Chapter 1

Introduction

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Chapter 1
Introduction

1.1 INTRODUCTION:

Websites is an essential part of today's communication. It is used as an apparatus by individuals, organizations, libraries etc. not only to promote their capabilities and competences but also to provide services to their clients/users. There is mass of information available on websites now a days. These websites are entrances to the virtual world and exits from the actual and objective world. Thematic and specialized websites are an informative and communicational instrument. It contains valuable and updated information and act as an information transfer channel. Specialists and other individuals can access to the daily information available on these websites and use them efficiently in their work.

The appearance of the World Wide Web (www) has seen the world confronted with a phenomenon called a website. Websites act as connection and communication points for the users with electronic information. Every corporation, organization or institute (i.e. Libraries) attempts to launch itself into the virtual world using this modern phenomenon. With respect to the abundance and variety of websites, specialized and thematic sites enjoy great status on the World Wide Web (www). Recognition, ranking and evaluation of these types of websites are of immense importance to the researchers of those fields.

It is true that the internet and websites are paradigm in global communication. Information flow is collapsing all boundaries, bringing together the library science community closer and closer.

1.2 CONCEPTUAL ANALYSIS:

1.2.1 Concept of websites:

A website is collection of interlinked web pages on a related topic, usually under a single domain name, which includes an intended starting file called “home page”. From the home page, one can go/visit all other pages on the website. Each site is owned and managed by an individual, company or organization. The complete set of documents
residing on all internet servers use the Hyper Text Transfer Protocol (HTTP) is accessible to users via a single point click system. World Wide Web (www) is a part of the internet that contains linked text, image, sound, video and documents.

1.2.2 Web Structure:

Before proceeding further, some concepts may be discussed briefly for better understanding of web structure

a) Web page: These are basic unit of web resources. Web pages are HTML formatted document like objects that incorporate text, graphics, sound, animation and multimedia elements. Pages are connected to one another using hypertext links (hyperlinks)

b) Website: A website is a collection of web pages. A web site can be accessed through its URL (Uniform Resource Locator e.g. http://www.csir.res.in)

c) Home page: The Home page is the first or top page of any website. It acts as a table of contents to organize the site.

d) Hyperlink: It is highlighted word, text, icon or graphic by clicking on which one can easily navigate to additional information on the same host server or one across the globe.

Library websites are increasingly becoming a tool that enables libraries to offer and market their services online. Partnerships or consortiums (among libraries and between libraries and other institutions) through the Internet are deemed necessary for the effective management of library services. The realization of Internet-related benefits and opportunities, therefore, depend on a library’s connectivity to the Internet. It is thus crucial to periodically audit the libraries websites in order to measure their web presence, structure and impact.

1.2.3 Web Browser:

The key to the web’s success is the fact that it is easy to use. A web browser also known as web client, is a software interface just like a word processing or a spreadsheet program which enables the user to read or browse web pages and move from an HTML
document on one computer to another HTML document on any other computer on internet. Microsoft internet explorer is the one common browser used to browse www.

1.2.4 Webometric:

Metrics studies in LIS such as Librametrics, Bibliometrics, Scientometrics, and Informetrics are well known. The number of studies has been carried out in these areas. The metric studies are used to measures scholarly communication; identify research trends and growth of knowledge; identify users of different subjects.

The term Webometric was first coined by Almind and Ingwersen (1997). According to Bjorneborn and Ingwersen (2004), the definition of ‘Webometric’ is "the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the Web drawing on Bibliometric and Informetric approaches." (http://www.ijidt.com/index.php/ijidt/article/download/451/333)

Figure 1.1: Relationship between Informetrics, Bibliometrics, Scientometrics, Cybermetrics and Webometrics (Bjorneborn and Ingwersen, 2004)

Figure 1.1 described the relationship among the various metrics clearly. One can observe the relationship between Informetrics, Bibliometrics, Scientometrics, Cybermetrics and Webometrics, one can observe that Webometrics is associates with
Bibliometrics and overlaps Scientometrics to an extent. “The area of Webometrics may look as fully enclosed by Bibliometrics, because the web scripts, whether words (or) images, are evidenced information stocked on the web server”.

