CHAPTER VII

CONCLUSION AND RECOMMENDATION

7.1 Conclusion

This research studied as a case study of the wholesale business. The objective is to propose the warehouse management system, which controls the movement and storage of items within a warehouse with the limited area for the local wholesalers.

To achieve this objective, the current warehouse management had been studied and mapped to find the causes of problems that prevent it to control the movement and storage of items within a storage area of a warehouse.

The study had been done from the layout of warehouse to the each detail of warehouse operation that performed by a warehouse operator. The layout study has shown that the current layout has many obstacles that waste space needless in a warehouse.

The layout study has founded that the storage area is messed up because products have been putted every where over the floor. The aisle in the storage area has not been determined so it is very hard to move in a storage area. It was very difficult to the specific product in a storage area because many products have been putted to block other products. Then the space of the storage area

The warehouse equipment study has founded that the current storage equipments is not fit with the product's size and there is no horizontal material handling equipments to move products in the storage area.

The study of warehouse operation has founded that there is no system to help the operator to know where they should store the product and all activities and information depends on human memory to memorize it. Each operator has different ideas of how to perform the warehouse activities. Beside that, the study had founded that there is no record about the quantity of products in a warehouse.

It can be said that the current warehouse management has no system at all and the infrastructure of the warehouse is not suit to use as a storage area. Therefore, the current warehouse management can not control the movement and storage of items within a warehouse because of these reasons:

1. It depends on human memory and experience which is good enough for the very small warehouse but when the company has expanded and there are more products in a warehouse. Human memory can not remember all of the information that is required to control the items in the warehouse.

2. The storage area is messes up because there is no system to indicate the suit storage area for a particular item and no manual to guide the operators what to do.

3. The warehouse equipment is not fit with the storage products so it is useless and waste of space in a storage area.

4. There is no system or data recording to provide information about quantity of each product and remained available storage areas in the warehouse so it makes excessive inventory and high dead stock.

5. Sometime the operators do not know the products that they need to find or pick because they use their memory to memorize the product's characters and appearance to identify it.

After the study has been done, the study shows that the current warehouse management system has created many problems for a company and these problems affects to the performance of the warehouse operation and company prosper directly. It can be concluded that these problems occur in most company that don't realize the important of warehouse management.

Business aspect problems

1. High excessive inventory.

2. Lost of plenty opportunities to sell due to product out of stock and it also has a high risk to lose customers to other competitors.

3. High dead stock

Problem in the warehouse operation

1. Storage capacity is not enough occasionally.

2. Checking quality and quantity of received item has many errors and conflicts occur in this activity.

3. Too much time consuming and errors have occurred when inexperienced operators identify items' name and storage location.

4. Warehouse staffs use much time to find an available storage area for the items.

5. Transferring items from a receiving area to a storage location requires too much time.

6. Warehouse staffs hurt their muscle when they carry very heavy items into a storage area.

7. In some storage equipments, it is difficult for an operator to put items into them.

8. Warehouse staffs spend much time to pick an item from its storage location.

9. It is difficult to identify items' name or their tag or mark when they are in the storage area.

10. Transferring items from storage location to a stacking area takes too much time.

11. Warehouse staffs pick a wrong item.

Then the new warehouse management that is suit to the warehouse of the wholesale business must be developed to meet the objective that is to be the warehouse management which controls movement and storage of items within a warehouse area. Beside that, the new warehouse management is designed to perform without the problem that has been founded in the previous system. The process to develop the warehouse management has consisted of 5 steps. The new warehouse management have been established from the basic physical structures and facilities of the warehouse to each detail of warehouse activities that been done by the operators. The process of developing the warehouse management that is appropriate to the wholesaler business has consisted of 5 steps.

The first step is the space planning and warehouse layout planning. The space of each activity has been planed by determining what is to be accomplished, how to accomplish it, space allowances for each element required accomplishing the activity then calculation the total space requirements. Improvement in fixed obstacles of the warehouse has been determined to increase the space utility efficiency of the warehouse. Then the location of each space has been defined by considering the requirement in term of space and location. The result is the receiving and shipping area has shared the space at the first floor of building no.2. The packing area has been

located at the first floor of building no.2 and trash area is located at the first floor of building no.1.

