

# A Comparative Analysis of JIT and Reengineering

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## Abstract

Although the authors of Reengineering insist that Reengineering is quite new and has nothing to do with JIT, in some cases, especially in the manufacturing sector, the difference between JIT and Reengineering is quite blurred. There are many similarities between Reengineering and JIT. So the paper tries to address the following question: Are those similarities features that Reengineering borrowed from JIT or just a simple coincidence between two completely different systems?

## 1. Introduction

The beginning of the 90s has given the impression that JIT is becoming something of the past. The only way for a company to change the rules of the game, maintain the leadership and enter the 21st century with a strong competitive edge is to reinvent itself, i.e., to embrace Reengineering. My own interest being in the manufacturing sector, I wondered whether globally outperforming and very successful JIT-based manufacturing companies, such as Toyota, should abandon their JIT production methods and JIT management style, and trade them off against Reengineering.

My contact with Reengineering as preached by its pioneers has left me perplexed. Although Reengineering is rich of bright, revolutionary insights, it seems to be a way of thinking, but not a system with well structured elements like JIT. And as such, its primary sector of application (such as manufacturing for JIT) is not defined at all and is therefore difficult to implement. Second, I have a strong impression that it incorporates many ideas from JIT though its inventors pretend that it is quite new and thus has nothing to do with JIT.

The objective of this paper is not to oppose JIT and Reengineering. It will rather try only to shed the light on the differences and similarities between the JIT system and Reengineering. In order to do so, I will compare first the basic concepts that define JIT and Re-engineering. Next, I will review some publicized cases of Reengineering in the USA and compare them with cases of JIT implementation in both Japan and the USA.

Although the paper is about JIT and Reengineering, I will sometimes outstretch that framework to

include the lean production system.

## **2. Birth environment**

The just-in-time production system was born on a workshop floor, on the production line at a Toyota factory. It was tested there, not in an engineering department of some university. That is why it is sometimes identified with Toyota and/or Toyota Production System in the automobile industry. However, it spread rapidly to other repetitive production in other sectors of the manufacturing industry. (The lean production is term coined by scholars of MIT to JIT-like production system and is thus used as synonymous to JIT production).

Reengineering is the invention of Michael Hammer and James Champy, two management consultants. It is identified with them. It is not associated with a specific company.

## **3. Definition**

### **3. 1. JIT**

According to Mr. Ohno (1988, p. 4) , “Just-in-time means that, in a flow process, the right parts needed in assembly reach the assembly line at the time they are needed and only in the amount needed. A company establishing this flow throughout can approach zero inventory” . Just in time enabler is the kanban system (an information system).

### **3. 2. Reengineering**

Hammer and Champy (1993) define Reengineering as follows: “Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed” (p. 32) . For them, “Reengineering a company means tossing aside old systems and starting over. It involves going back to the beginning and inventing a better way of doing work.” (p. 31)

IT is its enabler: “We say that in reengineering, information technology acts as an essential enabler. Without information technology, the process could not be reengineered. (p. 44)

### **3. 3. My Definition of JIT**

As we can see, JIT is not well defined. Of course, it is not the product of academics who deal with concepts in detail nor the work of consultants who want to sell their ideas. The definition of Reengineering is stated in a way that strikes the attention of the reader. I have tried to define JIT as follows: it is “a set of production techniques and methods aiming at (a) eliminating completely all possible wastes and their causes, and (b) reducing drastically the production lead time so that demand

and delivery of products should be met in time, making useless the necessity of keeping stocks of finished goods and/or even those of WIP” (Kupanhy, 1994, p.97).

#### **4. Fields of application**

##### **4. 1. JIT**

The main area of JIT application is the production assembly line of the manufacturing company. In other words, it deals mainly with the manufacturing processes. It tries to synchronize the production of the final assembly line with those of preceding processes and goes upstream as far as to join the suppliers processes.

##### **4. 2. Reengineering**

Reported cases of Reengineering are mainly to be found in the service industry; and in the manufacturing sector, they concern service operations.

