3. Chapter: Research Design & Methodology

3.1 Overview
There are fourteen sections in this chapter. The first section is the overview of this chapter. The second section is the introduction. The third and fourth section presents the statement of the problem & variables used. The next three sections present the objective, Hypothesis & sample of the study. The next four sections explicit the research design, tool construction, pilot study & reliability of the scale. The last three sections explain the main study, time schedule, statistical techniques & chapterisation.

3.2 Introduction
Research methodology is an important aspect of any kind of research work. The procedure adopted by researcher for the systematic investigation is known as methodology. This chapter includes all aspects of data collection, the population, sampling data analysis techniques along with the detained criteria based on the checklist from various websites followed by data presentation part which gives the distribution details on various parameters studied.

3.3 Statement of the Problem
Considering the reference literature regarding CALS study through website evaluation, the following problem has been stated “CONTENT ANALYSIS OF LIBRARY SERVICES IN LIBRARY THROUGH LIBRARY WEBSITE WITH SPECIAL REFERENCE TO MUMBAI REGION: A STUDY”
No one judge the quality of information found on internet before it is published, so we must evaluate the information available of the website. Some sites are created by experts or by Librarians who have experts in this field. However, the majority of World Wide Web sites are designed and authored by non-experts.

The main reason for this study is to evaluate the status of library that belongs to all the colleges / institutes that comes under the jurisdiction of Mumbai district. A checklist has been used to gather the data for all library webpage to find out the innovative services in the library. This study is to probe into the process of CALS strategy.
making with an emphasis on investigating the activities included and the social aspects of how and why a specific selection is made amongst all the potential choices. This is in order to scrutinize a substitute examination and conceptualization of the CALS strategy process.

Innovative services in the library are the need of the hour. Lots of opportunities were already gone for library professionals to face the challenges and improve the ICT skills. In the move it has included the efficiency of web, giving distant access to data further simple & practical and is getting cheaper & to stay it latest. There is in this manner expanding enthusiasm for the electronic based content to be given by the libraries. Today libraries have planned and created webpages to display their collection in India and some other parts. Determine the purpose of the website by looking closely at the content of the information. Study is based on CALS features on Library Homepage used following variables during the study.

In the move it has incorporated the offices of web, giving remote access to information all the more basic and handy and is likewise getting to be less expensive and to stay it a la mode. There is in this manner expanding enthusiasm for the electronic administrations to be given by the libraries.

### 3.4 Variables used

The following variables are selected for the present study.

**Independent Variables** are nine features used for evaluating the website.

i. Multimedia Features  
ii. Currency Accuracy & Updates  
iii. User Interface features  
iv. Content features & Analysis  
v. Link to online resources  
vi. Special collection  
vii. Links & Maintenance  
viii. Innovative & interactive web features  
ix. Miscellaneous features
Dependent variable:

The study considers the **total website score** as dependent variables. These variables are enhanced or remain unchanged introducing removing or changing the independent variables.

**Other variables:**

Types of libraries are other variable. ASC Library, Public Library, Engineering & technology Library, Special Library, Law Library B.Ed. College Library are other variables in this study.

**3.5 Research design**

The study evaluates user interface features of select library websites of Mumbai and uses a blended approach that consolidates both qualitative & quantitative methods of website assessment using specially constructed CALS features. Different elements of contents of homepage are evaluated.

This study using mixed method research includes qualitative and quantitative analysis.

Develop Checklist - The data obtained through checklist has been presented in 9 tables followed by their analysis & interpretation.

Methodology of research depends on the nature, scope & objectives of research problem. Evaluation of library websites/homepage of all the institution within Mumbai region has taken for the study. For this purpose various databases are used for published literature.
Table 3.5.1: Step of Research Design

Table 3.5.1 shows the various steps of conducting research.

A literature search was led in library science database for article about innovative services like interactive web features and SM. EBSCO database & other subscribed journals was used to recover scholarly articles for background study.
Apart from this the library blogs and the various academic institutional websites, which are linked to value added services, will be surveyed and evaluated. In addition to that UGC-NLIST consortium will be used to search latest scholarly articles. Secondary sources of information will be gathered through scholarly articles and journals available on print as well as online and also on the books. The collected relevant literatures were carefully studied & presented in the review of literature chapter IV. ‘Zotero’ were used to save search articles and created bibliography. Google scholar was used to search scholarly articles. Google alerts were used for relevant articles. EBSCO data bases are also used.

