

KNOWLEDGE RESOURCES HERITAGE OF INDIA: A WEBOMETRIC ANALYSIS

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Dr. S. K. Sonkar

Assistant Professor

SUBMITTED BY

Uttkarsh

BABASAHEB
BHIMRAO
AMBEDKAR
UNIVERSITY



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(A CENTRAL UNIVERSITY)
VIDYA VIHAR, RAEBARELI ROAD LUCKNOW, UTTAR PRADESH

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Declaration

I hereby declare that this dissertation entitled “**KNOWLEDGE RESOURCES HERITAGE OF INDIA: A WEBOMETRIC ANALYSIS**” submitted by me for the award of the Degree of Master of Philosophy in Library and Information Science to the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh is a record of research carried out by me under the supervision of **Dr. S. K. Sonkar**, Assistant Professor in Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh. To the best of my knowledge any part or whole of the dissertation has not been submitted elsewhere for the award of any other degree or any qualification of any University or examining body.

Date:

Place:

(Uttkarsh)

Research Scholar (M. Phil.)
Department of Library and Information Science
Babasaheb Bhimrao Ambedkar University
Vidya Vihar, Rae Bareli Road
Lucknow - 226025 (U.P.)

CERTIFICATE

This is to certify that the dissertation entitled “**KNOWLEDGE RESOURCES HERITAGE OF INDIA: A WEBOMETRIC ANALYSIS**” submitted by **Mr. Uttkarsh** is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

The dissertation submitted to **Babasaheb Bhimrao Ambedkar University, Lucknow** satisfies all the requirements as stipulated in the Master of Philosophy (M. Phil.) regulations- 2019 and it is fit for submission and evaluation for the award of degree of Master of Philosophy in Library and Information Science of the University.

Date:

Place:

Supervisor

Head of Department

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Date:

Place:

(Utkarsh)

Preface

Information science is an interdisciplinary field that encompasses the study of the production, organisation, storage, retrieval, dissemination and use of information. The websites of institutions has become one of the main sources of information in academic and research activities. The development of internet technology, especially TCP/IP, WWW, accelerated the popularity and services of internet and one can easily access linked throughout the globe with the help of WWW. Webometrics is a websites analysis such as link structure analysis which includes the analysis of Self Links, Hyperlink, External links, In-links and co-links. It also includes Web Impact Factor, search engine performances, webpage content analysis and web usage analysis. The website developer should maintain the website regularly to give updated information to the visitors. This will encourage more visitors to the website resulting to great exposure of the library or organisations and its contents. Therefore the present study “**Knowledge Resources Heritage of India: A Webometric Analysis**” analyses the Knowledge Resources of India, Ministry of Culture, Government of India, webometrically.

There are 5 chapters in the dissertation and chapters are arranged as follows:

Chapter 1 – Introduction- Deals with the concepts of the Webometrics, need of the study, objectives, hypotheses, scope of the study and methodology taken for data collection and analysis.

Chapter 2- Review of Literature- This chapter deals with the review of literature.

Chapter 3- Knowledge Resources Heritage: Profile- This chapter deals with the brief information about all the Knowledge Resources Heritage of India.

Chapter 4 – Data analysis and Interpretation- This chapter gives the insights of the tools used in data collection and deals with the analysis of the results and interpretations of the results.

Chapter 5 – Findings, Suggestions and Conclusion- This chapter includes the findings, suggestions and conclusion.

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Chapter 1
Introduction

Chapter 1

Introduction

1.1 Introduction

Information technology revolutionized the way of communication and sharing of information and after the invention of Internet which boost the information technology on another level which help in communication and retrieval of information. In nearly 3 decades of the invention of the Internet, it becomes one of the very important part of day-to-day life of human life. Other than communication, Internet plays vital role in influencing the education and business. In the current era of human civilisation people are very keen to know about different culture and their heritage so it is necessary for the websites of these resources put relevant and updated information.

The World Wide Web is a collection of documents linked over the Internet. WWW work as a node which connects the information to one another through hypertext. The information/ document on the web is written or layout, is in Hypertext Markup Language (HTML). From one web page to another web page which creates link between them is called as Hyperlink and these hyperlinks are called as hypermedia when images or any other multimedia is attached with the hyperlink.

1.2 Webometrics

Metric studies in Library and Information Science was started long back. In the field of metric studies Librametrics, Bibliometrics, Scientometrics and Informetrics are well known. There are vast studies has been carried out on these areas of metrics studies. Those metrics studies were all about to measure the scholarly communication, to identify research trend, to find the growth of knowledge, etc.

Since the mid-1990's increasing effort have been made to investigate the nature and properties of the World Wide Web by applying modern informetric methodologies to its space of contents, link structures and search engines (Bjorneborn and Ingwersen, 2001).¹ In 1997, Almind and Ingwersen used the term 'webometrics'

for the first time and identified that to measure the documents and information, web would be the important source (Almind and Ingwersen, 1997).²

In other words, we can say that quantitative analysis of the web sources is called as webometrics. Webometricians are the person who carry out the webometric study. The term ‘cybermetrics’ and ‘nettometrics’ used contemporary to the ‘webometrics’.

Earlier webometrics also considered as and still relevant that it is a application of bibliometric techniques to measure the different aspects of the websites. The measuring aspects of the websites as a webometrics study are such as number of web pages, keywords, hyperlinks, web search engine results, traffic on websites, pageviews, in-links, etc.

Bjorneborn and Ingwersen (2004)³ given webometrics accepted definition as “the study of web-based phenomena using quantitative techniques and drawing upon informetric methods”.

Thelwall (2009)⁴ defined webometrics as “the study of web content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study”.

Webometric analysis is a study of four aspects of the websites-

1. Analysis of links structure of the websites.
2. Content analysis of web pages.
3. Search engine performance.
4. Usage analysis of web.

1.2.1 Content Analysis of Web Pages

There are many studies which focused on the content of the websites. It helps in analysis of systematic organisation of information on the webpages. Content analysis is very helpful for students, researchers, scientists who seek information through Internet and it help in accessing the content efficiently. It analyses the arrangement of content on the websites and uses keywords to identify information.

1.2.2 Analysis of Links Structure of the Websites.

Analysis of links structure is quantitative study of hyperlinks between number of web pages. It is also a study of patterns of linking in the website itself and between the other websites. Link analysis gives the counts and analysis of external links, internal links and in-links.

1.2.3 Search Engine Performance

Search engine performance is a kind of evaluation of search engine. Search engines are also a website but it has more technology than general websites. Through evaluation, search engine improve their effectiveness in retrieval of information.

1.2.4 Web Usage Analysis

It maintains the users log file, analyses the browsing behaviour of the users and analysis for security applications. It is helpful in discovery and analysis of web usage patterns.

1.3 Web Impact Factor

Web Impact Factor is an average frequency of links of a particular website. WIF was developed by Ingwersen in 1998. Web impact factor work as a quantitative indicator of the website. It is a methodology of webometric studies. Web impact factor of websites vary from one search engine to another, so it can act as an indicator for evaluation of search engine performance too.

There are four types of links, so there are four types of WIF:

- I. **Simple Web Impact Factor:** It is a rate of links/ hyperlinks to the total number of web pages in the website.
- II. **Self-link Web Impact Factor:** It is a rate of self-links or internal links within in the website to the total number of web pages in the website.
- III. **External Link Web Impact Factor:** It is a rate of external link to the website, to the total number of web pages of the website.
- IV. **Revised Web Impact Factor:** It is a rate of in-links in the website to the total number of web pages of the website.

1.3.1 Advantages of Web Impact Factor

The major advantages and utilities of WIF include the following (Li 2003):

1. The WIF provides a quantitative indicator of the websites long – term influence. In the final analysis, impact simply reflects the ability to web sites and webmasters to attract users and cybercitizens, and consequently backlinks.
2. Total WIFs of national sector and larger segments or top-level domains are calculable. The variation of the WIF over different snapshots taken within short intervals exists.
3. WIF analysis presents a methodology for evaluating “international visibility” and impact of institutional and academic web sites, and their relations to other web sites. The WIF can be regarded as a useful tool to measure relative visibility of a company, organization or country on the web. It must be noted that the WIF is not the only indicator of the use, visibility and popularly of a web site.
4. WIF provides a way to evaluate website’s relative importance, especially when it is compared to others in same field. Therefore, to compare web sites, we do not compare web sites in different research field. So, the WI measures the success and relative influence to similar web sites.
5. The WIF may in turn provide novel insights into the retrieval process on the web. For instance, clusters of web sites can be detected by means of link page cooccurrence. The WIF can be regarded as a tool for meaning the accuracy of web search engine performance, web site organization, linking, and structuring of pages.

1.4 Statement of the Research Problem

“Knowledge Resources Heritage of India: A Webometric Analysis”

1.5 Objectives

Following are the objectives of the study:

1. To classify the domain of the websites.

2. To calculate the number of domain authority and page authority of the websites.
3. To calculate the external and internal links of the websites of the Knowledge Resources Heritage.
4. To find out the number of discovered and lost linking domains.
5. To evaluate the simple Web Impact Factor, self-link Web Impact Factor, external web impact factor and revised web impact factor.
6. To reveal the world traffic rank, pageviews and in-links through Alexa Web Ranking Tool.
7. To find out the Google PageRank of the Websites.

1.6 Hypotheses

Hypotheses for the study are as follows, on the basis of objectives:

1. Websites have different types of web domain name.
2. There are less lost linking domains of the websites.
3. There is significant difference between internal and external links among the websites.
4. There is similarity between self-link web impact factor and external web impact factor among the websites.
5. Global traffic rank of among the websites is significantly different using Alexa Web Ranking Tool.

1.7 Scope of the Study

The scope of the study includes the 16 websites of Knowledge Resources Heritage under Ministry of Culture, Government of India. Following are the lists of the Knowledge resources Heritage-

Table 1.1**Knowledge Resources Heritage of India**

S. No.	Knowledge Resources Heritage	Website Links	Est. Year	Location
1.	Rampur Raza Library	http://razalibrary.gov.in/	1774	Rampur, Uttar Pradesh
2.	Asiatic Society	https://www.asiaticocietykolkata.org/	1784	Kolkata, West Bengal
3.	National Archives of India	http://nationalarchives.nic.in/	1891	Kolkata, West Bengal
4.	Khuda Baksh Oriental Public Library	http://kblibrary.bih.nic.in/	1891	Patna, Bihar
5.	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library (TMSSML)	http://www.tmsmlibrary.com/	1918	Thanjavur, Tamil Nadu
6.	Anthropological Survey of India (ANSI)	https://ansi.gov.in/	1945	Kolkata, West Bengal
7.	Delhi Public Library (DPL)	https://dpl.gov.in/	1951	Delhi
8.	National Library	https://www.nationallibrary.gov.in/	1953	Alipore, West Bengal
9.	Central Reference Library	http://crlindia.gov.in/	1955	Kolkata, West Bengal
10.	Nehru Memorial Museum and Library (NMML)	http://nehrumemorial.nic.in/en/	1964	New Delhi
11.	Central Institute of Higher Tibetan Studies (CIHTS)	https://cihts.ac.in/webpage/index.aspx	1967	Sarnath, Uttar Pradesh
12.	Raja Rammohun Roy Library Foundation (RRRLF)	http://rrrlf.nic.in/	1972	Kolkata, West Bengal
13.	Indira Gandhi Rashtriya Manav Sangrahalaya (IGRMS)	https://igrms.gov.in	1978	Bhopal, Madhya Pradesh

14.	Gandhi Smriti and Darshan Samiti (GSDS)	https://www.gandhismiti.gov.in/	1984	New Delhi
15.	Maulana Abul Kalam Azad Institute of Asian Studies (MAKAIAS)	http://makaias.gov.in/	1993	Kolkata, West Bengal
16.	Central Institute of Himalayan Cultural Studies (CIHCS)	http://www.cihcs.edu.in/	2003	Dahung, Arunachal Pradesh

1.8 Methodologies

The study is aimed to analyse the 16 websites of knowledge resources heritage of India webometrically. Few Search Engine Optimization (SEO) tools were used to collect required data such as Open Site Explorer (www.opensiteexplorer.org), Alexa Internet (www.alexa.com/siteinfo/) and Check PageRank (<https://checkpagerank.net/>). Google search engine (www.google.com) was also used to collect required data using Boolean formula.

1.9 Significance of the Study

In recent year tourism in India increased exponentially and people visits the country to understand the culture. It might be possible that people before visiting the place they search on Internet about the places to visit, also researcher and information seeker access websites to get the desired information about the heritages. So, in this context it is necessary to evaluate the effectiveness of the website functioning, its structure and its content.

1.10 Structure of Dissertation

The dissertation has been presented in 5 chapters:

Chapter 1 – Introduction- Deals with the concepts of the Webometrics, need of the study, objectives, hypotheses, scope of the study and methodology taken for data collection and analysis.

Chapter 2- Review of Literature- This chapter deals with the review of literature.

Chapter 3- Knowledge Resources Heritage: Profile- This chapter deals with the brief information about all the Knowledge Resources Heritage of India.

Chapter 4 – Data analysis and Interpretation- This chapter gives the insights of the tools used in data collection and deals with the analysis of the results and interpretations of the results.

Chapter 5 – Findings, Suggestions and Conclusion- This chapter includes the findings, suggestions and conclusion.

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Chapter 2
Review of Literature

Chapter 2

Review of Literature

2.1 Introduction

Literature review is a process in which extensive study of the available literature related to the area of research, to get deep understanding about the topic, to find out how many ways that particular topic is explained and applied. Any published sources such as articles in journals, research paper in conferences, research abstracts, chapters of books, theses, websites, dissertations, etc. might be reviewed. Through extensive digging of the published literature researcher can design its research in more precise manner and get maximum benefits from the published sources in minimizing the research gap in the subject area.

The studies of webometrics can be categorised in many ways but here literature published in the field of webometrics is divided into 4 categories given below as per requirement and arranged in earlier to recent.

2.2 Studies of Categories of Webometrics

The review of literature goes from earlier to recent studies in the following categories:

1. Development of webometrics
2. Web link Analysis
3. Web Impact Factor
4. Website evaluation

2.3 Development of Webometrics

Almind and Ingwesen (1997)¹ in their paper, Informetric Analysis on the World Wide Web, Methodological Approaches to ‘Webometrics’, used the term ‘webometrics’ for the first time. In this case study, they applied informetric methods to world wide web so, these methods can be used to perform webometric analyses. In the case study, they compared the Danish proportion of world wide web to the other Nordic

countries and they found that Nordic countries are way forward than Denmark in analyses.

Abraham (1997)² believed that World Wide Web will be explosive in expansion and used the term 'global brain' for WWW. He alongside with others developed a tool of webometry which called tools of Web Watch. He has given a step-by-step strategy for visualization of complexity of WWW, which he sees it as a neural net and morphogenesis of WWW.

Rousseau (1997)³ explored the distribution of domain names and the links distributed among the websites over the Internet. In study, the word 'situation' is used to allocate the relation between the sites/ websites over the Internet. In their study, they are not concerned about the number of links on a particular web page but focused and interested in the number of times the particular web pages is referred to. Through this study he wanted to show, how Internet is Volatile.

