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A study of Just-In-Time installation and benefits and factors impacting its effectiveness

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A STUDY OF JUST-IN-TIME
INSTALLATION AND BENEFITS
AND FACTORS IMPACTING ITS
EFFECTIVENESS

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A Study Of Just-In-Time Installation
and Benefits and Factors Impacting Its Effectiveness

Today’s manufacturing world is more competitive than ever. American companies are falling behind at an alarming pace. But there is hope. Many companies have found success by using Just-In-Time manufacturing philosophies, both in the U.S. and abroad.

In this paper, I have tried to focus on some of the ways that companies can ease JIT installation, as well as on reasons why a company would want a JIT system in the first place. I point out things to avoid, and also what to encourage, both among employees and with suppliers. I also discuss the advantages of using JIT instead of moving manufacturing operations to foreign countries where labor is less expensive.
# A STUDY OF JUST-IN-TIME INSTALLATION AND BENEFITS AND FACTORS IMPACTING ITS EFFECTIVENESS

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INTRODUCTION

Today's American manufacturing companies have it pretty rough. The world view of American product quality is poor, at best. Countries whose economies and industries we have built are dominating the American marketplace. The American public has no sympathy after listening endlessly to union squabbles. And with labor rates and import/export policies, many American companies are choosing to become multi-national companies by performing much of their labor-intensive manufacturing outside of the U.S. All of this adds up to intense pressure on the industry as a whole to make changes that will allow U.S. industries to compete in the world market, and with the Asian manufacturers in particular.

One of the currently more popular means to achieving world-wide competitiveness is to implement a Just-In-Time
(JIT) manufacturing system. But implementing a JIT system is a very involved process, effected by all of the factors mentioned above and more. But if installed in a logical way, with an eye towards the future, the benefits can indeed restore competitiveness to a failing company.

JIT OVERVIEW

What is JIT?

A Just-In-Time system focuses quite simply on the elimination of all waste from a manufacturing system (Aletan 1991). Ideally, a successful JIT implementation would eliminate all inventory, breakdowns, scrap, inspections, reworks, and defects, bringing all of these negatives to zero (Aletan 1991). What?!? you say. No inventory! No inspections! What about quality?!? JIT focuses on giving each person in the manufacturing process the responsibility of inspecting his own work when he is done, as well as the work of the person before him when he gets the material to use. And inventory is unnecessary if you can eliminate breakdowns in the manufacturing line and shortages of supplies. In a JIT system, each person is responsible for constant monitoring and servicing of his machine, to be performed during times when his station is slightly ahead of his neighbors and he has no material to process. The shortage of supplies can be trickier to achieve. The ideal way is to reduce the number of R.T. Flewellyn's Honors Capstone : October 1993
suppliers, therefore increasing how much the supplier and manufacturer rely upon each other. And if the supplier knows that a large portion of his business comes from one customer, they will be willing to alter their way of doing business in order to keep the customer. This can lead to more frequent deliveries of smaller sizes, therefore reducing on-hand inventory. Many suppliers will also be willing to accept the responsibility of inspecting their own shipments before delivery, eliminating the necessity of the manufacturer to perform inspections of incoming material. Of course, these concessions don’t come cheap, but the increased cost of raw material will be more than offset by the reduced amount of money tied up in inventory.

JIT IMPLEMENTATION

Why Implement JIT?

Some of the most popular reasons to implement JIT in U.S. manufacturing companies include fewer inventory turns, increased customer service, decreased warehouse space, decreased marketplace response time, increased vendor quality, and fewer suppliers (Lieb, 1990). How will JIT increase customer service and improve marketplace response time? JIT tries to eliminate your inventory. If you have no inventory, then you don’t have products sitting on the shelf forever until they are sold. Instead, you build products as you need.
them. This decreases spoilage and inventory depletion from other factors, like theft and old age. Further, if the market changes, there is no need to clear out old inventory before beginning to sell a new product. Instead, the company can just start producing and marketing their new, timely product. All of these reasons still come back to the original idea of JIT philosophy, elimination of waste, and the dilemma faces American industry, its uncompetitive state in the world market. By implementing JIT and realizing the benefits listed above, U.S. industry can restore its competitiveness and once again become a world leader in manufacturing.

Why Doesn't Everyone Implement JIT?

JIT looks great on paper, and operates as well as advertised in a successful implementation. But JIT is not the answer for every company. Small businesses often cannot utilize a JIT system due to their lack of size. Larger companies enjoy economies of scale and therefore are often able to singlehandedly alter their environment. Small business have no such power. Suppliers are willing to alter delivery schedules and business practices as mentioned before, but only with the promise of large and frequent sales. The smaller a business is, the less influence it has over the supplier. Also, many small manufacturing firms don't have the corporate infrastructure to perform many of the companion implementations that will help improve the probability of JIT
Another roadblock to implementation is the labor force itself, particularly in unionized plants. Workers in many companies fear change, assuming that any technological change means that their job will soon be done by a robot. Therefore, workers often resist change, either through union strikes, worker slowdowns, or other means. This creates an adversarial relationship between management and the work force, making a smooth corporate technological update difficult. There are ways to avoid these labor problems, but many companies fail to plan for the worst. In many cases, the way this is done is to include the labor force in the JIT implementation as much as possible. This can be done with quality circles, education, and just plain listening to what the workers have to say (Inman 1990).

