thelwall, 2002) and Taiwan (Thelwall & Tang, 2003) and found that quantity of research produced by academicians played significant role for attracting links (Thelwall & Harries, 2004). In another study, to investigate the impact of geographic factors for interlinking of academic web spaces, Thelwall (2002b) found that as distance increases hyperlinking patterns of websites decreases.

Barjak et al. (2007) conducted a study, to know the factors affecting web impact of personal homepages of scientists, and found that personal and institutional characteristics of scientists play significant role in yielding higher impact. To reveal the motives of linking of websites, Kim (2000) made the first exhaustive approach for finding the motive of hyperlinking pattern in scholarly electronic articles. Nineteen (19) hyperlinking motives have been identified by Kim (2000) and categorized into three classes: scholarly, social, and technological. In another study, Wilkinson et al. (2003) investigated the motivation for academic website interlinking and found that scholarly activities conducted by academic institutions has significant reason for interlinking.

In Webometric researches, search engines are widely adopted tools to get the primary data. In a study, conducted by Almind & Ingwersen (1997), found that AltaVista supports advanced Boolean queries for webometric analysis i.e. to combine information requests about pages, links and domains. However, commercial search engines never return complete results and cover only 16 percent of the whole web (Lawrence & Giles, 1999). Many studies proved that results returned by search engines are unreliable and fluctuate (Ingwersen, 1998; Rousseau, 1999; Snyder & Rosenbaum, 1999; Bar-Ilan, 1999; Mettrop & Nieuwenhuysen, 2001, Shukla, 2009a). There are few studies, proved that results returned by search engines are problematic due to their variable coverage and they provide different results over a short period of time (Thelwall, 2001c, Shukla, 2009a). Thelwall (2001d) and Vaughan & Thelwall (2003) found that AltaVista is more reliable than any other and have good coverage of academic websites (Thelwall, 2001b). There are number of studies conducted on various aspects of web links based on AltaVista (Thelwall, Vaughan & Björneborn, 2005; Björneborn & Ingwersen, 2001; Li et al., 2003; Noruzi, 2005). To examine the performance of search engines over time, Bar-Ilan (1999) found that search engines loose the information content and relevant URLs (Uniform Resource Locators). In another study, Bar-Ilan (2000) examined search performance of two search engines “HotBot” and “Snap” over a period of ten days and found Snap's results were rather stable than “HotBot”. Thelwall (2001d), in a similar study conducted on various search engines over a period of seven months, found that only Google is able to respond quickly to changes and capable of finding new websites whereas AltaVista's results were very stable over time. Shukla (2009b) carried a research to extract number of backlinks against the type of academic institutions and concluded that type or category of academic institutions did not support higher backlinks. The study also established that Indian academic websites attracted more citations from commercial Web domains. In

another study, Shukla and Tripathi (2009) examined the extent of backlinks given by different domains and found that .com, .org, and .edu are most preferred domains to link to institutes of national importance websites.

Scope

The scope of work is limited to selected library websites under the category of Institutes of National Importance (<http://www.ugc.ac.in/institutes-national-importance.aspx>) and Premier Management Institutions (http://mhrd.gov.in/iim_hindi) of India. Presently, there are fifty two (52) Institutes of National Importance (INI) in India as per University Grants Commission (UGC), New Delhi (<http://www.ugc.ac.in/institutes-national-importance.aspx>). Among the institutions, there are 15 Indian Institutes of Technology (IITs), 1 IITDM at IIT Madras, 30 National Institutes of Technology (NITs), and 6 institutions belongs to different disciplines. For the study purpose, only 7 IITs (old in establishment i.e. before 2000 AD) among 15 IITs has been selected due to other 8 IITs established after 2008-2009 and still struggling for proper establishment and functioning. The 6 institutions belongs to different disciplines has been also selected for the study due to their establishment before 2000 AD. The 30 NITs and 1 IITDM at IIT Madras have been excluded from the study. There are 13 Premier Management Institutions (PMI) including 7 newly established (i.e. between 2008-2011) PMIs. Only 6 PMIs (old in establishment, before 2000 AD) have been included in the study. Though all 7 new PMIs have been established and become functional after starting of study which cannot be included in between also. Hence, the sample considered for the study is given in the Table 1. Code name for each institution is created for making references during the study.