Thus this definition covers quantitative aspects of both the construction and the usage of the Web embracing four main areas of present Webometric research:

a) **Web-Page Content Analysis:**

Analysis of webpage content is a kind of subject study based on the web site contents. It is the spontaneous arrangement of web pages and words by tools and different types of search engine for analyses. It provides hits on the systematic organization of web based information sources and compares the efficiency of search engines in retrieving the required information sources. “Simplistic counts and content analysis of web pages are like traditional publication analysis”. It will be useful for students, researchers, scientists who seek information through World Wide Web (www).

b) **Web Link Structure Analysis** (e.g. hyper, self & external link):

Web link structure study means citation analysis that provides links to other web pages or websites. It is the study of hyperlinks of a particular web site, patterns of linking like self links, in links, external links etc.

Figure 1.2: Main areas of Webometric study
c) **Web Usage Analysis** (e.g. log files of users’ searching and browsing behavior):

Web usage analysis is part of a more general user and usage research. It deals with the log files of user’s searching and browsing behavior. (http://www.ijodls.in/uploads/3/6/0/3/3603729/55-65313.pdf)

d) **Web Technology Analysis** (including search engine performance):

Web technology analysis refers to information system assessment. It relates to the search engine performance closely associated with the information retrieval and supports to webometric research.

“Webometric analyses generally concentrate on the analysis of websites mainly in the performance of the academic and other research organizations web domains (Jeyshankar, 2011)”.

A second definition of Webometric has also been introduced, "the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study" (Thelwall, 2009), which emphasizes a small subset of relatively applied methods for use in the wider social sciences. The purpose of this alternative definition was to publicize appropriate methods outside of the information science discipline rather than to replace the original definition within information science.

Webometric covers research of all network-based communication using informatics or other quantitative measure. Webometric, in future, may come up as one of the most interesting research area for the vast collection of electronic information available on the publicly indexable web.

1.2.5 **Library Website/Webpage:**

The library Website/Webpage is the online front door for the library. It always creates signage for users. The effective library website/webpage pulls together, in one unified interface, all of library resources in print and electronic media. It offers valuable public service and can redefine community. It can even lead users back to print. A good library website/webpage offers implicit instruction and projects an important image of the librarian as knowledge administrator or director in information era.

Creating a website/webpage for a library or knowledge resource center is exciting and at the same time challenging task for librarian. A well formulated strategy is pre-
requisite for successful website/webpage of library. Web engineering is an emerging discipline and the web design process is something challenging and at the same time rewarding. It is a real blend of Arts and Science. (Hirwade, 2006)

1.3 SIGNIFICANCE AND NEED OF THE STUDY:

Information and communication have become two most important strategic issues for the success of every enterprise. Today nearly every organization uses a substantial number of computers and communication tools, but they are often isolated. To overcome these obstacles, computer networks are necessary. Computer network is a new kind of organization of computer systems produced by the need to merge computers and communication.

With the help of www and related internet technologies any organization, institution and college can make their presence on internet. The objectives of college web site and its library are:

- To provide information about the college and its library.
- To provide information about its activities.
- To provide information services on-line.
- To provide links to relevant important sites
- To facilitate easy access to information and resources.

A good well designed and organized college web page serves as an excellent media for publicizing the library functions, activities, programs, resources and services. Important library announcement, change in policies, starting of new services, setting up of new facilities can be quickly brought to the notice of library users. But internet resources, like other traditional information sources, need to be evaluated in order to judge the quality or appropriateness of information.

Educational institutions’ web sites are huge all-around communication accessories and are progressively used for a vast variety of reasons from inviting new users to contribute the electronic based services. The websites of institutions have become one of the primary sources of information in research and academic activities. In terms of research, the educational institutions’ websites can declare the presence and
promote the performance of individuals, research communities, institutions and departments.

Engineering colleges are notable organizations in Higher and Technical Education and its related functions in Indian technical education. Engineering college libraries play a significant role in supporting their movements by executing different activities and contributing various benefits. In addition, as these institutions are situated at various parts of the country and its various states, it is not possible for the people living in remote areas to collect information about engineering college libraries, except websites.

