

# EFFICIENCY IMPROVEMENT OF INVENTORY MANAGEMENT FOR COMMUNITY ENTERPRISE GROUP WITH ABC ANALYSIS

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## ABSTRACT

Abstract—At present, Business marketing is fiercely competitive. From this situation, it affects the product manufacturers because customers can choose to use the service of a product manufacturer that can efficiently respond to their own needs. which all types of businesses have warehouses for production or sales activities are going smoothly. This research will discuss what can help manage a lot of inventory of community enterprises group in Udonthani province more efficiently by ABC analysis to separate the category of products into groups according to the value of products that turn around in the year into 3 groups, namely Group A, Group B and Group C in order of importance. which the research result, the annual inventory value of Group A, B and C are 249,500 baht, 221,200 baht and 141,200 baht respectively. And the inventory value of Group A, B and C are 40.77%, 36.15% and 23.08% respectively. Thus, classifying inventory, it helps inventory executives or responsible people of community enterprises group can arrange order importance of product for define policy to control inventory for each group, resulting in saving time in inventory control and also save money that over necessary of community enterprise group to create maximum benefits.

Keywords— Inventory Management 1, ABC Analysis 2, Inventory Control 3.

## INTRODUCTION

Currently, the production evolution of various industries in Thailand progress has been made rapidly and continuously. The warehouse management will focus on delivering enough products to meet demand and deliver the goods on time to meet the needs of customers. At present, the rapid advancement of technology has affected the market situation with intense business competition. From such situations, it may have a serious impact on the establishment. This is because customers can choose to use warehouse services that respond to their needs efficiently and a variety of customers according to their needs and have high bargaining power leads to price pressure. Enterprises must adapt to strong competition and must bear the costs of adapting.

The community enterprise group is a group that uses raw materials in the community to generate income with the community and is quite competitive. As a result, many community enterprise groups have to adjust and reduce production costs and generate additional income in the number of products of the group or it could be said that the community enterprise group must develop its operations to be more efficient and reduce costs. It can also meet the needs of consumers. In this regard, inventory management to respond to consumer needs will help reduce costs from having more inventory, causing demand and expenses in keeping products for the community enterprise group.

Pla Ra Lon and Pla Ra Bong are products that bring Pla Ra through the processing process. Each area has a different production process. The production of fermented fish and fermented fish has expanded from the household level to the business level. The profession of selling fermented fish and fermented fish has expanded greatly and what attracts consumers to buy it as a regular customer is the taste, but that does not mean that just delicious taste will result in smooth business operations because there are still many important factors that traders should not overlook, including cleanliness, service, raw materials used to prepare should meet standards. Store location or distribution channel to reach the target group which point of sale will be picked up and able to win the hearts of customers and nowadays.

Pla Ra Lon nikhom songkhro community enterprise is a retail and wholesale enterprise. There is a continuous demand for products from customers. For the reason that Pla Ra Lon nikhom songkhro community enterprise has insufficient inventory management, causing large purchases of raw materials. And when ordering raw materials,

sometimes the product will not be delivered on time, causing some products to have insufficient quantities to meet the demand. But on the other hand, some products have more than the demand for sales.

From this situation, the researcher was consulted with a community enterprise group in warehouse management that had problems in the inventory management and inventory management processes in the warehouse. Therefore, community enterprises must have an inventory management process to reduce the cost of inventory management and improve work efficiency and for community enterprise groups to be able to adapt to changes in the economy and the current working conditions. Therefore, the researcher applied the ABC analysis to the operation as a guideline to increase the efficiency of inventory management of the Pla Ra Lon Nikhom Songkhro Community Enterprise.

## LITERATURE REVIEWS

### 1. Warehouse management

Warehouse management is the process of controlling and organizing everything within the warehouse to be efficient. Since entering the product into the warehouse to export goods from the warehouse for sale or consumption. It will include Warehousing and inventory management, maintenance of equipment in the warehouse, restocking stock into the warehouse, purchase order packing. and deliveries, tracking and improving overall warehouse efficiency.

Objectives of warehouse management: reduce the moving distance as much as possible, make the most of the space, ensuring that labor, tools, equipment, and various utilities are sufficient and consistent with the planned level of business, satisfaction in daily work for those involved in moving goods. both incoming and outgoing using the quantity from purchasing and the need for delivery to customers as criteria, able to continuously plan, control and maintain the level of use of various resources in order to provide services under the cost that is cost-effective in the investment according to the specified business size.

Benefits of warehouse management: saves transportation costs, saves production costs, it helps to benefit from discounts to buy in bulk, help prevent shortages, help support the business's customer service policy, it helps to be ready to face the changing market conditions.