Wormell (1998)⁴ presented the possibilities of 'informetrics' emerging as a sub-discipline of Information Science where one can explore the online database and use 'informetrics' as a analytical tool. Using 'informetrics' one can explore the trend, development in the society, scientific disciplines, utility areas, etc.

Bar-Ilan (2000)⁵ in her study addressed the question whether the Web can serve as an information source for research. Using content analysis, she analysed the retrieved web pages from various search engines on June 7, 1998, as a result of the query 'informetrics or informetric'. She extracted the bibliographical references from the web pages which was taken for the analysis and then compiled the list of most productive authors, most cited authors, works and sources are compiled.

Owen and Willet (2000)⁶ described the webometric analysis of links relation to the websites associated with departments of LIS of UK universities. They used the advanced search feature of AltaVista- link:address and url:address to find the number of link of specific website. This paper reports that the granularity of the webometric analysis is at higher level. In last they concluded that, to boost the web visibility of the websites the LIS department have to host a wide range of types of materials as much as possible.

Fugl (2001)⁷ defined the rules which are important to keep in mind while or before performing the webometrics analyses. Also described the basic elements that constitute the base for webometric analysis- (a) documents being analysed, and (b) the tools used to collect data. The study presented the detailed concepts of citation theory and link theory. Study also deals with the tool which are available for the data collection and reviewed the link topology of the Internet. A tool developed by him was Link Agent to collect data.

Bjorneborn and Ingwersen (2001)⁸ investigated the nature and properties of Web in the perspective of modern informetric methodologies. The study attempted to show the interesting progress in webometric in selected areas and also demonstrated the development in untouched areas of webometrics. The paper also investigated the search engine coverage and performance. Problem regarding in calculating the Web Impact Factor is discussed in detail.

Thelwal (2002)⁹ surveyed the size of 670 websites of higher education institutions in countries associated with the European Union. They used AltaVista search engine to collect the data. They found that rich countries have larger university websites. In study they found that there were numbers of websites large in size but only few pages were indexed by the AltaVista.

Gopalkrishnan, Ambuja and Seetharama (2002)¹⁰ conducted a webometric analysis to analyse the nature and pattern of citation of Information Scientists in 'Annual Seminar on Electronic sources of Information' and 'Journal of Documentation, vol.55, 1999'. in study they found that 61% of citation were from web-citations in 'seminar volume' while 26% web-citations were reported in the volume of 'Journal of Documentation'. In last they concluded that web-citations will replace other citations in future.

Thelwall and Vaughan (2004)¹¹ presented overall theoretical framework and many different approaches of webometrics and its applications. They stated that Quantitative studies of hyperlinks have broader potential applications than bibliometric studies of citations.

Bjorneborn and Ingwersen (2004)¹² explained webometric within the framework of informetric studies and bibliometrics as a part of library and information

science, and associated webometrics with cybermetrics as a generic subfield. They investigated the link structure between the web nodes in webometric analysis.

Kaliczyńska (2004)¹³ in paper ‘Webometrics - can we measure the internet?’. Discussed the issues related to the webometrics such as the science which allow in conducting the researches over model and content of the Internet.

Ingwersen (2006)¹⁴ discussed the expansion of webometrics in the period of 10 years and he found that there was enormous amount of study in the field of webometrics. There were increase in reports and journal articles on webometric researches.

Pinto (2007)¹⁵ evaluated the Spanish public university websites dedicated to the European Higher Education Area (EHEA). Using 7 criteria they analysed the resources of the websites and the criteria used for analysis were visibility, authority, updates, accessibility, correctness and completeness, quality assessment and navigability. This study helped the university to know their weaknesses and which aspects needs improvement.

Thelwall (2008)¹⁶ discussed the usefulness of web connectivity among the research groups and explained in detail about the hyperlink- based techniques in achieving web connectivity. They used search engine to collect data using query syntax, LexiURL for link analysis and graphed the link data in appropriate ways. They found that webometrics could provide wide range to evaluate the web presence of research groups internationally.

Samir, Subal, and Mukhopadhyay (2009)¹⁷ studied the trend of bibliometrics to webometrics. They discussed in detail about the application areas of webometric, methodologies for data collection and tools and techniques used for analysis. Also described the method for calculating Web Impact Factor. In this study, the also carried out a webometric case study of Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs).

Aguillo (2010)¹⁸ introduced the Ranking Web of World Repositories with the objective promote Open access initiatives (OAI) supporting the use of repositories for scientific evaluation purposes. They discussed the set of metrics used for the evaluation such as web presence, impact and usage. For the visibility, external links received by

the repositories were taken into consideration. In study they found that there is strong presence of USA, German and British institutional repositories.

Mukherjee (2011)¹⁹ in his paper ‘Bibliometrics to Webometric: the changing context of Quantitative research’ divided the era of quantitative research Internet in two categories that is pre-WWW and post WWW. In pre-WWW era the focus was on conceptualisation and development of terms librarmetry, bibliometrics, scientometrics, informetrics while in post WWW era he discussed the webometrics and cybermetrics. Further in the study he discussed the various tools and techniques used in webometrics researches.

Minguillo and Thelwall (2012)²⁰ in their paper ‘Mapping the network structure of science parks: An exploratory study of cross-sectoral interactions reflected on the web’ aimed to introduce a method based on link structure. They selected 3 parks from Yorkshire and the Humber in UK to analyse webometrically and through social network analysis techniques and collected data using Yahoo!, Bing and SocSciBot.

Prabakan (2014)²¹ in his study titled ‘Hyperlink analysis and web impact factor of websites of observatory libraries’ examined the 41 websites of national and international observations. They done the hyperlink analysis, web impact factor and ranking.

Ninkov and Vaughan (2017)²² stated that “Webometrics research methods can be effectively used to measure and analyze information on the web”. They analysed the collected data for webometric study in both qualitatively and quantitatively. In study they suggested that professional information should be promoted more effectively on the web.

2.4 Web Link Analysis

Thelwall (2002)²³ conducted study on websites of 108 UK universities and the study was the comparison of three methods used to collect data that was the directory, the domain and the whole university site. On the basis of theoretical analysis, qualitative study and statistics, it is found that to count links between the websites is way better in directory and domain model than file model.

Vaughan and Hysenn (2002)²⁴ in their study found that there is a significant relation between the external links and the Journal Impact Factor of Library and Information Science journals. They also found that the journal which have high Journal Impact Factor attracts large amount of external links. In last, they concluded that selection of search engine for data collection could affect the conclusion of the study.

Thelwall (2004)²⁵ stated in his paper 'Interpreting Social Science Link Analysis Research: A Theoretical Framework' that link analysis is established technique in various forms and reflects the importance of the links and the web. He concluded that interpretation of link is required in link analysis, there is no single method for link interpretation is perfect and in last the final comment was theory of link analysis is not possible.

Park (2004)²⁶ examined the how South Korea is connected to Taiwan over web using search engine. On analysing the types of information shared using the hyperlinks it is found that most of the South Korean web pages were hyperlinked to those web pages of Taiwan which offers content on 'computers and Internet'.

Thelwall (2006)²⁷ elaborated that algorithm of search engine which decides the order of link on search result page which considers the number and quality of links among the pages matched. In study he found that approximately one-third of business sites do not carry links to external sites. About 17% sites carried links which provide services to the customers.

David, Thelwall and Harries (2007)²⁸ investigated through detailed classification of 2600 links from universities, commercial and other domain to find the potential of web links to act as an indicator of collaboration which reflects the importance of collaboration depending on the source page owner and targeted top-level domain. They concluded that cluster of links might show an indicator of collaboration between two organisations.

Shukla and Tripathi (2009)²⁹ studied how web impact as a measure for testing the effectiveness of the academic institute. They examined the backlinks of the institutes of national importance and to collect data they used a software programme 'Backlink Analyser'. There were two bases for ranking of institute. The result of the study shows that there were higher number of backlinks in average technical institute than any other institutes.

Holmberg (2010)³⁰ studied the use of co-inlinks to local government sites and found that municipalities of same region has frequent co-inlinks more than municipalities of different region. In study he found that geographical location influences the co-links. There is limitation in geographical patterns of co-inlinking. In last they concluded that co-inlinking is strongest on functional areas which able in forming the map cooperation between the municipalities.

Jalal, Biswas and Mukhopadhyay (2010)³¹ focused on web presence and visibility of websites of Asian countries. They used 4 search engines such as AltaVista, Google, Yahoo! and MSN to highlights the links counts of the selected websites of the Asian countries. Through their analysis they found that China, Japan and India had the highest web presence among the Asian countries.

Thelwall (2011)³² explored the 15 websites in which instead of counting the hyperlink of the websites, he counted the URL citations of the websites and compared them. He used the Yahoo! Search engine to collect the data. The result found that URL citation is very less than hyperlinks in academic areas. He concluded that there is no possibility to predict the impact on moving from link analysis to URL citation

Lee and Park (2012)³³ evaluated the visibility of the world class universities over Internet. They used Yahoo! to collect data and used many analytical methods for the analysis which included the correlations, Mann-Whitney test and Multidimensional scaling. In the paper they attempted to study the hyperlinks between the pair of websites which provided the web presence of the universities. It is also found that these was higher visibility for the websites from the English-speaking countries.

Jalal (2013)³⁴ compared the top Indian, Asian and World universities using web link analysis. Top 10 universities of Indian, Asian and World universities website were investigated. It was found that about 4745 out-links was to top 10 world's universities from the top 10 Indian universities. Also, there were about 289 out-links received by top 10 Asian universities from Indian universities. In case of In-links from Asian Universities, IIT Hyderabad received highest number of in-links that is about 475.

Jayshankar and Sujitha (2014)³⁵ performed the link analysis of the websites of universities in Kerala. They analyses the number of web pages, links structure, number of inlinks, internal links and external links. The data was collected using query

syntax. It was found that Kerala Agriculture University which has highest number of webpages had lowest number of external links.

Shukla and Vanlalfeili (2014)³⁶ evaluated the library websites of Indian Institutes of Technology webometrically. They used the URL analysis, WIF, Link pattern analysis and file format analysis to evaluate the websites. To collect data, they used Google using query syntax. The linking pattern was very low among the websites.

Beerappa and Sheshadri (2016)³⁷ done the web link analysis of websites of 12 documentation centers of India using the Google advanced web query syntaxes to collect the data. This paper also classified the domain of documentation centers out of 12, 6 documentation centers are using the “.in” domain. MATLAB Documentation centre recorded the highest number of web pages i.e. 48,500.

Dastani, Panahi and Sattari (2019)³⁸ analysed the 41 Iranian Medical Sciences universities webometrically. They used Moz, Google Scholar, etc. to collect data. Kerman University of Medical Sciences, North Khorasan, Busher and Urmia has highest number of input links. They study showed that few universities have possess high quality websites.

2.5 Web Impact Factor

Ingwersen (1998)³⁹ investigated the feasibility and reliability of Web Impact Factors. For the study he selected seven small and medium scale national and 4 large domain and also selected 6 institutional websites and data were collected over a month. He described the data isolation and calculation method and also discussed the tests. He calculated the impact factors associated with internal- web pages and external- web pages and data were collected using Boolean operations through AltaVista search engine.

Smith (1999)⁴⁰ compared the web impact factors of Australian universities and Australian electronic journals. He used AltaVista to collect data for the study. He calculated 3 web impact factors- external web impact factor, self-link web impact factor and overall web impact factor. He concluded that WIF of universities or research institutes or other organisations is very effective in influencing the web spaces.

Smith and Thelwall (2002)⁴¹ evaluated the web impact factors for Australian Universities. They used specially designed crawler to collect the number of links of

Australian universities and these data were compared to AltaVista and AllTheWeb search engine. They found that crawler generated links counts were not proportional to AltaVista and AllTheWeb link counts. Linking pattern of Australian universities were way better than that of New Zealand universities.

Thelwall (2002)⁴² compared the sources from where the links were collected for computing the Academic web impact factor. He tried to answer the best possible domain for counting backlinks. The domain such as .edu, .ac.uk, and .uk domains were primarily taken for the calculations of web impact factor of British universities.

Noruzi (2005)⁴³ calculated the web impact factors of Iranian universities. He used AltaVista search engine to count the links of the websites of the Iranian Universities. In study he found that Iranian Universities had very low inlinks web impact factor. He suggested that due to language barrier Iranian websites were not getting that much amount of attention over WWW. So, he concluded that due to linguistic and geographical barriers information were ignored.

Nurozi (2006)⁴⁴ critically reviewed the web impact factors development and applications. He used Yahoo! and AltaVista search engine to calculate the data as both allow to measure the number of web pages to the websites and the total number of backlinks to the websites. He concluded that web impact factor is useful in quantitative comparison of websites of same country.

Jeysankar and Babu (2009)⁴⁵ evaluated the websites of universities in Tamil Nadu which included 27 state universities and 18 private universities, through webometric study. They computed the simple WIF, self-link WIF and external WIF. They used AltaVista to collect the raw data. They found that number universities website had higher number of web pages but less in links counts so there was lower simple web impact factor, internal web impact factor and external web impact factor.

Islam (2011)⁴⁶ evaluated the websites of the 71 universities in Bangladesh and used webometric indicators such as simple WIF, self-link WIF and external WIF. He used AltaVista search engine to collect the data and ranked universities too. He found that about 20 universities had very low number of web pages so he suggested them to take necessary step to increase their web presence visibility.

Sujitha and Jeysankar (2013)⁴⁷ done the webometric study of the web page analysis of IITs websites. To collect data for the study they used Google search engine and some Boolean formula. They calculated the Simple WIF, internal WIF, External WIF and revised WIF and ranked the IITs accordingly. It was found that each IITs websites possess more external links than self-link and inlinks.

Prabakaran (2014)⁴⁸ in his paper “Hyperlink analysis and web impact factor of websites of observatory libraries” aimed to evaluate the library websites of 41 national and international level observatories through hyperlink analysis, web impact factor and ranking. He used web crawler software SocSciBot4 and search engine optimization tool to collect the data for the study. Through the analysis of the websites he found that website with a smaller number of web pages and high number of links topped in ranking among the 41 websites.

Verma and Brahma (2017)⁴⁹ taken the websites of 10 Central universities of North East India for the webometric study. They analysed the web impact factor of these 10 websites and they also tried to analyse the links count of the websites. To collect data for the study they used open Site Explorer. They calculated 3 web impact factor such as simple web impact factor, internal web impact factor and external web impact factor. The result of the study showed that Mizorum University ranked 1st in all WIFs.

Jhamb and Ruhela (2017)⁵⁰ attempted to analyse the websites of 7 public libraries of India working under the administration of Ministry of Culture, Government of India, webometrically. They calculated the web impact factor of the websites and also done the link count analysis of the websites. They used Open Site Explorer to collect the data. In study it is found that Central Secretariat library had the highest EWIF.

Kumar (2018)⁵¹ calculated the web impact factor of the 7 Deemed Universities in Andhra Pradesh and Telangana. He used Google search engine to collect the required data. He used webometric indicators such as number of web pages, links count and WIF of the websites. As per the study he found that Deemed Universities of Telangana has highest WIF in most despite having a greater number of pages possessed by the Deemed universities of Andhra Pradesh.

