International Journal of Scientific Research in Civil Engineering
© 2020 IJSRCE | Volume 4 | Issue 6 | ISSN : 2456-6667

A Review on Kanban System

Prabal Sharma[1], Rinkey Sahu[2]
[1]Student, [2]Assistant Professor
Department of Mechanical Engineering, G D Rungta college of Engineering & technology, Kohka, Bhilai, Madhya Pradesh, India

Article Info
Volume 4, Issue 6
Page Number: 102-105
Publication Issue :
November-December-2020

Article History
Accepted : 01 Dec 2020
Published : 10 Dec 2020

ABSTRACT

A successful implementation of kanban system have been done in the production system, in search of the ideal results of it, whole setup was done at a leading TMT manufacturing unit, A pull nature of kanban have been established and then the data is collected first, before that proper training is given to the workers of the organization, and keeping in mind all the necessary before implementation like 5s just in time and lean manufacturing concepts, after that 3 sets of data has been taken after the implementation of the kanban process, taking all the factors viz replenishment factor, buffer stock etc after that calculation has done and the optimum results have been achieved, the required results are then compared with the old data which was taken before the implementation of kanban, Results have been bifurcated in terms of Time , increase in Production and Increase in profit as well as cost savings.

Keywords : Kanban, TMT, 5s, Just in time, Replenishment, Buffer stock,

INTRODUCTION

Kanban is a Japanese word, which means "signboard,". To the early days of the Toyota production system, 1 Kanban traces its roots.It was developed by Taiichi Onho in the late 1940s, it was used by Toyota manufacturing units in japan to implement production processes in Just in Time (JIT). Initially it was not accepted by the world until 1970s, Taiichi Onho minimized the work in process or (WIP) between processes and reduced the cost associated with holding inventory.. However, In todays time Toyota continues to use the system not only to manage cost and flow, but also to ide ntify impediments to flow and opportunities for co ntinuous improvement.

Onho modeled many of the control points after U. S. supermarkets

hence the term kanban supermarkets. The idea of J IT manufacturing was originally conceived by Kiic hero Toyoda, founder of the Toyota Motor Compa ny, and son of Sakichi Toyoda, the founder of the Toyota Company, the parent company. However, the strategy of kanban was developed by Mr. Onho, which got one of the mainstays of Toyota's successful implementation of JIT producing.

ADVANTAGES OF KANBAN

- ✓ Reduces inventory
- ✓ Improves flow

- ✓ Prevents verproduction
- ✓ Spots control at the tasks level (with the operator)
- ✓ Makes visual scheduling and the board of the process.
- ✓ Improves responsiveness to changes popular
- ✓ Limits danger of stock oldness

Reduces Inventory

The kanban quantities based on current conditions like (downtime, scrap, and changeover times), you should see a decrease in inventory levels. From our experience, inventories can be reduced by 25 percent to 75 percent. The exercise of calculating kanban quantities forces you to identify your real situation. It also forces you to examine the comfort levels and informal rules that allow inventory levels to build up over time. Additionally, since yo u will use realistic data, you have a measure of confidence that the calculated quantities will allow you to successfully continue supplying your customers.

Improves Flow

When properly implemented, kanban improves the flow of the operation. The improved flow results f rom not only reducing inventory space,abutaalsoat heaorderacreatedabyadesigningatheakanbanamaterial aflow. The process of setting up control points, setti ng up flow lanes, hanging signs, and so on, provide s directions for oving the material. The kanban pr ocess also gives the operators producing the part g uidance on what and when to produce. (They also know when not to produce.) The increased contro ls serves to tame the woolly beast called inventoy

Prevents Overproduction

In many production processes, control of productio n quantities can be haphazard. This lack of control can allow overproduction of parts, which is one o f the seven wastes identified in the Toyota Produc tion System (TPS). The kanban prevents overprodu ction by specifying the production container sizes and the maximum number of containers to be pro duced. This structure thus allows control without expensive or laborintensive tracking systems. The kanban uses visual signals that let operators know how many of each part to produce and what to pr oduce next. These visual signals also tell operators (and their supervisors) when to stop and when to start production.

1.2.1 Places Control at the Operations Level (with the Operator)

Just as managers, supervisors, and materials planne rs can see the production schedule at a glance, so can the operators. Therefore, with proper rules an d scheduling guidance, the operators can run the l ine. The kanban's design tells them what to run, how much to run, and what sequence to run. Add itionally, the visual nature of the kanban tells ever yone immediately when the process is in trouble, so that someone can step in to make course correc tions.

Therefore, once again kanban reduces one of the s even waste not properly utilizing human resources. By creating a system that allows operators to con trol their production process, we proverbially harn ess their minds to help us succeed in the game of business.