The entire information of the engineering college library websites is needed for the user community. Therefore, the content and link structures of website become a great platform to test advanced techniques of appraising webometric activities. On the review of literature, it is found that a number of studies have been carried out in foreign countries on certain parameters of websites analysis such as link structure analysis which includes the analysis of Self Links, External links, and Inlinks. There are studies on Web Impact Factor, Search engine performances, Webpage content analysis and Web usage analysis. Some of the earlier studies require further study on websites to benefit exceptional consideration of the nature of weblink.

The study seeks to verify engineering college library websites in Maharashtra State in order to measure the libraries content, web structures and presence or visibility. The study’s target areas include the location of library links on institutions websites, total number of web pages, internal-links, external-links, self/reverse-links and the most popular links targeted by these institutions. An analysis and result of the present study will be useful to the users of engineering college library websites to know its information quality, content, link performance, organization of information and design.

The some advantages of the engineering college Library websites are:

- It reaches the users in a very short period of time
- It acts as a mirror for the library
- Latest information can be sent to the users very easily
- Users can download the information regarding library on their computer very quickly
- It is a powerful media than any other available media
- We can interact with users very easily (P. Krishnakumar, 2015)

To fulfill these objectives and advantages the study of Webpages and websites is necessary.
1.4 SCOPE AND LIMITATIONS OF THE STUDY:

This study sought to audit and map selected engineering college library webpages and websites in order to measure the libraries web structures, content, and visibility/presence. The study’s focus areas included the number of web pages, internal-links, external-links, self/reverse-links, location of library links on college websites, and the most popular link(s) targeted by these colleges. The most popular sites will be examine in order to determine the institutions / organizations / sites with which these libraries are linked.

The present study is limited to the engineering colleges in Maharashtra State and there are 374 engineering colleges under Directorate of Technical Education, (DTE) Maharashtra State, up to the date of March, 2017. In these 374 engineering colleges all State Government/Aided Colleges, University Managed Institutes, University Departments, Autonomous Engineering Institutes, and Unaided colleges are considered for the study.

Websites are updated periodically by engineering colleges. Due to this updating process links, they also keep changing on a continuous basis on their Webpages and websites. The consecutively issue is also addressed in this study because web information systems are continuously undergoing changes incrementally as well as radically. Results of one search engine sometimes differ from other search engine and also the hits of one day differ from next day. The period of data gathering took place from March 2012 to March 2017.

Also the present study is limited up to only for Webometric study of Web page content analysis and Web link structure analysis (e.g. hyper, internal, external & self link) of engineering college library Webpages and websites of Maharashtra State.

The another part of Webometric study is Web usage analysis (e.g. log files of users’ searching and browsing behavior) and Web technology analysis (including search engine performance) is not studied due to huge data and non availability of data on World Wide Web (www) at user end (i.e. Researcher end). This data can be retrieved only from web administrator’s login of engineering college websites. This is also one of the limitations of the present study.

Therefore researcher has selected to study on “A Webometric Study of Engineering Colleges in Maharashtra: Special Reference to Library Webpage’s”
1.4.1 Operational Definitions:

Therefore, in addition to the aspects of Webometric, the related terms of “Study,” “Engineering”, “Colleges”, “Maharashtra”, “Special”, “Reference”, “Library” and “Webpage’s” are also explained here.


Study: According to Illustrated Oxford Dictionary of English Language, (2007a) ‘Study’ means, “the devotion of time and attention to acquiring information or knowledge, especially from books, the pursuit of academic knowledge (continued their studies abroad), a thing that is or deserves to be investigate or examine (a subject) (Webometric study).”

According to Concise Oxford English Dictionary, (2007a) ‘study’ means, “a detailed investigation and analysis of a subject or situation, a thing that deserves to be investigated, done with deliberate and carefully effort.”

Engineering (Faculty): According to Oxford Advanced Learner’s Dictionary of Current English, (2015a) ‘Engineering’ means, “The activity of applying scientific knowledge to the design, building and control of machines, roads, bridges, electrical equipments, etc. (e.g. The Bridge is a triumph of modern engineering). Also Engineering Science is the study of engineering as a subject; a degree in Engineering (Civil Engineering, Mechanical Engineering, etc).”


