

Acrylic Sheet Warehouse Management Optimization of Sumipex (Thailand) Co., Ltd.

Kittisak Wattanamongkollarp and Tosaporn Mahamud

Abstract— The objective of this study was to study 1) method of warehouse management of acrylic sheets, 2) efficiency levels of acrylic sheet warehouse management, 3) comparison of warehouse management efficiency classified by personal data, and 4) relationship between warehouse management methods. Methods of warehouse management and warehouse management efficiency of acrylic sheets of Sumipex (Thailand) Co., Ltd. selected a sample of 200 people using questionnaires as a study tool. And the data that was processed using statistics, percentage and mean. Hypothesis testing using t- test, F-test (One-Way ANOVA), Correlation and Multiple Regression Analysis. The study found that most of the respondents were male. Be between 31-35 years old and have an education lower than a bachelor's degree. Have average monthly income 10,001-20,000 baht, positions as employees with 6-10 years of work. Performance of acrylic sheet warehouse management of Sumipex (Thailand) Co., Ltd. found that the overall efficiency of acrylic sheet warehouse management is at a very important level. Sorted as follows: Receiving the goods correctly according to the plan, Shipping accuracy. The product system is accurate. The importance of warehouse management of Sumipex (Thailand) Co., Ltd., in general, is at the very agree level. Sorted as follows: Receiving, storage, and distribution (Distribution) results of hypothesis testing. Personal factors of gender, age, average monthly income, Education level. Different levels of warehouse management efficiency are affected. Is statistically significant at the .05 level of personal data. Education and position. Different levels of warehouse management performance were not different.

Receiving **Suggestions:** **Management**
(Mahamud, Et, al. 2021) should have a table or a tool that informs the status of the product in advance to facilitate the process. And recording the product in the program should use the Barcode system to receive the product with a barcode attached to the product to increase the efficiency of the counting work to be convenient, fast, save time, reduce errors and reduce the cost. Spend and make information more accurate. In the case of the receipt of product returns from customers. The company should provide a document on the receipt of the product from the customer, whereby the staff of the company and the customer check the correctness of the product together before receiving the product back to the company. In terms of storage (Storage), administrators should manage the storage space efficiently. The storage space should be ready and sufficient for storage. By zoning goods. Determined by the product rotation cycle. Slowly turning products should be kept in the innermost zone. Medium rotation should be kept in the middle zone. And fast-rotating products should be kept near the door to facilitate dispatching. And control the temperature of the appropriate storage location. Classify the product and store it according to the temperature of the product.

Kittisak Wattanamongkollarp and Tosaporn Mahamud, Graduate School of Business Administration, Kasembundit University, Bangkok, Thailand.

In order to reduce the cost of deteriorated products from the weather

Distribution (Distribution) Managers should choose to use a larger truck. Able to deliver in bulk and meet standards such as 4-6 large-wheel trucks, reducing the number of rounds in delivery. There is grouping of products to distribute and send to the shop area in the same warehouse. It will reduce the cost of transportation used by cars and labor. And should use materials to prevent bumping into each other during transportation. So as not to damage the product. In addition, technology is applied in warehouse management that can increase efficiency in warehouse management so that products can be delivered to customers on time that the customer needs.

Keywords— Management Optimization Inventory.

I. INTRODUCTION

Globalization has brought about change. In terms of trade, economy, technology and consumer behavior, (Mitra, 1977) the commercial competition has become more intense. Tsourvakas, G.R (2004) There is a group. International trade and economy. Resulting in the delivery of goods and services. (Ramstad, 2009) The area was expanded throughout world and industrial sector of each country (Meyer, Ramirez, Rubinson, & Bennett, 1977) around the world expanding market competition. (Coffee, 2002) the including number of competitors. Increase efficiency and industry is therefore very valuable (Lhuillery, 2011) Thai industrial operators should consider apart from product quality development, inventory management. Use of information technology as a tool to increase efficiency in Managing the logistics and supply chain (Srinuan, Annafari, & Bohlin, E. (2011) The logistics activities consist of a variety such as Purchasing and Procurement, Logistics Communication and Order Processing, Transportation. (Transportation) Inventory Management, (Perego, Perotti, Mangiaracina, 2011) Site Selection, Warehousing and Storage, Demand Forecasting and Planning, etc. In the part of this research. Has brought information technology. Applied to increase efficiency in inventory management in the manufacturing industry, thus transforming it into a case study. Where inventory management is an activity. Logistics is a very important activity. This is because inventory costs affect operations. Of the organization in a high proportion after transportation costs.