Qualitative evaluation

The subjective part of the list contains around eight elements relating to library homepage, which acts as a recounting gadget for detailed information. Normally this information can get from the homepage of the site. The qualitative investigation of the list does not give any numerical values and are not considered for definite positioning of assessment. However, it is important to learn the particulars of the site for surfing and reaching them for added point of interest. Madhusudhan, M.,(2012)

Quantitative evaluation

The quantitative piece of list consist about fifty dichotomous questions to evaluate the websites based on a number of criteria-library services, web 2 features, currency, accuracy, significance, structure, scope, and links and so on. Also to consider evaluation of the user interface which is related to navigation, searching, advance search techniques features and informative feedback and support of study website to gather data.

Considering that most libraries do not have an independent website, it was decided to survey the website of all colleges and organizations coming under the jurisdiction of Mumbai district.

This research plans to assess website with the guide of subjective and quantitative elements physically and investigate how libraries are embracing different interactive and innovative services.
Evaluation of website will conduct during the period June 2014 to Sep. 2015 only. Only active web pages will consider under the study.

A set of questionnaire will be prepared for the library users containing open ended and closed ended question, to know the status and usage of interactive features in library website.

### 3.6 Objectives

The research is to measure the website of library content updates of home page or website that support the user to facilitate learning:

- To analyse the CALS features on the library website
- To figure out the innovative tools and resources to be included on the website/home page
- To analyse the status and role of social media in various libraries
- Survey analyse websites of libraries under concerned for an overview of Library services & products.
- To find out role and status of interactive features in libraries

### 3.7 Hypothesis

\( H_0 \) There is no significant difference between library content features and total website score

\( H_1 \) There is significant relationship between library content features & total website score.
3.8 Population & Sample size

The purpose of this study pertains to all the institutes library website / homepage of Mumbai region. At present there are a total 378 institutions are coming under Mumbai region. With breakup as Arts, Science & Commerce Colleges, Public Libraries, Special Libraries, Law Libraries, B.Ed. colleges, Management institutions, Engineering Institutions. The Study excludes Thane & New Mumbai institutions.

3.8.1 Sample Size:

Table 3.8.1 : Sample Size for data collection

<table>
<thead>
<tr>
<th>Type of Institutes</th>
<th>Total Institutions web-pages visited under the jurisdiction of Mumbai</th>
<th>No. of Institutes taken for study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts, Science &amp; Commerce Colleges</td>
<td>210</td>
<td>91</td>
</tr>
<tr>
<td>University +Deemed to be University</td>
<td>08</td>
<td>08</td>
</tr>
<tr>
<td>Public Library</td>
<td>10</td>
<td>09</td>
</tr>
<tr>
<td>Law College Institutions</td>
<td>14</td>
<td>09</td>
</tr>
<tr>
<td>Management &amp; Research Institutes</td>
<td>33</td>
<td>09</td>
</tr>
<tr>
<td>Special Library **</td>
<td>52</td>
<td>26</td>
</tr>
<tr>
<td>Engineering &amp; Technology Institutions</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td>B.Ed. Colleges</td>
<td>17</td>
<td>06</td>
</tr>
<tr>
<td>**Total Organizations’</td>
<td>378</td>
<td>180</td>
</tr>
</tbody>
</table>

**Special Library includes Hospital Library, Research Institutes, Architecture Colleges, Pharmacy Colleges, Institute of Aviation, Heritage Management, Media Studies, Insurance Institute, and Museum & Home Science Colleges.
3.8.2 Sampling Procedure

In the present study only those sample has been taken where at least three to four features is available on the website with a view to segregating further on the basis of types of libraries, the respective websites of 180 institutions were visited which were already chosen as stated above.

From this study, it was revealed that there was no clear cut instruction or model available to add content on website. Lot of differences was found during the CALS study process. Reason may be for this is that it depends on the web developer to add the icons and buttons as per their suitability to add the content on the website. Website development is by IT professions, some are hiring the services and a few are developed by Librarians or library professionals.

The criterion for evaluation was based on predefined parameters & features taken from different studies as checklist (Appendix I)

Following website features were used as checklist for sampling purpose.

While evaluating website some of the features are taken under consideration like

What are the innovative services available in the library?

Whether links to e resources/digital consortium/ online journals and useful links are given or not?

Whether help tutorials are available in the site?

What is the frequency of website updates and by whom?

Whether library uses interactive web features in home page of Library?

Is social media application is there in the website?

Is Library provides online library catalogue or not?

Is there any Institutional Repository set up by Institution and Library manages this?

The name of the institution website study was given in the Appendix II. A list of all the institutions those are not having website / library content or very less library information are also given in appendix III.
A study of these institutional websites will then be conducted to analyze the content, layout of the websites, types of web tools used, frequency of updating these tools, and whether these tools are easily identifiable on the website.

