



# The Lean Supply Chain

## – Electronic Kanban and Collaborative Supply Portals

By Bill Swisher

## Extending Lean across the Supply Chain

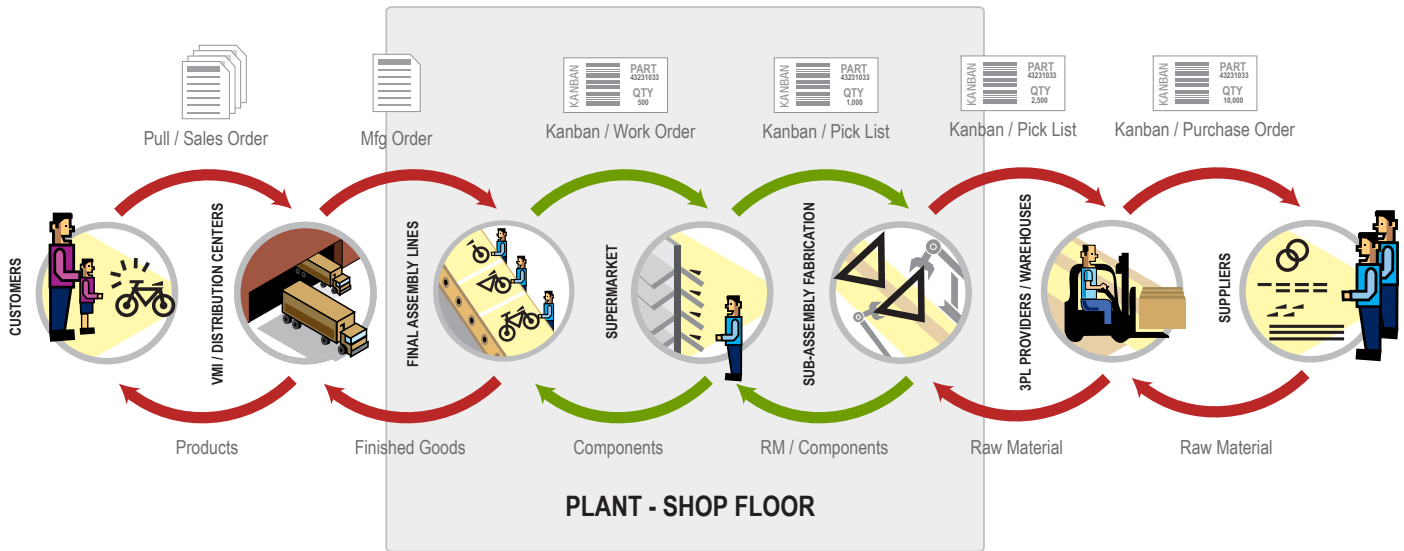
Lean manufacturing has become the de facto best practice across most manufacturing companies. Companies that have embraced lean principles have reduced their lead-times, improved quality, lowered inventory and engaged their employees. An important element of many companies' lean initiative has been the implementation of pull-based material replenishment systems, often referred to as **Kanban**.

The reason Kanban is pointed to as a key enabler of lean manufacturing efforts is that material availability is paramount to a factory's ability to respond to changes in demand. Regardless of how flexible or efficient a manufacturing company is, how committed its employees are, how well-designed or balanced a plant is, the bottom line is that without the necessary parts or material, stock-outs will occur and shipments are missed.

## Why Kanban Systems Work...and why they FAIL

The use of Kanban in manufacturing is usually credited to Taiichi Ohno, the renowned, former Toyota executive who formalized the Toyota Production System. His book, *"Toyota Production System, Beyond Large-Scale Production"* describes how Kanban is used to signal production and material replenishment. When Ohno wrote his book in the 1970's, Kanban systems were typically executed using manual, printed cards. These cards were preferred over electronic systems because physical cards are very visual, a key tenet of lean manufacturing and because electronic systems were still very new, untested, and expensive.

Kanban systems work because they eliminate waste. Waste such as the time lag inherent in MRP (materials requirement planning) logic, the excess inventory that piles up when MRP plans and buys material that is not needed when forecasts are inaccurate, and the waste associated with counting, adjusting and re-stocking material. Kanban is simple to use and triggers the replenishment of material based on what is consumed, not what is forecasted.



Unfortunately Kanban can fail. In complex manufacturing environments, with thousands or tens of thousands of purchased parts and fabricated components, physical Kanban cards will be lost or damaged. In large plants, manual card systems are still plagued by time lags and often require excess overhead as Kanban managers or expeditors attempt to handle demand spikes or seasonal orders.