From the study of the Company's warehouse management, the case study found the following problems. Often does not go according to the specified time. There was a delay. As a result, the product is not sufficient to meet the needs of customers, the

students are interested to study the optimization of warehouse management in order to be information for business operators who want to increase efficiency in warehouse management. The results obtained from this study have been used as a guideline for development, improvement and application to be beneficial in the operation of the business effectively.

II. OBJECTIVES OF THE STUDY

To study methods for warehouse management (Ten & Schmidt,2006) of Sumipex (Thailand) Company Limited. To study the efficiency level of warehouse management of acrylic sheets of Sumipex (Thailand) Co., Ltd. To compare warehouse management efficiency classified by personal data To study the relationship between warehouse management method and warehouse management efficiency of Sumipex (Thailand) Company Limited.

A. Hypothesis

1. Different personal information has different efficiency of acrylic sheet warehouse management of Sumipex (Thailand) Co., Ltd.
2. The warehouse management method is related to the warehouse management efficiency of Sumipex (Thailand) Co., Ltd.
3. The warehouse management method influences the efficiency of warehouse management of Sumipex (Thailand) Co., Ltd. acrylic sheets.

B. Scope of study

Content Study the factors of warehouse management of Sumipex (Thailand) Company Limited by using the Warehouse Management concept which consists of Handling of goods receipt Storage and distribution Warehouse management optimization Based on the concept of the sand cone theory (The Sand Cone Model) consists of Quality (Quality), Dependability, Speed (Speed) and Cost. efficiency) on the population and the sample used in this study was the management and staff of the acrylic sheet warehouse of Sumipex (Thailand) Company Limited. Between May 2020 - October 2020.

C. Warehouse management ideas

The Theories of Inventory is necessary for a business. (Christiano, & Eichenbaum, 1992) it is classified as current assets One item that a business should have for production or sales (Parente, Pegels, & Suresh, 2002) It can go smoothly Having too much inventory can be a problem for businesses.(Orobias, Nakibuuka, Bananuka, Akisimire, 2020) In addition high storage costs, obsolete, expired, stolen or lost products, it also leads to a loss of opportunity to bring the money that is not available. (Kumar, Kadow, & Lamkin, 2011) There is to find benefits in other areas. But on the other hand If a business has too little inventory, (Gaur, Kesavan, & Raman, 2014) it may suffer from stock out, losing opportunities to sell to customers. Is an open channel for competitors and may have lost customers something is lacking Is an important raw material Operations of both production and sales may be interrupted Which may affect

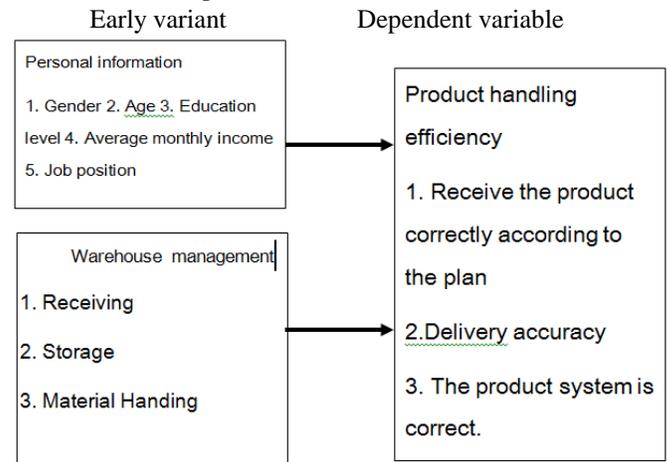
Image of the future business. Therefore, it is the operator's job to manage the inventory. Of their own in the appropriate level, not too much or too little Because investing in inventory is required A lot of money and may affect the liquidity of the business (Griffin, Jill, Lowenstein, Michael, 2002)

Inventory can be divided into 4 types:

1. Raw material is the item or parts that are used in manufacturing.
2. Work in Process is the work piece in the production process or waiting to Producing or looking forward to producing in the next step. Which has not been through all the production processes
3. Maintenance material (Maintenance / Repair / Operating Supplies) is parts or spare parts. Machine reserved for replacement when original part is broken or has expired.
4. Finished goods is the inputs that go through every production process. Complete, ready to sell to customers.

