



Challenges & Problems In Usability Testing Of Web Based Applications: A Study of Software Companies In Pune City

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ABSTRACT— Success of any GUI application depends on how it interacts with user through its user interface, how the user actions are performed to access application's features and whether application responds in functionally correct manner. An web application with incorrect behavior, or invalid user interaction can lead to huge problems. So testing of UI of web application is important aspect. To test the UI it's necessary to study different challenges and problems while testing UI aspect of web application. Therefore in this paper researcher has decided to attempt "Challenges & Problems in UT Testing of Web based Applications: A study of software companies in Pune City" Researcher hopes that this information will serve as useful input for UI developers, UI testing team while developing and testing the project.

Keywords— GUI Application, Challenges and problems, UI testing

1, INTRODUCTION

Testing the UI (user interface) of web applications has been always a main concern of developers and UI testers. It is the first thing that a user/customer notices once something is wrong. The main reason that usability is so important is because there are so many similar websites that people will go to the next site if the first one they visit is not usable. You can have the most beautiful website in the world, but people will leave immediately if they are unable to figure out how to navigate your site quickly. Usable websites increase user satisfaction whereas web sites which violate usability conventions confuse users and result in a loss of revenue for the companies behind them. This is because improving usability is a great way to encourage users to visit your site instead of the sites that belong to your



competitors and is often an approach that keeps customers coming back to your site again and again. Indeed, high-quality websites that are easy to use bring in customers and give a particular site a competitive edge over the competition.

2, OBJECTIVES OF STUDY:

1. To study different challenges & problems faced by selected companies in usability testing of web based applications.
2. To identify the different factors that software companies may need to consider while UI testing of web application.

3, 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

4, 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. Due to market pressure and very short time, the usability aspect of Web-based applications is often neglected by developers and UI designers while designing the web application, as it is considered too time-consuming and lacking a significant payoff. This depreciable habit affects negatively of the applications UI and, therefore triggers the need for adequate, efficient and cost effective testing approaches for testing UI. So it is important to study what are the different challenges & problems to test web applications Usability & to find out some important factors which may be useful input for developers, designers, testing team and test managers while designing and testing the UI of project.

5, RESEARCH METHODOLOGY:

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

Primary Data

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

Secondary data

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

Sampling Design

For the present study the data will be collected by using the primary & secondary methods.. 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 chosen.

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

For the present study total population is 265 .Out of those 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.

6, HYPOTHESIS:

1. Test Coverage of the web application is dependent upon Usability aspects of web application
2. Organizations are not having sufficient awareness of web site usability testing.

7, EMPIRICAL STUDY:

Table showing Challenges of Usability Testing of Web Application

Sr. No.	Challenges of Usability Testing	Rating					Mean Score
		1	2	3	4	5	
1	Comfort ability to use UI	1	5	13	25	6	3.6
		(2.00 %)	(10.00 %)	(26.00 %)	(50.00 %)	(12.00 %)	
2	Different display resolution & screen size	0	10	19	9	12	3.4
		(0.00 %)	(20.00 %)	(38.00 %)	(18.00 %)	(24.00 %)	
3	Testing 100% user interface	0	1	10	23	16	4.0
		(0.00 %)	(2.00 %)	(20.00 %)	(46.00 %)	(32.00 %)	
4	Printing of UI of Web application	2	18	20	7	3	2.8
		(4.00 %)	(36.00 %)	(40.00 %)	(14.00 %)	(6.00 %)	
5		4	3	9	19	15	3.7

Separate usability testing team is required	(8.00 %)	(6.00 %)	(18.00 %)	(38.00 %)	(30.00 %)
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Source: Survey Data

So, it is concluded that in case of Usability Testing Challenges 46% Software Companies are facing Testing 100% user interface is not possible as highest Critical challenge as mean score is 4 as shown in table No.8.1 Whereas 40% Software Companies are facing Printing of UI of Web application as average critical challenge as mean score is 2.8

