Chapter 3
Software Development Methodologies for Traditional Web Applications and RIAs

ABSTRACT
Chapter 3 presents a review of the state-of-the-art on methodologies for RIAs development. For this purpose, methodologies for traditional Web applications development are firstly presented, since, in some cases, methodologies for RIAs development are either extensions of existing Web (and hypermedia) methodologies or new UI design methods used on top of already existing Web methodologies. New approaches covering the RIAs features without relying on legacy Web models are also discussed. Some examples of Web development are UWE (UML-Based Web Engineering), which became UWE-R (UWE for RIAs), and WebML Extension, which is an extension of WebML (Web Modeling Language). These methodologies had to be modified in order to add new features to support the needs of RIAs development. Some other methodologies for RIAs development are RUX Method, OOH4RIA, OOHDM Extension, and PPRD.

1. INTRODUCTION
Software Engineering is the study and application of engineering to the design, development, and maintenance of software. The main issues of Software Engineering are design patterns, architectural styles, and software development methodologies. Hence, the importance of studying the different software development methodologies proposed in the literature for traditional Web applications and RIAs. According to the Oxford dictionary a methodology is “a system of methods used in a special area of study or activity” and in this case it is about software development.

In the one hand, there are software development methodologies for traditional software development such as RUP (Rational Unified Process), Scrum and XP (eXtreme Programming). In the other hand, there are also software development methodologies for Web development such as UWE (UML-based web engineering), WebML (Web Modeling Language) and OOHDM (Object-Oriented Hypermedia Design Method), among others. However, the aforementioned software de-
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Development methodologies for Web development do not consider the RIAs (Rich Internet Applications) features, i.e., they do not cover the development aspects of this application kind as they are only used on traditional Web applications, omitting aspects of RIAs. Preciado et al. (Preciado et al., 2005) discussed about the quantity and type of software development methodologies and tools that have been proposed for the design and development of Web applications. However, traditional Web applications continue to be insufficient to support the interaction and presentation of the features demanded by the user. Recently, RIAs provided a solution to these problems as they provide new levels of interactivity and presentation. The use of RIAs is exponentially growing; however there is a serious problem: lack of complete software development methodologies for this type of application. Preciado et al. (Preciado et al., 2005) described the main characteristics needed to model RIAs and an assessment process was proposed in order to obtain a suitable methodology to be able for achieving this goal. This process was used to evaluate how suitable some of the existing methodologies are and to demonstrate that each one has very few RIA characteristics. From this perspective, a new methodology is necessary or an extension of an existing one. Preciado et al. (Preciado et al., 2005) determined that none of the methodologies in these areas were suitable for modeling RIAs. RIAs offer new multimedia and interactivity features. Preciado et al. (Preciado et al., 2005) discussed that multimedia as much as hypermedia constitutes fields that are required to help in the identification of new software development methodologies for RIAs. RIAs have been of great importance on web development over the last few years. For this reason, diverse studies have proposed new development methodologies and/or extensions of existing methodologies for RIAs development.

In this chapter, a set of application development methodologies is presented. These methodologies are divided into two main groups, the first group is a set of methodologies used for traditional Web applications, and at the second group the methodologies for RIAs development are presented. In this second group is easy to identify that most methodologies are extensions of methodologies used in traditional Web applications to which had to make adjustments for supporting features of RIAs.

2. SOFTWARE DEVELOPMENT METHODOLOGIES FOR TRADITIONAL WEB APPLICATIONS

Firstly, the traditional methodologies for Web development are presented since they were the pioneers for the creation of new methodologies or extensions of existing methodologies to meet the needs for RIA development. Escalona and Koch (Escalona & Koch, 2004) carried out a review of methodologies for Web development, an improved extension of this review is presented below.

2.1. WSDM: Web Site Design Method

WSDM is a user-centered approach for the development of Web sites that models the application based on the information requirements of the users’ groups (Detryer & Leune, 1998). The development process is divided into four phases. WSDM phases are presented in Figure 1 and they are described below:

- **User modeling**, where users are classified and grouped in order to study system requirements according to each user group,
- **Conceptual design**, where a UML class diagram is designed to represent the static model of the system and a navigational model is designed to represent the possibilities of navigation,
- **Implementation design**, where models of the conceptual design are easily translated into an abstract language to be understood by the computer, and
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