D. Conceptual framework for education

The above study The studier relied on the concept of warehouse management. And optimizing acrylic sheets of Sumipex (Thailand) Co., Ltd. summarized and coordinated as a conceptual framework. In the study of warehouse management optimization of Sumipex.



III. RESEARCH METHODOLOGY

The study of increasing the efficiency of acrylic sheet warehouse management. The objective of Sumipex (Thailand) Co., Ltd. was aimed to study the management of Sumipex (Thailand) Sheet warehouse management of Sumipex (Thailand) Co., Ltd., increasing efficiency of acrylic sheet warehouse management. Of Sumipex (Thailand) Co., Ltd. Comparison of Warehouse Management Optimization Acrylic Sheet (Thailand) Co., Ltd. Classified by Personal Information And the relationship between warehouse management method and warehouse management enhancement of acrylic sheet of Sumipex (Thailand) Co., Ltd. data from the study can be used as a guideline for improving warehouse management efficiency for businesses. It can be performed effectively. The method of study was set as follows

A. Study Populations and Samples

Study population A total of 350 executives and employees of the acrylic sheet warehouse of Sumipex (Thailand) Co., Ltd. 200 sample samples were selected. Yamanae sample size calculation formula (1973).

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{350}{1 + (350) * (0.05)^2}$$

$$n = 186$$

In the calculation, 186 samples were obtained, but in order to prevent errors that may occur in responding to questionnaires. The information is not complete. The study therefore used a sample of 200 cases.

B. How we collect information

In order for the study to be complete, there is a method for collecting data. As follows: information gathered from Study from various sources including textbooks, documents and other research findings Relevant information obtained from Audience Questionnaires and get it back by yourself Carry out a clean check This is to ensure that the questionnaire is complete and can be analyzed for further analysis.

C. Data processing and analysis

Processing the data obtained from the questionnaire with a computer program by finding the percentage (Percentage) and mean (Mean) Microsoft Excel program, a ready-made program for creating pie charts and bar charts with words. Explain the results and the results from the chart are presented for analysis according to the characteristics of various variables.

D. Statistics used in data analysis

Descriptive Statistics The statistics used were: Percentage, Mean and Standard Deviation to describe the demographic data of respondents and variables. Inferential Statistics are used for hypothesis testing. Statistics used are t-test, ANOVA analysis uses F-test, (One-way ANOVA), Pearson Product Moment Correlation, and Multiple Regression.

IV. SUMMARY

Subject education Warehouse management enhancement Sumipex (Thailand) Co., Ltd. aims to study the level of warehouse management efficiency Sumipex (Thailand) Co., Ltd., the importance of warehouse management method, Sumipex (Thailand) Co., Ltd. And the relationship between warehouse management method of Sumipex (Thailand) Co., Ltd. and warehouse management efficiency of Sumipex (Thailand) Co., Ltd. The study method was a quantitative study. (Quantitative Research) is an independent translator, ie personal fundamentals consisting of gender, age, education level, job title and employment life, and warehouse management methods, including receipt, storage and distribution (Distribution) The dependent variable is the level of warehouse management efficiency Sumipex (Thailand) Co., Ltd. consists of the damage

from delivery. Delivery accuracy and the product system is accurate 200 questionnaires were used to collect data and use statistics for analysis.

A. Personal information

It was found that most of the respondents were male, aged 31-35 years old, graduated below bachelor's degree, average income 10,001-20,000. The work position is employee level and has a working age of 6-10 years. Priority level of warehouse management Sumipex (Thailand) Co., Ltd. From the study of the importance of warehouse management of Sumipex (Thailand) Co., Ltd. Included in the level, very agree In descending order as follows: Warehouse management. Receiving, storage, and distribution (Distribution) with details as follows

1. Receiving

It was found that the priority of receiving the goods was very important. And considering the level of importance Is in a very important level 5 items, consisting of the number of products to be accurate in accordance with the document. Checking the price tag to be correct according to the document Record the goods receipt into the product condition inspection system to be accurate according to the documents. And have a schedule for receiving products in advance, respectively

2. Storage

It was found that the overall average level of importance of warehouse management optimization method of Sumipex (Thailand) Co., Ltd. in the field of storage (Storage) is very important. And considering the level of importance Is in a very important level 5 items, consisting of the number of products to be accurate in accordance with the document. Checking the price tag to be correct according to the document Save the product receipt into the system. Inspecting the product condition to be correct according to the document and have a schedule for receiving products in advance, respectively