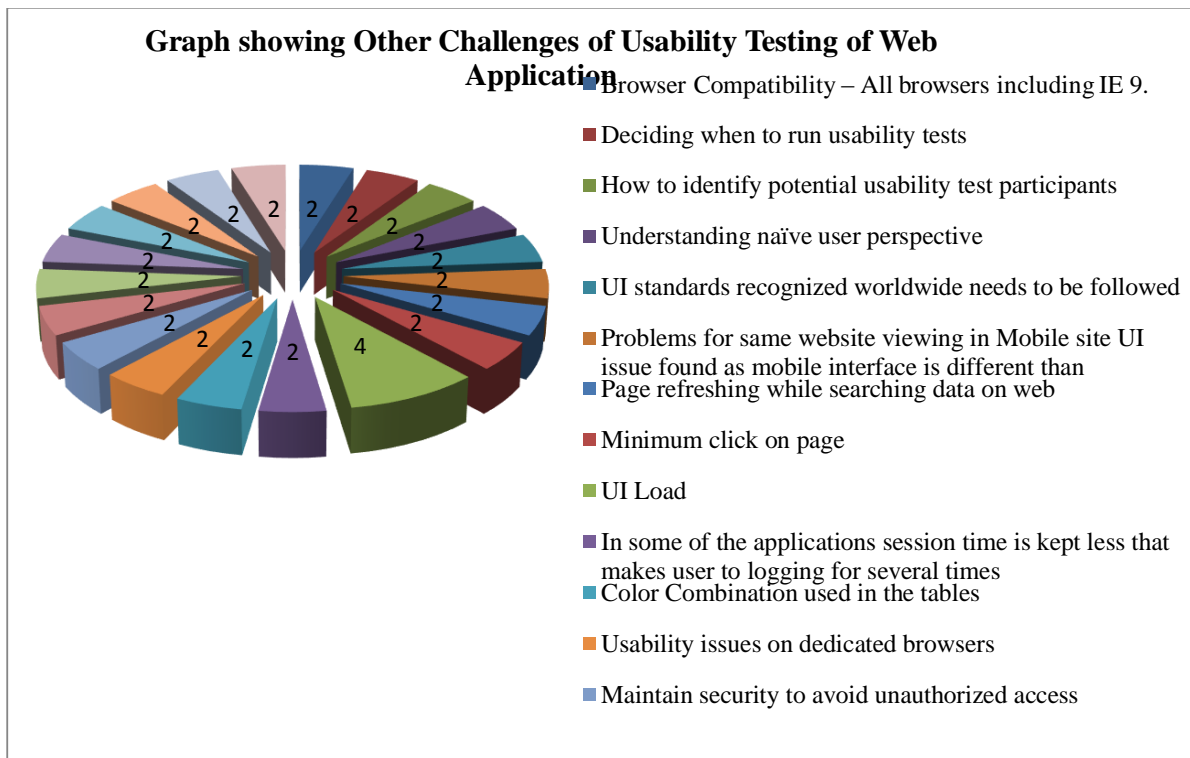


Table showing Problems of Usability Testing of Web Application

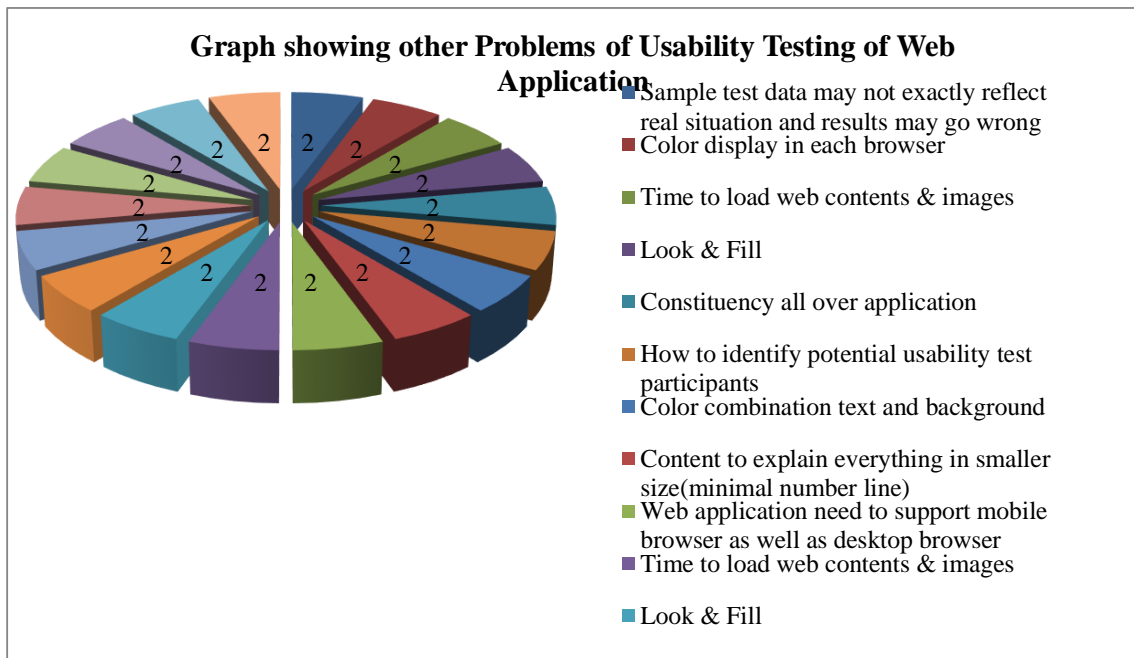
Sr. No.	Problems of Security Testing	Rating					Mean Score
		1	2	3	4	5	
1.	Consistent design of web application	0	2	15	16	17	3.9
		(0.00 %)	(4.00 %)	(30.00 %)	(32.00 %)	(34.00 %)	
2.	Content should be logical and easy to understand	2	5	20	13	10	3.4
		(4.00 %)	(10.00 %)	(40.00 %)	(26.00 %)	(20.00 %)	
3.	The end user may use different types of browser to access application	1	1	10	14	24	4.5
		(2.00 %)	(2.00 %)	(20.00 %)	(28.00 %)	(48.00 %)	

4.	The flow of functionality should be correct for using UI	0	6	5	25	14	3.9
		(0.00 %)	(12.00 %)	(10.00 %)	(50.00 %)	(28.00 %)	
5.	Notification/help to be provided for end user for particular field	0	16	13	14	7	2.4
		(0.00 %)	(32.00 %)	(26.00 %)	(28.00 %)	(14.00 %)	

Source: Survey Data

So, it is concluded that in case of Usability Testing Problems 48% Software Companies are facing The end user may use different types of browser to access application as highest Critical problem as mean score is 4.5 as shown in table No 8.2. Whereas 32% Software Companies are facing Notification/help to be provided for end user for particular field as least critical problem as mean score is 2.4

Graph showing Other Problems of Usability Testing of Web Application (critical level 1- Lowest & 5- highest)



It is concluded that majority of 64 % Respondent organization are not facing Other Problems of Usability Testing Shown in Graph No.8.2 where as total 36% respondent organizations are facing other problems of Usability Testing as shown in Graph No.8.2. 58 % Respondent organization are not facing Other Challenges of Usability Testing Shown in Graph where as total 42% respondent organizations are facing other challenges of Usability Testing.

