Chapter 5.4
Infrastructure Support for Smart Organizations:
Integration of Web Service Partners in Heterogeneous Environments

Peter Bertok
Royal Melbourne Institute of Technology, Australia

Xinjian Xu
Royal Melbourne Institute of Technology, Australia

ABSTRACT

In a rapidly changing world, continuous adoption of new practices is crucial for survival; organizations embracing the latest technologies have a competitive edge. Smart organizations readily take on board new organizational forms and practices, those in particular that offer agility and responsiveness. The Internet and the World Wide Web offer a new way of collaboration via Web services, but heterogeneity of different service components make cooperation difficult. This chapter describes a new approach to combine Web services by employing a layered structure, in which composition of a value-added service can be built from individual components, and each service component can have semantically equivalent but syntactically different alternatives.

INTRODUCTION

Smart organizations make good use of internal and external expertise. Knowledge existing within the company can be utilized across different departments, and skills available externally can be employed to improve product or service offerings and market position. To gain the most out of collaboration and cooperation across different organizational units, they have to be managed well and should be built on sound infrastructure.

In the last decade, Web services emerged as a very efficient tool to manage business processes

on a ubiquitous platform. In many cases, there can be several, semantically equivalent components, as many service providers offer similar services and similar content, albeit on different platforms and with different interfaces. While there may not be one method that addresses all challenges of heterogeneity, the approach of introducing an integration layer can often offer a solution.

This chapter presents the field of Web services that enable smart organizations to approach their operation in a new way. We start with explaining the benefits of internetworking and using the World Wide Web for business process cooperation. This is followed by a brief overview of Web services, presented from the aspect of smart organizations. Next, we address the problem of heterogeneity that poses one of the greatest challenges to the technology. Then we present an approach of introducing an integration layer that helps in overcoming the difficulties of heterogeneity and in adopting one particular service from among many similar ones. A practical example illustrates how the method works. The chapter concludes with an evaluation of the proposed model.

SMART ORGANIZATIONS AND WEB SERVICES

Smart Organizations

The changes in business practices present new challenges to companies; staying in the front line requires continuous innovation and investment. One of the most important competencies for organizations seeking to thrive is the application of smart technology in a smart way. Organizations are called smart if they have a knowledge-driven, internetworked focus helping and promoting dynamic adaptation to new organizational forms and practices. These organizations can create and exploit new opportunities, particularly those presented by the new economy (Filos & Banahan, 2000).

To succeed, companies need more than just domain expertise. The collective intelligence of an organization can be much more, or much less, than that provided by individual executives and other employees (Perkins, 2002). A key issue for smart organizations is collaboration and cooperation. Smart organizations recognize expertise, seek input from specialists and contract out many sub-tasks, possibly very important ones, to others who are better prepared for a particular job. Smooth teamwork relies on a well-supported underlying communication infrastructure providing links between different players, and the parties involved must be convinced that it is only through collaboration that the goals can be achieved. Companies are discovering that a sound infrastructure is even more important than specific technologies, as the infrastructure enables organizations to develop and implement new applications rapidly and seamlessly. Good and reliable infrastructure also enables new technologies to be easily employed and to be replaced when needed.

Web Services

The Internet and the World Wide Web have become a widely used communication infrastructure, but its potential in business-to-business (B2B) interactions has not been fully realized yet. Workflows have been widely used for coordinated execution of multiple tasks in heterogeneous environments before, and we are now witnessing the automation of process flows by employing Web-based services. The Web has been enhanced; from content provider it has become a service provider. Business functions have become accessible via networks; Web services can encapsulate sets of coherent operations.

Web services are compositions of service providers and service consumers, also called publishers and subscribers (Clark, Fletcher, Hanson, Irani, Waterhouse, & Thelin, 2002). The service provided can be functionality, such as organizing a travel itinerary, or data access, such as viewing

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