Kumar (2018)⁵² in his publication “Web Impact Factor and Link Analysis of Indian Council of Agricultural Research (ICAR) Organizations” analysed the websites according to webometric indicators. He evaluated the websites of 92 ICAR organisations and calculated the WIF and to collect data he used Google search engine using Boolean formula. He suggested that WIF could be used in comparison of websites.

Majhi and Das (2019)⁵³ in their study “Website of High Courts in India: a Webometric Study” tried to highlight the web impact factors and ranking of the websites. They used Google search engine to collect data for the study using query syntax. They calculated the simple web impact factor, self-link web impact factor, external link web impact factor and revised web impact factor. Meghalaya High court website ranked 1st with highest RWIF of 12.37.

2.6 Website Evaluation

Yimin et al. (2006)⁵⁴ evaluated the websites of public library of China through a correspondence analysis method. He evaluated the websites of the public library on the basis of 5 criteria which included traffic, visit, connectivity, speed and pageviews. He suggested that websites development would boost the local economy. They found that the connectivity of Tiwan library was bigger than others. In last it was the conclusion that websites should offer content in different languages to catch more traffic on the websites.

Mukherjee (2009)⁵⁵ attempted to evaluate the websites of Indian Political Parties by applying webometric techniques. He used Google, Yahoo! and Alexa to collect the data and to measure the website’s popularity he analysed the links and used Wayback machine. The study found that political parties were using internet to engage with the public and taking as a tool for communication.

Jowkar and Didegah (2010)⁵⁶ evaluated the websites of Iranian newspaper on the basis of traffic ranking, in-links, page views, average time, etc. and Alexa Internet to collect the required data. ‘Iran’ Newspaper had the highest traffic among the others. They also evaluated websites from foreign country engagement and it was revealed that ‘Bashirmazandaran’ newspaper catches highest number of foreign users.

Kothainayaki and Gopalakrishnan (2011)⁵⁷ they aimed to evaluate the 54 Agricultural Universities of India using webometrics indicators. To evaluate the websites, they considered the 3 indicators such as Google PageRank, Alexa traffic rank and rich files. This paper also presented the network diagrams.

Kanellopoulos and Kotsiantis (2012)⁵⁸ did the evaluation of websites of Greek newspaper using Alexa search engine. They used 6 parameters to evaluate the websites such as traffic rank, page views, web page download speed, inlinks, Greek visitors and foreign visitors. The study revealed that 'Naftemporiki' newspaper had highest traffic rank among the other Greek newspaper. 'Macedonia' newspaper received highest number of foreign visitors and most of them were from UK.

In their paper **Baka and Nur-Leyni (2015)**⁵⁹ tried to determine the visibility and accessibility of the top 30 and bottom 30 world class level university's websites. They used Alexa as it helps in getting the traffic rank to determine the visibility of the website. The result of the study revealed that top universities were more visible and accessible than bottom 30 universities. They suggested that websites need to make necessary steps to increase its accessibility and visibility.

Varadharajalu and Dhanavandan (2016)⁶⁰ examined the websites of 20 state universities of Andhra Pradesh using webometric methods. They have used many webometric methods to evaluate the websites such as domain analysis, Global web ranking, ranking in India, web impact factor, etc. They used Alexa online software to collect the number of web pages, ranking of websites at global and Indian level, page views, bounce rate, etc. It was found that Dr. N.T.R. University of Health Sciences and Sri Venkateswara Institute of Medical Sciences had highest global ranking among the 20 universities website.

Stephen (2019)⁶¹ did the webometric analysis of Central Universities in the North Eastern Region of the India. He used Alexa Internet to collect data for the study. The traffic ranking in India, bounce rate of the websites, page views, keywords, etc. were collected for the evaluation of the websites. The result showed that there were 42.50% of bounce rate on the website of Sikkim University and NEHU. NEHU also had highest traffic rank in India among the other Central Universities of North Eastern Region of India.

2.7 Conclusion

The above reviewed literature shows there are numerous amounts of studies in the field of webometrics throughout the world. The literature taken for the review are the period of 1997 to 2019. Majority of the study was about the evaluation of number of web pages, web impact factor, link analysis, global traffic ranking, pageviews, bounce rate, Google PageRank, etc. It is clear from the review, most of the study is on the library or university websites but there was no study found regarding “Knowledge Resources Heritage of India’.

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Chapter 3

Knowledge Resources Heritage: Profile

Chapter 3

Knowledge Resources Heritage: Profile

3.1 Introduction

Culture plays a vital role in development of a country and act as a main pillar for sustainability of a country. Culture also acts important role in progress of society.

According to Oxford Dictionary, “culture is quality of enlightenment and refinement arising from an acquaintance with and concern for what is regarded as excellent in arts, letters, manners, the sum total of the ways of living built up by a group of human beings and transmitted from one generation to another”.

Culture impacts the livelihood, behavioural attitude, economic development, environment, and communities

3.2 Ministry of Culture

The Ministry of Culture comes under the Government of India which is mandated to preservation and conservation of cultural heritage of and promotion of all types of arts and culture of India. Ministry is tasked to make the people more creative and dynamic for their cultural values. Ministry is also responsible to generate cultural awareness to the people of the country to the international level through cultural exchange.

3.2.1 History of Ministry of Culture

Ministry of culture was first came in existence in 1961 as a Ministry of Scientific Research and Culture Affairs and after that it has changes its name and ministry for numerous of times. The timeline of evolution of Ministry of Culture is given below:

Table 3.1
Evolution of Ministry of Culture, India

Allocation in respect of Department or Ministry of Culture	Date of Notification
M/o Scientific Research and Culture Affairs	Since 1961
May 3, 1971	May 3, 1971
D/o Culture	June 17, 1971
D/o Culture under M/o Education & Culture	September 17, 1979
D/o Culture under M/o Culture Affairs	August 13, 1985
D/o Culture under M/o HRD	September 25, 1985
D/o Culture under M/o Culture, Youth Affairs & Sports	October 15, 1999
D/o Culture under M/o Tourism & Culture	May 27, 2000
M/o Culture	September 6, 2001
D/o Culture under M/o Tourism & Culture	December 21, 2001
M/o Culture	May 27, 2004
D/o Culture under M/o Tourism & Culture	February 16, 2006
M/o Culture	June 1, 2006

(Source: Ministry of Culture, GoI, <http://www.indiaculture.nic.in/history>)

3.2.2 Mission of Ministry of Culture

The mission of the department is to preserve, promote and disseminate all forms of art and culture. In order to achieve this, the department undertakes the following activities, these mission as per on their website (<http://www.indiaculture.nic.in/mission-statement>):

- Maintenance and conservation of heritage, historic sites and ancient monuments,
- Administration of libraries.
- Promotion of literary, visual and performing arts.
- Observation of centenaries and anniversaries of important national personalities and events.
- Promotion of institutions and organizations of Buddhist and Tibetan studies.

- Promotion of institutional and individual non-official initiatives in the fields of art and culture.
- Entering into cultural agreements with foreign countries.
- The functional spectrum of the Department ranges from creating cultural awareness from the grass root level to the international cultural exchange level.

For functioning of the ministry there is 2 attached offices, 6 subordinate offices and 35 autonomous organisation.

Ministry also have 7 Zonal Cultural Centres which promotes folk and traditional arts of different regions of the country.

Ministry has divided cultural heritage and knowledge resources centres into 3 groups, namely:

1. Tangible Cultural Heritage
2. Intangible Cultural Heritage
3. Knowledge Resources Heritage

3.3 Tangible Cultural Heritage

In tangible cultural heritage, all the protected monuments of India i.e. of national importance comes under Ministry of Culture and functions under Archaeological Survey of India. Ministry also promotes the museum movement in India and majority of important museums included in tangible cultural heritage and administered by the ministry.

The following are the tangible cultural heritage of India:

1. Archaeological Survey of India
2. National Museum
3. National Gallery of Modern Art
4. Indian Museum
5. Victoria Memorial Hall
6. Salarjung Museum
7. Allahabad Museum

8. National Council of Science Museums
9. National Museum Institute of History of Art, Conservation and Museology
10. National Research Laboratory for Conservation of Cultural Property
11. National Mission for Monuments and Antiquities
12. National Mission for Manuscripts
13. Gandhi Heritage Sites Mission
14. National Culture Fun

3.4 Intangible Cultural Heritage

In intangible cultural heritage, regional museums which is promoted by the ministry by grants-in-aid. Ministry also extend financial supports to the individuals, groups of individuals and cultural organizations engaged in performing visual and literary arts. Through theatre movement National School of Drama promotes the tradition and cultural diversity.

The following are the intangible cultural heritage:

1. National School of Drama
2. Indira Gandhi National Centre for the Arts
3. Sahitya Akademi
4. Lalit Kala Akademi
5. Sangeet Natak Akademi
6. The Centre for Cultural Resources and Training
7. West Zone Cultural Centre
8. North Zone Cultural Centre
9. South Zone Cultural Centre
10. Eastern Zonal Cultural Centre
11. North East Zone Cultural Centre
12. South Central Zone Cultural Centre
13. North Central Zone Cultural Centre
14. Kalakshetra Foundation

3.5 Knowledge Resources Heritage

Ministry is custodian of all the major library of India. Ministry also extend grant-in-aid for library development as well as responsible for policy matters regarding library development. Through National Archives of India, the Ministry is responsible for maintenance all archival records of the country. So, knowledge resources heritage includes all the major library which have archival records and it also includes institution which is responsible for promotion of Buddhism and Tibetan Culture.

The following are the knowledge resources heritage:

1. National Archives of India
2. Anthropological Survey of India
3. Gandhi Smriti and Darshan Samiti
4. Nehru Memorial Museum and Library
5. Indira Gandhi Rashtriya Manav Sangrahalaya
6. Asiatic Society
7. Maulana Abul Kalam Azad Institute of Asian studies
8. Central University of Higher Tibetan Studies
9. Central Institute of Himalayan Cultural Studies
10. National Library
11. Raja Rammohun Roy Library Foundation
12. Delhi Public Library
13. Rampur Raza Library
14. Central Reference Library
15. Khuda Baksh Oriental Public Library
16. Thanjavur Maharaja Serfoji's Sarasvati Mahal Library

Let's look into all these knowledge resources heritage in brief.

3.5.1 National Archives of India

The National Archives of India is established during British colonial period. As a purpose to keep all the administrative the records of the East India Company at a Central Repository which led to the establishment of Imperial Records Department (IRD) on 11 March, 1891 in Culcutta (Kolkata) in Imperial Secretariat Building and Prof. G.W. Forrest was the first officer in charge.

Imperial Records Department shifted to Delhi in 1911 from Culcutta. After Independence in 1947 Imperial Records Department was named as National Archives of India and Dr. S. N. Sen was designated as Director of Archives which was previously known as 'Keeper of Records. In June 1990 the post Director of Archives is renamed as Director General of Archives.

National archives of India have public records, oriental records, cartographic records, private papers of important personalities and microfilms, and manuscripts which is available for administrators, researchers and general public.

At present National Archives of India has one Regional Office at Bhopal and 3 Records Centre at Jaipur, Puducherry and Bhubaneswar.

3.5.2 Anthropological Survey of India

Anthropological Survey of India is one of the important research organisation and only Governmental setup for anthropological research in bio-cultural studies. Way back in 1916, Zoological Survey of India was Zoological and Anthropological section of Indian Museum but in 1945 Anthropological section of Zoological Survey of India dissected and became Anthropological Survey of India (An.S.I). Dr. B. S. Guha was designated as first founding Director in 1946 and in 1948 its head office moved to Calcutta (Kolkata) from Banaras.

To emphasizes contemporary relevance and national importance, An.S.I always mandated to pursue the research in socio-cultural and biological aspects of people of India in holistic approach.

The main objectives of Anthropological Survey of India are as follows as on their website (<https://ansi.gov.in/principal-objectives/>):

- To study the tribes and other communities that form the population of India both from the biological and cultural point of view.
- To study and preserve the human skeletal remains, both from ancient and contemporary period.
- To function as a training centre for students in anthropology.
- To collect, preserve, maintain and document the bio-cultural heritage and the traditional art and craft of the people of India through Anthropological Museums.
- To publish the results of the researches.

Anthropological Survey of India has 7 regional centres all over the country as given below:

1. Andaman and Nicobar Regional Centre (Port Blair, 1951)
2. North-East Regional Centre (Shillong, 1953)
3. Central Regional Centre (Nagpur, 1955)
4. Southern Regional centre (Mysore, 1960)
5. North-West Regional Centre (Dehradun, 1969)
6. Western Regional Centre (Udaipur, 1975)
7. Eastern Regional Centre (Kolkata, 1976)

Anthropological Survey of India studies the Indian population scientifically not only to collect scientific knowledge but for the wellbeing of the nation. It is very helpful in bringing the harmony among the people of the country by studying the changing conditions of the tribal and underprivileged social groups.

3.5.3 Gandhi Smriti and Darshan Samiti

Gandhi Smriti and Darshan Samiti (GSDS) was came into existence after the merger of Gandhi Darshan and Gandhi Smriti in September 1984. It acts as autonomous body, which function under the Ministry of Culture and gets financial support. In its working committee, the Prime Minister of India is chairperson and

other members are senior Gandhian and representatives from different government departments.

The GSDS is working on a aim and objective to spread the life, mission and thought of Mahatma Gandhi through many socio-educational and cultural programme.

There is 2 campus of the Samiti:

1. Gandhi Smriti
2. Gandhi Darshan

3.5.3.1 Gandhi Smriti

Gandhi Smriti is the place where Mahatma Gandhi's life was ended on 30 January 1948 i.e. at Old Birla House no. 5, Tees January Marg, New Delhi, India. Gandhi lived in the house only for 144 days before his assassination so it has lots of memories of Mahatma Gandhi. The house was acquired by Government of India in 1971 and converted into National Memorial and preserved as it was as of the days Gandhi lived there. For public it was opened on the eve of the Independence Day of India of the year 1973.

The house divided into many sections such as Gandhi Smriti Gallery, a auditorium which show film about Gandhi, his room on the day of assassination is still as it was on that day, Gandhi Smriti literature centre is there which has vast collection of Gandhiana, etc.

3.5.3.2 Gandhi Darshan

Gandhi Darshan is second campus of Gandhi Smriti and Darshan Samiti at Rajghat adjacent to Mahatma Gandhi Samiti. It was established in 1969 on 36 acres of land as a 'Pilgrim of Peace' with the contribution of 13 Indian states and 7 foreign countries i.e. called as Gandhi Darshan International Exhibition.

It was established to interpret the Gandhi's message of truth and non-violence.

Presently there is two exhibitions in Gandhi Darshan- 'My Life is My Message' and Freedom Struggle, in clay models.

Establishment of International Centre of Gandhian Studies and Peace Research was announced in 1994 but came into existence on 30 January, 2002.

3.5.4 Nehru Memorial Museum and Library

In memory of Jawaharlal Nehru, the official residence of Nehru was converted into Nehru Memorial Museum and Library on 14 November, 1964. It is housed in Teen Murti house which is located south of Rashtrapati Bhavan, New Delhi. Founded as autonomous body and it is mandated to promote the advance research on Modern and Contemporary India.

NMML Society was established in 1966 to manage the institution which become as a research centre of national importance.

