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Study on Application of JIT Project in Organizations

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ABSTRACT: Just-In Time (JIT) was a famous management strategy use in business manufacturing to reduce the cost by reducing the in-process inventory since 20th century. A demand-pull enables a firm to produce a goods or product in an actual quantity and at an actual time. This cause the stock level of raw material, work-in process inventory, finish goods inventory can be keep in minimum to eliminate the waste, remove variability and improve throughput. However, there still have weaknesses or problem when implemented the JIT system. Therefore, method such as modification of executive management, modification of engineering, modification of inventory management and modification of human resources is modified to cover the weaknesses of the problem that exist in JIT system.
Keywords: JITsystem; implementation; weakness ; method; modification

INTRODUCTION

Just-In Time (JIT) was a famous management strategy use in business manufacturing to reduce the cost by reducing the in-process inventory since 20th century. JIT is a _pull system of production' which actual orders will start to manufacture when order is done by customer. A demand-pull enables a firm to produce a goods or product in an actual quantity and at an actual time. This cause the stock level of raw material, work-in process inventory, finish goods inventory can be keep in minimum to eliminate the waste, remove variability and improve throughput. JIT was including JIT suppliers, JIT layout, JIT inventory and JIT scheduling [1].

To implement the JIT, the first condition is have stable and closed suppliers. A close relationships, stable and trust are the criteria of a successful JIT. There are few criteria of JIT suppliers should be concern to avoid the failure of JIT. Diversification of suppliers should be applied, so that the company have different vendor that can provide raw materials continuously. Besides, the suppliers should be located near to buyer. Therefore, the raw materials can send directly to the work areas in a short period. The quality of the raw materials also can be maintain and deliver on time.

In the implementation of JIT system, Heizer & Render [1] say that layout is also play an important role. It can reduce another waste which is movement waste. An action of movement which does not have additional value to the product is considered as waste of a movement. Thus, a flexible layout that can reduce the waste of both people and material is needed for any company. There are few techniques had been suggested to all company about the arrangement of layout. Minimize the distance between the sources of raw material and the company; build a little space for inventory, and use flexible or moveable equipment that are benefit to the company.

According to Heizer & Render [1], JIT inventory is the minimum inventory necessary to keep a perfect system running. The major purpose of using JIT inventory is to reduce the inventory cost. When there are large quantity amount of inventory, extra space or a big store is needed to keep those inventory and it was an extra cost. Besides, large quantity amount of inventory hide the problem of the product such as scrap, setup time, quality problem and so on. As we reduce the quantity of inventory, the problem that exposed can be solved and the system can be run smoothly with a lower cost.

JIT scheduling is also an important component when apply the JIT system. An effective schedule can reduce setup time by meet customer orders, so that the time is reduced and cost is saved. A smaller lot size of inventory requires little cost to store and the setup cost is also decrease. Thus, the total cost also will lower when apply JIT system.

LITARATURE

During year 2011, there is a crisis of intense of global competition in the world. This affected many firm in various sector and force them to find out more opportunity to save the cost in every aspect for the firm. They tried hard to prevent being eliminated from the business world. Thus, JIT system was used extensively in the firm to overcome the cost problem as it considers as a powerful tool or system which can eliminate the wasteful cost and others. The relationship between JIT supply and JIT production was focused in find out whether these two components are interdependence or operating separately. Besides, it was also carried out to determine the relationship between the efficiency performance and delivery performance with the JIT supply and JIT production. Then, different hypothesis was carrying out to determine the achievement of system. Questionnaires and scale measurement was use to collect the data and sample. Result was finalized through the analysis of the data and sample.

As a result, JIT production was achieving the efficiency performance and delivery performance. However, the JIT supply does not achieve the efficiency performance and delivery performance. Thus, the research cannot be the supportive for the previous study as it has different result. In addition, the role of JIT supply is twofold, it interact with JIT production which is interdependence to each other's. Therefore, the adoption of JIT supply can hinder for the low level and abolish the JIT production on delivery for extremely low level which stated by Danese, Romano & Bortolotti [2].

Jr., K. W., & Inman, R.A [3] was focused on the relationships among JIT-II selling, market orientation and organizational constructs. The relationship between the system, market orientation and organizational performances cannot be evaluated because JIT-II selling is

not widely use in the business world. However, there is an assumption which stated that the greater the market orientation, the higher its business performance. Besides, JIT-II strategy is emphasized on the relationships between purchaser and the vendors. In the production and marketing process, JIT seller has the ability to deliver the product in zero–defect quality, zero-variance quantity, and minimizes the total waste and total cost of an organization. As the quality of a product is improve, the market orientation of the organization will become more stable and the organizational performance will improve. In addition, JIT-II strategy strengthens the seller‘s market orientation within the customer‘s purchasing process. It was benefit to the buyer and seller due to the strong supply chain linkages. Seller who implemented the JIT-II strategy is not to fulfill the customer demand but it is to let the customer fulfill the demand that set by the seller. During implemented the strategy, sellers are involved in the new design of product through different and high technology techniques. Through the JIT-II selling strategy, seller can take immediate action which response to the demand changes of customer. In short, JIT-II selling is a market orientation strategy [3].

