

Chapter X

Trading E–Coalition Modeling for Supply Chain

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ABSTRACT

As the Internet grew and evolved, it became more widely used by everyone. What once was utilized by the military and used for academic purposes is now employed by companies for e-business marketing strategies and alliances in the supply chain. Historically, companies have found many ways to work together, playing different roles with regard to manufacturing, supplying, selling, delivering, and buying in the supply chain. Most of the time, according to role, members of each company get together in a shared space (i.e., marketplace) to work on a particular project (i.e., delivering quality goods or services to customers). The emergence of the Internet has brought an appropriate media to expand markets and enable collaboration with partners in all stages of product manufacturing, testing, and delivering through electronic commerce. Support for these collaborations over the Internet, called e-coalition here, is what this chapter is about.

INTRODUCTION

Recently, several research works on software process technology (e.g., Tiako, Lindquist, & Gruhn, 2001) have proposed models for organizing distributed software development among autonomous and remote software enterprises. The suggested models of collaboration rely on Internet technologies, which offer a communication medium. They allow software development ventures in a dynamic manner and help automate a variety of contract types among enterprises (Tiako, 2002). The ways e-commerce companies interact to build a supply chain (Simchi-Levi, Kaminsky, & Simchi-Levi, 2000) over the Internet and deal with constraints for delivering products to customers are about the same as those used by software enterprises, as described above. Related work in e-commerce, at some level, provides framework for negotiation (Benyoucef & Keller, 2000) or mediation (Moukas, Guttman, & Maes, 1998; Guttman & Maes, 1998) in dealing with e-business relationships, but is still limited in terms of infrastructure for ad-hoc collaboration in the marketplace.

A coalition for supply chain is important in production networks where suppliers and partners work together for specific purposes. Such coalition includes several activities resulting in formal or informal arrangements. Activities define ways and constraints on what to exchange, how to exchange and when, as well as the condition. Coalition also deals with all aspects of teaming and partnering, such as partner assessment and selection, quality of product to deliver to customers, and profit and risks taken and shared. To increase individual profits in the face of globalization, participants have to work together to attain new markets and develop quality products or render services. The emergence of the Internet has brought an appropriate media to expand markets and enable collaboration with partners in all stages of product manufacturing, testing, and delivering through electronic commerce. Support for these collabo-

rations over the Internet, called e-coalition here, is what this chapter is about.

Traditional electronic commerce models enable the online offering, ordering, payment, and delivery of goods. One common characteristic of different models is their isolation. Though they are connected to the Web, they are still isolated islands in the online universe; they cannot interact with each other without media-breaks. The isolation is enforced by the limited support for ad-hoc modeling and coordination of interactions among partners in the lifecycle for delivering quality goods or services. Support for these relationships over the Internet provides opportunities to bundle complementary needs of partners according to unpredictable requirements in the market. This chapter augments existing electronic commerce models by defining an infrastructure for collaborative electronic markets. It considers an example of a trading coalition between a travel agency and its partners. It also describes the underlying technologies for implementing the proposal.

This chapter is organized as follows: we present some basic definitions of supply chain and a brief history of electronic commerce. Then we describe an approach for e-coalition modeling and a typical scenario of usage where e-coalitions involving a travel agency and its partners for supplying flight tickets are considered. The underlying technologies used to develop this proposal are presented, followed by related work and a conclusion.

BASICS OF SUPPLY CHAIN

A production supply chain involves getting a smooth and efficient flow of goods, services, and information from raw materials through to finished goods in the hands of the ultimate customer (Ellram, 1990; Jones & Riley, 1985; Bolumole, 2000). Key supply chain activities include production planning, purchasing, materials management, distribution, customer service, and

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