According to Illustrated Oxford Dictionary of English Language, (2007b) ‘faculty’ means, “an aptitude or ability for a particular activity, and a group of related college or university departments, e.g. Faculty of physical sciences. According to
Concise Oxford English Dictionary, (2007c) ‘faculty’ means, “a group of college or university departments concerned with a major division of knowledge. And the teaching or research staff of a college or university.”

**College(s):** According to Illustrated Oxford Dictionary of English Language (2007c) ‘College’ means, “An educational institution of advanced learning and research conferring degrees.”

According to Concise Oxford English Dictionary, (2007d) ‘College’ means, “A high-level educational institution in which students study for degrees and academic research is done.”

**Maharashtra (a place):** According to Illustrated Oxford Dictionary of English Language (2007d) A place: - a Country, State, City, Village, etc.

Concise Oxford English Dictionary, (2007e) described that “in place working or ready to work; established. (Engineering Colleges where established.)

A state of India encompassing 3,07,713 sq.kms.

**Special:** According to Oxford Advanced Learner’s Dictionary of Current English, (2015b) ‘Special’ means, “not ordinary or usual; different from what is normal, more important than others; deserving or getting more attention than usual, etc.”

**Reference:** According to Oxford Advanced Learner’s Dictionary of Current English, (2015c) ‘Reference’ means, “a thing you say or write that mentions subject/s the else, the act of mentioning subject or things, etc.”

**Library:** According to Oxford Advanced Learner’s Dictionary of Current English, (2015d) ‘Library’ means, “Building in which collections of books, CD’s, newspapers, etc are kept for people to read, study or borrow.” (e.g. Public/Reference/College/University, etc. Library)
Webpage(s): These are basic unit of web resources. Webpages are Hyper Text Markup Language (HTML) formatted document like objects that incorporate text, graphics, sound, animation and multimedia elements. Pages are connected to one another using hypertext links (hyperlinks).

According to Oxford Advanced Learner’s Dictionary of Current English, (2015e) ‘Webpage(s)’ means, “a document that is connected to the World Wide Web and that anyone with an internet connection can see, usually forming part of website.”

1.5 OBJECTIVES OF THE STUDY:

The present study is undertaken with the following objectives:

1.5.1. To study engineering college websites of India in general and Maharashtra in particular.

1.5.2. To identify the online services given by engineering college libraries in Maharashtra.

1.5.3. To find out the most targeted websites of engineering college Libraries in Maharashtra.

1.5.4. To know the web structures of the websites of engineering college Libraries in Maharashtra.

1.5.5. To compile the directory of web addresses of the engineering college Libraries in Maharashtra under Directorate of Technical Education (DTE).

1.6 HYPOTHESES OF THE STUDY:

1.6.1 Most of the engineering colleges in Maharashtra have their own websites on World Wide Web (www).

1.6.2 Engineering colleges and their libraries regularly update their websites.

1.6.3 Engineering college libraries offer web based services to their users.

1.6.4 Most of the libraries of engineering colleges in Maharashtra don’t have their independent website.
1.7 RESEARCH METHODOLOGY AND DATA COLLECTION:

Following methodology is used for collecting the data:

1.7.1 Selection of Search Engine and Analysis software
1.7.2 Collection of URL of selected Web addresses
1.7.3 Collection of Data in MS-Excel sheet retrieves through Searching on World Wide Web (www)

Webometric technique is used for the present study. The Methodology applied in the present study involves engineering college library websites survey and Webometric analysis.

Website Survey: The investigations in this study consider 374 engineering college websites in Maharashtra. The web addresses of the engineering college websites are collected from website of DTE, AICTE & NBA by using Google, AltaVista, Yahoo, etc search engines. The main search is conducted using the keyword of all engineering college name / web address.

Webometric Evaluation and Analysis: The study analyses the content of the engineering college library websites and Webpages in Maharashtra State and their link performance. The present research study is divided in to two parts.

In the first part, the study has used commercial search engine “Google” for retrieving the required Webometric data for the content analysis of engineering colleges’ library Webpages and Websites.

