Software Companies are even not using separate testing team to test the web application.

Graph No. 4.2.

Graph showing information about Separate Testing Team to Test the Web Application.

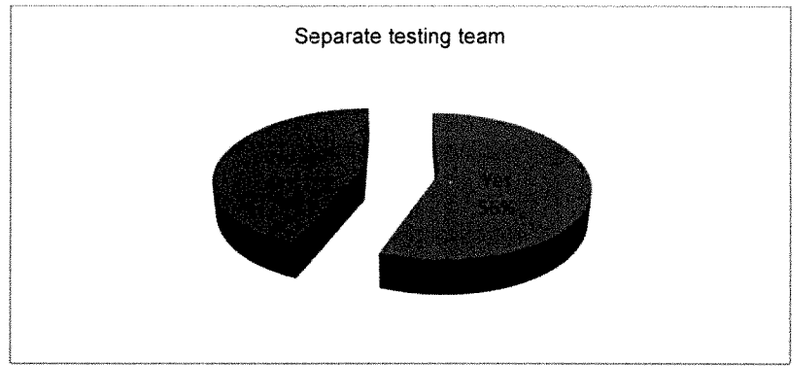

Table No 4.3

Table showing information about Automation tools need to test web Application.

Age	Automation tools are required to test application effectively					Total	In Percentage (%)
	Most Effective	Effective	Moderate	Least Effective	Not Effective		
18-22	0	0	0	0	0	0	0
22-26	2	5	6	0	0	13	26
26-30	1	15	6	1	0	23	46
30-34	3	6	0	0	0	9	18
35-above	2	2	1	0	0	5	10
Total	8	28	13	1	0	50	
Percentage (%)	16	56	26	2	0		100

Source: Survey Data

Table No.4.3 revels that the age wise information of the respondents with respect to Automation Tools are required to test the web application effectively.46% respondents are belongs to the age group 26-30.where as there is no respondents from age group 18-22.Also 56% respondents are saying Automation tools are required &

effective to test Web Application. Whereas there is no respondents of Opinion Not Effective..So, it is concluded that 46% respondents are belongs to age group 26-30.Also 56% respondents having opinion Automation tools are required & effective to test Web Application.

Graph No 4.3

Graph showing information about Automation tools need to test web Application.

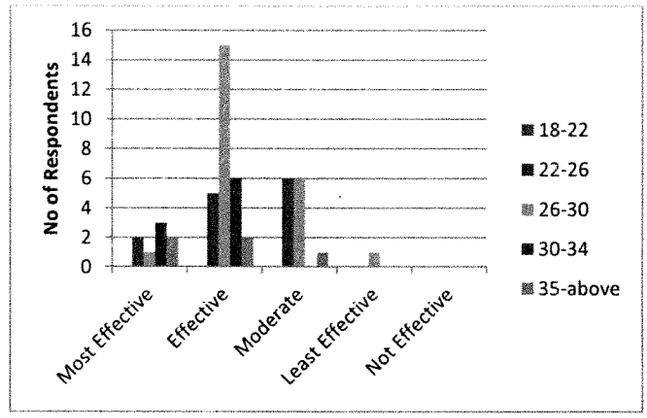

Table No 4.4

Table showing Usage of Automation Tools

Usage of Automation Tool	Type of Automation Tool		Total
	Open Source	Vendor Specific	
Yes	18	12	30
	(36.00%)	(24.00%)	(60.00%)
No	7	13	20
	(14.00%)	(26.00%)	(40.00%)
Total	25	25	50
Percentage	(50.00%)	(50.00%)	(100.00%)

Source: Survey Data

Table No.4.4 revels that usage of Automation tool in Software companies from Pune City. From table No.4.4, 60% respondent's organizations are using Automation tool for testing web applications. Out of that 36% respondent's organizations are using Open Source Automation Tool for testing web application & 24% respondents organizations are using Vendor Specific Automation Tool for testing web application where as 40 % respondents organization are not using Automation Tool for testing web application. So from Table No.4.4,it is concluded that majority of 60% respondents organizations are using Automation tool for testing web application

where as only 40% respondents organization are not using automation tool for testing web application

Graph No 4.4

Graph showing Usage of Automation Tools

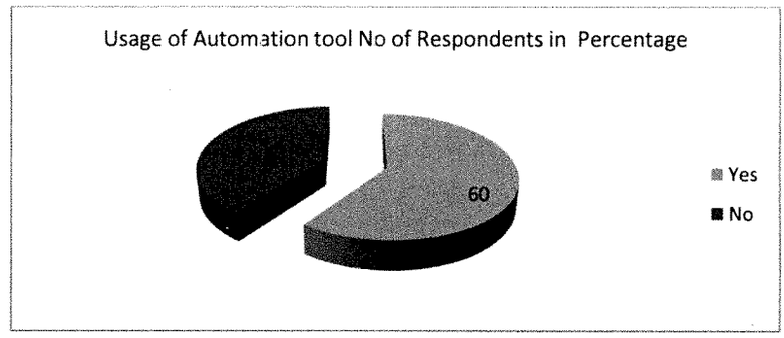

Table No 4.5

Table showing Challenges of Usability Testing of Web Application.

Sr. No.	Challenges of Usability Testing	Rating					Mean Score
		1	2	3	4	5	
1	Comfortability 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	Separate usability testing team is required	4	3	9	19	15	3.7
		(8.00 %)	(6.00 %)	(18.00 %)	(38.00 %)	(30.00%)	

Source: Survey Data

Table No.4.5 revels that the Challenges of Usability Testing of Web Application. 50% Software Companies are facing Comfortability to use UI as highest Critical Challenge (as the rating is 4,also the mean score is 3.6 which belongs to rating 4)Where as only 2% Software Companies are facing this challenge as least critical(as Rating is 1).38% Software Companies are facing Different display resolution & screen size as critical

challenge(as the rating is 3 & mean score is 3.4 which belongs to 3 rating) where as no Software Company facing this challenge as least critical. 46% Software Companies are facing Testing 100% user interface as highest critical challenge (as rating is 4 also the mean score is 4.0 which belongs to rating 4) where as no Software Company facing this challenge as least critical. 40% Software Companies are facing Printing of UI of Web Application as critical challenge(as the rating is 3,also the mean score is 2.8 which belongs to rating 3) Where as only 4% Software Companies are facing this challenge least critical(as Rating is 2).38% Software Companies are facing Separate usability testing team is required as highest critical challenge(as the rating is 4,also the mean score is 3.7 which belongs to rating 4) where as only 8% Software Companies are facing this challenge least critical.

So, it is concluded that in case of Usability Testing Challenges 46% Software Companies are facing Testing 100% user interface is possible as highest Critical challenge as mean score is 4 as shown in table No 4.5. Whereas 40% Software Companies are facing Printing of UI of Web application as average critical challenge as mean score is 2.8

Graph No 4.5

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

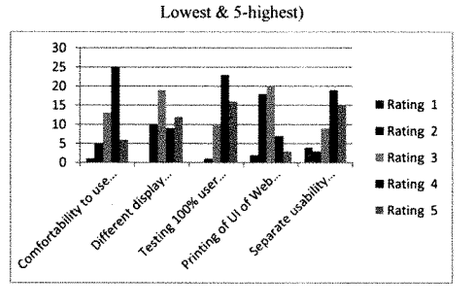

Table No 4.6

Table showing Problems of Usability Testing of Web Application.

Sr. No.	Problems of Usability Testing	Rating					Mean Score
		1	2	3	4	5	
1.	Consistant 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

Table No. 4.6 revels that the Problems of Usability Testing of Web Application. 34% Software Companies are facing Consistant design of web application as highest Critical problem (as the rating is 5 & also the mean score is 3.9 which belongs to rating 4) Where as no single company facing this problem as least critical.40% Software Companies are facing Content should be logical and easy to understand as average critical problem (as the rating is 3 & also the mean score is 3.4 which belongs to rating 3) where as only 4% Software Companies facing this problem as least critical. 48% Software Companies are facing The end user may use different types of browser to access application as highest critical problem (as rating is 5 & also the mean score is 4.5 which belongs to rating 5) where as only 2% Software Companies facing this problem as least critical. 50% Software Companies are facing The flow of

functionality should be correct for using UI as highest critical problem (as rating is 4 & also the mean score is 3.9 which belongs to rating 4) where as no single Software Company is facing this problem as least critical.32% Software Companies are facing Notification/help to be provided for end user for particular field as least critical problem(as rating is 2 & also the mean score is 2.4 which belongs to rating 2)

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 4.6. 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 No 4.6

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

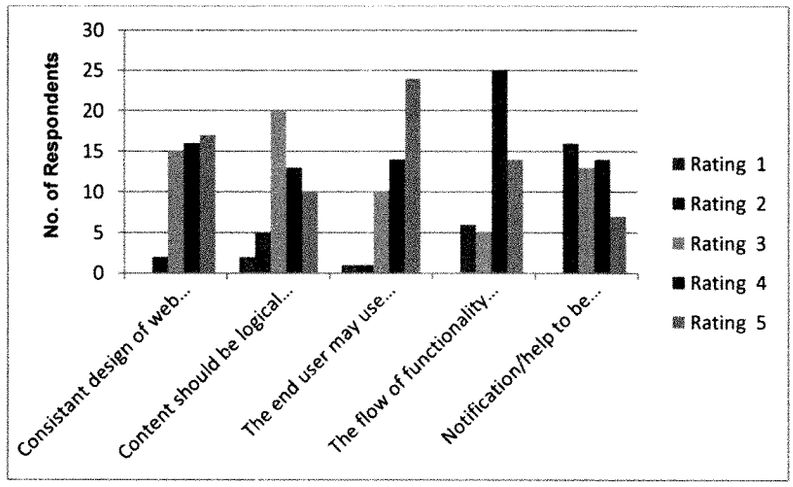

Table No 4.7

Table showing Other Challenges of Usability Testing of Web Application

Sr. No.	Challenges of Usability Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	Browser Compatibility – All browsers including IE 9.				1		1	2
2.	Deciding when to run usability tests					1	1	2
3.	How to identify potential usability test participants				1		1	2
4.	Understanding naïve user perspective					1	1	2
5.	UI standards recognized worldwide needs to be followed				1		1	2
6.	Website viewing in Mobile site UI issue found as mobile interface is different.					1	1	2
7.	Page refreshing while searching data on web			1			1	2
8.	Minimum click on page				1		1	2
9.	UI Load					2	2	4
10.	Session time is kept less that makes user to logging for several times					1	1	2
11.	Color Combination used in the tables			1			1	2
12.	Usability issues on dedicated browsers			1			1	2
13.	Maintain security to avoid unauthorized access				1		1	2
14.	To keep Safe user's Data				1		1	2
15.	Reorganization of the objects in the applications				1		1	2
16.	Module wise loading performance				1		1	2
17.	Dynamic HTML crating and loading			1			1	2
18.	Session in and out time		1				1	2
19.	Graphical representation			1			1	2
20.	Lack of intuition testing			1			1	2
	Total	0	1	6	8	6	21	
	Percentage	0	2	12	16	12		42

Source: Survey Data

Table No. 4.7 revels that Other Challenges of Usability Testing of Web Application. Only 2% respondent companies are facing each challenge shown in Table No.4.7.So,Majority of 98% respondent companies are not facing each individual Other Usability Challenge shown in Table No.4.7.Total 42 % respondent organizations are facing other challenges of Usability testing shown in Table No.4.7.

