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**Obstacle and Material Handling Management: The Way to  
Improve Efficiency of Warehouse in /Bangkok Port (PAT)**

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## **Abstract**

The objective of this research is to study the efficiency of Bangkok port and think of a plan to development warehouse layout. The research begins considering the problem during an internship and then explores the issue with advice about the thesis. The process of this research includes using primary and secondary data by interviewing employees in the area, and being a trainee at the Bangkok port on a cooperative program. The method used in this research is applied research with developmental research about the warehouse and then analyzing the data to know the problem and the cause. Researchers suggested a development plan: installing rack and change the layout in the warehouse, this method can increase efficiency in work of warehouse, such as increase capacity to store items and goods, decrease time to find goods and reduce the chance of damage to the goods.

**Keywords:** Material Handling, Warehouse, Layout

## **1. Introduction**

Today the country has a rate of import and export goods in increasingly high rate which makes competition of the consigned cargo high. Bangkok Port is located at Klongtoey Bangkok, Thailand. The warehouse of the Bangkok Port has total 17 warehouses which the main duty is to store goods for import and export. However, the Bangkok Port is a port that outdated and based on another private pier in Thailand. We want to plan to develop so that it works more efficiently and more quickly than ever.

At Bangkok Port, the warehouse or we called it as transit shed. The warehouse faces the problem of lack of inventory management, warehouse management and a lack of the resources needed to work, or move item and goods such as a forklift and container handlers by the library actually is, this case study will start in the morning, the entire cargo container and in open containers will have the shipping business, instead of receiving the goods on behalf of the owner of the goods, Because of delay in work due to the major factor, that is, the item is not found because of 1) no

storage system as a standard for storing goods, 2) not specified by position to place the accurate item, 3) waste of time to search for the item because it takes too long to find something.

The resources in the transport of goods is not enough and something is not yet removed from the cabinet and therefore should be improved to ensure product alignment, so to make finding products easy and convenient delivery of goods, which will help. Because of this, the time is wasted in transporting goods and search for products which, if managed in a better format it can help reduce the operating period can increase overall productivity in the warehouse.

The theme of this thesis is to study and find the solutions to improve management of warehouses inside the Bangkok Port warehouse by the ways to improve the action plan developed from the warehouse to learn and study and warehouse management practices to resolve problems that occur today and bring benefits in product management. The objectives of the study were: 1) find the point of the problem inside Bangkok port warehouse and study how we manage Bangkok port warehouse by use the knowledge from the classroom and internship, 2) create a plan how we manage the port to decrease work time of work process, Increase the level of facilities by creating a plan using storage strategy. The important thing that can solve the problem of inventory management is rack in the warehouse, and 3) plan the way to solve and increase efficiency.

## **2. Literature Review**

### *2.1 Problem in Bangkok Port*

The Bangkok port is facing congestion problems. The major problem is the insufficiency of port facilities. The capacity of the port may be limited by an obstruction of the bottleneck and suggest the possibility for capacity improvement. According to Tantivasadakarn (1985) “the shed dwelling times is determined by many factors such as complex and overlapping documentation process of the Customs and Pat may delay the shed. Lacking of ET07s trucks and handling equipment may aggravate the problems. The problem of insufficient delivery truck is removed nowadays allowed some private company to use their vehicles to transport their cargo. And last the problem is about insufficient handling equipment in the warehouses, it seems to be a minor problem which may occurs only the peak to a period of demand.”

### *2.2 Operation of warehouse*

John von Neumann and Oskar (1944) define the operation of the warehouse as the responsible for receiving goods by monitoring the number of features that will distinguish the store by category management system, audit and inspection accuracy associated with quantity, number of the condition and care to prepare the delivery the goods. The layout of the warehouse is planned according to the operations performed. In traditional warehouses is considered for long-term storage of goods, and their primary functions are warehousing, consisting of the maintenance and keep in of stocks. Currently, the role of warehouses is changing, Now considered on the material flow are converted and moved as quickly as possible, that cause of operations of warehouses expansion (Komarava, 2016)

### *2.3 Importance of Inventory Management*

Inventory management is plan to manage products in warehouse to be proper for distribute products. The effective inventory management is a capability necessary to lead in the global marketplace

(Ozal,2008). Kumar, et. al (2016) stated that an inventory management is most generally for used technique to manage inventory efficiently. There are most techniques to classify the inventory items, the most classification technique is ABC analysis. In ABC analysis the items are classified into A, B & C classes based on the total cost usage or value of goods. ABC analysis is a well-established categorization technique for determining which items should get priority in the management of inventory management's warehouse (Ravinder and Misra, 2014).

