THE STUDY OF WORK PROCESSES WITHIN THE WAREHOUSE: A CASE STUDY XYZ COMPANY LIMITED.

Tommanee Sooksai*
* *College of Logistics and Supply Chain,*
Suan Sunandha Rajabhat University, Bangkok, Thailand,
E-Mail: tommanee.so@ssru.ac.th

ABSTRACT

The research on the study of work processes within the warehouse: a case study XYZ Company Limited aims to study the working process within the warehouse, a case study of XYZ Co., ltd. from the observation and collecting data on the company's warehouse management process. Why-Why Analysis and Fishbone Diagram were used to find the causes and ways to increase the efficiency of moving goods within the warehouse with the ABC Analysis theory. It was found that the picking of goods was delayed due to 4 reasons: inadequate equipment, the staff who lack expertise in the operation, the process that still lacks the pattern in each step of the operation, and a variety of products. The company has technology but it cannot be used to identify location, therefore the problem of old products and new products mixed together, making management difficult. After the study company should be analyzing ABC for product classification, it can improve the storage process within the warehouse more efficiently. And finally measured 3 dimensions of logistics performance: cost dimension, time dimension, and reliability dimension for to measure the key performance indicator of work processes within the warehouse: a case study XYZ Limited.

Keywords: Work Process, Warehouse, Why-Why Analysis

INTRODUCTION

Effective and efficient logistics management makes the competitive advantage which is to be above business competitors in terms of quality, lower cost, differences, speed, punctuality of service, and, most importantly, cheap products and services. This generates customer satisfaction and loyalty for future purchases by creating flexibility within the organization [1]. Effective logistics management is important to the company in two ways: increasing revenue in terms of sales and reducing production costs or services with the efficient management of storage and product flow by arising from the alternatives among the activities in the logistics system. Selecting a group of logistics activities that can reduce the total cost of using the organizational resources superlatively must be implemented with planning and proper or effective management, saving or reducing costs. The short work time can causes customer satisfaction because it can satisfy customers' requirement. That is to say, logistics makes the accuracy of products and services in amount, quality, time, location, and price. Therefore, logistics can create utilities in terms of location, time, and customer satisfaction. It can create loyalty in the product and a good corporate image. It, finally, causes the increase of the revenue from the sales [2]. At present, the warehouse is an important part of the supply chain management system of each organization. In general, the warehouse serves to store products in various points of the shipping process.

Inventory is an important thing that should be paid close attention to. Problems that occur in counting and stock inaccuracy affect the production. The actual inventory not corresponding to the system causes the stock out or product less than the specified minimum stock and also causes the excess product or product over specified maximum stock, making insufficient storage space. It is one of the reasons that affect the business. The business that has insufficient products to sell to customers will negatively result for business. While, the product exceeds the needs of customers, causing the company has to bear more cost of inventory and its customers lose confidence which causes the business to not be able to operate with customers. The inventory system management therefore plays an important role in satisfying customers. Warehouse management is a support activity that makes receiving goods, product distribution, and delivery efficient due to saving time and expenses in operations, such as inventory control, determining product storage location to be able to pick up correctly and quickly, and making First In First Out (FIFO) system, etc. This results in efficient inventory management system.

XYZ Co., Ltd. provides warehouse services to companies that need to deliver the products in the country and abroad. Most products are car accessories which are imported from overseas. There are some parts produced in Thailand. Most products are Fast Moving products. Products will come in just a few days or come in and send out immediately. Therefore it found some defects in some processes. Consequently, the company delays to response to the needs of the customers. The researchers realized the importance of managing this process to be more effective. Thus, the research on the efficiency enhancement of warehouse space management with ABC analysis: a case study of XYZ Company limited was conducted so that the company can compete with other entrepreneurs efficiently and sustainably.

OBJECTIVE

To study the working process within the warehouse, a case study of XYZ Co., ltd.

METHODOLOGY

Warehouse Efficiency Enhancement Concept

Warehouse management means organizing the movement of goods, storage of goods, arrangement of goods, and systematic maintenance of goods to sustain the goods in good condition by using low operating costs to assist in operations and make a profit for the business. This operation is arisen from the management of all resources within the warehouse effectively [3].