3. Distribution (Distribution)

Found that the level of importance of product distribution Is at a very important level and considering the level of importance Is in a very important level, 4 items consist of a document indicating the products to be distributed to each store Grouping products to distribute and deliver according to the store area There is a fixed time and place of distribution. And the use of anti-shock materials during the movement, respectively Warehouse management efficiency level Sumipex (Thailand) Co., Ltd. From the study of warehouse management efficiency level, Sumipex (Thailand) Co., Ltd. found that the overall picture was at a very agree level, namely, receiving the goods correctly according to the plan. And the accuracy of product delivery And the product system is correct in order with the details as follows

4. Receiving the goods correctly according to the plan

It was found that the level of importance of receiving the product was correct according to the plan. Is at a very important level and considering the level of importance Is in a very important level of 3 items, consisting of the correct product according to the document The product must be undamaged

before receiving it. And the documents must not be damaged respectively

5. Shipping accuracy

Found that the level of accuracy in product delivery Is at a very important level And considering the level of importance It is in a very important level. 3 items consist of delivering the goods to the correct destination. The correct quantity of goods is delivered every time. And the delivered goods are in perfect condition, respectively

6. The product system is accurate.

Found that the level of importance of the product system is correct Is at a very important level and considering the level of importance Is at a very important level of 3 items, consisting of the correct receipt of the product according to the computer system The annual count is based on the actual number. And there is a random stock count system in order.

V. COMPARE LEVELS WAREHOUSE MANAGEMENT EFFICIENCY SUMIPEX (THAILAND) COMPANY LIMITED CLASSIFIED BY PERSONAL INFORMATION

A. Hypothesis test results

Hypothesis 1: Different personal information affects different levels of warehouse management efficiency. According to the study, it was found that Different personal information, genders, ages, and years of work affect different levels of warehouse management efficiency. With statistical significance at the .05 level. Personal information section Education and position Different levels of warehouse management performance were not different. Relationship between warehouse management method and warehouse management efficiency level Sumipex (Thailand) Co., Ltd.

Hypothesis 2: Warehouse management method is related to warehouse management efficiency level of Sumipex (Thailand) Company Limited. According to the study, it was found that Warehouse management method Receiving, storage, and distribution (Distribution) The overall relationship with the warehouse management efficiency level Sumipex (Thailand) Co., Ltd., the level of relationship is high, in the same direction. Assumptions 3: Warehouse management method influences warehouse management efficiency level Sumipex (Thailand) Co., Ltd.

It was found that the warehouse management method had an influence on the efficiency level of warehouse management of Sumipex (Thailand) Co., Ltd. on receipt of the ERP system in receiving goods. Storage of products (Storage) in terms of efficient storage management Storage according to the appropriate temperature Distribution (Distribution) in regard to product distribution There is a suitable distance transmission area grouping. There are documents indicating and timing. The exact distribution location is available Delivery on time Influence on warehouse management method has statistically significant influence on warehouse management efficiency level of Sumipex (Thailand) Co., Ltd. at the .05 level.

B. Suggestion

From the study, the students suggested the improvement of warehouse management efficiency of Sumipex (Thailand) Co., Ltd. as follows:

1. Receiving: Management should have a table or a tool that informs the status of the product in advance to facilitate the process. And recording the product in the program should use the Barcode system to receive the product with a barcode attached to the product to increase the efficiency of the counting work to be convenient, fast, save time, reduce errors and reduce the cost. Spend and make information more accurate In the case of the receipt of product returns from customers The company should provide a document on the receipt of the product from the customer, whereby the staff of the company and the customer check the correctness of the product together before receiving the product back to the company

2. Storage (Storage): The administrators should efficiently manage the storage area. The storage space should be ready and sufficient for storage. By zoning goods Determined by the product rotation cycle Slowly turning products should be kept in the innermost zone. Medium rotation should be kept in the middle zone. And fast-rotating products should be kept near the door to facilitate dispatching. And control the temperature of the appropriate storage location Classify the product and store it according to the temperature of the product. In order to reduce the cost of deteriorated products from the weather

3. Distribution (Distribution) Managers should choose to use a larger truck. Able to deliver in bulk and meet standards such as 4-6 large-wheel trucks, reducing the number of rounds in delivery. There is grouping of products to distribute and send to the shop area in the same warehouse. It will reduce the cost of transportation used by cars and labor. And should use materials to prevent bumping into each other during transportation So as not to damage the product In addition, technology is applied in warehouse management that can increase efficiency in warehouse management so that products can be delivered to customers on time that the customer needs.