Table showing information on Test coverage of web application dependency

<i>Test coverage of web application dependent on which factor</i>	<i>Number of Respondents</i>	<i>In Percentage (%)</i>
Security Aspects	1	2
Functionality	11	22
Performance	5	10
Usability	1	2
All above	32	64
Total	50	100

Source: Survey Data

From Table No.8.3, it is concluded that, Majority of 64% respondents agree with Test coverage of web application dependent on all four factors i.e. Security aspects, Functionality, Performance and Usability

Graph showing information on Test coverage of web application dependency

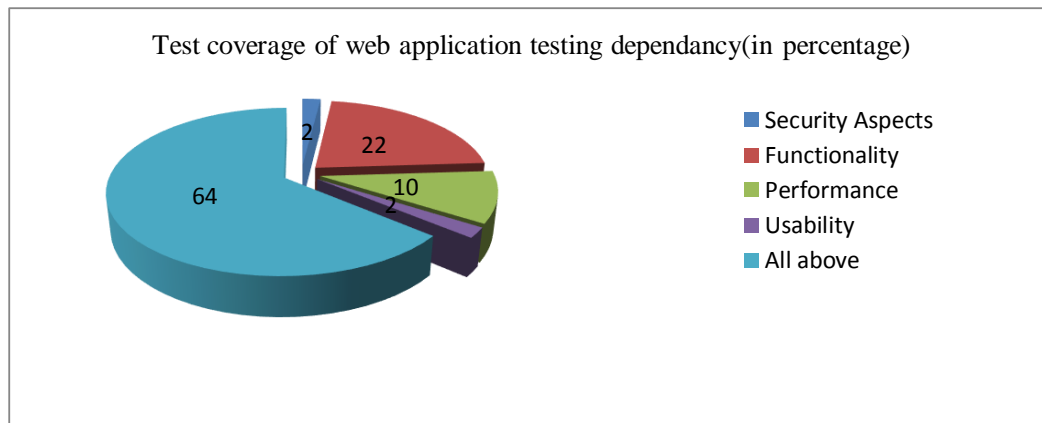


Table showing respondent's awareness of Usability Testing of Web Application.

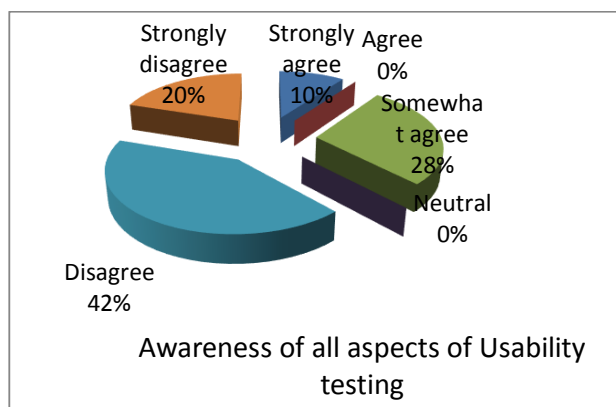
<i>Awareness of all aspects of usability testing</i>	<i>Number of Respondents</i>	<i>In Percentage (%)</i>
Strongly agree	5	10
Agree	0	0
Somewhat agree	14	28
Neutral	0	0
Disagree	21	42
Strongly disagree	10	20

Total	50	100
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Source: Survey Data

From Table No.8.4, it is concluded that 42% respondents are not aware of all aspects of usability testing.

Graph showing respondent's awareness of usability testing of web application



8, CRITICAL FACTORS NEED TO CONSIDER WHILE USIBILITY TESTING

To test the UI of website is called as Usability testing. To test either your UI is user friendly for user to do their tasks. The following **factors needs to consider while testing UI of website as per the researcher recommendation**

1. Navigation

Navigation describes the way users navigate within a page, between different user interface controls (buttons, boxes, lists, windows etc.), or between pages via e.g. links.

- a. Application navigation is proper through tab & mouse
- b. Main features accessible from the main/home page.
- c. Any hot keys, control keys to access menus.
- d. Navigation Labels Are Clear & Concise
- e. Company Logo Is Linked to Home-page-This may sound minor, but people expect logos to link to home-pages, and when they don't, confusion follows. Researcher seen video of users clicking on a logo over and over, with no idea what to do next.
- f. Links Are Consistent & Easy to Identify
- g. Site Search Is Easy to Access-If you have a site search, make sure it's prominent.

Usability guidelines tend to prefer the upper-right corner of the page.