In beginning, there was two wing of Teen Murti Bhavan in which east wings was dedicated to museum while western wings were converted into library but due to rapid growth of research material there was lack of space which leads to the construction of new library building adjacent to the Teen Murti Bhavan and inaugurated in 1974.

With increasing research on Indian history and society of the modern and contemporary period it became one of the eminent research institute of the country.

Most importantly NMML is established to preserve and acquire the papers, historical materials of Jawaharlal Nehru and its family.

Central Government nominates the General Council, the President and the Vice-President of the Nehru Memorial Museum and Library

3.5.5 Indira Gandhi Rashtriya Manav Sangrahalaya

Indira Gandhi Rashtriya Manav Sangrahalaya is one of the largest Anthropological Museum in India in the area of 200 acres in Bhopal, Madhya Pradesh located in Shamlu Hills which has a evidences of prehistoric settlement.

Indira Gandhi Rashtriya Manav Sangrahalaya also known as National Museum of Mankind started working as a 'subordinate office of Department of Culture under Ministry of Culture, Government of India in March 1977. In 1979

the office was shifted to Bhopal and become autonomous organisation in March 1985.

IGRMS has extended its functioning which led to formation of Southern Regional Centre at Mysore in October, 2001.

The main objective of the IGRMS

- To present the bio-cultural evolution of humankind through exhibitions which focuses on the diversity and cultural patterns of India
- IGRMS emerged as a centre for research and training in museology and promote museum movement in India.
- To becomes an organisation which revive the vanishing culture and traditions.

IGRMS has plenty of artists from different cultural background who perform activities in exhibition. This exhibition is focused to show the cultural and traditional life style of different communities to the modern people. All these activities and education programmes is for modern people to make aware about the local knowledge from centuries and make them cautious towards destruction of ecology and environment.

3.5.6 Asiatic Society

Asiatic Society is one of the oldest i.e. about 225 years old and prestigious publishing house of India. Asiatic Society is brainchild of Sir William Jones and was founded on January 15, 1784 at Calcutta. The society was established in the view of Asiatic Studies. Sir William Jones wanted that the naturalists, chemists, philologists, men of science, etc. from different parts of the Asia should write down their observation so the society will publish it, if they would not do so the knowledge will vanish from the people. Asiatic Society has high publishing standards so it is widely known among the learned. In 1788, the 1st volume of 'Asiatick Researches' was published by the society which contained 28 articles from different part of the Asia. The 1st journal 'Asiatick Researches' was resolved in 1842 and published in 20 volumes. In 1832, 'The Journal of the Asiatic Society of Bengal' was published with the almost the same objectives as of 'Asiatick Researches' but in 1953, the title of the journal 'The Journal of the Asiatic Society

of Bengal' changed to 'Journal of the Asiatic Society'. Till date Asiatic Society published many series of publications such as Bibliotheca Indica, Memoris (1905), Monographs (1946), etc. There is no exact number of publications is found but from different records it exceeds to 500 publications.

The library of Asiatic Society has a large collection of old/ ancient manuscripts of India and majority of them are in Sanskrit. The library has huge collection of books (1.2 lakh), printed journal (80000) of major languages of the world, maps, microfiche, microfilm, paintings, pamphlets and photographs.

The society also has its museum which was established in 1814. The collection of museum includes inscription in stone and metal, icons, old coins, Sanskrit manuscripts as well as many Indian ancient languages, etc.

3.5.7 Maulana Abul Kalam Azad Institute of Asian Studies

Maulana Abul Kalam Azad Institute of Asian Studies was established on January 4, 1993 at Calcutta. The name of the institute is named after the first education minister of the independent India Maulana Abul Kalam Azad, so the institute is devoted to study the life and work of Maulana Abul Kalam Azad. It is research institute work as a autonomous body under Ministry of Culture, Government of India and funded by the same. The institute is joint initiative of the Government of India, Department of culture, Ministry of Human Resource Development and the Government of West Bengal. The institute is registered as a society under the West Bengal Registration of Societies Act, 1961.

The second focus of the institute is to study and research on social, cultural, economic, political and administrative developments in Asia after mid of nineteenth century specially the country having link with India. The research area of the institute is concentrated on Central Asia. The institute awards fellowship and scholarships and also provide monetary assistance to carry out research.

The institute also maintain the personalized museum of the Maulana Abul Kalam Azad in his residence in Kolkata, which was established on March 11, 2006.

The library of the institute is open for public to study and research. Library has collections of books, journals, microfilms, photographs, audio recordings, etc. which helps in research.

3.5.8 Central Institute of Higher Tibetan Studies (CIHTS)

Central Institute of Higher Tibetan Studies is a 'Deemed to be University' functions under the Ministry of Culture, Government of India located at Sarnath, Varanasi founded in 1967. Formerly CHITS was known as Central University for Tibetan Studies and started functioning as a constituent wing of Sampurnananda Sanskrit University. CHITS turned into autonomous organisation in 1977. CIHTS is one of the two institute which was established to promote and protection of Buddhist and Tibetan culture and tradition.

CHITS is well known institute to educate Tibetan Refugee students and who lives in Himalayan region of India and share common Dharma of Buddhism, culture, tradition and language. Institute provides advanced studies of Buddhism and Tibetan studies to the pupils who haven't got the opportunity to live their culture and tradition in Tibet. Research work is carried out on tradition along with modern sciences and other disciplines.

Mission of Central Institute of Higher Tibetan Studies are as follows as on their website (<https://cihts.ac.in/webpage/index.aspx>):

- Act as a centre for preserving the culture and tradition of Tibet.
- Restoration of ancient Indian sciences and literature which is in Tibetan language but the original manuscripts are lost.
- Offer higher education to students of Tibet Refugee and Himalayan region.
- Carry out research work on tradition of Tibet as per modern university system and provides degree in Tibetan studies.

Objectives of Central Institute of Higher Tibetan Studies are as follows as on their website (<https://cihts.ac.in/webpage/index.aspx>):

- i. To provide quality education in Buddhist and Tibetan studies.
- ii. To Provide degree in Buddhist and Tibetan studies.
- iii. To carry out research in traditional subjects and other with modern disciplines.
- iv. To publish research work as per International standards.
- v. To carry out exchange programme to impart the education and research works.

- vi. To provide education of modern disciplines along with traditional Buddhist and Tibetan studies.

3.5.9 Central Institute of Himalayan Cultural Studies (CIHCS)

Central Institute of Himalayan Cultural Studies, before constitution, was formerly under a guardianship a society called Buddhist Culture Preservation Society (BCPS), Bomdila, Arunachal Pradesh in 2003 under the supervision of His Highness 13th Tsona Gontse Rinpoche. BCPS was affiliated to Sampurnanand Sanskrit University, Varanasi to carry out academic procedure.

In 2000, Department of Culture of Government of India took an initiative to lay down an institution for Himalayan Culture Studies and a Task Force was constituted by the department. As per the recommendation of the Task Force, initial work of the institution was taken up by BCPS in August, 2000 before the registration of CIHCS.

In May, 2010 cabinet approved the establishment of Central Institute of Himalayan Cultural Studies at Dahung in West Kameng District of Arunachal Pradesh. The CIHCS was registered as society under the Societies Registration Act, 1860 in 10th November, 2010 at Itanagar, Arunachal Pradesh and became an autonomous organisation of Ministry of Culture, Govt. Of India.

The institute is mandated to carry out Under Graduate, Post graduate and Doctoral programmes in Buddhist and Himalayan Studies; and, to establish and maintain feeder schools. CIHCS helps in preservation and promotion of cultural and traditional activities of the Himalayan and North-Eastern region of India. The institute also performs research work in Buddhist Studies, Bhoti language and literature and Himalayan studies. CIHCS emerged as a centre for teaching traditional arts and crafts and modern skills to people of the region to establish economic stability in livelihood and provide sustainable development to the region without harming the local ecology and environment.

3.5.10 National Library

The National Library of India is one of the finest and huge libraries of the country with a large number of reading materials and acts as a repository of reading

materials published in India and across the world authored by Indian author and all those materials about India of any language.

The foundation of National Library is a amalgamation of two libraries- Culcutta Public Library (CPL) and The Imperial Library, of pre - independence era of India.

The foundation of Culcutta Public Library in 1836 led the library movement in the country but not as a Govt. Institution. Services was free to Poor and other public. CPL got the collection Of 4,675 volumes of College of Fort William. CPL also received donations of books from the individuals and library also purchase India and foreign books of peer quality. Till 1850, library had begun to collect books in Gujrati, Marathi, Pali, Simhalese and Punjabi. These are the collection make the National Library a unique library with rare collections. CPL also published its *Catalogue of the Culcutta Public Library* in 1848.

Whereas, The Imperial Library was formed in 1891 with the combination of secretariat libraries. The collection of The Imperial Library contains books of libraries of East India College, Fort William and East India Board in London but all these collections was restricted to only the superior officers of the Government.

But the then viceroy Lord Curzon found that CPL and The Imperial Library is not working as per expected so he decided to merge the both library and passed Imperial Library Act passed in 1902 and formally opened for public on 30th January, 1903 at Metcalfe hall, Kolkata to work as a reference library, reading and research place for students and repository of material to improve the richness of reading materials related to India. Under the Press and Registration of Books Act, 1867 library can ask for any book for free of cost. Until the Independence of India in 1947, the Imperial Library had a collection of 3,50,000 volumes of reading materials.

After getting Independence from British in 1947, Government of India passed a 'Imperial Library (Change of Name) Act' in 1948 to rename the Imperial Library to National Library. B. S. Kesvan became the 1st librarian of the National Library and played vital role in getting the Viceregal Palace in Belvedere, Alipore, Kolkata. The National Library was formally opened for the public on 1st February, 1953. National Library is one of the four big public library of the country which is liable to receive one copy of books published in India free of cost as per 'Delivery of Books (Public Libraries) Act, 1954 under the provisions of 'Press and

Registration of Books Act, 1867. This act was amended in 1956 which included the periodical publication and newspaper. Government of India also signed many MoUs for cultural exchange with other countries for library to enrich itself not only in publications but also in personnel.

The library has a division for 14 languages of India such as Assamese; Bengali; Gujrati; Hindi; Kannada; Kashmiri; Malayalam; Marathi; Oriya; Punjabi; Sanskrit, Pali & Prakrit; Tamil; Telgu; and Urdu. There are also 5 foreign language division such as East Asian Language; West Asian & African Language; Germanic Language; Romance Language and Slavonic Language.

The National Library has a rare book division where about 12,000 rare Indian language manuscripts and books are preserved. This division organises number of seminars or talks throughout the year and receives prominent scholars and visitors. It also has collection of Arabic and Persian manuscripts.

Library also maintains the gifted collection of prominent personalities such as Buhar collection, Ashutosh collection, Ramdas Sen collection, Barid Baran Mukherjee collection, Sir Jadunath Sarkar collection, etc.

3.5.11 Raja Rammohun Roy Library Foundation

Raja Ram Mohan Roy Library Foundation (RRRLF) which established in 1972 at Kolkata, on the silver Jubilee of the independence of India and named after the great social reformer Raja Rammohun Roy. The year 1972 was also his bicentennial Birth Anniversary. The foundation of Raja Rammohun Roy Library Foundation leads the public library movement in the country and act as a policy maker and funding agency for public libraries in the country. RRRLF is a autonomous body of Ministry of Culture, Government of India and also fully financed by the same.

The foundation has 22 members of committee appointed by Government of India. The foundation works with the states and union territories in cooperation to establish and run public library. It helps states in adopting library legislation for the development and functioning of public library. Foundation supports the public library financially and technically. The RRRLF taken an initiative to establish District Youth Resource Centre (DYRC) in collaboration with Nehru Yuvak Kendra Sangathana.

Raja Ram Mohan Roy Library Foundation perform surveys of libraries on their Quantitative and Qualitative aspects.

RRRLF also taken an initiative of digitization of books, newspapers of pre-independence, manuscripts, photographs, journals, copyright-free materials, etc. owned by various public libraries across the country to create National Digital Repository.

3.5.12 Delhi Public Library

Delhi Public Library (DPL) was founded on October 27, 1951. Initially it was sponsored by UNESCO as a pilot project with the assistance of Government of India. UNESCO provided the both technical and financial support and in 1955 the functioning control of DPL was handed over to Government of India by the UNESCO. Currently, Ministry of Culture, Government of India has taken over its administrative control but a autonomous organisation.

DPL has a collection of over 18 lakh books or reading materials in many different languages of India. The library consist collection for every age group. DPL also have a Braille library for visually impaired persons. Delhi Public Library has a network of 37 centers across the capital of India. DPL provide 73 mobile points and have 24 deposit points across Delhi. For children each branches of DPL has a separate section. DPL runs prison library in Tihar Jail in Delhi and also provide mobile library services.

Delhi Public Library has a collection of about 10,000 gramophone or records or cassettes of ghazal, musics, bhajans, films, etc. To avail this services one has to be member of the library and to listen these recordings readers can use headphones or other computer peripherals.

3.5.13 Rampur Raza Library

Rampur Raza Library counted as a prominent libraru in South Asia. It is located in Rampur, Uttar Pradesh, India. Rampur Raza Library has a huge collection of manuscripts, documents, paintings reading materials, etc. of different religions and tradition but in largely it is a treasure house of Indo-Islamic learning and arts. The library was founded by the then Nawab of Rampur State Nawab

Faizullah Khan in 1774, started with his personal collection. After him many Nawabs, scholars, ulema, poets, painters, and others deposited their collection so library has a notable collection in the period of 1794-1840. To organise library hired a Afghan scholar and to preserve the collection the library invited calligraphers and binders from Kashmir and other part of India. Nawab Raza Ali Khan introduced modern education in schools and college during the period of 1930 so he needed a librarian to organise the rare collection and his collection of manuscripts and books about Indian music.

After independence of India, Rampur State merged to Union of India so from 1949 to July, 1975 library was working under management of trust which was constituted on August 6, 1951. Library was in pathetic condition and on seeing the condition of this heritage, the then Minister of Education, Government of India - Prof. S. Nurul Hasan brought this library under Act of Parliament. So the library comes under the administrative authority of Central Government which provide financial support and helps in running of the library. Currently, the library is autonomous organisation under Ministry of Culture, Government of India.

The library has a huge collection of 17,000 manuscripts, documents, specimens, books, etc. in Arabic, Persian, Pashto, Sanskrit, Hindi and Turkish language. Also has a collection of many Indian painting and palm leaves of Indian languages.

3.5.14 Central reference Library

Central reference Library is working as a repository for Indian National Bibliography (INB). Central reference Library was founded in 1955 at Kolkata in the same premise of National Library. Central reference Library work as a sub-ordinate office under Ministry of Culture, Government of India. The Central reference Library is mainly devoted to maintain, publish and sale Indian National Bibliography, as a authentic bibliographic source in which books of 14 Indian Language, which also includes English. Central reference Library make bibliography of those published books in Assamese, Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Oriya, Punjabi, Sanskrit, Tamil, Telugu and Urdu languages, which is received by the National Library under the Delivery of Books and Newspapers, (Public Libraries) Act, 1954 and the language of the

books. The editor of Indian National Bibliography acts as an independent librarian of the library.