The importance of logistics management in the warehouse to enhance competitiveness by maintaining existing customer base and increasing customer base is the cost reduction, delivering products in perfect condition, delivering products on time, and customer service. When the customers are satisfied, they return to buy the products. Logistics management has to be considered in other areas [4] as follows

1. Warehouse management policy is important to business organizations. It is a practice guideline that executives will set up. It express about the mission and responsibilities of each department for the same standard for the whole company. Consequently, the follower must achieve the objectives or goals set by the executives in the direction that is specified correctly according to the principles and vision of the executives.

2. In determining the location of the factory or company the link to the production process must be considered. It includes the source of raw materials used in the production

process, the source of the market, the rules of the factory site, and the availability of utilities. These things directly affect the cost of goods. It also impacts the overall efficiency of operations in the logistics system of the factory.

3. The executives must have operational plan. It includes raw material planning, production capacity planning, and planning to move raw materials to the warehouse and to the customers.

4. Planning material movement during production and factory layout need to be operated concurrently. The principles of management must be consistent with the logistics management concepts that focus on time and place management in the movement of materials in the production process.

Principles of Goods Movement in Warehouse

1. Orientation Principle. It is the study on the relationship of the system from the plan being used in order to be able to know management methods, existing problems, and physical and economic limitations so that entrepreneurs can determine future needs and goals.

2. Planning Principle. It is the plan including basic requirements, preferred options, and considering the possibility of caring for the material, and the product storage.

3. Systems Principle. It is the bringing the care and storage activities into the system. The possibility in economics aspects is focused. This includes the tasks of receiving, inspecting, storing, producing, assembling, packaging, warehousing, shipping, and transportation.

4. Unit Load Principle. It is the product management as large unit as possible.

5. Space Utilization Principle. It is the space management for the most benefit.

6. Standardization Principle. It is the Standardization of methods of handling products and equipment wherever possible.

7. Ergonomic Principle. It is the recognition of ability and limitation of human anatomy in order to be able to design the equipment and product care process In order to achieve the most efficient usage between users and systems.

8. Energy Principle. It is the gathering information on energy consumption of the material handling system and process continuously when comparing or preparing improvements for the most cost-effective benefits.

9. Ecology Principle. It is the minimization of adverse effects on the environment when selecting material handling equipment and procedures.

10. Mechanization Principle. It is the bringing the machinery into consideration whether it is efficiency and worth the money spent or not.

Operation Process and Flow Process Chart

A flow process chart is a chart showing the sequence of the flow of a product by way of recording all activities/events under review with appropriate symbols. This chart is similar to operation process chart with the difference that it utilizes symbols of operation, transportation, inspection, delay and permanent storage. The operation times and distances moved are also recorded along the symbols side [5].

A useful feature of the flow process chart is that it can be drawn up as the process is happening, and thus, get an accurate description of the process. By watching and recording, a person for example can follow a part, noting how and when it is produced, moved, checked and stored. This ensures that what actually happens gets recorded. Later when analyzing the process, some steps become obvious candidates for improvement, such non-value-adding activities, long delays and excessive transportation [6].

Cause and Effect Diagram

A fishbone diagram, also called a cause and effect diagram or Ishikawa diagram, is a visualization tool for categorizing the potential causes of a problem in order to identify its root causes. A fishbone diagram is useful in brainstorming sessions to focus conversation. After the group has brainstormed all the possible causes for a problem, the facilitator helps the group to rate the potential causes according to their level of importance and diagram a hierarchy. The design of the diagram looks much like a skeleton of a fish. Fishbone diagrams are typically worked right to left, with each large "bone" of the fish branching out to include smaller bones containing more detail [7].

To begin making a cause and effect diagram, write the main issue or problem to be analyzed in a box that is typically on the right edge of the page, halfway down the drawing area or page. A line called the "spine" or "backbone" should extend to the left starting from the edge of the main box (if you're using a Smart Draw template, this will already be there for you). Next, angle branches off of the spine, each representing a cause or effect of the main issue. Each of these branches can contain additional branches [8]. Most cause and effect diagrams examine a similar set of possible causes for any issue analyzed. In the manufacturing industry, these are referred to as the 6Ms:

Methods. Are there well-written and appropriate training guidelines in place? Are certain policies or regulations causing slow-downs or creating unnecessary steps?