Table 1: List of Institutions under Study (with code name, alphabetical in order)

SN	Name of Institutions (code name)	Year of estd.	Category
1.	All India Institute of Medical Sciences, New Delhi (AIIMS)	1956	INI
2.	Dakshina Bharat Hindi Prachar Sabha, Chennai (DBHPS)	1918	INI
3.	Indian Institute of Management, Ahmedabad (IIMA)	1961	PMI
4.	Indian Institute of Management, Bangalore (IIMB)	1973	PMI
5.	Indian Institute of Management, Calcutta (IIMC)	1961	PMI
6.	Indian Institute of Management, Indore (IIMI)	1996	PMI
7.	Indian Institute of Management, Kozhikode (IIMK)	1997	PMI
8.	Indian Institute of Management, Lucknow (IIML)	1984	PMI
9.	Indian Institute of Technology, Bombay (IITB)	1958	INI
10.	Indian Institute of Technology, Delhi (IITD)	1961	INI
11.	Indian Institute of Technology, Guwahati (IITG)	1994	INI
12.	Indian Institute of Technology, Kanpur (IITK)	1959	INI
13.	Indian Institute of Technology, Kharagpur (IITKGP)	1951	INI
14.	Indian Institute of Technology, Madras (IITM)	1959	INI

15.	Indian Institute of Technology, Roorkee (IITR)	1847	INI
16.	Indian Statistical Institute, Kolkata (ISIK)	1931	INI
17.	National Institute of Pharmaceutical Education and Research, Mohali (NIPER)	1998	INI
18.	Postgraduate Institute of Medical Education and Research, Chandigarh (PGIMER)	1962	INI
19.	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram (SCTIMST)	1973	INI

Legends: INI = Institutes of National Importance; PMI = Premier Management Institutions

Objectives of the study

1. To find out the extent of backlinks for the selected institutes of national importance and premier management institutions library websites;
2. To ascertain the pointing behaviour of backlinks to selected institutes of national importance and premier management institutions library websites; and
3. To ascertain the search engine that retrieves higher backlinks for selected institutes of national importance and premier management institutions library websites.

Research Methodology

The data is collected for library websites of selected nineteen institutes of national importance and premier management institutions of India. For collection of data, web browser (Internet Explorer) and four search engines (Google, AlltheWeb, AltaVista and Yahoo Site Explorer) were used as tools. Initially each institute's library website was examined to find out number of active web pages in the website and URL of each web page was recorded. This exercise was done for all selected institutes of national importance and premier management institutions library websites. Extents of backlinks were recorded for each active web page of individual library websites using search engine Google. All the backlinks for all the active web pages in the individual library website were added together and recorded during the study. Same exercise was done with search engines AlltheWeb, AltaVista and Yahoo Site Explorer. The data was collected in five rounds at the interval of one year (between the time periods of October/November, 2009 – October/November, 2013).

Time duration of data collection:

The time duration of five rounds for the longitudinal study is as follows:

- R1 = Round 1 (October/November, 2009)
- R2 = Round 2 (October/November, 2010)
- R3 = Round 3 (October/November, 2011)
- R4 = Round 4 (October/November, 2012)
- R5 = Round 5 (October/November, 2013)

Table 2: No. of Backlinks for the INI & PMI Library Websites in Different Search Engines