So, it is concluded that majority of 58 % Respondent organization are not facing Other Challenges of Usability Testing Shown in Table No.4.7 where as total 42% respondent organizations are facing other challenges of Usability Testing as shown in Table No.4.7

Graph No 4.7

Graph showing Other Challenges of Usability Testing of Web Application

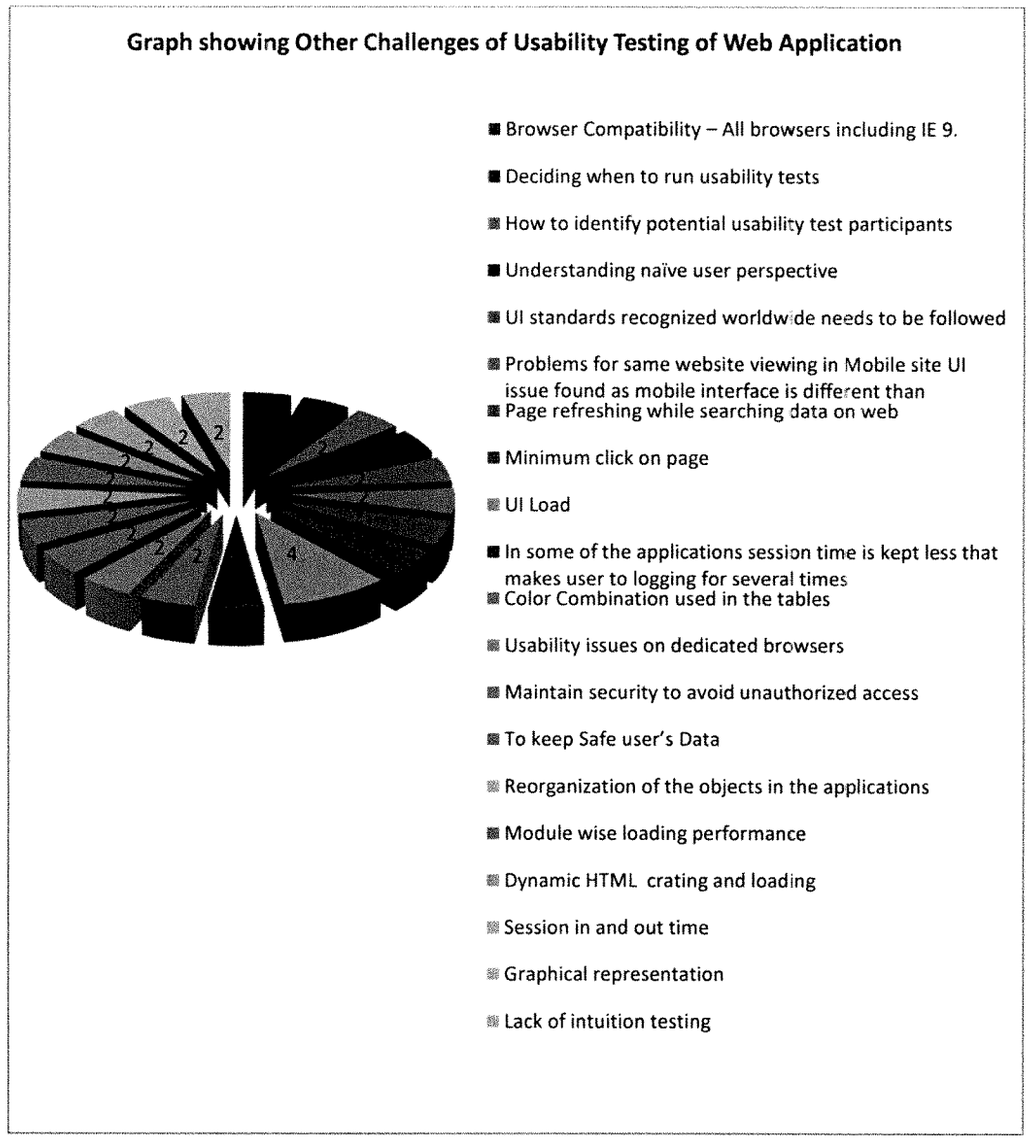

Table No 4.8

Table showing Other Problems of Usability Testing of Web Application

Sr. No.	Problems of Usability Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	Sample test data may not exactly reflect real situation and results may go wrong					1	1	2
2.	Color display in each browser			1			1	2
3.	Time to load web contents & images			1			1	2
4.	Look & Fill				1		1	2
5	Constituency all over application					1	1	2
6.	How to identify potential usability test participants				1		1	2
7.	Color combination text and background				1		1	2
8.	Content to explain everything in smaller size(minimal number line)			1			1	2
9.	Web application need to support mobile browser as well as desktop browser				1		1	2
10.	Time to load web contents & images			1			1	2
11.	Look & Fill				1		1	2
12.	Constituency all over application					1	1	2
13.	Spelling mistakes				1		1	2
14.	Alignment Issue				1		1	2
15.	Wrapping			1			1	2
16.	Images					1	1	2
17.	Security Problem				1		1	2
18.	Browser issues				1		1	2
	Total	0	0	5	9	4	18	
	Percentage	0	0	10	18	8		36

Source: Survey Data

Table No. 4.8 revels that Other Problems of Usability Testing of Web Application. Only 2% respondent companies are facing each Problem shown in Table No.4.8.So,Majority of 98% respondent companies are not facing each individual Other Usability problem shown in Table No.4.8.Total 36 % respondent organizations are facing other problems of Usability testing shown in Table No.4.8.

So, it is concluded that majority of 64 % Respondent organization are not facing Other Problems of Usability Testing Shown in Table No.4.8 where as total 36%

respondent organizations are facing other problems of Usability Testing as shown in Table No.4.8

Graph No 4.8

Graph showing Other Problems of Usability Testing of Web Application

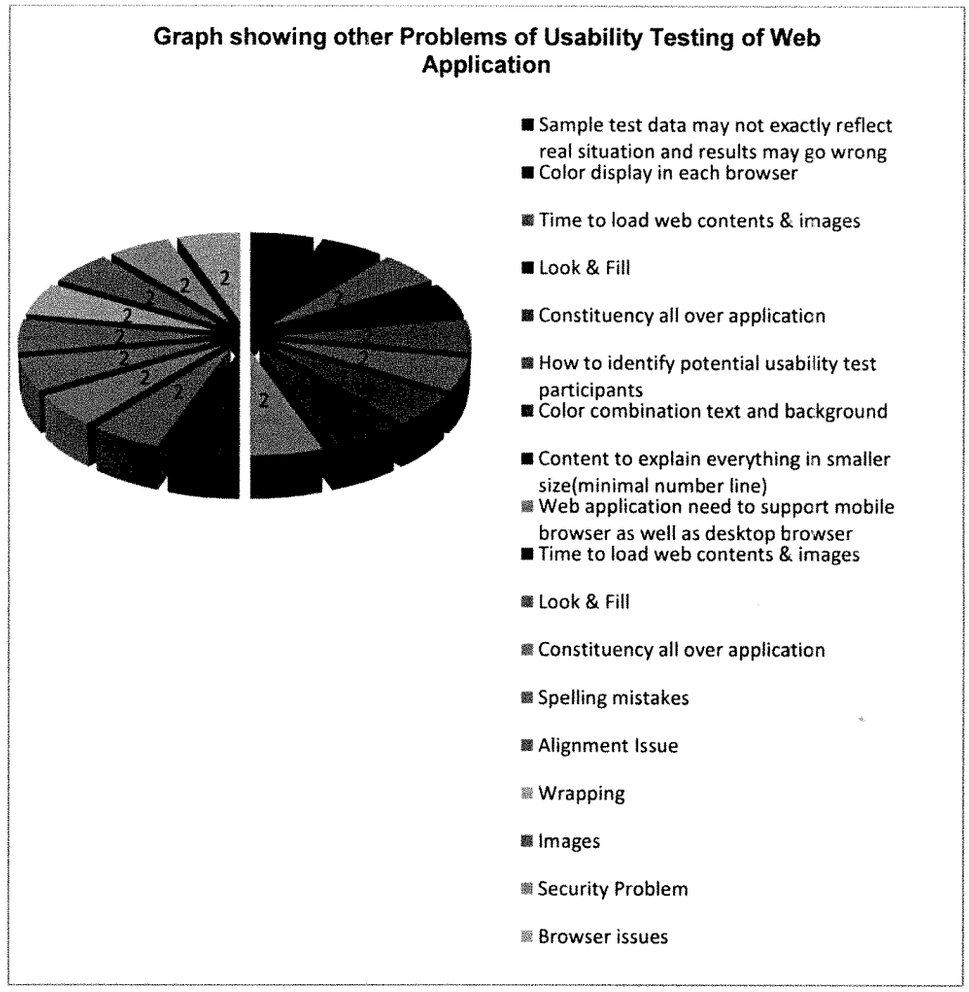

Table No 4.9

Table showing Challenges of Functionality Testing of Web Application

Sr. No.	Challenges of Functionality Testing	Rating					Mean Score
		1	2	3	4	5	
1.	Define clear and complete test requirements and manage changes to requirement	0	4	7	12	27	4.4
		(0.00%)	(8.00%)	(14.00%)	(24.00%)	(54.00%)	
2.	Functional gaps in test plans	0	3	20	16	11	3.4
		(0.00%)	(6.00%)	(40.00%)	(32.00%)	(22.00%)	
3.	How to utilize available limited resources (time to provide optimum test coverage to the product functionality while covering various supported configurations)	0	6	10	26	8	3.7
		(0.00%)	(12.00%)	(20.00%)	(52.00%)	(16.00%)	
4.	To monitor exact hardware, software configuration for test environment	0	9	28	3	10	3.2
		(0.00%)	(18.00%)	(56.00%)	(6.00%)	(20.00%)	
5.	Tester assigning improper severity / priority to defects	3	5	25	13	4	3.2
		(6.00%)	(10.00%)	(50.00%)	(26.00%)	(8.00%)	

Source: Survey Data

Table No 4.9 revels that the Challenges of Functionality Testing of Web Application. 54% Software Companies are facing Define clear and complete test requirements and manage changes to requirement as highest Critical Challenge (as the rating is 5 & also the mean score is 4.4 which belongs to rating 4) Where as no single Software Company is facing this challenge least critical. 40% Software Companies are facing Functional gaps in test plans as average critical challenge (as the rating is 3 & also the mean score is 3.4 which belongs to rating 3) where as no Software Company facing this challenge as least critical.52% Software Companies are facing How to utilize available limited resources (time to provide optimum test coverage to the product functionality while covering various supported configurations as highest critical challenge(as rating is 4 & also the mean score is 3.7 which belongs to rating 4) where as no Software Company facing this challenge as least critical.56% Software

Companies are facing to monitor exact hardware, software configuration for test environment as average critical challenge (as rating is 3 & also the mean score is 3.2 which belongs to rating 3)Where as no Software Company is facing this challenge as least critical.50% Software Companies are facing Tester assigning improper severity / priority to defects as average critical challenge(as rating is 3 & also the mean score is 3.2 which belongs to rating 3) where as only 6% Software Companies are facing this challenge least critical.

