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A STUDY ON JUST IN-TIME IN K.P. GROUP OF COMPANY

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ABSTRACT

How many people in the automobile industry, manufacturing industry, and electrical industry can truly say that they have not heard about JIT? Not many. Just in Time (JIT) has been a very popular operation strategy partly because of its success in Japanese industry. Various benefits for example, inventory reduction, improved in operation efficiency and faster response. JIT implementation can involve a series of incremental steps and missteps, before the desired outcome is achieved. Customer has focus on product quality, product delivery time and cost of product. Therefore, success full implementation of JIT is vital to many industries. JIT implementation improves performance through lower inventory levels, reduced quality cost and greater customer responsiveness. This paper will examine the roll of a company's resource. This paper presents a literature review on a small manufacturing that altered its resources configuration from a producer- consumer relationship separated by a buffer, to a simultaneity constraint. The result of this paper shows that the removal of the buffer system increased the manufacturing system's need for mix flexibility and indicates that JIT system is success full, and operating JIT system can lead to many advantages to the case company.

KEYWORDS - *Just In-time, Manufacturing system, Waste elimination, Equipment Efficiency.*

INTRODUCTION

The principle of Just in Time (JIT) is to eliminate sources of manufacturing waste by getting right quantity of raw material and processing the right quantity of products in the right place at the right time. Just-in-Time (JIT) theory has been operating widely in the Japanese automobile industry and the electronics industry, though more and more applications can be found in many industries over the world. In today's competitive global business environment, the goal of all manufacturing systems is long-term Survival. The ideology of JIT is 'producing the necessary item in the necessary quantity at the necessary time is an eternal diver of production and operations management'. A manufacturing company's survival in an increasingly competitive market closely depends upon its ability to produce highest quality product at lowest possible cost and in a timely manner with shortest possible lead time.

The roots of JIT system can probably be traced to Japanese manufacturing industries. Japan has inherent limitation of lack of space and lack of natural resources. Japanese have developed an aversion towards all kinds of wastes. They view scrap and rework as waste and hence strive for perfect quality. They strongly believe that inventory storage wastes space and results in locking up of valuable material and capital. Anything that does not contribute value to the product is viewed as waste. Thus, it is quite natural for the JIT philosophy to develop in Japan. Apart from eliminating wastes JIT has another important feature utilizing the full capability of the worker. Workers in JIT system are charged with responsibility for producing quality parts Just in Time to support the next production process. The objective of JIT system is to improve profits and return on investment through cost reduction, inventory reduction and quality improvement. Involvement of workers and elimination of waste are the means of achieving these objectives.

Just in Time (JIT) means making only what is needed, when it is needed, and in the amount needed. For example, to efficiently produce a large number of automobile parts, which can consist of around 40,000 parts, it is necessary to create a detailed production plan that includes parts procurement. Supplying what is needed, when it is needed according to this production plan can eliminate waste, inconsistencies, and unreasonable requirements, resulting in improved productivity. In addition, these goals should be achieved by paying utmost respect to the humanity of the employees who make the system work. Sometime, the difficulty of achieving the goals lies in the complexity of manufacturing operations. It is not difficult to build the high quality product, but is extremely difficult to do so while maintaining excellent quality, and at some time respecting the humanity of people who do the actual work of building that product.

Just in Time (JIT) is a production strategy that strives to improve a business return on investment by reducing in-process inventory and associated carrying costs. Just in Time (JIT) is a type of operations management approach which originated in Japan in the 1950s. Just-In-Time (JIT) is a system that focuses on waste reduction and continuous improvement to achieve operational excellence. In a manufacturing context, JIT involves a manufacturing system where the parts needed to complete finished products are produced or delivered at the assembly site as required. Over the last three decades, hundreds of journal articles have been written on research carried out in the area of JIT manufacturing. The vast majority of these articles extol the benefits that can be achieved through the implementation of JIT practices, including increased performances with respect to manufacturing costs, quality levels, delivery responsiveness and flexibility. JIT manufacturing is said to be based on a number of principles.