SEARCH ENGINES →	GOOGLE					ALLTHEWEB					ALTAVISTA					YAHOO SITE EXPLORER				
Institutes (in Code) ↓	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
AIIMS	0	0	0	0	0	2	2	3	3	3	2	2	3	3	3	8	8	12	12	12
DBHPS	No website exist for library					No website exist for library					No website exist for library					No website exist for library				
IIMA	0	0	0	0	0	14	12	14	15	18	13	13	15	15	18	11	12	16	16	21
IIMB	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
IIMC	1	2	2	2	1	6	8	8	6	12	7	8	8	6	12	12	10	11	9	28
IIMI	0	---	----	0	0	0	0	2	1	0	0	0	2	1	0	0	0	3	2	0
IIMK	3	6	8	9	6	15	20	38	36	30	15	20	40	36	33	40	56	66	71	79
IIML	0	0	0	0	0	3	4	5	2	3	3	4	5	2	3	3	3	3	2	3
IITB	6	9	4	3	6	34	41	71	67	81	35	43	71	67	83	72	80	84	82	99
IITD	12	20	20	14	7	24	31	55	47	27	26	32	57	49	27	55	65	61	56	57
IITG	1	1	1	1	1	13	14	19	20	19	14	15	19	20	18	19	20	26	27	25
IITK	1	2	2	1	2	9	10	18	16	17	10	11	18	17	18	24	26	30	26	37
IITKGP	3	4	3	2	1	16	19	26	27	55	17	22	27	28	56	39	42	47	40	41
IITM	5	9	11	13	12	25	30	35	36	42	26	32	36	37	39	52	55	51	49	78
IITR	0	1	----	0	0	1	1	3	2	2	1	1	3	2	2	1	1	2	2	4
ISIK	1	1	2	4	1	43	45	54	56	55	46	47	54	57	59	58	60	66	64	72
NIPER	No website exist for library					No website exist for library					No website exist for library					No website exist for library				
PGIMER	No website exist for library	0	0	0	0	No website exist for library	0	0	0	0	No website exist for library	0	0	0	0	No website exist for library	0	0	0	0
SCTIMST	--	0	--	0	0	--	---	--	--	--	--	---	--	--	--	--	----	--	---	--
Total	33	55	53	49	37	206	238	352	335	365	216	251	359	341	372	395	439	479	459	557
Grand Total	227					1496					1539					2329				

Legends: R1 = Round 1, R2 = Round 2, R3 = Round 3, R4 = Round 4, R5 = Round 5

Research Analysis & Discussion

Categorization of Backlinks Pointing to Library Websites

In order to study the pointing behaviour of backlinks to a library website, seven categories of library web pages have been identified which are given in Table 3.

Table 3: Categories of Library Web pages

SN	LIBRARY WEB PAGES CATEGORIES	CODE
1	Index page / homepage	IP
2	Library databases / e-journals / journals web pages	JP
3	Institutional repository / digital library web pages	DL
4	E-resources (including e-books, e-reference sources, e-standards, etc.)	ER
5	Library Web OPAC / OPAC	OP
6	Theses / e-theses / dissertations	ET
7	Other web pages ¹	OL

Note: The websites which are without any backlink are indicated by symbol “N” and websites which are not indexed by search engines are indicates by symbol “W” wherever applicable.

Further, all web pages available within an individual library website are categorized based on these seven categories of library web pages. The backlinks received by library websites of institutes of national importance and premier management institutions are assessed on the basis of seven categories of library web pages. This is important to study the pointing behaviour of backlinks on library web pages including the categories to which it is pointing. Pointing of backlinks towards library web pages indicates impact and usefulness of that web page.

On the basis of seven categories of library web pages, extent of backlinks obtained by four search engines have been recorded for all nineteen institutions library websites under study. The following tables (Table 4, 5, 6, & 7) represent the extent of backlinks pointing to different categories of library web pages in respect of each search engine.

