CHAPTER-3

RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

Websites are basically developed to provide efficient services to its users. Different categories of the websites are designed according to the services they render to its citizens. The website’s standardization is one of the most important aspect which a designer must keep in mind during design phase and Moreover, the organization for whom the websites are being designed must keep a watch on various designed standards so that dynamic categories of the user can be made available with all facilities offered by the concerned organization. The willingness on the part of organization to provide information and services for the empowerment of the users is a testament to the organization’s commitment. The overall objective of this endeavour is to study and critically analyze present functioning of various categories of the websites, particularly those websites selected and widely used by a different category of users for availing various services from different organizations.

The basic objectives of the study are:

I To study and critically analyze the present functioning of various websites and website development process models, to develop blue print guidelines and automated methodology to exploit the potential of website design methodology for efficient and effective website design and development.

II To carry out the opinion survey of various stakeholders/webmaster/designers, etc. on different aspects of website design and also how the use of standard guidelines can improve it.

III To propose an initial framework for website development and then finally the model for website design and development by elaborating the design phase into several design issues.

IV To embed an automated methodology to help designers/webmasters for testing website design during its design phase.
3.1.1 VARIOUS CONSIDERATIONS

In order to make smooth, efficient and effective investigation of the above objectives, a number of different considerations have been worked out. These considerations are:

I The identification and assessment of different design issues in various websites is a herculean task for a single research keeping in view the efforts required. Therefore, it was considered to select a sample and restrict the study to five categories of the websites which are of great importance and used widely by different categories of the users.

II To study the sample categories of the websites and elicit information from heterogeneous group of people involved in website usage, the obvious choice was a case study approach supplemented by survey method. For this, primary source of data was preferred but recourse to secondary sources was adopted wherever felt necessary. The survey was carried out through the use of questionnaire, automated tool and personal discussions.

III For data analysis and design it was considered appropriate to use tool like SPSS and MATLAB for analyzing the data and drawing conclusions after plotting graphs for various parameters.

IV Since the proposed system design is computer based therefore its selection, development and implementation aspects such as hardware and software selection, design and development of guidelines, implementation strategies require special consideration.

3.2 RESEARCH METHODOLOGY

3.2.1 RESEARCH PHASES

The entire work was divided into eight phases so that the desired efforts to improve website design could be applied. A brief description of each phase is given below:

Phase-I In this phase a detailed study of various website development models was carried out. Five different categories of the websites which include Government, Commercial, Job Portals, Social Networking and Educational were undertaken for the study. The investigation into different additional software development lifecycle method was conducted to check their readiness
for website development. The output of this phase is the system investigations report of various traditional software development process models and website development methodologies that has been presented in chapter 4. In addition to the above study, efforts have also been made to study the use of traditional software development methodologies for developing websites, difference in software and website development, limitations in various traditional software development methodologies when used for developing websites. The impact of all the traditional methodologies available has been studied through the literature survey carried out in chapter 2 and by visiting different website development houses for conducting personal interview with the webmasters and website designers. On the basis of the conclusion drawn from above exercises an initial framework is proposed for website development, which was later tested and elaborated after considering various aspect of website design.

**Phase-II**

In this phase again the problem was identified related to various website design issues and total nine parameters were listed to carry out the further study. The nine parameters identified through the literature survey carried out in chapter 2 were verified from the common users and designers/webmasters through the use of questionnaires. The nine website design issues identified and verified are Browser Compatibility, Color Combination, Page Loading Speed, Website Size, Security, Technology, Hyperlinks, Sitemap and Feedback.

**Phase-III**

In this phase data collection has been made through the questionnaires. One questioner was designed for the common users to gather information about the general understanding of website utility and website design issues with respect to nine parameters identified in previous phase. The impact on five categories of the websites taken as sample data was also studied. The second questionnaire was designed for the webmasters/designers working in different website development houses to collect their opinion about website design and role of website design guidelines/standards in website design.

**Phase-IV**

This phase consists of Reading and analysis of data collected in Phase-I, Phase-II, and Phase-III using specialized tools like Microsoft Excel, SPSS, MATLAB, etc.
Phase-V In this phase an automated tool is developed by incorporating the website design standards/guidelines recommended by W3C for nine website design issues identified and undertaken for the study. The tool developed incorporates all the ideas gathered from Phase-I to Phase-IV. The automated tool will help designers/webmasters in testing and analyzing websites for its optimization.

Phase-VI This phase includes testing and analyzing of data gathered through automated tool.

Phase-VII This phase is concerned with the proposed system design for website design and development. It includes the elaboration of initial framework proposed in Phase-II by incorporating the nine website design issues identified by the researcher and verified by the user and designers in its design phase. The proposed website design system is to be adopted by various designers to carry out α-testing of the website design during its design phase. In order to make website design user centric, a strict adherence to the website design guidelines/standards recommended by W3C needs to be adopted.

Phase-VIII This phase is concerned with research findings, conclusion, recommendations and scope for further research.

3.2.2 DATA COLLECTION MODELS

I DOCUMENTS STUDY

Five different categories of the websites were studied so as to gain the understanding of the drawbacks in its designs issues. The traditional software development methodologies were also referred to gain an understanding of its use in website development. What is being presently done and how the various website development houses develop and design websites also studied. The W3C guidelines for the development of websites were also referred to have an insight into website design standards. To carry out above activities below given documents were studied.

a) INFORMATION AVAILABLE ON WEBSITES: A number of different websites were visited related to five categories undertaken for the study to understand the various website design issues.

b) INFORMATION FROM BOOKS/JOURNALS: Different books and journals were referred, those deals with websites design and development issues.
c) INFORMATION FROM W3C DOCUMENTS: Various documents of W3C were studied for having better understanding of website design standards/guidelines recommended by different documents of W3C.