Study identified and selected library websites which are providing innovative services to the institution. Mainly five criteria will be undertaken for the evaluation of web documents that are accuracy, authenticity, objectivity, currency & coverage of web documents.

Here are some steps to follow up for the research.

1. Visit the Mumbai University website and download the list of colleges coming under the jurisdiction of University of Mumbai.
2. Visit SNDT website and note down the list of colleges affiliated that are coming under Mumbai region.
3. Check all hospital libraries and prepare a list with their URLs
4. Check all specialized libraries/organization list and checked the URL
5. Find out the URL of the institution and check whether they have effective library page or not. Some are not having website. Some are not having library information at all.
6. Download the list of colleges from UGC site coming under the Maharashtra State. Then filter the List of institutions coming under Mumbai only.
7. Prepare a list of all colleges stream i.e. Arts, Science & Commerce together and special libraries in one category. Another category is Public library, Medical Library, Engineering library and Management institute.
8. Study excludes School libraries in Mumbai, because there is hardly any information available on the school website. The nature of School Library is also totally different in compare to higher education institutions.

3.9 Technique of Data Collection

For the purpose of sampling, the evaluation of all the institutions websites or library homepage was done by actually visiting the respective website. The websites were visited from July 2014 to Sep 2015. Some of the websites having no information
earlier were visited again and found that some of the site is active now which was not available during late year of 2014.

The checklist was pretested by consulting few experts and guide for getting their suggestions & modifications regarding CALS study process and understanding the same.

### 3.9.1 Construction of checklist

For preparing a checklist an extensive literature search was done besides consulting experts in this field. The draft version of the checklist with 135 elements was also circulated to a few experts as part of the pilot study.

Out of this exercise, a few features were added with simpler terms to understand the content easier and few terms were deleted which seem to be repeated in the study.

As a result some features give similar answers were also clubbed in the checklist. With the outcome of this a checklist of 104 element has come out & prepared under excel sheet. A separate worksheet has prepared for different types of libraries.

### 3.9.2 Data Analysis techniques & interpretation

The collected data were classified and tabulated according to the objectives used in the study. For proper arrangement of the data, a master able as prepared by the researcher and was subjected to statistical analysis.

The general data interpretation was made with the help of percentage analysis.

### 3.10 Website Evaluation

When we access or retrieve information on the World Wide Web we need to decide whether information is useful, reliable or appropriate for the purpose looking for that information. Think critically about worldwide resources to decide the authenticity of the source.
Keeping in view the scope of the library website evaluation, this chapter contains the description of various methods qualitatively and quantitatively accompanied by different perspectives of CALS through website.

Cornell University Library (2012) states some of the questions as checklist which may include in the evaluation criteria such as URL extension, creator of the page, authority, accuracy, currency, is information cited authentic? Is there any biasness?

There are sure conventional criteria which are utilized to decide the nature of print data in libraries, however can also be connected to the assessment of web documents

Evaluation guidelines & standards given by different authors and university –

**Attributes of Website Evaluation**

<table>
<thead>
<tr>
<th>Author/University</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNFCCC United Nations Framework Convention on Climate Change</td>
<td>Accuracy, Authority, Objectivity, Currency &amp; Coverage.</td>
</tr>
<tr>
<td>Dalhousie University, Canada</td>
<td>Authority, Purpose, Coverage, Currency, Objectivity &amp; Accuracy</td>
</tr>
<tr>
<td>Cornell University Library</td>
<td>Accuracy, Authority, Objectivity, Currency &amp;Putting it all together</td>
</tr>
<tr>
<td>Kent State University Libraries</td>
<td>Authority, Objectivity, Accuracy, Currency &amp; Usability</td>
</tr>
<tr>
<td>University of Washington, TRIO training</td>
<td>Accuracy, Authority, Objectivity, Currency &amp; Coverage</td>
</tr>
<tr>
<td>CARS checklist given by Robert Harris 2007-2015</td>
<td>Credibility, Accuracy, Reasonableness, and Support</td>
</tr>
</tbody>
</table>

**Table 3.10.1: Attributes of Website Evaluation**

Evaluating information found on the site webliminal. This site provides a chart about domain extensions (.gov, .edu, .com) & describes the possible information one could find there.
3.11 CALS Strategic Process Flow

Having elucidated the sense of CALS in this thesis, another term that requires explanation is that CALS is a strategic process of evaluation of WEB2.0/Library 2.0 features on the website.

