Chapter 5
Generalized Demand-Driven Web Services

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ABSTRACT

Highly developed economies are based on the knowledge society. A variety of software tools are used in almost every aspect of human life. Service-oriented architectures are limited to corporate-related business solutions. This chapter proposes a novel approach aimed to overcome the differences between real life services and software services. Using the design approaches for the current service-oriented architecture, a solution that can be implemented in open source systems has been proposed. As a result, a new approach to creating an agent for service composition is introduced. The agent itself is created by service composition too. The proposed approach might facilitate the research and development of Web services, service-oriented architectures, and intelligent agents.

INTRODUCTION

Globalization and the information based society have begun to modify all business processes, beginning with resource identification and finishing with product delivery. Rainey (2012) presents a new sustainable adoption model in the context of globalization. He considers that innovation will play a key role in the future global system. The main directions of research are related to the improvement of technologies, business models, and leadership.

There is a corporatist approach that neglects the impact of small and medium enterprises (SMEs) on the global market (OECD, 2012). The motives may be related to the decreased chances to create new knowledge due to an insufficient amount of funding regarding their own research and develop-

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ment (R&D) departments. Also a small company that really identifies a free corner in the market can quickly increase in power and influence. Anyhow, the most dynamic part of the advanced economies is still based on SMEs. The globalization process is already based on using a high level of information technologies communication (ICT). Further global cyberspace development will be a common goal for all involved actors.

The idea of shifting business mostly in cyberspace is not new. The experts predicted that this might be a valuable approach a decade ago (Lowson, King, & Hunter, 1999). They also expressed some concerns related to the control of the very complex infrastructure that was expected to emerge. Their fears have proved to be partially correct, especially from the security related point of view. As for the rest, reality proves that the people have begun to increase the activity over Internet, but in most cases, they just replicate real life procedures. So the problems are similar in both approaches. The e-business concept offers almost equal chances for anyone who wants to develop and deliver various services for the society (Hong, Nag, & Yao, 2009). There are initiatives like the Android market or Apple store that give access to anyone who wants to publish their application and be paid for it. Moreover, it is the open source initiative that has begun to be more attractive due to the global economic crisis.

Various software packages like Systems Applications and Products in Data Processing (SAP) are already seen as evolving into an interface layer between preexisting technologies for business management and the new cyberspace related procedures (Anderson, 2011). The new concept of Web service begins to offer a first solution in this direction.

Services may be delivered by a person or by any kind of economical agent, beginning with small companies and ending with transnational corporations. Due to the generalization of electronic payment in advanced economies, the entire business cycle can be virtualized, excepting production and delivery. Even the production can be considered as virtualized if we look at the SCADA based systems (Galloway & Hancke, 2012). The distribution can also be seen as virtualized in the case of software products delivery. This economic model is already in place and its adoption is continuously increasing because of lowering costs.

In the near future, the main problem will be the identification, classification and evaluation of performance and costs of cyberspace services. The importance of cyberspace services will increase (Peppard & Rylander, 2005). As a result, the implementation differences between the services produced in the real world and the virtual ones will disappear from the user's point of view. Human services, production services, business services and computing services are still treated separately. The business world demands more and more complex instruments for computer aided decision support (Sauter, 2011). The next step will be to find an integrated approach in presenting and using all services. The concept of service, no matter if it is virtual (e.g. Web service) or real (e.g. goods transportation or face-to-face), must be reviewed in the context of globalization and future cyber-infrastructure.

In the following sections, a new approach in designing and implementing demand driven services based on intelligent agents and service oriented architecture is presented. After analyzing the current meaning of terms, such as service, electronic service and demand driven Web services, several new approaches in solving their problems have emerged. The concept of demand driven Web service was enlarged to encompass the classical service providers. This was required by the accelerated integration of classic business models in the present information based society. Those traditional processes are still managed with various software solutions. Within this chapter, a simple solution based on open source approaches, such as LDAP, was proposed for service metadata indexing. A new concept of implementing intelligent agents, without a dedicated framework, is