II. LITERATURE REVIEW

(Golhar et al) - have classified the JIT literature as waste elimination, participation of employee, total quality control (TQM) and supplier participation.

(Berkley) - has done similar work for production process. He has selected 24 elements in the production process as operational design factors.

(Dr. P.S Sharma Bala, R., 2012.) - Education of workers about JIT concepts and top management commitment were proved essential to ensure the effectiveness and success of implementing JIT Deshpande and Golhar [16] examined human resource practices of JIT firms in Canada through an empirical study. Worker flexibility; ability to work in groups, self-inspection a concern for a firm's success was some extremely important characteristics of some JIT firms. Without these workforce qualities, continuous improvement in the workplace will be difficult. Recruitment practices indicated that the JIT firms preferred to recruit from within the organization. There was a strong commitment of the JIT firms in upgrading employee skills and, therefore, the number of training programs and training budget had increased significantly. There was also a significant increase in group incentive programs, teamwork, and communication within the organization. JIT firms also made concerted efforts towards employee retention by providing a better work environment. The firms that had adopted JIT were benefiting from its implementation. Productivity, product quality increased significantly with a significant decrease in the overall inventory, lead time to meet customer demand, and the labor cost/unit. These benefits further helped the JIT firms in successfully competing in the global environment. Resistance to change, production scheduling and union resistance were the most often cited problems by firms during JIT implementation managers.

(Bala, R., 2012) - Multiple regression models based on dependent variables and independent variables were employed to find the most significant factors among JIT requirements. Communication between the production and marketing departments was determined to be a critical success factor for increasing inventory turnover in JIT firms. Employees' participation and bottom-up management were identified as the critical factors for improving quality and flexibility. Contrary to previous studies, however, a negative correlation between integration of MRP and JIT, sales in dollar per employee and inventory turnover was identified, and top management support was not determined as a critical factor for successful JIT implementation. The results of this study further suggested that the JIT environment, personnel management practices, such as bottom-up management encouraging employees' participation, and organization management, such as communication linking the production and marketing departments should be enhanced.

(Ahmad, S., R.G. Schroeder, and K.K. Sinha, 2003.) - Kumar and Garg took a closer look at JIT implementation problems and benefits in Indian context. A survey of Indian industries was conducted to identify those JIT elements which are highly difficult to implement, those which are easy to implement in the Indian context and to identify the most expected JIT benefits in the Indian context. It was found perfect JIT implementation may not be feasible in most Indian industries due to lack of resources, lack of technology, non-availability of multifunctional workers, etc. However, some elements such as continuous improvement, layout improvement, quality circles, small lot size, etc. are easy to implement as reported by Indian industries. Therefore, maximum weightage must be given to these elements to reap maximum benefits. The elements which were found to be difficult to implement included zero defects, automation, JIT purchasing, Kanban system, set up time reduction, etc. Reduced work in process, reduced purchase lot size, reduced production lead time, improved competitive position, etc. were found some of the high-ranked expected benefits as a result of JIT implementation.

(Boysen, N. and S. Bock, 2011) - The survey indicated that techniques such as quality circle, total preventive maintenance, cause and effect diagram, kaizen, JIT purchasing etc. require more attention since their implementation may be helpful to improve present position of Indian industries in the areas of quality, cost and flexibility. against everybody's will. Voluntary participation and training are necessary. Being a philosophy, JIT does not restrict itself to high technology manufacturing environments which make extensive use of modern technologies like flexible manufacturing systems (FMS) or computer integrated manufacturing (CIM).