Google distribution of backlinks:

Table 4: Distribution of Backlinks over Library Web Pages (Retrieved by Google)

Name of Institutes	Search Engine – Google					
	GR1	GR2	GR3	GR4	GR5	TOTAL
AIIMS	N	N	N	N	N	--
DBHPS	Not included due to lack of institute's library website					
IIMA	N	N	N	N	N	--
IIMB	N	N	N	N	N	--
IIMC	1 IP	2 IP	2 IP	2 IP	1 IP	8 IP
IIMI	N	W	W	N	N	--
IIMK	3 DL	1 IP, 5 DL	1 IP, 7 DL	1 IP, 8 DL	6 DL	3 IP, 29 DL
IIML	N	N	N	N	N	--
IITB	4 IP, 2 DL	6 IP, 3 DL	4 IP	3 IP	6 IP	23 IP, 5 DL
IITD	8 IP, 4 DL	11 IP, 7 DL, 2 OL	11 IP, 1 OL, 8 DL	7 IP, 1 OL, 6 DL	2 IP, 5 DL	39 IP, 30 DL, 4 OL
IITG	1 IP	1 IP	1 IP	1 IP	1 IP	5 IP
IITK	1 OL	1 IP, 1 OL	1 IP, 1 OL	1 IP	2 OL	3 IP, 5 OL
IITKGP	2 IP, 1 DL	3 IP, 1 DL	2 IP, 1 DL	2 IP	1 IP	10 IP, 3 DL
IITM	5 IP	6 IP, 1 ER, 1 ET, 1 OP	8 IP, 1 ER, 2 ET	10 IP, 1 ER, 2 ET	11 IP, 1 OL	40 IP, 3 ER, 5 ET, 1 OP, 1 OL
IITR	N	1 IP	W	N	N	1 IP
ISIK	1 IP	1 IP	2 IP	3 IP, 1 OP	1 IP	8 IP, 1 OP
NIPER	Not included due to lack of institute's library website					
PGIMER	Not included due to lack of institute's library website during first round					
SCTIMST	W	N	W	N	N	--

Legends: GR1= Google Round 1, GR2= Google Round 2, GR3= Google Round 3, GR4= Google Round 4, GR5= Google Round 5, IP = Index page / homepage, JP = Library databases / e-journals / journals web pages, DL = Institutional repository / digital library web pages, ER = E-resources (including e-books, e-reference sources, e-standards, etc.), OP = Library OPAC, ET = Theses / e-theses, OL = Other web pages, N = No backlinks, W = Website not indexed

On the analysis of backlinks data found in Table 4, it is observed that only ten (10) institutions library websites have backlinks during the study period. Three institutions were not included in the calculation, for all four search engines, due to absence of library websites during the complete research period or partial absence. Moreover, there are six (6) institutions library websites doesn't have any backlinks either due to lack of backlinks to library websites or lack of indexing of library websites in particular search engine's database. On the analysis of backlinks count to the ten (10) institutions in all five rounds, it is evident that backlinks are not permanent in nature i.e. backlinks pointing today for some website may not be pointing tomorrow for the same website.

AlltheWeb distribution of backlinks:

Table 5: Distribution of Backlinks over Library Web Pages (Retrieved by AlltheWeb)

