

# Consumption-based Replenishment Redefining the Industrial Supply Chain

Since few companies can source material and produce all products in the volume required to meet a day's production, the solution lies in consumption-based replenishment. Consumption-based replenishment has its roots in lean manufacturing and "kanban" replenishment—a Japanese term for a card used to signal the need for inventory replenishment. Kanban now describes the "pull" method of keeping production lines optimally stocked with parts at the exact time and quantity needed. A simple analogy: Think of a carton of milk in the supermarket—as one carton is pulled off the shelf, another carton slides into its place, immediately restocking the inventory.

The cloud-based supply-chain solutions streamline the production schedules with customer demand and synchronize the supply with shop-floor consumption. It uses the consumption driven replenishment model to establish a true pull process across the value chain. The primary goal of the system is to right-size the inventory whether it is finished goods, work-in-process, or raw materials. Using a unique supply-chain-loop-based architecture, manufacturing companies can establish real-time collaboration with their customers and suppliers. This collaboration allows manufacturers to carry the right mix of inventory at the distribution center, shorten the lead time to their customers and improve the service levels through elimination of part shortages.

At an APICS (Association for Operations Management) meeting in Van Nuys, CA, late last fall, Nicole Smith of Zurn Wilkins (a Rexnord Company) shared the company's experience of reducing customer lead time from fifteen days to less than two days. She also shared how the company was able to reduce the raw material and WIP (work in process) inventory by twenty percent.

Rexnord is a diversified multi-platform industrial company that manufactures and markets power transmission and water management products. Revenue last year was \$1.3 billion and the firm employs nearly 7000 people.

Ultriva, based in Cupertino, CA, implemented a demand driven manufacturing model by providing full visibility, scheduling, and sequencing of production of customer orders at the cell level for one of the Rexnord plant in Indianapolis. Previously it took ten days before the order reached the factory floor; orders were scheduled on a weekly basis, causing an overall lead time of fifteen days.

The image displays two screenshots of a cloud-based supply chain management dashboard. The top screenshot is the 'Buyer Dashboard' and the bottom is the 'Supplier Dashboard'. Both dashboards feature a 'Home' section with 'Inventory Health' cards (e.g., 208 Items, 277 Items, 826 Items) and 'Alerts' lists. The 'Order Tracking' section shows cards for 'Cards' (e.g., 0, 2382, 5246, 5796) and 'My Routines' for daily and monthly tasks. The 'Supplier Dashboard' shows similar metrics (e.g., 15 Items, 20 Items, 292 Items) and 'Order Tracking' (e.g., 7 Cards, 514 Cards, 514 Cards, 514 Cards). Text overlays on the image highlight key features: 'RYG dashboard indicators show inventory health', 'Built-in Workflow & business rules engine', 'Complete order tracking', 'Automated email alerts based on pre-set business rules', 'Daily/monthly business process routines', and 'Single version of the truth – buyers & suppliers see the same view from their perspectives'.

As a manufacturing journalist it was a pleasure to interview Narayan Laksham, Ultriva founder and CEO. He founded the company 1999 with a vision of building an organization that develops customer driven solutions which guarantee high value, quick deployment, and measurable return on investment. Laksham has written articles on several lean topics including "When Push comes to Pull Kanban wins." He is also a co-inventor of the patent pending "Inventory Optimization Tool." This recent conversation revealed how much has changed in the supply chain during the intervening conversation, when first interviewed six years ago.

Laksham commented about the Rexnord situation, noting, "We facilitated the orders to be directly dropped at the manufacturing cells within 15 minutes of receipt. If the order was received before 2 pm it was manufactured and shipped on the same day; if after 2 pm, it was shipped the next day. Currently over 30,000 finished goods SKUs (stock keeping units) are being manufactured using this advanced process."

After the initial process, Rexnord implemented the supplier kanban modules across several plants in the US, to ensure that the raw materials were available to meet demand. More than 22,000 parts are being replenished by 178 suppliers across these plants. Finally Rexnord implemented internal kanban to set up a pull system from its final assembly to upstream work centers.