So, it is concluded that in case of Functionality Testing Challenges,54% Software Companies are facing Define clear and complete test requirements and manage changes to requirement as highest critical challenge as mean score is 4.4 as shown in table No 4.9. Also 52.00 Software Companies are facing How to utilize available limited resources (time to provide optimum test coverage to the product functionality while covering various supported configurations)as highest critical challenge as mean score is 3.7, Where as other challenges shown in table No.4.9 are average critical challenges faced by Software Companies.

Graph No.4.9

Graph Showing Challenges of Functionality Testing of Web Application.(critical level 1-Lowest & 5-highest)

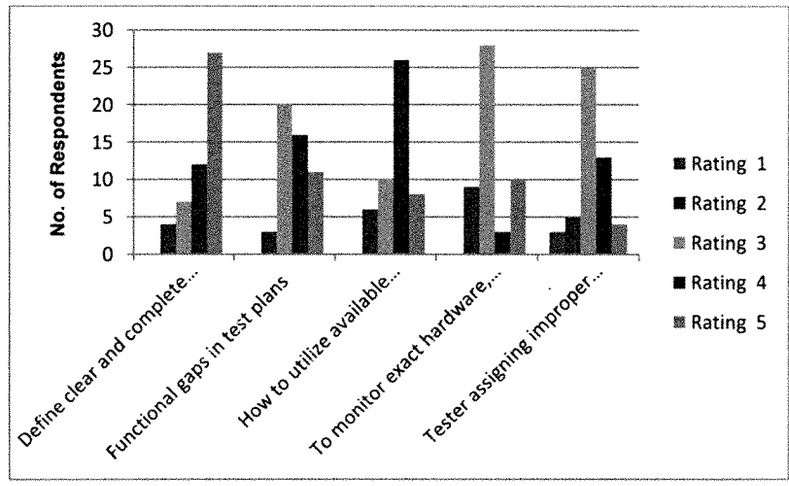

Table No 4.10

Table showing Problems of Functionality Testing of Web Application

Sr. No.	Problems of Functionality Testing	Rating					Mean Score
		1	2	3	4	5	
1.	Incomplete and ambiguous defect reporting	2	7	17	15	9	
		(4.00%)	(14.00%)	(34.00%)	(30.00%)	(18.00%)	3.4
2.	Inappropriate configuration procedure for the fixed defects which comes for verification	1	12	11	24	2	
		(2.00%)	(24.00%)	(22.00%)	(48.00%)	(4.00%)	3.6
3.	A web application with broken links or inappropriate context can lead to huge problems	1	4	14	12	19	
		(2.00%)	(8.00%)	(28.00%)	(24.00%)	(38.00%)	3.8
4.	Site should be searchable in different ways	1	7	22	17	3	
		(2.00%)	(14.00%)	(44.00%)	(34.00%)	(6.00%)	3.2
5.	To check functions of database not the contents	0	4	19	17	10	
		(0.00%)	(8.00%)	(38.00%)	(34.00%)	(20.00%)	3.4

Source: Survey Data

Table No.4.10 revels that the Problems of Functionality Testing of Web Application. Majority of the 34% Software Companies are facing Incomplete and ambiguous defect reporting as average critical problem (as the rating is 3 & also the mean score is 3.4 which belongs to rating 3) Where as only 4% Software Companies are facing this challenge least critical. Majority of 48% Software Companies are facing Inappropriate configuration procedure for the fixed defects which comes for verification as highest critical problem (as the rating is 4 & also the mean score is 3.6 which belongs to rating 4) where as only 2% Software Companies facing this problem as least critical. Majority of 38% Software Companies are facing A web application with broken links or inappropriate context can lead to huge problems as highest critical problem (as rating is 4 also the mean score is 3.8 which belongs to rating 4) where as only 2% Software Companies facing this problem as least critical. Majority of 44% Software Companies are facing to Site should be searchable in different ways as average critical problem(as rating is 3 & also the mean score is 3.2 which belongs to rating 3)Where as 2% Software Companies are facing this problem least critical. Majority of

38% Software Companies are facing To check functions of database not the contents as average critical problem (as rating is 3 also the mean score is 3.4 which belongs to rating 3) where as no Software Company is facing this problem least critical.

So, it is concluded that in case of Functionality Testing Problems,48% Software Companies are facing Inappropriate configuration procedure for the fixed defects which comes for verification as highest critical problem as mean score is 3.6 as shown in table No 4.10. Also 38.00% Software Companies are facing A web application with broken links or inappropriate context can lead to huge problems as highest critical problem as mean score is 3.8, Where as other problems shown in table No 4.10 are average critical problems faced by Software Companies

Graph No 4.10

Graph Showing Problems of Functionality Testing of Web Application.(critical level 1-Lowest & 5-highest)

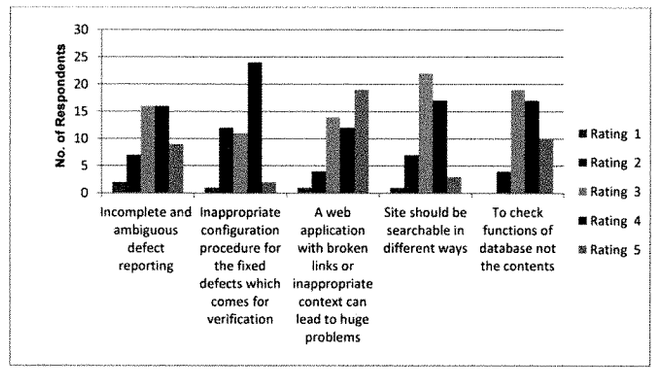

Table No 4.11

Table showing Other Challenges of Functionality Testing of Web Application

Sr. No.	Challenges of Functionality Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	Performance Testing				1		1	2
2.	Tackling HTML5, CGI, PHP JSP and other variety of technologies involved					1	1	2
3.	Continuously changing flow				1		1	2
4.	Improper test data				1		1	2
5.	Deciding test cases for complete function testing					1	1	2
6.	Database testing			1			1	2
7.	Regression due to CR			1			1	2
8.	Impact analysis on CR				1		1	2
9.	Functional behaviour depending on different OS		1				1	2
10.	Functional behaviour depending upon browsers		1				1	2
11.	Understanding exact requirements for testing					1	1	2
12.	Coverage of most important functions					1	1	2
13.	Understanding linkeages between different functions, dependability between them				1		1	2
14.	End to End flow of transactions					1	1	2
15.	3rd party connectivity					1	1	2
16.	Server configurations				1		1	2
17.	Client Server configurations			1			1	2
18.	Linguistic testing (Different languages support)			1			1	2
19.	Graphical representation			1			1	2
	Total	0	2	5	6	6	19	
	Percentage	0	4	10	12	12		38

Source: Survey Data

Table No. 4.11 revels that Other Challenges of Functionality Testing of Web Application. Only 2% respondent companies are facing each challenge shown in Table No.4.11.So,Majority of 98% respondent companies are not facing each individual Other functionality challenge shown in Table No.4.11.Total 38 % respondent organizations are facing other Challenges of Functionality testing shown in Table No.4.11.

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So, it is concluded that majority of 62 % Respondent organization are not facing Other challenges of Functionality Testing Shown in Table No.4.11 where as total 38% respondent organizations are facing other Challenges of Functionality Testing as shown in Table No.4.11

Graph No.4.11

Graph Showing Other Challenges of Functionality Testing of Web Application.(critical level 1-Lowest & 5-highest)

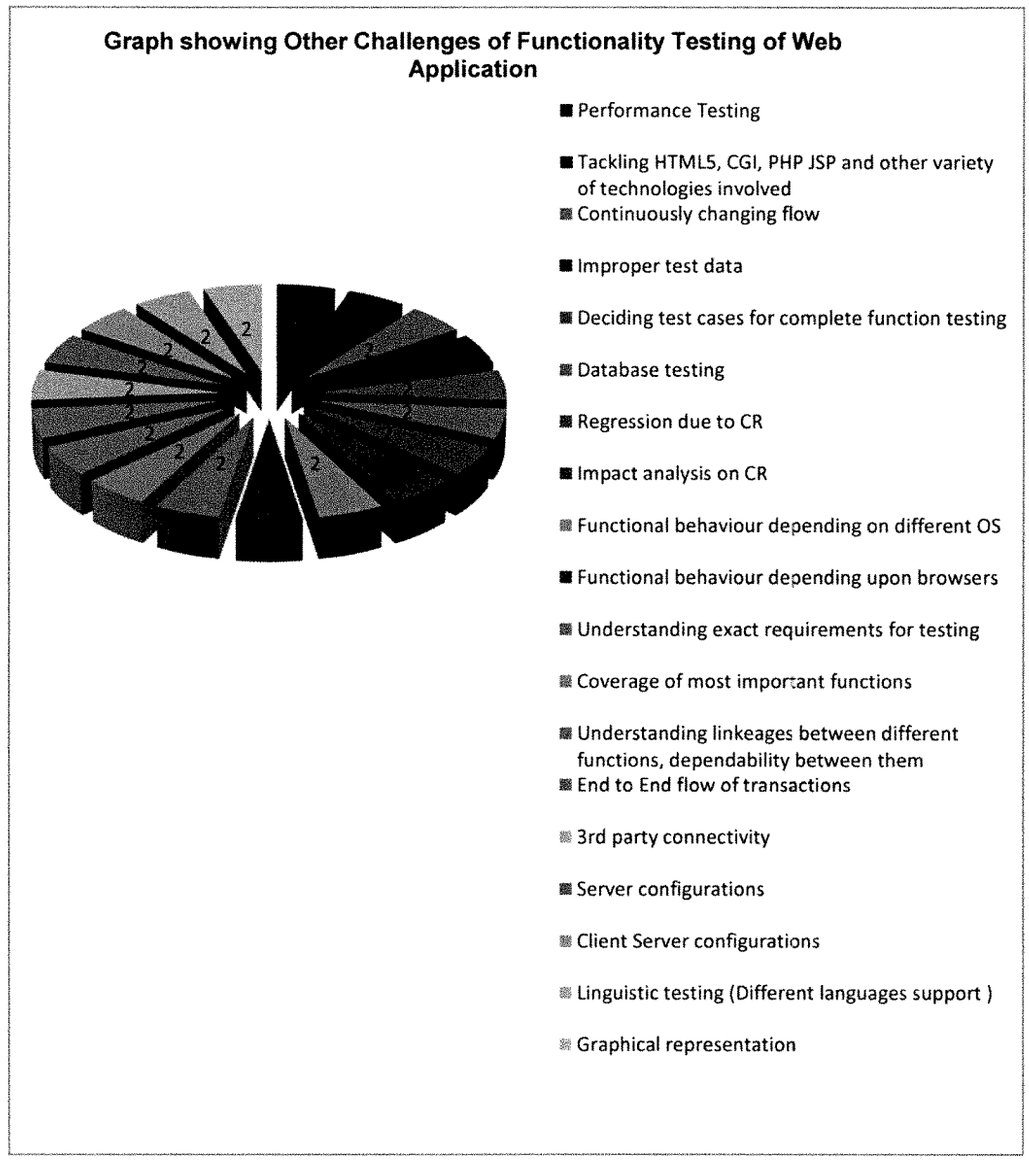

Table No 4.12

Table showing Other Problems of Functionality Testing of Web Application

Sr. No.	Problems of Functionality Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	Interacting with the background/middleware software and testing those too					1	1	2
2.	Sending sensitive data			1			1	2
3.	Defining Pass/fail criteria precisely					1	1	2
4.	During actual testing, noting /recording weird behavior if any				1		1	2
5.	Reporting bugs accurately with all the steps and fine details				1		1	2
6.	Calculation				1		1	2
7.	Dynamic Error messages and user redirect					1	1	2
8.	Performance issues				1		1	2
	Total	0	0	1	4	3	8	
	Percentage(%)	0	0	2	8	6		16

Source: Survey Data

Table No. 4.12 revels that Other Problems of Functionality Testing of Web Application. Only 2% respondent companies are facing each problem shown in Table No.4.12.So,Majority of 98% respondent companies are not facing each individual Other functionality problem shown in Table No.4.12.Total 16 % respondent organizations are facing other Problems of Functionality testing shown in Table No.4.12.

