

Using Web Services for Internal Data Integration

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ABSTRACT

Web services refer to technologies that standardize the communication of applications in order to connect systems, business partners, and customers cost-effectively through the World Wide Web. The use of Web services over the intranet and Internet has been increasing. Web services are used to support application-to-application communication and to address interoperability issue for systems integration projects, especially in the context of electronic commerce and e-business. This paper provides some general concepts of Web services along with description and examples of one particular application area: internal business integration.

INTRODUCTION

Web services use the Web technology to perform application-to-application integration. They help integrate applications at a significantly lower cost than any other integration technology today. These services can be viewed as a new form of middleware that is based on XML (extensible markup language) and the Web technologies, like HTTP (hyper text transport protocol). Both the underlying data format XML and the Web services are platform- and language-independent. Therefore, a Web service can be developed using any language, and can be deployed on any platform, from the small, hand-held devices to the large computers. It can be accessed by any other application, regardless of the language or the platform. Web services simplify the process of making various applications communicate with each other and this would result in lower development cost, faster time to market, easier maintenance, and reduced total cost of ownership.

The range of applications of web services is dependent on the requirements of a business. One of the current areas of application of web services is data integration within a business. As businesses use different environment and platforms in different departments, it has been really difficult for applications to communicate with each other. There is tremendous potential benefit to be realized by integrating business applications at a reasonable cost. Web services allow this integration at a low cost. The business applications of Web services, in general, provide a mechanism of communication between two remote systems, connected through a network. So,

for example, in case of a business merger, companies will not have to invest large amount of financial resources in developing software to bring the systems of the different companies together. By integrating the business applications through Web Services, the information systems of the two distinct companies can be linked together.

WEB SERVICES FOR DATA INTEGRATION

In a typical organization numerous business applications exist that have been developed over time using different models and technologies. This is a common scenario as different technologies and component models are better suited for different applications and platforms. Often these applications are not integrated due to high integration cost and complexities, which could result in the creation of data silos. For example, it may not be possible to share customer data collected by the accounting department and stored in the accounting system with the marketing department because marketing system is not integrated with the accounting system; or it may be extremely difficult and costly to integrate value-chain members' systems to share business data across the value chain because of disparate systems and computing environments used. XML and Web services can be used to alleviate the complexity of integrating fragmented business applications and data, and efficiently integrate business applications and data sources.

According to a survey done by Gartner, Inc., Web services are being used in more than half of the applications integration projects (Cantara, 2003). Although, Web services approach is being used for both internal and business-to-business integration projects, currently it is more often used for internal integration projects (Accenture 2003). Web services can also be used to expose legacy system's functionality and data sources to other existing or new applications. Client applications only see the interface provided by the application. Web services can encapsulate legacy applications and describe an interface that can be used by other applications to interact with it.

One of the major hindrances in widespread use of web services is the security issue. It is necessary to secure Web services, especially those implemented to support inter-organization integration, to prevent misuse by unauthorized users. Basic protocols do not provide the security required for electronic business transactions between business partners. Secure Socket Layer (SSL) may be used for security in Web services. However, SSL is more appropriate for securing a direct single-hop connection between machines. It is not particularly useful when messages have to traverse multiple connections, and most message exchanges between business applications require messages to travel over multiple connections (Curbera, et al., 2002). Use of SSL also degrades Web services' performance in terms of processing and bandwidth requirements (Kobielus, 2003). However, standards-making organizations and vendors are continuing their unified efforts for enhancing Web services in the areas of security, reliability, and interoperability (Peterson 2003).

INTERNAL DATA INTEGRATION THROUGH WEB SERVICES

Allowing access to the corporate data to a company's employees could become a daunting task, especially, if the data should be accessible at anytime and from anywhere. Of course, a simple solution is to make the data available through the web site, however, the data available on the

website is human viewable but can not be manipulated by an application as may be needed by a customer service person. Additionally, sometimes a company might want that the data be available to field staff remotely through various hand-held devices (Fig. 1). In such situations, use of Web services can greatly simplify the process of integration.

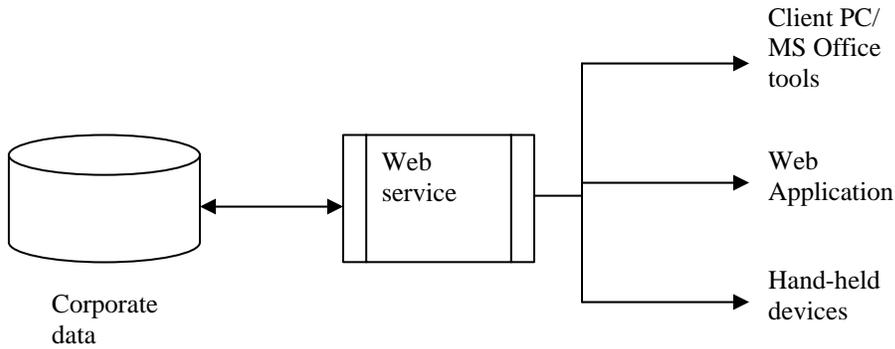


Fig. 1: A Web service for accessing corporate data remotely

As an example, if the data resides on a database server, through a Web service it can be presented on the web or made accessible to a Microsoft Office client (like Excel, Word, InfoPath etc.). Fig. 2 shows potential interactions for receiving required data form corporate database server to Excel client application. In order to develop such a client-side application, a short code or macro is required to process client request and server response.

CONCLUSIONS

This paper presents an overview of Web services and also outlines how these services can be utilized for data sharing and integration for internal business functions. Among the major advantages of Web services are simplicity, cross-platform integration and lower integration cost. Web services are still in infancy and security issues are still unresolved, however these issues are expected to be addressed in near future.

| OrderId | CustomerId | EmployeeId | OrderDate | RequiredDate | ShippedDate | ShipVia | Freight | ShipName | ShipAddress | ShipCity | ShipRegion | PostalCode |
|---------|------------|------------|-----------|--------------|-------------|---------|---------|-------------|----------------|-------------|------------|------------|
| 11077 | RATTC | 1 | 5/6/1998 | 6/3/1998 | 10/8/2003 | 2 | 8.53 | Rattlesnake | 2817 Milton Dr | Albuquerque | NM | 87110 |

Fig. 2: Received the data into Excel spreadsheet

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