Central reference Library also publishes Index Indiana, which indexes those articles published in Indian Language periodicals. Firstly, Index Indiana was started as quarterly publication in 1977 but from 1981 it is published annually. Indian Language Bibliography are also published by Central reference Library in Tamil, Bengali and Assamese while other language bibliography in Malayalam, Urdu, etc. is published in collaboration with state governments.

3.5.15 Khuda Baksh Oriental Public Library

Khuda Baksh Oriental Public Library was earlier a personal collection of the father of Khuda Baksh, Maulvi Mohammad Bakhsh. Maulvi Mohammad Bakhsh has a collection of 1400 manuscripts and rare printed books. On His death-bed Maulvi Mohammad Bakhsh asked Khuda Baksh, his son, to open a public library for public. So, Khuda Bakhs constructed 2 storied building, to put all those collections of his father and he himself collected manuscripts from Arab world, in 1888. On October 29, 1891 the library was open for the public in Patna, Bihar, India with a collection of 4000 manuscripts in Arabic, Persian and Turkish and also had a additional collection of rare printed books in Arabic, Persian and English.

Khuda Baksh Oriental Public Library become Institution of National Importance on December 26, 1969 under Act of Parliament. Currently, Khuda Baksh Oriental Public Library works as a autonomous body under Ministry of Culture, Government of India.

The library act a a repository of heritage preserved in manuscripts, palm-leaf, deer-skin, cloth and sundry materials. Library possess rare printed book collections in Arabic, Persian, Urdu, English, Hindi, German, French, Punjabi, Japanese and Russian. Library turning its collection into digitized format for the reader and researcher within the library premise.

Khuda Baksh Oriental Public Library is the only library in the world who possess the only copy of ‘Tarik-e-Khandan-e-Timuriya’ and other rare manuscripts and printed books which is not found elsewhere in the world.

3.5.16 Thanjavur Maharaja Serfoji's Sarasvati Mahal Library

Thanjavur Maharaja Serfoji's Sarasvati Mahal Library also known as Saraswathi Mahal Library established in Thanjavur, Tamil Nadu, India. Thanjavur Maharaja Serfoji's Sarasvati Mahal Library considered as one of the oldest libraries of Asia was initially Royal library for Nayak Kings of Thanjavur during the period of 1535- 1675. In 1675, Thanjavur was captured by Maratha rulers and till 1855 it was in transformation with addition of local culture. The library seen notable development during the Maratha ruler Serfoji II, he was a great scholar of arts and language and studied German, English, French, Italian and Latin. To enrich the collection of libraries he directed many scholars/ Pandits to acquire books or manuscripts of Sanskrit from Northern India and other far- flung areas.

In 1918, library was open to public and working under Tamil Nadu state. So, the library is named after the great scholar and Maratha ruler Serfoji.

The library has a collection of around 40,000 manuscripts in Sanskrit, scripts in Grantha, Devanagari, Nandinagari, Telegu and Tamil. There is about 3,076 collection of manuscripts of Marathi and mostly are written on paper but Telegu scripts are written on palm-leaf.

The library owned a museum in its building. Museum displays the manuscripts, illustrated manuscripts, drawings, atlases, Thanjavur style paper paintings, canvass paintings, glass paintings, etc. for the public.

Chapter 4

Data Analysis and Interpretation

Chapter – 4

Data Analysis and Interpretation

4.1 Introduction

In this chapter, details about the tools used to collect data of 16 websites of knowledge resources heritage in view of objectives taken for the study and collected data is analysed in tables and interpreted.

4.2 URL Domain Analysis

URL stands for Uniform Resource Locator. It is an address of the resources over the Internet. URL of a resources are same for every search engine. Tim Berners-Lee coined the term URL in 1994. In common URL is known as “web address”.

ODLIS defined URL as, “The unique address identifying a resource accessible at a particular location on the Internet for routing purposes. The same resources or different version of it, may be available simultaneously at other Internet addresses.”

The URL domain of the websites of the Knowledge Resources Heritage analysed in respect of TLDs (Top-level Domains) which incorporates gTLDs (Generic TLDs) and ccTLDs (Country Code TLDs).

- **Top-level Domain (TLD):** The top-level domain is last portion of the URL or domain name. TLD helps in identifying which unit serving as a Network Host. The first TLD was ‘.arpa’.
- **Generic Top-level Domain (gTLD):** Generic top-level domain categorises the TLD. Initially there was 7 gTLDs, such as .com, .edu, .gov, .int, .mil, .net and .org. Out of these 7 gTLDs, 3 has no restriction in use, anyone can use to register their domain name using .com, .net and .org and remaining 4 are used strictly by Governments entities. Recently, 7 more gTLDs got authorized such as .areo, .biz, .coop, .info, .museum, .name and .pro and many more are in queue to get authorisation from Internet Corporation for Assigned Names and Numbers.
- **Country Code top-level Domain (ccTLD):** Country code top-level domain lies in last part of any domain name and it represents the country. Country code is represented in two character and there are 240 such country code for country and

external territories. Country codes are also used with subdomains (e.g. co.in which denotes commercial entity in India)

Table 4.1
URL Domain Analysis of Knowledge Resources Heritage of India

S. No.	Knowledge Resources Heritage	Website Links	Top-Level Domain (TLDs)	
			gTLDs	ccTLDs
1.	National Archives of India	http://nationalarchives.nic.in/	.nic	.in
2.	Anthropological Survey of India (ANSI)	https://ansi.gov.in/	.gov	.in
3.	Gandhi Smriti and Darshan Samiti (GSDS)	https://www.gandhismriti.gov.in/	.gov	.in
4.	Nehru Memorial Museum and Library (NMML)	http://nehrumemorial.nic.in/en/	.nic	.in
5.	Indira Gandhi Rashtriya Manav Sangrahalaya (IGRMS)	https://igrms.gov.in/en	.gov	.in
6.	Asiatic Society	https://www.asiaticsocietykolkata.org/	.org	
7.	Maulana Abul Kalam Azad Institute of Asian Studies (MAKAIAS)	http://makaias.gov.in/	.gov	.in
8.	Central Institute of Higher Tibetan Studies (CIHTS)	https://cihts.ac.in/webpage/index.aspx	.ac	.in
9.	Central Institute of Himalayan Cultural Studies (CIHCS)	http://www.cihcs.edu.in/	.edu	.in
10.	National Library	https://www.nationallibrary.gov.in/	.gov	.in
11.	Raja Rammohun Roy Library Foundation (RRRLF)	http://rrrlf.nic.in/	.nic	.in
12.	Delhi Public Library (DPL)	https://dpl.gov.in/	.gov	.in
13.	Rampur Raza Library	http://razalibrary.gov.in/	.gov	.in
14.	Central Reference Library	http://crlindia.gov.in/	.gov	.in
15.	Khuda Baksh Oriental Public Library	http://kblibrary.bih.nic.in/	.nic	.in
16.	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library (TMSSML)	http://www.tmssmlibrary.com/	.com	

Table 4.2
Categories of Domains of Knowledge Resources Heritage

S. No.	TLDs (Top Level Domain)	Number of Knowledge Resources Heritage	Percentage (%)
1	.gov.in	8	50
2	.nic.in	4	25
3	.com	1	6.25
4	.edu.in	1	6.25
5	.org	1	6.25
6	.ac.in	1	6.25
Total		16	100%

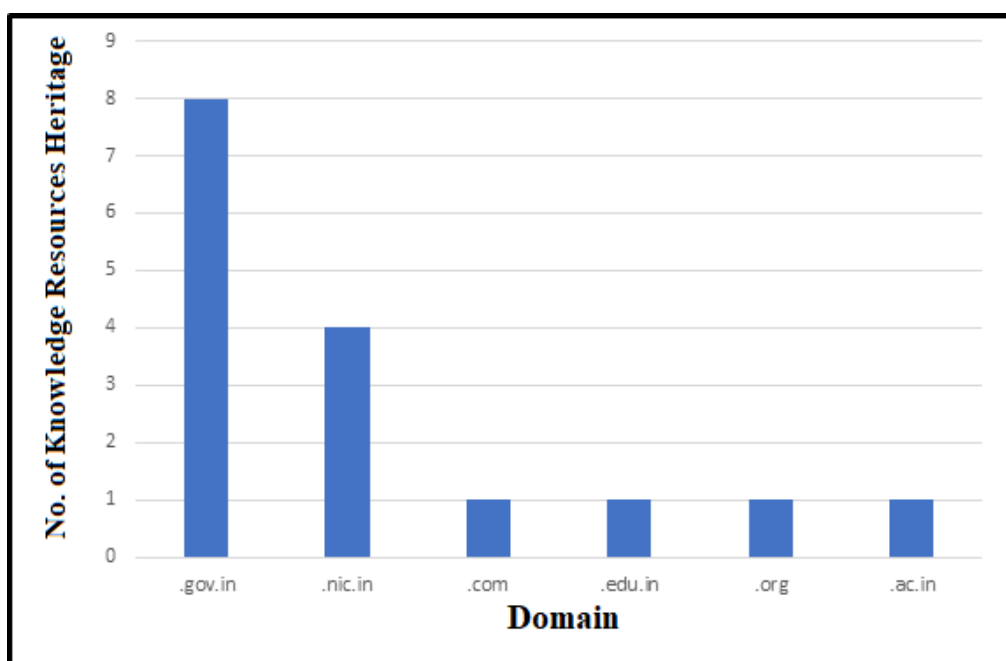


Fig. 4.1 Categories of domain of Knowledge Resources Heritage

Table 4.1 tabulated the top-level domains or domain name of the 16 websites of the Knowledge Resources Heritage. In table 4.1, TLD is subdivided into gTLDs and ccTLDs. It is obvious that all these websites are only of India, so the ccTLDs would be .in and as a subdomain with gTLDs but 2 websites out of 16 doesn't have .in ccTLDs because these 2 websites were not using restricted gTLDs. The mostly used gTLDs is .gov which is used by 8 websites and then comes .nic which is used by 4 websites, while

Asiatic Society and Thanjavur Maharaja Serfoji Mahal Library uses .org and .com gTLD which is not restricted gTLD.

Whereas table 4.2 categorized the different types of TLDs and it is found that there are 6 types of TLDs used by 16 websites of the Knowledge Resources Heritage of India. The most used TLD is .gov.in which is used by 8 websites and 4 websites uses the “.nic.in” i.e. 50% and 25% respectively. Rest 4 websites are using the domain name of .com, .edu.in, .org and . ac.in. Fig. 4.1 is a graphical representation of categories of different types of TLDs.

4.3 Data collected Using Link Explorer (Open Site Explorer)

Open Site Explorer (www.opensiteexplorer.org) is one of the free SEO tools of Moz named as Link Explorer i.e. Link Explorer is latest version of Open Site Explorer with new tool for analysis of links. About 36.5 trillion links indexed by Link Explorer. ‘Dotbot’ crawler is used by Moz to collect link data. Dotbot of Moz is built on machine learning model. Dotbot is optimized to select those pages only which appears in Moz collection of Google search engine result pages.

Moz.com, formerly known as SEOMoz, was founded by Rand Fishkin and Gillian Muessig in 2004. Now, it focuses on search engine optimization (SEO) while earlier it worked as a blog and online community where experts of SEO share their research and ideas. In 2013, SEOMoz was re-branded to Moz and launched MOZ Analytics which included many features for content, social media and many more for links management and their ranking.

4.4 Domain and Page Authority

Domain and page authority are a quality score developed by Moz to rate the domain or sub-domain or websites and specific page respectively on a search engine. Domain and page authority are calculated by using logarithms developed by Moz and to obtain the domain and page authority of websites, Moz Open Site Explorer is used.

Table 4.3
Domain Authority & Page Authority Knowledge Resources Heritage using Open Site Explorer as on 13th March, 2020

Knowledge Resources Heritage	Domain Authority (%)	Page Authority (%)
Khuda Baksh Oriental Public Library	62 (12.20%)	50 (9.39%)
National Library	43 (8.46%)	45 (8.45%)
National Archives of India	42 (8.26%)	44 (8.27%)
Gandhi Smriti and Darshan Samiti	41 (8.07%)	34 (6.39%)
Nehru Memorial Museum and Library	37 (7.28%)	35 (6.57%)
Raja Rammohun Roy Library Foundation	36 (7.08%)	39 (7.33%)
Rampur Raza Library	36 (7.08%)	37 (6.95%)
Delhi Public Library	31 (6.10%)	40 (7.51%)
Anthropological Survey of India	31 (6.10%)	31 (5.82%)
Maulana Abul Kalam Azad Institute of Asian Studies	26 (5.11%)	35 (6.57%)
Asiatic Society	26 (5.11%)	32 (6.01%)
Indira Gandhi Rashtriya Manav Sangrahalaya	20 (4.92%)	31 (3.75%)
Central Institute of Higher Tibetan Studies	23 (4.25%)	17 (3.19%)
Central Reference Library	22 (4.33%)	28 (5.26%)
Central Institute of Himalayan Cultural Studies	14 (2.75%)	24 (4.51%)
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	13 (2.55%)	21 (3.94%)
Total	508	532

4.4.1 Domain Authority of Knowledge Resources Heritage

Domain authority is a rank of website on search engine result pages (SERPs) at root domain or subdomain level i.e it predicts the performance or the rank of websites on Google. The score of domain authority lags between 0 to 100, so higher the domain authority scores higher the rank on SERPs. To evaluate the domain authority of website, factors like linking root domains and total number of links taken into consideration along with other factors. The manager of website can track the performance of website by comparing the current domain authority score with previous domain authority score. Google does not use the domain authority in ranking of website. There is no effect of Domain Authority on search engine result pages (SERPs). Website having high quality external links will have high domain authority score whereas newly developed website starts domain authority scale from 1. One can say that Domain authority is a comparative tool to use in comparing with other competitive websites. It is not easy to

influence domain authority directly because it depends on number of factors which is not easy to deceive a search engine like Google because Google consider number of factors to rank website on search engine result pages.

Table 4.4
Rank of Websites according to Domain authority

Knowledge Resources Heritage	Domain Authority (%)	Rank
Khuda Baksh Oriental Public Library	62 (12.20%)	1
National Library	43 (8.46%)	2
National Archives of India	42 (8.26%)	3
Gandhi Smriti and Darshan Samiti	41 (8.07%)	4
Nehru Memorial Museum and Library	37 (7.28%)	5
Raja Rammohun Roy Library Foundation	36 (7.08%)	6
Rampur Raza Library	36 (7.08%)	6
Delhi Public Library	31 (6.10%)	7
Anthropological Survey of India	31 (6.10%)	7
Maulana Abul Kalam Azad Institute of Asian Studies	26 (5.11%)	8
Asiatic Society	26 (5.11%)	8
Central Institute of Higher Tibetan Studies	23 (4.25%)	9
Central Reference Library	22 (4.33%)	10
Indira Gandhi Rashtriya Manav Sangrahalaya	20 (4.92%)	11
Central Institute of Himalayan Cultural Studies	14 (2.75%)	12
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	13 (2.55%)	13
Total	508	

Table 4.4 shows the ranking of 16 websites of knowledge resources heritage of India according to domain authority. Khuda Baksh Oriental Public Library is ranked 1st with highest domain authority of 62 out of 100 i.e. 12.20% among the 16 websites of knowledge resources heritage followed by National Library ranked 2nd and National Archives of India ranked 3rd with domain authority of 43 (8.46%) and 42 (8.26%) respectively. Raja Rammohun Roy Library Foundation and Rampur Raza Library has same domain authority of 36 (7.08%), Delhi Public Library and Anthropological Survey of India shares same domain authority of 31(6.10%), and Maulana Abul Kalam Azad Institute of Asian Studies and Asiatic Society both has same domain authority of 26 (5.11%) out of 100. Central Institute of Higher Tibetan Studies and Central Institute of Himalayan Cultural Studies shares many common aims and objectives but there is

huge difference in their domain authority as former has domain authority of 23 (4.25%) while later has 14 (2.75%). Thanjavur Maharaja Serfoji's Sarasvati Mahal Library ranked 13 i.e. last in list with domain authority of 13 (2.55%).