So, it is concluded that majority of 84 % Respondent organization are not facing Other Problems of Functionality Testing Shown in Table No.4.12 where as total 16% respondent organizations are facing other Problems of Functionality Testing as shown in Table No.4.12

Graph No 4.12

Graph Showing Other Problems of Functionality Testing of Web Application

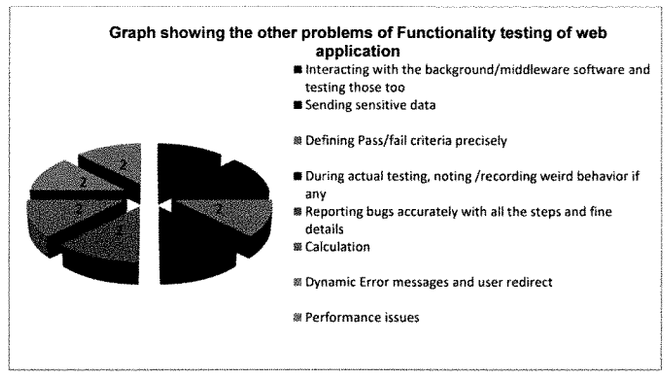

Table No 4.13

Table showing Challenges of Security Testing of Web Application

Sr. No.	Challenges of Security testing	Rating					Mean Score
		1	2	3	4	5	
1.	Difficulty in Automation security testing	0	2	11	16	21	4.1
		(0.00%)	(4.00%)	(22.00%)	(32.00%)	(42.00%)	
2.	Difficulty in finding skilled testers with the right competencies	0	2	22	15	11	3.4
		(0.00%)	(4.00%)	(44.00%)	(30.00%)	(22.00%)	
3.	Reflected cross site scripting vulnerabilities	0	3	10	31	6	3.8
		(0.00%)	(6.00%)	(20.00%)	(62.00%)	(12.00%)	
4.	Most vulnerability is high-priority(A vulnerability that is present in a rarely used part of the application is just as likely to cause damage as one on the application's log-in page)	0	4	23	8	15	3.4
		(0.00%)	(8.00%)	(46.00%)	(16.00%)	(30.00%)	
5.	Browser level security, the browsers have vulnerabilities, & need to be all the times	1	6	9	26	8	3.6
		(2.00%)	(12.00%)	(18.00%)	(52.00%)	(16.00%)	

Source: Survey Data

Table 4.13 revels that the Challenges of Security Testing of Web Application.42% Software Companies are facing Difficulty in Automation security testing as highest critical challenge. (as rating is 5 also the mean score is 4.1 which belongs to rating 4) Where as no Software Companies are facing this challenge least critical.44% Software Companies are facing difficulty in finding skilled testers with the right competencies as average critical challenge(as the rating is 3 also the mean score is 3.4 which belongs to rating 3) where as no Software Companies facing this problem as least critical. Majority of Software Companies are facing Reflected cross site scripting vulnerabilities as critical challenge (as rating is 4 also the mean score is 3.8 which belongs to rating 4) where as no Software Companies facing this challenge as least critical.46% Software Companies are facing Most vulnerability is high-priority as average critical challenge (as rating is 3 also the mean score is 3.4 which belongs to rating 3)Where as no Software Companies are facing this challenge as least critical. M 52% Software Companies are facing Browser level security, the browsers have vulnerabilities, & need to be all the times as highest critical challenge(as rating is 4 also the mean score is 3.6 which belongs to rating 4) where as only 2% Software Companies are facing this problem least critical.

So, it is concluded that, in case of Security Testing Challenges,44% Software Companies are facing Difficulty in finding skilled testers with the right competencies as average critical challenge as mean score is 3.4 as shown in table No 4.13. Also 46.00% Software Companies are facing as Most vulnerability is high-priority as average critical Challenge as mean score is 3.4, Where as other Challenges shown in table No 4.13 are highest critical Challenges faced by Software Companies

Graph No 4.13

Graph Showing Challenges of Security Testing of Web Application.(critical level 1-Lowest & 5-highest)

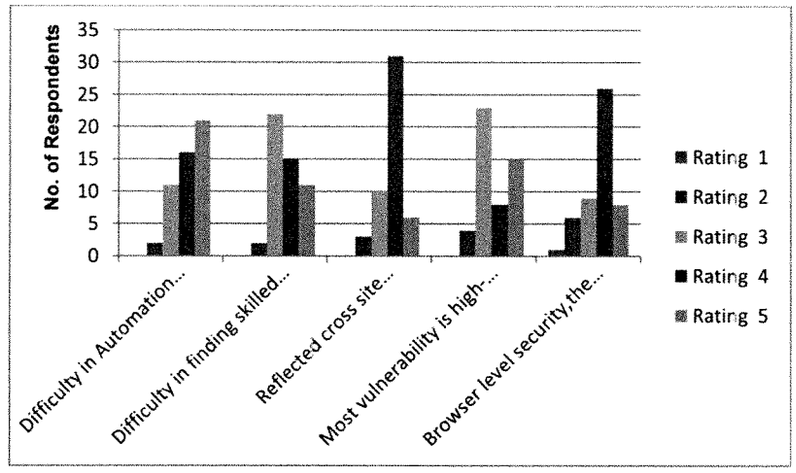

Table No.4.14

Table showing Problems of Security Testing of Web Application

Sr. No.	Problems of Security Testing	Rating					Mean Score
		1	2	3	4	5	
1.	Choosing the right tool for Web application Security testing	0	7	12	27	4	3.5
		(0.00%)	(14.00%)	(24.00%)	(54.00%)	(8.00%)	
2.	Design-level vulnerabilities(For eg. error handling in object-oriented systems, object sharing and trust issues, unprotected data channels, lack of auditing)	0	3	12	10	25	4.1
		(0.00%)	(6.00%)	(24.00%)	(20.00%)	(50.00%)	
3.	SQL Injection	1	5	15	12	17	3.7
		(2.00%)	(10.00%)	(30.00%)	(24.00%)	(34.00%)	
4.	Shell Injection	2	8	13	18	9	3.6
		(4.00%)	(16.00%)	(26.00%)	(36.00%)	(18.00%)	
5.	Phishing	2	3	6	14	25	4.1
		(4.00%)	(6.00%)	(12.00%)	(28.00%)	(50.00%)	

Source: Survey Data

Table No.4.14 revels that the Problems of Security Testing of Web Application.54% Software Companies are facing Choosing the right tool for Web application Security

testing as highest critical problem(as rating is 4 & also mean score is 3.5 which belongs to 4). Where as no Software Companies are facing this problem least critical. 50% Software Companies are facing Design-level vulnerabilities as highest critical problem.(as rating is 5 & also mean score is 4.1 which belongs to 4) where as no Software Companies facing this problem as least critical. 34% Software Companies are facing SQL Injection as highest critical problem (as rating is 5 & also mean score is 3.7 which belongs to 4) where as 2% Software Companies facing this problem as least critical. 36% Software Companies are facing Shell Injection as highest critical problem(as rating is 4 & also mean score is 3.6 which belongs to 4)Where as 4% Software Companies are facing this problem as least critical.50% Software Companies are facing Phishing as highest critical problem (as rating is 5 also mean score is 4.1 which belongs to 4)where as only 2% Software Companies are facing this problem as least critical.

So, it is concluded that, in case of security testing problems, Majority of Software Companies are facing the problems shown in table No.4.14 as highest critical problems as mean score of all problems belongs to 4. Whereas very few Software Companies are facing these problems as least critical.

Graph No 4.14

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

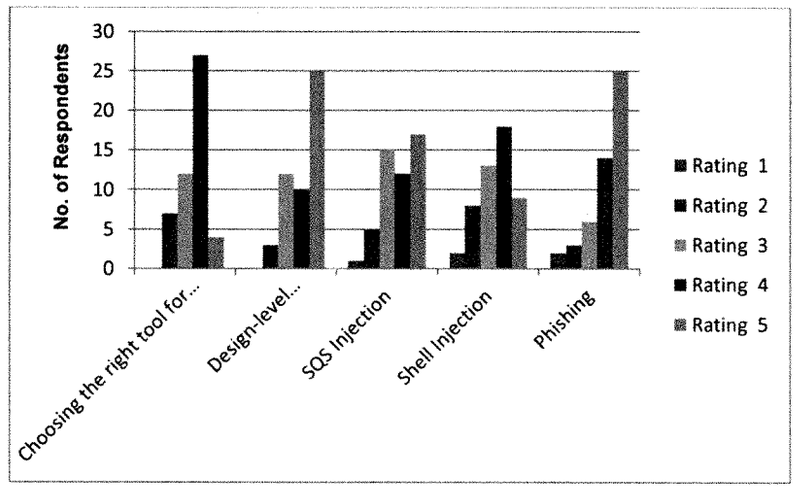

Table No 4.15

Table showing Other Challenges of Security Testing of Web Application

Sr. No.	Challenges of Security Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	XSS (Cross Site Scripting)				1		1	2
2.	Meet regulatory compliance					1	1	2
3.	To stop network monitoring hackers				1		1	2
4.	Data encryption algorithm			1			1	2
5.	Skilled labor				1		1	2
6.	Third party component				1		1	2
7.	Upgrading knowledge continuously with latest tools , security areas of testing				1		1	2
	Total	0	0	1	5	1	7	
	Percentage(%)	0	0	2	10	2		14

Source: Survey Data

Table No. 4.15 revels that Other Challenges of Security Testing of Web Application. Only 2% respondent companies are facing each challenge shown in Table No.4.15.So,Majority of 98% respondent companies are not facing each individual Other Security challenge shown in Table No.4.15.Total 14% respondent organizations are facing other Challenges of Security testing shown in Table No.4.15.So,it is concluded that majority of 86 % Respondent organization are not facing Other challenges of Security Testing Shown in Table No.4.15 where as total 14% respondent organizations are facing other Challenges of Security Testing as shown in Table No.4.15

