

# Inventory Management System in Construction of Buildings

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**Abstract-**The concept of inventory management system has been one of analytical aspects of management establishing control over purchase, storing and to keep track of the materials, workforce, equipment and production units involved for construction projects. The proper management of this component can improve the productivity and cost efficiency of a project. One of the major problem in delaying construction projects is poor managing systems. The inventory management system for construction industry involves procurement, identification, transport and storage of materials in construction projects. The main objective of our study is to investigate the efficiency and its impact in application of inventory management system in construction of small scale projects. Identification of impacts and risk influence of inventory management systems in a small-scale projects. The lack of proper handling and storage of material in construction site has made it difficult to track and locate the material availability and suggestion about inventory management system and its control over efficiency construction projects will be analysed and the outcome of the effective utilization of inventory at construction site of small scale project to overcome the difficulties by giving best the possible recommendations. ABC analysis is one of the most conventionally inventory management system suited for construction infrastructure.

**Keywords-** Inventory management, Construction materials, Financial analysis, Tracking goods, Identifying factors

## I. INTRODUCTION

The term inventory means referring the goods and materials used by a firm for the purpose of production and sale. It is also essential to provide flexibility in operating construction and production activities of an organization. Inventory management is a system by which the construction companies and suppliers can stores and keep track of their material, workforce, equipment and production units involved for construction projects.

The most important functions of any type of business is inventory management system. Without stock management it is difficult for any company to maintain control and to handle customer needs. The clear understanding about inventory management system is important construction companies handling multiple projects at the same time nearly 60% of money for the inventory in a project.

Inventory management is defined as the process responsible for the coordination of planning and controlling the inventories in an suitable manner to provide a pre-decided service to the customer at a min cost. Inventory management is simply the process by which an organization supplied with the goods and services enabling the best way to achieve its objectives of buying, storage and transportation of materials.

## II. OBJECTIVES OF INVENTORY MANAGEMENT SYSTEM

- To analyze the possibility of applying inventory management system in construction sectors.
- To make an analysis about suggestion of experts through questionnaire survey about inventory management system in construction industry.
- To identify the impact and influence of inventory management system in reducing time delay and material scarcity.

## III. SCOPE OF INVENTORY MANAGEMENT SYSTEM

- The inventory management system concerns the fine lines between replenishment of lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory prices forecasting, physical inventory, quality management, returns and defective goods.
- Inventory management system can be made applicable for initiation of utilizing the left out of stock of any item used in construction sectors.
- Measuring the change in inventory allows the company to determine cost incurred for materials during the progress of the project.

#### IV. BENEFITS OF INVENTORY MANAGEMENT SYSTEM

- The inventory management has several benefits like increased profitability, improved cash flow, timely decision making and customer satisfaction etc.
- Reducing the overall cost of the materials in construction projects.
- Better control over material supplied to the site can be achieved.
- Improvements in labor productivity and control over project schedule can be attained.
- Inventory management system facilitates improved accuracy in material management, avoiding unexpected time delays in progress thereby resulting in considerable saving in total expense of the project.

#### V. RESEARCH METHODOLOGY

The collection of detailed information about inventory management system will be done. A systematic approach and proper investigation about in fluency factors of inventory management system towards a project will be carried out. Administered to collect various data by questionnaire surveying. The respondent have been asked to express their opinion on the variable point scale about application and feasibility of inventory management system in construction project. It has been also checked and analysed for avoiding common types of risks in inventory management system.

