JUST IN TIME APPROACH IN INVENTORY MANAGEMENT

Abdul Talib Bon (Corresponding author)
Faculty of Technology Management, Business and Entrepreneurship
Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, Malaysia
Tel: +60127665756 E-mail: talibon@gmail.com

Anny Garai
Faculty of Technology Management, Business and Entrepreneurship
Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, Malaysia
Tel: +60137016298 E-mail: anniegai_87@yahoo.com.my

ABSTRACT

Quality improvement and costs control are vital to organizations for work performance enhancement and fulfilling customers’ requirement. Inventories that are stored in large amount of quantities will result in waste and space usage. One effective solution is using Just in Time (JIT) concept as a method to reduce costs, improve quality and meet the ever-changing customer needs. The adoption of Just in Time (JIT) concepts seems to be the most effective way to overcome these circumstances. JIT is management philosophy that emphasizes on eliminating waste and increase productivity. The main purpose of this research is to find out whether the implementation of JIT would reduce the inventories at Electronics component industry especially at the parts producing stamping of FCM. This research is done by case study. Therefore the data collection would be using secondary data which is the documentation from FCM itself and also via observation. The data were analyzed by doing the comparison before and after the implementation of JIT using Microsoft words excel. From the analysis that had been done, the implementation of JIT had increased the inventories management at the stamping parts production. As the conclusion, the implementation of JIT in the inventory management at the parts production stamping at Electronics component industry had successfully reduce the inventories level while improving the inventory level.

Keywords: Stamping Production, Just in Time, inventory management, electronics component industry.

1. Introduction

Globalisation phenomena had created the business without boundaries. Most of the organisation nowadays only focuses in two main elements that can influence the global market, which is customer satisfaction and also the product and services quality. Organisation all around the world need to take the initiative to increase the product quality to satisfy the needs and customer demand that always change besides minimizing the production cost. This initiative is needed to keep the challenge at the market (Canel, et al., 2000). One of the most effective solutions is with the application of Just in Time (JIT). Application of JIT could involve few important elements at organisation such as production level, marketing level, engineering level and purchasing level. The application of JIT more focuses on management process. Therefore, JIT can be applied at varying process. (Canel, et al., 2000). JIT is the concept of management that invented specially to avoid waste. This is in order to minimize the waste and increase the productivity (Zhu and Meredith, 1995). JIT is one type of Lean Manufacturing (Yen, 2003). Lean manufacturing is the process to control the production which depends on the demand by the customers. It is also act to reduce waste. The application of Lean Manufacturing can reduce the stock, work space and the production of raw materials. This philosophy can maximize the production (Forza, 1996). At Malaysia context, application of JIT is not popular. According to Simpson, et al., (1998), JIT had been applied by national automotive firm as a transitory JIT. Transitory of JIT is one of the ad hoc inventory models. This is can give half of the inventory in order to reduce the production
cost beside can make the technology transfer at the international level. This research is made to study the application of Just in Time (JIT) in inventory management at stamping production at Electronics component industry.

1.1 Background of Study

At FCM there is lot type of inventories and this requires a huge space to restore it. Therefore FCM need to prepare an enough space. However, this situation requires FCM to overcome the cost of restore. But this is not the really big issues to FCM. What really worries FCM management is the huge batch of inventories. The batch of inventories had caused FCM loss in profit because there is no moving out of the output to customer. Therefore the cases are also not only arises due to this problem. Besides that, in Japanese firm, the concept of keeping the inventory is a big waste in industry. Based on this problem, Heizer J. & Render B. (2006), Just in Time (JIT) is the best strategy to increase the operation especially at the inventory management. However, if the raw material cannot be delivered during the production, there would be a big problem.

1.2 Problem Statement

This study is to elaborate the JIT application in inventory management at the stamping production at FCM. The problems that occur in this study are what is the importance of application of JIT in order to influence the inventory management at the stamping production at FCM?

1.3 Objective

In this research, researcher has the stand to achieve the objective so that it could be archived. The objective is to study the application of Just in Time (JIT) in inventory management at Stamping Production at Electronics component industry.

1.4 Scope Of Study

The scope of study is focused at the stamping production at Electronics component industry. The main products of FCM are keyboard and relays. Respondents that involved are top management and the staff at stamping production of FCM. Data would be collected through qualitative method and be analysed quantitatively. From this study, the researcher hopes that can help Electronics component industry on the applications of JIT in their operation. The researcher hopes that with this study, it can help Electronics component industry and academician which is up to the upcoming researchers.

2. Literature Review

JIT is not the new concept in production sector (Stevenson, 2001). It started during 1920 and being used by Henry Ford at the automation industrial. JIT is one of the Lean Manufacturing that had been introduced by Toyota Motor Corporation to increase the work quality and production. The application of JIT in Lean Production will give good return in production process. These philosophies would make the production even faster and to reduce the inventories stock.

2.1 Lean Production and Lean Manufacturing

Lean Manufacturing first introduced as systematic ways to reduce or terminate the waste. It is the management philosophy that require commitment from responsible person that relate with reduced waste, make the work procedure become smooth and optimize the production (Chase, et al., 2001). Lean Manufacturing firstly introduced by the Toyota Motor Corporation. Which is involved the inventory management, quality control, industrial relationship,
employee management and relationship between factory and the suppliers (Bowen and Youngdahl, 1998). JIT is one of the elements in Lean Manufacturing meanwhile Lean Production is known as Big JIT. It is the philosophy of management operation that act to terminate the waste in every aspect in production such as industrial relationship, vendor relationship, technology, raw material management and inventories (Chase, et al., 2001). Lean Production can use to reduce time, inventories, space, employees and production cost.