VI. SUGGESTIONS FOR THE NEXT STUDY

- A qualitative study on improving the storage efficiency of products in Sumipex (Thailand) Co., Ltd. should be studied.

REFERENCES

- [1] Christiano, L., & Eichenbaum, M. (1992). Current Real-Business-Cycle Theories and Aggregate Labor-Market Fluctuations. *The American Economic Review*, 82(3), 430-450. Retrieved May 22, 2021, from <http://www.jstor.org/stable/2117314>
- [2] Coffee, J. (2002). Racing towards the top: The impact of cross-listing and stock market competition on international corporate governance. *Columbia Law Review*, 102(7), 1757-1831. <https://doi.org/10.2307/1123661>
- [3] Gaur, V., Kesavan, S., & Raman, A. (2014). Retail Inventory: Managing the Canary in the Coal Mine. *California Management Review*, 56(2), 55-76. <https://doi.org/10.1525/cmr.2014.56.2.55>
- [4] Griffin, Jill and Lowenstein, Michael W. (2002), *Customer Winback: How to Recapture Lost Customers—and Keep Them Loyal*. New York: John Wiley & Sons.

- [5] Lhuillery, S.(2011) Absorptive capacity, efficiency effect and competitors' spillovers. *J Evol Econ* 21, 649 (2011). <https://doi.org/10.1007/s00191-011-0228-2>
- [6] Meyer, J., Ramirez, F., Rubinson, R., & Boli-Bennett, J. (1977). The World Educational Revolution, 1950-1970. *Sociology of Education*, 50(4), 242-258. doi:10.2307/2112498
- [7] Mitra, A.H (1977) *Terms of Trade and Class Relations* Taylor and Francis Limited, London (1977)
- [8] Mahamud, et. al,(2021) New Normal Mindset in Human Resources Strategies of Entrepreneurs for Sustainability in Thailand. *Turkish Journal of Computer and Mathematics Education*. 12(11) 4565-4575 <https://doi.org/10.17762/turcomat.v12i11.5951>
- [9] Orobia, L.A., Nakibuuka, J., Bananuka, J. and Akisimire, R. (2020), "Inventory management, managerial competence and financial performance of small businesses", *Journal of Accounting in Emerging Economies*, Vol. 10 No. 3, pp. 379-398. <https://doi.org/10.1108/JAEE-07-2019-0147>
- [10] Parente, D.H., Pegels, C.C. and Suresh, N. (2002), "An exploratory study of the sales-production relationship and customer satisfaction", *International Journal of Operations & Production Management*, Vol. 22 No. 9, pp. 997-1013. <https://doi.org/10.1108/01443570210440500>
- [11] Perego, A., Perotti, S. and Mangiaracina, R. (2011), "ICT for logistics and freight transportation: a literature review and research agenda", *International Journal of Physical Distribution & Logistics Management*, Vol. 41 No. 5, pp. 457-483. <https://doi.org/10.1108/09600031111138826>
- [12] Ramstad, E. (2009) Expanding innovation system and policy – an organisational perspective, *Policy Studies*, 30:5, 533-553, DOI: 10.1080/01442870903208551
- [13] Sameer Kumar, S.M. Kadow, B.B & Lamkin, M.K (2011) Challenges with the introduction of radio-frequency identification systems into a manufacturer's supply chain – a pilot study, *Enterprise Information Systems*, 5:2, 235-253, DOI: 10.1080/17517575.2010.536262
- [14] Srinuan, P., Tsani Annafari, M. and Bohlin, E. (2011), "An analysis of switching behavior in the Thai cellular market", *info*, Vol. 13 No. 4, pp. 61-74. <https://doi.org/10.1108/14636691111146154>
- [15] Ten Hompel, M. and Schmidt, T. (2006), *Warehouse Management: Automation and Organisation of Warehouse and Order Picking Systems*, Springer, Berlin. <https://doi.org/10.1007/b138514>
- [16] Tsourvakas, G.R (2004) Public Television Programming Strategy Before and After Competition: The Greek Case, *Journal of Media Economics*, 17:3, 193-205, DOI: 10.1207/s15327736me1703_5