Supply Chain Flow Considerations for Modern Omnichannel Retailing

Navigating the Product Flow Smoothly from Source to Customer

Abstract

Retail supply chains are no longer linear. They don't traverse a simple straight route from supplier factories to distribution centers (DC) and on to store shelves. With every node becoming a fulfilment location, efficiently 'moving' the product requires a scientific approach to manage flow across complex supply chain tributaries that merge into one single focal point – i.e. the consumer.

This paper analyzes how unique omnichannel product flows are challenging today's retail supply chain network. It highlights constraints, flow disruptors and blind spots which can add cost to a retailer's operation and negatively impact shoppers' experience.

Seasonal stress

By the time Santa starts loading his sleigh, retailers have already spent months getting ready for the holiday season. Christmas trees and gifts start pouring in as early as August. A news report, on Christmas items appearing at retail stores, quoted a rankled customer saying, 'Let's get Halloween out of the way first'[1]. This is an indication that even consumers see and feel the impact of supply chain flow issues.

Merchants struggle to manage the influx of merchandise ahead of the holiday season. With little extra room in stores and DCs, it's a common sight during peak season to see goods being held in trailers along the edges of a retailer's parking lot. The retailer's supply chain is often strained before Black Friday kicks off.

This phenomenon can be traced back to the ordering cycle which probably was executed before previous Christmas learnings were baked into the next season projections.

Bulk loads of Christmas trees hitting the stores and DCs in advance

Choked store floors, backroom & DCs resulting in unloaded trailers in yards

Impact flow of other products and inconvenience for customers

Figure 1. Illustration of impact on flow due to events

CPG manufacturers sell as much as 40 to 70 percent[2] of their products to retailers and wholesalers during promotional periods. All of these products need to efficiently flow through a retailer's supply chain without encountering any bottle necks.

The last mile of supply chain flow is especially intricate. If the customer changes the mode of fulfilment from 'Ship to Home' to 'Buy Online Pickup in Store', the flow of product delivery needs to be significantly re-orchestrated. Adjustments may involve re-routing the order, cancelling the earlier shipment, re-inducting the inventory back into the node, allocating new inventory at a different node and arranging for store labor to ensure the merchandise is ready for pick up --- all while maintaining a seamless customer experience.

Mastering the product flow is key to meeting customer expectations and beating the competition. To realize smooth flow, it is critical to have a forecast of inventory movement as well as a flowcast to monitor the inventory at every node.

Flow can be impacted throughout the year with sudden shifts in demand or several seasonal spikes such as Valentine's Day, Halloween, and Thanksgiving Day. An omnichannel supply chain network must be agile and flexible to accommodate flow variations quickly with predictive, proactive and corrective capabilities.

Flow disruptions abound

In theory, if a supply chain had no restrictions on cost and other parameters, it should be possible to meet every request and need. However, in reality the flow needs to be maneuvered based on resources such as capacity, time, cash flow, fleet and logistics.

In addition, flow challenges vary by the type of retail ecosystem like grocery, fashion, fresh produce, and so on. Understanding each merchant's unique environment is one of the most important aspects of being able to enable a smooth flowing network.

According to National Retail Federation, retailers hired between 640,000 and 690,000 seasonal workers in 2016[3]

FACILITY CAPACITY	SCHEDULE / TIME	STOCK	LOGISTICS
Supplier Manufacturing / Volume	Lead Time	Stock on hand	Fleet Capacity
Inbound Dock and Receiving	Rosters (ordering, replenishment, order review)	Shelf life	Third party fleet
DC Picking and break pack	Working calendar	Order multiples	Transportation schedule and calendar
DC Automation Rated	Transportation Calendar	Order minimums	Transportation minimum / Load build
DC Yard and Storage	Vehicle unloading and loading turnaround time		Import vessel booking and capacity
DC throughput			Ports of export and import
Store fill and receiving			Consolidator and CFA capacity and policies
Backroom Storage			
Store shelf capacity			

Figure 2. Illustrative Key Constraints for Flow

While some constraints can be worked around with additional spend, it comes with its set of challenges. For example, more than half a million temporary workers hired will be trained and made productive for the peak holiday season. But this focus only covers a few months of the year. Staffing quickly decreases in January.

Multiple factors within the supply chain have the potential to disrupt flow. Flow disruption is primarily attributed to demand variations and underlying seasonality, and promotions among others. However, it is essential to holistically view supply chain product flow across suppliers, DC/FC, stores and logistics (including last mile) to ensure disruption is predicted, proactively addressed and corrected, so as to contain its impact on the unwanted drift.

Supplier	DC	Stores	Logistics
▪ Volume Breach ▪ Booking Slots Availability at DC ▪ Inconsistent ordering – cycle/volume ▪ Schedule delays ▪ Transportation Delays ▪ Inadequate forecast visibility ▪ Emergency orders ▪ Changing order quantities	▪ Seasonal Volume Surge ▪ Unconstrained Order Due and Need By Date exaggeration ▪ Promotion & Event build up ▪ Emergency/Rush Orders ▪ Unplanned Markdowns & Liquidations ▪ New product introduction and new store openings ▪ Forward Buying ▪ Inadequate DC Capacity ▪ Daily demand volume fluctuations ▪ High product variety management ▪ Automation Inflexibility / breakdown ▪ Lead time variability ▪ Forecast errors resulting in unwanted stock build up or unplanned inbound surge	▪ Abrupt stock build up for season, event or promotion ▪ Backroom inventory visibility ▪ Store shipment schedules ▪ Advance allocation for events ▪ Delete line inefficiency	▪ Inadequate in-transit visibility ▪ Weather/traffic Conditions ▪ Vehicle Break down/accidents ▪ Import lead times ▪ Fleet capacity

Figure 3. Illustrative Flow Disruptors

There are hurdles across value chain from supplier to distribution center to logistics and stores

Ready for the unknown

While we can address flow constraints and proactively mitigate the impact of disrupting factors, the retail supply chain at times is challenged by disruptors which are not evident and tend to be 'blind spots'. For example, the buyer team may forward buy products in large quantities in order to avail volume discounts or for any commercial reason. These unplanned activities can choke the network and challenge all network constraints.

