Chapter 1.19

Negotiation, Trust, and Experience Management in E–Supply Chains

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ABSTRACT

This chapter reviews fundamentals of e-supplhy chain management and examines the transformation from the traditional supply chains to the e-supply chains (e-SC). This chapter applies experience management (EM) and experience-based reasoning (EBR) to intellegent agents in the e-SC and explores how to use experience in extablishing trust in other agents. The role of trust and deception in supply chains for real-time enterprises is discussed, and a logical framework for fraud and deception is explained in this chapter. EBR is considered as a way to manage trust in the supply network. This chapter explores cooperation and negotiation, trust and deception in e-supply chains by providing methodologies and intelligent techniques for multiagent trust, negotiation, and deception in an e-SC. Finally, a unified model is developed for integrating co-operation and negotiation, trust and deception in e-supply chains. Although primarily theoretical, the chapter highlights new areas of research which will impact supply chain management.

INTRODUCTION

Current supply chain management (SCM) is largely based on older information retrieval methods. It generally has not taken advantage of the 'dynamic' information that is now available due to developments in information and communication technology (ICT) and knowledge management (KM). The focus of SCM has also changed from a supply-side view of optimizing production efficiency to a demand-side view of consumers driving the process. Supply chains

(SCs) are developing into demand networks that adapt to consumer demand in almost real time (Silisque, Brito, Almirall, & Cortés, 2003). With moving towards real-time enterprises, there is an imperative need for rapid automated and intelligent response in the supply network. As discussed in this chapter, an e-SC can be considered as a form of agent society, with trust and negotiation between the intelligent agents as a significant issue.

Experience of suppliers and customers plays an important role in an SC. In particular, customer experience management (CEM) will become a major issue in e-SC because the latter is a customer-centered service in the Internet world (Sun & Lau, 2006). Further customer experience is a prerequisite for customer satisfaction in SC, which is highly dependent on the flexibility of the SC, such as its ability to respond to changes in demand. Because the selection and interaction space of customers in e-SC is theoretically infinite, how to manage customer experience in e-SC also becomes a significant issue for any e-SC providers.

Experience management (EM) is a new concept in information systems (IS) and information technology (IT), although KM has become well-established in business management and artificial intelligence (AI). However, experience has always played a similar rule to knowledge for organizations. Experience-based reasoning (EBR) is a reasoning paradigm using prior experiences to solve problems, and could be considered an advanced form of knowledge-based reasoning (Sun & Finnie, 2005a). This chapter will develop the concept of EM and EBR, and apply them to intelligent agents in the e-SC. In particular the use of experience in establishing trust in other agents will be explored. Any organization will have some history of dealing with problems relating to orders and perturbations in the network and the solutions applied, as well as some formal processes for dealing with these. To respond automatically, software must be capable of reacting, as one would expect a human agent to do. The

information available to the agent can come from a variety of sources, including analysis of historical information/experience at the informational/planning level.

Multi-agent systems technology has been successfully applied in many fields such as e-commerce (Sun & Finnie, 2004a) and supply chain management (Finnie, Barker, & Sun, 2004). The trend for the future will be to increasingly autonomous behavior of agents. However, it is imperative that management considering relinquishing control of key aspects of the business to software systems be aware of the issues involved, in terms of how agents will need to operate and negotiate, as well as the potential for misuse of trust with adverse economic results. The increasing importance of strong IT governance and control procedures, and the possible criminal implications for failing to implement these, makes it essential that management be aware of developments in this area. The major contribution of this chapter is in establishing a basis for understanding the new field of experience management and the role it may play in the new supply chain environment. In addition the issue of trust and the role of experience in automating trust development should be appreciated. This chapter will resolve these issues by providing some methodology and intelligent techniques for multi-agent trust and negotiation in an e-SC based on EM. These include the use of EM to enable agents in an e-SC to learn from prior experience in dealing with suppliers and customers, and issues relating to trust and deception in the agent world of the e-SC.

The rest of this chapter is organized as follows: the next section examines fundamentals of e-SC management. We then review the concept of experience management, explore cooperation and negotiation in e-supply chains, and discuss trust and deception in e-supply chains. Finally this chapter proposes a unified model of integrating cooperation and negotiation, trust, and deception in e-supply chains, and the chapter ends with some concluding remarks.

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