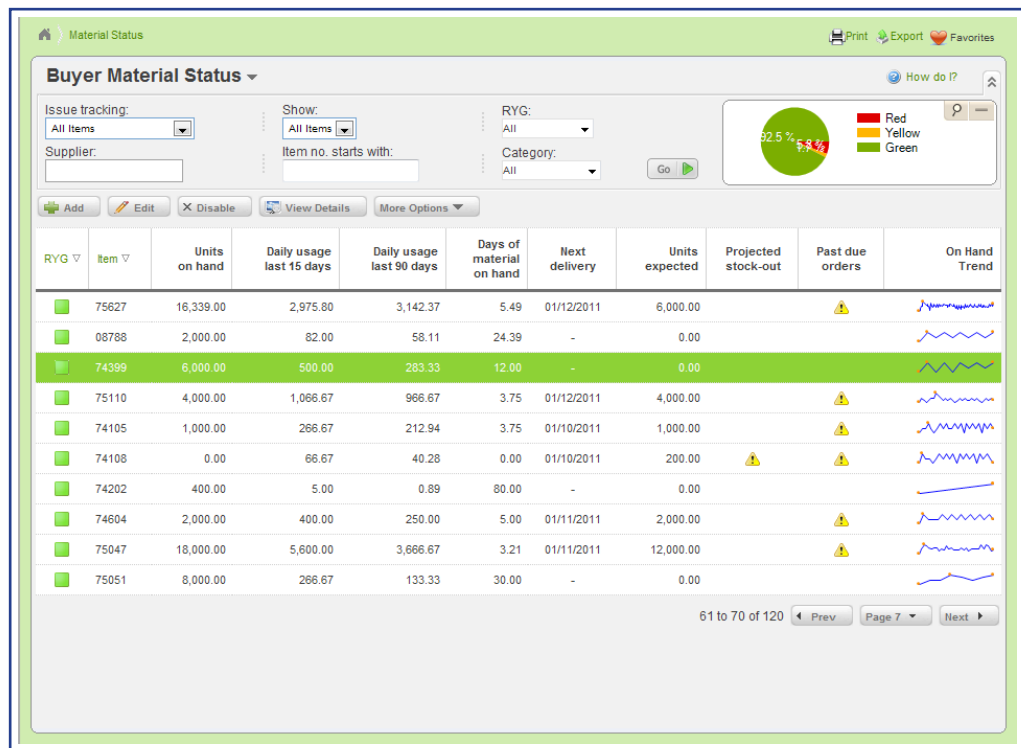
In addition, not all parts or materials are best suited to be managed by a Kanban system. There are certain parts that are best purchased based on orders or forecasts because of their high variability of demand or because they are rarely required. Carrying any quantity of these parts on-hand is impractical. The biggest instance of Kanban systems failing is when manufacturing companies try to extend manual Kanban to their extensive supplier network.

## How the Internet has changed Kanban forever

Many companies that have had success with manual Kanban systems within their plants have failed when they have attempted to extend Kanban to their suppliers. In order to manage the thousands of parts and materials that are part of a manufacturer's supply chain, all the part's characteristics and supplier capabilities need to be considered: Is the part even a candidate for Kanban? What has been the part's historical usage? What are the ideal container sizes? What is the real supplier lead-time? What safety stock should be employed? Does the part have an ideal order quantity? What are the supplier's capabilities to respond to a Kanban signal? These and many other considerations should be examined

before a Kanban system is implemented.

Once the Kanban system is established, other factors come into play. How do I communicate with a supplier that provides both Kanban and non-Kanban parts without causing confusion? How do I handle spike demand to ensure my Kanban system doesn't run out of parts and cause a stock-out? How do I handle seasonality? How do I deal with multiple suppliers that supply the same part? How do I address vendor managed inventory or consigned inventory with my Kanban system? How do I handle lot traceability in a regulated industry? What is the impact on Kanban for my global suppliers with long lead-



times?

It is these and many other real world issues that cause manual Kanban systems to fail. That is the bad news; the good news is there is a solution. Electronic Kanban will address all of these challenges and many more if electronic Kanban is executed via a Collaborative Supply Portal. Collaborative Supply Portals leverage the Internet as a medium to facilitate and execute all of the material replenishment requirements of a manufacturing company delivering benefits to both the manufacturer and their suppliers.

Collaborative Supply Portals that leverage the Internet provide a low-cost, easy-to-use platform for suppliers to access demand signals and to acknowledge the receipt of orders and the shipment of goods. A Collaborative Supply Portal also provides buyers with real-time visibility of those acknowledgements as well as, shipping and receipt transactions. This real-time visibility provides all of the trading partners with the ability to be proactive in responding to changing demand. In addition, Collaborative Supply Portals allow trading partners to get immediate exception alerts when orders spike, when suppliers are unable

to commit to orders, or when shipments are late.

