RESEARCH DESIGN.

1.1 INTRODUCTION:

1.1.1 Necessity of Software Testing

Testing is always most important part in software. Let's take a real life scenario .If you are buying anything, machine, there is always written warranty. What does that mean .User immediately think that this product will definitely work as this is assuring with saying warranty, he or she will be more satisfied .How the warranty comes. Well this is something that electronics and machines are already testing. That they will work. So the same case goes to software that testing is assuring the quality and working of product. This is a market point of view. Now if you will take another point like any good developer can write good code and there is no need for testing. Even any developer is also testing his software product always. Without testing how he can say that product is ready to use. So testing is done side by side always. This is different part who is doing testing developer or tester. But testing is done for every product. As developer cannot do everything by himself, he cannot find his mistakes so easily .Another point is usability testing like taste, feel, and look, easy to use which not possible without involving testers & users. It cannot be done only by one person or just by writing good code. Another point is performance testing of web applications like Load & Stress Testing which is practically not possible to do it manually, for that automation testing tools are used by performance Tester's. So, Researcher say testing is always necessary part to ensure the quality of the product.

1.1.2 Introduction to Web Applications

A Web application is an application that is invoked with a client (mostly by Web browser).over the Internet, Intranet or Extranet. A Web-based application allows the information processing functions to be initiated remotely from a client (browser) and executed partly on a Web server, application server and/or database server. These applications are specifically designed to be executed in a Web-based environment. When we visit on Web, we can find different kind of Websites. In general, there are two types of Websites, the one type is based on the HTML also called static Websites and behave like simple printed newspapers or magazines. These Websites have published and printed materials for the end users. The examples of such kind of

Websites are the different Websites of newspapers e.g. The New York times, BBC etc. The second type of Websites enables the end users to interact with the Website. In this type Web pages are generated dynamically in the response of end user's input or action. These Websites work as software and utilities, also called as Web applications. Web applications (also called Web software) run on servers and end users access these applications through Web browsers. The examples of Web applications are supply chain management, online banking systems, online retail systems and different email services like Google, yahoo and hotmail. Web applications are more complicated as compare to simple static Websites and provide a new way to deploy software applications to the end users. Web-based applications are based on mixture between print publishing and software development, between marketing and computing, between internal communications and external relations, and between art and technology. Web applications are interactive software which has complex Graphical User Interfaces (GUIs) and numbers of back-end software components are integrated. These applications have revolutionized the business arena and have provided new opportunities to businesses and to the end users.

1.1.3 Web Application Testing

Web application testing is a collection of related activities with a single goal: to uncover errors in web application content, function, usability, navigability, performance, capacity and security. To accomplish this, a testing strategy that encompasses both review and executable testing is applied. This strategies are performed by all participate in web application testing. If end users encounter errors that shake their faith in the web application, they will go elsewhere for the content & function they need, and the web application will fail. For this reason testing team must work to eliminate as many errors as possible before the web application goes online. So the web application testing process begins on focusing on user visible aspects of the web applications and proceeds to tests that exercise technology & infrastructure. Seven testing steps are performed: Content testing, interface testing, navigation is testing, Component testing, Configuration testing, Performance is testing & security testing. There are different automation tools available in market to do Web testing. Some of the tools include QTP, Load Runner product of HP.QTP is used for doing functional and regression testing and Load Runner is used for doing Load and stress testing. Also so many open source tools are available for doing the automation testing

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of web application. Now days most of the companies are using open source testing tools for doing automation testing of web application. Also now days some of the companies are developing their own tools to do automation testing of web application.

1.2. OBJECTIVES OF STUDY:

1. To study different challenges & problem faced by selected companies to test web based applications.
2. To identify the different factors that software companies need to consider to achieve sufficient test coverage.
3. To study how to improve the quality of web applications testing.
4. To study Special Test Cases for Websites Heavily Loaded with AJAX and Flash.

1.3. STATEMENT OF THE PROBLEM:

Web based Applications are increasingly becoming more feature rich, important and also the most popular means for developing commercial systems. Most companies are developing web based software wherever possible. This helps in catering to large number of end users. The deployment of the applications is fairly easy. The web based applications are powerful and have the ability to provide feature rich content to a wide audience spread across the globe at an economical cost. Hence it is a daunting task to test these applications and with more and more features testing these applications is becoming even more complex. Therefore the researcher research focuses on *"Challenges & Problems in Testing of Web based Applications: A study of software companies in Pune City"*

1.4. SCOPE OF THE STUDY:

Geographic Scope: The Geographic scope of the present study is confined to the boundaries of Pune City. The Topical scope focuses on study of challenges & problem in testing of web based applications with special reference to Pune city.

Analytical Scope: The Analytical scope covers fulfilling the objectives set out of the study.