Graph No 4.15

Graph Showing Other Challenges of Security Testing of Web Application.(critical level 1-Lowest & 5-highest)

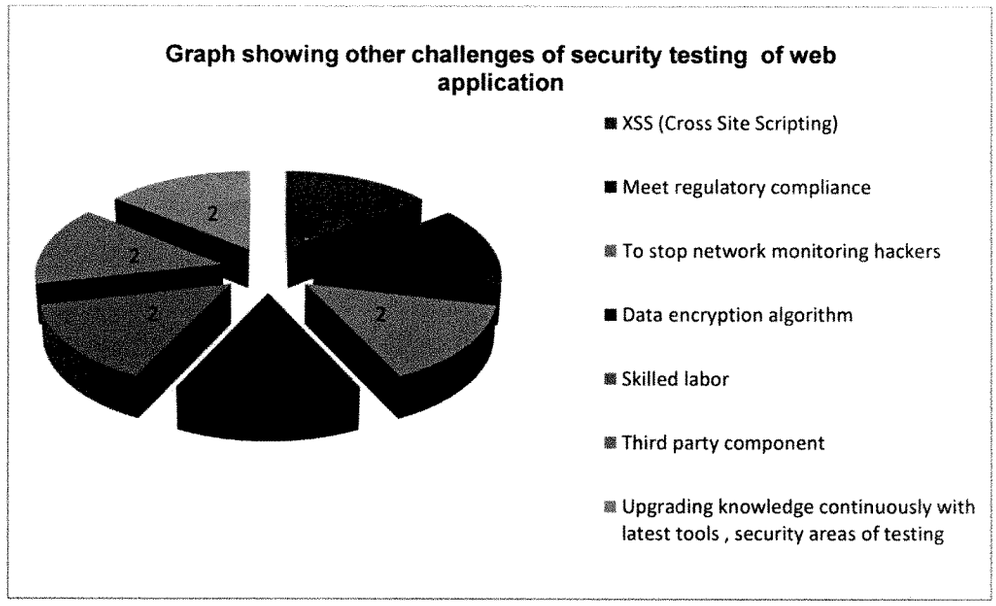

Table No.4.16

Table showing Other Problems of Security Testing of Web Application

Sr. No.	Problems of Security Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	Proactively secure sensitive customer records					1	1	2
2.	Over 3000 legacy and new applications				1		1	2
3.	Cookies, session hijacking				1		1	2
4.	Exhaustive testing if not done, leaves security concerns					1	1	2
5.	Minimum agreement on security related issues – what type of security, levels to be provided.			1			1	2
	Total	0	0	1	2	2	5	
	Percentage	0	0	2	4	4		10

Source: Survey Data

Table No. 4.16 revels that Other Problems of Security Testing of Web Application. Only 2% respondent companies are facing each problems shown in Table No.4.16.So,Majority of 98% respondent companies are not facing each individual Other Security Testing problem shown in Table No.4.16.Total 10 % respondent organizations are facing other problems of security testing shown in Table No.4.16.So,it is concluded that majority of total 90 % Respondent organization are not facing Other problems of security Testing Shown in Table No.4.16 where as total 10% respondent organizations are facing other problems of security Testing as shown in Table No.4.16.

Graph No 4.16

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

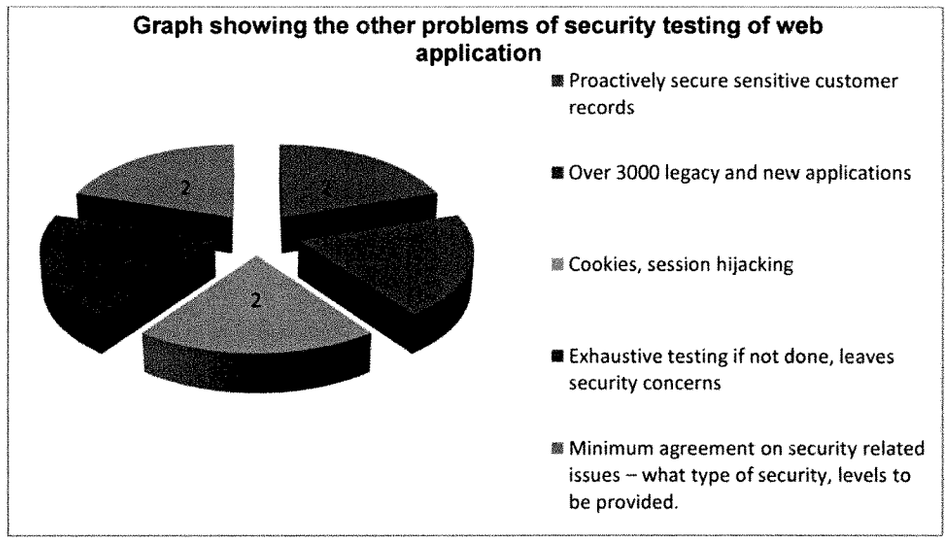

Table No.4.17

Table showing Challenges of Performance Testing of Web Application.

Sr. No.	Challenges of Performance testing	Rating					Mean Score
		1	2	3	4	5	
1.	Ambiguous, Unclear, unknown, not-sure kind of requirements from clients	0	5	8	22	15	
		(0.00%)	(10.00%)	(16.00%)	(44.00%)	(30.00%)	3.9
2.	Procurement of expensive tool licenses	1	3	14	28	4	
		(2.00%)	(6.00%)	(28.00%)	(56.00%)	(8.00%)	3.6
3.	Cost, technical issues faced while upgrading to newer versions of performance testing tool	1	3	11	27	8	
		(2.00%)	(6.00%)	(22.00%)	(54.00%)	(16.00%)	3.7
4.	Unavailability of compatible performance testing tool versions	1	5	15	25	4	
		(2.00%)	(10.00%)	(30.00%)	(50.00%)	(8.00%)	3.5
5.	Stringent project timelines	0	4	8	10	28	
		(0.00%)	(8.00%)	(16.00%)	(20.00%)	(56.00%)	4.2

Source: Survey Data

Table No.4.17 revels that the Challenges of Performance Testing of Web Application. 44% Software Companies are facing Ambiguous, unclear, unknown, not-sure kind of requirements from clients as highest critical challenge.(as rating is 4 & also mean score is 3.9 which belongs to 4) Where as no Software Companies are facing this challenge least critical.56% Software Companies are facing Procurement of expensive tool licenses as highest critical challenge (as the rating is 4 & also mean score is 3.6 which belongs to 4) where as 2% Software Companies facing this challenge as least critical.54% Software Companies are facing cost and technical issues faced while updating to newer versions of performance testing tool as highest critical challenge (as rating is 4 & also mean score is 3.7 which belongs to 4) where as 2% Software Companies facing this challenge as least critical.50% Software Companies are facing Unavailability of compatible performance testing tool versions as highest critical challenge(as rating is 4 & also mean score is 3.5 which belongs to 4)Where as 2% Software Companies are facing this challenge as least critical.56% Software Companies are facing Stringent project timelines as highest critical challenge (as rating is 5 & also mean score is 4.2 which belongs to 4). Whereas no Software Companies are facing this problem as least critical.

So, it is concluded that in case of Performance Testing Challenges, Majority of Software Companies are facing the Challenges shown in table No.4.17 as highest critical challenges as mean score of all Challenges belongs to 4.Where as very few Software Companies are facing these challenges as least critical.

Graph No 4.17

Graph showing Challenges of Performance Testing of Web Application. (critical level 1-Lowest & 5-highest)

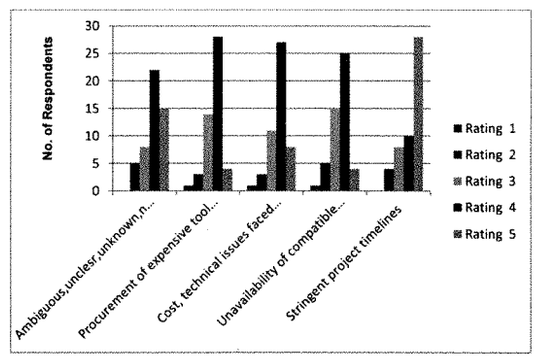

Table No 4.18

Table showing Problems of Performance Testing of Web Application.

Sr. No.	Problems of Performance testing	Rating					Mean Score
		1	2	3	4	5	
1.	Performance testing tool selection.	0	7	16	21	6	3.5
		(0.00%)	(14.00%)	(32.00%)	(42.00%)	(12.00%)	
2.	The vulnerability of skills	0	7	8	11	24	4.0
		(0.00%)	(14.00%)	(16.00%)	(22.00%)	(48.00%)	
3.	If an application is in distributed network, then monitoring the performance of each server	0	2	14	15	19	4.0
		(0.00%)	(4.00%)	(28.00%)	(30.00%)	(38.00%)	
4.	Because of heavy load ,the failure due to dynamic contents of business process	0	5	11	13	21	4.0
		(0.00%)	(10.00%)	(22.00%)	(26.00%)	(42.00%)	
5.	Long load time, poor response time and poor scalability	0	9	13	13	15	3.6
		(0.00%)	(18.00%)	(26.00%)	(26.00%)	(30.00%)	

Source: Survey Data

Table No.4.18 revels that the Problems of Performance Testing of Web Application. 42% Software Companies are facing Performance testing tool selection as highest critical problem.(as rating is 3.5 & also mean score is 3.5 which belongs to 4) Where as no Software Companies are facing this problem least critical.48% Software Companies are facing The vulnerability of skills as highest critical problem. (as rating is 5 & also mean score is 4) where as no Software Companies facing this problem as least critical.38% Software Companies are facing If an application is in distributed network, then monitoring the performance of each server as highest critical problem(as rating is 5 & also mean score is 4) where as no Software Companies facing this problem as least critical.42% Software Companies are facing Because of heavy load ,the failure due to dynamic contents of business process as highest critical problem. (as rating is 5 & also mean score is 4) Where as no Software Companies are facing this problem as least critical.30% Software Companies are facing Long load time, poor response time and poor scalability as highest critical problem. (as rating is 5 & also mean score is 3.6 which belongs to 4) where as no Software Companies are facing this problem as least critical.

So, it is concluded that Majority of Software Companies are facing the problems shown in table No.4.18 as highest critical problems in Performance Testing as mean

score of all problems belongs to 4 Where as very few Software Companies are facing these problems as least critical.