Machines. Are there any maintenance issues with the tools used or the number of tools available?

Materials. Are there any issues getting raw materials from suppliers? Any problems with transportation (timing) or with the quality of the supplies?

Measurements. Could there be errors in calculation or contamination that caused false readings? Could the way you measure be inconsistent in some way? Is your equipment regularly calibrated and maintained?

Mother Nature/Environment. Is there too much moisture in the environment? Are temperatures too hot or too cold? Is there excessive dust or other contamination?

Manpower/People. Do you have too little of your workforce devoted to a process? Are new people adequately trained? Is the training consistent? Are the right people with the right experience being hired or promoted? Is there a specific position creating a bottleneck or making frequent mistakes?

ABC Analysis

The ABC analysis suggests that inventories of an organization are not of equal value. Thus, the inventory is grouped into three categories (A, B, and C) in order of their estimated importance. 'A' item are very important for an organization. Because of the high value of these 'A' items, frequent value analysis is required. In addition to that, an organization needs to choose an appropriate order pattern (e.g. 'just-in-time') to avoid excess capacity. 'B' items are important, but of course less important than 'A' items and more important than 'C' items. Therefore, 'B' items are intergroup items. 'C' items are marginally important [9].

There is no fixed threshold for each class, different proportion can be applied based on objective and criteria. ABC Analysis is similar to the Pareto principle in that the 'A' items will typically account for a large proportion of the overall value but a small percentage of the number of items. ABC class are

'A' items – 20% of the item accounts for 70% of the annual consumption value of the items

'B' items – 30% of the item accounts for 25% of the annual consumption value of the items

'C' items – 50% of the item accounts for 5% of the annual consumption value of the items

Step 1 The Study of information

The researcher has conducted a study on XYZ company limited 's warehouse that have internal storage model which are categorized zone to the type of goods, as shown in Figure 1. And found that company still have barriers to picking goods, even though the categorized zones are clearly arranged but there are many types of products were mixed.

