Chapter X

OODM: An Object-Oriented Design Methodology for Development of Web Applications

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ABSTRACT

Today, the Internet and the Web are the most amazingly and dynamically growing computer technologies. The number of users accessing the Web is growing exponentially all over the world. The Web has become a popular environment for new generation of interactive computer applications called Web (or hypermedia) application. The Web applications (WAs) have special characteristics that have made them different from other traditional applications. Hence, many design methodologies for the development of WAs have been proposed. However, most of these methodologies concentrate on the design aspects of applications, and they often do not strictly follow any software development life-cycle model such as the WaterFall software development life-cycle model. In this chapter, we propose an object-oriented design methodology for the development of WAs. The main features of this proposed methodology are...
that it follows WaterFall model and captures the operations in objects of the applications; thus making the methodology an object-oriented methodology.

INTRODUCTION

Today, the Internet and the Web are the most amazingly and dynamically growing computer technologies. The number of users accessing the Web is growing exponentially all over the world. The Web has become a popular environment for a new generation of interactive computer applications called Web (or hypermedia applications) to be widely used worldwide (Herman & Reynolds, 1994; Rumbaugh et al., 1991; Shah, 2001). The Web applications (WAs) have special characteristics that made them different from other traditional applications (Balasubramaniam, Isakowitz, & Stohr, 1994; Balasubramanian & Turoff, 1995; Fernandes, 1991; Garzotto, Paolini, & Schwabe, 1991; Garzotto, Mainetti, Paolini, & Milano, 1993; Herman & Reynolds, 1994; Isakowitz, Stohr, & Balasubramanian, 1995; Rumbaugh et al., 1991; Yourdon, 1996). Traditional development methods such as structural analysis and design techniques (SADT) and object-oriented development methods (OODM) are incapable of analyzing, designing, implementing, and testing WAs (Cho et al., 1997; Fernandes, 1991; Herman & Reynolds, 1994; Isakowitz, Stohr, & Balasubramanian, 1995; Schwabe & Rossi, 1995; Shah, 2001; Walker, 1992). Development of WAs is not a trivial task. Note that we use the terms hypermedia application (HA) and Web application (WA) synonymously. These WAs consist of a large number of interlinked pages that need to be developed in a systematic way, and this need has been realized and has become one of the major topics of important conferences and meetings in this area. Hence, many hypermedia design methodologies such as hypermedia design model (HDM), relationship management methodology (RMM), object-oriented hypermedia design model (OOHDM), an object-oriented design method for hypermedia information systems (OODMHIS), and many more have appeared in the literature (Fernandes, 1991; Herman & Reynolds, 1994; Isakowitz, Stohr, & Balasubramanian, 1995; Schwabe & Rossi, 1995).

However, most of the existing hypermedia design methodologies suffer from the following problems and deficiencies:

• The methodologies do not explicitly follow phases of any software development life-cycle model such as WaterFall model (Somerville, 2001; Pressman, 1992), and their main emphasis and focus are on the design aspects during development of the applications. It means that the methodologies mainly use the processing guidelines of design phase of WaterFall model.
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