In an effort to better understand why supply chain managers are frequently broadsided with wrong size inventory, Laksham explained, "The inability of current supply chain management systems to support true collaboration and execution between manufacturers and their supply chain

partners result in supplier whiplash, poor delivery performance, and lost revenue.”

The mission of providing greater transparency and visibility between manufacturers and supply chain partners allows manufacturing customers to experience an average 35% increase in inventory velocity. The across-the-board improvements in employee productivity and supply chain decision making has delivered even greater value through ultra-responsive, demand-driven supply chains.

Scott Harvey, vice president of Operations at CareFusion, another enthusiastic user of the technology remarked, “The cloud-based platform has a low barrier to entry and allows for an incredibly high level of standardization across all of our suppliers, which made it the obvious solution. As a medical device company working in a highly regulated industry, it is imperative that we maintain a high level of transparency and accountability.”

During the extensive interview with Laksham, he concluded that the shift for most manufacturing companies is becoming demand responsive. “Returning to a more basic question of the objective of supply chain management is vital. The goal is to source, make and deliver the product from the point of origin to the point of consumption in the least amount of time at the lowest cost. Given that goal, the two most important attributes of supply chain management are responsiveness to the velocity of product flow, and the ability to move products quickly and with agility. These attributes enable the transition from push-based replenishment to pull-based replenishment. To focus on these attributes, it is vital to look toward the customer, the customer’s customer, or the end-user of the product.”

The kanban principle can be effectively implemented with the use of technology, as consumption-based replenishment has evolved from its simple card-based roots into highly sophisticated software applications. These applications can help manufacturers determine the most optimal inventory levels for operations, and can rapidly recalculate efficient replenishment trigger points as demand varies over time. By taking a customer-centric approach to daily operations, manufacturers focus investments on enabling operations to build only what is needed to replenish what the customer has ordered. This paradigm shift results in companies embracing a goal of delivering the products customers want, when they want them, and in the quantities they want.

#### **LEAN TECHNOLOGIES IMPACTING THE INDUSTRIAL SUPPLY CHAIN**

The future of lean technologies indicates that supply-chain solutions will be increasingly required to meet the demands of the marketplace. Collaborative Supply Portal (CSP) must manage raw material replenishment, Lean Factory Management (LFM) will manage shop-floor schedules, and Collaborative Demand Portal (CDP) will be required to service distribution centers, dealers and OEMs

all focus on the execution side of the factory floor. Lean planning must cross-over to procurement as well in the form of a collaborative request for quote (RFQ) module. RFQ technology allows buyers and suppliers to collaborate easily and effectively in a bidding process. The iterative process tracks and traces the bids in real time until a winning bid is converted into a purchase order. The collaborative Planning Module integrates planning data with execution and establishes a feedback loop.

It is all about leaning the supply chain. In the past manufacturing was vertically integrated and the suppliers were located within a short radius. Manufacturing today is less integrated and the suppliers are global. Only through supplier collaboration, and real-time flow of order, shipment and receipt information can be controlled and automatically computed. The result is the next important step of lean—kaizen, or continuous improvement. Manufacturing is more competitive than ever with shorter lead times, higher service levels, exploding numbers of finished good SKUs and thinning margins. Laksham points out, “The focus of leaning in manufacturing was concentrated on streamlining the factory floor, alignment of production lines, optimization of space, and standardizing of operating procedures. One key area which was not touched was the supply chain material replenishment. Given that purchase parts could be as high as 60% of manufacturing costs, applying lean methodologies to this process is critical. As excess inventory eats the margins, part shortages reduce customer service levels and result in lost revenues.”

The plant floors have been made lean. Now industrial firms are eliminating waste by applying lean principles to supplier and customer collaboration. This combination will result in sensing demand changes and synchronizing supply resulting in right-sizing of inventory across the respective transaction points.



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