



INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

REVIEW ON WEB ENGINEERING

G. N. DUDHAT, PROF.K.G.BAGDE

1. M.E. 1st Year(CSIT), H.V.P.M College of Engineering, Amravati.
2. M.E., M.Phil (CS), H.V.P.M College of Engineering, Amravati.

Accepted Date: 27/02/2014 ; Published Date: 01/05/2014

Abstract: Web Engineering is the application of systematic, disciplined and quantifiable approaches to development, operation, and maintenance of Web-based applications. It is both a pro-active approach and a growing collection of theoretical and empirical research in Web application development. The most significant research disciplines for Web Engineering are Network Engineering, Software Engineering, Databases and Storage Systems, and Hypermedia. Important aspects of these disciplines are distilled into key knowledge areas for Web Engineering. . This paper gives an introductory overview on Web Engineering. It presents the principles and roles of Web Engineering, assesses the similarities and differences between development of traditional software and Web-based systems, identifies key Web engineering activities and reviews some of the ongoing work in this area. It also highlights the prospects of Web engineering and the areas that need further study.

Keywords: Web engineering, Web-based system development, Web design, Web development, Web life cycle

Corresponding Author: MS. G. N. DUDHAT



PAPER-QR CODE

Access Online On:

www.ijpret.com

How to Cite This Article:

GN Dudhat, IJPRET, 2014; Volume 2 (9): 588-593

INTRODUCTION

Web Engineering is the application of systematic, disciplined and quantifiable approaches to development, operation, and maintenance of Web-based applications¹. It is a response to the early, chaotic development of Web sites and applications as well as recognition of a divide between Web developers and conventional software developers. Viewed broadly; Web Engineering is both a conscious and pro-active approach and a growing collection of theoretical and empirical research. The need for Web Engineering is felt (or dismissed) according to perceptions of the developers and managers, their experiences in creating applications made feasible by the new technologies, and the complexity of Web applications. In the span of a decade, the Web has created billions of dollars of wealth, transformed entire industries, and entered the mass culture. It has created new expectations on ease of access, freshness, and relevance of information accessed via the Internet from commercial, governmental, and academic Web sites. Meeting these growing expectations requires the construction of large-scale Web applications, in turn fuelling the demand for engineers who have the necessary skills and background. As the Web continues to be employed across multiple domains, there is a demand for technical personnel that have a strong theoretical background in Web Engineering. Since the Web is a new technology, many people involved in Web Engineering have only a portion of the desired theoretical background. This is a contributing factor for the current problems with Web-based systems development, which has been characterized as frequently being ad-hoc, and lacking "rigor, a systematic approach, and quality control and assurance." [3] While the collapse of the speculative .com bubble has created an oversupply of people with Web Engineering experience, this is a temporary phenomenon. The Web is a relatively new technology, still in the beginning phases of a long period of adoption. As Web technology continues to diffuse into myriad mission-critical functions, there will be a steady and growing need for Web Engineers, and for educational programs tailored to develop skills needed by Web Engineers. These programs will satisfy the demand for trained engineers, as well as raise the state of the practice in Web Engineering. The growth of the Internet, Intranets, Extranets, and the World Wide Web has already had a significant impact on business, commerce, industry, banking and finance, education, government and entertainment sectors, and our personal and working life. Many legacy information and database systems are being migrated to the Internet and the Web environments. Electronic commerce through the Internet is rapidly growing, cutting across national boundaries. A wide range of new, complex distributed applications is emerging in the Web environment. The popularity and ubiquity stems from the nature of the Web itself and its features: it provides an information representation that supports interlinking

of all kinds of content, easy access for end users, and easy content creation using widely available tools.

In the absence of disciplined process for developing Web-based systems, we may face serious problems in their successful development, deployment, operation of and 'maintenance.' Poorly developed Web-based applications that are mushrooming now have a high probability of failure. Worse, as Web-based systems grow more complex, a failure in one can and will propagate broad-based problems across many. When this happens, confidence in the Web may be shaken irreparably, causing a Web crisis [1]. The potential Web crisis could be more serious and widespread than the software crisis, which the software developers have been facing [2]

In the early stages of Web development, White¹⁰ and Powell¹¹ identified and emphasized the need for engineering as in Web Document Engineering and Web Site Engineering. Web Engineering, more generally, explicitly recognizes the fact that good Web development requires multidisciplinary efforts and does not fit neatly into any of the existing disciplines

MATERIAL AND METHODS:

Web applications handle information in its myriad forms (text, graphics, video, audio). Information sciences, multimedia, hypermedia and graphic design deal with structuring, processing, storing and presenting this information. Human-computer Interaction (HCI) and requirements engineering are essential to understand users and their requirements. Network management, general computing and simulation and modeling are required to deliver the information and desired functionality with an acceptable performance level. Software engineering, including new development methodologies, is *Web engineering* essential for project and process management. Since information is very often published for worldwide access, publishing paradigm, and legal, social and ethical issues have to be taken on board. Consequently, good Web development must utilize relevant parts of all these disciplines and not be dominated by narrow viewpoints. Web Engineering is a response in recognition of this multidisciplinary nature of Web applications. Interestingly, the ACM Computing Curricula 2001 formulates its first principle with a similar statement by stating that "Computing ... extends well beyond the boundaries of computer science"²⁰. However, their recommendations cover the entire computing area whereas Web Engineering concentrates on Web development.