4.4.2 Page Authority of Knowledge Resources Heritage

Page Authority is a rank of specific page at SERPs i.e. same as domain authority, page authority also predicts the performance or the rank of website on Google. The score of page authority also lags between on the algorithmic scale of 0 to 100. Thus, higher the score on the scale, higher the rank of that specific page. To evaluate the page authority i.e. at individual page level, the web index of Moz and about 40 other factors are taken into consideration. As same as domain authority, page authority also uses machine learning model which uses algorithm to calculate the results across thousands of search engine result pages. It is also a comparative tool. External links from high-authority pages will improve the page authority score.

Table 4.5
Rank of Websites according to Page Authority

Knowledge Resources Heritage	Page Authority (%)	Rank
Khuda Baksh Oriental Public Library	50 (9.39%)	1
National Library	45 (8.45%)	2
National Archives of India	44 (8.27%)	3
Delhi Public Library	40 (7.51%)	4
Raja Rammohun Roy Library Foundation	39 (7.33%)	5
Rampur Raza Library	37 (6.95%)	6
Nehru Memorial Museum and Library	35 (6.57%)	7
Maulana Abul Kalam Azad Institute of Asian Studies	35 (6.57%)	7
Gandhi Smriti and Darshan Samiti	34 (6.39%)	8
Asiatic Society	32 (6.01%)	9
Anthropological Survey of India	31 (5.82%)	10
Indira Gandhi Rashtriya Manav Sangrahalaya	31 (5.82%)	10
Central Reference Library	28 (5.26%)	11
Central Institute of Himalayan Cultural Studies	24 (4.51%)	12
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	21 (3.94%)	13
Central Institute of Higher Tibetan Studies	17 (3.19%)	14
Total	532	

Through table 4.5, which shows the ranking of websites of knowledge resources heritage according to page authority. The website of Khuda Baksh Oriental Public Library again topped in the list of page authority with page authority of 50 i.e. 9.39% among all the 16 websites of knowledge resources heritage of India. Here also National Library and National Archives of India ranked 2nd and 3rd respectively among the 16 websites with page authority of 45 (8.45%) and 44 (8.27%) respectively. In case of Delhi Public Library which scored page authority of 40 (7.51%) and ranked 4th is performing better at page-level than domain level. Many website like Gandhi Smriti and Darshan Samiti, Nehru Memorial Museum and Library, Anthropological Survey of India, Asiatic Society, Central Institute of Higher Tibetan Studies and Central Institute of Himalayan Cultural Studies downgraded its performance at page level but other website upgraded their rank by 1 at page level Raja Rammohun Roy Library Foundation, Maulana Abul Kalam Azad Institute of Asian Studies, and Indira Gandhi Rashtriya Manav Sangrahalaya. At page level the performance of Central Institute of Higher Tibetan Studies is poor than domain level and ranked last in the list of page authority with 17 (3.19%).

4.5 Internal Links, External Links and Total Links

Links plays a important role in influencing the rank of website on search engine result pages. To increase the ranking of the website the authority has to build a links of higher value which helps the website to appear on first SERPs and it is continuous process. Links are essential for search engine optimization (SEO). The Open Site Explorer is used to collect data for the table 4.6.

Table 4.6
Internal Links, External Links and Total Links using Open Site Explorer
as on 16-Mar-2020

Knowledge Resources Heritage	Internal Link (%)	External Link (%)	Total Link (%)
Anthropological Survey of India	8398 (0.01%)	24,033 (0.53%)	32,431 (0.05%)
Asiatic Society	3980 (0.01%)	18,168 (0.4%)	22,148 (0.03%)
Central Institute of Himalayan Cultural Studies	3,532 (0.01%)	108 (0.002%)	3,640 (0.01%)
Central Reference Library	9,049 (0.01%)	22,735 (0.5%)	31,832 (0.05%)
Central Institute of Higher Tibetan Studies	94,232 (0.15%)	2,131 (0.05%)	96,363 (0.14%)

Delhi Public Library	10,728 (0.02%)	35,543 (0.8%)	46,271 (0.07%)
Gandhi Smriti and Darshan Samiti	48,595 (0.08%)	23,697 (0.52%)	72,292 (0.11%)
Indira Gandhi Rashtriya Manav Sangrahalaya	4,456 (0.05%)	49,391 (1.05%)	53,847 (0.08%)
Khuda Baksh Oriental Public Library	3,10,86,062 (48.69%)	21,12,980 (46.4%)	3,31,99,042 (48.52%)
Maulana Abul Kalam Azad Institute of Asian Studies	4,301 (0.05%)	23,792 (0.52%)	28,093 (0.04%)
National Archives of India	9,89,240 (1.55%)	1,41,978 (3.12%)	11,31,218 (1.65%)
National Library	88,34,542 (13.84%)	47,343 (1.04%)	88,81,885 (12.98%)
Nehru Memorial Museum and Library	2,16,83,960 (33.96%)	24,098 (0.53%)	2,17,08,058 (31.72%)
Raja Rammohun Roy Library Foundation	1,056 (0.001%)	23,770 (0.52%)	24,826 (0.04%)
Rampur Raza Library	4,360 (0.05%)	29,974 (0.66%)	34,334 (0.05%)
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	10,60,327 (1.66%)	19,77,570 (43.42%)	30,37,897 (4.44%)
Total	6,38,46,818	45,57,311	6,84,29,003

4.5.1 Internal Links of Knowledge Resources Heritage

Internal links are those hyperlinks which exist on that same particular website and which uses same domain to move from one page to another page of the website. Other than helping in navigation in a website, internal links help in constructing hierarchy of information in the website. The architecture of website should be created using internal links in such a way crawler of search engine reaches to the deep pages of the website easily which helps the website appears in first search engine result pages and this can be easily accomplished by using pyramidal structure of website.

The internal links of any website is sum of - (i) Internal, Followed Links, and (ii) Internal, Nofollowed Links, these are explained below

(i) **Internal, Followed Links:** Followed links are those which moves from one page of the domain to the other page of the same domain and does not have a 'nofollow' tag on it so it is crawled by the search engine crawler and get indexed.

(ii) Internal, Nofollowed Links: Nofollowed links are those links which is a internal link but have a rel="nofollow" HTML tag which restricts the site from being crawled by the search engine crawler and in getting indexed.

Internal Links does not have a ability to change the ranking of the website on search engine. Pages should contain those links which user may visit out of their curiosity.

Table 4.7
Rank of Website as per Internal Links

Knowledge Resources Heritage	Internal Link (%)	Rank
Khuda Baksh Oriental Public Library	3,10,86,062 (48.69%)	1
Nehru Memorial Museum and Library	2,16,83,960 (33.96%)	2
National Library	88,34,542 (13.84%)	3
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	10,60,327 (1.66%)	4
National Archives of India	9,89,240 (1.55%)	5
Central Institute of Higher Tibetan Studies	94,232 (0.15%)	6
Gandhi Smriti and Darshan Samiti	48,595 (0.08%)	7
Delhi Public Library	10,728 (0.02%)	8
Central Reference Library	9,049 (0.01%)	9
Anthropological Survey of India	8398 (0.01%)	10
Indira Gandhi Rashtriya Manav Sangrahalaya	4,456 (0.006%)	11
Rampur Raza Library	4,360 (0.006%)	12
Maulana Abul Kalam Azad Institute of Asian Studies	4,301 (0.006%)	13
Asiatic Society	3980 (0.006%)	14
Central Institute of Himalayan Cultural Studies	3,532 (0.005%)	15
Raja Rammohun Roy Library Foundation	1,056 (0.001%)	16
Total	6,38,46,818	

Table 4.7 shows the distribution of internal links of the 16 websites of the knowledge resources heritage and all the websites are ranked according to their number of internal links they pose. The Internal links of Khuda Baksh Oriental Public Library

is 3,10,86,062 (48.69%) and holds 1st rank followed by Nehru Memorial Museum and Library with 2,16,83,960 (33.96%) and National Library with 88,34,542 (13.84%) internal links and ranked 2nd and 3rd respectively. Thanjavur Maharaja Serfoji's Sarasvati Mahal Library and National Archives of India has impressive number of internal links which help them to acquire better rank on search engine result pages as they have internal links of 10,60,327 (1.66%) and 9,89,240 (1.55%) respectively and ranked 4th and 5th. Raja Rammohun Roy Library Foundation is one of the important foundation in India which promotes public library in India has the lowest number of internal links which is crawled by the crawler is only 1,056 and ranked last, it might have more internal links which may contain "nofollow" tag which does not allowed the crawler to index those links, if not so then it is necessary for the authority to put more contents on the website which increase the rank on SERPs.

4.5.2 External Links of Knowledge Resources Heritage

External links are those hyperlinks which targets the other website i.e. the link from one domain to other external domains. According to many top search engine optimization (SEOs), external link influence ranking of website on search engine result pages more than internal links. So, the search engines regard external link as third-party votes which influences in ranking. To evaluate the ranking/ popularity of the websites as per of external links was started by Alta Vista which is upgraded by the Google later because external links are difficult to manipulate. External links provide relevancy for the search engines to form knowledge hubs.

The external links of any website is sum of - (i) External, Followed Links, and (ii) External, Nofollowed Links; these are described bellow

(i) External, Followed Links: Followed Links are those links which targets the other domain and does not have a 'nofollow' tag on it which allows the crawler to crawl and get indexed.

(ii) External, Nofollowed Links: Nofollowed links are those links which targets the other domain but contain HTML tag rel='nofollow' which prohibits the crawler of the search engine to crawl those pages and to get indexed.

Table 4.8
Rank of website as per External Links

Knowledge Resources Heritage	External Link	Rank
Khuda Baksh Oriental Public Library	21,12,980 (46.4%)	1
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	19,77,570 (43.42%)	2
National Archives of India	1,41,978 (3.12%)	3
Indira Gandhi Rashtriya Manav Sangrahalaya	49,391 (1.05%)	4
National Library	47,343 (1.04%)	5
Delhi Public Library	35,543 (0.8%)	6
Rampur Raza Library	29,974 (0.66%)	7
Nehru Memorial Museum and Library	24,098 (0.53%)	8
Anthropological Survey of India	24,033 (0.53%)	9
Maulana Abul Kalam Azad Institute of Asian Studies	23,792 (0.52%)	10
Raja Rammohun Roy Library Foundation	23,770 (0.52%)	11
Gandhi Smriti and Darshan Samiti	23,697 (0.52%)	12
Central Reference Library	22,735 (0.5%)	13
Asiatic Society	18,168 (0.4%)	14
Central Institute of Higher Tibetan Studies	2,131 (0.05%)	15
Central Institute of Himalayan Cultural Studies	108 (0.002%)	16
Total	45,57,311	

The external links of 16 websites of the knowledge resources heritage is analysed in table 4.8 and ranked. Khuda Baksh Oriental Public Library has 21,12,980 (46.4%) external links and ranked 1st then comes Thanjavur Maharaja Serfoji's Sarasvati Mahal Library with 19,77,570 (43.42%) and National Archives of India with 1,41,978 (3.12%) external links and ranked 2nd and 3rd respectively and both jumped 1 places from their rank in internal links, so this shows that these two website gain more external links and has better content than other lower ranked website. Indira Gandhi Rashtriya Manav Sangrahalaya, Delhi Public Library, Rampur Raza Library, Anthropological Survey of India and Central Institute of Himalayan Cultural Studies

has jumped in ranking as of internal links in table 4.7, while the websites of National Library, Nehru Memorial Museum and Library, Central Institute of Higher Tibetan Studies, Gandhi Smriti and Darshan Samiti, Maulana Abul Kalam Azad Institute of Asian Studies and Central Reference Library has shown decline in their ranking as of internal links they have in table 4.7. Raja Rammohun Roy Library Foundation has the lowest external link of only 108 links which is very poor as it is of national importance but getting few external links, it is to website does not contain good content which attracts other website to give hyperlink to the web pages of the website of Raja Rammohun Roy Library Foundation.

4.5.3 Total Links of Knowledge Resources Heritage

Total links are the sum total of Total Internal Links and Total External Links i.e. it is a sum of Internal, follow link; Internal, Nofollow link; external, follow link and external, nofollow link.

Table 4.9
Rank of Websites as per Total Links

Knowledge Resources Heritage	Total Link (%)	Rank
Khuda Baksh Oriental Public Library	3,31,99,042 (48.52%)	1
Nehru Memorial Museum and Library	2,17,08,058 (31.72%)	2
National Library	88,81,885 (12.98%)	3
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	30,37,897 (4.44%)	4
National Archives of India	11,31,218 (1.65%)	5
Central Institute of Higher Tibetan Studies	96,363 (0.14%)	6
Gandhi Smriti and Darshan Samiti	72,292 (0.11%)	7
Indira Gandhi Rashtriya Manav Sangrahalaya	53,847 (0.08%)	8
Delhi Public Library	46,271 (0.07%)	9
Rampur Raza Library	34,334 (0.05%)	10
Anthropological Survey of India	32,431 (0.05%)	11
Central Reference Library	31,832 (0.05%)	12

Maulana Abul Kalam Azad Institute of Asian Studies	28,093 (0.04%)	13
Raja Rammohun Roy Library Foundation	24,826 (0.04%)	14
Asiatic Society	22,148 (0.03%)	15
Central Institute of Himalayan Cultural Studies	3,640 (0.01)	16
Total	6,84,29,003	

In case of the total links, table 4.9 indicates that Khuda Baksh Oriental Public Library has highest total links of 3,31,99,042 (48.52%) and ranked first after that Nehru Memorial Museum and Library with 2,17,08,058 (31.72%) total links and National Library with 88,81,885 (12.98%) total links at root domain level. Thanjavur Maharaja Serfoji's Sarasvati Mahal Library which ranked 4 has good number of internal and external links so it has total links about 30,37,897 (4.44%). Many prominent organisations have lower total links which is necessary for the authority to increase its ranks because many of these websites either has more internal links or external links which is uneven for a website to get high rank on search engine result pages (SERPs). Central Institute of Himalayan Cultural Studies has only 3,640 total links which is very poor and ranked last, here also external link is only about 108 just because the website has poor content so other websites are not creating hyperlink for the above said website.

