Intelligent Sortation Wave-Design to Optimize Transport Connections with Faster TAT in a Distribution Center

Syed Tanveer Ahmed
Operations Research Analyst – Supply Chain Design
Flipkart Internet Pvt. Ltd.
Bangalore, India
ahmed.syed@flipkart.com

Sarvartha Kanchan
Director – Supply Chain Design
Flipkart Internet Pvt. Ltd.
Bangalore, India
sarvartha.kanchan@/flipkart.com

Abstract

In ecommerce marketplace, logistic speed has emerged as a critical factor influencing online retail supply chain design. To compete in this virtual arena, picking, packing and shipping single items and small volume orders to customers, needs to be done as efficiently as possible. Orders require delivery to customers - not weekly or bi-weekly as with retail stores, but typically within 24 to 72 hours. In a conventional marketplace supply chain model, the sellers make the goods ready based on customer orders and signal to their logistics partner for a pickup. The supply chain activities typically start with the consolidation of load for a given geography and then distributed within the supply chain network.

In this paper, we propose an analytical model to estimate the sortation wave timings in a marketplace distribution center to optimize transport TAT's subject to inbound load profile, sortation capacity at a distribution center, transport mode and lane-wise load split and transit time between destinations. The model which has been tested by simulations with different illustrative examples, works on the logic of earliest deadline first scheduling algorithm to maximize the desired objective function. Each destination has a transport cut-off before which its corresponding load needs to be sorted and bagged for dispatch. The model aims to improve the transport TAT's without increasing the design cost of the distribution center or the transportation network.

Keywords
Logistics; E-commerce; Distribution Center; Sortation; Wave-Design

Biography

Syed Tanveer Ahmed is currently working as an Operations Research Analyst in Supply Chain Design for Flipkart India Pvt. Ltd., the largest e-commerce organization in India. He earned his B.Tech. in Electrical Engineering from Indian Institute of Technology (IIT) Bhubaneswar, India. He is now working to transform supply chain design through mathematical modeling and optimization and achieve the most simplified, 100% utilized, fastest supply chain network in the country. His research interests include soft computing, simulation, optimization and network design. He is a member of IEEE.

Sarvartha Kanchan is currently working as a Director of Supply Chain Design for Flipkart India Pvt. Ltd. He earned B.Tech. in Electronics and Communication Engineering from Technical University of Uttar Pradesh, India and Masters in Operations Management from ICFAI University, India. Sarvartha has worked in supply chain environment of highly regulated / process driven manufacturing companies like GE Healthcare, Britannia Industries

Limited and complex logistics and warehousing domain with Flipkart. He has worked across different supply chain functions namely, Strategic Sourcing, Vendor Development, Process Engineering & Quality, Materials Management and Order Fulfillment. He was responsible for driving efficiency improvement projects in supply chain at a corporate level and was looking at end to end value chain for driving LEAN Six Sigma improvements. Currently he looking at transforming supply chain design to improve speed, reliability and cost for the logistics function of Flipkart. His interests include vendor development, manufacturing, simulation, optimization, design for six sigma and lean. He is member of ASQ, APICS, WERC.