

PULL (Kanban) SYSTEMS

(Responding to the Pull or Order of the Customer)

Steve Krar

The concept of pull in Lean production means to respond to the pull or needs of customers. Lean companies design their operations to be more responsive to the varied and changing needs of their customers. Lean companies that are able to create such an operation can avoid the more traditional batch-and-queue method, which is generally acknowledged to be the worst way to process material through a factory. A more continuous flow results in items being moved immediately from one workstation to the next as soon as they are ready. Planning for the delivery of a product to customers becomes more efficient and demand from customers becomes more stable.

The word Kanban is Japanese for instruction card or sign board. The Kanban is used to signal the need for replacing or refilling materials necessary for production. There are a variety of ways that the signal can be sent. Actual cards, that accompany goods through the production process can be used to keep track of current inventory. However, something as simple as the arrival of an empty container at an upstream processing station is a clear signal that the parts that were in the container have been used and more are needed. Kanban can be used in manufacturing systems where the product is manufactured to the pull of market demand.

Pull Production Focus

A Kanban card can be generated to identify production of part(s) to replenish in-house inventories, a withdrawal of product for shipment to a customer, or to signal the replacement of raw materials and components. Using Kanbans there must be a purchase or an order to generate the card. The product is pulled through the production sequence based on the order from the customer.

Pull/Kanban is a part of the Lean Production or Just-in-time (JIT) manufacturing process, applying Lean principals to eliminate waste. Every method in the Lean production system focuses on the elimination of waste. Lean principals should not be limited only to manufacturing operations, all areas of a company can benefit from the application of Lean principals. Reduction of waste ensures lower costs, higher quality products, and better service and delivery.

Pull Production Defined

Pull/Kanban is based on the concept of building products to actual demand and not to



forecast. A company should not make large amounts of stock and then try to sell it. Companies need to be aware of the market place and what the customers wants. The pull system uses visuals to signal when parts need to be replaced.

Pull Systems/Kanban control the flow of resources in a production process by replacing only what has been consumed. This is a customer-order driven production schedules based on actual demand and consumption rather than forecasting.

Pull vs. Push

The key differences between pull and push systems are **Pull** is to make to order, while **Push** is make to stock. Pull production systems are usually compared to the Push system of production where production is pushed from one operation to the next through the factory whether the product is needed or not. The pull system is the center of any synchronized factory, it works by working backwards, using signals or cards to trigger or start production. The process starts at the finished products warehouse or the shipping area. When a customer orders a product, the process triggers the previous operation to replace it; signaling more products is needed. The process continues backward through the factory to where raw materials are withdrawn which in turn triggers the supplier to ship the raw materials.

Production Challenges

In today's global economy consumer are demanding quicker turnaround times along with a larger variety of quality products and specific features. Being able to predict variations in customer demands makes forecasting a complex process. As trends change so do consumer demands for different specifications sizes, colors, styles, and accessories for the products. This makes it nearly impossible to provide the products, or predict, what the consumer will request. The pull system eliminates the guesswork by making the consumers order the trigger to start production.



Purpose

If the demand for products always stayed the same, companies could operate at maximum efficiency, producing only what was required and no more. But in reality the demand for products can vary greatly from the day, week, or month. An organization must have enough

capacity so that there are enough people, machines, and materials available to produce what is needed at times of peak demand. When there is a smaller batch of work to be done, one of two things can happen; the underutilization of people, machines, or materials or overproduction.

When Kanban systems are used correctly no overproduction occurs, which is the largest source of waste in most manufacturing companies. The Kanban system provides a company the following positive results:

- Employees know exactly what is required based on the conditions in the workplace.
- Employees do not need to be assigned a job, they are allowed to perform work when and where it is needed.
- Unnecessary paperwork is eliminated and the possibility of making an error is reduced.
- The skill level of employees is increased and the variety gives them more satisfaction from their work.