Chapter 113
Software Process Improvement for Web-Based Projects Comparative View

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ABSTRACT

Software process improvement has been the main target of many web application development organizations. Despite the importance of software process improvement, there is enough evidence that the majority of web-based software organizations are reluctant to adapt existing software process improvement models and standards as they perceive them as being oriented towards traditional software organizations. It has been observed that improvement efforts web-based software development organizations based on process improvement frameworks which are designed for traditional software organizations fail most of the time. This chapter attempts to make a review of different software process improvement models and check the suitability of these models to meet the special characteristics and requirements for the web-based projects. The findings of this study can be helpful for the web-based software development organizations in assessing and improving software processes.

INTRODUCTION

In the last two decades, there have been a significant increase on the expectations and demand of Web-based application due to the influence of the World Wide Web on our modern economy (Pressman, 2004). At the same time, the development, deployment and maintenance processes of the web-based systems which have become more and more complex and difficult to manage, have not progressed at a sufficient rate to meet these demand and expectations (Cardoso, 2007).

Many developers of web-based projects do not take into concern the unique requirements and characteristics of Web applications. They fail to realize that characteristics and requirements of web-based systems considerably different from that of traditional software, and so does their development (Alrifai, 2008). Hence, many developers conduct web applications in an ad hoc manner, and fail to adopt sound design methodologies, resulting in poor quality web systems and applications. A survey by the Cutter Consortium (2006) shows that failure to meet business needs (84%), project schedule delays (79%), and

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budget overruns (63%), lack of functionality (53%) and poor quality of deliverables (52%) are the main problems cited by the stakeholders of such applications.

In finding solutions to the problems of web-based application development, there has been an increasing pressure on the Web-based application industry. The search for solutions to improve Web-based software development has continued for many years and Web-based applications organizations are now realizing that one of their fundamental problems is the inability to effectively manage the Web-based applications development process (Sulayman & Mendes, 2011). Software Process Improvement (SPI) has been recognized as an efficient and effective way for organizations to improve their quality of the software they develop and the productivity with which they work with. For this, SPI is an essential tool for improving Web-based applications development process (Sulayman & Mendes, 2011).

Process improvement in Web-based software projects is of growing concern for many reasons such as reducing cost and time, producing high quality software, and improving productivity (Smite et al., 2011). Despite the importance of SPI implementation, there is evidence that the vast majority of Web-based software development organizations are reluctant to adapt SPI models and standard because of their complexity (Abdel-Hamid & Abdel-Kader, 2011). It has been detected that improvement efforts in Web-based software projects based on process improvement frameworks which are designed for traditional software projects fails most of the time (Sulayman & Mendes, 2011).

In the absence of theoretical or empirical work examining the suitability of the traditional SPI standards and models for Web-based projects development, we believe that it is important to examine the suitability of the existing SPI standards and models for Web-based projects development process. The motivation for this study was to fill the gaps in the field of software process improvement. The main contributions of this study are:

1. Examine the suitability of the existing software process improvement models and standards for Web-based projects.
2. Increasing awareness on the importance of software process improvement in Web-based projects.

We believe that achieving these goals will lead to enrich the SPI in Web-based projects with new properties that leads to enhance the SPI projects implementation.

BACKGROUND ON WEB-BASED SOFTWARE DEVELOPMENT

There is a relatively small but a rising research on the differences between the Web-based applications and traditional software development. In general, this literature shows that the Web-based applications have certain unique inherent characteristics that make Web-based development considerably different and possibly more difficult comparing with software development (Rousan et al., 2014). The Web-based application characteristics which are usually built in shorter time-frames, serving as direct interface to various stakeholders, should meet a broad set of requirements and more than often serve a specific group of users. They are usually built from template solutions, by using coarse-grained authoring tools, which were developed by a multidisciplinary team (Ginige, 2002). These characteristics constitute the reasons why many concepts, methods, techniques, and tools of traditional software development are either insufficient to meet the needs of Web-based applications or have to be modified in order to do so (Pressman, 2004). Thus, Web-based project developers must have a reasonable understanding of the characteristics of Web-based project development and how these may affect the outcome of the project.