

# Chapter 8.5

## Business Networking with Web Services: Supporting the Full Life Cycle of Business Collaborations

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### **ABSTRACT**

This chapter describes how the latest advances in Web services technology are paving the way toward dynamic B2B integration. It begins by distinguishing between three kinds of life cycles: the operational life cycle, the B2B trading life cycle, and the business networking life cycle. In the past, most B2B integration solutions have been designed to support the operational life cycle by specifying a set of pre-defined B2B conversations. We will show that Web services can be used to settle those conversations at run-time, and that they can support the B2B trading life cycle all the way from partner search to contracting, operation, and evaluation. In general, though, the B2B trading life cycle may change across different markets, which requires mechanisms for a company to retrieve information about how it should proceed once it enters a new market. These mechanisms belong to the business networking life cycle, and they can be supported by Web services as well.

The conclusion is that Web services provide the required features to support the full life cycle of business collaborations.

### **INTRODUCTION**

The Web has an unparalleled potential to reshape the way companies conduct their businesses. As a globally connected and widely accessible network infrastructure, the Web allows an enterprise to find and establish business relationships with new business partners. At the same time, it allows an enterprise to integrate its systems and processes with those of its business partners. Provided with a common, global network infrastructure, enterprises can associate with each other in order to become more competitive or to offer improved products or services. The result is the development of business networks, which combine the competencies of several business partners.

Solutions such as EDI, sophisticated Web sites, e-marketplaces, e-procurement systems (Albrecht, Dean, & Hansen, 2005), and B2B frameworks (Shim, Pendyala, Sundaram, & Gao, 2000) have been at least partly successful in achieving B2B integration by providing either the infrastructure or the data formats for message exchange. The challenge today is to come up with a technological solution by means of which an enterprise could search for, evaluate, select potential business partners and interact with them in a mostly automated way. We will refer to this kind of dynamic B2B integration as *business networking* (Österle, Fleisch, & Alt, 2001). We will show in this chapter that Web services, more than any previous technology, display an unprecedented potential to support business networking.

## **WEB SERVICES AS AN INTEGRATION TECHNOLOGY**

Before the arrival of Web services technology, integration was about defining interfaces and making sure that systems correctly implemented or invoked those special-purpose interfaces. There was RPC, there was message-oriented middleware, there were transaction-processing monitors, and there was CORBA. Then Web services came along and with it came the capability of discovering and binding to interfaces either at build-time or at run-time. Not that the concept is entirely new—CORBA, for example, included a mechanism called dynamic invocation interface (Vinoski, 1997)—but the ability to describe and deploy components that can be easily discovered and invoked, possibly in an automated way, came only with the adoption of WSDL (Chinnici, Moreau, Ryman, & Weerawarana, 2005) and UDDI (Clement, Hatley, von Riegen, & Rogers, 2004) standards.

As the foundation of Web services technology matures, it becomes clearer how they will be able to achieve the ultimate goal of dynamic B2B in-

tegration. From enterprise application integration to enterprise-wide service-oriented architectures, and then to supporting B2B interactions between different organizations, Web services technology is a cross-level integration paradigm that allows an application to invoke another component, as well as a company to interact with another organization. At first, the single key enabling feature to these scenarios seemed to be the possibility of publishing, searching for, and discovering Web services. Today, the problem of integration is known to require other features such as service composition, orchestration, and coordination, besides addressing, routing, security, and policy capabilities.

Most of these features are being addressed by separate standardization efforts, such as WS-coordination (Cabrera, 2002), WS-transaction management (Bunting, 2003), WS-BPEL (Arkin, 2005), WS-Addressing (Box, 2004), WS-security (Atkinson, 2002), and WS-policy (Bajaj, 2004). As the technological landscape becomes cluttered with acronyms and different standards, it might seem that the original goal of dynamic B2B integration may take long to achieve. Truth is however that most, if not all, challenges have been already identified, and several authors have introduced advances to Web service technology in features such as negotiation, contracting, security, matchmaking, monitoring, composition, and coordination as we will show in this chapter.

There is not much more to wait on the way toward supporting dynamic B2B integration—what we call business networking—if only one is able to sort out and combine the available contributions in Web service technology. This is precisely what we aim at in this chapter by describing the contributions that are most relevant to supporting the full life cycle of business collaborations. Rather than reiterating how Web services can support B2B exchanges—solutions for that have been available for a long time—our purpose is to introduce a full life cycle approach, showing how Web services can support every phase of business

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