

“I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of the degree of Master of Science of Construction Management”

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VENDOR MANAGED INVENTORY IN CONTRUCTION INDUSTRY IN
MALAYSIA

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A report is submitted as a partial fulfillment of the
requirement for the award of degree Master of Science of
(Contruaction Management)

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JUNE 2009

I declare that this thesis entitled “VENDOR MANAGED INVENTORY IN CONSTRUCTION INDUSTRY IN MALAYSIA” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature :

Name : WAI SOON HAN

Date : 30 JUNE 2009

This thesis is dedicated to my beloved parent

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ABSTRACT

Successful project management involves efficient management of project resources such as materials and labors. Material management is focusing on material handling and delivery. This study looks into vendor-managed inventory as a potential solution for reducing inventory problems at site. There is potential of successful application of VMI in Malaysia but it will depend on the response of the industrial players. Vendor-managed Inventory is an inventory control system that shifts the responsibility of taking care inventory at site to contractors. The first signs of VMI were perceptible in manufacturer that used to reduce the cost of holding inventory. The objectives of this project are to study the inventory and its problem in undertaken construction project and analysing the potential of VMI in local construction industry. Other objective is to investigate the extent of expected barriers and benefits from the viewpoint of construction personnel. Based on the survey, there are two major problem faced by construction personnel including inaccurate measurement that lead to wastage problem and site inventory records (spreadsheet application) which tends to be flawed due to manual process. The survey shows that there are few more steps for local construction industry to reach the concept of VMI. Finally the project reveals that lack of cooperative culture and increased repeat business with the key suppliers or contractors has identified as major expected barrier and benefit from viewpoint of construction personnel.

ABSTRAK

Kejayaan sesuatu pengurusan projek termasuk pengurusan yang berkesan bagi sumber projek seperti bahan and buruh. Pengurusan bahan memberi penumpuan terhadap pengendalian dan penghantaran bahan. Projek ini memberi perhatian kepada VMI yang merupakan cara pengurusan bahan yang memberikan tugas untuk mengendalikan bahan di tapak kepada kontraktor sebagai penyelesaian yang berkesan bagi mengurangkan masalah pegangan bahan mental di tapak. Projek ini mangandungi tiga objektif iaitu mengkaji masalah bahan bagi projek yang sedang dijalankan. Objektif yang kedua ialah mengkaji tahap kobolehlaksanaan VMI di kalangan industri pembinaan di Malaysia. Objektif terakhir sekali ialah mangkaji halangan and manfaat yang dijangkakan muncul daripada perlaksanaan VMI di kalangan staf tapak di kalangan industri pembinaan di Malaysia. Berdasarkan kepada maklumat daripada soal selidik, dua masalah yang terutama iaitu jangkaan yang tidak tepat terhadap bahan yang akan menyebabkan pembaziran dan catatan bahan di tapak yang sentiasanya hilang atau tidak sempurna dan meyebabkan masalah dalam mengendalikan bahan. Kajian menunjukkan langkah-langkah amat terhad diambil bagi konsep penuh VMI. Hasil kajian mendapati kurangnya budaya kerjasama sesama sendiri dan bertambahnya peluang perniagaan dengan pembekal atau kontraktor merupakan antara halangan dan manfaat yang utama daripada perspektif responden.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Project management is the direction and supervision of a project by the used of certain tools control techniques. These control techniques include cost, manpower, time, equipment, communication, motivation, etc. An important element that may contribute to the success of a contracting organization is how well this organization is being managed.

Management is a series of activities that must be performed to the needs of an organization. Effective project management is important in ensuring the successful delivery of a construction project. When it's involved a project these activities include scoping, planning, organization, controlling, and corrective measures.

The first project management activity is scoping. Scoping is the activity that developed at the outset of the project as it involves establishing realistic and specific objectives. Objectives must be a reasonable, achievable, and in measurable term which covers costs, schedules, quality or any other performance requirement.