#### **5. Goals**

##### **5. 1. JIT goals**

JIT goals are clearly defined. JIT wants to reduce production costs. How? By eliminating all possible wastes relating to the manufacturing. JIT has identified manufacturing wastes, and classified them in order to deal properly with them.

Another important goal of JIT is to satisfy the customer by the quality of its products. The JIT-company assures the quality from design to manufacturing; and the quality assurance is supported by QCC and continuous improvement activities. To satisfy each individual customer it aims at zero defects, customized products, zero lead time.

##### **5. 2. Reengineering goals**

Reengineering goals are contained in its definition: to achieve dramatic improvements in terms of cost, quality, service and speed (Hammer & Champy p.32).

#### **6. Means (Techniques) to achieve those goals**

##### **6. 1. JIT techniques**

JIT provides top management with its philosophy and implementation team with a set of techniques, such as quick setup, automation, full-work system, breaking of physical barriers, etc. (see Kupanhy, 1995, p. 62–63)

## **6. 2. Reengineering Techniques**

Reengineering provides a vision for top management but it does seem to have a set of defined techniques. It requires much more a work of a genius on behalf of those in charge of its implementation. Anyway, it requires first to identify the process to reengineer and create a reengineering team which will identify the problems and decide on the techniques to use.

## **7. Implementation steps**

### **7. 1. IT**

JIT implementation steps are easy to identify and this can be shown (See Kupanny, 1995).

### **7. 2. Reengineering steps**

For Reengineering, there are no ready-made techniques. It depends on the situation.

## **8. Chance of success**

### **8. 1. Reengineering**

According to the inventors of the concept of Reengineering, Reengineering succeeds in 50% of cases!

### **8. 2. JIT**

JIT success is almost certain for any company which is serious about JIT introduction programs.

## **9. Some Cases of JIT and Reengineering**

### **9. 1. JIT**

Since Kawasaki Electric switched to JIT, they “now produce in three days or one week what used to take 60 days.” At The World Company, it took about one month to produce a single jacket or a single dress. Everyone at World thought this was acceptable. When a request was made to speed up production time, the one month would be cut to 25 or even to 20 days. That was considered an accomplishment. However, when the production time for each jacket or dress, from beginning to completion, was precisely monitored, it was found that it actually took less than 1.5 hours. World, like most other garment makers, produced clothing in batches of several thousands. Sleeves would be sewn, then collars, then pockets, and so on. This meant that it took a lot of time to finish even one garment because work was being done on so many at the same time. Misawa Home's Matsumoto plant used to produce six different types of panel. Now that the plant has been transformed into a small-lot-size production plant, it produces more than 30 different types. At any rate, Misawa Homes used to manufacture about 20 different types of components every day. They are trying to increase

that by tenfold to about 200 different types. Moreover, the inventory is to be reduced to one-tenth. Misawa also says that productivity at Matsumoto and Nagoya plants will be doubled and tripled, respectively (see Shinohara, 1988).

Other cases are given by J. Abegglen (1986). According to Abegglen, Toyota Bolt maker setup time was reduced from 8 hours to 1 minutes; Mazda Ring gear cutter: from 6.5 hours to 15 minutes; MHI 8-arbor boring machine: from 24 hours to 3 minutes; Yanmar Cylinder block line from 9.3 hours to 9 minutes. Outside Japan, let us just cite two cases. According to J. Schonberger, after introducing JIT, HP Dot matrix printer's production lead time was reduced from 5 days to one; its WIP from 3 weeks to 3 days. At Omark, the lead time went from 30 to one day; WIP was reduced by 80%; and the defects by 50% (Schonberger, 1986).

## 9. 2. Reengineering

The most striking cases of Reengineering are given by Hammer and Champy. According to them, IBM Credit, after redesigning the process, introducing IT and replacing specialists by generalists (multi-function workers), accomplished a 90% reduction in cycle time and hundred fold improvement in productivity. At Ford Account payable, after reengineering thanks to IT realized the following results are reported: work force was reduced from 500 people to 125. Kodak, thanks to CAD/CAM (concurrent reengineering), reengineered and cut nearly in half as - to 38 weeks - the time required to move from concept to production (See Hammer, 1994). AT & T's Bell Laboratories in New Jersey redesigned the "design for production", and realized 74% reduction in cost. Company X reengineered and reduced the changeover time from 4 to 6 hours to 15 minutes. A carpet manufacturer reduced the lead time: from 4 hours to 15 minutes; the inventory reduction by 48% and the associated cost reduction by \$16 million; they reduced the cost of quality by about 30% (\$ 8 million); rapid change over increased current equipment utilization by 50% (a labor capacity improvement of \$ 1.3 million); the new layout saved \$ 460k (See Johanson, 1993).