In the second part, the study has used software “A1 Website Analyzer 8” for retrieving the required Web link data for the link structure, performance and analysis of library Webpages of engineering college Websites.

To evaluate the Webpages and websites of engineering college libraries in Maharashtra state, following criteria and data sheet were framed by the researcher. The following data sheet has shown the content fields, link presence and pages attached with links of their respective Webpages and websites.

Based on the analysis of the Webpages and Websites of engineering college libraries in Maharashtra State, rating and grading is done by using the score as shown in the following data sheet. The scores are also assigned according to the detailed information displayed on Webpages and Websites, out of the maximum points defined
for that particular criterion. As per score, Webpages and Websites have been rated, ranking and grading with descending order of scoring. (Hirwade, 2006a)

Table No.1.1

DATA SHEET

I. CONTENT ANALYSIS

1. College Code:
2. Name of the Engineering College:
3. Type of the Engineering College:
4. Year of Establishment:
5. Zone / Region:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Criteria Main Fields</th>
<th>Criteria Sub Fields</th>
<th>Criteria Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General fields</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Basic Information of Library</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Library Sections Information</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Library Collections Information</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Library Periodicals Information</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Electronic Resources and Databases Information</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Library Services Information</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Technical Services Information</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Value Added Information</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>Library Multimedia Tools</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Library Web-based services</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Link to Social Networking Sites from Library Website</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>Link to Open Access Resources from Library Website</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>14</td>
<td>Link to Reference Sources from Library Website</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Link Availability</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>
Whenever necessary tables, figures and graphs were framed for content analysis and the similar features were grouped at one place for collecting the required data.

The American Psychological Association (APA) style manual has been followed for citing references in this study.

1.8 CONSPECTUS:

Present study is divided in the following chapters:

Preliminary pages
i. Title page
ii. Certificate of Guide
iii. Declaration by the Candidate
iv. Acknowledgement
v. Table of Contents
vi. List of Tables
vii. List of Figures
viii. List of Graphs
ix. Abbreviations Used

Chapters
1. Introduction
2. Webometric: Reviews of Related Literature
3. Engineering College Libraries: An Overview
4. Data Analysis & Interpretation
5. Conclusions & Implications

Bibliography

Appendices
1.9 BRIEF DETAILS OF CHAPTERS:

The scheme of chapters of the research thesis is as follows:

In the first chapter, researcher has included some of the sub themes for explanation of the research topic which includes Introduction, Concept of websites, Web Structure, Web Browser, Webometric, Significance and Need of the Study, Scope & Limitations of the Study, Objective of the Study, Hypothesis of the study, Research Methodology and Data collection, etc.

The second chapter deals with review of literature. This chapter presents some of the abstracts of various studies that had been done on the areas of webometric. The worldwide studies are collected, related to web content analysis, web link analysis and general webometric from leading databases. All the reviews were classified and studied to get an in-depth view of the topic. The large body of literature on webometric provides the basis to the present study.

Third chapter includes the overview of Engineering Colleges and their Libraries in Maharashtra State, History of Higher Education, Technical Education, it’s developments and historical perspective, The role of AICTE in technical institutions, Role of industries in technical institutions, Role of library in a technical institutions, Role of librarian in technical institutions library, Qualification, experience and job description of librarian, Infrastructural norms for engineering college libraries, Status-Wise Engineering Colleges, etc.

Fourth chapter deals with the source of data collection, method of data collection and analysis of the data. This chapter presents analysis and interpretation of data collected from 374 engineering college’s library Webpages and Websites in Maharashtra from March 2012 to March 2017 as per approved engineering colleges by DTE, Maharashtra and AICTE, Delhi. Data is systematically classified and tabulated, analyzed and interpreted. Whenever necessary tables, figures and graphs were framed for content analysis part and the similar features were grouped at one place for collecting the required data.
In the fifth chapter, conclusions were drawn on the basis of analysis. Testing of hypotheses, suggestions, recommendations, limitations and implications of studies have been given by researcher in this chapter.

The data analysis of the study is done by applying the statistical tools and techniques such as Frequency and Percentage Analysis, Ranking method, Web-impact Factor.
References