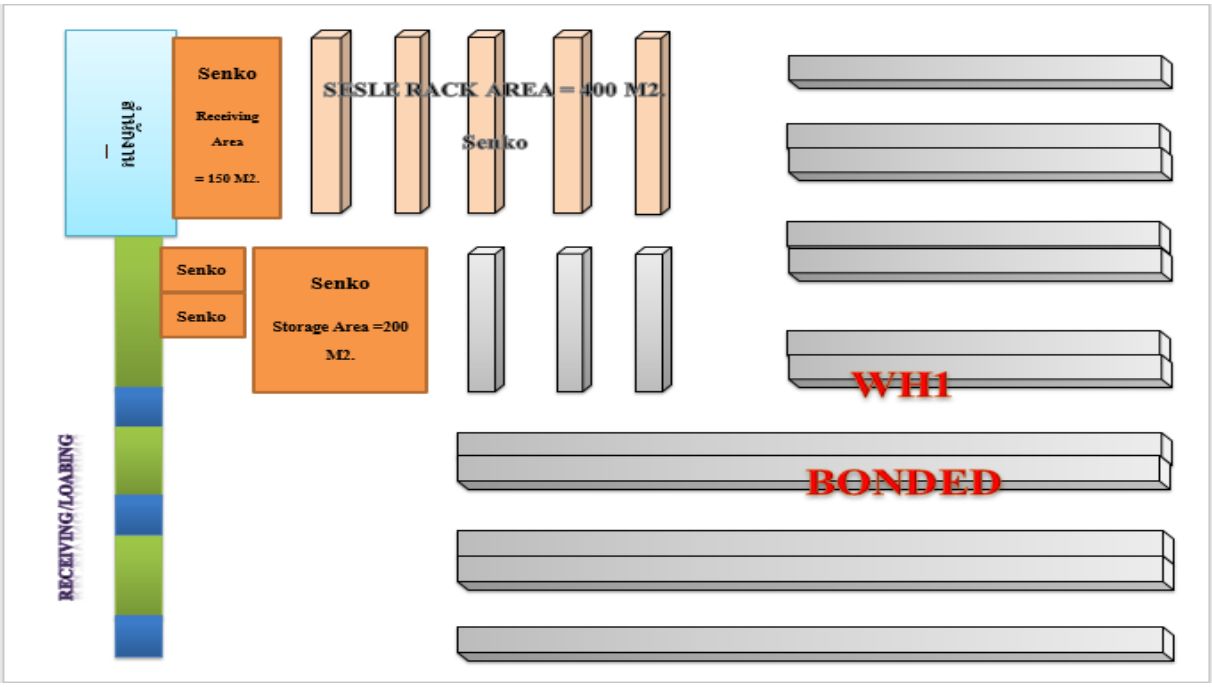


Figure 3: Warehouse Layout before Improvement

The researcher studied the data of the company by using Flow Process Chart to be able to know the working process within the company. In which this process flow chart, it will show the work process, analyze the process of the flow of raw materials, parts, inventory, equipment, and staff that move in the process simultaneously. With various activities by the symbols shown in Table 1.

Table 1. Flow Process Chart of picking products in the warehouse.

Flow Process Chart								
Position	**XYZ company limited 's warehouse**					**conclude**		**count**
activities	**Pick**					**Event**		7
Date	**5/1/2562**					**work process** ○		3
staff	**Mr.....**					**Moving process** ⇨		2
Analyst	**Project producer**					**Delay process** D		1
						Inspection process □		0
						Storage process ▽		1
activities	symbol					Duration (minutes)	Distance (m)	Suggestion
Receive order	○	⇨	D	□	▽	5		
Send the order to the staff to prepare the product.	○	⇨	D	□	▽	2	50	
Search for products	○	⇨	D	□	▽	30		
Prepare products (Collect products in the same order)	○	⇨	D	□	▽	25		

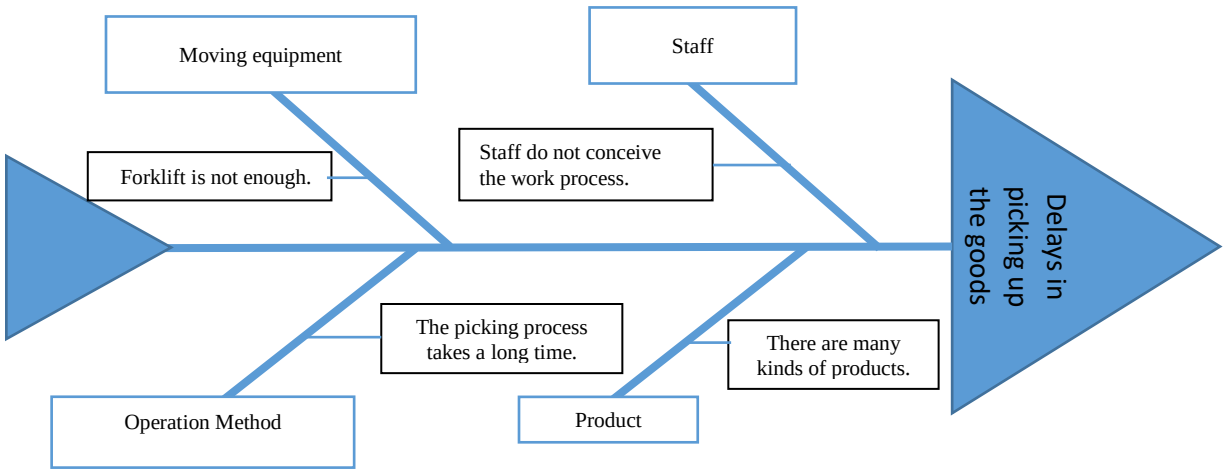
Move the product to the point of receiving goods.	○	⇨	D	□	▽	5	75	
Check products	○	⇨	D	□	▽	15		
Move goods onto a transport vehicle	○	⇨	D	□	▽	10	2	

Step 2 Finding the cause of the problem

Finding the cause of the problem with Cause and Effect Diagram has analysis form, as shown in Figure 2.

Figure 2

Finding the cause of the problem with Cause and Effect Diagram



As shown in Figure 2, on the moving equipment inside the warehouse, there is a hand lift for moving and picking products instead of using an insufficient forklift in order to keep up with the needs of customers. It also found that the staff still lacked warehouse management skills. There is no understanding of the nature of the work that they have been assigned. They, moreover, refuse to improve themselves in the job due to high self-confidence and rarely listen or improve work as the supervisor wants. Therefore, this causes lacking in work efficiency. In addition, there are many types of products in the warehouse. Thus, this causes the delayed and complicated work due to the lack of product storage in order to make it easier to pick up. Finally, the operation method in the picking process takes a long time.