2.2 Just In Time (JIT)

Usually, JIT process being implemented in the organisation that reached the highest application of JIT. Wagner M. S and Silveira- Camargos V, 2009). This is because organisation and the supplier should have a good relationship and believe because when there is demand from factory, the suppliers can supply them on time. The first way to implement JIT is build a good relationship with the suppliers, customers and also sub-contractor to reduce inventory “buffer” to few hours. According to Canel, et al., (2000), JIT aims is to reduce time waiting during production process. Therefore, the cost of inventories not only can be minimized but also the time for the production also shortens. JIT concept is not saying about the standardisation or the way of managing but it really focusing on the zero inventories

2.3 Benefits of Application of Just In Time in Lean Production

The application of JIT would give a lot of benefits such as to the producer to increase the quality to fulfil the customer demands and reduce the inventories and built a good relationship with the supplier (Salaheldin, 2005). Positive of JIT application can successfully give benefit to three communities, which is supplier only, purchased only or both. The benefits are, reducing in inventories and time waiting for the inventories, increase the quality and technical support, increase productivity, reduce waste and machine maintenance (Wafa, et al., 1996). JIT actually help to reduce machine maintenance and at the same time, to make sure the suppliers can produce the inventories on time (Yasin, et al., 2001). According to Yasin, et al. (2002), the big problem of JIT application is employer issues and the suppliers. Employer issue is about the objection of JIT concept, less supportive of JIT and less of employees.

3. Methodology

This study is using action research that is descriptive and makes the research by quantitative. In this study, researcher would use observation and data collection from the result of the observation.

4. Data Analysis

4.1 Introduction

This chapter would discuss and analysis the data that had been collected from FCM. There are four different data that had been provided by the researcher according to the case. For the first case, the researcher would get the standard time during the raw material collected from the rack and the replace at the turn table using forklift. The second case is the machine die setup. Meanwhile the third case is standard time for winding process. The time is counted during the winding process and the material place at the stand before and after the winding process. For the last case, is during packing and deliver the part to the warehouse. This chapter also would discuss about type of test and analysis to the case to make sure that the data is valid and researcher can get a clear vision about the elements of Just in Time (JIT) being implemented by the FCM.
4.2 Results of Study

In this study, researcher would discuss the results that researcher gets from the study. All the data that had been collected by the researcher would be divided according to the case and according to the flow chart of stamping production refer to Figure 1. Figure 1 shows Standard Time (ST) and Cycle Time (CT) according to the cases that had been studied.

\[
\begin{align*}
\text{ST} &= 10.8 \text{ min} \\
\text{ST} &= 480 \text{ min} \\
\text{ST} &= 5.37 \text{ min} \\
\text{ST} &= 17 \text{ min} \\
\text{CT} &= 10 \text{ times} \\
\end{align*}
\]

Figure 1: Stamping Flow Chart

4.2.1 Analysis of Case 1

This section would show the data collected from case 1 for the application before and after the part production stamping. In this case 1 (refer Figure 2) the standard time would be the counting from the raw materials from the racks to the turntable using forklift and then the return back of the forklift to the place. Refer from Figure 3 as shown the graphs for before and after the applications of JIT for case 1.

Figure 2: Case 1
4.2.2 Analysis of Case 2

For case 2, (refer Figure 4) is to reduce the standard time that is using for die setup. Figure 5 showed the graph before and after application of JIT.

Figure 3: Graph Before and After Application of JIT (Case 1)

Figure 4: Case 2
4.2.3 Analysis Case 3

For case 3, (refer Figure 6) is to reduce standard time for winding process. Figure 7 show before and after application of JIT for Case 3.
4.2.4 Analysis Case 4

For case 4, (refer Figure 8) is to reduce standard time during packing and deliver to warehouse. Figure 9 show the application of JIT before and after.
5. Conclusion

The purpose of this study is to make sure the application of concept Just In Time (JIT) at Electronics component industry especially at the stamping production. This chapter would discuss about the results of the analysis according to the objective and problem statement. The discussion would focus in certain case at stamping production depend of the results that analyze from before and after the application of JIT. Besides that, this chapter also would discuss the suggestion. After the analysis, application JIT in inventory management at stamping production is depend on the activities below:

(i) Raw material always in enough quantities.
(ii) Work in process always at the minimum quantities.
(iii) Finished good would directly deliver to buyers.
(iv) Wasting work in process seldom occur.
(v) Buffer stocks always at the minimum quantity.
(vi) Delivering raw material depends on demand only.
(vii) Space for inventories is small.
(viii) Time table scheduling is made by the suppliers.
(ix) Delivering materials is more often and only at small size.
(x) Long term relationship is built between suppliers.

(xi) Suppliers is advised to use the application of Just in Time (JIT), and

(xii) The employers should give the commitment on inventories and quality.

Besides that, researcher has little suggestion to the upcoming interested researchers with the concept of Just in Time. The suggestions are: (i) this research only limited at one factory which is Electronics component industry. The next researcher should broaden their scope of study; (ii) Future study on the application of JIT concept especially in the purchasing and engineering level; and further study about the elements associated with JIT.

References