#### *2.4 Significance of Material Handling*

Material handling is much more than the handling of inventory – it is the movement, protection, storage and control of materials and products throughout their lifespan of manufacturing, warehousing, distribution, consumption, and disposal. Akincilar and Rad (2013) stated that in today's high competitive global markets, demand's customers can adjustable lot size in short time, higher quality and flexibility; in short, they want it all. In order can stay competitive in the market, Material Handling Systems (MHS) is the place to accomplish this goal.

Material handling must be for warehousing; which people know objective to use material handling for suitability in work. The conveyer, cranes, hoists and industrial trucks are an example of general equipment.

##### Important Elements of Material Handling

The Four Elements are:

- a) Motion is movement products from point to other point or moving products form aim to destination, which in different type of products will have different movement for high efficiency.
- b) Time is important factor that tell about efficiency of movement or work, it is high or low.
- c) Quantity must be relations with time that if use more time must be high quantity.
- d) Space is important factor of motion because motion, movement of products or transfer products must be use space for build high system efficiency in transfer product or movement product

#### *2.5 Problem from Human Error*

Human error is mistakes cause from activity of human that high or low level to accept in system. Type of human error can separate 2 types as follows:

- a) Accidental mistake: cause from do, or do not by not have to think ahead, example do not forget detail of information, accident and others
- b) Intended mistake: cause from do, or do not by human, employees or staff believe that is the right decision, example multiple concurrent tasks will help you to finish work faster.

Factors that affect to the ability in work of human

- a) Internal factors: cause from element inside human, employees or staffs, this will affect to work of human such as skill, experience, knowledge, and so on.
- b) External factors: cause from environmental factors and mission, tools and how to work.
- c) Pressure factors: cause from mind pressure and body pressure.

Pressure will have negative impact but in some cases, pressure is necessary to achieve the goal, motivation to success in work.

### 3. Research Methodology

#### 3.1 Research Design

The design of this study will be based on applied research to use knowledge and concept from study to applied and use to create development plan concept for develop Bangkok Port (Port Authority of Thailand). According to Kothari (2008), he gives definition of applied research as “aims at finding a solution for an immediate problem facing a society, or an industrial/business organization, whereas fundamental research is mainly concerned with generalizations and with the formulation of a theory”. First, we will study the structure of warehouse first to see which point is the problem that we can handle and improve the efficiency. Next, to find the cause of the problem to know what the cause make problem happened after that we will plan the way to development and make it better when the plan is completed we will give the solution plan to the Bangkok Port manager to receive comment.

#### 3.2 Learn the basics of establishment

We decided to collect the information first the first step that we will do is to go to the Bangkok Port (Port Authority of Thailand). The task of the warehouse is unable to work alone so they must work with the custom agencies to work alongside in this department. The worker in this department should learn and know about rules, regulation and some steps that necessary for the work of customs because product at every stage are in the customs control. Staff at the warehouse must follow the rules of the port seriously do their works correctly according to the authority. They must be interested in education, from new regulations and orders changes constantly, so to make the operations department at the goods goes smoothly and not have any problems.

##### 3.2.1 Unloading goods

The mission of unloading goods from the cargo ship is start with the ship agent. They will send a request to warehouse department and custom to make process of import before opening the cabinet cargo for a day after that port will prepare to supply handling equipment, Staff and Operational Areas Local support in its station.

In the opening cargo day, the warehouse department will separate the staff into each line for work with the staff from ship agency to list items from the ship. They must write down every item that come on a container on the paper that we called “Tally Sheet” according to mark of packaging item and the number of items.

##### 3.2.2 Kinds of Shelter

- a) Operation area means the area that placing tables and chairs to make documents.
- b) The storage area means the area to place goods.
- c) Tools area means the area of power tools

#### 3.3 Study about cause of problem

The researchers will collect data from organization guide, record and report through the employee inside the port so this will make us to see the point of problem clearly.

Collect data from

- a) Employee of warehouse department
- b) List questions to ask
- c) Data analyze and interpret

### Question to interview

The purpose of this thesis is to find the way to improve efficiency in the warehouse so the question will be like how the employee think about their workplace and their material handling to use in work we want to figure out the plan to increase material handling or change the warehouse layout so the question that we think to use with employees are as follows:

- a) What is the problem that usually happened in the warehouse?
- b) What do you think about how to resolve the problem?

As we see the kind of question we want to know the opinion from employee to find the right way to increase efficiency in work.

### *3.4 Planning methods*

After we known the problem and cause of the problem next step is about to think and create a development plan. The plan will create from our knowledge and find some information and strategy from book and article like ABC Classification Concept to save time in work process.

### *3.6 Present the solution plan*

Because of Port authority of Thailand is control under the government so it is hard to change system or adapt the real strategy after we thought about development plan, we will send the research document to staff of warehouse's Bangkok port and advisor of thesis for get feedback.

