Stop the Chaos & Start Kanban!

Whitepaper

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Kanban

Businesses that rely on material movement are compelled to find ways to manage that material throughout their supply chains, improve quality, reduce cost, and deliver on time. That pursuit of excellence spawned lean manufacturing. A traditional (non lean) supply chain pushes inventory through the system, causing rescheduling, expeditors, unexpected setups resulting in chaos, resulting in longer lead times, lower profits and dissatisfied customers. A lean supply chain pulls inventory through the system, creating one piece flow wherever possible and utilizing Kanban where flow is not possible.

Kanban Defined

Kanban is a visual system to manage inventory. There are different ways you can signal when to produce more parts. There could be a line on a wall, an empty spot on a shelf, a card and many other options. A kanban card is the most common method. When the card is pulled, that is the signal to replenish what has been consumed. It is used to eliminate overproduction and a way to link disconnected processes. It helps create a lean supply chain which eliminates unevenness, instability and waste in all enterprises throughout the chain. Kanban helps to reduce lead times and improve on time delivery which ultimately improves customer satisfaction.

Traditional Supply Chain

A traditional (non lean) supply chain was intended to buffer you from demand and the Market place; therefore in an effort to mitigate risk, each enterprise quotes long lead times so they don't have to hold inventory and so they can make the required parts in time to respond to purchase orders. The long lead times drive up the order quantities, which drive capacity spikes through the entire supply chain. The result is longer lead times due to the larger order quantities. Profit is compromised at all companies in the supply chain as we reschedule and run off a hot list for that week. The early version was for the vendor to hold all the inventory which drove costs up, drove lead times up even farther as each company in the Supply Chain fails to meet the delivery requirement. This can cause the end customer to increase their order sizes and space them out further which causes more unevenness and capacity constraints the vicious circle ensues. Every part number in each enterprise goes through this cycle, encompassing potentially thousands of parts and hundreds of customers at each company in the supply chain. There were partnerships in words only between customers and suppliers.

Example

Before implementing kanban, our lead time to our customers was approximately 10 weeks, if we did not have the parts in stock. We would start with the first up stream process (closest to the supplier) and push material through each operation, through the supply chain, to the customer. If we didn't have the right parts in process, we then had to push more orders into the system, which would cause us to push orders aside to get another order through, it wouldn't allow people to work efficiently they had to wait for a "hot list" creating more chaos. What is the alternative? A lean supply chain or material pull system.

What is the Difference?

The difference between the traditional (non lean) supply chain and a lean supply chain is remarkable ….The traditional is based on a min/max level also knows as safety stock. We manufactured goods based on a forecast or historical data "just in case" we needed it. It also provided three ways to buffer companies from the market place. The first is inventory which was manufactured and stored base on min/max levels. By having this excess inventory you run the risk of product beginning obsolete due to engineering changes or changes in the Market place. The second is excessive lead times which we needed to buffer from excess noise in the system (expediting, rescheduling, etc), change in demand, long setups and bad dates. The third and most expensive is excess capacity this is when we run machines because we have the availability to run them even though we do not currently have any customer demand which will result in more inventory. With a lean supply chain we are moving from "just in case" to "just in time" which means we will run the parts when we need it and only the quantity that we need. The lean supply chain that utilizes kanbans to link the customer to the supplier is eliminating the buffers of the traditional system. The lean supply chain is going to reduce the amount of inventory because we are only replenishing what has been consumed. This will allow us to increase our response to changes in the Market place and engineering changes because we do not have excess inventory. It will eliminate slow moving and obsolete parts. We are eliminating the excess noise in the system by creating a kanban with our customers, this will allow us to reduce our lead times and allow people to work efficiently as

opposed to a hot list. We are not going run machines that are not scheduled. We will move personnel around and train them in other areas that we have bins to fill so we have a cross functional work force.

Implementation of a Lean Supply Chain using Kanban

To implement a lean supply chain, we create one piece flow. One piece flow is when parts move through different operations without any work-in-process. Some of the benefits are it builds quality into the process, it creates flexibility, high productivity and many more. When situations arise where we can not achieved one piece flow like long setup times, the distance between the operations is too far, or some older technology is not designed to be utilized in this way. These are situations where we utilize kanban supermarkets. These supermarkets contain right-sized amounts of inventory that, allow seamless production flow to occur when it is not possible to physically link processes & achieve flow. This pulls material through the supply chain starting with the downstream process (closest to the customer), which pulls from the upstream processes (closest to the suppliers), pulling only the goods that are needed, only when they are needed and only the required amounts. Inventory is controlled to have the correct mix of all components needed, in the right places, and we are pulling from the upstream processes. This results in reducing lead times down to only transit time. Since suppliers and customers are physically disconnected, it is not possible to create true production flow and reap the associated benefits like reducing work-in-process, improve quality by reducing scrap, improving on time delivery, and lead times could be as low as one or two days. By teaming together and linking our processes with kanban supermarkets, we can strengthen the value stream and improve our total performance. The next step in the inventory supply chain is to evolve to consignment (which will allow better cash flow, even shorter lead times and a better competitive market).

