OPTIMIZING ECOMMERCE NETWORK INVENTORY FOR REDUCED LOST SALES AND UNPRODUCTIVE INVENTORY

Pull Logic

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Transforming Supply Chains with AI

Pull Logic's uniquely focused AI brings cutting edge technologies to solve the problem of lost sales and too much unproductive inventory, resulting in a more responsive and resilient supply chain.

WHITE PAPER

Problem Statement

Companies specializing in direct-to-consumer deliveries encounter a significant challenge in maintaining optimal inventory levels across various locations to meet consumer demands within specified timeframes, all while avoiding overstocking. Unforeseen fluctuations in consumer demand and supplier deliveries can disrupt even the most meticulously crafted strategies, leading to lost sales due to insufficient availability of desired products within desired timeframes, as well as excess inventory of less desirable items.

Pull Logic's Value Proposition

Pull Logic is founded upon the innovative research of Dr. Benoit Montreuil, focusing on intelligently aligning customer demand with supply chain operations. Dr. Benoit's research has simplified the intricacies of customer preferences and their associated trade-offs into a user-friendly availability-focused metric and optimization target known as the Product Availability Ratio (PAR), illustrated in Figure 1. Pull Logic provides a solution by dynamically orchestrating inventory deployment near customers, mitigating lost sales while simultaneously minimizing unproductive inventory, thus enhancing overall profitability.

Figure 1: Components of Product Availability Ratio (PAR)

Key Features

- **Product Network Approach:** Treating products as a connected network, with potential for substitution based on product characteristics and customer preferences.

- **Hyperconnected Facility Network Approach:** Considering facility nodes as interconnected elements in a network, enabling intelligent stocking, proactive transshipments, and inventory pooling to enhance agility and resilience in inventory management.

- **Smart Responsive Alignment:** Dynamic forecast-driven approach for aligning customer demand (Simulated via historical Sales and Inventory Positions) with supply chain operations. This facilitates real-time tracking and prescriptive management of key performance indicators (KPIs), as illustrated in Figure 2.

▮ **Algorithmic Expertise:** Harnessing a combination of smart rule-based heuristics, machine learning algorithms, optimization methodologies, and simulation-based testing to drive decision-making and enhance performance.

Sales
Tracking of sales through all channels (e-commerce & retail)

Inventory
Tracking accross the network (Fulfillment & Distribution Centers)

Operational Costs
Tracking various costs incurred as part of the solution

Demand Forecast
Dynamic updates and validation to ensure supply chain operational alignment

Product Availability (PAR)
Ensuring optimal assortment for all nodes in the network

Autonomy
Ensuring d-days r%-robustness for all nodes to protect from uncertainies and disruptions

Lost Sales
Tracking of potential lost sales due to suboptimal inventory deployment

Unproductive Inventory
Tracking of inventory beyond target autonomy not contributing to PAR

Digital Twin
Comparison of all the KPIs contrasting current supply chain model with PL models

Figure 2: Real-time Tracking & Prescriptive Management of Key Performance Indicators

Case Study

A major e-commerce-based retailer specializing in home goods with an extensive product portfolio comprising tens of thousands of SKUs and operating multiple distribution centers across the United States, has implemented Pull Logic to enhance their inventory deployment throughout the distribution center network. Previously, the company relied on traditional inventory management systems and static allocation methods within a rapidly changing environment, leading to suboptimal inventory levels and inefficient order fulfillment processes. Consequently, this resulted in extended shipping times and unsatisfied customers and therefore lost sales.

With Pull Logic's solution, the goal is to serve 99% of customers within 2 days, as shown in Figure 3.
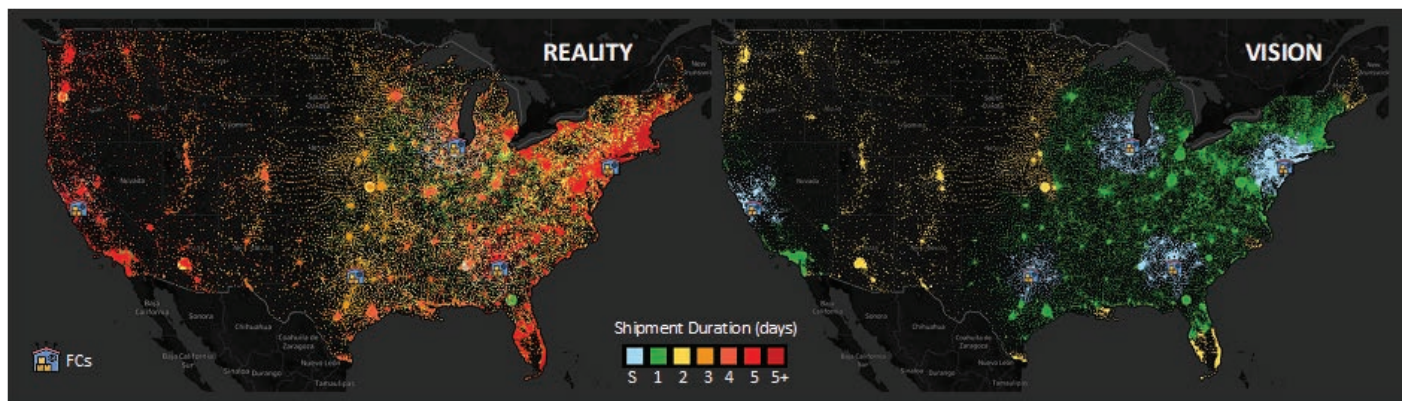
Shipment Duration		Same day (S)	1 day	2 days	3 days	4 days	5 days	5+ days
Proportion of Orders	Reality	20.08%	30.75%	36.83%	5.73%	4.28%	1.96%	0.37%
	Vision	31.92%	49.40%	18.53%	-	-	0.14%	-

Figure 3: Vision to serve 99% customers within 2 days (points denote customer orders)

Benefits for the ECR (E-commerce Retailer) with Pull Logic's solution include:

Achieve up to **99%+** product availability	Reduce uproductive Inventory **30-50%** without impacting service levels
Increase revenue & profitability **10-30%** without increasing inventory	Increase **10%+** customer satisfaction

Problems we Solve:

Availability Optimization:

■ How can we determine the optimal inventory levels and quantities at each location to minimize holding costs while ensuring products are readily available to meet customer demand?

■ How can we improve the accuracy of our demand forecasting to better align inventory levels with actual customer demand, reducing the risk of stockouts and excess inventory?

■ How can we incorporate substitution options effectively into our inventory optimization process to ensure we maintain product availability while minimizing excess inventory?

■ How much unproductive inventory can be reduced without impacting service levels?

Accolades

Gartner
Cool Vendor in Supply Chain

NRF
Innovation Lab

ATLANTA BUSINESS CHRONICLE
Startups to Watch

BEST STARTUP
Emerging US Analytics Startups

Conclusion

Pull Logic's innovative approach to view "product availability" as well as "lost sales" together with its AI-focused models and algorithms revolutionizes inventory allocation:

■ Higher sales by having products in stock close to the customer,

■ Reduced shipping cost, and

■ Ultimately, enhancing customer satisfaction and profitability

Contact us today to learn more about how Pull Logic can transform your supply chain and inventory management strategy.

Want to see a demo?

Email: **hello@pulllogic.com** or Call us at **404-939-5422**