## **Electronic Kanban is a Closed Loop System with built in Fail Safe Processes**

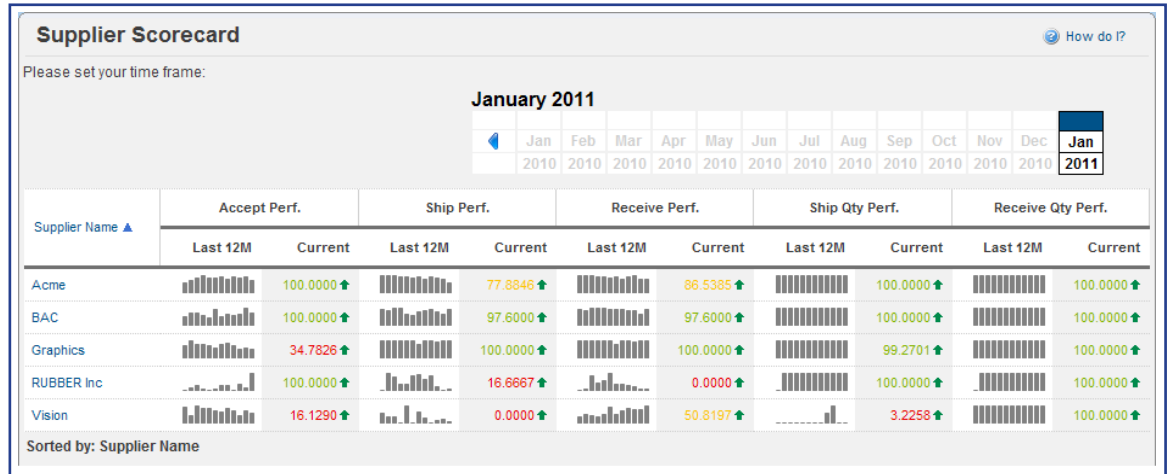
Electronic Kanban actively controls the demand signal as it propagates throughout the value stream. Material requirements are represented by a series of inter-connected closed loops between consuming and supplying entities. Signals are automatically released (usually via a barcode scan) from consuming entities to supplying entities based upon the Kanban sizing, minimum/maximum re-order points, and vendor managed inventory. Demand signals may come from customer orders, from replenishment signals provided by consuming work centers or inventory supermarkets within a plant, between related plants, or external vendors.

Electronic Kanban eliminates lost cards or misplaced inventory. This ensures a FIFO (first in, first out) inventory management process resulting in less exposure to obsolete inventory, especially in the case of inventory that is subject to high engineering change or material with a short shelf life. Because electronic Kanban releases and receipts are typically triggered via the use of bar code scanners, these transactions can be designed to eliminate manual data entry errors or duplicate transactions. These fail-safe processes eliminate errors that result in waste and non-value added activity.

## **Continuous Improvement to support Lean Excellence**

Lean practitioners recognize that lean excellence can only be achieved in an environment of continuous improvement. In order to improve, manufacturers need to have baseline metrics and a method of tracking performance against those metrics. Electronic Kanban provides the basis for these metrics and provides real-time status of performance. Metrics such as supplier on-time delivery, fill rates, replenishment cycle times and inventory turns are all key metrics that can be tracked, analyzed and acted upon to facilitate continuous improvement.

Furthermore, since electronic Kanban is facilitated via supply portals, all the performance data is updated in real-time, providing a single version of truth for all trading partners. This eliminates the lack of consistent data that is created when customers and suppliers are using independent reporting systems.



## Conclusion

Lean manufacturing and Kanban are proven manufacturing methodologies but the advancement of electronic Kanban and the use of Collaborative Supply Portals has allowed companies to take their lean manufacturing efforts to a new level. The era of implementing lean manufacturing without software is over. Lean systems and Collaborative Supply Portals have now been in use for over a decade and have been adopted by many leaders in the manufacturing industry with amazing results.

## About Ultriva

Founded in 1999, Ultriva provides lean Supply Chain applications to help companies control demand and supply. Ultriva's Collaborative Supply Portal, Lean Factory Management and Demand Driven Distribution are deployed in over 145 plants in manufacturing companies around the world including Trane, Ingersoll Rand, Dresser, Thermo Fisher Scientific, Franke, AGCO, A.O. Smith and Regal Beloit.

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## About the Author

Mr. Swisher started his career at General Motors - Chevrolet Motor Division and has over 20 years of experience in lean manufacturing. Mr. Swisher has held management positions at leading lean consulting firms including JCIT, Breakthrough Management Group and TBM Consulting. Today Mr. Swisher leads the business development team at Ultriva.

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