The process of warehouse management: These processes generally revolve around receiving and delivering goods. And if it's a major activity in the process at all, then there will be.

1. Goods Receive is the receipt of goods into stock in the inventory, whether from factory production or imported from other places.

2. Identify goods to ensure the accuracy of names, forms, numbers or other information that is unique to the goods.

3. Sorting goods are classified for convenience of storage, such as good, damaged, old, new. This must be separated in warehouse storage.

4. Put away, moving goods into rows, shelves, and positions of goods

5. Holding goods is to take care of the degradation of the goods.

6. Inventory counts as detailed in the stock count sheet (type, quantity, etc.) Compare the data collected with those obtained from the actual count.

7. Dispatch goods are the delivery or payment of goods to the recipient or the return of goods to the depositor.

8. Picking is the process of picking up items from different areas of the inventory and bringing them together to the next zone.

9. Shipping is the process of packing, packing, marking, weighing, and delivering products out of a warehouse to retailers and consumers.

10. Preparation of reports to monitor products and the results of warehouse management for use in planning development and improvement, including processing numerical, statistical and descriptive summaries.

### 2. Warehouse management for maximum efficiency

The most important startup steps to optimize warehouse management organization need to make sure that organization have prepared everything in the best possible way.

1. Organize the space

This is done by writing a warehouse layout, balancing the two things:

1. Providing a sufficiently wide space for your warehouse.
2. At the same time, there must also be enough space for employees to move goods.

The area can be divided as follows: A space to pick up incoming new items, space to open boxes and place new products, warehouse Office, main storage space for goods, storage for excess, expired, or stock backlog, packaging area or packing zone, transport area.

organization may actually feel that there are so many areas that it's cumbersome to manage, but if organization sketch out warehouse layout in the first place to optimize the space and size of the area before setting it up, organization will need to do it. It will make warehouse more organized and convenient to use.

#### 2. Label in the warehouse

Warehouse management can only be effective if organization name a location for a stock and have it clearly labeled. Warehouse teams must always check the warehouse system to see "what kind of goods, where they are located." The principle is this: using letters and numbers in naming, to make it easier to understand.

#### 3. Inventory arrangement

Once organization has managed the location of product labels in inventory. Employee sorting positions by the criteria of products. Thus, choose the best-selling products near the packaging or packing zones.

All-in-one ecommerce business provider Research has shown that of the more than 20 retailers he asked, 60% of the company's sales usually come from the 20% products that generate the most profit.

1. organization need to know what that 20% product.
2. Then store the goods as close to the packing zone as possible.

ABC strategy is therefore likely to be increasingly used in inventory management. Organization will need to divide total inventory into three groups: A, B, and C.

- A = Focus on the most high-value and profitable goods.
- B = Sells frequently, but with less value and profit than item A.
- C = Products that do not sell much and generate the least profit.

Organization then choose to place "Item A" closest to the pack zone, while Item C is the farthest away, some small and lightweight items may be sold often enough to be stored on shelves above the pack table, which will result in the packers being able to pack quickly and picking up larger items.

#### 4. Don't be afraid to rearrange items

Rearranging items can take time and resources to operate, it can be a level of hassle, but the warehouses are properly arranged. It can save overall time and significantly reduce costs for managing your entire supply chain. For example: Items that used to be the hardest to sell out during the summer, perhaps the best-selling in the winter, such as sweaters, knit hats, or umbrellas and raincoat, should be rearranged closer to the pack zone during the rainy season. So it makes sense to rearrange the product according to the season and when it should be.

#### 5. Equipment in the warehouse must be of quality

Warehouse management is most effective only if organization have the best equipment in warehouse. The most important things in the warehouse to pay the most attention to are: Stock rack / drop rack / cargo rack, It is important that the stock layer and shelf must be of high quality, strong and load-bearing, and should be designed / manufactured to suit the workpiece in the warehouse. Racks and stock racks to best suit warehouse and stock.

### 3. ABC analysis

ABC analysis is a concept that focuses on grouping products into 3 groups for easy management by product groups. There are many types of rankings according to the policies that want to use the management of the organization, such as Ranking products according to the total annual inventory held value of each item, each item's sales value or profit share of that product classified according to the consideration criteria such as Use the number of material items (Unit) to think together with the value (Value). The value mentioned may be holding value or sales value or profit share value to group

- Product group A is product in group A consisting of only a few items or having a small number of SKU (Stock Keeping Unit), maybe only 5-15%, but it is an inventory item that The value is higher than 70-80 %

- Product group B is product in group B, which is the secondary value product, will be less important, will consist of items between 15-30%, but it is an inventory item that Values below 30 % may fall within the specified values. As for products withholding value or selling value or share of the secondary profits will not be were given less importance to B and C respectively.

