Abstract

Web-based application development represents some unique challenges to the developers. There is a growing need for better development methodologies. The traditional system development methods for non-Web applications can still be effective, but need to be adapted and enriched in the new development environment. This chapter discusses the challenges and proposes a Modified Prototyping Method (MPM) for Web application development. MPM views Web applications as organic systems that are continually adapting to their environments. MPM places more emphasis on architectural decision for system scalability and proactive system maintenance. It suggests not only a process but also a set of design techniques at each stage. The method provides a balanced view of technology and management requirements in the Web application development process.
Introduction

Web technology is transforming the way organizations conduct business and communicate with constituent groups. For application developers, Web technology represents a new world of software engineering with new techniques, new tools, and new design and deployment environment. The technology enables organizations to deliver Web applications easily and quickly and provides more efficient methods to do maintenance. As a result, organizations are more responsive to user needs and quicker to customize applications for specific users.

However, Web application development presents unique challenges to the developers. Among these challenges are usability design, content maintenance, high scalability, high security requirement, and increasing demand for fast system deployment by customers. In addition, the developers are faced with competing system architectures, platforms, and tools, most of which are still evolving.

Web application development lacks standards and structured methodologies. For many developers, building Web applications is a “mad science” (Callaway, 1997). The most common approach is “implement, test, and release.” The resulting systems are often of low usability and very difficult to maintain (Powell, Jones, & Cutts, 1998; Nielsen, 2000; Nielsen & Tahir, 2002). Many organizations simply ignore the issue of software development processes altogether and depend on the talent, skills, and motivation of the development team (Yourdon, 2002). According to a study on the adoption of system development methodologies (Fitzgerald, 1998), 60 percent of the respondents reported not using any methodologies. Seventy-nine percent of those not using a methodology indicated that they did not intend to adopt one.

For simple projects of sufficient short duration and with experienced developers, not following a formal methodology may not be a problem. But for large projects of long duration and requiring more than one level of supervision, a methodology is highly recommended if organizations want to avoid anarchy within Web development teams (Yourdon, 2002).

This chapter discusses Web-based business applications and development methodologies. A Modified Prototype Method (MPM) for Web application development is presented. Among the major topics covered are Web applications components, the challenges facing Web application developers, client-side and server-side technologies, Web application architectures, Web design techniques, and comparisons between MPM and other similar methodologies. The chapter concludes with a summary and discussion on the advantages and disadvantages of deploying Web applications.

Web Applications

In recent literature, a Web application is defined as any application program that runs on the Internet or corporate intranets and extranets. The user of a Web application uses
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