

## Chapter 3.7

# Web Services vs. ebXML: An Evaluation of Web Services and ebXML for E-Business Applications

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### ABSTRACT

Web services and ebXML are modern integration technologies that represent the latest developments in the line of middleware technologies and business-related integration paradigms, respectively. In this chapter, we discuss relevant aspects of the two technologies and compare their capabilities from an e-business point of view.

### INTRODUCTION

For companies operating in an increasingly globalized business environment, e-business means online transactions, automated business collaborations, and system integration. This means not only the provision of products through supply chains, but also the delivery of services and information through networks. The e-business tools and standards come from two domains known as Web

services and e-business XML (ebXML; electronic business using extensible markup language).

Web services are a technology-oriented approach. Its ancestors include CORBA (common object request broker architecture) and other middleware technologies such as TPM (transaction processing monitor) and RPC (remote procedure call). The W3C (World Wide Web Consortium) is a big sponsor of Web-service technologies. Many Web-services standards, such as SOAP (simple object access protocol), WSDL (Web service description language), UDDI (universal description, discovery, and integration), and so forth, are W3C standards or recommendations. Many world-level IT companies currently support Web-service technology. Web services are moving from a middleware solution to a tool of business-process integration (BPI) by adding more functions for business-entity descriptions and business-process management.

In comparison, ebXML is the successor of EDI (electronic data interchange). ebXML is spon-

sored by UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business) and OASIS (Organization for Advancement of Structured Information Standards). It is the latest achievement in a long line of business-integration paradigms that include EDI, ANSI X12 (American National Standards Institute X12; X12 stands for the originator of this standard, the Accredited Standards Committee X12 [ASC X12]), EDIFACT (electronic data interchange for administration, commerce, and transport), EAI (enterprise application integration), XML-EDI, B2Bi (business-to-business integration), and BPI. Compared to Web services, ebXML is more at the executive business level (Alonso, Casati, Kuno, & Machiraju, 2003). Although currently there is a lack of software tools implementing ebXML specifications, existing Web-service software can be modified as an implementation of ebXML specifications through binding.

In this chapter, we discuss relevant aspects of the two technologies and compare their capabilities from an e-business point of view. We see a B2B process as following. Before doing business with someone, a business needs to find its partner. While negotiating with this potential partner, documents and messages must be processed via reliable and secure channels, such as post or courier services. Those documents must be designed in a semantic fashion in forms that both partners understand. In order to ensure smooth business operation, the companies will have to agree upon the processes the resulting transactions are to follow. Ultimately, a contract or trading-partner agreement (TPA) must be signed to establish this new business relationship. Therefore, we compare the two technologies from the above aspects. We point out the capabilities and the limitations of both and discuss trends in the future development of both technologies. This also helps the readers to make right decisions about choosing the specifications and implementation software when facing a new B2B integration project.

## OVERALL FUNCTIONALITY

Both Web services and ebXML put their service entities on a network and have means for service description, service discovery, and service invocation. A Web service adopts a service-oriented architecture (SOA) with three kinds of parties: service providers, service requesters, and service registries (as shown in Figure 1). The service providers register their service descriptions in the service registries for service-discovery purposes. The service requesters search the service registries for services that meet their requirements. The service requesters then can communicate with the service providers directly and use their services. Similar to Web services, ebXML also has a service register to collect the service descriptions. Different from Web services, however, the business partners are not distinguished as service providers or requesters, but are treated as the same role of business partners. The service discovery and invocation are similar to Web services (details in this section). For some people in the ebXML community, ebXML is not an SOA solution. If we consider SOA as a kind of architecture in computing technology, the argument is true that SOA is a solution to software-component reuse, analogous to object-oriented architectures. However, we can expect that the implementation of ebXML should be a kind of SOA that comprises loosely joined, highly interoperable application services. In fact, the current practice shows that ebXML adopts some SOA technology such as SOAP.

In Web services, the interactions among the parties are implemented in a straightforward manner. The communications between any parties use SOAP, which is based on Internet protocols and XML technology. It is exactly SOAP that makes Web services interoperable across the platforms and programming languages. UDDI is the protocol used by a service registry to describe the information of the services. One important piece of information in the business descriptions is the URI (uniform resource indicator) for the WSDL file. WSDL is an XML file describing how the

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