- Product group C is the product in group C, the product with the lowest value. will be given the least importance, it will consist of 50-60% of high-volume products, but it is the inventory that the value is as low as 5-10%

The theory of clustering analysis, ABC analysis, is applied from Pareto's principle by Vilfredo Pareto, an Italian economist. noted that “The essentials are less important than the unimportant, which tend to be more, at a ratio of 20:80. which is worth more than a large group of commodities that are generally of little value.” (Diana et al ,2017)

## METHODS

The target population used in this research were employee who works within Pla Ra Lon nikhom songkhro community enterprise. The sample size consisted of 20 employees and sampling with using a specific sample group. There are about 16 products sold, which are classified according to product characteristics namely Fermented fish simmer, Jeow bong , Pimp jeow bong, Sun dried striped snakehead fish, Sun dried Nile tilapia , Sun dried whisker sheatfishes, Grilled fish chilli paste, grilled fish meal, Boiled fermented fish sauce, Pimp hell chili paste and Fish meal spicy dip. The tool used for this data collection was used in unstructured interviews. By interviewing members of community enterprises involved in the production. and gather information on financial and accounting documents for the convenience of the interviewee. In the interview, leader of community enterprise and one person involved in inventory management was interviewed, namely the store manager from purchasing, storing, and disbursing inventory. To collect information about the proportion of work of employees in each department in ordering products, keeping inventory and other operations, the proportion of consumption, cost of each type of product and the duration of the order processing. To be used as a basis for calculating ABC analysis using interview methods to ensure that accurate and consistent information is used. Data analysis uses data collection method ABC analysis to classify inventory types. Divided according to the value of that type of product.

## RESULTS

### 1. ABC analysis results

Grouping of products of Pla Ra Lon nikhom songkhro community enterprise. The researcher has grouped the products according to the ABC analysis method to classify the inventory. Which the group of Pla Ra Lon nikhom songkhro community enterprise selling 16 items of products, which are classified according to the nature of the product namely Fermented fish simmer, Jeow bong , Pimp jeow bong, Sun dried striped snakehead fish, Sun dried Nile tilapia , Sun dried whisker sheatfishes, Grilled fish chilli paste, grilled fish meal, Boiled fermented fish sauce, Pimp hell chili paste and Fish meal spicy dip.

Inventory data and inventory usage in 2021 at the same product but in different sizes. The amount of customer demand in each size has different needs shown in Table 1.

And shows turnover inventory value in 2021 which are as follows inventory item information and the amount of inventory used in 2021, there are same product but in different sizes and the amount of customer demand in each size has different needs shown in Table 2.

**Table 1**  
**Inventory data and inventory usage in 2021**

No.	Inventory Item	package size (g.)	inventory usage per year	Price per unit (Baht)
1	Fermented fish simmer (plastic jar)	200	540	80
2	Jeow Bong (plastic jar)	50	2860	20
3	Jeow Bong (plastic jar)	100	2280	35
4	Jeow Bong (plastic jar)	200	2250	50
5	Pimp Jeow Bong (plastic jar)	150	320	40
6	Pimp Jeow Bong (plastic jar)	240	270	80

No.	Inventory Item	package size (g.)	inventory usage per year	Price per unit (Baht)
7	Sun dried striped snakehead fish (bag)	100	430	100
8	Sun dried nile tilapia (bag)	150	320	150
9	Sun dried whisker Sheatfishes (bag)	100	410	100
10	Grilled fish chilli paste (plastic jar)	200	460	100
11	Grilled fish meal (bag)	50	250	50
12	Grilled fish meal (bag)	200	220	150
13	Boiled Fermented fish sauce (bottle)	250	350	20
14	Boiled Fermented fish sauce (bottle)	500	440	40
15	Pimp Hell chili paste (plastic jar)	100	280	40
16	Fish meal spicy dip (bag)	200	170	150