Nowadays, US manufacturing firms were declined gradually in the economic market and lost the competitive edge compare to Japanese firms. This is due the different view of management between the US firm and Japanese firm. Japanese firm firmly believe follow a doctrine which is quality should be aimed on the needs of customer and this doctrine brought them to achieve a world-class standard in the world.

In US, there are some firms implemented the JIT system and total quality management (TQM) while JIT focus on continuous improvement and TQM focus on quality of product. Even some firm does not implement JIT, TQM or both systems; they still can survive in the business world. However, for the firms which implement both the JIT and TQM have gain holistic benefit. For the firms who have implemented the JIT and TQM, the quality of product and productivity was increase compare to the firm who only implemented JIT. TQM system can contribute a quality standard improvement to the product while JIT can contribute the productivity level improvement to the firm. An increase of employee involvement and supplier participation was increase for both system compared to the firm who just implemented JIT. Thus, JIT and TQM can be implemented simultaneously in the firm which can bring much benefit to the firm [4].

China as the largest exporter and _manufacturing floor of the world‘, but not every firm in China implemented JIT system. This is due to the organization ownership where the power is located in the top management. When there is no approval from the top management, the firm cannot apply the system. Besides, the organization and culture factor also play an important role in implementation. China was share many important common culture to others country, it can be the pioneer of the future firm in Asia.
However, China was the biggest economic body in the world; the style of the management can bring effect to the western firm. Different firm with different types of ownership will have different strategy to implement the system. This was become the problem for firm to implement it in organization. It can influence the organization performance of the firm; hence bring an effect to the organization. Ownership structures not only affect the organization performance and implementation of JIT, it is also affects the relationship between the JIT implement and organizational performance. Thus, a step-by-step approach should be applied to prevent the negative effect to the organization structure [5].

A successful implementation of JIT system cannot only depend on the JIT principles, but it should also depend on the way of implementation. The implementation of JIT has been more successful in Japan compared to the west, which indicates that Japanese and Western management are in different way. JIT in Japanese management was emphasized the elimination of waste in the total process from purchasing to distribution, where waste mean increase in cost, but did not bring an additional value for the customer. Thus, JIT is view as a business philosophy rather than just a manufacturing process or tool for reducing the inventories.

According to Storhagen, N. G.[6], a project had done a comparison between companies in Japan and Swedish. This project was aimed to analyze the Japanese‘s way of solving problem by means of logistics; compare to differences and similarities between Japanese and Swedish attempts to improve the logistics system; and develop knowledge of applicability and analyze the possibility of implementing JIT in Swedish industry. Besides, a basic assumption is developing which culture and tradition are not obstacles to implement the main part of JIT system in Swedish industry. A flow model, Japanese model and factor-matrix model was conclude based on the collection of the data.

The element of JIT are described and classified as process, interaction, structural and effect factors. Successful implementation of JIT has to start with process factor. Process factor are related to the human factors which focused on organizational change and development. Human resource management must be emphasis on the system to be successful. Interaction factors represent a network orientation and the structural factors are technique and methodological orientation while effect factors are performance measures and represent the results of the efforts of the other three groups of factors. The Swedish companies show a pattern of weak process factors, but comparatively strong structural factors. Thus, the key factor for the successful implementation is to establish a confidence among the people in the organization. The implementation of JIT must be brought in line with the condition both within the company and with regard to this environment [6].

According to N.Rajam Ramaswamy, V.Selladurai and A.Gunasekaran [7], JIT is a concept and philosophy rather than a technique. As the concept has developed a number of specific techniques and approaches, it has been absorbed into the general philosophy. Several researchers have studied and reported on the success of these techniques in large such industries but very rarely implement these techniques to small and medium enterprises (SMEs). In the survey study, there is no general pattern for implementation sequence was found and identifies the problem of implementation and operation of JIT. The researcher was classify the implementation barrier to two categories which are people related problem and technical problem. They conclude each company must provide education training to the employee to train their personnel to overcome the problem of cultural.

Buffer stock removal is the major area to be addressed (in three out of five case, it tops the list). Orders are seasonal and there is no repetition of orders, there is no speculative purchasing. Furthermore, issues such as preventive maintenance and multi-functional workers are well addressed in the system. Participation of employer and employees play an important role in the improvement of the system to indicate the resist of change. Therefore, education and cross training between employees is needed to reduce such resistance to achieve better performance for an organization [7].

