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"An Investigation of JIT (Just in time) Approach in Inventory Control of Ongoing Construction Project "

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Abstract - *Just in Time (JIT) method is a production technique which improves efficiency of manufacturing. JIT technique is â□œIndustry manufacturing the product only which is required, when it is required & in how much amount it is required. The Industry manufactures the product what the demand from client, to real requests. Just in time approach also explained as manufacturing the required products, with appropriate quality as well as in required quantities, for safe moment. This means that the industry will utilize their self-resources & allotting them the work without any problem. Inventory management is a significant function in order to increase productivity in construction projects. In Inventory management includes arrangement of materials, choosing proper supplier & examination, procuring of material, expenses, delivery, material conveyance & its distribution. Today construction industry needs to minimize cost in addition to improve quality and on-time delivery. According to lean manufacturing, â□œinventory□□ is important factor of any construction firm that increases cost, reduces profitability and requires more working capital without adding any value to the customer and organization. Unfortunately, in our traditional accounting system, inventory plays role as an â□œasset□□ whereas it is a most expensive â□œliability□□. This fact was discovered by Toyota Motor Corporation and they developed a unique â□œJust-In-Time□□ technique to reduce inventory to the minimum possible degree.)*

***Key Words*: Just In Time, Inventory Control, Conventional Method, MSP Analysis**

1.INTRODUCTION

Simply in Time (JIT) technique is a production method which used for completing project within time. JIT method is, "agency production that specialize in what's exactly required in how a whole lot quantity & when it is to be required". The business enterprise manufacturing which is clients demand. If we describe simply in time then it is a way for manufacturing the crucial gadgets, with suitable first-rate, in required quantities. It means that business enterprise can make do with their very own property and allocate them with none problem.

Just in Time (JIT) approach is a production methodology which used for finishing venture inside time. JIT method is, "agency production specializing in what is precisely required in how plenty amount & when it's far to be required". The enterprise production that is customers call for. If we describe just in time then it is a technique for manufacturing the essential items, with appropriate exceptional, in required portions. It implies that organisation could make do with their personal assets and allocate them without any trouble.

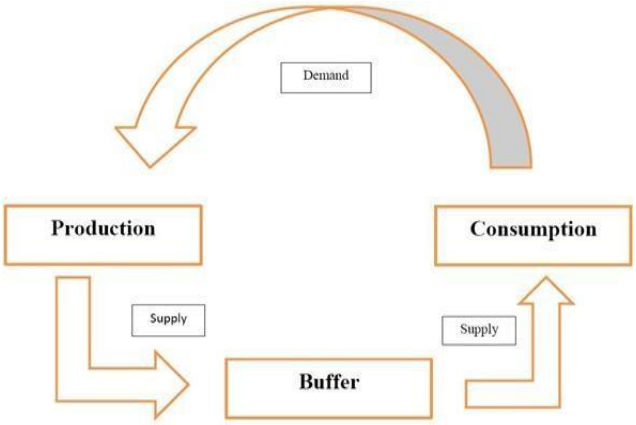

Chart-1

JIT generally identifies four types of waste to be reduced:

i. Waste because of Overuse

ii. Waste in the transportation

iii. Waste of ideal time

iv. Stock Waste

1.1 Potential Benefits of JIT

The positive results of JIT application in the development industry include:

- Strengthening the competitive advantage of companies so that they reliably and permanently meet the requirements of the Customer.
- Improving the character of construction materials and parts.

- Cost reduction in terms of inventory minimization.
- Improving connections with suppliers
- Completion of work ahead of schedule
- Improving the organization of construction sites

1.2 Scope of Study

In this study, the focus is on small and medium scale construction projects which face cost overruns due to inefficient inventory management and need up gradation in their process. A case study will compare two approaches. Different parameters on the same site will be analysed and reviewed to see if JIT approach is better than conventional approach for inventory management in Construction Industry. The traditional approach to material management has changed over the past three decades. JIT is being implemented in Indian construction industry. Material management and inventory control are becoming more and more popular in the construction industry. The performance of JIT was not improved despite the same construction project being carried and implemented. The study on JIT is carried out to study the process of implementation, understand and find out the problems, and give suggestion to solve them.

1.3 Problem statement

The traditional approach to the material management system has been changing in the last three decades. The JIT (Just-In-Time) philosophy is being implemented in the Indian construction industry.

Currently, various techniques for material management and inventory management are being implemented in the construction industry. A similar construction project was carried out and implemented by JIT, but the performance of JIT still did not improve according to the requirements of the studied literature. Therefore, this study on JIT is conducted to study the implementation process, understand and find out the problems and provide suggestions to solve them.

2. LITERATURE REVIEW:

Shubham Dharmadhikari, Prof. V Payghan (November 2022) This article explains that all economic development projects need to adapt to changes in the economy over time. Product management focuses on optimizing the product to ensure inc reased efficiency during development. Unfortunately, in our t raditional system, equity is a part of investment but it is the r iskies. Small and mediumsized organizations face problems d ue to lack of access to software like Endeavor Asset Manage ment. It is important to use a sharpening stone regularly to s tay competitive. Just-in-time (JIT) is one of the activities that can improve inventory management without requiring a large investment. Yogesh C. Suthar, MD. J.R. Pitroda (2022) This article shows that just-in time (JIT) methods are very promising for monitoring precast concrete flow through precast buildings and precast concret e. In general, in developing countries, the JIT information ma nagement method appears to be better than the JIC method i n reducing costs and increasing efficiency. Woman. Pradnya R. Pingale and Dr. Madhav B. Kumthekar (May 2022) The aut hor says in this article that the construction industry in India has been considered highly competitive and dynamic in rece nt years. The construction industry is trying to implement ne w business strategies to survive in the competitive market. C ompanies should try to offer quality products, low prices tha t reach customers in the shortest possible time. This is where new strategies come into play that aims to reduce costs by el iminating unnecessary extra work.