When one considers carefully these cases, i.e. the result of applying JIT or Engineering, it seems that the difference between JIT and Reengineering is blurred. The biggest success of Reengineering is the fact that it was a best-seller book.

## 10. Similarities: JIT-borrowed techniques or simple coincidence between Reengineered and JIT?

- ① By the results they give, it's difficult to distinguish between JIT and Reengineering.
- ② JIT is a philosophy and a consistent system of production; Reengineering is not a system, but a set of ideas.

- ③ JIT as well as Reengineering insists on the “redesign of process” in order to create the flow of materials. Both insist on the importance of a layout that breaks barriers between processes. The main difference is that while JIT provides a set of techniques that can help realize the flow, Reengineering provides just examples. Let's however point to the fact that in the manufacturing the process is something evident. That is not the case in the service industry. The merit of Reengineering is the fact that it seeks to define the process in service industry.
- ④ JIT as well as Reengineering use multi-function workers.
- ⑤ As for the waste, both just in time and Reengineering recognize the necessity of eliminating waste. JIT defines what waste is and provides a set of specified techniques to deal with. Reengineering does not do it clearly.
- ⑥ JIT insists also on breaking administrative barriers. For Reengineering, the way to eliminate bureaucracy and flatten the organization is by reengineering the processes so that they are no longer fragmented.
- ⑦ Reengineering is not kaizen as JIT is not kaizen but JIT recognized however that it is supported by kaizen. What supports Reengineering?
- ⑧ Both JIT and Reengineering advocate the empowerment of workers: Because employees involved in the process assume responsibility for making sure that customers' requirements are met on time and with no defects, they need less supervision. Instead, the company encourages these empowered employees to find innovative and creative ways to reduce time and cost continuously while producing a defect-free product or service.
- ⑨ At its early stage, it was said that without IT Reengineering was not possible. JIT from its birth it did assume IT as a prerequisite.

### **Conclusion:**

Although its authors insist that Reengineering is quite new and has nothing to do with JIT, in some cases especially in the manufacturing sector, the difference between JIT and Reengineering is blurred. There are more similarities between Reengineering and JIT. Are those similarities borrowed techniques from JIT or just a simple coincidence between two completely different systems, i.e., JIT and Reengineering?

The reengineering and JIT have many common features. As JIT has a longer history, we can say without fear of contradicting ourselves that it's Reengineering which has borrowed those common features to JIT. That's why many gurus of JIT have transformed themselves overnight in reengineering specialists.

The process has always been at the center of manufacturing activities. As such, it is the main point of

focus of JIT in its quest for the total elimination of all kinds of wastes related to the production operations. Reengineering has the merit of drawing the attention of the service industry to the service production process as the core part of its activities. The process is where the value for the customer is created. And the core process is the most important in the value creation. It's thanks to reengineering that the management in the service sector has refocused its attention on the importance of the process. That explains why the most successful cases of reengineering, the most referred to, are in the service industry. Tentatively, I may dare say that reengineering looks like a special case of application of JIT to the service sector. And I would not feel shocked to hear that some people may sustain the opposite view, i.e. JIT can be considered as the application of reengineering methods to the manufacturing sector. The only question would rise here is: "Is Reengineering made of specific techniques, if yes, what are they?"

In my study and analysis of Reengineering, the greatest obstacle I have encountered is the fact that there are no clear, defined methods or techniques that make up Reengineering. Contrary to JIT which is a well structured system of production, Reengineering looks a like a set of concepts and cases of companies that succeeded in Reengineering. And for professionals like consultants, I am sure that Reengineering catches their attention quickly, but it should be hard for them to know how to implement it.

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