Chapter VIII

Web Service Modeling Framework for the Enhanced Data Warehouse

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ABSTRACT

This chapter presents how Web services architecture can be leveraged to extend an existing system to an open and flexible platform. It reviews crucial issues related to modularization, properties of the Web services, integration of heterogeneous services and incorporating new services. We describe the modeling framework used, which is the Web Service Modeling Framework (WSMF). As a case we show how the enhanced data warehouse system was remodeled in order to transform it from a closed solution to an open Webservices-based system called the enhanced Knowledge

Warehouse (eKW). We analyze eKW as a Web service and show how eKW conforms to the eight layers of functionality in Web services. We also speculate about the future of eKW in the semantic web and innovations it can contribute to knowledge management. In the semantic Web eDW should be used as a source of knowledge, hence the name "knowledge warehouse".

Introduction

Until now the Web has focused on publishing information that is readable primarily by humans. However, recently more and more attention has been paid to processing information automatically by computers. To achieve this goal, sophisticated systems are designed. They use various techniques of artificial intelligence, for example, shallow text processing (Neumann & Piskorski, 2002).

Tim Berners-Lee suggested another solution – to create the Web so that it can be easily processable by machines. Such a Web is called the *semantic Web* (Berners-Lee, Hendler & Lasilla, 2001).

Another issue is making a computer application accessible through the Web. The ultimate vision is that of the Web as a distributed computation device.

According to the IBM Web Services Tutorial, "web services are a new breed of web applications. They are self-contained, self-describing, modular applications that can be published, located, and invoked across the Web" (Leymann, 2001).

The idea we extend in this chapter was originally called the *enhanced Data Warehouse* (eDW) (Abramowicz, Kalczynski & Wecel, 2002). As a response to numerous proposals to improve the original concept of data warehousing, (e.g., Gray & Watson, 1998; Nemati et al., 2002), eDW extends the existing enterprise data warehouse with unstructured information filtered from selected sources on the Web. eDW was primarily designed as a closed system; that is, only users of a particular data warehouse could take advantage of this solution. Moreover, eDW was entirely based on internal modules without taking advantage of other systems. According to recently observed trends, we decided to re-engineer the architecture of the eDW system.

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