After the objectives are being defined clearly, the subsequent project management activity is planning. Planning of activities usually includes time, cost,

equipment and manpower schedule. Planning develop from several main activities which were then breakdown into smaller activities.

The planning of activities for a project can be very complicated due to the complexity of a project. Planning tools available include bar chart, linked bar chart, critical path method (CPM), precedence diagram, PERT, etc. Meanwhile, many computer planning softwares are available in the market. The popular software includes Microsoft Project, Primavera, Suretrak Project Manager, and Computer Associate Superproject.

Organizing is also the important activity of project management. Organizing is the process which was use to relate tasks to people, other firms, regulatory agencies and others. Organizing structures include functional, project, and matrix organization. Project Manager normally is the person who designs the structure, delegation of responsibilities, relationships between individual and groups.

Besides, project manager's roles also include establish a project organization chart for each project to define clearly authority and responsibility for all project team members. Meanwhile, project manager should be able to develop a work breakdown structure that divides the project into definable and measurable units of work.

The fourth project management activity is controlling. Control is a task to ensure the project's objectives are achieved. Control includes managing the resources that will directly influence schedule, cost, quality or any other performance measure. The driving force for keeping a project "on schedule" is money.

However, monitoring is also an important part of controlling process in managing a project. Monitoring is the process that consists of two basic components. The first consists of a means of understanding on what is happening on a project, and obtaining information about the project by some measurable variable. Usually, many firms use scheduling techniques to perform project monitoring effectively.

The last project management activity is corrective measures. Corrective measures are the deviation from the planned activities which requires remedial corrective actions. The process to identify an appropriate corrective action may be derived using different approaches. The different approaches in deriving corrective measures include heuristic knowledge, decision tree, structured approach, experience, and so on.

Among important resources in project are labor and material. Construction material management normally focuses on delivery and handling them, for example applying Just-in-time in material delivery. Other studies address wastage problem in construction. Little focus on treating construction material as inventory in construction process. This is due to various reasons such as inventory theory has long embedded in manufacturing sector. Furthermore, the logistic and supply management literatures usually deal with the issue in the context of goods, repetitive manufacturing, and retailing.

From the logistics management perspective, construction industry differs from repetitive manufacturer and consumer goods in several aspects such as each construction is different, the final product is one-kind-a-end, there are a lot of companies and staff working at each site, and the production of the construction firm take place in a different locations.

In order to apply the logistics management concept in construction industry, there are several requirements needed to place for the material delivery. First, the transparency of material availability is needed for site inventory. And second, the collaborative between suppliers and contactors in term of sharing information. Thirdly, the mutual consent between both parties is important in order to provide a location for storing inventory.

1.2 Research Problem

Inventory in construction represent purchased goods during construction process. In certain context, inventory in construction same as manufacturing field. In construction, the procured material like piles, cements, bricks and so on will be delivery to site first before any construction works can carry out. When all the material gathered on site, it represents the concept of inventory that certain management should be applied to avoid spoilage and wastage.

However, in another context, inventory in construction differs than manufacturing field due to the each construction project possess different site that add difficulty in managing on-going material. Meanwhile, in recent construction field, machineries can be categorised as fixed asset or fixed inventory due to the existence of some rental machineries in most of the construction industry in Malaysia.

In the need to apply better technique of material management, it is good to explore the potential solution for managing material logistics of construction projects. The solution is called Vendor-managed inventory. This approach shifts the responsibility of taking care inventory at site from contractor to supplier. The review literature step by step which related to inventory management, material management, and vendor managed inventory in local construction. A study via questionnaire is beneficial to obtain the information related to the level of VMI's implementing in local industry.

No attempt has been done to explore and discuss of application of the Vendor Managed Inventory in local industry. Hence the study ought to be taken to address the issue.

1.3 Objective

The aim of this project is to explore the potential solution for managing material logistics of construction projects. The solution is called Vendor-managed inventory (VMI). The objectives of this study are:

- i. To study the inventory and its problems in project undertaking,
- ii. To analyze the potential of VMI in construction industry in Malaysia,
- iii. To investigate the extent of expected benefits and barriers of VMI from the construction personnel perspectives.