A retail supply chain needs to skillfully handle flow blind spots. It is important to be aware of activities or information that can evade a normal flow analysis but might surface on the supply chain radar with little warning.

Demand Forecasting	Sourcing	Replenishment & Allocation	Order Management	Facility Operations	Logistics
▪ One time Buys ▪ Returns ▪ New Product Introduction ▪ New planogram	▪ In-consistent ordering cycle ▪ Capacity visibility during ordering ▪ Actual need date during ordering ▪ Demand visibility to supplier	▪ Non-Replenishable Items ▪ Bulk move of items nearing shelf Life ▪ Unplanned deletes ▪ Multiple PO Changes ▪ Order Adjustment for Volume Discount ▪ Manual Overlays from store	▪ In-transit inventory ▪ Back room inventory ▪ DC Operational Capacity ▪ Lack of visibility to merchandise plan	▪ Omni Channel demand fulfilment ▪ One time buys ▪ Forward Buys ▪ Automation break down ▪ Back room inventory ▪ Un planned package size changes ▪ Returns ▪ Supplier lead time variability ▪ Emergency Orders	▪ Supplier delays ▪ Forward Buys ▪ One time Buys ▪ Emergency Orders ▪ Weather Conditions ▪ Break downs and accidents

Figure 4. Key Flow Blind Spots

These blind spots are a result of optimized local sub process KPIs, without a view of holistic strategic supply chain performance goals. Multiple unanticipated events can trigger hiccups in the supply chain flow.

Navigating flow with key tools

For an effective and proactive approach, it is critical to provide tools which help supply chain teams visualize the flow and subsequently smoothen it. The key components to effectively manage the flow are visibility, smoothening and optimization through predictive, proactive and corrective capabilities.

Flow Visibility

For an omnichannel supply chain, a Flow Control Tower (FCT) framework acts as a gyrocompass to provide visibility and direction for navigation. It is a key enabler for smooth sailing, and not only provides flow visibility but also maps constraints and senses any disruptors which may impact the flow. Additionally, the FCT provides alerts and recommendations to avoid greater operational costs or negative impacts to customer experience.

Flow Smoothening

While flow visibility is about proactive flow predictions, flow smoothening is about leveraging scientific algorithms to proactively sense the presence of issues and overcome them.

Here are a few algorithms and tools that may be used:

- **Stock build** to build up the inventory in anticipation of upcoming demand like for an event or promotion
- **Dynamic buffer management** to dynamically adjust inventory levels using near real-time demand
- **Capacity constraint reviewed purchase order** placing proper POs with vendors considering the available DC capacity and in-transit inventory
- **Upstream aggregation for slow moving products** to efficiently utilize capacity for downstream nodes by pushing slow and non-moving inventory to upstream nodes, thereby freeing up space for products in demand

Flow Optimization

Flow optimization is end-to-end supply chain flow management The end-to-end optimization of operations, addressing constraints and interdependencies of operations, improve flow and balance individual sub-processes. Simply put, it is predicting disruptors, proactively detecting blind spots, and correcting issues that have occurred. It involves all aspects of people, processes and technology to make flow work effectively without eroding efficiencies and profitability.

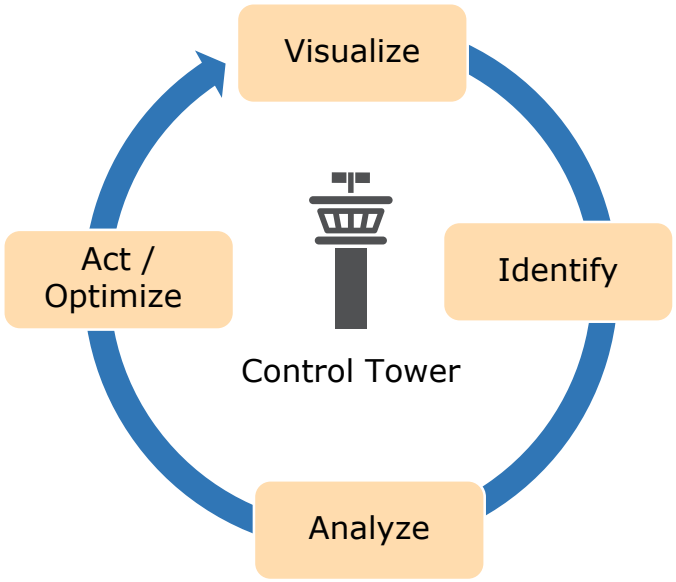

Figure 5. Flow Control Tower enabled Optimization

Conclusion

Successful retailers are ensuring focused attention to supply chain flow along with a detailed view into flow constraints, disruptors and blind spots which can be effectively managed with scientific tools and algorithms.

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