Introducing JIT Manufacturing: It's Easier Than You Think

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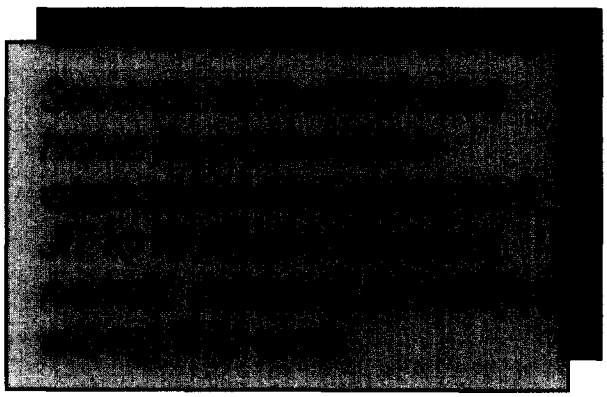
The practical difficulties arising from the implementation of a Just-in-Time (JIT) inventory management approach have caused some managers to dismiss it as a passing fad. When asked to cite the inventory strategies that do and do not work for their companies, purchasing managers identified JIT as the most frequently mentioned failure. Their general sense was that "modified JIT works, pure JIT does not." The success of JIT implementation may also be a function of the size of the company, with smaller firms finding it more difficult.

If JIT is abandoned because it does not appear to work as described in articles and textbooks, the cost savings of an efficient, integrated manufacturing process will be lost. As documented here, the solutions of actual companies in response to the impediments of introducing JIT in its purest form may be instructive for other firms facing similar problems.

The popularity of JIT inventory methods has grown steadily over the last two decades. Officially introduced by Toyota in the 1970s, JIT methods have spread to manufacturing companies all over the world. The appeal lies mostly in an emphasis on simplicity and a cost-saving, "bare-bones" approach. Researchers generally agree about JIT on several points, one being that JIT methods, with some alteration, can be successfully adapted for use in American manufacturing plants of all sizes. Setting up a JIT system, however, involves the entire business, from suppliers to production to customers—even to administrative aspects such as accounting.

There may be significant disadvantages with the system, such as uncooperative suppliers, the distance between suppliers and manufacturers, and overstressed workers. On the other hand, the benefits to be realized include less need for maintaining safety stock, a lower lead time, higher quality, automated communication with customers, and cross-training for workers.



A JIT approach has as its main goal the reduction of the levels of inventory and its associated carrying costs—or to reduce waste altogether. The less time a product is in process, the less inventory there is to finance, store, and manage. The objective is to push to zero the amount of time the product is waiting to be worked on, in transit, and/or being inspected.

Benefits that should result from the implementation of a JIT system include:

- lower inventory carrying costs;
- space and cost savings in the factory and warehouse;
- reduced risk of obsolescence; and
- reduced response time to customers' orders and delivery times.

To the extent that the JIT system can be put into practice without any impediments, a "theoretically correct" demand-pull system will be in place.

JIT in theory often differs greatly from JIT in practice. Not all companies can continuously feed inventory into work-in-process and manufacture their product without interruption. Different industries have different manufacturing processes that, for varying reasons, are not suited to JIT treatment. This does not completely rule out the possibility for the company to practice JIT; it just means it has to find a way to adapt or adjust its processes to incorporate as many JIT principles as possible.

To examine how different manufacturers have adapted JIT to fit the needs of their compa-

nies, we interviewed the production managers of five manufacturing companies. The sample was chosen to represent a variety of industries and manufacturing technologies available in the area, ranging from heavy manufacturing to food processing. We asked the managers to describe their general manufacturing environment, inventory and ordering practices, working arrangements with suppliers, and costs associated with switching to a JIT-type system (see **Figure 1** for a list of the questions). Each company demonstrated a reason peculiar to its industry why it could not employ JIT in its theoretical form.

Electronics Manufacturer

This company had $7.4 billion in sales and $8.9 billion in total assets in 1994. Its lines of production include information systems and electronics, power systems, industrial systems, transportation, and consumer products. The inventory manager stated that the company has a special distributor system developed many years ago that is geared to work with its manufacturing process. Because of the nature of the complex electronic goods it produces, the company is restricted to ordering large quantities of parts from its suppliers, some of whom are located abroad.

These factors would preclude the company from practicing JIT in its theoretical form. However, some JIT principles have been incorporated into the distributor system. The company feeds the inventory directly into work-in-process, with no initial inspection. A minimum number of suppliers are kept for each category of parts: one for electrical parts and two for prefabricated parts. The distributor handles most of the requirement planning and delivery scheduling. According to the inventory manager, one of the main goals of this system is to decrease costs while increasing quality—a goal that coincides with one of the main principles of JIT.

Figure 1
Survey Questions

General Manufacturing Environment
1. Do you have a repetitive manufacturing environment, where the same product or type of product is manufactured or assembled again and again?
2. Is it a flow or process production, like an assembly line, where the product is manufactured or assembled in stages in different departments or in different parts of the line?
3. Do you have stable production rates so that you try to produce a given number of units of product for a certain time period (hour, day, week)?

Inventory and Ordering Practices
4. Do you have a program in place or are you implementing a program to reduce or eliminate inventories and work-in-process?
5. Do you have a "push" system, where you produce to inventory, or a "pull" system, where you produce to demand? In other words, do you produce as long as you have enough inventory to cover it, or do you feed inventory into production as it is demanded by the processes? What drives the production?
6. Is inventory delivered in frequent small batches, just enough to cover a few hours' or days' production?
7. Do you thoroughly inspect each incoming inventory order, or do you feed it directly into work-in-process?

Suppliers
8. What are the major parts you order from outside suppliers?
9. How many suppliers do you have for each of those parts?
10. Do your suppliers have a just-in-time or similar system, or do you encourage them to do so?
11. Are your suppliers' production and inventory methods similar to yours?
12. Do you have a "partnership" with your suppliers, working closely with them on production methods, quality control, and design specifications?
13. Are your suppliers located nearby?

Other
14. Have you had any problems or do you foresee any problems with your JIT system?
15. What were/are some of the costs the company incurred to switch to a JIT system?
16. If you do not have a JIT system, why not? What kind of inventory system do you have?

Air Filter Manufacturer

This company manufactures air filters for use in air conditioning units, automobiles, and the like. It is a division of a corporation whose total assets in 1994 were $5.1 billion and whose sales were $6.6 billion. The division's main barrier to following theoretical JIT is that it must maintain a three- to four-week surplus of a critical part, one that is common to most of its manufactured products. According to the manufacturing manager, keeping a surplus is necessary because of the setup costs involved in production. It is cheaper overall to maintain this inventory than to manufacture a small number of these parts every time they are needed. Moreover, keeping inventory on hand reduces lead times.

Other than that, the company practices other components of JIT, such as holding little inventory, having a small number of certified suppliers, and reducing inspection of incoming inventory. The company has been using this system for several years. The manager mentioned the idea of driving down costs to remain competitive—again, a central principle of JIT.

Food Processing

No financial information was available for this company, which produces food products and diet supplements from ingredients found all over the world. The manager said the company has been using a form of JIT since its birth in the 1950s. Its inventory system involves keeping only a few carefully screened vendors to supply inventory and working closely with them on quality control