Name of Institutes	Search Engine – AlltheWeb					
	AWR1	AWR2	AWR3	AWR4	AWR5	TOTAL
AIIMS	2 IP	2 IP	3 IP	3 IP	3 IP	13 IP
DBHPS	Not included due to lack of institute's library website					
IIMA	14 IP	12 IP	14 IP	15 IP	18 IP	73 IP
IIMB	1 OL	1 OL	1 OL	1 OL	1 OL	5 OL
IIMC	6 IP	8 IP	8 IP	6 IP	9 IP, 1 JP, 2 OL	37 IP, 1 JP, 2 OL
IIMI	N	N	2 IP	1 IP	N	3 IP
IIMK	2 IP, 13 DL	3 IP, 17 DL	3 IP, 35 DL	3 IP, 33 DL	6 IP, 24 DL	17 IP, 122 DL
IIML	2 OL, 1 JP,	1 IP, 2 OL, 1 JP	1 IP, 2 JP, 2 OL	1 JP, 1 OL	2 OL, 1 JP	2 IP, 9 OL, 6 JP
IITB	31 IP, 1 ET, 2 DL	35 IP, 2ET, 4 DL	57 IP, 11DL, 3JP	57 IP, 10 DL	66 IP, 1 OL, 12 DL, 2 JP	246 IP, 3 ET, 39 DL, 5 JP, 1 OL
IITD	16 IP, 8 DL	20 IP, 1 OL, 10 DL	24 IP, 1 OL, 30 DL	19 IP, 1 OL, 27 DL	25 DL, 2 OL	79 IP, 100 DL, 5 OL
IITG	12 IP, 1 OP	13 IP, 1OP	18 IP,1OP	19 IP, 1OP	18 IP, 1 OP	80 IP, 5 OP
IITK	8 IP, 1 OL	9 IP, 1 OL	16 IP,2OL	14 IP,2OL	15 IP, 2 OL	62 IP, 8 OL
IITKGP	14 IP, 2 DL	17 IP, 2DL	23 IP, 2DL, 1ER	25 IP, 1DL, 1 ER	53 IP, 2 ER	132 IP, 7 DL, 4 ER
IITM	18 IP, 3ER, 2 OL, 2 JP	20 IP, 1 JP 3 ER,2OL, 2 ET, 2 OP	23 IP, 2 JP, 4 OL,1OP 3ER, 2ET	26 IP,1OP 4OL,1JP 3 ER,1ET,	25 IP, 1JP, 8 OL, 5ER, 3 OP	112 IP, 17 ER, 20 OL, 7 JP, 5 ET, 7 OP
IITR	1 IP	1 IP	3 IP	2 IP	2 IP	9 IP
ISIK	41 IP, 2 OP	44 IP, 1 OP	51 IP, 1 OP, 2 JP	55 IP, 1 OP	52 IP, 2OP, 1 JP	243 IP, 7 OP, 3 JP
NIPER	Not included due to lack of institute's library website					
PGIMER	Not included due to lack of institute's library website during one round					
SCTIMST	W	W	W	W	W	--

Legends: AWR1= AlltheWeb Round 1, AWR2= AlltheWeb Round 2, AWR3= AlltheWeb Round 3, AWR4= AlltheWeb Round 4, AWR5= AlltheWeb Round 5

In Table 5, there are fifteen (15) institutions library websites have backlinks. Only one institution library websites doesn't have any backlinks due to lack of indexing of library websites in particular search engine's database. On analyzing the backlinks count to the fifteen institutions library websites, again it is evident that backlinks are not permanent in nature. Sometimes backlinks are pointing towards some web page of library websites and in next round those backlinks are increasing or decreasing suddenly.

AltaVista distribution of backlinks:

Table 6: Distribution of Backlinks over Library Web Pages (Retrieved by AltaVista)