What else can aid JIT implementation?

’Understand first, then clarify, next simplify, and finally automate’ (Beatty 1990) is my favorite quote about JIT implementation. It was written with automation in mind, but I feel it transcends that boundary and applies to any update of any system or process for any company.

The first step is to understand. Understand the company, the way it works, the way the workers feel about change, and what advantages the company can realize from JIT. Understand the product, how it is made, the processes involved, where
there is room for improvement before JIT, and how JIT can improve it. Then clarify. Clarify what the company wants to achieve and where it wants to go in the future. Clarify the process of manufacture and its flaws. And talk with the workers. Clarify to them what the company is doing and why. Make sure that they realize that they are a big part of this, and their future depends upon JIT's success. Next simplify. The more steps there are in a process, the more room there is for error. Start from the beginning. Simplify the design of the product, see if it is possible to decrease the number of parts, type of parts, or if odd parts that are hard or expensive to obtain can be eliminated. Simplify the manufacturing process. Try to eliminate unnecessary or redundant processes. Reduce the cycle time by cutting down on move times. This includes getting supplies from the warehouse or toolroom, getting material from station to station, and reducing work in process (WIP). It will be much easier to streamline operations before JIT implementation than during. There will be more resources available, because once the installation starts, everyone will be involved with the JIT. Also, the company may find that JIT is not what they need, instead they just need a product redesign and a corporate overhaul. Finally implement JIT. Once as many variables in the implementation have been eliminated as is possible, thereby reducing the number of potential surprises, there will be a much greater chance of success than there would have been.
JIT: IN THE UNITED STATES AND ABROAD

JIT originated in Japan, and is still a major component of that country’s manufacturing industry. In the aftermath of Japan’s destruction during World War II, the U.S. government took pity on Japan, sending money, talent, and other resources to organize the rebuilding of their economy. This start from scratch with nothing to lose effort was the perfect arena to implement new technologies. W. Edwards Deming was one of the Americans who helped take part in this rebuilding effort. He quickly became a well known champion of the JIT philosophy, successfully implementing JIT systems for many Japanese manufacturers. This philosophy soon became the favorite for Japanese companies, helping to restore Japan to international prominence.

Why wasn’t this done originally in the United States? At that point in Japan’s history, they had little choice but to do what was suggested to them by the rich and generous U.S. And back home, America was enjoying its world dominance, the Great Depression only a memory, reveling in its great victory in the War. It is difficult to convince someone who is successful to change their entire organizational philosophy overnight, which JIT requires a company to do. Unfortunately, most of the U.S. has just stood by and watched while Japan has...
passed us by, waiting, possibly, until it is too late to catch back up.

Many U.S. companies have chosen shift production to foreign countries instead of trying to restore their operations in the U.S. They build plants in companies like Taiwan and Mexico, where factory workers earn just dollars a day. This often happens when a company is sick and tired of dealing with the unions, who fight for increased wages, and fight against labor cutbacks and technology advances. Fighting for these things are good for the workers in the short run, resulting in more jobs and higher pay, but when the company closes the factory in favor of one in Korea, it is the workers who lose out.

Import and Export laws also affect a company’s decision to move. The U.S. has no import restrictions, while other countries have very protective import policies. These policies are often anti-American, and if a company can achieve classification as a non-U.S. company, they can increase their chance of foreign market success.

More and more companies are now rebuilding using JIT instead of foreign manufacturing (Lieb 1990). The average factory worker in Japan is paid much more than the average factory worker in the U.S., but you don’t see Japanese companies building plants in Mexico. This is because if you use JIT properly, the cost savings and increases in profit will more than outweigh those achieved by moving operations
elsewhere.

From this information, some would think that the best way to go would be to open a plant in a Third World nation and implement JIT there right from the start. Bad idea. The entire idea of JIT is reliability and frequent shipments. If your supplier has to deliver raw materials to Mexico on a daily basis, the costs incurred would be enormous. And the quality of communications and transportation in many countries is sub-par, at best. And many countries deal with political strife as a way of life. As mentioned before, the first step is to simplify, not complicate.

CONCLUSION

JIT is a proven technology: Proven to work right when installed with forethought and intelligence. American manufacturing needs a boost, and JIT may just be the answer for many of these companies.
BIBLIOGRAPHY


LENGTH OF JIT EXPERIENCE
Of Selected U.S. Manufacturing Firms

- < 1 Year: 34%
- 1-3 Years: 42%
- > 5 Years: 11%
- 3-5 Years: 14%

Adapted from Traffic Management, November 1990
BENEFITS OF JIT IMPLEMENTATION

- Reduction in downtime
- Reduction in inventory
- Reduction in work space
- Reduction in scrap
- Increase in equipment utilization
- Increase in labor utilization
- Increase in inventory turns
- Increase in service
- Reduction of total costs
- Increase in ROI

Adapted from Interfaces, March-April 1990