2. Content

Correctness is whether the information is truthful or contains misinformation. The accuracy of the information is whether it is without grammatical or spelling errors. Remove irrelevant information from your site. This may otherwise cause misunderstandings or confusion. The points to be tested,

- a. Spellings and Grammars
- b. Updated information's
- c. General Appearance
- d. Page appearance
- e. Color, font and size
- f. Frames
- g. Consistent design
- h. Major Headings Are Clear & Descriptive-Headings should be clear, and for SEO benefit, using heading tags
- i. URLs Are Meaningful & User-friendly-This is a point of some debate, but meaningful Keyword-based URLs are generally good for both visitors and search engines.
- j. HTML Page Titles Are Explanatory-More importantly, your page titles (in the <TITLE> tag) should be descriptive, unique, and not jammed full of keywords. Page titles are the first thing search-engine visitors see, and if those titles don't make sense or look spammy, they'll move on to the next result.

3. Identity-A key question when someone first comes to your site is "Who are you?" It's important to answer it quickly. The point to be tested in identity

- a. Clear Path to Contact Information-Web Application Visitors wants to know that they can get in touch with you if they need to. It's also hard to do business if no one can contact you. Preferably, list your contact information as text (not in an image) - it'll get picked up by search engines, including local searches.
- b. Company Logo Is Prominently Placed-Put your logo or brand where it's easy to find, and that usually means the upper-left of the screen. People expect it, and they like it when you make their lives easy.
- c. Home-page is Digestible In 5 Seconds-website visitors are a fickle bunch, and they need to get the basic gist of your home-page in just a few moments.
- d. Tagline Makes Company's Purpose Clear

4. Accessibility-It means anything that might keep a visitor from being able to access the information on a website. The points to be tested-

- 1) Web Application Load-time is Reasonable.
- 2) Adequate Text-to-Background Contrast.
- 3) Font Size/Spacing is Easy to Read
- 4) Flash & Add-ons Are Used Sparingly
- 5) Images Have Appropriate ALT Tags
- 6) Site Has Custom Not-found/404 Page
- 7) Other user information for user help: Like search option, sitemap, help files etc. Sitemap should be present with all the links in web sites with proper tree view of navigation. Check for all links on the sitemap. "Search in the site" option will help users to find content pages they are looking for easily and quickly. These are all optional items and if present should be validated.

9. CONCLUSION

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The present concluded of the study are based on the Primary data, discussion with the various Sources such as Quality Test Engineers, Software Quality Analyst, Software Developer, Software Engineer, Project Manager and other concern peoples and observation of the researcher while doing the Research.

1. 40% Software companies from pune city are facing Printing of UI of Web application as average critical challenge.
2. In usability testing 32% software companies are facing Notification/help to be provided for end user for particular field as least critical problem.
3. Some of the respondent organizations are facing other challenges and problems of Usability Testing

10, FINDINGS

1. Test coverage of web application dependent on all four factors i.e. Security aspects, Functionality, Performance and Usability.
2. Testing 100% user interface as highest Critical challenge in case of usability testing of web application.

3. In case of usability testing of web application Software Companies are facing end user may use different types of browser to access application as highest Critical problem.
4. Majority of the respondents companies are not aware of all aspects of web application usability testing.

11. SUGGESTIONS

1. Pune city software companies should have separate usability testing team to test UI of web application as it is highest critical challenge to test 100% user interface, so if software companies have dedicated expert usability team then it will defiantly improve usability testing process.
2. Pune city Software companies should have separate manual testing team as well as separate automation testing team to test the web application
3. Testing team should consider critical factors of usability testing suggested by researcher.

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BIOGRAPHY



Dayanand S Patil is Assistant Manager-T & D in IGATE Global Solutions Pune. He has having 9 years of experience in training and development. He is ISTQB Certified Software Tester and Microsoft Certified Professional. His main research interest include web application testing, Automation testing. He has published research papers in several national and international journals. He has completed M.Phil. from Shivaji University Kolhapur.



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