



Tech Solutions Must Involve People, Too

If the employees don't buy it, it won't work

BY DOUG CATER

Most manufacturers have heard the term “Kanban.” In fact, many organizations use some type of informal Kanban replenishment system for maintaining inventory on a limited basis. Few organizations, however, use Kanban as a system for synchronizing plant activities. This article will drill down into

that in some detail to provide a clear picture of what Kanban is, how it works and what its benefits and limitations are.

What is “Kanban”?

The closest translation of this Japanese word is “signal.” It is a signal from the customer to a supplier that he needs more parts or material. Sound simple? It *is* simple. “I need more parts!” Say it . . . “I need more parts!”

Now, let's formalize that.

“Here is a piece of paper (card, bin, ticket or other device) that indicates how many parts I need, the part

number, the description, where they should be placed, what size and type of container they should be in, how many should be in each container and how many minutes, hours or days you have to replace them for me. Take it with you, and bring it back when you have completed the order.”

Kanban is no more complicated than that. It is a structured approach to replenishing materials and/or parts, based on consumption. We establish our system quantities based on a mix of historic and forecasted information about supply and demand. Variability in both is considered, so that even during periods of high demand and long supply times (within reason) we continue to protect the capacity of our key resources with material. In fact, the probability of a material outage can be calculated and a business decision can be made to choose an inventory level that is lower or higher, based on that risk.

Kanban can be used in the procurement of materials and components from suppliers. It can be used to replenish materials between processes. It can be used to restock a warehouse or supply finished goods to a

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customer. Anywhere you use an "order" today, such as a sales order, work order, purchase order, stock order, etc., you could be using a Kanban, with all its inherent benefits.

Benefits

Most manufacturing operations are plagued by some degree of inventory-related problems. Processes that are not properly synchronized end up driving inventory levels too high in some areas, or they result in inventory outages that impact major customers and bottom line profitability. If ever there was a "silver bullet" cure for this type of problem, Kanban is it.

Once implemented, the administrative burden to replenish materials and components in a Kanban environment goes to virtually zero. Suppliers and consumers manage the system. This holds true whether we are dealing with outsourced materials or in-process components. Ownership and accountability for maintenance of the system is driven down to the shop floor.

Kanban is the mechanism for synchronizing material flow in the plant.

Material is produced only as it is needed and at the same time, the capacity of downstream processes is protected from material outages. The process is reliable, simple to understand and easy to use. Only significant changes in demand, or supply capability, require adjustments in the system to protect capacity and minimize inventory. Otherwise inventory levels are controlled within the limits established by the system, minimizing the impact of engineering changes, changing customer preferences, etc.

Imagine the myriad decisions your supervisors and managers make that are required because inventory levels in the MRP system are not accurate. "Should we finish this run of 'grapple grommets' on the 75 Ton, knowing we will shut down the welders . . . or should we change over to 'widgets' now, knowing we'll need to set up and run 'grapple grommets' again tonight?" Consider how nice it would be if the operator of the 75 Ton could have made the decision yesterday, based on accurate inventories, to prevent the unnecessary set up and the material outage. Kanban systems can do just that, by making the pertinent infor-

mation visible to the operator.

Limitations

On the other hand, some of the problems experienced in Kanban implementation can be insurmountable if the organization is not committed to continuous improvement. As expected, the Kanban system requires storage space for materials and parts. The amount of storage space is obviously a function of the number of parts in the Kanban. The drivers of Kanban size are:

- Demand and variability in demand
- Order frequency
- Order quantities
- Transportation time and shipping frequency
- Supply and variability in supply
- Manufacturing cycle time
- Set up times and cost
- Batch sizes and run frequency
- Container size

Hence, if you are not committed to reducing batch sizes, increasing run frequencies and reducing cycle times, implementing Kanban may drive your space requirements to the point where you think you need more warehouse

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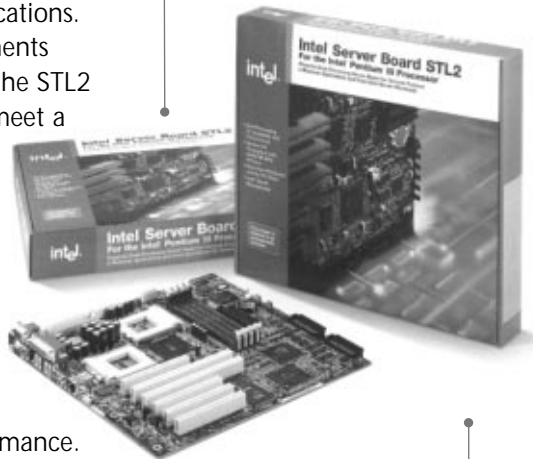


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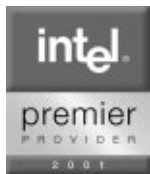


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space. Wrong conclusion! Reduce your set-up time, reduce your batch sizes, increase your preventive maintenance and replenish more frequently. Still, you are surviving under your current conditions, so go ahead and implement Kanban! You will see dramatic improvement and it will become perfectly clear where you need to focus your process improvements to minimize space requirements.

Organizations also run into trouble when signals are not properly communicated. If you have communication problems in your organization now, you should analyze why and start to address the problem. If the organization lacks discipline, it will be reflected in the performance of your Kanban system. Lost cards, cards not returned to the proper location, or untimely returns are the same as someone forgetting to ask for parts. Poor communication of your needs will result in material outages, plain and simple. The system is designed around a required lead time and if the signal doesn't arrive, the parts won't either.

Who Can Use Kanban?

Surprisingly, Kanban works well on very long lead time items (particularly if demand and supply are reasonably consistent); it works equally well on high or low volume parts; and it works well with dedicated or non-dedicated resources. It also works well in custom job shops, high volume repetitive and continuous flow processes. And, while it does not necessarily reduce inventory levels, it normally does, simply because material is replenished based on consumption rather than based on computer generated orders that utilize outdated information.

Admittedly, Kanban is a compromise. It doesn't minimize inventory levels; it controls them at a level that protects system capacity. The perfect replenishment process would be Single Piece Flow, with a batch size of one . . . which takes years to implement. The alternatives — systems that do not tie inventory levels to consumption, but rather connect them with forecasted demand including MRP and ERP systems — tend to focus at a micro level, driving inventory levels based on unreliable forecasts.