After that the material handling equipment has been determined by considering the size of storage items and aisle and the storage equipments have been designed to suit the size of storage products in each group. The result is the steel platform hand trucks have been determined to replace the manpower when there is product horizontal movement. The storage equipments have been designed into 4 models to suit the size and characteristic of product in each group.

The second step is assigning the material to be stored to the storage locations. To assign the items to the appropriate storage location that maximizes the effective use of space and maximizes accessibility of all items need the storage locator and the allocation system.

The combination philosophy is selected to use as the storage locator system because it can response to the objectives while can fit well with other considered factors. The allocation system that is suit to the wholesale business is the system that is mixed with popularity, family grouping and size concepts. The process to assign item to suit storage location has been divided into 2 parts. The first part is to assign the suit location of each group by considering the special requirement of each group and popularity concept. The second part is to locate the specific storage location for each item by using the allocation system code. The code is designed to guide an operator to know where they should put the products in and the special items have the fixed storage location but the bulk items have no fixed storage location. Then the operators can be acknowledged where they should store each item by the allocation system code of each item.

The third step is to determine the storage location addresses and item identifiers system. The item identifier system in this warehouse is used only to identify the item so the name of item on its package that is marked by the suppliers is good enough to identify system. As a result, item identifiers system of this warehouse relies on the suppliers markings on the exterior of package. Although most of product in this warehouse have been marked their name on the package by the suppliers, there are some of them which are not been marked by supplier. Then warehouse operator must mark the name of the item which is written on the receiving bill on the exterior of the package by them.

The addressing or location system that is selected should have an underlying logic that is easy to understand. The addressing of storage location must contain the information that can inform its specific location including building no., storage floor, type of storage equipment, sequence no. of storage equipment and the layer in storage equipment. As a result, there are 5 codes that represent the storage location. The first code represents the no. of the building that storage location been located. The second code represents the no. storage floor that storage location been located. The "F" letter in this code means the floated floor. The third code represents the type of storage equipment and there are 4 type of storage equipment. The "R" letter represents that this storage location is in the Rack storage equipment. The "A" represents that this storage location is in the Model A shelf, "B" represents that this storage location is in the Model B shelf and "C" represents that this storage location is in the Model C shelf.

The fourth code represents the no. of storage equipment that the storage location is located in and codes have 2 digits. The fifth code represents the layer no. in storage equipment that the storage location is located in.

The fourth step is to design the warehouse database system. The warehouse database system is a supporting system that supports main operation in a warehouse with useful information. The 6 activities that require information from the warehouse database system are the receiving, identifying, dispatching product to storage, order picking product, inventory checking and ordering product from supplier. The computerized approach that is match to requirement of this warehouse is manually captured information and paper-based information is entered into the database through keying by human. This computerized approach needs human to involve in collecting data and keying data into database of computer system. Then the role of computer is just storing the data and sorting it to make it easily for the operators to find and understand. As a result, managing database of this warehouse use only Microsoft access program or Microsoft Excel to run and show the information is good enough. Beside that Microsoft office has been used in this warehouse already and the users already knows how to use this software.

There are 5 databases in the warehouse database system. These 5 databases are the database of the allocation system code, database of item's storage location, database of the quality checking record, database of the product movement record and database of the specification of storage unit type. To implement the warehouse

database system requires the computer and the small office network in the receiving and shipping area.

The fifth step is to design the warehouse operation. The operations that are needed to perform these functions efficiently are necessary to identify and establish standards for the tasks to be performed and the operation procedure. After there are many systems have been designed to bring the warehouse management meets its objective, the warehouse operation must support the other systems, equipment and space in a warehouse also.

