A Multi-Agent Based Framework for a Closed Loop Supply Chain Material Flow and Transportation Planning System

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Abstract

The importance of reverse logistics which concerns about environmental issues is increasing due to the scarcity of natural resources of the world. As a consequence, planning and organization of the recycled products from users to recycling collection centers is playing a very important role for effective usage of scarce natural resources. Closed loop supply chain (CLSC) is about both forward and reverse channel management with an integrated view. Collection, remanufacturing, disassembly and recycling centers are the entities within the return channel of CLSC. A good management of dynamic information flow among these entities helps the system operates effectively. Multi-agent paradigm, a branch of artificial intelligence seems very appropriate for the design and implementation of such reverse channel management where the information flow is very dynamic. In this paper, return channel of a closed loop supply chain material flow and transportation planning system is designed by using PROMETHEUS^{TM} agent-design methodology in order to develop some effective return channels for recycled products.