## **4. Anticipated Results**

From the analysis of the problem, in planning to increase efficiency and improve the warehouse in work by using the ABC classification of Bangkok port's warehouse is the main work is to receiving, preservation, and delivery goods. The problem occurs that comes from lack of materials handling, human error, and standard of storage systems. Which problems mentioned that makes low efficiency in work such as waste of time to find goods, make goods has damage and takes a long time to deliver the goods with big goods or big lot. Which from mentioned problem, as a result concept and plan to improve warehouse, increase efficiency in work and reduce error in work less than before by as following:

Step 1: Researchers came to Bangkok port's warehouse for survey, study work flow and from internship of Mr. Punchart Chanakul found problems in the warehouse such as standard of storage systems in warehouse or out of date in storage systems(ground stacking) causes movement of goods frequently then made damage to the goods, goods place does not match specified location in the location sheet made frequency to waste time for found goods and low preservation goods.

Step 2: From the inquiry with Mr. Passakorn Siriwan about frequency in and out of item in the warehouse. The warehouse divided the area as 4 areas. Researchers were studied about ABC classification and bring the idea to adapt and create new plan to install Rack to response the frequency of the area by install more rack on more frequency area and less rack on less frequency area. As we studied and observe the

work flow first the area number 2 is the most frequency area that have item in and out so we install rack as 75 percent of area number 2. Next is area number 4 that have frequency in and out item less than area number 2 so we install rack as 50 percent of area number 4. Third is the area number 3 that have frequency less than number 4 so we install rack 30 percent of area number 3 and the remaining area still use the old system (Block/Ground stacking) and the last one is area number 1 that have the lowest frequency so we install rack as 25 percent from all area in area number 1 and remaining area is the area for use Block/Ground stacking.

Step 3: Researchers plan the way to develop from the data and information by internship, observe the work flow and inquiry the professional employee from Bangkok port. Researchers were always contact with professional employee to ask about problem, about feedback of this concept and possibility to bring the material handling to use inside the port but the truth is hard to change the structure in the Bangkok port because the Bangkok port is under control by the government. The way to use rack in the warehouse can help employee find the item easier than current system and can decrease time of work and also can increase the area to store item because rack can store item in vertical line that will make the warehouse have efficiency in work and help employee work faster and happier.

## 5. Suggestions

In the future researchers hope that the Bangkok port will develop the warehouse and bring the new material handling to use in the warehouse to improve efficiency of work and make attractive to customer and employee to work with. As we can see from this research the main cause is about the culture and mindset of the employees inside the port in the future researchers hope that if have someone interest about congestion and efficiency in the port like we will recommend to put the point at rules or culture to find the possible way to change it and increase the efficiency of work and ethics of employees.

## References

Akincilar, S. and Rad, C. (2013). Material Handling System Design: A Case Study in Bosch Rexroth Japan, Master thesis, Production and Management, School of Engineering in Jonkoping.

Bajpai, N. (2011) "Business Research Methods" Pearson Education India, Retrieved from <https://research-methodology.net/research-methodology/research-types/applied-research>.

Bangprasit, K., Singhaseni, O. and Maneechot, K. (2014), Warehouse Optimization with New Layout: Case study of VR Service and Success Ltd, Bachelor thesis, Department of Industrial Management, Faculty of Industrial Technology and Management, King's Mongkut University of Technology North Bangkok.

Chatsakuleak, P., Singsura, P. (2012), Warehouse Optimization Enhancement: Case study of University Food Public Company Limited, Bachelor thesis, Department of Industrial Management, Faculty of Industrial Technology and Management, King's Mongkut University of Technology North Bangkok.



Collignon, J. and Vermorel, J. (2012) ABC Analysis (Inventory) article, February 12, Knowledge Base, Retrieved from: [https://www.lokad.com/abc-analysis-\(inventory\)-definition](https://www.lokad.com/abc-analysis-(inventory)-definition).

Neumann, J. Von, Morgenstern, O. (1944), Theory of games and economic behavior United State of America, Princeton University Press.

O'Bryne, R. (2017). What is the definition of warehousing and warehouse? About Warehousing Article. Retrieved from: <https://www.logisticsbureau.com/about-warehousing/>

Ravinder, H., & Mirsa, R. (2014). ABC Analysis for Inventory Management: Bridging the Gap Between Research and Classroom, American Journal of Business Education – Third Quarter 2014 Volume 7 Number 3.

Richards, G. (2017), Warehouse Management: A complete Guide to Improving Efficiency and minimizing Costs in the Modern Warehouse, Kogan Page Limited.

Sorat, T. (2015). Journal for the advancement of Engineering and Industry, Inventory management process. Retrieved from: [http://www.brainasset.com/blog.php?blog=15&c\\_id=9](http://www.brainasset.com/blog.php?blog=15&c_id=9)

Tantivasadakarn, C. (1985). Cost effectiveness of port capacity improvement: A case study of container handling at Bangkok Port, Master of Arts (Economics) Thesis, Faculty of Economics, Thammasat University.