RESULT

The researcher analyzed the location and found that the product classification should be used to classify by ABC Analysis to make it easier to store and picking products according to the movement of inventory. And place products according to the frequency of picking to be able to control the efficiency of the product picking. Warehouse management using the method of arranging products with inventory classification based on activities (ABC Analysis) make to know what type of product is Fast Moving product and put those products in order of importance.

Class A is the products that have fast turnover and provide the company with high business profits. Therefor carefulness and management are very important. As rapid turnover, there is no problem in costs and expenses but products in Class A have is possibly not enough to meet the demand in the market. Therefore, there should always be predictions and forecasts of the demand for the products. If there is a proper management of Class A, it positively affects the turnover rate of inventory as well. Because the product cost is not high

in the warehouse due to the flow of goods all the time. In addition, the flow of products to customers also results in the company receiving the sales revenue. Therefore, it results in a higher number of inventory turnover rates as well.

Class B is the products that are in the warehouse before being delivered to customers in a certain period but not much time. Reasonable amount of Products in this category should therefore be kept in warehouse but it should not be too much because it will cause the expense on the storage.

Class C is the products that have the most time in the warehouse but a small amount of sales per year. There should be a new analysis and modernization continuously because the market demand for each product is uncertain. The up and down of the demand depend on many factors since most of the money lost is sunk cost.

DISCUSSION

The efficiency enhancement of warehouse space management with ABC Analysis: A Case study XYZ Company Limited is to study the guidelines for inventory placement to facilitate the fast moving of products and able to effectively respond to related processes. The organization should be aware of the form of product layout and logistics management process within the warehouse. In addition, employees are an important part in driving the process within the warehouse. It is important that employees must have knowledge about Location and symbols on each product in order to speed up the activity within the warehouse. The research results correspond which found that employees who had different personal factors in terms of gender, age, education level, work experience, and job positions will be perceived in the use of the overall system within the warehouse differently [10]. Therefore, there is a need for training or teaching before starting the real work. The problems and obstacles in the operation arise from the environmental factors in the warehouse, such as the equipment in the warehouse is not enough to meet the demand. Consequently, workers in various parts In the warehouse should be manage the time in equipment usage appropriately during the rush time of each process.

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REFERENCES

[1] Thaweesak Theppitak. (2007), Logistics management, warehouse management, inventory control, purchasing, production management. Bangkok: Expernet.

[2] Khumni Api Prichayanai. (2003), Logistics and Supply Chain Management of Strategy to Rich helps to save. Bangkok: Nutporn Favtory.

[3] Monthatipkul, C., and Yenradee, P., (2007). Positioning Safety Stock in a One-Warehouse Multi-Retailer Supply Chain Controlled by Optimal Inventory/Distribution Plan. International Journal of Industrial Engineering, 14(2), 169-178.

[4] Bunsap Panischayakarn. (2006), Logistics Management Leader. Bangkok: Intertransport Logistics.

[5] Minakshi Jain, (N/A). Operation Process and Flow Process Chart (With Diagram). (online). From http://www.yourarticlelibrary.com/industrial-engineering-2/operation-process-and-flow-process-chart-with-diagram/90465.

[6] CITOOLKIT. Continuous Imporvement Toolkit. Folw Process Chart. (online). From https://citoolkit.com/articles/flow-process-chart/

[7] Ishikawa K, Loftus JH, (Eds) Introduction to quality control. Tokyo, Japan: 3A Corporation; 1990.

[8] Smartdraw (2019). Cause and Effect. (online). From https://www.smartdraw.com/cause-and-effect/
[9] Diana L., Francisco A., Soumaya Y. & Ada A. (2017). A multi-start algorithm to design a multi-class classifier for a multi-criteria ABC inventory classification problem. Expert systems with application, 81(1), 12-21.
[10] Varaporn Saninmool. (2014). The Study Readiness of Warehouse Staff Using Warehouse Management System Program. Jornal of Logistics and Supply Chain College. Nonthaburi: Buddy Creation Publishing, Thailand. Vol. 1, No. 2, Pp. 74-82.