

## Chapter-2

### REVIEW OF LITERATURE

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#### **2.1 Review of Literature:**

**According to the Avancini A** (25-26 Sept. 2011), in their paper titled “Security testing of Web applications: A Search based approach for Cross-site scripting Vulnerabilities” Published in Source Code Analysis and Manipulation (SCAM), 11th IEEE International Working Conference says, More and more web applications suffer the presence of cross-site scripting vulnerabilities that could be exploited by attackers to access sensitive information. Hence proper tests are required to assess the security of web applications. In this paper, Researcher resort to a search based approach for security testing web applications.

**According to Sebastian Elbaum, Srikanth Karre, Gregg Rothermel** in their paper titled “Improving Web Application Testing with User Session Data” says, Web applications have become critical components of the global information infrastructure, and it is important that they be validated to ensure their reliability. Therefore, many techniques and tools for validating web applications have been created. Only a few of these techniques, however, have addressed problems of testing the functionality of web applications, and those that do have not fully considered the unique attributes of web applications. In this paper Researcher’s explore the notion that user session data gathered as users operate web applications can be successfully employed in the testing of those applications, particularly as those applications evolve and experience different usage profiles. Researchers report results of an experiment comparing new and existing test generation techniques for web applications, assessing both the adequacy of the generated tests and their ability to detect faults on a point-of-sale web application. Our results show that user session data can produce test suites as effective overall as those produced by existing white-box techniques, but at less expense. Moreover, the classes of faults detected differ somewhat across approaches, suggesting that the techniques may be complimentary.

**According to Ricca, F. ITC-irst, Italy, Tonella, P.** (April-June 2006) in their paper titled ”Detecting anomaly and Failure in web Applications” Published in MultiMedia,

IEEE journal says, Improving Web application quality will require automated evaluation tools. Many such tools are already available either as commercial products or research prototypes. Here Researcher uses ReWeb and TestWeb to find some anomalies and failures in four case studies.

**According to Arora A., Sinha M.**( February-2012 ) in their paper titled “Web Application Testing: A Review on Techniques, Tools and State of Art” Published in International Journal of Scientific & Engineering Research, Volume 3, Issue 2 ISSN 2229-5518 journal says, Researcher considered web testing with respect to various web testing techniques and Web testing tools. This research paper is providing help to get information about existing web testing technique, current scenario of web testing and proposing new research direction in web testing field. The main conclusion is that all testing are fully dependent on implementation technologies and future testing techniques have to adapt heterogeneous and dynamic nature of web application. This finding remarks that, there is a need to generate a test environment to test latest web technology designed web application and exercise each of them. New testing issues can arise for testing web services for improving effectiveness and efficiency of web.

**According to Abufardeh, S.** Computer Sci. Dept., North Dakota State Univ., Fargo, ND, USA (25-27 Aug. 2009) in their paper titled “Software Internationalization: Testing methods for Bidirectional software “published in INC, IMS and IDC, 2009. NCM '09. Fifth International Joint Conference says, we propose testing methods that can be used to test critical aspects of bi-directional software in general and specifically Arabic software. These testing methods are discussed in the context of the Dynamic Systems Development Methodology (DSDM) process lifecycle that integrate internationalization and localization processes into the software lifecycle.

**According to Di Lucca Giuseppe A., Fasolino A.R** (April-June 2006) in paper titled “Testing Web-based applications: The state of the art and future trends “published in Science Direct says, the focus is mainly on testing the functionality of a Web-based application, even if some discussion about the testing of non-functional requirements is provided too in his paper.

**According to Arie van Deursen and Ali Mesbah** (Report TUD-SERG-2009-032) in paper titled “Research Issues in the Automated Testing of Ajax Applications” published in Delft University of Technology Software Engineering Research Group Technica Report Series says, As more and more applications are moved to the web, Ajax technology plays an increasingly important role in our society. Unfortunately, the state-based, asynchronous nature of Ajax in combination with the limited possibilities for static analysis of rich Internet applications, pose an increasing threat to dependability.

One way to deal with this threat is the use of automated testing. This requires the use of a crawler that can detect and follow clickable elements introduced by client-side logic. Furthermore, it requires the capability of distinguishing correct from incorrect executions, for which we propose to rely on invariants expressed over the browser’s Document Object Model. While this approach has proven successful in various case studies, a number of questions remain, related in particular to the scalability of the approach. In order to address these concerns, in this paper Researcher have surveyed a number of research directions and areas of future research, in which techniques from traditional testing are made to work with the specific constraints and opportunities imposed by Ajax applications.

**According to Grindal Mats, Offutt Jeff, Andler Sten F.**( July 2004) in their paper titled “Combination Testing Strategies: A Survey” published in *GMU Technical Report ISE-TR-04-05* says Combination strategies are test-case selection methods where test cases are identified by combining values of the different test object input parameters based on some combinatorial strategy. This survey presents 15 different combination strategies and covers more than 30 papers that focus on one or several combination strategies.

**According to Barber Scott** (July 2000) in their paper titled “How Fast Does a Website Need To Be” published in PerfTestPlus says, why a blanket response time standard is not the best answer in terms of design criteria and explores the critical items that need to be considered in determining appropriate response time goals for websites.

**According to Stout Glenn A. (August, 2001)** Senior Functional Specialist The Revere Group in his paper titled “Testing a Website: Best Practices “.It discuss best practices for testing a web application, and how the System Development Lifecycle (SDLC) benefits from using these best practices.

