ABSTRACT

This chapter addresses issues, alternatives, and best practices for prototyping in Web development. The chapter’s primary objective is to provide a clear and concise overview of key concepts and best practices for practitioners and students, as well as other audiences. The chapter focuses on graphical user interface (UI) prototyping for Web development, but many of the principles apply to non-UI prototyping and other sorts of software development. First, we introduce and motivate the chapter, and review the major objectives, benefits and risks, and classifications of prototypes. Second, we describe the major approaches to prototyping. Finally, we conclude with future trends and a summary of best practices.

Introduction

In software development, prototyping is the process of creating a preliminary version for evaluation, before investing more resources. The prototyping process can be divided into four key steps (see Figure 1); Floyd (1984) uses similar steps, but different terminology. First, we prioritize the objectives and scope of the prototype, so we can focus on critical aspects of the prototype, and avoid aspects that are not immediately relevant. This is discussed in the section titled “Objectives and Scope of Prototyping.” Second, we create the prototype, which typically is much easier than constructing the final system. A set of approaches is described in the section titled...
"Creating Prototypes." Third, we review the prototype to understand what works well, what could be improved, and what new issues have been identified. Several evaluation methods are described in the section titled “Reviewing and Reacting.” Fourth, we react to the prototype and determine what to do next. In some cases there may be nothing more to learn from the prototype, and it can be discarded, or archived for future reference. More often, the evaluation will lead to more iterations through these four key steps.

This chapter provides a concise overview of key concepts and best practices for practitioners and students, as well as other audiences. The chapter focuses on graphical user interface (UI) prototyping for Web development, but many of the principles apply to non-UI prototyping. Similarly, prototyping issues and approaches apply to many sorts of software development, but the chapter emphasizes Web applications, based on a variety of Web development projects the authors have been involved with in the last ten years. We provide a multidisciplinary perspective, since effective prototyping involves a variety of disciplines, including business, psychology, and software engineering. The chapter also draws on our experiences developing a tool to help design, simulate, document, and review prototypes for Web applications and other software systems.

**BACKGROUND**

In this chapter, “development team” is the group of analysts, designers, software developers, and other people responsible for building a Web-based application, or “system,” which may be divided into numerous “components.” “Stakeholders” are other people or organizations with a significant interest in the project, including upper management, other business functions such as sales, and (of course) the intended end users of the system.

Web development, like other software development, involves a wide variety of activities. These activities can be grouped into four broad categories that span the system’s life cycle. First, the team must analyze the problem to understand users, their needs, important tasks, and other relevant requirements. Second, the team must design the system or component to fulfill these requirements. Third, the team must build the system or components; this includes activities such as coding, integration, and testing. Finally,
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