(Callen, J.L., M. Morel and C. Fader, 2008) - The remaining elements are techniques to achieve the Elimination of Waste. There are five elements: uniform factory load, set-up time reduction, machine/work cells, pull system (Kanban) and JIT purchasing; which were grouped into one, denominated Production Flow. All these elements reveal how the operating process proceeds in the passage of an operation to the next. The second element is Quality. It is important to note that Quality itself does not require JIT, but JIT requires Quality. Employee Involvement is the last element which needs to be infused in each element so that JIT can work. Six of these elements are related within the organization and one, JIT purchasing, is related with the exterior (Hay, 1991). Through the seven essential elements identified above by Hay (1991), it is possible to identify the main features of JIT: Uniform Factory Load; Set-up Time Reduction; Machine/Work Cells; Pull System (Kanban); JIT Purchasing; Product Design; Process Design; Supplier Quality; Workforce flexibility; Greater participation and responsibility; Continuous improvement; Jidoka and Multifunction Employees. After a successful implementation of the elements and characteristics of JIT, companies can experience the benefits and advantages as those which were described by the various interpretations on JIT.

(C.H., L.G. Hassel and D.R. Upton, 1999) - There was much interest in American industries in the use of just-in-time (JIT) manufacturing to reduce the work-in-progress (WIP) inventory and to increase the quality of the end product. However, while it promised significant results, it might be difficult to justify that management discard an operating MRP system in favour of a philosophy.

JIT is not just a way to reduce inventory but it is a mean of solving problems that block the building of an excellent manufacturing organization. Its applications and benefits apply not only to the shop floor but also to the marketing, purchasing and accounting aspects. But benefits from this system cannot be achieved overnight. It is a slow process and takes 5 to 10 years to obtain optimum results.

Statement of Problem:

To ensure or study the effect of just in time environment at industry level with the types of manufacturing systems and important factors in just in time environment and how inventory should be kept in just in time environment.

Hypotheses:

H0: There is a significant relationship between types of manufacturing systems and important factors used in just in time environment.

H1: There is no significant relationship between types of manufacturing systems and important factors used in just in time environment.

Objectives:

1. To know the effect of just in time environment at industry level.
2. To study the awareness of this concept of "Just in time".
3. To study the important factors used in just in time and usual manufacturing problems.

3.0 Research Methodology:

The given study is descriptive in nature. Primary study has been collected and used from questionnaires made and circulated. 100 samples were collected from different people. Graphical representation techniques such as bar graphs and simple percentage analysis is used to analyze the data.

Data Analysis and Interpretation:**Percentage Analysis****Table A**

Age	No. of respondents	%	Gender	No. of respondents	%
25-35 Years	32	32	Female	50	50.0
35-45 Years	8	8	Male	46	19.2
45-55 Years	8	8	Others	4	23.3
More than 55 Years	1	1	Total	100	100
Less than 25 years	51	51	Recent Employment History	No. of respondents	%
Total	100	100	1-5 years	36	36
Employees Working	No. of Respondents	45.8	5-10 years	28	28
100-500	25	25	Less than 1 year	22	22
500-1000	41	41	More than 10 years	14	14
Less than 100 employees	10	10	Total	100	100
More than 1000 employees	24	24	Types of Manufacturing systems	No. of respondents	%
Total	100	100	Process type Production	51	51
Manufacturing Performance	No. of Respondents	%	Repetitive large batch production system	27	27
Adherence in Schedule			Small batches little repetition	22	22
Good Quality		%	Factor in just in time	No. of respondents	%
High Output	14	14	Ability to produce small batch economically	35	35
Low cost	20	20	Advanced warning of quality problems	41	41
Total	100	100	Low inventory to be cost competitive	24	24
			Total	100	100

(Source – Survey Data)

Age of respondents

From the above table, it is been observed that 51% of employees are less than 25 years whereas 32% of employees are 25-35 years of age whereas 8% of employees are 35-45 and 45-55 years of age have the same range and lastly 1% of employees are of 25-35 years of age.

Gender

According to the table, it is been observed that 50% of the employees are female employees whereas 46% of them are male and 4% of them are others. That means that majority are female employees working in the organization.