1.4 Scope of Study

The uniqueness of construction industry makes the integration of supply chains can be challenging in both vertical and horizontal dimensions.

Vertical dimension refers to the integration of site and upstream supply chain. In this dimension, (studies such as Ballard and Howell, 2003; Koskela, 2000) had highlighted the importance of cooperation between construction site and material suppliers in order to improve the logistics processes.

Meanwhile, horizontal dimension refers to the challenging situation where large number of suppliers and subcontractors in each project and constantly changing production locations. Horizontal integration is an issue that is discussed more in context of production strategies of multinational companies (Turkulainen and Ketokivi, 2006)

And, (Kari et.al, 2009) highlighted the challenge of managing logistic at corporate level in construction industry, presents and evaluates vendor-managed-inventory as a potential solution for small item (cheap standard product that continuously needed in production, such as nuts and bolts) logistics.

This project extent previously works on material management using VMI methods that applied VMI concept in material logistics and investigate the extent of expected barriers and benefits from the construction industry personnel viewpoint.

1.5 Significant of the Study

As mentioned earlier, little studies have been focused on treating construction material as inventory in construction process. Therefore, it is a necessity to explore the potential solution for managing material logistics of construction projects.

This project will first identify the problems of the inventory management in project undertaking in construction industry in Malaysia. The expected problems in inventory management in construction industry include wastage and the problem delivery of materials to site. This project will assess the potential of VMI in local construction industry. Survey questionnaires will distribute to obtain professional opinion and from the local construction industry personnel regarding the general acceptance of VMI.

This project will investigate the extent of expected benefits and barriers from the construction industry personnel viewpoints. This project will propose the innovative method in managing inventory in construction industry. The conclusion from project shows that the innovative method (VMI) is able to attract construction personnel's attention. Therefore, the application of innovative managing inventory method shall be encouraged for all construction projects in Malaysia.

1.6 Methodology

The aim and objectives of this project is accomplished via literature search on Vendor Managed Inventory and survey on construction personnel. The literature search is done by using materials like journals, dissertations, texts, articles, and computer network information system.

The theory and literature reviews of the material management in site, inventory management, and VMI in construction industry were firstly reviewed. The second section in this project will be the information obtaining. Questionnaires will be distributed to obtain the data from local construction personnel. And the last part of this project related to the analyzing and assessing the extent of expected benefits and barriers from local construction industry personnel. Figure 1.0 shows the briefly overall project methodology

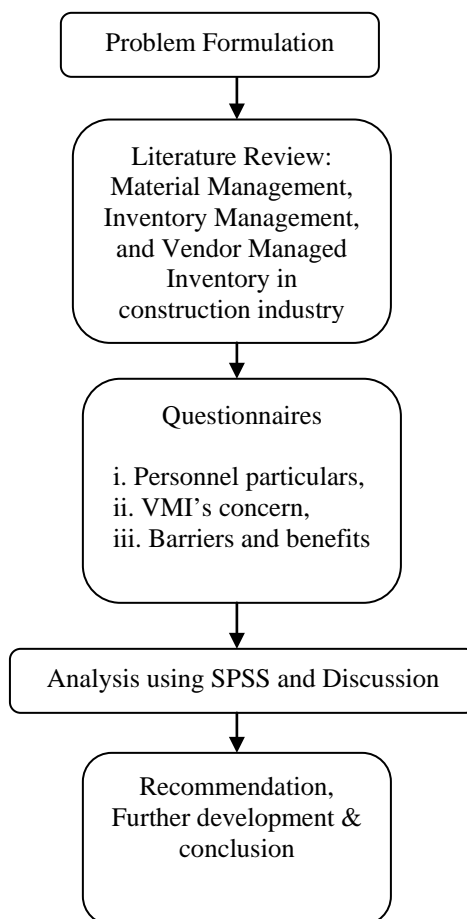


Figure 1.0: Methodology of overall project