Name of Institutes	Search Engine – AltaVista					
	AVR1	AVR2	AVR3	AVR4	AVR5	TOTAL
AIIMS	2 IP	2 IP	3 IP	3 IP	3 IP	13 IP
DBHPS	Not included due to lack of institute's library website					
IIMA	13 IP	13 IP	15 IP	15 IP	18 IP	74 IP
IIMB	1 OL	1 OL	1 OL	1 OL	1 OL	5 OL
IIMC	7 IP	8 IP	8 IP	6 IP	9 IP, 1 JP, 2 OL	38 IP, 1 JP, 2 OL
IIMI	N	N	2 IP	1 IP	N	3 IP
IIMK	2 IP, 13DL	3 IP, 17DL	3 IP, 37 DL	3 IP, 33 DL	6 IP, 27DL	17 IP, 127 DL
IIML	2 OL, 1JP	1 IP, 2OL, 1 JP	1 IP, 2 JP, 2 OL	1 JP, 1 OL	2 OL, 1 JP	2 IP, 9 OL, 6 JP
IITB	31 IP, 2ET, 2DL	36 IP, 3ET, 4DL	57 IP, 3JP, 11DL	57 IP, 10 DL	66 IP, 4JP, 1OL, 12DL	247 IP, 5 ET, 39 DL, 7 JP, 1 OL
IITD	16 IP, 10 DL	21 IP, 1OL, 10DL	24 IP, 1OL, 32DL	19 IP, 1OL, 29DL	2 OL, 25 DL	80 IP, 106 DL, 5 OL
IITG	13IP, 1OP	14IP, 1OP	18 IP, 1 OP	19 IP, 1OP	17 IP, 1OP	81 IP, 5 OP
IITK	9 IP, 1OL	10 IP, 1OL	16 IP, 2OL	15 IP, 2OL	16 IP, 2OL	66 IP, 8 OL
IITKGP	15IP, 2DL	19IP, 3 DL	23IP, 3DL, 1 ER	26 IP, 1 DL, 1ER	54 IP, 2ER	137 IP, 9 DL, 4 ER
IITM	18IP, 3ER, 4OL, 1JP	21IP, 1 JP, 3 ER, 3OL, 2 ET, 2OP	23IP, 2 JP, 3 ER, 4OL, 2 ET, 2OP	26IP, 1 JP, 3 ER, 1ET, 2 OP, 4OL	24IP, 1 JP, 6 OL, 5ER, 3 OP	112 IP, 6 JP, 17 ER, 5 ET, 9 OP, 21 OL,
IITR	1 IP	1 IP	3 IP	2 IP	2 IP	9 IP
ISIK	42 IP, 2OP, 2 JP	44 IP, 2JP, 1 OP	51 IP, 2 JP, 1 OP	56 IP, 1 OP	53 IP, 3 OP, 3 JP	246 IP, 8 OP, 9 JP
NIPER	Not included due to lack of institute's library website					
PGIMER	Not included due to lack of institute's library website during one round					
SCTIMST	W	W	W	W	W	--

Legends: AVR1= AltaVista Round 1, AVR2= AltaVista Round 2, AVR3= AltaVista Round 3, AVR4= AltaVista Round 4, AVR5= AltaVista Round 5

On analyzing the backlinks data found in Table 6, it is found that result is same as given with AlltheWeb search engine (in Table 5), except extent of backlinks. Result retrieved by AltaVista displays that there may be some close analogy with search engine AlltheWeb in terms of fetching database records or database search strategy.

Yahoo Site Explorer distribution of backlinks:

Table 7: Distribution of Backlinks over Library Web Pages (Retrieved by Yahoo Site Explorer)

