

Kanban Overview

Overview

Kanban is a Japanese word that literally means sign board or sign. In the context of production control, kanban refers to the visual signals that authorize the production or movement of items.

Kanban are sometimes referred to as the nervous system of a lean production system. Just like our human brains send instructions to our various body parts, a kanban system gives production control instructions to each and every work area. It does this by connecting Information flow with material flow by attaching kanban cards to the actual goods.

Development of the Kanban System

The Kanban system was developed by Taiichi Ohno of the Toyota Motor Corporation as a way to make Toyota's vision of Just in Time manufacturing a reality on the production floor.

Ohno's original aim was to stop overproduction in his machine shop, which was creating large inventories and costing a lot of money.

Mr. Ohno was inspired to create the Kanban system by the product replenishment methods he observed in American supermarkets. What caught his attention was the way shelves were restocked with goods only after products were consumed – in other words “pulled” – by customers.



How the Kanban System Works



In the broadest context, kanban is a tool of the Just In Time system. At the most basic level a kanban is a signal that authorizes the production or movement of items.

We often use a chain lying on the ground to visually demonstrate the difference between a kanban, pull-based system, and the traditional push system that doesn't use kanban. When we attempt to move the chain by pushing it we end up with the type of situation shown in the image above. Just as the chain is uneven and loose, push production systems often create

uneven inventory levels resulting in having too much of the wrong inventory and not enough of the correct inventory.

But when we pull production through the system, meaning we only produce product when it's required, the chain is tight, resulting in all processes having the right inventory when they need it.

Limitations of the Kanban System

With this said, kanban systems are far from perfect. You see, the Kanban system can be full of wastes such as excessive handling, inventory and processing.

In fact, the ideal Just-in-Time production system would use no kanban at all so long as it produces what the customer wants, when they want it, in the quantity they want.

In other words, our goal shouldn't be to implement a kanban system. Instead, our goal should be to true, one-piece, flow.

Different Functions of the Kanban System

Let's now move our attention to the different functions of kanban. First of all, a kanban sets limits within a production system.

You might think of a kanban card as a type of currency that's exchanged for an item much like money is used to buy parts or materials. If there's no kanban – no items get moved or produced.

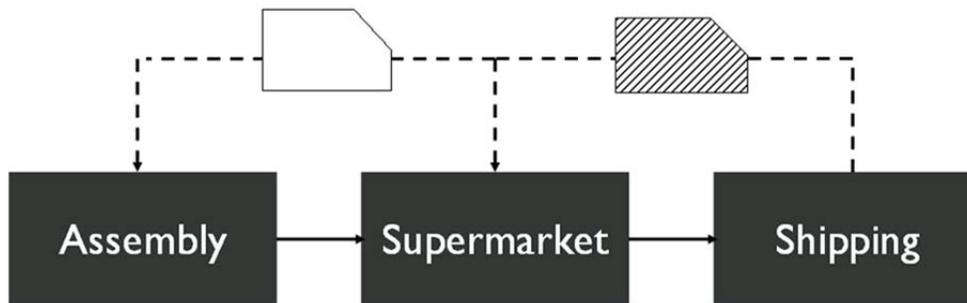
When a kanban system functions correctly, nothing is ever made or moved without a kanban signal of some kind. This enables companies to limit the extremely deadly waste of overproduction since things are NOT produced until they're needed.

In addition to setting limits, kanban also physically link material and information flow through a card or, as we often see today through a bar code scan.

And finally, kanban makes abnormalities visible since no material should be without a kanban and no kanban on the shop floor should be found anywhere but attached to the material, in the heijunka board or in the kanban post box.

2-Card Kanban System

The first type of kanban is the classic 2-card system where production and withdrawal kanban cards are used.



In the example above, we see a shaded withdrawal kanban going from shipping to the supermarket. This is a signal from shipping to the supermarket that it needs product to meet a customer request. Once the shipping clerk removes product from the supermarket a production, kanban will be sent to the assembly department signaling there's an item missing in the supermarket that needs to be replenished.

A kanban card normally contains information such as the Part name and number, the Supplier process name, the quantity per container, the Delivery address, the Storage address and the number of cards in the system.

A kanban system using cards differs most significantly from the two-bin system, in that the card is pulled as soon as the first part is taken.

1-Card and 2-bin Kanban Systems

The next type of kanban system is referred to as the "1-card" system. And while we refer to it as 1-card there may not be a card used at all. Instead, we might use empty containers, or carts, or colored golf balls, or ping pong balls, a light, or really any kind of signal that conveys information.

One of the most practical examples of a one card kanban system is the mailbox flag. When the flag is up, a signal is sent to the postal worker that there's something inside the mailbox we wish to mail.

Another system that doesn't rely on traditional kanban cards is the 2-bin system. In the 2-bin system, standardized bins or containers perform the role of the kanban card. An empty bin signals that more parts are required. The collection of empty bins should follow time-based standard work whenever possible so that one person can supply the materials reliably for a department or section.