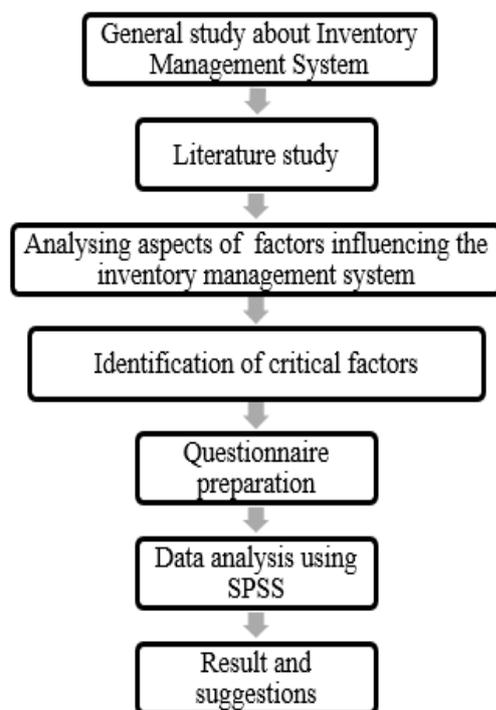


Fig. 1 Project Methodology.

#### VI. FACTORS IDENTIFICATION

The factors which are influencing inventory management system were identified based on literature review.

- To identify the allocation of cost for inventory
- To identify the need for stock inventory
- To analysis the importance of inventory system in construction project
- To identify the importance worker/labours in inventory
- To analysis the affects of inventory.

#### VII. ANALYSIS OF DATA

After the study of literature review a plan for collecting the field information using the inventory management systems in construction companies. The main important factor is to collect the detailed information of some risks and advantages are using in small scale building directly to the respondent. It shows the several impacts on performance of the inventory management system in small construction works. This questionnaire survey was conducted through the construction professionals, engineers, project managers in construction and construction companies to identify the risk factors in inventory management system. The given data was analysed to find the frequency of response in various risk factors.

Table no. 1 Analysis of data.

s.no.	Statement
1.	Inventory management system must be in an organization/companies handling multiple projects
2.	Skilled manpower required for managing
3.	Inventory management is more important comparing to other works
4.	Inventory management is most useful for construction projects in future
5.	Inventory management helps growth of the company
6.	Inspection is required when the goods arriving to the location of project
7.	Maintaining safety in storing materials
8.	Proper space required in assembly of materials
9.	Periodical system (periodic checking) is suitable for construction projects
10.	Damages mostly occurs during transportation to project location
11.	Pre-ordering of the material
12.	Purchasing material more than required quantity
13.	Control in stock overflow in construction site
14.	Lack of experience in material management
15.	Wastages are occuring mostly by labours
16.	JIT (Just in Time)method is suitable inventory management for small scale buildings

17.	Estimation of future demand in project
18.	Maintaining stock is important comparing others
19.	Accepting goods before the scheduled delivery date is better for avoiding demand of material
20.	Maintaining daily records of goods in-stock and out-stock
21.	Selection of vendor Selection of vendor
22.	Impact of price in vendor selection
23.	Better relationship with vendors and customers will reduce the cost of purchase
24.	Maintenance of reliable information on stock levels
25.	Involvement of contractor in material management
26.	Checking appropriate cost of materials
27.	Handling and transportation charges of inventory
28.	Procurement and holding cost spent on inventory
29.	Material delay affects the profit to be gained in the project
30.	Storage of capital or financial support



Fig.2 Represents strongly disagree and disagree.

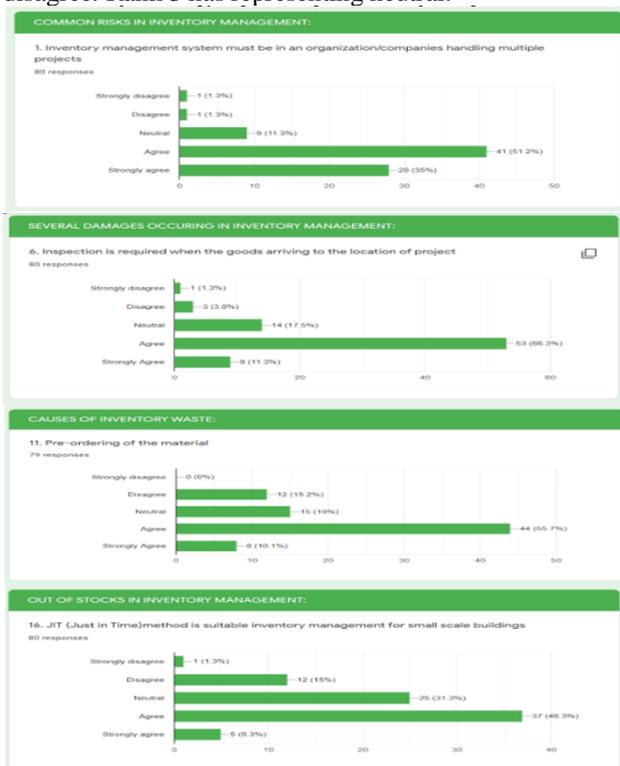
The SPSS statics software is used for analysing the collected data. This was helps to find the survey authoring and development of data collections, data mining and collaborations. The mean value was calculated by the total number of cases and the number of items.

