Applications of Just in Time in Manufacturing Industry

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Abstract. The purpose of assembling organization in current scenario is to provide best quality of output at minimum cost at the correct time. Just in Time (JIT) has been accepted now a day’s worldwide as it has many advantages like more throughput time, higher efficiency and best quality. The objective of this paper is to discuss the key issues and all important principles for understanding the framework of JIT implementation. This paper also shows the techniques and pay off of JIT implementation in manufacturing industry. A structured questionnaire survey is used for JIT fabrication methodology. The thoughts introduced within this paper used JIT fabricating in their associations.

Keywords: Self-test, implementation, pay off, strategic issues.

1. Introduction

Manufacturing is not, at this point a neighborhood matter. Advances in correspondence and transportation have significantly diminished the world's size, and manufacturing should now be viewed as a world issue. The resulting assortment of decisions settles on choices with respect to manufacturing methodology extremely troublesome and hazardous. Today enterprises face world rivalry, and manufacturing is at the core of the issue. To keep up serious edge, ventures occupied with manufacturing face the trouble of lessening costs and improving their quality level [1]. One approach to achieve this is to utilize right technique in manufacturing. It is important to build up a pledge to manufacturing prior in item improvement stage. It is critical to utilize regular faculties in considering the various decisions and to do choices that will make the manufacturing cycle viable, quick and troubled with extremely low overhead [2]. JIT is another perspective about manufacturing. The test of JIT is that it establishes a total takeoff from the old operational frameworks that have been utilized for a long time in our production lines [3]. A large portion of the JIT ideas have been created in Japan through numerous long stretches of difficult work and consideration in detail. JIT producing has most likely gotten more consideration in a brief timeframe than some other new manufacturing method [4]. The explanation is that JIT gets the acknowledgment for a ton of Japanese manufacturing achievement, if India is not kidding about mechanical and innovative independence despite expanding rivalry there is no decision – JIT can't be overlooked. Strategy creators should give cautious thought to the inception and extension of JIT in manufacturing industries [5].
JIT fabricating is progressively turning into a subject of much interest all through the Western World and has been broadly provided details regarding lately [6]. Prior to looking into the writing, it is helpful to consider or to audit the fundamental idea of JIT. Recognize that an association can't embrace JIT in separation, yet just with the nearby cooperation of other included associations, especially providers, so that dangers of late conveyances of materials and parts are limited [7]. Besides, it requires a serious level of association inside the organization with the goal that it can react quickly to showcase requests [8].

JIT has acquired significant interest since it permits an organization to deliver excellent items with decreased waste and with expanded degrees of efficiency [9]. Schonberger depicts the JIT framework as to: "Create and convey completed products just in time to be sold, sub-gatherings without a moment to spare to be collected into completed merchandise, and bought materials in the nick of time to be changed into manufactured parts" [10].

2. Key Issues in JIT Manufacturing:
Key issues in assembling fall into two classes. The primary tends to those issues that are identified with how an industry connects with clients and rivalry and second is worried about top administration decisions and needs [11]. For a fact five key inquiries have been distinguished and are:
- How will JIT sway available spot [12]?
- How appropriate is JIT for specific assembling climate [13]?
- How should JIT be executed [14]?
- What essential changes are to be made, to make an industry into a JIT industry [15]?

3. Getting a JIT System off the Ground:
Probably the main standard is (list isn't thorough and there are different guidelines that will likewise be useful):
- Use dreary assembling, day by day plans, Kanban and day by day pull strategies. It dodges the intricacy of work arranges and permits issues to be identified when they happen [16].
- Start teaching center administrators and laborers about JIT standards right away. Their comprehension of JIT must be clear, regardless of whether they are at first incredulous of results.
- Have ranking directors engage with key providers toward the start of the program. This is basic for rousing the providers to help JIT. Point out to providers that they remain to pick up from having a drawn out relationship with, and being single source providers of the organization. Remind providers that occasionally an underlying interest in help is required [17].
- Don't begin with a worldwide program. Pick a couple of key zones where to execute JIT. At that point pick another zone. On the off chance that you attempt to do excessively, the framework won't work easily and representative will get disappointed and lose interest [18].
- Develop JIT frameworks and techniques toward the start, and afterward give preparing prior to establishing them. Try not to leave the techniques for some other time. In any case the framework will decline. As the association picks up experience, survey the methods and search for potential enhancements [19].
- Develop a bunch of quantifiable objectives for the JIT program, see table 1. At that point screen them and audit their status with directors and laborers. Permit the objectives to be changed midstream, if essential [20].