Graph No 4.18

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

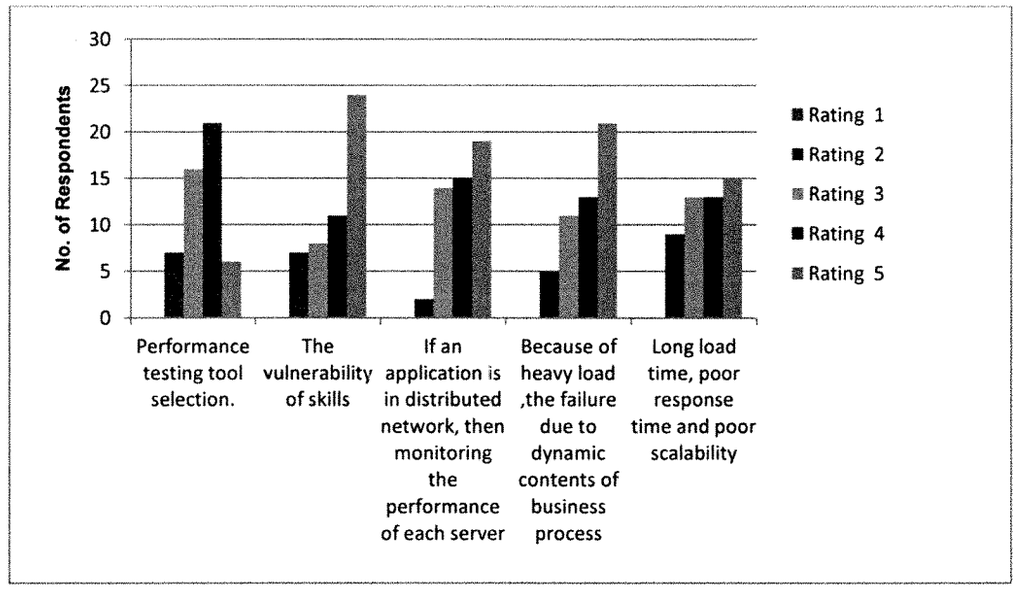

Table No.4.19

Table showing other Challenges of Performance Testing of Web Application.

Sr. No.	Challenges of Performance Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	Providing infrastructure to support heavy load/stress testing					1	1	2
2.	Resource allocation				1		1	2
3.	Server network configuration			1			1	2
4.	Changes in technology (new OS, new upgrades)			1			1	2
5.	Simulators not adequate for performance testing			1			1	2
6.	Tangible testing plan				1		1	2
7.	Report analysis				1		1	2
8.	Using responses as input to other requests					1	1	2
9.	Session handling		1				1	2
10.	Deciding on thresholds like time VU's			1			1	2
11.	Clustered environment				1		1	2
12.	Multiple JVM's					1	1	2
13.	Maintaining Huge data					1	1	2
	Total	0	1	4	4	4	13	
	Percentage(%)	0	2	8	8	8		26

Source: Survey Data

Table No. 4.19 revels that other challenge of performance testing of Web Application. Only 2% respondent companies are facing each challenge shown in Table No.4.19.So,Majority of 98% respondent companies are not facing each individual Other performance Testing challenges shown in Table No.4.19.Total 26 % respondent organizations are facing other challenges of performance testing shown in Table No.4.19.So,it is concluded that majority of total 74 % respondent organization are not facing Other challenges of performance Testing Shown in Table No.4.19 where as total 26% respondent organizations are facing other challenges of performance Testing as shown in Table No.4.19.

Graph No 4.19

Graph showing Other Challenges of Performance Testing of Web Application.(critical level 1-Lowest & 5-highest)

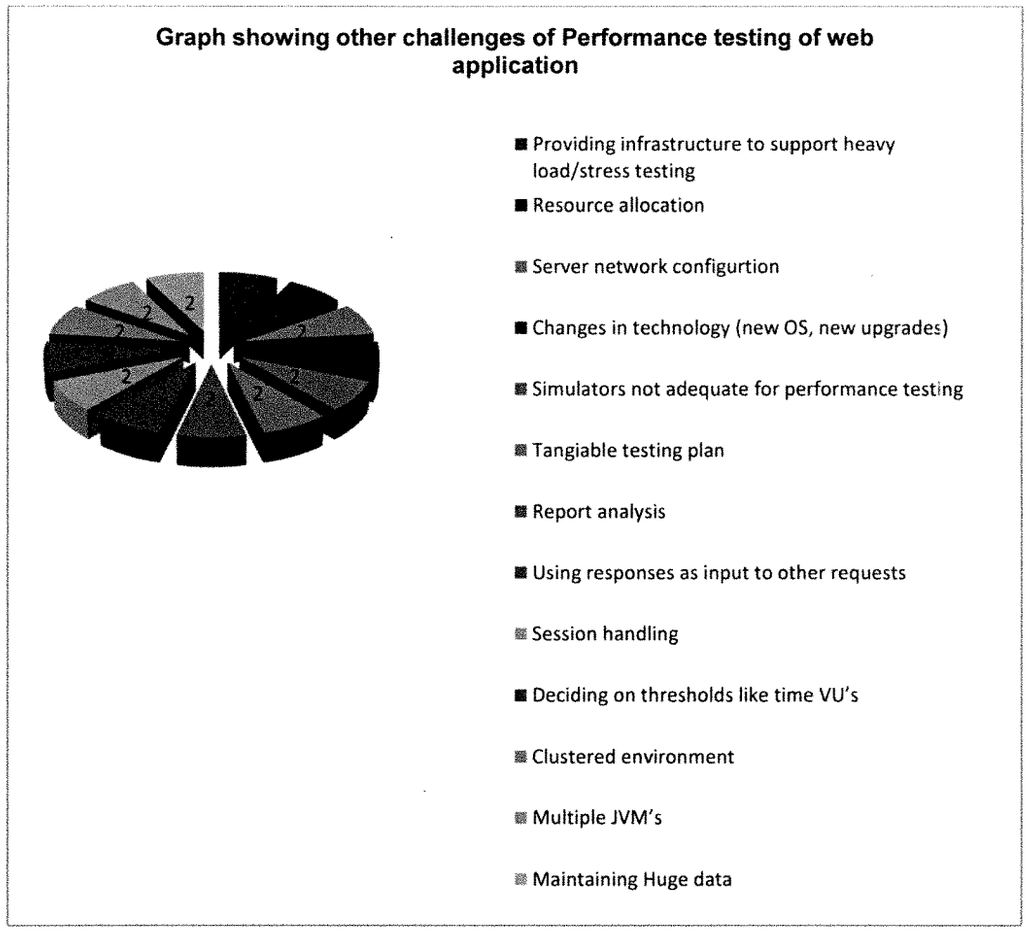

Table No 4.20

Table showing other Problems of Performance Testing of Web Application.

Sr. No.	Problems of Performance Testing	Rating					Total Respondent	Percentage (%)
		1	2	3	4	5		
1.	Monetary considerations in the setup and scaling of devices /environment					1	1	2
2.	Selection Improper development environment			1			1	2
3.	Simulators does not reflect real time situation always			1			1	2
4.	Missing Data					1	1	2
5.	Table indexing					1	1	2
	Total	0	0	2	0	3	5	
	Percentage (%)	0	0	4	0	6		10

Source: Survey Data

Table No. 4.20 revels that other problem of performance testing of Web Application. Only 2% respondent companies are facing each problem shown in Table No.4.19.So,Majority of 98% respondent companies are not facing each individual Other performance Testing problems shown in Table No.4.20.Total 10 % respondent organizations are facing other problems of performance testing shown in Table No.4.20.So,it is concluded that majority of total 90 % respondent organization are not facing Other problems of performance Testing Shown in Table No.4.20 where as total 10% respondent organizations are facing other problems of performance Testing as shown in Table No.4.20

Graph No 4.20

Graph showing other Problems of Performance Testing of Web Application.(critical level 1-Lowest & 5-highest)

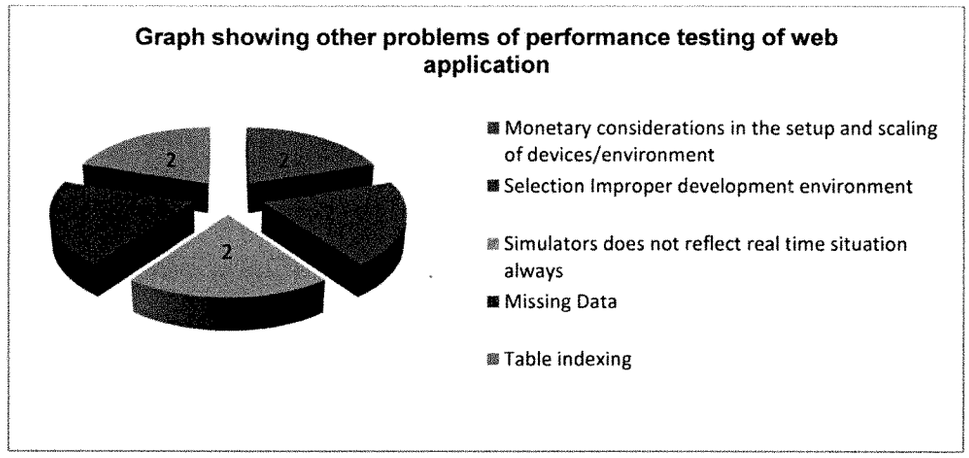

Table No 4.21

Table showing respondent's opinion on Performance testing of web application

Performance of Testing is dependent on	Number of Respondents	In Percentage (%)
Load Testing	9	18
Stress Testing	10	20
Both Load & stress testing	30	60
None of these	1	2
Total	50	100%

Source: Survey Data

Table No.4.21 revels that the respondent's opinion on Performance testing of web application is dependent on which factor.

Majority of the 60% respondent's opinion is performance testing of web application is dependent on both Load and Stress Testing. Whereas 18% respondent's opinion is performance testing of web application is dependent on Load Testing. and 20% respondents opinion is performance testing of web application is dependent on Stress Testing.

So, it is concluded that performance testing of web application is dependent on both Load and Stress

Graph No 4.21

Graph showing respondent's opinion on Performance testing of web application

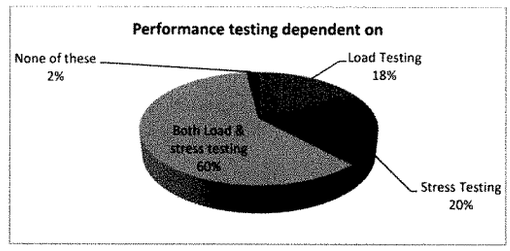

Table No 4.22

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

Awareness of all aspects of security testing	Number of Respondents	In Percentage (%)
Strongly agree	05	10
Agree	01	02
Somewhat agree	12	24
Neutral	01	02
Disagree	21	42
Strongly disagree	10	20
Total	50	100

Source: Survey Data

Table No.4.22 revels that 42% respondents are disagree with awareness of all aspects of Security Testing of web application where as only 10% respondents are strongly agree with awareness of all aspects of Security testing of web application.

So, it is concluded tha 42% respondents are not aware of all aspects of security testing.

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Graph No 4.22

Graph showing respondent's awareness of Security Testing of Web Application.

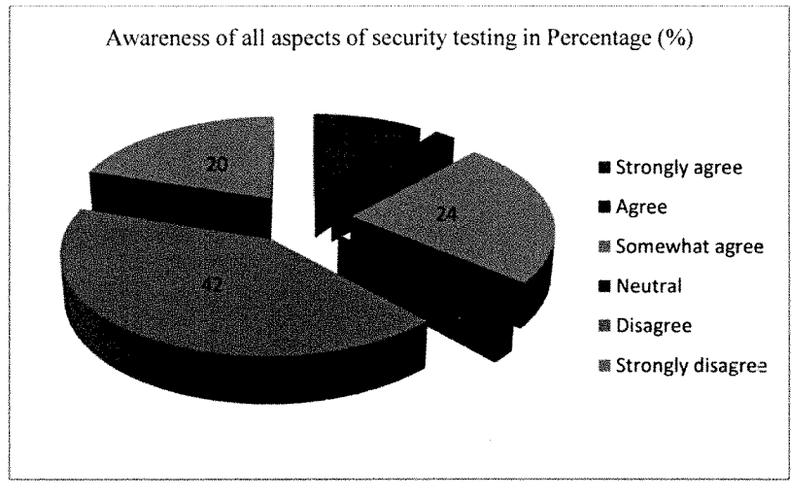


Table No 4.23

Table showing information of Web Application Testing reduces maintenance cost.

