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Impact of Information Visibility of Quality and Physical Flow on the Closed-Loop Supply Chain

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Abstract: Modern manufacturers should operate the closed-loop supply chain system which integrates collection and recycling activities into conventional supply chain activities in order to obey the extended producer responsibility. It is known as an enabler to reduce virgin sourcing costs and to promote resource circulation. However, there exists the chronic problem of uncertainty about returned end-of-life products with regard to timing, quality and quantity, which hinders the efficient operation of closed-loop supply chain. In this paper we propose the internet-of-things enabled closed-loop supply chain management system which gives information visibility with radio frequency identification, wireless sensor network, and other information and communication technologies. Then we illustrate positive impacts on the closed-loop supply chain in terms of process efficiency, production planning and resource circulation when the proposed system is implemented.

Keywords: Closed-loop Supply Chain Management, Resource Circulation, Internet-of-Things