

Optimal Sortation strategy for a distribution network in an E-commerce supply chain

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Abstract

The backbone of any retail e-commerce success story is a unique design of supply chain network, providing the business an unparalleled speed and scalability. Primary goal of the supply chain strategy is to meet customer expectation by offering fastest deliveries, while keeping the cost minimal. Meeting this objective at the large market that India provides is the problem statement that we have targeted here. There are many models and optimization techniques focused on network design to identify the ideal facility location and size, optimizing cost and speed. In this paper we are presenting a tactical approach to optimize cost of an existing network for a predefined speed. We have considered both forward and reverse logistics of a retail e-commerce supply chain consisting of multiple fulfilment (warehouse) and delivery centers, which are connected via sortation nodes. The mathematical model presented here determines if the shipment from a node should get sorted directly for the last mile delivery center or it should travel as consolidated package to another node for further sortation (resort). The objective function minimizes the total cost by varying the resort percentages between nodes and provides the optimal resource allocation and number of sorts at each node.

Keywords

Supply Chain Network, Sortation and Distribution Strategy, Mathematical Model

Biography

Pankhuri is a Specialist in Supply Chain Design Department in Flipkart Internet Pvt. Ltd. She has been involved in distribution and transportation Process Design, mostly pertaining to Returns Supply Chain and Design of Sortation Network for E-commerce. She did her Undergraduate from Indian Institute of Technology, Bombay, India, in Aerospace Engineering. Her areas of interest are end-to-end operational process designing, optimization and sortation design.

Charumani Singh is Senior Specialist in the Supply Chain Design Department in Flipkart Internet Pvt. Ltd. She pursued her MBA from the Indian School of Business, India. Prior to that she worked in organizations such as Lutron Electronics, Thinklink Consulting and Norgren Kloehn, on manufacturing design, new product introduction, lean Implementations, process improvements and automation. She has a MS degree in Industrial Engineering from Penn State University and a BE degree in Manufacturing and Automation Engineering from NSIT, India.

Poornima Krothapalli is an Analyst in Supply Chain Design Department in Flipkart Internet Pvt. Ltd. She pursued her undergraduate from Indian Institute of Technology, Delhi, India in Textile Technology. She is involved in optimizing and standardizing the transport and network process in E-commerce Supply Chain. Her interests include financial modelling and optimization techniques.

A Krishna Karthik is an analyst in the Supply Chain Design Department in Flipkart Internet Pvt. Ltd. He pursued his B.Tech from the Indian Institute of Technology, Bhubaneshwar, India, in Mechanical Engineering. His areas of interest are modelling, optimization and automation. His innovative approach on NFC based sortation has won him the hack fest contest at Flipkart twice.