Web Application Testing reduces Web Application maintenance cost	Number of Respondents	In Percentage (%)
Strongly agree	13	26
Agree	31	62
Somewhat agree	4	8
Neutral	1	2
Disagree	1	2
Strongly disagree	0	0
Total	50	100

Source: Survey Data

Table No.4.23 revels that Majority of 62% respondents are agree with Web Application Testing reduces web application maintenance cost. Where as only 2% respondents are disagree with Web Application Testing reduces web application maintenance cost.

So, it is concluded that Majority of 62% respondents are agree with Web Application Testing reduces web application maintenance cost.

Graph No 4.23

Graph showing information of Web Application Testing reduces maintenance cost.

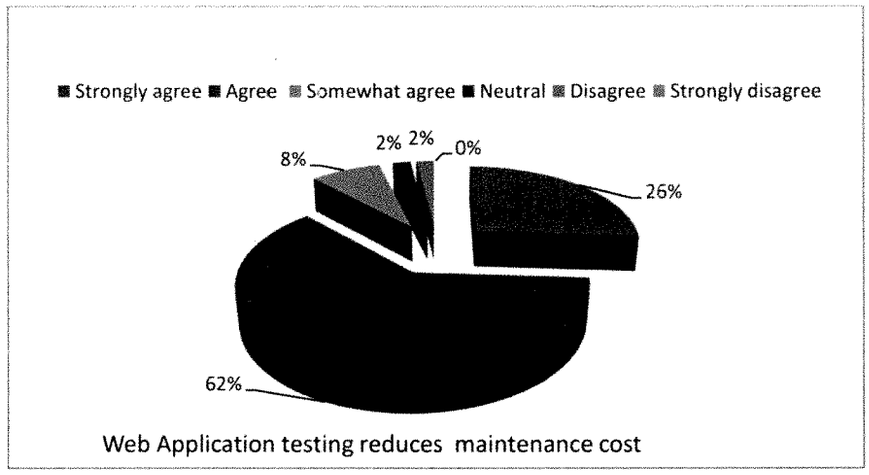


Table No 4.24

Table showing information of Testing improves quality of Web Application

Web Application Testing improves quality of Web Application	Number of Respondents	In Percentage (%)
Strongly agree	19	38
Agree	26	52
Somewhat agree	5	10
Neutral	0	0
Disagree	0	0
Strongly disagree	0	0
Total	50	100

Source: Survey Data

Table No.4.24 revels that 52% respondents are agree with Web Application Testing improves quality of Web Application. Whereas not single respondent is disagree with Web Application Testing improves quality of Web Application.

So, it is concluded that 52 % respondents are agree with Web Application Testing improves quality of Web Application

Graph No 4.24

Graph showing information of Testing improves quality of Web Application

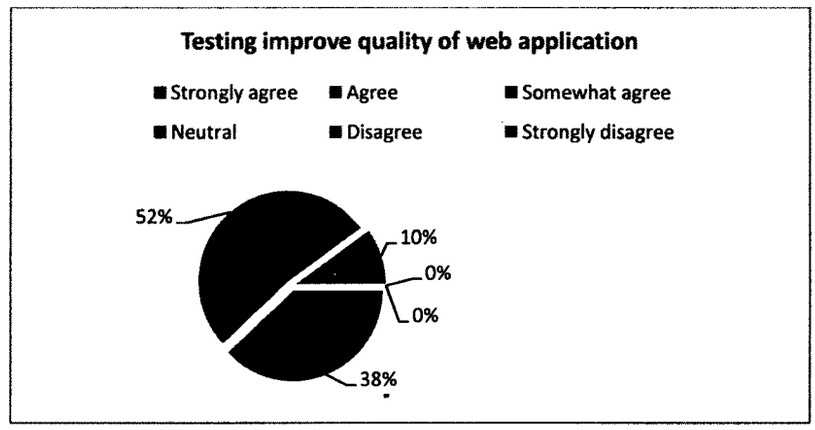


Table No 4.25

Table showing information of Web Application Testing Quality dependency

Quality of web application Testing depends on quality of functional & Non-functional Testing	Number of Respondents	In Percentage (%)
Strongly agree	14	28
Agree	21	42
Somewhat agree	5	10
Neutral	5	10
Disagree	5	10
Strongly disagree	0	0
Total	50	100

Source: Survey Data

Table No.4.25 revels that 42% respondents are agree with Quality of Web Application Testing will depend on Quality of Functional & Non-functional Testing of Web Application. Whereas no single respondent is strongly disagree with Quality of Web Application Testing will depend on Quality of Functional & Non-functional Testing of Web Application. So, it is concluded that 42% respondents are agree with Quality of Web Application Testing will depend on Quality of Functional & Non-functional Testing of Web Application

Graph No 4.25

Graph showing information of Web Application Testing Quality depends on Quality of Functional & Non-functional Testing.

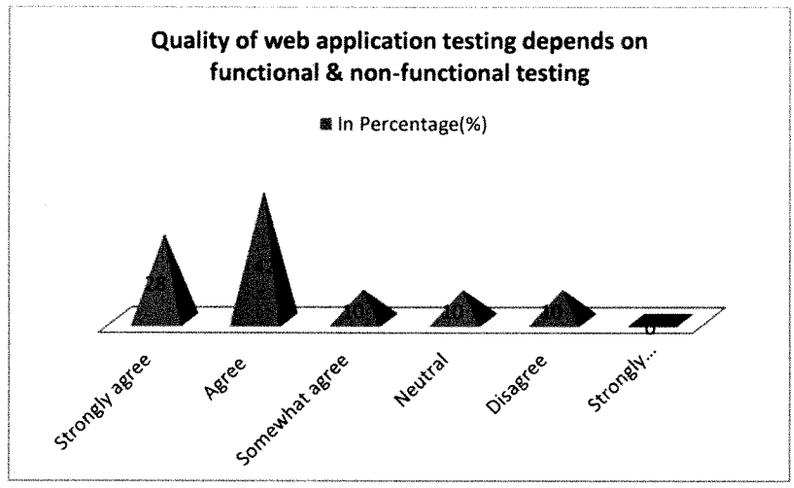


Table No 4.26

Table showing information of Organization uses model for Web Development.

Organization uses any model for Web Application Development	Number of Respondents	In Percentage (%)
Yes	19	38
No	31	62
Total	50	100

Source: Survey Data

Table No.4.26 revels that Majority of 62% respondents are organizations are not using model for Web Application Development. Whereas 38% respondents organizations are using model for Web Application Development.

So, it is concluded that Majority of 62 % respondents Organizations are not using model for web application development.

Graph No 4.26

Graph showing information on Organization uses model for Web Development.

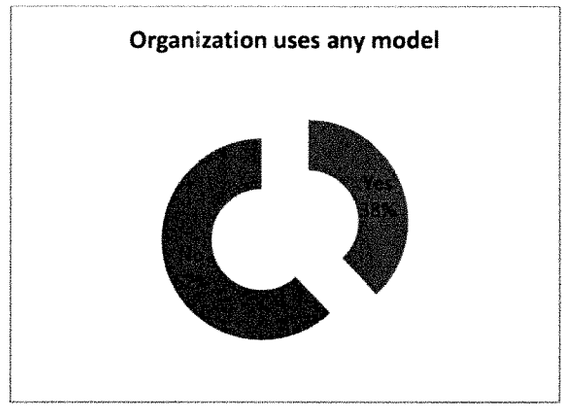


Table No 4.27

Table showing information on process improvement in testing process improves quality of web application

Continuous process improvement in testing process required to improve quality of web application	Number of Respondents	In Percentage(%)
Strongly agree	20	40
Agree	21	42
Somewhat agree	6	12
Neutral	3	6
Disagree	0	0
Strongly disagree	0	0
Total	50	100

Source: Survey Data

Table No.4.27 revels that 42% respondents are agree with Continuous process improvement in testing process required to improve quality of web application Where as no respondents are disagree continuous process improvement in testing process required to improve quality of web application.

So, it is concluded that 42% respondents are agree with Continuous process improvement in testing process required to improve quality of web application testing

Graph No 4.27

Graph showing information on process improvement in testing process improves quality of web application

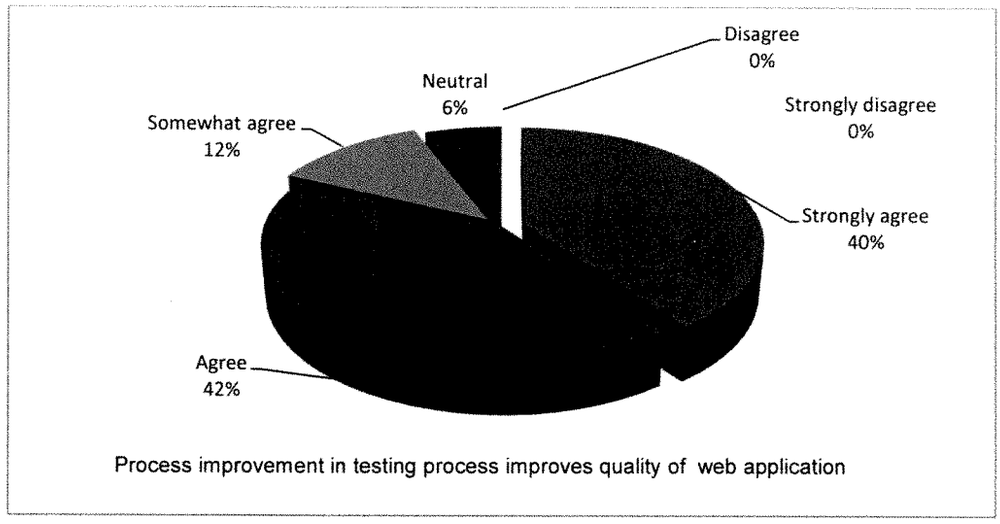


Table No 4.28

Table showing information on Need of Special test cases for Websites heavily loaded with Ajax & Flash

Need of Special test cases for Websites heavily loaded Ajax & Flash	Number of Respondents	In Percentage (%)
Strongly agree	25	50
Agree	18	36
Somewhat agree	5	10
Neutral	1	2
Disagree	1	2
Strongly disagree	0	0
Total	50	100

Source: Survey Data

Table No.4.28 revels that 50% respondents are Strongly agree with Need of Special test cases for Websites heavily loaded Ajax & Flash Where as no respondents are strongly disagree with Need of Special test cases for Websites heavily loaded Ajax & Flash.

