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Abstract

**CSET MODEL FOR OPTIMIZING MAKE-TO-ORDER
SUPPLY CHAIN FORMATION**

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A multi-agent model for optimal resource allocation of a make-to-order supply chain in Business-to-Business (B2B) e-marketplace, called Collaborative Single Machine Earliest/Tardiness (CSET) model is proposed. It brings an optimal supply chain formation of co-operative competition e-marketplace. This model integrates Pareto-optimality with Just-in-Time (JIT) principle into a double-agent-based intelligent system for optimizing dynamic supply chain formation and workflow scheduling respectively. Pareto-agents work with a Collaborative-agent to obtain an optimal resource allocation with a low average cost as well as the most satisfaction of all participants, so as to gain an optimal supply chain formation. In addition, this model mainly focuses on improving the sequence timing factor. JIT is able to shorten the waiting time while Pareto-optimality provides a mechanism that each participant will be satisfied with the result. Combining these two methods, an unprecedented efficiency on supply chain can be achieved in an e-marketplace. Furthermore, an example of virtual supply chain in Sportswear e-marketplace is used as the experimental target. A computer simulation is programmed to verify this phenomenon. Through CSET simulation, its advantages are proven: (1) the fairness under a co-operative competition e-marketplace is improved; (2) allocation result has an acceptable average cost; (3) information transferring time is shortened by nearly 50%. Finally, some potential applications both in open and internal e-marketplaces will be discussed to illustrate how this new model can be adopted in real life situations.