

Chapter 24

Concept of an Agent-Based Electronic Marketplace

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ABSTRACT

This study explains the concepts of an electronic marketplace (e-marketplace) and the types of e-marketplaces in today's computing environment that is facilitated and driven by the Internet. The concept of software agent and the different types of agents which may exist in an e-marketplace application in the current setting of the global economy is also discussed. Specifically the idea of using mobile agents in the implementation of an e-marketplace is investigated. This article also introduces an example of a mobile agent-based e-marketplace which offers secure infrastructure services. The complex and challenging computing environment in which agents operate requires efforts in the standardization and management of agents.

INTRODUCTION

The concept of conducting business transactions via the electronic media has been an essential part of many businesses during the last few decades.

Currently, the Internet which provides a set of interconnected networks has made it possible for individuals and businesses to conduct business transactions electronically. The process of buying, selling, transferring or exchanging products, services, payments and/or information via computer networks such as the extranet, intranet and

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the Internet is called electronic commerce (EC) (Turban et al, 2008).

EC can be commonly distinguished by the relationships or transactions between the participants. Business-to-business (B2B) transactions are transactions carried out by businesses with other businesses which might be their supply chain members, suppliers and intermediaries that share business information. Business-to-Customer (B2C) refers to cases where the transacting parties are businesses and their individual customers. These mainly focus on retail transactions.

EC can be conducted in an e-marketplace where buyers and sellers meet online to exchange products, services, and/or information. Traditionally, a market has been used as a place to match buyers and sellers. However, the current climate of fierce global competition requires sellers to develop their own opportunities winning criteria in order to attract buyers. Likewise, buyers are presented with so many choices of products from various merchants such that the process of making business decisions has become more complex and time-consuming. A seller's objective is to maximize his/her revenue and possibly find loyal customers. On the other hand, a buyer now has a choice of not purchasing a product/service at a posted price. Price and other product/service attributes can be negotiated through a market mechanism such as an auction, thereby creating a healthy and fair competition.

How do buyers continuously monitor the availability of a product/service that are of interest to them? Likewise, how does a seller find potential buyers for the product/service that they are offering? The solutions to these problems form parts of the features provided by an e-marketplace. According to Bakos (1998) an e-marketplace plays a central role in facilitating the exchange of information, product, services and payment. The function of an e-marketplace is similar to a physical market except that the computerized system is more inclined to create more efficient markets by providing updated information to participating

sellers and buyers. In addition, an intermediary also plays a vital role in providing value-added activities and services to the buyers and sellers. The intermediary collects buyers' requests and sellers' offers. Besides matching buyers' requests with suppliers' offers, it can also send unsolicited messages updating the buyers and sellers with current information that may be of interest and importance to them.

To enable distributed buyers and sellers to conduct online business transactions, many new business models have been proposed. The Internet and agent technology have been regarded as the enabling technology to realize many new business models ranging from e-shops, e-procurement, e-auction and e-mail to virtual enterprises and e-marketplaces (Timmers, 1998). These services differ in terms of the technological requirements, the participants involved and the potential benefits that can be harvested by market participants. This chapter elaborates upon the fundamental concepts of e-marketplace trading and how mobile agent technologies help create it in e-business environments.

BACKGROUND OF ELECTRONIC MARKETPLACE

A market is a meeting place for buyers and sellers where they are able to engage in trading and commerce. An e-marketplace is a virtual space that serves as a meeting place for buyers and sellers and at the same time serves also as a provider of integrated knowledge about all products and services. Transactions in an e-marketplace are carried out via various market mechanisms. Three main functions of a market, traditional or otherwise facilitate (Zwass, 2003):

- 1) matching buyers and sellers;
- 2) as a moderator in the exchange of information, products, services and payment related to the transactions; and

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