### VIII. RESULT AND DISCUSSION

The factor analysis of inventory management system is carried out through the principle components method and the mean values are calculated.

Table 2 Factors Mean Value and Ranking.

The prepared questionnaire of inventory management system in small scale buildings is distributed to 81 members and their response have been collected. The answers were ranked in order to obtain statistical data. The ranking should be based on 5point scale method. Rank 1 represents strongly agree and rank 2 represents agree. Then rank 5 and 4 represents strongly disagree and disagree. Rank 3 has representing neutral.



Factors	Mean value	Ranking
Maintaining daily records of goods in-stock and out-stock	4.35	1.
Proper space required in assembly of materials	4.14	2.
Maintaining safety in storing materials	3.93	3.
JIT (just in time) method is suitable for small scale buildings	3.90	4.
Selection of vendors	3.87	5.
Inventory management system must be in an organization/companies handling multiple projects	3.87	6.
Skilled manpower required for managing	3.86	7.
Checking appropriate cost of materials	3.83	8.
Inspection is required when the goods arriving to the location of project	3.81	9.
Material delay affects the profit to be gained in the project	3.79	10.
Maintenance of reliable information on stock levels	3.76	11.
Estimation of future demand in project	3.76	12.

Impact of price in vendor selection	3.74	13.
Maintaining stock is important comparing others	3.74	14.
Better relationship with vendors and customers will reduce the cost of purchase	3.70	15.
Handling and transportation charges of inventory	3.61	16.
Lack of experience in material management	3.58	17.
Storage of capital or financial support	3.56	18.
Involvement of contractor in material management	3.56	19.
Procurement and holding cost spent on inventory	3.50	20.
Accepting goods before the scheduled delivery date is better for avoiding demand of material	3.50	21.
Pre-ordering of the material	3.46	22.
Damages mostly occurs during transportation to project location	3.46	23.
Periodical system (periodic checking) is suitable for construction projects	3.41	24.
Purchasing material more than required quantity	3.38	25.
Inventory management helps growth of the company	3.19	26.
Inventory management is most useful for construction projects in future	3.09	27.
Inventory management helps growth of the company	3.08	28.
Wastages are occurring mostly by labours	3.07	29.
Control in stock overflow in construction site	2.81	30.

A total of 30 items were analysed with 81 number of respondents. In that 2 items are categorised in class A (4.00-4.99) and 27 items are comes under the section of class B (3.00-3.99). finally class C (2.00-2.99) has only one. It shows inventory management is very useful for maintaining daily records of materials in location of project. Storing materials in construction sites properly and making just in time method of investigation of material records. The important risks are occurred due to stock overflow and wastages done by labours.

## IX. CONCLUSION

Inventory management system plays a vital role in activities of an organisation involved in construction as well as production and supply of producer. The study on inventory management system has been extensively done for high rise buildings and large scale construction projects. There should be a centralised material management team co-ordination between site and

organization. In addition to applying inventory management system for small scale projects proper control, tracking and monitoring of the inventory management system is also required which is responsible to complete the company project in a specified budget within a certain period of time efficiency. The common risks are occurred due to the wastages and stock overflows occurred in the construction sites. The inventory management system is useful for small scale buildings also for controlling wastages and making daily records for the material management in construction projects. It helps to control loss of payments and work delay caused by materials.

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