Name of Institutes	Search Engine – Yahoo Site Explorer					
	YSER1	YSER2	YSER3	YSER4	YSER5	TOTAL
AIIMS	8 IP	8 IP	12 IP	12 IP	12 IP	52 IP
DBHPS	Not included due to lack of institute's library website					
IIMA	11 IP	12 IP	16 IP	16 IP	21 IP	76 IP
IIMB	1 OL	1 OL	1 OL	1 OL	1 OL	5 OL
IIMC	12 IP	10 IP	11 IP	9 IP	17 IP, 1 JP, 10 OL	59 IP, 1 JP, 10 OL
IIMI	N	N	3 IP	2 IP	N	5 IP
IIMK	8 IP, 32 DL	10 IP, 46 DL	11 IP, 55 DL	12 IP, 59 DL	13 IP, 66 DL	54 IP, 258 DL
IIML	2 OL, 1 JP	2 OL, 1 JP	2 JP, 1 OL	2 JP	2 OL, 1 JP	7 OL, 7 JP
IITB	64 IP, 1 ET, 7 DL	68 IP, 3 ET, 9 DL	69 IP, 15 DL	69 IP, 13 DL	83 IP, 4 JP, 11 DL, 1 OL	353 IP, 4 JP, 4 ET, 55 DL, 1 OL
IITD	13 IP, 41 DL, 1 OL	16 IP, 4 OL, 45 DL	16 IP, 1 OL, 44 DL	16 IP, 40 DL	3 OL, 54 DL	61 IP, 224 DL, 9 OL
IITG	18 IP, 1 OP	19 IP, 1 OP	24 IP, 2 OP	25 IP, 2 OP	24 IP, 1 OP	110 IP, 7 OP
IITK	22 IP, 2 OL	24 IP, 2 OL	27 IP, 3 OL	23 IP, 3 OL	32 IP, 5 OL	128 IP, 15 OL
IITKGP	36 IP, 1 JP, 2 DL	37 IP, 1 JP, 4 DL	42 IP, 5 DL	38 IP, 2 DL	40 IP, 1 ER	193 IP, 2 JP, 13 DL, 1 ER
IITM	21 IP, 5 JP, 9 ER, 4 OP, 3 ET, 10 OL	32 IP, 1 JP, 5 ER, 4 ET, 9 OL, 4 OP	27 IP, 3 JP, 6 ER, 4 ET, 9 OL, 2 OP	30 IP, 2 JP, 6 ER, 2 ET, 7 OL, 2 OP	37 IP, 4 JP, 17 OL, 12 ER, 3 ET, 5 OP	147 IP, 15 JP, 38 ER, 17 OP, 16 ET, 52 OL
IITR	1 IP	1 IP	2 IP	2 IP	4 IP	10 IP
ISIK	55 IP, 2 OP, 1 JP	57 IP, 1 JP, 2 OP	63 IP, 2 JP, 1 OP	63 IP, 1 OP	66 IP, 3 JP, 3 OP	304 IP, 7 JP, 9 OP
NIPER	Not included due to lack of institute's library website					
PGIMER	Not included due to lack of institute's library website during one round					
SCTIMST	W	W	W	W	W	--

Legends: YSER1 = Yahoo Site Explorer Round 1, YSER2 = Yahoo Site Explorer Round 2, YSER3 = Yahoo Site Explorer Round 3, YSER4 = Yahoo Site Explorer Round 4, YSER5 = Yahoo Site Explorer Round 5

In Table 7, fifteen (15) institutions library websites have backlinks. Besides this, one institution library website doesn't have any backlinks due to lack of indexing of library websites. Three institutions library websites have not been included in the study due to lack of library website in all rounds of data collection or due to partial absence. Further, on the analysis of backlinks count, again, Yahoo Site Explorer has also shown that backlinks are not permanent for any library website.

Summary of Categorization of Backlinks Pointing to Library Websites

The backlinks received by institutions library websites are summarized individually. The total backlinks received through all four search engines by each of the library websites are distributed as per seven categories. The following table (Table 8) represents the summary of distribution of overall backlinks according to seven categories of library web pages for institutions library websites. On analyzing the backlinks categorically, it is found that majority of backlinks (70.20%) pointed towards index page/homepage of library websites (IP category), whereas 1.56% towards electronic journals/online databases (JP category), 01.50% towards E-resources (ER category); 1.36% towards Web OPAC (OP category) and 20.85% towards institutional repository/digital library (DL category) web pages. There are very less no of backlinks pointed towards theses/e-theses (ET category) i.e. only 0.77% whereas 03.76% backlinks pointed towards “Other web pages” (OL category) which includes rest of the library web pages.

