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To Study the Impact of Just-In-Time System

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ABSTRACT: The purpose of this research is to study the Impact of Just-In-Time (JIT) system on inventory and financial performance. JIT production has received a great deal of attention, worldwide, since its introduction in Japan a few decades ago. It has been well documented that some of the main benefits of JIT implementation are reduction of inventories and cost savings. JIT philosophy has been primarily used in manufacturing operations to manage materials and other production activities. The overall goal of JIT is to eliminate waste and it is a continuous process that can be viewed in terms of the extent to which the culture and philosophy of JIT permeates the organization.
Keywords: Type your keywords here, seprated by semicolons;

INTRODUCTION

Just-in-time (JIT) systems control work flow by bringing in materials and sending out goods on demand. JIT also refers to an integrated, problem-solving approach aimed at improving quality and facilitating timeliness in supply, production, and distribution [1]. This just simply means that just-in-time is a production and inventory control system in which materials are purchased and units are produced only as needed to meet actual customer demand. JIT requires that a firm has a few dependable suppliers and is believed to improve productivity and build a leaner manufacturing system which minimizes inventories and minimizes risk and helps to reduce the cost of manufacturing. With JIT, the ultimate goal would be zero inventory. Companies typically hold inventory in three locations that are raw materials, work-in-process inventory of partially worked materials or sub-assemblies for workstations to complete and finished goods to be shipped out to customers.

The topic of Just-in-time inventory is very important and relevant to all operations managers today. It has become a major factor of competitiveness in the global environment. The concept is a minimized costing system that increases efficiency, productivity and quality through economies of scale and control. Current business enterprises need this for both cost benefit and effectiveness to increase their chance of survival in the competitive market of the global environment.

The main benefits associated with the JIT inventory are reduce set up time. Reducing the set up time enables the company to lessen or eliminate inventory for ―changeover‖ time. Besides that, JIT can improve the flow of goods from warehouse to shelves. Individual or small lot sizes lessen the lot delay inventories, thus simplifying inventory flow and management. Moreover, efficient use of employees with multiple skills are implemented in JIT. Featuring employees skilled to work on distinctive parts of the process enable companies to move workers when they are required.

The objectives of this research proposal is to identify the effects of JIT on inventory cost and explore the effects of JIT on financial performance of manufacturing firms in Malaysia. The aim of this research is to review previous works in JIT inventory and analyze the available literature to distinguish the gap of knowledge in this field. We ask that authors follow some simple guidelines. In essence, we ask you to make your paper look exactly like this document. The easiest way to do this is simply to download the template, and replace the content with your own material.

1. The impact on the inventory level

One of the characteristics of JIT is inventory reduction. Based on one of the journal, some firms that deliver on a JIT basis are reducing their inventory holding while others are experiencing the opposite [2]. Based on the research that he did, 9 of the 18 firms in the study claimed to manufacture JIT. Those suppliers which manufactured JIT themselves were generally able to reduce inventories. However, one supplier to the electronics sector that had implemented JIT manufacture and purchasing had seen an increase in finished goods inventories. Suppliers which did not purchase or manufacture on a JIT basis had seen increases in inventories in terms of raw materials, work in progress (WIP) and finished goods. Firms which were able to manufacture JIT themselves were able to achieve JIT delivery without the consequences of increased inventory holding. The suppliers in the study that did not manufacture JIT had experienced increased inventories. Increased inventories were primarily due to long purchase and manufacture lead times, fast response time demanded by the customer, schedule instability and safety stock requirements.

The implementation of JIT can improve firm performance. The companies have cut finished goods inventories. For example, some of the work-in-process inventory was cut from 30 days to 3 days [3]. JIT promotes conditions necessary to manufacture high quality products to meet market demand with small levels of inventory and high levels of productivity. Furthermore, JIT can reduce the inventory and other forms of waste while maintaining customer service because it identifies those factors that cause waste to happen [4]. One of the goals of JIT is to reduce finished goods inventories. Inventory can be minimized by ensuring that all needed materials, parts, and products are produced just in time and in the correct quality and quantity. Parts and products are produced only if needed, not to be stored in a warehouse for future use [5]. Reduction of inventory is a result of JIT practices and a measurement of overall improvement and performance of the system [6]. Actually, reduction of inventory throughout the system can be divided into raw material inventory, in-process inventory, and finished goods inventory. The amount of inventory on hand was measured by the number

of weeks of inventory maintained by the firm [7]. It was found that JIT is inversely related to inventory levels because inventory reduction is one of the most commonly cited theoretical advantages of JIT. Moreover, inventory levels of inbound materials, work-in-process, and outbound goods were found to be inversely related to JIT. Inventory reduction in all areas can be used as a measurement of overall improvement and performance of a JIT system. Not only that, our results also indicate that size can directly influences overall inventory levels. The larger the firm, the fewer the weeks of inbound and outbound inventory are kept on hand [8].

The most highly publicized theoretical advantages of JIT is the overall reduction of inventory. One of the predominant indicators of JIT effectiveness, a made to order or pull-based system is related to inventory reductions. In this sense, raw materials tend to exhibit an immediate reduction. At the same time, the reduction of work-in-process lowers the costs of inventory holding and related activities. Finally, the level of finished goods inventory should be reduced as a result of improvements in process reliability and reduced cycle times. One goal of JIT is to reduce or eliminate the need for raw material, work-in-process, and finished goods inventories. By ensuring that all needed materials, parts, and products are produced just in time and in the correct quality and quantity, inventory is minimized. In other words, reduction of inventory is a result of JIT practices and a measurement of overall improvement and performance of the system.