As mentioned, different terminologies are used to signify why this study is called a CALS. Likewise, different terminologies are used to refer to a process in which a sequence of activities take place to conclude the prospective CALS used for a library web portal. When a library shifts from a manual system to an automated system, the term automation is common, where the process concerned can be referred to as the automation process.

Nowadays, with the extensive use of technology within libraries, it is less common that a library shifts from a manual system to a computerized system for the first time. More frequently, a library prefers to reinstate an existing computer-based system with a substitute computer-based system. Common terms used to illustrate this shift contain the migration process, the system selection process, or CALS procurement or re-procurement process and so on. Apart from this, social networking framework is boosting utilization of web 2.0 libraries.

People are aware of online content databases and there are many open public libraries online. Private online libraries permit user to download and literature only after uploading any good literature which does not exist with databases. Thus many business / social strategies are building with innovative web tools on their site.

This study is limited to geographical area of Mumbai region only; few Libraries are having quality content on their website. OPAC and WEB-OPAC is directly related to automation of the libraries. Libraries which are using library software can able to provide machine readable catalogue called Online Public Access Catalogue. **Kanamadi, S. & Kumbar, B.D. (2006)** OPAC is accessible on Intranet and WEB OPAC is available on internet. It has been observed that few libraries are having independent website or library home page. Maximum libraries so far are not implemented web 2.0 and other interactive tools in the website. This may be due to lack of technical staff in the library, low library funds or IPR issues while using social-plugins. However some good libraries are using WEB-OPAC which seems to be
dynamic in nature. Hence we considered WEB-OPAC features on selected libraries observed.

As we can refer figure 5 for Web-OPAC for IIT Mumbai, these system is developed by IITB students and seems very informative for users. Generally students and faculties need to refer lots of e-books, journals and literature documents. We carried content analysis of this web2.0 features and found “search” and “Advanced Search” facility. As an input to these both search options, we can put any desired search keyword, title of document or name of author of any e-book. Also, user can search by “media” option like CDs, DVDs or e-books etc. When we talked with students of IITB, they informed that the huge database is connected to system via digitalization. The team of students maintains Web-OPAC with latest literature, e-books and literature relevant to many domains. Obviously, the IITB follow IPR (Intellectual Property Rights) while making all data open over web.

As a different domain Web-OPAC, we visited web link of National Law School of India University, Bangalore.

Figure 3.2 shows homepage for Web-OPAC. There are very few but useful contents like AUTHOR, AUTHOR and TITLE SERIES, AUTHOR and SUBJECT,
PUBLISHER, CALL NUMBER, SUBJECT, PLACE, TITLE, ANY FIELD are placed on the homepage. These fields further enable user to input search string to get search results.

Figure 3-2: Web-OPAC National Law School, Bangalore

We compared contents of National Institute of Engineering Mysore (refer figure 3.3 below), and it is observed that it is only for registered members of institute. Search facility is available for other users or even user can browse and download catalogue in MARC21 format of online library. So, we can say this one is “Free Access” Web-OPAC. There are many users’ friendly options available on left pan of website and those are: OPAC Search, Facilities, Timings, Instructions, E-Journals, E-Access Rules, Staff, Photo Gallery, Maintenance and New Events. Hence, user can view all information in one go.
Figure 3-3: Web-OPAC National Institute of Engineering, Mysore

Screen in figure 3.4 shows Web-OPAC of JRD Tata Memorial Library launched by IIS, Bangalore. There are lots of services and web links but, those links were connected to the external journal links. Hence, those links cannot be part of Web-OPAC and we deleted such links from further evaluation.

Figure 3-4: Web-OPAC JRD Tata Memorial Library
This homepage shows many services, facilities, guidelines for user along with many prestigious journal links. The one difference noted with this Web-OPAC apart from other Web-OPAC is that, we can see library collection statistics (refer figure 3.5), library budget of 2010-2011 and staff details. We actually expecting library budget for current year but we can say this is one negative point of Web-OPAC of IIS, Bangalore. One thing we can say that, we need to improve our focus towards maintenance of such web2.0 enabled Web-OPAC.

**Figure 3-5: Usage Statistics of Web-OPAC JRD Tata Memorial Library**

Whereas we analyzed Indian Council of Social Science Research (ICSSR) but we found very few common options as discussed for earlier Web-OPAC. But one strong point is that, this Web-OPAC is with options of social networking sites like Facebook, Twitter, Google Plus etc, so user of system can share their experience and data over social network. ICSSR-SRC also provided lots of external web links which redirects to other libraries’ Web-OPAC so; library user can refer other references online. (Refer figure 3.6 below)
Apart from above discussed Web-OPACs, we found perfect web2.0 library system of IIT, Delhi. As shown below in figure 3.7, we can understand utilization of WEB2.0 ideal library system framework. Here we can see main options shown in RED color mark like – search by key word facility which is common and essential option for any Web-OPAC WEB 2.0 system.

