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STUDIES ON A MULTI-AGENT SYSTEM FOR SERIAL ENTERPRISE SUPPLY CHAINS

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Abstract. In this paper, we employ multi-agent paradigm for modeling and analyzing enterprise supply chains. A multi-agent system for a serial enterprise supply chain (MASESC) is proposed. We describe the framework of the system firstly. Then, domain specific ontologies are presented for describing enterprise supply chains and the agents for the enterprise supply chain are designed in detail. With the system, we examine the impact of the incentive strategy of individual agent on the performance of enterprise supply chains.
Keywords. Multi-agent system, Enterprise Supply Chain, Ontology, Incentive

1 Introduction

Globalization of markets, inter-linked business environment, decreasing product/service life cycles, increasing customers' expectations, and rapid changes in process and product technologies, have made the field of competition shift to the management of supply chain. It adds complexity to the management of business operations in the 21st century. A supply chain can be defined as a network of autonomous or semiautonomous business entities collectively responsible for procurement, manufacturing and distribution activities associated with one or more families of related products (Swaminathan and Sadeh, 1998), which is certainly a complex system.

Agency was proposed as a new machine devoted to solve complex problems by means of cooperation among agents (Amigoni, Somalvico and Zanisi, 1999). Decentralization of decision authorities is inevitable for managing a large organization today. Modern organizations constantly face the challenge of making timely decisions using specialized information. An effective way of meeting such a challenge is to delegate decision rights to the person on the spot who has the intimate knowledge of his or her immediate surroundings (Hayek, 1945). Thus multi-agent systems based on the decision made by distributed autonomous agents are a natural choice for modeling supply chains,

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