JIT production system identifies the hidden problems in the value chain and reduces the production waste of the system while increasing the throughout. Even through the JIT system seems to be interesting and less complicated, it requires lot of coordination with supply chain to avoid delays in the production schedule. The opposite of the JIT production is known as JIC (just in case) system where it produces goods for inventory with the intention of having goods just in case a customer places an immediate order. Besides, JIT has evolved into a management philosophy containing a body of knowledge and encompassing a comprehensive set of manufacturing principles and techniques. Japanese firm tend to focus on enhancing the long-run competitiveness rather than emphasizing the realization of short-term profits. Stockholders and owners of Japanese companies also encourage the maximization of-term benefits. JIT management has a high degree of cultural aspects embedded in its development. The cultural differences which contribute most to this belief include the Japanese work ethic and the role of unions within many western work environments. JIT cannot be effective in firms outside Japan which has not been substantiated as several organizations that successfully implemented JIT. Besides, JIT manufacturing consist of several components or elements which must be integrated together to function in harmony to achieve JIT goals. These include human resources and the production, purchasing, manufacturing, planning and organizing function of an organization. In short, these elements can be grouped together into above-mentioned Toyota production system of people, plants and system.

Although the benefit of using JIT is numerous and cited more frequently than any potential limitations, several shortcomings have been identified. There are cultural differences have been cited as a possible limitation of JIT. These will be problems that may be difficult to overcome or work around without changes in attitudes and worker philosophy. Besides, the traditional approach to manufacturing involves the use of large inventories with safety stocks. This has the potential to cause problems for the organization which relies heavily on safety stocks to absorb any increases in demand. Furthermore, loss of team autonomy is a possible result of reducing or eliminating buffer inventories. Reduced buffer inventories and workers flexibility contradict the other aspects of JIT concerning quality circles. In addition, loss of autonomy over methods involves the idea that, under JIT, employees must adhere to strict methods of production in order to maintain the system. This idea diminishes the _entrepreneurial spirit‘ which many workers may have previously enjoyed prior to JIT implementation. JIT success may be _industry specific‘, i.e. craft-oriented businesses are considered to be better candidates for a JIT program than organizations producing commodity-type products.

There are some guidelines for implementation of JIT system was suggested. Long change over time, unleveled production schedules, highly variable production processes and others should be removed before implementing the JIT system. Fiedler et al. proposed two stage of process to implementing JIT such as prepare the plant and its people for flexibility, low costs, short lead times and high quality by concentrating on design; maintenance; quality; layout; set-up time and people. Another step is strived to produce zero lead-time with no waste by focusing on: total people involvement; visibility; process data collection; enforced improvement; flow scheduling and so on. Thus, it can be easier to implement JIT in the organization [8].

Recently, additional studies on JIT implementation in developing countries have been conducted [9]. Some organizations have failed to implement JIT concepts successfully due to a variety of issues. Ang [10] broadly classified the barriers that building professionals encountered into two categories: industry related problem and human related problem. There are limited supports from government, consultants, clients, and statutory boards do not promote JIT implementation in the construction industry. Oral et al [11] identified six common characteristics of developing countries and their likely impact on JIT implementation. There are implementation costs, costs of technology and maintenance, labor productivity and labor costs, inflation and the supply conditions, the demand conditions and lastly is culture.

However, there are few constraints of JIT implementation. Poor labor skills and insufficient training was hindering the implementation of JIT. Chinese construction industry is a highly labor intensive sector and most of the construction labor force is composed of peasants and unemployed workers, thus it can be easily recruited due to low requirement for skills. Another constraint is lack of project management experience. Previous studies have found that the project management skills in China are lagging behind those of developed countries. The limited management skills have prevented construction workers in china from working efficiently. Poor organization structure, unstable construction material prices and poor material management; supplier relationships, limited use of prefabricated components and others also is the hinder of implemented the JIT.

For further improvement, there are some recommendations for implement JIT in practice. Conducted training programs in JIT for top management to raise their awareness of the benefits that may be derived from JIT and consequently reinforce their commitment. In addition, reward and recognize those companies that have experimented with JIT implementation which can encourage another company to do so. Establish JIT consultancies to provide training or educational services to construction practitioners and facilitate the changes that JIT brings about to their company [12].

Five major constraints upon JIT practices are being proposed by two researchers in western countries and this was become a reminder to all organization as it want to implemented JIT system. The first constraints that propose are customer-driven and economic conditions. JIT practices face difficulties under certain economic environments. JIT does not fare well under raw material price fluctuations. The ability to commit JIT practices can also be diluted by other economic factors such as business cycle or by capital availability and costs. Furthermore, the rate of customer demand as well as the nature of customer expectations can also place limitations on the effectiveness of JIT practices and it was implicitly assumes a reasonably level rate of customer demand. JIT is even

less likely use traditional planning system to operate in a stockless manner. Further, while customers continue to dictate ever-higher levels of responsiveness and customization, this type of demand are also not well tolerated under JIT.