**Table 2**  
**Turnover inventory value in 2021**

No.	Inventory Item	Package size (g.)	Inventory usage per year	Price per unit (Baht)	Inventory value per year (Baht)
1	Fermented fish simmer (plastic jar)	200	540	80	43,200
2	Jeow Bong (plastic jar)	50	2860	20	57,200
3	Jeow Bong (plastic jar)	100	2280	35	79,800
4	Jeow Bong (plastic jar)	200	2250	50	112,500
5	Pimp Jeow Bong (plastic jar)	150	320	40	12,800
6	Pimp Jeow Bong (plastic jar)	240	270	80	21,600
7	Sun dried striped snakehead fish (bag)	100	430	100	43,000
8	Sun dried nile tilapia (bag)	150	320	150	48,000
9	Sun dried whisker Sheatfishes (bag)	100	410	100	41,000
10	Grilled fish chilli paste (plastic jar)	200	460	100	46,000
11	Grilled fish meal (bag)	50	250	50	12,500
12	Grilled fish meal (bag)	200	220	150	33,000
13	Boiled Fermented fish sauce (bottle)	250	350	20	7,000
14	Boiled Fermented fish sauce (bottle)	500	440	40	17,600
15	Pimp Hell chili paste (plastic jar)	100	280	40	11,200
16	Fish meal spicy dip (bag)	200	170	150	25,500

Grouping of inventory according to ABC analysis shown in Table 3 which can be summarized as follows

Inventory in group A are as follows Jeow Bong (plastic jar) and size of product are 50 g. , 100 g. and 200 g. This group of inventory must be closely controlled and very strict. The ordering and use of inventory requires a complete and detailed record of the order and most complete. There are regular and continuous audits.

Inventory in group B are as follows Fermented fish simmer (plastic jar) 200 g. , Sun dried striped snakehead fish (bag) 100 g. , Sun dried nile tilapia (bag) 150 g. , Sun dried whisker Sheatfishes (bag) 100 g. and Grilled fish chilli paste (plastic jar) 200 g. This group of inventory must be controlled as usual, there is moderate strict control, that is, there is a periodic audit such as every 1 month or 3 months, depending on the management of the enterprise group. In which there must be a record of the product list as well as the product group A, record the disbursement Even if the purchase is made infrequently to reduce the risk of loss And try to check the inventory in the warehouse to be safe and sufficient to avoid product shortages.

And inventory in group C are as follows Pimp Jeow Bong (plastic jar) 150 g. and 240 g. , Grilled fish meal (bag) 50 g. and 200 g. , Boiled Fermented fish sauce (bottle) 250 g. and 500 g. , Pimp Hell chili paste (plastic jar) 100 g. and Fish meal spicy dip (bag) 200 g. This group of inventory requires little or no record keeping. It is a low-value but abundant inventory. The controls don't have to be so strict. Some product counts are checked from time to time. by using the inventory system at the end of the period, that is, space for a while and then check the warehouse to see how much is missing and then order more products.

**Table 3**  
**Grouping of inventory according to ABC analysis**

No.	Inventory Item	Package size (g.)	Inventory usage per year	Price per unit (Baht)	Inventory value (Baht)				Group of ABC Analysis
					value per year	accumulated value	percentage of value	Percentage of accumulated value	
1	Fermented fish simmer (plastic jar)	200	540	80	43,200	43,200	7.06	7.06	B
2	Jeow Bong (plastic jar)	50	2860	20	57,200	100,400	9.35	16.41	A
3	Jeow Bong (plastic jar)	100	2280	35	79,800	180,200	13.04	29.45	A
4	Jeow Bong (plastic jar)	200	2250	50	112,500	292,700	18.39	47.83	A
5	Pimp Jeow Bong (plastic jar)	150	320	40	12,800	305,500	2.09	49.93	C
6	Pimp Jeow Bong (plastic jar)	240	270	80	21,600	327,100	3.53	53.46	C
7	Sun dried striped snakehead fish (bag)	100	430	100	43,000	370,100	7.03	60.48	B
8	Sun dried Nile tilapia (bag)	150	320	150	48,000	418,100	7.84	68.33	B
9	Sun dried whisker Sheatfishes (bag)	100	410	100	41,000	459,100	6.70	75.03	B
10	Grilled fish chilli paste (plastic jar)	200	460	100	46,000	505,100	7.52	82.55	B
11	Grilled fish meal (bag)	50	250	50	12,500	517,600	2.04	84.59	C
12	Grilled fish meal (bag)	200	220	150	33,000	550,600	5.39	89.98	C
13	Boiled Fermented fish sauce (bottle)	250	350	20	7,000	557,600	1.14	91.13	C
14	Boiled Fermented fish sauce (bottle)	500	440	40	17,600	575,200	2.88	94.00	C
15	Pimp Hell chili paste (plastic jar)	100	280	40	11,200	586,400	1.83	95.83	C
16	Fish meal spicy dip (bag)	200	170	150	25,500	611,900	4.17	100	C

The amount of inventory used per year, the inventory value per year, and the percentage value of inventory which has the following information , Group A have the amount of inventory used per year is 7,390 unit, the inventory value per year is 249,500 baht, and the percentage value of inventory is 40.77 , Group B have the amount of inventory used per year is 2,160 unit, the inventory value per year is 221,200 baht, and the percentage value of inventory is 36.15 and Group C have the amount of inventory used per year is 2,300 unit, the inventory value per year is 141,200 baht, and the percentage value of inventory is 23.08 shown in Table 4.