II USE OF QUESTIONNAIRE

The survey has been carried out through questionnaires as shown in Annexure-I and Annexure-II. These questionnaires were designed for common users and webmasters/designers. The questionnaires were distributed among the people of different age groups, locations, sex and educational qualification. Before distribution of the questionnaires to the respondents, a pilot study was conducted on few respondents so as to test the effectiveness of the questionnaires. As a result of this some new questions were added and some were modified to avoid ambiguity. The design and modification of the questionnaires is done after having a detailed discussion with the supervisor and other experts.

Similarly, one more questionnaire has been designed online for studying the designers/webmasters view with respect to website design issues and standards/guidelines in five different categories of the websites.

Due to pre-occupation of the respondents, they were given with ample of time to answer the questions contained therein. It was after a number of follow-ups that the questionnaires were received while in some cases they were not even returned. Due to busy schedule and remote location of website designers, an online questionnaire was designed and link was sent on their e-mail ids. After multiple requests the feedback was taken back online.

III USE OF AUTOMATED TOOL

Finally after receiving the data through questionnaires from the above respondents, an automated tool was designed and developed by the author to test website design issues and data recorded through automated tool was also used to make opinion about website design issues, standards/guidelines.

VI USE OF INTERVIEWS/DISCUSSION

A series of interviews and discussions were conducted with different webmasters/website designers working in government as well as multinational website development houses in order to fill in the information gaps generated during the process.
of filling up of questionnaires. In addition some common users were also consulted to have clear picture about website design. The process of interviews and discussions has also been used to collect certain information from the respondents.

3.3 QUESTIONNAIRE DESIGN

The objective of questions was to know the public opinion regarding website design issues in various categories of the websites and websites accessibility for different categories of the users selected randomly for the purpose. In addition, the questions in the questionnaires were designed to study the impact of website design issues on various users by keeping in mind the behaviour of websites on different platforms. The questionnaires were designed to study current status of website design with respect to different categories of the users and to do the comparative study of five different categories of websites taken as sample data on the basis of nine website design issues.

The questions in all the questionnaires were framed in a structured manner with close end options so that the response can be used directly without any bias for computer based statistical analysis. At the same time, efforts were made to make the answer having multiple choices so as to avoid any subjective bias. The different aspects on which the questions were asked include:

I. COMMON USERS: Opinion, experience and attitude towards websites, quality, applications and verification of identified website design issue is the major consideration for common users. Regarding common user’s interaction, it mostly pertains to five most widely used different categories of the websites with respect to nine most important and effective website design issues which include Browser Compatibility, Color Combination, Page Loading Speed, Website size, Hyperlinks, Security, Technology, Sitemap, and Feedback. A small description of each website design issue was also given before asking questions for better understanding. The questionnaire was divided into nine different parts. Part A contained the general questions and remaining eight parts from B to I contained the questions related to each website design issue separately. The questionnaire design process for common user is given below in Figure 3.3.I.A.

II. WEBSITE DESIGNERS/WEMASTERS: The website designers were asked questions about their understanding and adherence to the website design
standards/guidelines in designing various categories of the websites. The questionnaire for this section was divided into nine different parts. The Part A contained the general questions about the designers understanding of website design standards/guidelines recommended by W3C and Part B to I contained questions related to nine different parameters/website design issues identified and selected for the study. The identified design issues were verified by designers through online questionnaires. The process of designing online questionnaire for designer is given below in figure 3.3.II.A

Figure 3.3.IA: Flowchart to Design Questionnaire for Common Users.
Figure 3.3.II.A: Flowchart to Design Questionnaire for Website Designers.
3.4 SELECTION OF RESPONDENTS

A convenient sampling has been used to select the respondents for study. For this purpose, in case of general public, the sampling elements comprised of common users consisting of different age group, sex, qualification, living area and employment status. These questionnaires were distributed at different locations in Jammu and Kashmir, Punjab, Haryana and Delhi.

The questionnaires were distributed mostly at District headquarters viz a viz Jammu, Kathua, Udhampur, Rajouri, Srinagar, Doda and Kishtwar and various educational institutions of Punjab, Haryana, and Delhi. A total of 500 questionnaires were distributed for general public out of which only 450 were received back. While collecting these questionnaires back few common users were also interviewed for making an investigation of the impact of website design issue on general public. To study the satisfaction level of the website designers around 50 questionnaires were sent online and out of these 45 were received back.

Finally all the above responses from the general public about the general awareness about websites and website design issue were analyzed and interpreted for conclusions and recommendations. Opinions from different designers about website design, standards/guidelines were also processed in the same manner. Most of the website designers and common users completed the questionnaire within one week. The website designers/webmasters were e-mailed reminder letters for quick feedback.

This section discussed the complete research design methodology adopted by the researcher, various objectives of the research, different research phases, questionnaire design process for users and designers, and various sources for information, data collection methods and about the participants who completed the questionnaire.

3.5 ANALYSIS OF QUESTIONNAIRE

The researcher discussed the analysis of the questionnaires data in terms of major and minor research questions. As previously mentioned the questionnaire was divided into nine sections on the basis of nine parameters selected as design issues in various categories of the websites. Each parameter approximately contained three to four questions separately for common users and designers. In verification section of the questionnaire the designers/users are also asked for any new parameter to be included as website design issue for future research. The industry participants and common users were asked to rate the levels of agreement (Strongly
Agree, Agree, Partially Agree, Disagree, and Can’t Say) for each website design. In some questions the users/designers level of agreement is tested only in Yes or No. Maximum number of questions tested the common users/designers level of agreement in terms of option available as name of the five different categories of the websites (Educational Websites, Commercial Websites, Job Portals Websites, Social Networking Websites and Government Websites) taken as sample data for testing.