Employees working in Company

According to the table, it is been observed that 41% of the employees are 500-1000 employees whereas 25% of employees are 100-500 employees and 24% of employees are more than 1000 employees and 10% of employees are less than 100 employees. That means that majority of employees are 500-1000 employees.

Recent Employment History

According to the table, 39% of employees have employment history of 5-10 years whereas 31% of employees have employment history of less than 10 years and 19% of employees have employment history of more than 10 years and 11% of employees have employment history of 1-5 years. That means that majority of employees have recent employment history of 5-10 years and least employment history is of 1-5 years.

Types of manufacturing systems

According to the table, 51% of company has process type production whereas 27% of company has repetitive large batch production systems and 22% of company has small batches little repetition. That means that majority of company have process type production.

Manufacturing Performance

According to the table, 36% of employees think that most important manufacturing performance is low cost whereas 30% of employees think that most important manufacturing performance is high output whereas 20% of employees think that most important manufacturing performance is good quality and 14% of employees think that most important manufacturing performance is adherence to schedule. That means that majority of employees think that most important manufacturing performance is low cost.

Factor in just in time

According to the table, 41% of employees think that company has advanced warning of quality problems whereas 32% of employees think that the most important factor in just in time is advanced warning of quality problems whereas 35% of employees think that the most important factor in just in time is ability to produce small batch economically and 24% of employees think that most important factor in just in time is low inventory cost. That means that company has most important factor in just in time is advanced warning of quality problems.

Chi – Square Test**Table - A****Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.121 ^a	6	.085
Likelihood Ratio	11.296	6	.080
N of Valid Cases	100		

a. 3 cells (25.0%) have expected count less than 5. The minimum expected count is 3.08.

In the chi – square test, the researcher find that the calculated value is (11.121) higher than the table value. The degree of freedom is 6 and the significant level is 3% is > 0.05 . Therefore, null hypothesis is rejected. So, there is a significant relationship between types of manufacturing systems and most important manufacturing performance.

FINDINGS

- Main job function of the company is finance rather than manufacturing.
- Recent employment history is 1-5 years which is not good. The company is not good at retaining employees.
- The most common and usual manufacturing problem of the company is Product Quality.
- The most hindering factor in the Just in Time environment is the high demand fluctuations of employees in the company.
- The most common type of production system is process type production.
- The inventory is kept with the supplier as a safety stock in just in time environment.
- The most important reason for implementing just in time is the long-term quality leader.
- The most important factor in just in time is advanced warning of quality problems or checks.
- People are not aware of this concept of just in time which they mostly learned from journals.
- This company has a shorter delivery time which is their competitive advantage over competitors.

SUGGESTIONS

There are almost 500-1000 employees working in the organization so the company productivity is appropriate.

Current business climate is highly cost competitive which is competitive advantage for this company rather than other companies.

Finance is main job function of the company rather than manufacturing and production as it requires JIT.

The respective employment history with the company is 5-10 years which means company has strategy of maintaining and retaining employees.

The sales for 2020 sales have increased to more than 50 lakhs from 2000 sales.

Action should be taken to manage the hindering factor i.e. huge demand fluctuations and overcome the market.

Most usual manufacturing problems are product quality which should be kept an eye upon to avoid deterioration of quality product.

CONCLUSIONS

Just in time is a manufacturing philosophy that leads to producing the required items, at the required quality and in the right quantity at the precise time as they are required. It is an approach to achieving excellence in elimination of waste.

Overproduction, inventory, defective products, etc. are some of the examples of what can be wasted according to JIT.

Just in time is a system of enforced problem-solving. Quality within JIT manufacturing is necessary, because, without a quality program in JIT, JIT will fail. The JIT technique is a pull system rather than a pull system, based on not producing things until they are needed.

Just in time has its influence in ordering, scheduling and producing sides of a manufacturing firm. Furthermore, techniques are also very important. Moreover, integration also plays a very vital role in JIT system.

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