Second constraint is logistics. Interruption of material delivery along the supply chain can quickly affect manufacturing shutdowns and or finished goods shortages when insufficient raw material buffer stock is maintained along the chain. From some example, it suggest that removal of raw material buffer stocks along the supply chain may well be capturing immediate cost savings in exchange for increased risk of finished goods stock out as well as a greater overall cost should those stock out occur. Moreover, the longer the delivery lead time, the higher the level of buffer stock is required.

Third constraint is organizational culture and conditions. The well noted experience of Allen-Edmonds, a high-end American shoe manufacturer, exemplifies the important effect that the state of the organization can have upon successful JIT implementation. The company quickly discovered the piecework system (paying labor by units of production rather than by the hour) and JIT practices to be at odds with one another. Besides, improvement in delivery times and inventory levels were quickly achieved, however management was disappointed with the decreased worker productivity and eventually returned to the piecework system. Japanese managers have also experienced cultural constraints upon JIT as they globalize their supplier operations. They also found that other aspects of their organizational culture upon which they had to rely did not translate well across borders.

Fourth constraint is intractable accounting and finance practices. Traditional cost accounting systems can confound attempts to implement JIT practices in various ways. Cost accounting measures are typically cycled monthly or quarterly, while worker improvement efforts take place daily or even hourly. The traditional cost accounting focus upon direct labor cost is also problematic. It ignores the primacy of time minimization in JIT environment. Traditional financial practices also confound. If reducing inventory by half can be accomplished by some fixed cost, eventually, at some point, the proposal for further reduction of inventory will fall short of the hurdle rate imposed by financial staff. Yet JIT implementation typically has negative impact on short-term financial measures. Last constraint is small supplier difficulties. Small company cannot reap the same scale of benefits from JIT since they lack the economics of scale that their high volume, repetitive manufacturing customers possess. They are forced to purchase in much smaller quantities, and hold for less influence over their suppliers to reciprocate JIT policies, and so view themselves as the _whipping boys‘ for JIT [13]. In sum, some arguments suggest that JIT actually raises global product costs; costs experienced by small suppliers and passed down the supply chain. It may be well argued that a significance portion of organizational savings due to JIT are captured, not as efficiencies, but as externalities [14].

Moreover, there is a problem with JIT system as the benefit and constraint is defined out. Raw materials are important for a company, thus an enough raw materials are needs to make sure the production can be continuous work to meet the customer demand. Consequently, an accurate, consistent quality and continuous supply raw materials need to production. Besides, a backup inventory should be prepared to avoid the lack of raw materials to produce product when customers order.

Researcher and practitioners indicated that several modifications to existing system should be undertaken prior to JIT implementation. There are four modifications method that propose such as modification of executive management, modification of engineering, modification of inventory management and modification of human resources. For the modification of executive management, JIT requires a modified approach by top management which may include significant modifications; such as designing an organization that integrates strategy with people to achieve the basic premise of JIT, elimination of all types of waste; reducing of specialization and organization functions, responsible to the quality of product, and development of management and employee‘s commitment can be take action to continuous improvement. Example of the modification in engineering is minimize the work distance, standardization of product, change work center layout; standardize the work-in process, using total productive maintenance (TPM) as an integral part of a JIT system[15]; plus analyzing the operation in order to identified where standardization, simplifications and automation are needed [16]. Besides, reduce the number of supplier; change the policy of order, stabilizing production schedules on a daily or weekly basis and establish new procedures for dealing with supplies like defining the criteria for supplier base on quality, cost and timing is propose for better inventory management. Lastly, increase the job satisfaction of employee‘s, increase the flexibility of work time, training employee‘s, improving the skills of employee‘s, training of management and employees to create an organizational culture consistent with the JIT philosophy; and build up a good relations with suppliers and improving communications between management and employees are can be due to modification of human resources [17].

CONCLUSION

Despite the advantages of JIT and constraints, there is many study had done by researchers which mainly focus on the problem of implementation of the JIT system. However, there is less study are concerned about the weakness or the problem of the JIT system itself. There are many constraint have been found out to implement the system while they do not notice that the system also have their own weaknesses. The insufficient supply of raw material in market can cause problem to the production line due to no backup of raw materials. Besides, there are a lot of methods to improve the JIT system. Modification of executive management, modification of engineering, modification of inventory management and modification of human resources can cover the weaknesses of the problem that exist in JIT system. More studies should be carrying out to tackle those constraints when JIT system is practiced. By improving the JIT system, JIT system can perform well in an organization and productivity can be increase. Therefore, further studies are required to cover the weaknesses of JIT. This may provide opportunity to others researchers to execute more research in this field and to merge with others modification effort that should be undertaken prior to JIT implementation; such as management, engineering and logistics modifications.

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