Kanban the Toyota Way

An Inventory Buffering System to Eliminate Inventory

KANBAN THE TOYOTA WAY: AN INVENTORY BUFFERING SYSTEM TO ELIMINATE INVENTORY

First edition. October 15, 2020.

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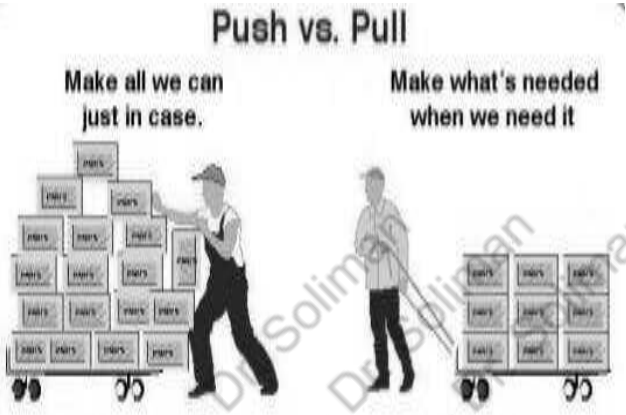
Introduction

For decades, production has relied on the old principal mass production invented by Henry Ford where parts are being produced in batches and pushed to the market hoping for a customer to buy. Things are based on forecasting and sales were too optimistic. This system disconnects the factory from the customer. The factory is producing only to a forecast. The production at the supplying (assembly) process also called customer process is being regulated by a schedule.

Pull is one of the lean principle. The production at the customer process is being regulated by the customer's process withdrawals from the supplying process's store, rather than by a schedule. A pull system begins with the customer, then backs up through production where the user goes to get-or pull-parts from supplier operations in just the amount needed, only when needed. This continue all the way back to raw material suppliers so that every segment

of the business, from grower or miner to consumer, is tied together like links of a chain.



This may sound easy but hard to implement. Toyota made this only after establishing a production cell or one-piece flow, and after the whole operation is working to takt.

Mistakenly, many companies inversely apply lean by trying to introduce a pull system in an environment where batches are being produced and no one-piece flow process at time.

Pull Concept VS Push

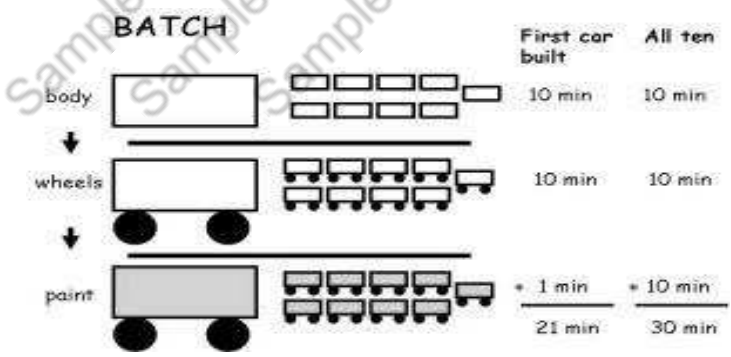
Pull concept present the lean thinking (invented by Toyota), while push present the mass productivity thinking (invented by Henry Ford). One of the most debate issues is the use of mass production technique. The approach involves making as many parts as possible using the maximum available resources and all available machines. It doesn't take into consideration the customer demand rate or the sales forecasting.

Furthermore, if you are making 500 parts, and there were a problem with the production process, a quality failure can occur with all of those parts. Problems are hidden with the mass productivity approach; it will be also so difficult to discover where the error is coming from. So the root causes will remain hidden.

If a supplier process is producing with mass productivity and building too much work in process WIP inventory, the

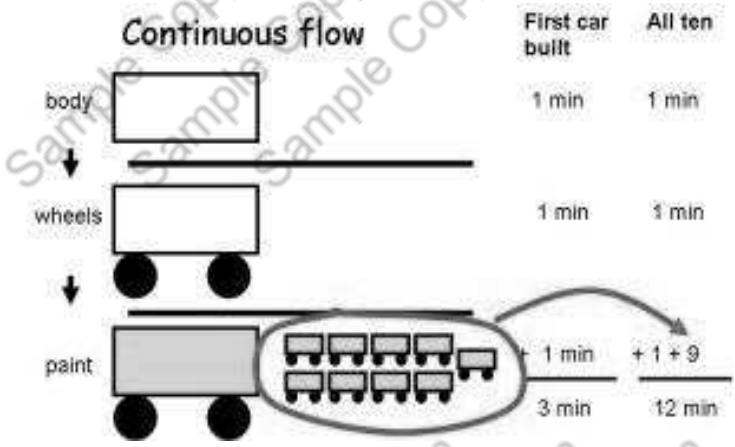
downstream process will find all what it needs even if the supplier process has been went down suddenly. The downtime is hidden, and is not important; no one will consider preventing it in the future unless it has an obvious affection on the production process. Also if the operator at the supplier process is spending time getting tools or parts, the downstream process is still receiving the parts it needs to make.