KANBAN CARDS

When most people think of kanban they automati cally think of kanban cards, probably because the Toyota Production System relies heavily on the us e of cards for their signals. But, be aware that ma ny people have strong feelings about the use of ca rds as signals because of bad experiences with losi ng the cards or the cards being mismanaged. What

are these mystical items called kanban cards? The y are essentially pieces of paper that travel with t he production item and identify the part number and amount in the contnr

Part Number:	*80800-14898*
Part Name:	10 V Power Supply
Production Line:	Line A
Container Type:	Plastic 12 × 14
Container Quantity:	20
Storage Location:	Portable Radio Line
Production Operation:	50
Bin Location:	C-3

Fig 1 : A Kanban card

KANBAN CALCULATION

Replenishment interval

It is the smallest batch size that process can run and still keep the customer supplied. This interval essentially tells how long it takes to produce adjusted production requirements. The replenishment interval is a function of the time available after considering process parameter:

❑ Production rate

❑ Changeover times

❑ Downtime (both planned and unplanned)

The replenishment cycle will ultimately be determined by the time left over for changeovers after subtracting required production run time from available production time. Therefore, the length of this cycle will be a function of how long it takes to "bank" enough changeover time to make all the necessary changeovers.

$$\text{Time Required for Production} = \text{Sum}\ (\text{Adjusted Production Requirements} \times \text{Cycle Time Per Part})$$

Fig 2-Equations for production time:

$$\text{Available Time} = \text{Total Time in a Shift} - (\text{Planned and Unplanned Downtime})$$

Fig 3- Equation for available time.

$$\text{Available Time (Continuous Processes)} = \text{Total Time in a Shift} - (\text{Time for Planned Maintenance, Cleaning, and Breakdowns})$$

Fig 4- Equation for available time in a continuous process.

$$\text{Container Quantity} = \frac{(\text{Buffer Quantity} + \text{Replenishment Interval Quantity})}{\text{Container Quantity}}$$

Where:

$$\text{Buffer Quantity + Replenishment Interval Quantity} = (\text{Buffer} + \text{Replenishment Interval}) \times \text{Adjusted Production Requirement}$$

Fig 5 : Equation for calculating the container quantity.

LIMITATIOS OF KANBAN SYSTEM

Less Effective in Shared-Resource Situations:

Infrequent orders may render the kanban process ineffective. For instance, if your upward production line made many parts, your requests to make more parts required by the downstream line will require a buffer to ensure that the downstream line does not run out. This is because each production line requires a separate signaling card.

Product Mix or Demand Changes May Cause Problems:

The kanban system assumes stable, repetitive production plans. The kanban concept implies that the warehouse or the supplier should deliver components to the production line as and when they are needed. Fluctuations in demand and products may affect the functioning of the kanban system. Therefore, the system is less suited to industries where product volumes and mixes fluctuate.

The Kanban System Does Not Eliminate Variability

The kanban system may produce poor-quality items that need to be reworked or scrapped if production is disrupted with lengthy and unpredictable down times. Kanban is structured like a traffic signal, to manage the flow of traffic to meet customer needs by signaling when to start, stop or slow down

production. Any variability or unpredictability will affect the functioning of the system, making it send confused, mixed and wrong signals with regard to the optimal production levels.

Production Flow Problems

Kanban is not suited for manufacturing environments with poor-quality products, short production runs, a multitude of product types and highly variable product demands. The Kanban system requires planned weekly and monthly production schedules coupled with day-to-day flexibility. This may not be possible in a manufacturing environment with multiple product types; variable production demands and long production runs, thus reducing the overall efficiency of the production line.

Quality Miscues

The kanban system brings quality levels of inventory close to zero. In cases of high uncertainty and disruptions in the transportation network, inventory buffers are needed to guard poor quality from the internal processes and also from the suppliers. This delays your production process.

CONCLUSION

From the above we conclude that because of implementation of Kanban system in a manufacturing process, following benefits or advantages we can get-

- ✓ It gives the accurate & detailed information of production.
- ✓ Defective parts & items are found accurately & sent back.
- ✓ The production flow rate tends to have an increase.
- ✓ It doesn't required to have an extra record of process.

Once understand, it can be well accepted on large basis.

REFERENCES

[1]. "AIDT- Just in time manufacturing" September 11,2006. American Society for Quality Control (ASQC).

[2]. "A Guide to the Project Management Body of Knowledge", 4th ed. Pennsylvania, USA: Project Management Institute, Inc., 2008.

[3]. "Applying the Kaizen Method and the 5S Technique in the Activity of Post-Sale Services in the Knowledge-Based Organization",proceedings of the international multi conference of engineers & computer scientists 2010 vol3,IMECS2010,march 17-19,2010,Hong Kong.

[4]. "Basic concepts of Lean Manufacturing" Marek Piatkowski - F.S.P. Consulting Inc. Toronto,Canada,1994,Phone: 416-235-2631, e-Mail: Marek.Piatkowski@rogers.com,THE PRODUCTION SYSTEM DOCTOR' S OF F ICE - WWW.TWINETWORK.COM.

[5]. "Implementing World Class Manufacturing", Rubrich, L. & Watson, M. (1998), Fort Wayne, IN: WCM Associates.

[6]. "Japanese Manufacturing Techniques", Schonberger, R.J. (1982), New York, NY: The Free Press.

Cite this article as :

Prabal Sharma, Rinkey Sahu, "A Review on Kanban System", International Journal of Scientific Research in Civil Engineering (IJSRCE), ISSN : 2456-6667, Volume 4 Issue 6, pp. 102-105, November-December 2020. URL : http://ijsrce.com/IJSRCE204617