4.6 Discovered and Lost Linking Domain of Knowledge Resources Heritage

Discovered links are those which SEO crawler found the website for the first time but it does not mean the website is created newly, while the lost links means crawler couldn't be able to find the website during last crawl of the page. The reason for not being crawled, there might be server error, link might be getting updated or 404 error. The date crawler didn't find the link is called as Date Lost and on the date link is discovered or found is called as Date Found. The Open Site Explorer (Link Explorer) crawl the high-quality web pages at least every 90 days. In link index of Link Explorer many links may be crawled at least 6 months ago.

Table 4.10
Discovered Link and Lost Linking Domain using Open Site Explorer as on 13
March 2020

Knowledge Resources Heritage	Total Discovered link	Total Lost Link	Net
Khuda Baksh Oriental Public Library	1600	545	1055
National Library	70	37	33
National Archives of India	65	21	44
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	56	0	56
Gandhi Smriti and Darshan Samiti	55	10	45
Delhi Public Library	54	8	46
Raja Rammohun Roy Library Foundation	41	17	24
Maulana Abul Kalam Azad Institute of Asian Studies (MAKAIAS)	27	14	13
Nehru Memorial Museum and Library	26	7	19
Anthropological Survey of India	25	7	18
Indira Gandhi Rashtriya Manav Sangrahalaya	20	12	8
Asiatic Society	18	4	14
Rampur Raza Library	16	6	10
Central University of Higher Tibetan Studies	6	3	3
Central Institute of Himalayan Cultural Studies	3	1	2
Central Reference Library	2	4	-2
Total	2084	696	1388

After observing the table 4.10, the website of Khuda Baksh Oriental Public Library is of high quality as it has high domain authority and page authority so the link is crawled regularly and the website is performing very well because in last 60 days of crawling the website got discovered about 1600 times which is very high among 16 websites of knowledge resources heritage. Also, the website is in regular maintenance as there is 545 lost links because crawler not found the link. The website of National Library and National Archives of India has a discovered link of 70 and 65 respectively, the authority of these website must have to improve those factors which hinders it from becoming high-quality website so the link will get crawled regularly.

4.7 Web Impact Factor of Knowledge Resources Heritage

In this section, the web impact factor of 16 websites of the knowledge resources heritage is analysed and interpreted. Web Impact Factor (WIF) is a ratio of number of links to the number of total web pages possessed by the website. WIF is kind of tool/ indicator which shows, how popular the websites are.

The Google search engine was selected for collecting the raw data to calculate the web impact factor (WIF), which is the most popular and largest search engine. Same like other search engines Google also has some query syntax to extract the data from the Web. The 5 Boolean search command/ formula were used to collect the required data for the websites of Knowledge Resources Heritage over the Web are as follows in table 4.11:

Table 4.11
Query Syntax for Google

Syntax/ Command	Result
site:URL	To determine the number of web pages of that particular URL or website
link:URL	To determine the number of web pages with hyperlinks in that particular website.
link:URL AND site:URL	To determine the number of internal links i.e. self-link of that particular website.
link:URL AND NOT site:URL	To determine the numbers of external links i.e. link going out of that particular website to the other websites.
link:URL NOT site:URL	To determine the total numbers of link incoming to that particular website from other website, i.e. in-links.

The web impact factor analysis included the simple Simple Web Impact Factor, Self-link Web Impact Factor, External Link Web Impact Factor and Revised Link Web Impact Factor. The data of these web impact factors is represented in tables from 4.12 to 4.15.

4.7.1 Simple Web Impact Factor of Knowledge Resources Heritage

The Simple Web Impact Factor is calculated as, total links of the website is divided by total number of web pages of that particular website.

$$\text{Simple Web Impact Factor} = \frac{\text{Total Number of Links}}{\text{Total Number of Webpages}}$$

Table 4.12
SWIF of Knowledge Resources Heritage

Knowledge Resources Heritage	Number of Web pages	No. of Linked Web Pages	Simple Web Impact Factor (SWIF)	Rank
Anthropological Survey of India	491	26,70,000	5,437.88	1
National Library	10,630	4,37,00,000	4,111	2
Delhi Public Library	430	3,93,000	913.95	3
Rampur Raza Library	98	11,000	112.24	4
Gandhi Smriti and Darshan Samiti	680	65,200	95.88	5
National Archives of India	1,960	1,60,000	81.63	6
Asiatic Society	140	6,020	43	7
Nehru Memorial Museum and Library	8,500	1,16,000	13.65	8
Central Institute of Himalayan Cultural Studies	153	1,800	11.76	9
Maulana Abul Kalam Azad Institute of Asian Studies	282	3,090	10.96	10
Raja Rammohun Roy Library Foundation	355	2,990	8.42	11
Central Reference Library	125	677	5.41	12
Indira Gandhi Rashtriya Manav Sangrahalaya	1,020	5,300	5.2	13
Central Institute of Higher Tibetan Studies	1,020	3,160	3.1	14
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	1,350	916	0.68	15
Khuda Baksh Oriental Public Library	11,200	1,900	0.17	16

The table 4.12, presented the distribution of data of Simple Web Impact Factor of 16 of knowledge resources heritage and their ranking on the basis of their simple web impact factor. From above table one can observe that Anthropological Survey of

India has highest simple web impact factor of 5,437.88 and secured rank 1 among the 16 websites of the knowledge resources heritage. National Library and Delhi Public Library has a SWIF of 4,111 and 913.95 respectively and both ranked 2 and 3 respectively. Rampur Raza Library and Gandhi Smriti and Darshan Samiti has SWIF of 112.24 and 95.88 respectively and secured 4th and 5th rank in the list of SWIFs. Khuda Baksh Oriental Public Library occupies the last position in the list with simple web impact factor of 0.17.

4.7.2 Self-link Web Impact Factor of Knowledge Resources Heritage

The SLWIF is calculated as, total self-link of the websites is divided by total number of the web pages of that particular website.

$$\text{Self Link Web Impact Factor} = \frac{\text{Total Number of Self-links}}{\text{Total Number of Webpages}}$$

Table 4.13
SLWIF of Knowledge Resources Heritage

Knowledge Resources Heritage	Number of Web pages	No. of Self-link	Self-link Web Impact Factor (SLWIF)	Rank
Asiatic Society	140	135	0.964	1
Central Institute of Higher Tibetan Studies	1,020	670	0.656	2
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	1,350	822	0.608	3
Delhi Public Library	430	178	0.413	4
Indira Gandhi Rashtriya Manav Sangrahalaya	1,020	377	0.369	5
National Archives of India	1,960	608	0.31	6
Central Reference Library	125	28	0.224	7
Gandhi Smriti and Darshan Samiti	680	120	0.176	8
Anthropological Survey of India	491	85	0.173	9
Maulana Abul Kalam Azad Institute of Asian Studies	282	38	0.134	10
Raja Rammohun Roy Library Foundation	355	33	0.092	11
Rampur Raza Library	98	7	0.071	12

Central Institute of Himalayan Cultural Studies	153	6	0.039	13
Nehru Memorial Museum and Library	8,500	260	0.03	14
National Library	10,630	134	0.012	15
Khuda Baksh Oriental Public Library	11,200	84	0.007	16

Table 4.13, presented the distribution of data by Self-link web impact factor and the ranking of 16 websites of knowledge resources heritage as per their SLWIF. It is clear from the table 4.13, Asiatic Society has highest Self-link web impact factor of 0.964 and ranked first among all the 16 knowledge resources heritage. Whereas, Central Institute of Higher Tibetan Studies and Thanjavur Maharaja Serfoji's Sarasvati Mahal Library ranked second and third in the list of SLWIF with SLWIF of 0.656 and 0.608 respectively. On observing the table 4.13, Delhi Public Library and Indira Gandhi Rashtriya Manav Sangrahalaya got the position of 4th and 5th with the SLWIF of 0.413 and 0.369 respectively. Khuda Baksh Oriental Public Library again ranked last too in the list of self-link web impact factor with SLWIF of 0.007.

4.7.3 External Link Web Impact Factor of Knowledge Resources Heritage

The EWIF calculated as, total external link of the website is divided by total number of web pages of that particular website.

$$\text{External Web Impact Factor} = \frac{\text{Total Number of External Links}}{\text{Total Number of Webpages}}$$

Table 4.14
EWIF of Knowledge Resources Heritage

Knowledge Resources Heritage	Number of Web pages	No. of External Link	External Link Web Impact Factor (EWIF)	Rank
Central Institute of Higher Tibetan Studies	1,020	700	0.686	1
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	1,350	822	0.608	2
Asiatic Society	140	85	0.607	3

Indira Gandhi Rashtriya Manav Sangrahalaya	1,020	377	0.369	4
National Archives of India	1,960	621	0.316	5
Delhi Public Library	430	109	0.253	6
Gandhi Smriti and Darshan Samiti	680	156	0.229	7
Anthropological Survey of India	491	85	0.173	8
Raja Rammohun Roy Library Foundation	355	61	0.171	9
Central Reference Library	125	21	0.168	10
Maulana Abul Kalam Azad Institute of Asian Studies	282	34	0.120	11
Rampur Raza Library	98	7	0.071	12
Central Institute of Himalayan Cultural Studies	153	6	0.039	13
Nehru Memorial Museum and Library	8,500	206	0.024	14
National Library	10,630	68	0.006	15
Khuda Baksh Oriental Public Library	11,200	63	0.005	16

The result of table 4.14, shows the distribution of data by external link web impact factor and all the websites are ranked as per their EWIF score. On observing the result of table 4.14, Central Institute of Higher Tibetan Studies scored the highest external link web impact factor of 0.686 and ranked 1st among the 16 websites of knowledge resources heritage of India. Whereas, Thanjavur Maharaja Serfoji's Sarasvati Mahal Library scored EWIF of 0.608 and Asiatic Society scored 0.607 and secure the rank of 2nd and 3rd respectively. On the other hand, Indira Gandhi Rashtriya Manav Sangrahalaya and National Archives of India secured the position of 4th and 5th with EWIF of 0.369 and 0.316 respectively. Again, the website of Khuda Baksh Oriental Public Library has the lowest EWIF of 0.005 and secured last rank in the list of external web impact factor.

4.7.4 Revised Link Web Impact Factor of Knowledge Resources Heritage

The RWIF is calculated as, total number of in-links i.e. link coming from other website is divided by total number of web pages of that website.

$$\text{Revised Web Impact Factor} = \frac{\text{Total Number of In-links}}{\text{Total Number of Webpages}}$$

Table 4.15
RWIF of Knowledge Resources Heritage

Knowledge Resources Heritage	Number of Web pages	Number of In-link	Revised Web Impact Factor (RWIF)	Rank
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	1,350	768	0.568	1
Asiatic Society	140	79	0.564	2
National Archives of India	1,960	473	0.241	3
Gandhi Smriti and Darshan Samiti	680	102	0.15	4
Delhi Public Library	430	61	0.141	5
Maulana Abul Kalam Azad Institute of Asian Studies	282	25	0.088	6
Indira Gandhi Rashtriya Manav Sangrahalaya	1,020	65	0.063	7
Central Institute of Higher Tibetan Studies	1,020	57	0.055	8
Rampur Raza Library	98	5	0.051	9
Anthropological Survey of India	491	23	0.046	10
Raja Rammohun Roy Library Foundation	355	14	0.039	11
Central Reference Library	125	4	0.032	12
Central Institute of Himalayan Cultural Studies	153	2	0.013	13
Nehru Memorial Museum and Library	8,500	105	0.012	14
Khuda Baksh Oriental Public Library	11,200	96	0.008	15
National Library	10,630	45	0.004	16

Here table 4.15, depicted the distribution of data by RWIF and all the 16 websites knowledge resources heritage of India are ranked as per their Revised Web Impact Factor. On observing the table 4.15, the website of Thanjavur Maharaja Serfoji's Sarasvati Mahal Library has scored highest revised web impact factor of 0.568 between the 16 websites and occupied the 1st rank. The RWIF of Asiatic Society is too closed

to Thanjavur Maharaja Serfoji's Sarasvati Mahal Library i.e. 0.564 and secured 2nd position whereas National Archives of India occupied 3rd rank with revised web impact factor of 0.241. Gandhi Smriti and Darshan Samiti ranked 4th with RWIF of 0.15 and Delhi Public Library has RWIF score 0.141 which secured 5th position. In the list of RWIF, National Library has lowest revised web impact factor of 0.004 which makes it the lowest ranked, while in case of Khuda Baksh Oriental Public Library has secured the rank 15th with RWIF of 0.008 which is one place above among the list of simple web impact factor, self-link web impact factor and external web impact factor.

4.8 Data Collection Using Alexa

Alexa (www.alexa.com/siteinfo/) is an online web analytics tool owned by Amazon. It was formerly independent company established in 1996 but acquired by Amazon in 1999. Alexa toolbar analyses lots of factor to rank a website. Alexa also provide SEO to improve the performance of websites. Using Alexa toolbar, the data for global traffic ranking, Indian traffic ranking, page views and In-links of the selected 16 websites of knowledge resources heritage is collected on March 4, 2020 and presented in tables from 4.16 to 4.19.

4.8.1 Global Traffic Ranking

Global traffic rank is the popularity of the website globally. Alexa uses some combination of factors to rank a website globally such as average daily visitor and number of pageviews on the website over last three months.

Table 4.16
Global Traffic Ranking of Knowledge Resources Heritage

Knowledge Resources Heritage	Global Ranking	Rank
Khuda Baksh Oriental Public Library	2,469	1
Delhi Public Library	5,54,916	2
National Archives of India	5,66,791	3
National Library	5,95,816	4
Raja Rammohun Roy Library Foundation	8,54,840	5
Anthropological Survey of India	8,89,142	6

Nehru Memorial Museum and Library	9,24,662	7
Gandhi Smriti and Darshan Samiti	12,03,321	8
Maulana Abul Kalam Azad Institute of Asian Studies	21,09,063	9
Central Institute of Higher Tibetan Studies	25,17,989	10
Asiatic Society	25,51,416	11
Central Reference Library	26,93,089	12
Rampur Raza Library	27,78,183	13
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	30,13,536	14
Central Institute of Himalayan Cultural Studies	36,87,655	15
Indira Gandhi Rashtriya Manav Sangrahalaya	40,94,157	16

Table 4.16 depicts the global traffic ranking of 16 websites of knowledge resources heritage of India. From the analysis of table 4.16, it is clear that Khuda Baksh Oriental Public Library has a highest global ranking among another selected website i.e. 2469 and ranked 1st in the list. Whereas, Delhi Public Library and National Archives of India has a global ranking of 5,54,916 and 5,66,791 respectively and ranked 2nd and 3rd respectively in the list. National Library ranked 4th with the global traffic ranking of 5,95,816 while Raja Rammohun Roy Library Foundation secured 5th rank in the list with global traffic ranking of 8,54,840.

4.8.2 Indian Traffic Ranking

Indian traffic ranking works same as global traffic ranking but it is on country level from where the website is emerged.