Mass productivity creates the inventory problems, hides many wastes behind it, and effect the delivery time to customers. If you are assembling one piece of product in 3 minutes, waiting for 10 pieces to be assembled will take 30 minutes. The cycle time of one piece became 30 minutes although the add value time is only 3 minutes.



If we assume it takes 1 min per car at each stage, then we would expect the following results:

Time to build first car: 21 minutes
Time to build first batch of ten: 30 minutes.



Time to build first car: 3 minutes.
Time to build first batch of ten: 12 minutes.

With pull concept, and producing only what is needed for each process step and between the production lines, there will be a minimum work in process WIP inventory. If a process is went down, the downstream process won't be able to receive parts, and the upstream process won't be able to produce and build WIP inventory. Problems are now surface and clear. And everyone will strive to fix downtime and prevent the recurrence of this downtime.

Advantages of pull system:

- ✓ Problems are surfaced quickly.
- ✓ Produce according to the customer needs saving cost & resources.
- ✓ Reduce the WIP inventory.
- ✓ Shorter lead time.
- ✓ Increase value-added work.
- ✓ Better quality control.

Pull and Flow

The expressions "pull" or "pull framework" are regularly utilized conversely with flow stream. It ought to be gotten that, similar to stream, pull is an idea, and the two are connected, be that as it may, not the equivalent. Stream characterizes that condition of material as it moves from one cycle to another. Pull directs when material is moved and who (the client) discovers that it is to be moved.

Unlike push which has no defined agreement between the supplier and the customer regarding the quantity of work to be supplied and when, pull has three featured things as described by liker (2005):

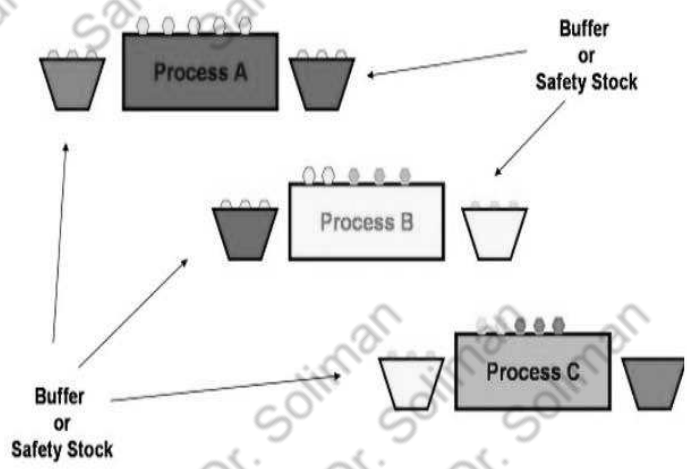
1. Defined: A characterized concurrence with determined limits relating to volume of item, model mix, and the sequence of model mix between the two parties (provider and client).
2. Devoted. Things that are divided among the two gatherings should be

committed to them. This incorporates assets, areas, stockpiling, compartments, and so forward, and a typical reference time (takt time).

3. Controlled. Basic control strategies, which are outwardly evident and genuinely obliging, keep up the defined arrangement.

The kanban "sign" is one of the apparatuses utilized as a component of a pull framework. The kanban is basically the specialized technique and could be a card, a vacant space, a truck, or some other flagging technique for the client to say, "I'm prepared for additional." There are numerous different components too, including visual control and normalized work. On the off chance that the three components of pull are appropriately introduced, an "association" is shaped between the provider and client measures.

The three components direct the boundaries of the association and its family member strength and "snugness."



Creating a flow with visually defined agreement.

Pull and Teamwork

You can't use a pull system only with your customers without connecting it to your suppliers and throughout the value chain. You need to tell your supplier to deliver parts to you more frequently and on daily basis. Vendors may resist at first, but you have to explain to him that frequent deliveries mean minimum amount of holding inventory raw material, as well as the cost of carrying. The space needed to store all of these parts will be freed. The free space allow more business grow and future expand of business rather than being wastes in sluggish materials. The material movement cost will be reduced, and the amount of resources required to move material will be minimized. The finance team will no longer have to track the excess inventory. And once you get the supplier to deliver to you on daily basis, the risk of running out of stock of those parts is eliminated.

At Toyota, pull principle is the key to avoid over production waste. You want to

deliver to customer what he wants, when he wants and in the amount he wants. You want to eliminate inventory but keep a little buffer to protect your customer. This buffer is based on customer demand not on an internal schedule or plan like what many companies are still doing.

Think of a pull concept like a supermarket. The supermarket has a warehouse. This warehouse is the shelves. The supermarket stock items on shelves based on the customer demand experience and keep a little stock for future demand. When customer take something from the shelf, it will be replenished. A market attendance should come regularly and check what has been taken and replenish the items. A pull system mean the company is tied to customer. The company is no longer producing based on schedules and plans that in many cases based on machines capacity.