The reduction of lot sizes helps to reduce both inventory and inventory costs related with carrying the inventory because the maximum inventory level and the inventory-reorder quantity drops [9]. Reducing set up time is an excellent way to reduce inventory investment and to improve productivity [9]. He explain that JIT make every effort to utilize small lot sizes that are ―pulled" rather than ―pushed" through the manufacturing process [9]. Furthermore, this statement is supported by Selto, that he claimed JIT unlike traditional supply chain systems where parts and products are pushed through the system as quickly as possible, the JIT system concentrates on avoiding the manufacture or delivery of parts and products before they are needed, only to build safety stock or buffer inventories that sit idle accumulating inventory carrying costs [10]. It is simply means that, the low level of the holding stock on hand will reduce inventory carrying stock.

2. **The impact on the financial performance**

JIT can enhance financial performance because defects are detected faster in small batches. In a meantime, costs are minimized through holding low levels of inventory, thus supply chain becomes more responsive and flexible. The selection of suppliers is on the basis of least total cost. The total cost here included delivery reliability, price and quality. The relationship with the suppliers are based on long term emphasis and suppliers are either single or dual sources. As a result, a closer relationship between buyer and supplier can be formed. Moreover, a form of mutual dependency built among them. By extending JIT to the supply chain system, both the buyer and the supplier get benefits from it. Thus, a win-win situation can be produced. The buyer is able to shift the responsibility for inventory and quality to the supplier, consequently benefiting through reduced inventory costs and reduced re-work costs. The buyer may also be able to benefit through value engineering (VE) savings by involving the supplier in the design stages. Further savings can be made by reducing material handling costs through the implementation of standard or reusable packaging. In the automotive industry at UK, the principal objective behind JIT is to push costs back on to suppliers in order to gain control and to buffer the buyer against demand fluctuations as it will be most severely borne by the sub-contractor [11]. There are two distinct viewpoints been identified from the literature review. The first suggests that both participants in a JIT supply relationship will benefit. The other suggests that JIT procurement simply transfers costs to an upstream organization. All suppliers indicated that the administrative burden had increased. Some firms managed to utilize existing resources to cope with it. Therefore, there were no extra costs been incurred although others had incurred extra costs.

The specific financial implications of JIT include gains in revenues and reductions in costs resulting in increased net income and profitability [12]. Revenues should increase if the cost reductions are passed on as lower prices but this also need to depends on demand elasticity. Costs should decrease through reductions in total costs of material acquisition and storage, reductions in repair and warranty costs, and reductions in inventory audit time and costs [13]. Thus, JIT strategies can improve financial efficiency b y increasing revenues and decreasing costs. This results in increased of net income and improved profitability of the company.

Recent models comparing inventory costs under JIT purchasing plans and economic order quantity (EOQ) purchasing plans have tended to favor EOQ purchasing in situations where annual demand of inventory is moderately large. Presents a series of inventory purchasing cost models that extend prior methodology by including relevant physical distribution cost savings [13]. Additional comparative models are presented to further demonstrate how other relevant costs factors can be included in a comparative EOQ/JIT model. A cost comparison with an existing problem from the literature is used to illustrate the informational efficacy of new models. In an early research done by the EOQ model was reconverted into a series of JIT purchasing models that could be used in determining inventory deliveries and cost savings. This models demonstrated how total annual inventory ordering costs could be minimized by placing an optimal number of smaller-sized, more frequent order deliveries under a JIT system [14]. It is important to note that their models showed no limitation on the cost advantages of using JIT based on the model parameter of annual demand. Many recent researchers felt that the economic impact and complex costing structures observed in JIT operations can be accurately captured and measured in models [15]. One of the researchers, Fazel , developed a series of innovative models that can be used to directly compare EOQ and JIT systems to determine which is best in a particular cost structure and at a particular annual demand level. He showed that regardless of an organization‘s cost structure, JIT inventory purchasing was only preferable at lower levels of annual demand. Furthermore, he demonstrated that at a certain annual demand level, the cost advantages of EOQ purchasing would always be preferable to a JIT purchasing system. Products, firms, and industries where inventory represents a dominant cost component in the total cost to customers will be able to benefit from using JIT ordering systems. For each product, firm, and industry there are potential cost differences that might lessen the importance of one cost component over another in the models presented in this research. Some cost components were categorized into seven different types of EOQ-related cost opportunities under a JIT system [16].

This journal is about the use of performance measurement systems in firms implementing JIT. Mail questionnaire was sent to larger New Zealand manufacturing companies. A total of 36 percent of the sample of companies had implemented a JIT programme. JIT firms were found to use non-financial performance indicators to a greater extent than non-JIT firms. For JIT firms, there was a significant positive correlation between the use of non-financial performance indicators and organisation performance. A significant positive correlation was also found between the use of non-financial performance indicators and organisation performance for all firms in the survey. Results from this study suggest that there are benefits in adapting the accounting performance measurement system to support and enhance JIT implementation. The study indicates potential benefits from the use of non-financial performance measures for both JIT and non-JIT firms.

Manufacturers expect that by adopting JIT strategy, their financial performance will improve. However, so far only a few studies have been carried out to show the effect of JIT on a company‘s financial performance. JIT systems will increase gain in revenues, reduce costs and increase profit, hence there will be higher percentage of return on asset and sales. The reduction of costs will decrease through reduction of storage, repair and warranty costs on the inventory. Besides that, the quality of the goods will become more supreme when JIT is implemented, thus sales volumes for these firms are increased substantially over the time period.
JIT strategies therefore aimed to improve financial efficiency by increasing revenues and decreasing costs [17]. This results in increased in net income and improved profitability. As productivity increased and assets are used more efficiently, return on assets (net income/total assets) will rise. The improved efficiency and subsequent freeing-up of assets that may be used for additional sales should cause a similar increase in the asset turnover (sales/total assets).

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