Web Engineering: A Multidisciplinary

Field Web-based systems "involve a mixture between print publishing and software development, between marketing and computing, between internal communications and external relations, and between art and technology."

In view of the nature of the Web and Web-based applications, Web engineering is bound to be a multidisciplinary field, with encompassing inputs from diverse areas such as human-computer interaction, user interface, systems analysis and design, software engineering, requirements engineering, hypermedia engineering, information structures, testing, modeling and simulation and project management, as well as social sciences, arts and graphic design.

Web Engineering Activities

Web Engineering is not a single activity or task. It deals with all aspects of Web-based system development, starting from conception and development to implementation, performance evaluation, and continual maintenance

WEB-BASED SYSTEMS DEVELOPMENT

Web Development Process Models

To help to reduce the difficulty in building Web-based systems we need a process model that describe the phases of Web-based system development - some of the aspects that make Web-system difficult include complexity, changeability, invisibility and unrealistic schedule . A process model should help developers "to address the complexities of Web-based systems, minimize risks of development, deal with likelihood of change, and deliver the site quickly, while providing feedback for management as the project goes along [1] Further, the progress of Web-based development should be monitorable and trackable. The process besides being easy to apply should facilitate continual update/refinement and evolution, based on feedback from users/clients. For information some of the hypermedia/Web development process models . An object-oriented model for the Web application development process, which uses XML technology to support modularity and reuse of Web document, is described in [3].

Analysis and Web Design

Requirement analysis and Web-based system design is a very important activity and calls for a systematic and disciplined approach. Some of the approaches and design considerations.

Testing of Web-Based Systems

Testing, and verification and validation (V & V) of Web-based systems is an important and challenging task in the Web engineering process. And, yet very little attention is given by Web developers to testing and evaluation. Web- based system testing differs from conventional software testing and poses new challenges. Web-based systems need to be tested not only to check and verify whether it does what it is designed to do but also to evaluate how well it

appears on (different) Web browsers. Importantly, they need to be tested for security and also for usability, from the ultimate user's perspective. However, the unpredictability of the Internet and Web medium makes testing Web 6 based systems difficulty. Currently, not much attention is given to Web-based system testing by developers. Also we need to develop new approaches and techniques for testing and evaluation of complex Web-based systems.

Management of Large Web Sites

Management of large Web sites is a difficult task, especially in the midst of change which is a fact of life in the Web environment.

Web Configuration Management. Web-based systems undergo changes, perhaps more often and quite extensively, in their development and operational period. The changes called for may include trivial to large-scale change of information/data and major modification to requirements, and also may vary in their significance. These changes need to be handled in a rational, controlled manner. Web configuration management (WCM) encompasses a set of activities for controlling and facilitating change: identification, version control, change control, auditing and reporting. It also provides a framework for handling change in a rational, controlled manner. It could adopt commonly practiced software configuration management (SCM) concepts, principles and approaches to the Web environment.

Barriers to Web Technology Adoption Three levels of adoption of Web technology: information access, work collaboration, and core business transaction. They also identify three key areas of potential knowledge barriers to Web technology adoption: technology-related knowledge barriers, project related knowledge barriers, application related knowledge barriers.

CONCLUSION

Web Engineering deals with the process of developing, deploying and maintaining Web applications. The main themes of Web Engineering encompass how to successfully manage the diversity and complexity of Web applications development, and, hence, to avoid potential failures that may have serious implications. It is a pro-active approach and at this stage a collection of a body of work. The need for Web Engineering is strong. The task before the Web developers and researchers is to create a robust and tested body of work that can be recommended to suit the specifics of Web applications and environments.

REFERENCES

1. Zelnick, N., Nifty Technology and Nonconformance: The Web in Crisis, *Computer*, October 1998, pp 115 –116 and 119.

2. Pressman, R.S., Can Internet-Based Applications be engineered? *IEEE Software*, September/October 2010

3. *IEEE Internet Computing*, Special issue on Web Usability, Mar-Apr 2012

4. *IEEE Internet Computing*, Special issue on Web Usability, Mar-Apr 2011

4. Goeschka, K.M. and Shrank, M.W. (2010) Client and Legacy Integration in Object-Oriented Web Engineering, *IEEE Multimedia*, Special issues on Web Engineering, vol 8, no 1, pp 32-4