

Forward Placement of Inventory to Strategically Curb Delivery Lead Time - Decision Framework and Design Methodology

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Abstract

The e-commerce business ideology has transformed the business – customer interface drastically and continues to do so. In the prevailing customer acquisition phase, it is common to see businesses in e-commerce pitch value-based differentiation to attract and lock-in customers for the long run. It has become imperative to identify the *buying levers* and take appropriate measures to positively influence them with a view to build sustainable leadership and maintain a strong competitive stance.

A detailed study of buying patterns reveals that e-commerce customers make a purchase decision primarily on the basis of *Product Pricing, Forward Speed, Order Promise or Reliability, Payment Methods* offered and *Cancellation Convenience*. Forward speed or *Order to Delivery* lead time being one of the most important differentiating factors, a significant improvement here enables organizations to curb redundancy, introduce new services and enlarge the target market segment, enhance brand image and establish market dominance. It is thus evident that a disruptive innovation in forward movement holds great promise for any e-retail firm providing differentiation and thus a decisive edge over competition.

This paper explores the intricacies of *Forward Placement* of inventory in an e-commerce supply chain with a focus on catering to the increasing demands of express delivery. Supply Chain as a science has always reiterated on maintaining centralized inventory and repeatedly stated the sub-optimality arising out of fragmenting this inventory pool. This framework bases its decision to adopt a decentralized model by harnessing the available intelligence and thus bridging the information asymmetry on customer behavior and demand patterns.

The framework has been designed with an intent to allow for such a fundamental modification in a supply chain which exists in the highly volatile e-commerce industry. Multiple levers effecting the decision including *order profiling (OP), order clusters (OC), order consolidation (OC), order delivery window (ODW), viable minimum delivery time (VMDT), inventory capacity (IC), inventory days on hand (IDOH), service premium potential (SPP)* have been analyzed to efficiently implement the framework.

This framework has been applied to assess the situation and identify locations for a leading Indian ecommerce company offering multiple categories with plethora of unique SKUs. This has enabled the company to introduce a new service offering of *4 hour delivery promise*, thus introducing a potential to earn premium from customers and cater to new market segments interested in high speed deliveries. Furthermore, this paper discusses a potential design modification to the supply chain to introduce *forward placed inventory (FPI)* in an e-commerce setup. A brief insight has also been provided to the areas where it can be further optimized and deployed across various industries.

Keywords

Ecommerce, Fulfilment Center, Inventory Decentralization, Forward Placed Inventory, Order to Delivery Time

Biography

Rajat Varshney is a Senior Process Specialist in the Fulfilment Center Design team at Flipkart.com, India's largest online marketplace. His core strengths are Supply Chain Design and Process Reengineering. He has worked with CSC India, Capgemini India and ISayOrganic in Information Technology and Supply Chain Domains. He earned his Post Graduate Diploma in Management in Information Management from the SP Jain Institute of Management and Research, Mumbai, India and Bachelors of Technology in Computer Sciences from Aligarh Muslim University, Uttar Pradesh, India.

Ananth Rangarajan is a Manager-II in the Fulfilment Center Design team at Flipkart.com, India's largest online marketplace. His focus areas are Industrial Engineering and Supply Chain Innovation. He earned his Bachelor in Industrial Engineering from the University of Pune, India and has graduated from the Postgraduate Program in Management at the Indian School of Business with concentrations in Finance and Operations Management. Ananth has served with Mercedes-Benz India in Assembly Line & Plant Management, Logistics & Supply Chain Management and Production Planning. He has been involved in academic research since his deputation to the University of Windsor, Ontario, Canada as an Undergraduate Exchange Scholar. He has been associated with the IEOM society since the inaugural conference in Dhaka'10 where he was the youngest delegate. He has published conference and journal articles on financial modelling, simulation, service sector process flows, urban transportation, healthcare, back office operations and e-commerce. He also serves on the panel of peer reviewers for multiple international journals and conferences.