Effort Estimation in Early stages of Web Application Development

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Abstract: **Effort Estimation is process of estimating the development effort of web application. A cornerstone of Web project management is sound resource estimation. Resources are factors, such as cost, effort, quality, problem size, that have bearing on a project's outcome. Unfortunately, most Web development projects suffer from unrealistic project schedules, leading to applications that are rarely developed on time and within budget. Effort estimation consist in predict how many hours of work and how many workers are to develop a project. Estimation the project has not yet been solved and even the project manager has to deal with it since the beginning. Thus we need effective effort estimation techniques so that we can deal with these issues and develop web applications within budget and time meeting user requirements. Although estimating the effort required in developing web applications is a difficult task, accurate estimates of development effort have an important role to play in the successful management of web development projects. This paper is a review about web effort estimation methods and attributes from the other earlier researchers.**

Keywords: Web Applications, effort estimation, machine learning techniques.

I. INTRODUCTION

A. Introduction To Web Applications

Originally, Web was used by few scientists for sharing scientific information. But now, many of us rely on Web-based applications. A *web application* is defined as a software application that uses websites as a front end and back end provides full user functionality so that the user can affect the status of the business logic on the web server. The number of websites on internet is over one billion and is still increasing every year. But most of the web projects are not finished within time and budget by the Web developers. A survey on Web-based projects, published by the Cutter Consortium in 2000, revealed a number of problems with large outsourced Web-based projects (E. Mendes & Mosley, 2008):

- 84% of surveyed delivered projects did not meet business needs
- 53% of surveyed delivered projects did not provide the required functionality
- 79% of surveyed projects presented schedule delays
- 63% of surveyed projects exceeded their budget

B. Introduction to Web Effort Estimation

Effort estimation consists in predict how many hours of work and how many workers are needed to develop a project (M.J. Moayed, A. Ghani, 2007). Effort estimates help project managers allocate resources, control costs and schedule and improve current practices, leading to projects finished on time and within budget. Having realistic estimates of the required effort early in a Web application's life cycle lets project managers manage resources effectively (Emilia Mendes, Counsell, & Mosley, 2001). Numerous organizations world-wide are developing thousands of commercial and educational Web applications. However, there are no standardized development techniques or large datasets of historical data on Web development projects. For Web development, cost or effort is difficult to estimate because (Emilia Mendes, Mosley, & Counsell, 2005):

- There is no standard to sizing Web applications. Each can be created using diverse technologies such as several forms of Java, HTML, XML, and so on.
- People involved in Web development are represented by less experienced programmers (Reifer, 2002).
- Web project's primary goal is to bring quality applications to market as quickly as possible.
- Web development processes differ from traditional approaches (Reifer, 2002).

In the field of software development, effort estimation for conventional software projects, a number of methods have been developed, tested, and successfully implemented. But developing Web applications is different from conventional software projects. Three different methods: *Expert Judgement, Algorithmic Models and Machinelearning*, are used to estimate the effort required to complete web application projects. Most of the Web developers use previous similar project experiences or expert judgement for effort estimate. Examples of

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