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A Study of Multi-Agent Based Supply Chain Modeling and Management

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ABSTRACT

Supply Chain Management (SCM) is a management paradigm to understand and analyze the flow of goods, services and the accompanying values reaching to the consumers followed by the processes of purchasing, production and distribution with combining and connecting the whole system. Today, SCM is regarded as an essential strategic factor which has a great deal of influence on earning competitiveness in the abruptly changing global business environment. Multi-agent technology becomes the best candidate for problem solver under these circumstances. An agent performs given tasks automatically using inter-collaboration or negotiation with other agents on behalf of a human on the basis of real-time connectivity. There will be the conflict among the pursuit of the profit of all members of the SCM. In order to maximize the total profit of the SCM, negotiation among all members is necessary. In this research, we propose to find the best negotiation strategy that makes all members of the SCM satisfied in a simple SCM. We suggest a new negotiation algorithm in the SCM environment with using multi-agent technology. The ideas behind the suggested model are negotiation algorithm with a trading agent and we consider multiple factors that are price, review point and delivery time. We created agents with Java Agent Development Framework (JADE) and performed the simulation under JADE and Eclipse environment. The case study denotes that our algorithm gives a better result than the Kasbah system that is a typically well known system where users create autonomous agents that buy and sell goods on their behalf. We've used benefit/cost ratio as a performance measure in order to compare our system with the Kasbah system.

KEYWORDS

Supply Chain Management, Multi-Agent, Trading Agent, JADE, Eclipse

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