| Table 1: Goal-Performance table for Monitoring |
|-----------------------------------------------|
| Just-In-Time | Low | Medium | High |
| WIP in the process | 2 Weeks | 1 Week | 1 Day |
| Cycle time reduction | 25 % | 25-75 % | Over 75 % |
Scrap and rework reduction | 30 % | 30-80 % | Over 80 %
Number of suppliers under Just-In-Time | 25 % | 25-75 % | Over 75 %
Quality improvement | 50 % | 90 % | 100 %
Number of parts with no receiving inspection | 25 % | 25-75 % | Over 75 %
Factory space reduction | 25 % | 25-50 % | Over 50 %
Productivity increase | 25 % | 25-50 % | Over 50 %
Overhead reduction | 20 % | 20-50 % | Over 50 %

Quality improvement is measured by the percentage of reduction in the number of defects.

Productivity increases can be measured in different ways, for example, factory output against the number of hourly workers.

4. Planning & Implementation
In general there are three phases for JIT implementation. These are

**Planning**

a. Creating the new organization [21]
b. Understand the current situation [22]
c. Aligning the Systems
d. Have a clear vision of what is to be achieved
e. Choose a management team for driving the projects
f. Select project teams and projects

**Start-up**

a. Empower and Encourage the teams [23]
b. Train all the employees for fully supported
c. Decide key area where improvement is required [24]
d. Completing the Transformation [25]
e. Define JIT Project
f. Develop JIT Implementation Plan

**Continued Operation**

a. Do not condemn failures [26]
b. Local & Strategic Performance Measures [27]
c. Continue with improvement plans

Some of the specific rules are:
- Involve all levels of management [28]
- Don’t forget people requirements and provide training to do their jobs.
- Evaluate long-term needs [29].

Some of the things that can go wrong are:
- Cuts in budgets
- Product design changes during commissioning [30].
- Project targets change [31].
- Insufficient development effort.
- Lack of continuity in project management.

| Implementation Steps | Time (in months) |
|----------------------|------------------|
|                      | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 |
| **A Planning**       |                 |
| 1 Creating the new organization |            |
| 2 Understand the current situation |            |
| 3 Aligning the Systems |            |
| 4 Have a clear vision of what is to be achieved |            |
| 5 Select project teams and projects |            |
| 6 Choose a management team for driving the projects |            |

| Implementation Steps | Time (in months) |
|----------------------|------------------|
|                      | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 |
| **B Start-up**       |                 |
| 1 Empower and Encourage the teams |            |
| 2 Train all the employees for fully supported |            |
| 3 Decide key area where improvement is required |            |
| 4 Completing the Transformation |            |
| 5 Define JIT Project |            |
| 6 Develop JIT Implementation Plan |            |

| Implementation Steps | Time (in months) |
|----------------------|------------------|
|                      | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 |
| **C Continued Operation** |             |
| 1 Local & Strategic Performance Measures |            |
| 2 Do not condemn failures |            |
| 3 Continue with improvement plans |            |

**Table 2 JIT Implementation**

Many companies have tried to implement JIT and found considerable obstacles. The self test addresses over forty central elements of an effective JIT implementation [32]. The test will highlight problems which have source cause, many of which are hidden under layers of poor business habits. The objective of
this is to help you test the success of your JIT implementation and to help you find and resolve any obstacles that may be there [33]. A five level statistical rating scheme will help to immediately score themselves against a standard set of models designed to match their JIT environment [34]. The results will identify the weaknesses and strengths of the company under consideration.

The two greatest values of this self test will be:

1. Gaining an objective view of the implementations problems
2. Learning a methodology for refocusing the JIT efforts.

New companies entering the JIT environment or those who are already working on JIT will find the self test to be simple and useable.

Conclusion:

JIT is a revolutionary concept that is a challenge by its very simplicity. It introduces no advances technology or complicated principles but instead strives to eliminate the unnecessary burdens of complicity. Complicated processes are not necessary in JIT. An industry can build the same product with less labor, less overhead, more quality and no time by using the principles of JIT system. Making the complex simple is the main goal of JIT. The results that can be gotten will be surprising. Just-In-Time (JIT) is a proven management innovation which assuming international importance for achieving industrial excellences. This philosophy is emerging as a concept which facilitates significant improvements in manufacturing performance. It is an approach to problem solving the main areas to attack is those identified as wasteful and to eliminate waste. It is a lead time reduction programme to zero or as close as possible to that number.

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