**According to Linglingay Padolina** in his paper titled “Web testing “written for the the course EDC385G: Interactive Multimedia Design & Production at the University of Texas. Austin. Says, How important is it to test your website before going live? Site testing is essential so that every aspect of your website is functioning, especially software Site testing ensures that there are no broken links, no missing graphics, no misspelled words, no bugs in the software, and that download time is as specified.

**According to Yalla Prasanth, Dr. Reddy L S S, Srinivas M.** (September 2011) in their paper titled “Framework for Testing Web Applications using Selenium Testing tool with respect to Integration Testing “published in IJCST Vol. 2, says, The web application testing is more complicated as it involves different testing strategies and tools, because the tool has to support different characteristic properties and also different frameworks. The main objective of this paper is to propose a framework that integrates or supports the architectural elements that have been already compared with respect to integration testing and finally doing the same by using the testing tools like QTP, Win runner and Load Runner.

**According to Shivangi Kaushal,Jagpuneet Kaur Bajwa**(Volume 2, Issue 10, October 2012) in paper titled “Analytical Review of User Perceived Testing Techniques “published in International Journal of Advanced Research in Computer Science and Software Engineering (ISSN: 2277 128X ) says, An overview of the existing testing techniques is provided. Existing web applications have undergone performance testing to check the quality of services of the web based application. But in this paper researcher have reviewed functional and stress testing with respect to user’s requirements of web based applications. Functional and Stress testing is still a raw area of research as can be seen with problems that exist in web applications load time and response time. There is a need to test applications that can estimate load time so that web application’s crashes could be avoided in future.

**According to Vahid Garousi, Ali Mesbah, Aysu Betin-Can, Shabnam Mirshokraie** in paper titled “A Systematic Mapping Study of Web Application Testing” says, The web has proven to be a powerful medium for delivering software services over the Internet. Due to its inherent distributed complexity and dynamism, testing is known to be a challenge for web developers. That is why many researchers have worked in this domain from the early days of the web. In this paper, researcher presents a first systematic mapping of the papers in the area of web application functional testing, published between 2000–2011. Our initial search retrieved 147 papers of which 79 were included in this study using a selection strategy. We incrementally derived a classification scheme by analyzing the included papers and used that scheme to conduct the mapping. In addition, we present a first bibliometrics analysis of the domain to gain an understanding of the publication trend per year, citations, active researchers and venues in the area. Our study indicates that web testing is an active area of research with an increasing number of publications. Our mapping shows the state-of-the-art in web application testing, areas that have been covered and techniques and tools that have been proposed. It provides a guideline to assist researchers in planning future work by spotting research areas that need more attention. For instance, areas that need additional investigation for web application testing include automated oracle generation, mutation testing, concolic testing, testing asynchronous client/server interactions, coverage metrics (e.g., state coverage and code coverage), test support for server-side languages such as Ruby and Python, and client-side DOM and CSS. As future work, based on this study, researcher intend to conduct a systematic literature review of the field to analyze the existing evidence.

**According to Samad Paydar, Mohsen Kahani** *Computer Engineering Department, Ferdowsi University of Mashhad* in their paper titled “Ontology-Based Web Application Testing” says, researcher first presented a brief survey current works that have used ontology in the software testing process. Then, the possible applications of using ontologies in web application testing were investigated. It can be concluded that the full potential of using ontologies for web application testing has yet to be explored and it is an open area for research and innovation to develop intelligent methods and

procedures for maximize the automation of different activities involved in software testing process.

**According to Charu Babbar, Neha Bajpai** *Centre for Development of Advanced Computing ,Noida Centre for Development of Advanced Computing ,Noida in their paper titled "Website Performance Analysis Based on Component Load Testing: A Review" Says*, -Developers typically measure a Web application's quality of service in terms of response time, throughput, and availability. Poor QoS translates into frustrated customers, which can lead to bad opportunities. One way to assess IT infrastructure performance is through load testing, which assess how the website supports its expected workload by running specified set of scripts that emulate behavior at different load levels. This paper addresses the website performance analysis based on component load testing with different QoS measures.

**According to By Brad C. Johnson** (September 2008) in paper titled "Evaluating the safety of your Web presence Web Application Testing "published in ISSA Journal says, Today, almost every organization provides some information or service over the Internet. The Internet is an inherently hostile environment as you have no control over who is using it or what their intentions are. The prudent thing to do is to understand what risks your Web presence introduces and ensure that your web servers are properly hardened, your web applications are properly designed and implemented, and that you have compensating controls in place to address any residual risks.

In this article researcher mentioned four different areas that should be assessed to reduce risk and we spent most of our time talking about one area in particular: Have we tried to Break into our own Web application like a hacker would? Web application testing should always be performed before any new application is released or if it has undergone major changes and this testing should also be done periodically to ensure that new risks have not crept into the production environment.

From the review of related Literature given above researcher can infer that the study conducted so far in the field of web application testing, have covered many different aspects, however less attempts have been made so far to study challenges & problems of testing web based application by testing team of various software companies.& also what are the different factors that software testing team should consider to get

sufficient test coverage before application goes online. The need for the present study is further evident from the fact that demand for web application development is increasing, and clients are showing more interest in web based applications. Hence in the present study an attempt has been made to study the challenges & problems in testing of web based application by software testing teams in Pune city software companies.