So, it is concluded that Majority of 50% respondents are strongly agree with Special test cases should be written to test Websites heavily loaded Ajax & Flash

Graph No 4.28

Graph showing information on Need of Special test cases for Websites heavily loaded Ajax & Flash

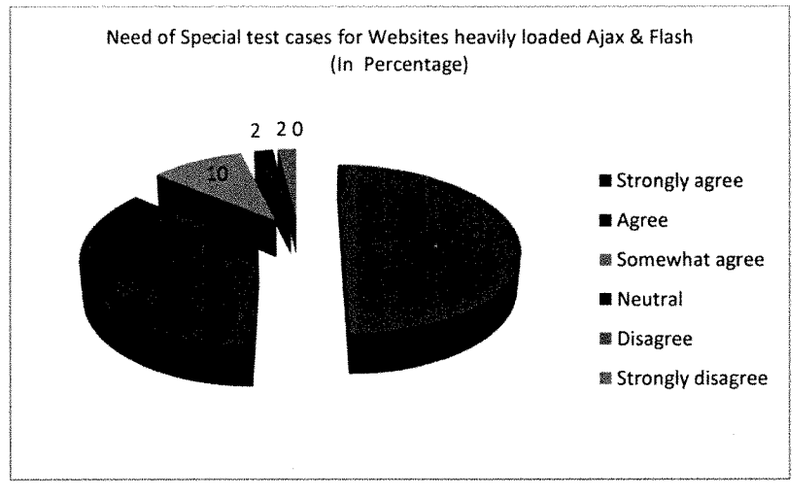


Table No 4.29

Table showing information on Test coverage of web application dependency

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

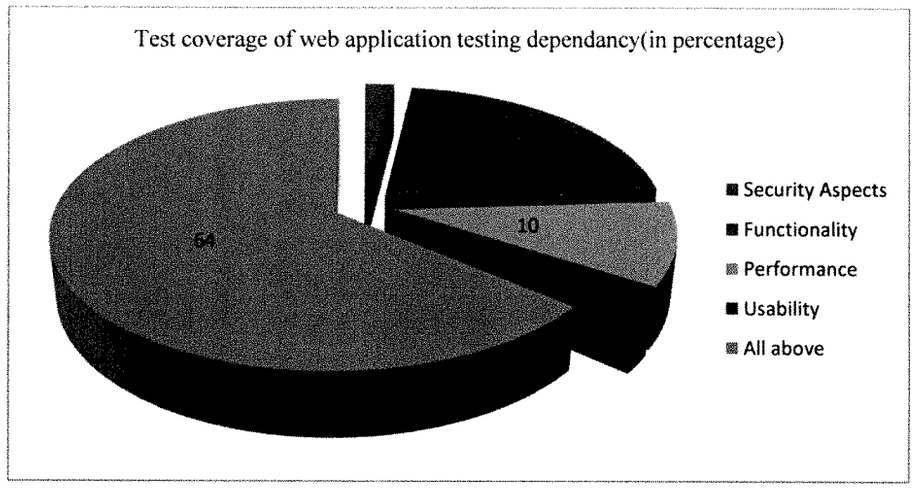
Source: Survey Data

Table No.4.29 revels that Majority of 64% respondents opinion are Test coverage of web application dependent on all four factors i.e. Security aspects, Functionality, Performance, Usability. Whereas only 2% respondents opinion is Test coverage of web application dependent on Usability.

So, 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 No 4.29

Graph showing information on Test coverage of web application dependency



4.2 Testing of Hypothesis

For the present study the data is collected with the help of exhaustive questionnaire and presented in tabular format. The hypothesis were tested by using the primary data with the help of suitable statistical technique such as T test, Chi-Square Test etc.

4.2.1 Hypothesis

A hypothesis is a tentative statement about the relationship between two or more variables.

4.2.2 Types of hypothesis

There are different types of hypotheses:

a. **Simple hypothesis** - this predicts the relationship between a single independent variable (IV) and a single dependent variable (DV)

For example:

- Lower levels of exercise postpartum (IV) will be associated with greater weight retention (DV).

- IV = independent variable
- DV = dependent variable

b. **Complex hypothesis** - this predicts the relationship between two or more independent variables and two or more dependent variables.

1. Example of a complex multiple independent variable hypothesis:

Low risk pregnant women (IV) who:

- value health highly ;
- believe that engaging in health promoting behaviors will result in positive outcomes;
- perceive fewer barriers to health promoting activities;
- are more likely than other women to attend pregnancy-related education programs (DV).

2. Example of a complex multiple dependent variable hypothesis:

The implementation of an evidence based protocol for urinary incontinence (IV) will result in (DV):

- decreased frequency of urinary incontinence episodes;
- decreased urine loss per episode;
- decreased avoidance of activities among women in ambulatory care settings.

Hypotheses can be stated in various ways as long as the researcher specifies or implies the relationship that will be tested.

For example:

- Lower levels of exercise postpartum are associated with greater weight retention.
- There is a relationship between level of exercise postpartum and weight retention.
- The greater the level of exercise postpartum, the lower the weight retention.
- Women with different levels of exercise postpartum differ with regard to weight retention.
- Weight retention postpartum decreases as the woman's level of exercise increases.
- Women who exercise vigorously postpartum have lower weight retention than women who do not.

c. **Directional hypotheses**

These are usually derived from theory. They may imply that the researcher is intellectually committed to a particular outcome. They specify the expected direction of the relationship between variables i.e. the researcher predicts not only the existence of a relationship but also its nature.

d. **Non-directional hypotheses**

Used when there is little or no theory, or when findings of previous studies are contradictory. They may imply impartiality. Do not stipulate the direction of the relationship.

e. **Associative and causal hypotheses**

- **Associative hypotheses**

Propose relationships between variables - when one variable changes, the other changes. Do not indicate cause and effect.

- **Causal hypotheses**

Propose a cause and effect interaction between two or more variables. The independent variable is manipulated to cause effect on the dependent variable.

The dependent variable is measured to examine the effect created by the independent variable.

A format for stating causal hypotheses is:

The subjects in the experimental group who are exposed to the independent variable demonstrate greater change, as measured by the dependent variable, than do the subjects in the control group who are not exposed to the independent variable.

f. **Null hypotheses**

These are used when the researcher believes there is no relationship between two variables or when there is inadequate theoretical or empirical information to state a research hypothesis. Null hypotheses can be:

- simple or complex;
- associative or causal.

g. **Testable hypotheses**

Contain variables that are measurable or able to be manipulated. They need to predict a relationship that can be 'supported' or 'not supported based on data collection and analysis.

Procedure for testing of hypotheses is as follows:

Step–1: Calculate the estimated (E) frequencies using observed frequencies (O)

Step–2: Calculate the difference between observed and estimated frequencies i.e.(O-E)

Step–3: Find out the square of (O-E)

Step-4: Calculate $\chi^2 = (O-E)^2/E$

Step-5: Calculate the degree of freedom (df) v= (r-1) x (c-1)

Test the χ^2 value and the table value for calculated degree of freedom, if calculated value (χ^2) is less than the table value then the hypotheses is accepted otherwise it is to be rejected.

4.2.3 Hypothesis Testing

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

   The above hypothesis is based on the following question.

   Q.1.Test Coverage of Web Application Testing is dependent on which factor?

   A] Security Aspects B] Functionality C] Performance

   D] Usability E] All A,B,C,D

   The above hypothesis have been tested using the t-test.

T-Test [DataSet0]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Security	50	.02	.141	.020
Functionality	50	.22	.418	.059
Performance	50	.10	.303	.043
Usability	50	.02	.141	.020
All Above	50	.64	.485	.069

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Security	1.000	49	.322	.020	-.02	.06
Functionality	3.718	49	.001	.220	.10	.34
Performance	2.333	49	.024	.100	.01	.19
Usability	1.000	49	.322	.020	-.02	.06
All Above	9.333	49	.000	.640	.50	.78

Based on the above table standard deviation for the all parameter has been calculated. It is observed that the all above parameter is having a little variation as compared to other parameter also t-test has been calculated with 95% confidence and 5% level of significance the hypotheses stands for **reject.** Hence it is concluded that the **test coverage of the web application is not dependent upon Security aspects of web application.**

2. **Performance of web applications is dependent on both Load & Stress testing.**
   The above hypothesis is based on the following question.

   Q. Performance of Web Application Testing is dependent on?

   A] Load Testing B] Stress Testing

   C] Both Load & Stress Testing D] None of these

   The above hypothesis has been tested using the t-test.

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T-Test [DataSet0]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Load	50	.18	.388	.055
Stress	50	.20	.404	.057
Both	50	.60	.495	.070
None of these	50	.02	.141	.020

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Load	3.280	49	.002	.180	.07	.29
Stress	3.500	49	.001	.200	.09	.31
Both	8.573	49	.000	.600	.46	.74
None of these	1.000	49	.322	.020	-.02	.06

Based on the above table standard deviation for the all parameter has been calculated. It is observed that the both parameter is having a little variation as compared to other parameter also t-test has been calculated with 95% confidence and 5% level of significance the hypotheses stands for **accept**. Hence it is concluded that the **Performance of web applications is dependent on both Load & Stress testing.**

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

The above hypothesis is based on the following questions.

Q. Does your testing team is aware of all the aspects of Web Application Security Testing?

A] Strongly Agree B] Agree C] Somewhat Agree D] Neutral

E] Disagree F] Strongly Disagree

The above hypothesis has been tested using the t-test.

T-Test [DataSet0]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Strongly agree	50	.10	.303	.043
Agree	50	.02	.141	.020
Somewhat agree	50	.24	.431	.061
Neutral	50	.02	.141	.020
Disagree	50	.42	.499	.071
Strongly disagree	50	.20	.404	.057

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Strongly agree	2.333	49	.024	.100	.01	.19
Agree	1.000	49	.322	.020	-.02	.06
Somewhat agree	3.934	49	.000	.240	.12	.36
Neutral	1.000	49	.322	.020	-.02	.06
Disagree	5.957	49	.000	.420	.28	.56
Strongly disagree	3.500	49	.001	.200	.09	.31

Based on the above table standard deviation for the all parameter has been calculated. It is observed that the disagree parameter is having a little variation as compared to other parameter also t-test has been calculated with 95% confidence and 5% level of significance the hypotheses stands for **accept**. Hence it is concluded that the **Organizations are not having sufficient awareness of web site security testing.**

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

The above hypothesis is based on the following questions.

Q. Which Automation Tool your Company is using for testing Web Application, Please provides the name?

A] Open Source B] Vendor Specific

Table No 4.4

Table showing Usage of Automation Tools

Usage of Automation Tool	Type of Automation Tool		Total
	Open Source	Vendor Specific	
Yes	18	12	30
No	7	13	20
Total	25	25	50

Calculation of χ^2 test

Oi	Ei	Oi-Ei	(Oi - Ei)2	(Oi-Ei)2/Ei
18	15	3	9	0.6
12	10	2	4	0.4
7	15	-8	64	4.2666667
13	10	3	9	0.9

χ^{2}= 6.1666667

df = r-1 * c – 1	2-1 *2-1	= 1 d.f.	
	at 5%	Table	
	level	value	3.841

For One degree of freedom at 5% level of significance, the table value is 3.841. The calculated value of χ^2 is much greater than the table value and hence the hypotheses stands rejected. Therefore, it may be concluded that there is majority of software companies are using the open source automation tool.