Also, most important feature of this Web-OPAC is “Restricted Database Search” option, which can be used by user when they know about databases connected to system. This we can say, facility for specific search.

Other very useful option is to filter document search by using number of years (i.e. publication years) between which user want to retrieve data. This facility will lowers system/server overhead due to search query and user can get fast result retrievals.

Also, there is facility for document search so user can search by title or author name of subject domain. This facility also reduces server overhead to index document search.
As we now came to know what ideal system options are needed to implement WEB2.0 Web-OPAC, we chosen “Sahitya Academy Library” Web-OPAC where lots of scope is available to improve system. As shown in figure 3.8 bellow, this system is with only “Search” by author, title etc options and “Database” used is only single known as “SAL”. The single database is always produces system/server overhead if database contains lots of data (1 GB or more). One positive point with this content analysis is there are “Quick Search” options on left pan of website and here user can search for books/newspapers/periodicals or articles. Again there is need of social sharing facility over here.

**Figure 3-7 Web OPAC IIT central Library Delhi**

**Figure 3-8: Web -OPAC Sahitya Academi Library**
Using web-opac in particular library is a marketing tool of library documents that helps the user to know the collection without coming to the library if it is available on intranet. If it is available on web then any can see the catalogue via internet. Web OPAC link can be shared with the library website and user can go directly through that link. That increases the perceptions of the website. (Fig.3.9)

In this study, it is not taken for granted that all CALS changes within libraries entail a selection process or a procurement process. In addition, a process of system appraisal and selection does not essentially require heading to a system change. A system selection concluded in next chapters. Instead, a system selection process may ensue to the end, but it is then determined to subsist with the existing system. The process that takes place in any of these cases, regardless of whether it includes a selection, procurement, or a system change is here called the CALS strategy process.

In this study, by strategy making process researcher can note a series of communications, actions, and proceedings that are included in formulating a strategy over time. The focal point of the strategy making process in this study relates to the studied libraries’ and supportive information for future CALS. Number of different terms will be used, with the same meaning, to refer to this CALS strategy process, or in short CALS strategy. Here refer to the strategy making process associated to a
library’s future CALS, whether the existing LMS remains the same after the process, or an alternate CALS is preferred and used.

CALS strategy making is not essentially compared to LMS (Library Management Systems) selection. With CALS selection process, it is destined as an active process within which a number of alternative options like WEB 2.0, Social Sharing of data are appraised and where one alternative among several options is preferred as most apposite. CALS procurement process refers to the formal activities in which a number of system suppliers are allowed to vie for the business of selling an appropriate LMS to a library. LMS change concerns situations where a library decides to replace its existing LMS with an alternative. The CALS strategy process as termed here can encompass all, some or none of these processes.

As will be seen in the upcoming chapters, a selection can be made without the selection process, a system-change can arise without LMS procurement, and a CALS selection process can be concluded without a system change, i.e. the library remains with the existing system. The CALS strategy making process, in this study, covers all these adaptations.

### 3.12 Chapterisation

The whole study is organized in five broad chapters. A brief depiction of the chapters is given below-

Chapter I

The chapter one is introductory in nature. This chapter gives brief description about the concept, sources & types of information. Also describes the need for the study and significance of the study. This chapter includes operational definitions and concept to understand the topic better. Limitations of the study reported at the end of this chapter.

Chapter II

The Chapter two reveals background of the earlier literature available in the similar area of research. The review of literature provides a comprehensive view of the works accomplished so far.
Chapter III

Third chapter focuses on the research design & structure of the research. This includes the description of the issues related, intention & Hypothesis set for the study, Research methodology, sampling, data collection & limitations of the study.

Chapter IV

Chapter four dealt with data analysis and interpretation of data, shown in figures, tables & charts. Analysis of each type of library done separate and comparison of the entire library website score also conducted in the study.

Chapter V

Chapter five is devoted to the findings, suggestions and recommendations for further research and conclusion of the study. Perfect features of dynamic website were also given as an outcome of the research. List of top ten website also described with justification of ranking of the site given in this chapter, which is followed by conclusion.

Bibliography

Appendix –I Checklist

Appendix – II List of Institutions taken for study

Appendix –III List of Institutions where Library information was not available

Appendix – IV Total Score as per checklist