1.5. HYPOTHESIS:

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1. Test Coverage of the web application is dependent upon Security aspects of web application

2. Performance of web applications is dependent on both Load & Stress testing.

3. Organizations are not having sufficient awareness of web site security testing.

4. Most of the companies are using vendor specific automation tool

1.6. SIGNIFICANCE OF STUDY:

The wide diffusion of Internet has produced a significant growth of the demand of Web based applications with more and more strict requirements of reliability, stability, inter-operability and security. Due to market pressure and very short time, the testing of Web-based applications is often neglected by developers, as it is considered too time-consuming and lacking a significant payoff. This depreciable habit affects negatively the quality of the applications and, therefore triggers the need for adequate, efficient and cost effective testing approaches for verifying and validating them. So it is important to study what are the different challenges & problems to test web applications & to find out some important factors to get sufficient test coverage.

1.7. RESEARCH METHODOLOGY:

For the present study the data is collected by using the primary & secondary methods.

1.7.1 Primary Data

The primary data is collected with the help of extensive questionnaire & interview techniques.

1.7.2 Secondary data

The secondary data is collected by using published & unpublished information like books, journals, magazines etc.

1.8. Sampling Design

For the present study the data is collected by using the primary & secondary methods. The primary data is collected with the help of extensive questionnaire & interview techniques. The secondary data is collected by using published & unpublished information like books, journals, magazines etc.

The relevant data for the study is collected from both the primary & secondary sources. The primary data is collected through field survey by using structured questionnaire, personal interviews, discussions & mails. The required sample is collected by using *simple random sampling & Cluster sampling techniques*.

Simple random sampling: A randomly selected sample from a larger sample or population given all individuals in the sample an equal chance to be choosen.

Cluster sampling: With cluster sampling the researcher divides the population into separate groups called clusters. Then simple random sample is selected from the population.

According to government records from jilha Udyog Kendra, the data required to sample design is shown in table.

Total number of registered Software companies in Pune city	265
Web Development & web testing registered companies in Pune city	*75*
Other domain Software companies(Engineering, Automation etc)	*190*

So, *Total population is 265* .Out of that 75 companies are doing web development & web testing. Out of 75 web development & web testing companies Researcher have selected 50 companies for the present study. So, the *sample size is 50* software companies from pune city. These 50 companies are located at different places in Pune city. So, Researcher have used here clustered sampling method. The companies are divided into groups that are in cluster according to different areas in Pune city as shown in following table.

Sr.No.	Cluster Name	Number of companies out of 75 area wise	Number of companies out of 50 area wise
1	Camp	3	2
2	Hinjewadi	6	5
3	Magarpatta City	5	3
4	Kothrud	12	8
5	Shivajinagar	3	2
6	Hadapsar	8	5

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7	Wakad	1	1
8	Chinchwad	2	1
9	Baner	8	5
10	Kondhwa	4	2
11	Kharadi	11	7
12	Deccan	1	1
13	Karve Nagar	5	3
14	Yerwada	6	5

Then simple random sample is selected from the population. *So, for the present study researcher has used simple random sampling & clustered sampling techniques.*

1.9 organization of the thesis

The thesis is organized on the basis of following chapter scheme

Chapter 1: Research Design

Chapter 2: Review of Literature

Chapter 3: Theoretical framework of testing:

Chapter 4: Data Analysis

Chapter 5: Conclusion, finding & suggestions

Gist of Chapters

Chapter 1: Research Design

This chapter deals with three parts-**I) Introduction-**Here the researcher gives brief introduction to the subject Software testing & Web application testing. **II) Research Design-**In this part researcher gives an idea about methods used in conducting research, objectives, statement of problem, Significance of study, hypothesis, sampling design and chapter scheme of the study **III)Geographic information of study area-**In this part researcher gives geographic information of study area i.e scope of the study.

Chapter 2 : Review of Literature

In this chapter researcher done the review of related published & unpublished literature like books, journals, magazines, articles, conferences, workshops etc

Chapter 3: Theoretical framework of testing-.This part deals with theoretical concepts of testing which are used by researcher during his research study and **technical contribution of researcher-**In technical contribution part researcher gives some critical factors that companies need to consider while testing web based application usability, functionality, Security aspects & performance. Researcher has given proposed testing framework which will be useful for Pune city software companies testing team.Also researcher has written some special test cases to test websites heavily loaded with Ajax and flash

Chapter 4: Data Analysis

This chapter is consisting of the analysis and interpretation of primary & secondary data.

Chapter 5: Conclusion, finding & suggestions

In this chapter researcher gives his findings based on data analysis and writes Conclusions for Software Quality Test Engineers, Software Quality Analyst, Software Developer, Software Engineer, Project Manager. Also in this chapter researcher gives useful suggestions and recommendations while testing of web based applications .At the end of the thesis researcher put forth the bibliography which contains list of references referred by the researcher during the research period. Researcher also adds annexure of important information