Mohamed Hussein, Tarek Zayed (2021) According to this paper, Modular integrated construction (MiC) is a revolutionary construction method. However, the logistics management of MiC has always been barrier a major to the wider adoption of MiC. Nonetheless, this challenge can be tackled by the application of lean techniques, namely, just- in-time (JIT). Numerous studies have identified and evaluated the critical factors (CFs) required to implement JIT, herefore, this research, for the first time, provides a systematic review and meta-analysis of these CFs. The systematic review identifies 42 CFs. To further provide a synthesis analysis of previous studies, a meta-analysis approach is used. Mali Pritam et.al (2020) This paper explains that, material management plays very important role in any industry. Improper handling and managing materials on site during a construction process will influence the total project cost, time and the quality. JIT delivery is a service of frequent deliveries in work packs or task loads, 'pulled' just in time for the trade to perform the next task without incurring any delays. This can be done either through a individually by suppliers. JIT deliveries reduce or even eliminate the need for on-site storage of materials. Not only does this improve the site logistics but it reduces the risk of damage or loss of materials stored on-site as well as reducing congestion and the associated risks such as safety incidents.

Vihar Patel, Jayraj solanki (2020) In this paper author said that, the building industry in recent times is seen to be highly competitive and dynamic. To remain with the world market of building industry we need to adopt new approaches or new system. This is where the importance of new concept comes into play like Just-in-time. This thesis addresses the Just-in-time (JIT) concept used in housing project. Initially, a framework is established for this study through the presentation of brief history and marketing theories. Then, through literature review, questionnaire of four different phases has been made, which are in turn later used to compare the data collected from the industry.

3. OBJECTIVES OF THE STUDY:

- To understand the detail literature of JIT for commercial construction project.
- To study procedure of implementation of JIT.
- To identify the problems in implementation of JIT.
- To carry out comparative analysis between conventional approach and JIT approach for inventory by MSP software.

4. METHODOLOGY:

Following methodology will be adopted –

PHASE I

i. To study literature review.

ii. Collection of data from ongoing commercial construction projects.

iii. Apply ABC analysis for the material from ongoing commercial construction projects.

PHASE II

iv. Identifying the risk factors in construction project.

v. Prepare schedule of risk factors for optimization.

vi. Tracking & controlling of project by MSP software.

vii. Comparative analysis of collected data by JIT method.

viii. Recommendation & Conclusion.

5. IDENTIFICATION OF SOURCE:

Just-in-time (JIT) is the process of buying the right amount of inventory at the right time. Large organizations have their sources, but small organizations encounter various issues with inventory management. Supplier analysis: Suppliers are entities that provide materials to organizations. They supply different materials to organizations, which could be singular or multiple depending on the organization.

6. SCHEDULING:

It will clear idea associated with day by day paintings. This schedule will deliver to provider earlier for presenting cloth on time. offer shop room / location & proper stock for distinct kind of materials. Plan for date, time, vicinity, quantity and no. of gadget needed.

7. JIT IMPLEMENTATION PROCESS:

One of the significant goal in executing a JIT Framework is to accomplish a common objective of the entire organization.

- First step is identifying of material conveyance issue in organization and give answer to organization.
- Second step is Material Quantity Calculation. ABC Analysis is done. This Analysis assists to choosing material for JIT implementation.
- Third Step is arrangement of JIT plan. Find out number of days needed to finish work. Plan incorporate date, spot of material conveyance, time and no. of equipment needed.
- Fourth step is supplier selection. Analytical Hierarchical Process is utilized for supplier selection. Then material purchasing plan prepared. JIT Plan Submit to plant and supplier.
- Keep up proper communication between site engineer, supplier and plant supervisor.

8. OUTLINE OF THESIS:

This thesis is divided into the following chapters:.

- In the first chapter general information and the need for just in time are given along with the objectives and motivation of the dissertation work
- The second chapter contains a literature review including a review of previous studies carried out by some of the researchers
- Chapter three explains the path of the methodology adopted to achieve the objectives of the dissertation work carried out
- The fourth chapter deals with the status of the application of jit concepts and the selection of ongoing construction sites
- the fifth chapter includes the data collection and analysis of sites by the jit in msp along with the methodology adopted to achieve the objectives of the dissertation
- chapter sixth explains results, discussions, which are evaluated from the data, and also suggestions for improving the performance of inventory control
- in the seventh chapter, a cost comparison of the site is conducted
- Chapter eight concludes the overall study and provides recommendations for future research.

9. Conclusion:

- In this study JIT gives new directions of planning and performing activities in construction project therefore JIT is way that combines difficult targets of less cost, low requirement for inventory, proper quality and delivery dependability. In short JIT is a framework that produces the needed items in the time and the quantities required. For this we are using MSP software for better planning and scheduling the activities.
- In the study it is found that JIT implementation depends on supplier selection of suppliers is the difficult primary step, due to selection of supplier is important for an effective material management. For this selection of vender we are using 1000s mind software.
- This research work helped us to know the present material procurement processes and vendor development practices adopted by the contractors engaged in road and highway projects. It completely depends upon the quantity of material to be procured, different levels of firms, availability of suppliers and supplier capabilities.

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