Chapter V

Next Generation B2B Commerce Using Software Agents

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ABSTRACT

Enterprises in the 21st century are striving to be agile in order to take advantage of the transient market opportunities. Enterprises are engaging in business-to-business (B2B) commerce with business partners by entering into short-term as well as long-term business arrangements using various technologies such as electronic exchanges. In order for the enterprises to be successful in their business endeavors, a key requirement is that the underlying information technology (IT) infrastructure in enterprises be intelligent and flexible enough to adapt to various changes in the market opportunities quickly. In this chapter, we first examine the information technology (IT) infrastructure requirements for intelligent enterprises in supporting B2B commerce. We then review agents technology and propose an agents-based architecture to support B2B commerce. This architecture covers electronic exchanges and enterprise systems for B2B commerce. Finally, we present some workflows to show how B2B commerce can be conducted using the agents-based architecture.

INTRODUCTION

In this 21st century, the era of intense business competition and transient market opportunities, business enterprises have to constantly change their product and service offerings in response to the demands of the market. Enterprises are now being forced to enter into new business arrangements with trading partners for short durations and then dissolve these arrangements when they outlive their purpose. New customers and partners are constantly being sought, while enterprises make efforts to retain existing customers. Market forces, consumerism, and technological advances are forcing enterprises to focus more and more on core competencies, and to outsource many activities that are not part of their set of core competencies. Outsourcing, as well as the need to find new ways to tap market opportunities, makes its necessary for enterprises to implement better as well as automated solutions for their business-to-business (B2B) commerce needs rather than use traditional approaches. B2B is driven more by collaboration of enterprises with complex business rules rather than by a predefined set of arrangements that usually exist within an organization. In the past, partnerships were traditionally done based on people and trust, leading to limited scope and reach. In this global economy of the 21st century, new partnerships, with a complete value chain need to be formed. Innovative and pioneering infrastructures need to be setup to enable enterprises to come together more easily and readily. The business environment outlined above makes it necessary for enterprises to have a flexible information systems infrastructure that constantly evolves to support the changing business needs and the dynamics of the market place. In reality, most enterprises have information systems infrastructure that is often too rigid to facilitate the rapid deployments of new functionalities, and thus impede enterprises from realizing their evolving business objectives.

With the widespread adoption of e-commerce, enterprises are now being forced to implement e-commerce strategies. Of particular importance to many enterprises is business-to-business (B2B) commerce, which leverages new and emerging Internet technologies to support business transactions. Despite the recent negative trends and economic slowdown, B2B e-commerce is still considered a key segment of e-Business. Estimates vary widely from $1.5 trillion in 2004 to $4.3 trillion in 2005 for world wide B2B e-commerce. Although B2B commerce systems existed before in the form of electronic data interchange (EDI) systems, the needs of the next age B2B systems are likely to be vastly different. Highly intelligent and efficient mechanisms have to be deployed to enable businesses to come together. It is no longer about exchanging documents efficiently; it is about creating an infrastructure that enables businesses to make intelligent decisions.

In this chapter, we first examine the information technology (IT) infrastructure requirements for intelligent enterprises in supporting B2B commerce and then propose an agents-based architecture to support B2B commerce. This architecture covers electronic exchanges and enterprise systems for B2B commerce. This chapter is organized as follows. An overview of B2B landscape is presented first, followed by the requirements for an IT infrastructure to support B2B commerce. An overview of intelligent agents including literature review is then presented, followed by the details of the proposed agent-based architecture for e-exchanges and enterprise B2B system components. Details of some transaction workflows are then presented. At the end, the contributions of this chapter along with future research opportunities are presented.

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