**Table 4**  
**Result of inventory classification according to ABC analysis**

Group	The amount of inventory used per year (Unit)	The inventory value per year (Baht)	The percentage value of inventory
A	7,390	249,500	40.77
B	2,160	221,200	36.15
C	2,300	141,200	23.08

## 2. Discussion of research results

From studying the inventory management process and grouping inventory of community enterprises according to the ABC analysis method, the efficiency of warehouse operations can be increased as follows:

- Use the space to store products more efficiently.

Community enterprise groups can classify which products are group A inventory, which is high-value inventory and is in demand by customers. Community enterprises can use the space in the warehouse to store these inventory in sufficient quantities to meet the needs of customers. And store them into categories for each delivery group, reducing the time to search for inventory in the warehouse. And at the same time, it can reduce the stock of inventory group B and group C, which is a low-value inventory group. As a result, the Pla Ra Lon Nikhom Songkhro community enterprise group was able to reduce the cost of inventory management. Which is consistent with Wanwipa Cuhanpet (2017) research on prefabricated warehouse layout using ABC analysis technique, a case study of XYZ Co., Ltd. The results obtained from the research applied ABC analysis technique to classify inventory and arrange products with the highest sales. near the exit and products with moderate sales or moderate movement and low product sales. or moving slowly inside the warehouse Thus reducing the time and distance in picking the product appropriately. And which is consistent with Chanicha Moryadee et al.(2020) conducted research to find a solution to the pharmaceutical warehouse system of a pharmacy in Nakhon Pathom Province. The results obtained from research applied ABC analysis to prioritize the importance of each product category. Then use the results obtained to design a new warehouse layout. To make it easier to manage inventory more efficiently. This makes it easier for the store staff to pick up the product and there are fewer errors in their work.

- Estimate stock availability more accurately

Community enterprise groups can classify which products are group A inventory, which is high-value inventory and is in demand by customers. Which closely and rigorously monitors and collects information on the inventory of the community enterprise group, it will increase the accuracy of inventory reserve estimation. It is very useful for determining stock quantities and calculating inventory costs. And at the same time, when there is an accuracy in inventory reserve estimation, it reduces excess inventory. As a result, the Pla Ra Lon Nikhom Songkhro community enterprise group was able to reduce the cost of inventory management. which is consistent with Thanapat Rattanachamroon (2020) researched inventory management for convenience stores that sell food items with short shelf life restrictions. The results obtained from the research applied ABC analysis technique to select the inventory and then forecast the demand for the most accurate inventory estimate based on mean absolute percentage error (MAPE)

- Increase inventory turnover

Clarity in demand and the appropriate amount of stock in stock. It will increase the inventory turnover rate in the warehouse higher. As a result, it can reduce the risk of overstocked inventory and reduce the cost of deteriorating products. And it can help reduce the cost of keeping the product that exceeds the customer's needs. which is consistent with Jittrayubol Papisaro (2016) research on warehouse management used to keep meters to

increase the efficiency of the warehouse and reduces excessive inventory. The results obtained from the research applied the ABC analysis technique to prioritize the movement of goods to know the list of goods that are circulating in and out of the warehouse. And to improve the lay out in the warehouse management found that the warehouse has better efficiency.

## **CONCLUSION AND FUTURE WORK**

The purpose of this research was to study the inventory management process and reduce the cost of inventory management of Pla Ralon Nikhom songkhro Community Enterprise by using ABC analysis method collected from unstructured interviews. by interviewing the community enterprise group and the financial and accounting documents of the community enterprise group

The results of the research and analysis of inventory management with ABC Analysis techniques help inventory managers and members of community enterprises. Able to manage large quantities of inventory, can also prioritize the inventory and store inventory effectively.

However, the criteria used to classify the inventory in the research study mentioned in the above content is an estimate based on ABC Analysis calculations, where the inventory control in each category depends on the policy of the community enterprise group. Under the condition that the community enterprise group can quickly respond to the needs of customers. and the lowest cost of inventory management

Future research can focus on any stock based community enterprise or any stock based industry. For example, small and medium sized enterprises (SMEs) that have small scale warehouses can be investigated as case studies with ABC analysis.

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