

DYNAMIC INFORMATION FLOW FOR DESIGNING SIMULTANEUS COORDINATION MODEL IN E-SUPPLY NETWORK

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ABSTRACT

The automation of negotiation among buyers and suppliers has provided cutting-edge knowledge on scientific approaches to the management of supply networks in a highly informed global environment. Concentrating on information flow and cooperation among echelons, studies have designed coordination mechanisms for a two-echelon supply chain: buyers on the one side and suppliers on the other. However, quantitative investigations are hardly found that take into account the difficulties introduced by sheer number of participants in the network when attempting to find, and negotiate with potential counterparts. In order to consider the autonomy levels and conflict objectives in the network, we introduce the concept of a simultaneous coordination mechanism which allows the agents share information both vertically, i.e. suppliers and buyers, and horizontally, i.e. the interaction among buyers, to re-establish global optimality. The proposed coordination mechanism begins with search process based on the similarity of users' profiles in a multidimensional space defined by negotiable attributes. Then, the material flow is formulated as a multiple-objective problem to allocate the benefits of the mechanism to all partners. To illustrate the model characteristics in providing dynamic flow, we model a prototype using Colored Petri Nets (CPNs). The model allows us to take the advantage of the developments and diffusion of modern information and network technologies.

Keywords: Supply Network, Simultaneous Coordination, Multi-Agent Technology,
CPNs