Table 8: Summary of Distribution of Backlinks over Web pages of Institutions' Library Websites

Name of Institutes	Library Web pages Categories							TOTAL
	IP	JP	DL	ER	OP	ET	OL	
AIIMS	78	--	--	--	--	--	--	78
DBHPS	Not included due to lack of institute's library website							--
IIMA	223	--	--	--	--	--	--	223
IIMB	--	--	--	--	--	--	15	15
IIMC	142	3	--	--	--	--	14	159
IIMI	11	--	--	--	--	--	--	11
IIMK	91	--	536	--	--	--	--	627
IIML	4	19	--	--	--	--	25	48
IITB	869	16	138	--	--	12	3	1038
IITD	259	--	460	--	--	--	23	742
IITG	276	--	--	--	17	--	--	293
IITK	259	--	--	--	--	--	36	295
IITKGP	472	2	32	9	--	--	--	515
IITM	411	28	--	75	34	31	94	673
IITR	29	--	--	--	--	--	--	29
ISIK	801	19	--	--	25	--	--	845
NIPER	Not included due to lack of institute's library website							--
PGIMER	Not included due to lack of institute's library website during one round							--
SCTIMST	--	--	--	--	--	--	--	--
Total	3925	87	1166	84	76	43	210	5591
Percentage	70.20	1.56	20.85	1.50	1.36	0.77	3.76	100

Legends: IP = Index page / homepage, JP = Library databases / e-journals / journals web pages, DL = Institutional repository / digital library web pages, ER = E-resources (including e-books, e-reference sources, e-standards, etc.), OP = Library OPAC, ET = Theses / e-theses, OL = Other web pages

Discussion

The backlinks retrieved by Google, AlltheWeb, AltaVista and Yahoo Site Explorer for Institutes of National Importance (INI) & Premier Management Institutions (PMI) library websites are analyzed and it is observed that index page/homepage of library websites attracted the highest number of backlinks than any other web pages of library websites. There are quite good number of backlinks available for digital libraries web pages also. The good number of backlinks for index pages indicates the impact of index page/homepage of library website indicating the content richness of library web pages. Digital library/institutional repository web pages have also received quite good number of backlinks which display the impact of digital libraries/institutional repositories over other web pages of library websites except index pages and proved the content importance which mostly a user will look for.

Distribution of Backlinks - INI Library Websites

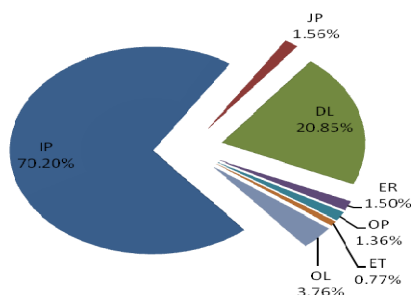


Fig. 1: Overall distribution of Backlinks on Library Web Pages

Conclusion

The backlinks retrieved by search engines Google, AlltheWeb, AltaVista and Yahoo Site Explorer for INI & PMI library websites are analyzed and observed that index page/homepage of library websites have attracted the highest number of backlinks than any other web pages of library websites. The index page/homepage is a web page which is connected with each internal web page available in the website and functions as gateway for the whole website. There may be two reasons for the highest number of backlinks attraction to index page/home page are; one the index page itself may attract other websites to link and; second the information content available on the index page is very rich. Digital library web pages have attracted a significant number of backlinks but less than index page/homepage of library websites. Since, digital library/institutional repository web pages are hyperlinked with the index page/homepage of library websites, due to a part of library websites, other [hyperlinking] websites are not paying much attraction to hyperlink these rather than index page/homepage. Some websites have provided hyperlink to digital library web pages within

the index page/homepage of library website which have very specific web content or purpose related to digital content. Few of the backlinks are attracted at journals, e-resources and Web OPAC pages of library websites. The backlinks to “Other web pages” are also witnessed. It is evident that journals, e-resources and Web OPAC pages are less important than index page/home page of library websites in terms of pointing behavior of links. This analysis indicates, if, library websites have provided useful information on pages, then it may attracts more backlinks. Further among all four search engines, on analyzing Table 2, it is found that Yahoo Site Explorer has retrieved maximum number of backlinks than others. This indicates Yahoo Site Explorer is more reliable than Google, AlltheWeb and AltaVista in terms of backlinks study.

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ⁱ Category of "Other web pages" includes web pages of library collection, library services, library sections, library facilities, library rules, library history / introduction etc.