9 Reasons Why to Implement Kanban?

The reasons to use a material pull system are:

1. Ability to manage and balance the flow of material through the supply chain
2. Elimination of the waste of handling, storing, expediting, obsolescence, repair, rework, facilities, equipment and excess inventory (work-in-process and finished goods)
3. Replenishing only what has been consumed instead of a forecast
    a. This is will allow a faster response time to change in the market place and thus keep current with the market place.
4. It provides a visual control of all resources which everyone can understand
5. It is a simple process that allows flexibility and eliminates chaos
    a. Expediting, rescheduling, premium freight etc

6. Improved customer satisfaction
    a. Reduced lead times
    b. Improved on time delivery performance
    c. Improved responsiveness
7. Improved efficiencies
    a. Making only what is needed, when it is needed
    b. Reduce setup time by making part families
    c. Visual goal of success to eliminate stock outs
8. Easier scheduling
    a. Common order quantities based on actual usage
    b. Visual signals to produce as opposed to relying on a forecast
9. Higher profits (margins)
    a. Managing the 3 M's
        i. Manpower: used to effectively to reduce lead time inventory, and create a cross functional work force
        ii. Material: creating pull for raw and finished goods inventory.
        iii. Machine: building product based on demand (pull of a card) as opposed to a forecast.

Basic Kanban terms

- **Kanban Card -** physical card that is used to prompt an action to buy or produce a part
- **Bin** - is the physical location of the inventory on a rack or shelf with an amount of inventory that corresponds with the quantity on the kanban card
- **Bin System** - a kanban system that utilizes bins and has one kanban card per bin
- **Kanban Quantity** – the amount consumed and how quickly we can fill it
- **Cycle Time** - The maximum time required for the kanban quantity to be refilled (time it takes to start the raw material until it is put in the supermarket.
- **Supermarket** - The racks & shelves where the kanban inventory is kept
- **Spike** - A temporary or unusual increase in demand for a part which means we need to make more product for a short period of time

Rules to be Successful

In order to be successful with kanban, rules like the some of the following must be implemented and adhered to. When the bin is empty, you must turn in the kanban card. The cards should not be turned in unless the bin is empty. Always pull from one bin at a time, until empty. To help employees conform to the rules, you may use a visual cue; you can create pull from here arrows and point it to the bin that should be pulled from. The most important rule is to keep track of the kanban cards and turn them in on time. If a kanban card is lost or not turned in at the right time it

will result in a stock out situation. A stock out situation is when all bins are out of parts, and will happen when these rules aren't followed. When a stock out situation occurs, it creates capacity constraints on the supply chain and could result in pushing material as opposed to pulling material, resulting in a lot of expediting and chaos. . This is the only mechanism that will prompt an action to fill the bin.

Another rule is to always replenish a bin with the full quantity and establish rules when it isn't possible, such as utilizing a partial fill notice to keep track of how many pieces you have replenished so far. If you don't follow this process, it may result in not putting the kanban card back on the shelf with the parts, thus when the bin empties, again no card will be triggered to replenish. Keeping the bins organized is a key concept to the success of this process.

Best ways to keep the bins organized

- Keep the area and shelves around the bins neat & organized
- Keep cards & card holders in good condition
- Implement a card tracking system to ensure cards are not lost
- Keep the bin sections sized properly (no extra boxes outside of the bin locations)
- Rotate the stock properly, FIFO (First In First Out)
- Putting parts away correctly
- Keep an eye out for these potential problems
    - Parts are present in a location but the card is missing
    - Card is present in a location but there are no parts
    - Partial quantities in more than one bin
    - Parts that are put away in the wrong location

Summary

Creating kanbans with customers is a great way to reduce lead times and improve on time delivery. It goes beyond focusing on an order and is a partnership between the customer and supplier. Each company yields benefits from this process. The customer sees shorter lead times and increased on time delivery. The supplier sees the same benefits and increases customer satisfaction. Kanban creates evenness but does not force you to be rigid. Kanban allows flexibility as demand fluctuates. It's a great way to reduce inventory and improve inventory turns. Implementing kanban is an excellent way to improve the business partnership and communication between both companies. This will give you a competitive advantage which will maintain or increase your market share.

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