Table 4.17
Indian Traffic Ranking of Knowledge Resources Heritage

Knowledge Resources Heritage	India Ranking	Rank
Khuda Baksh Oriental Public Library	207	1
Delhi Public Library	41,414	2
National Library	80,356	3

Gandhi Smriti and Darshan Samiti	81,469	4
Raja Rammohun Roy Library Foundation	84,115	5
National Archives of India	89,127	6
Anthropological Survey of India	1,32,544	7
Nehru Memorial Museum and Library	No Data	-
Maulana Abul Kalam Azad Institute of Asian Studies	No Data	-
Central Institute of Higher Tibetan Studies	No Data	-
Asiatic Society	No Data	-
Central Reference Library	No Data	-
Rampur Raza Library	No Data	-
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	No Data	-
Central Institute of Himalayan Cultural Studies	No Data	-
Indira Gandhi Rashtriya Manav Sangrahalaya	No Data	-

Table 4.17, shows the Indian traffic ranking of 16 websites of knowledge resources heritage of India. On observing the table 4.17, Khuda Baksh Oriental Public Library secured the rank 1 in the list with Indian traffic ranking of 207. While rank 2 and 3 occupied by Delhi Public Library and National Library respectively with the Indian traffic ranking of 41,414 and 80,356 respectively. The 4th 5th ,6th and 7th position is occupied by Gandhi Smriti and Darshan Samiti, Raja Rammohun Roy Library Foundation, National Archives of India and Anthropological Survey of India respectively.

4.8.3 PageViews

Alexa calculates the pageviews as an average number of pages viewed by users on a website in last 90 days. Website with high pageviews indicates that website has a quality information and services.

Table 4.18, shows the pageviews data of 16 websites of knowledge resources heritage and ranked.

Table 4.18
PageViews of Knowledge Resources Heritage

Knowledge Resources Heritage	PageViews	Rank
Nehru Memorial Museum and Library	4	1
National Library	3.5	2
Khuda Baksh Oriental Public Library	3.04	3
Gandhi Smriti and Darshan Samiti	3	4
National Archives of India	2.4	5
Raja Rammohun Roy Library Foundation	2.1	6
Maulana Abul Kalam Azad Institute of Asian Studies	2	7
Central Institute of Higher Tibetan Studies	2	7
Asiatic Society	2	7
Central Reference Library	2	7
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	2	7
Central Institute of Himalayan Cultural Studies	2	7
Delhi Public Library	1.8	8
Anthropological Survey of India	1.4	9
Rampur Raza Library	1	10
Indira Gandhi Rashtriya Manav Sangrahalaya	1	10

On the analysis of the table 4.18, Nehru Memorial Museum and Library has highest pageviews of 4 and ranked 1st in the list. While National Library has a pageviews of 3.5 and Khuda Baksh Oriental Public Library has pageviews of 3.04 and both ranked 2nd and 3rd respectively. On 4th, 5th and 6th position Gandhi Smriti and Darshan Samiti, National Archives of India and Raja Rammohun Roy Library Foundation lies with pageviews score of 3, 2.4 and 2.1 respectively. About 6 knowledge resources heritage scored pageviews of 2, such as Maulana Abul Kalam Azad Institute of Asian Studies, Central Institute of Higher Tibetan Studies, Asiatic Society, Central Reference Library, Thanjavur Maharaja Serfoji's Sarasvati Mahal

Library and Central Institute of Himalayan Cultural Studies and all ranked 7th in the list.

4.8.4 In-Links

In-links is another type of indicator to measure the popularity of websites which confines the number of websites connected to particular websites.

Table 4.19
In-Links of Knowledge Resources Heritage

Knowledge Resources Heritage	In-Links	Rank
Khuda Baksh Oriental Public Library	3646	1
National Library	282	2
National Archives of India	214	3
Raja Rammohun Roy Library Foundation	176	4
Delhi Public Library	126	5
Indira Gandhi Rashtriya Manav Sangrahalaya	88	6
Gandhi Smriti and Darshan Samiti	81	7
Nehru Memorial Museum and Library	67	8
Maulana Abul Kalam Azad Institute of Asian Studies	67	8
Rampur Raza Library	51	9
Central Institute of Higher Tibetan Studies	34	10
Central Reference Library	33	11
Anthropological Survey of India	28	12
Asiatic Society	23	13
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	10	14
Central Institute of Himalayan Cultural Studies	10	14

Table 4.19, depicted the In-links of 16 websites of knowledge resources heritage and ranked. Khuda Baksh Oriental Public Library secured the rank 1 with highest in-links of 3646 among the 16 websites. National Library and National Archives of India occupied 2nd and 3rd position with in-links of 282 and 214 respectively. The

position of 4th, 5th, 6th and 7th occupied by Raja Rammohun Roy Library Foundation, Delhi Public Library, Indira Gandhi Rashtriya Manav Sangrahalaya and Gandhi Smriti and Darshan Samiti respectively. On rank 8 two websites has same in-links of 67 and both are Nehru Memorial Museum and Library and Maulana Abul Kalam Azad Institute of Asian Studies.

4.9 Google Page Rank

Google PageRank is developed by Larry Page and Sergey Brin, the founders of Google, at Stanford University and got patented in 1998 which was expired in 2018 but not renewed by the Google. PageRank is a kind of system of algorithms which ranks the web pages on Google search result pages. When one website hyperlinks the other web page of other website, the PageRank algorithms takes it as a popularity vote of the website which is targeted by other website. Google also uses many techniques to rank a page along with its highly developed text-matching techniques which matches with the query asked and as per relevancy of the query, it shows the high rank pages at top in Google’s search result page. Google PageRank scores on the scale of 10 i.e. score lies between 1 to 10 and it was indicated on PageRank toolbar in 2000 for public but in 2014 Google stopped updating it and in 2016 retired this toolbar for public. The reason for elimination of PageRank toolbar for public was, many SEOs were started manipulating the website which hampered the Google’s reliability. But, Google is still using this algorithm to ranking the websites and it was confirmed by Gary Illyes of Google on Feb 9, 2017.

As the patent was not renewed in 2018, there are numbers of websites which uses those algorithms to calculate the PageRank. So, **Check PageRank** (<https://checkpagerank.net/>) was used to calculate the PageRank of the 16 websites of knowledge resources heritage.

Table 4.20
Google PageRank of Knowledge Resources Heritage as on 16 March 2020.

Knowledge Resources Heritage	Google Page Rank
Khuda Baksh Oriental Public Library	6
National Library	4
Delhi Public Library	4

National Archives of India	4
Gandhi Smriti and Darshan Samiti	4
Raja Rammohun Roy Library Foundation	4
Rampur Raza Library	4
Anthropological Survey of India	3
Asiatic Society	3
Maulana Abul Kalam Azad Institute of Asian Studies	3
Central Reference Library	3
Central Institute of Himalayan Cultural Studies	2
Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	2
Nehru Memorial Museum and Library	-
Indira Gandhi Rashtriya Manav Sangrahalaya	-
Central Institutue of Higher Tibetan Studies	-

Table 4.20, shows the Google PageRank of the websites. Khuda Baksh Oriental Public Library website has topped the list with having 6 out of 10 on Google PageRank scale followed by 6 websites with 4 out of 10 on Google PageRank such as National Library, Delhi Public Library, National Archives of India, Gandhi Smriti and Darshan Samiti, Raja Rammohun Roy Library Foundation and Rampur Raza Library. The other 4 websites such as Anthropological Survey of India, Asiatic Society, Maulana Abul Kalam Azad Institute of Asian Studies and Central Reference Library scored Google PageRank of 3 out of 10. Central Institute of Himalayan Cultural Studies and Thanjavur Maharaja Serfoji's Sarasvati Mahal Library scored 2 on the scale of PageRank. The remaining 3 websites of Nehru Memorial Museum and Library, Indira Gandhi Rashtriya Manav Sangrahalaya and Central Institutue of Higher Tibetan Studies have no PageRank so it means the websites has not much value to get calculated using the algorithms.

4.10 Conclusion

A detailed analysis of data and interpretation of websites of knowledge resources heritage of India is done in this chapter. The data is collected using various tools such as Open Site Explorer, Google search Engine, Alexa and Google PageRank and the collected data is analysed quantitatively to prove the hypotheses framed for the study. Webometric indicators are used to rank the website as per their popularity and ranked according to their global traffic ranking.

Chapter 5
Findings, Suggestions and Conclusion

Chapter 5

Findings, Suggestions and Conclusion

5.1 Introduction

This chapters deal with the findings of the study after analyzing and interpreting the data in Chapter 4 along with discussions and suggestions.

5.2 Findings and Discussions

The analyses, interpretation and evaluation of the websites of Knowledge Resources Heritage of India was according to objectives formulated in the beginning of the study. The major findings drawn from the study are as follows:

1. While going through the list of Knowledge Resources Heritage on website of Ministry of Culture, Government of India, the name of the knowledge resources heritage were not correct such as Central Institute of Higher Tibetan Studies was named as Central University of Higher Tibetan Studies while Thanjavur Maharaja Serfoji Sarasvati Mahal Library was named as Thanjavur Maharaja Serfoji Mahal Library. It is necessary for the authority to provide correct information to the users to maintain the credibility of information given on ministry website.
2. Out of 16 websites, 14 websites of knowledge resources heritage were using restricted gTLDs such as .gov, .nic, .edu and .ac and all these websites had .in ccTLD. While website of Asiatic Society and Thanjavur Maharaja Serfoji Sarasvati Mahal Library were using gTLD of .org and .com respectively. Websites having ccTLD is of more benefit for them in getting higher SEO value on country-based search result and also SERP give search result related to the website which have same local ccTLD. Another benefit is, the local user visits the website with confidence of getting authentic information and it also increases the credibility of websites in local people.

3. Domain Authority of Khuda Baksh Oriental Public Library was highest among the 16 websites i.e. 62. Google identifies those websites having high domain authority as a trustworthy websites and Google take it as a factor which helps in determining the rank of websites on SERP. High domain authority helps the website in getting good position in search engine result pages.
4. Again, out of 16 websites Khuda Baksh Oriental Public Library had scored highest page authority of 50 and secured the rank 1st. It has same benefits as of domain authority. To increase page authority of any web page of a particular website, it is necessary to create new pages with high quality content with detailed and expanded information. Also, other web pages should be updated regularly.
5.
 - (i) Khuda Baksh Oriental Public Library had highest number of internal links which was about 3,10,86,062 and secured the rank 1 among the 16 websites.
 - (ii) In case of external links, Khuda Baksh Oriental Public Library secured the rank 1 in the list of external links of the 16 websites of knowledge resources heritage, with total external links of 21,12,980.
 - (iii) The website of Khuda Baksh Oriental Public Library possesses highest number of total links that is about 3,31,99,042 and secured rank 1.

High number of internal and external links improve the search engine optimization of website (SEO). Internal links helps in engaging the user to the website through relevant and quality information which improves the page views so as, improves the PageRank which directly boost the position of website on search engine result pages.

Website do have good amount of external links but it doesn't mean that add any external links to the pages. The external links must have of good quality, informative and trustworthy, which helps in improving the credibility of the website. Also, valuable external links improve the authority of the website which directly improve the position of website on SERP.

6. (i) Simple web impact factor of all 16 websites of knowledge resources heritage was calculated and it was found that Anthropological Survey of India had highest simple WIF of 5,437.88 and secured rank 1st .
(ii) Asiatic society had scored the highest self-link web impact factor of 0.094 and secured 1st rank among the 16 websites.
(iii) Central Institute of Higher Tibetan Studies scored the highest external link web impact factor of 0.686 and ranked 1st .
(iv) Website of Thanjavur Maharaja Serfoji's Sarasvati Mahal Library has scored highest revised web impact factor of 0.568 between the 16 websites and occupied the 1st rank.

The website having high web impact factor show the 'international visibility' of the website i.e the popularity of website. So, the website with high WIF their visibility will be high and vice versa. It helps in comparing the website of same field to improve the performance of underperforming website.

7. Using Alexa Internet, Global Traffic Ranking of the 16 websites were evaluated and Khuda Baksh Oriental Public had the highest traffic rank of 2,469 among the 16 websites also Khuda Baksh Oriental Public Library had Indian Traffic Ranking of 207 and ranked 1st among the 16 websites. The website having high Alexa rank shows the popularity of the website and it also helps users to trust the website. High popularity also means that the website contains good quality content so other website place links of the website in their content which helps the website in getting external link which effects the position of website in SERP.
8. In case of PageViews, Nehru Memorial Museum and Library had highest PageViews of 4 and secured 1st rank among the 16 websites of knowledge resources heritage. High pageviews denotes the website has good quality information. Through pageviews, website come to know which page is seen most so other website can provide information similar to that to increase its pageviews.

9. Khuda Baksh Oriental Public Library had highest number of In-links that is about 3646 which was calculated using Alexa Internet and ranked 1st among the websites of other knowledge resources heritage. In-links also known as internal links. High number of in-links helps website in getting high rank in SERP. When we add more internal links to the website, Google index those web pages or internal links after crawling which improves the indexing of the website in Google database which helps the internal links getting good position in SERP.

10. The 16 websites of knowledge resources heritage were also evaluated on the basis of Google PageRank and it was found that Khuda Baksh Oriental Public Library had Google PageRank of 6 out of 10 which is highest among the selected websites. The websites need to improve their PageRank by publishing content regularly. High PageRank of website helps Google to index the content super-fast i.e. within minutes of publishing. It also increases the credibility of websites.

5.3 Suggestions

1. Ministry of Culture must cross-check the information on website before making it public.

2. Websites must provide 'last date of update' to show the currency.

3. Websites should provide multilingual accessibility for people who have limited English proficiency.

4. The websites which have small number of internal links must add more contents to its website, so increased number of internal links helps the websites to get topped in the search engine result pages.

5. Websites must provide detailed and relevant information on the webpages which attracts more external links which influence the websites ranking in SERPS, domain authority and page authority.
6. To increase the pageviews, websites have to update the information in real time and it also help in getting more traffic which improves the websites Global Traffic Ranking.
7. Websites should use a smaller number of 'nofollow' tag HTML code, which helps the crawler to index pages in their search engine directory which increase the visibility of the webpages on the search engine result pages at top.
8. Websites must improve their follow internal links and follow external links which help in getting better web impact factor.
9. Websites should interlink themselves for better flow of information to the visitors and it will increase the traffic on the website.
10. Webmaster of the websites use Search Engine Optimization (SEO) tools to check the performance of the website over the search engine and make necessary improvement in the website for better performance.
11. The websites of knowledge resources heritage should interlink to each other in order to share information and enhance websites performance.
12. Websites should provide feedback facility for users to give suggestion to enhance the website better than before.
13. Important announcements, changes in policy, starting of new services, setting up of a new facility are to be quickly brought to the notice.

5.4 Scope for Further Research

The present study includes only web link analysis and web impact factor. Following are the areas for further research:

1. Web content analysis of websites of Knowledge Resources Heritage of India.
2. Web usage analysis of websites of Knowledge Resources Heritage of India.
3. Impact of Blogs, Twitter, Facebook Pages, Reviews and Testimonials on Knowledge Resources Heritage of India: A Webometric Study

5.5 Conclusion

There is number of webometric studies regarding library and organisations websites but this study is the only webometric study of the websites of the Knowledge Resources Heritage of India. All the knowledge resources heritage has their web presence. The study is done in very precise manner. There are many websites need necessary improvement because they performed very poorly in the study which hampering their visibility and accessibility over the search engine. The findings and suggestions will be useful for the webmaster of the websites to improve their performance.

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