Therefore, the warehouse operation of this warehouse involves in 7 sequential steps to attain effective warehouse operation system. Warehouse operations include the following:

1. Receiving

2. Identifying item to determine its storage location.

3. Dispatching to Storage : Put away and Storage

4. Order picking

5. Packing

6. Loading and Shipping

7. Physical inventory

After several step of the warehouse management process development, implementing the new warehouse management need investment from the company. The cost of investment has consisted with 3 parts. The first part is the cost of infrastructure improvement which is estimated by the contractor around 100,000 Baht. The second part is the cost of equipment improvement which is estimated by the supplier around 794,000 Baht. The final part is the cost of implementing the warehouse database system which is estimated around 26,500 Baht. As a result, the total cost of implementation the warehouse management system is 920,500 Baht.

7.1.1 How the new warehouse management controls the movement and storage of items within the warehouse of the wholesale business.

The new warehouse management has been developed from the basic to controls the movement and the storage of the product. Firstly, the storage equipments have been designed to suit the product then each product group has been assigned into the specific storage area in the warehouse. Then the item identifier of the product

and the storage location address of each storage location are determined to help the operator to indicate the products and find the storage location because it is not possible to control what it can't be found. This system helps warehouse staff to keep track of where items are at any given time. The storage locator system and the allocation system have been used to determine the allocation system code for each product. This code will inform the operators to know where they should store a particular product. The allocation system code is used to control where the product should be stored.

The computer's database and the paper system is used together to control the movement of item. There are only 2 movements in this warehouse which are receiving products from suppliers and shipping the products to the customers. After the product is moved into the storage location, the operator must write down the storage location address of that storage location and the quantity of the product into the storage recording paper. Then the administrator uses the warehouse database to record the data and the database will support the information to the operators that where they should pick the item. When there is movement of product in the warehouse, the database must be updated and the data comes from the storage recording paper which informs the data of product moving in and the order picking recording paper which informs the data of product moving out of the warehouse. The operators use the information in the database to inform the storage location of the product that they are looking for.

As a result, it means the new warehouse management system can control the controls the movement and storage of items within the warehouse of the wholesale business.

7.1.2 How the new warehouse management eliminates the problems in the current warehouse management

1. High excessive inventory and lost of plenty opportunities to sell due to product out of stock: These 2 problems come from the same cause that there is no information about the stock level of product to assist the administrator product ordering decision. The new warehouse management has the warehouse database system to record the product movement. The database is able to provide information about quantity of each product and remained available storage areas in the warehouse.

This information will be used by the administrators so they know the stock level of each product exactly and use the information to support their ordering decision.

2. High dead stock: Cause of this problem is there is no data about items' movement to analyze and forecast demand of each items. The new warehouse management has the warehouse database system to record the product movement. However this information must be used by the inventory management to analyze and forecast demand of each items.

3. Storage capacity is not enough occasionally: This problem is the effect from the administrator has no information about the stock level of product to assist the administrator product ordering decision. Then they don't know exact amount of items in stock and they don't know their remained available storage area also. The new warehouse management has the warehouse database system to record the product movement. This will ensure the warehouse has the products in the stock at the right level all the time. Then the new warehouse management has planned the layout of the storage area by using storage space planning. It is particularly critical because the storage activity accounts for the bulk of the space requirements of a warehouse. Inadequate storage space planning can easily result in a warehouse that is significantly larger or smaller than required. Too little storage space will result in a world of operational problems, including lost stock, inaccessible material, poor housekeeping, damaged material, safety problem, and low productivity. Therefore, to avoid these problems, storage space planning is approached from a quantitative viewpoint as opposed to a quantitative assessment of requirements. With the storage space planning, the new warehouse management can be sure that it has the storage space for all products at the right stock level all the time.

4. Checking quality and quantity of received item has many errors and conflicts occur in this activity: The cause of this problem is the receiving activity has been done on the public street or at the office area which is very small and crowded. There is no specific area for it. Then the new warehouse management uses the space planning to determine the space that is needed to perform the receiving activity and defining it location by considering its requirement to design the layout. The new system has located the receiving area at the first floor of building no.2 and reserved the space for the receiving area to perform the receiving operation efficiently.

5. Too much time consuming and errors have occurred when inexperienced operators identify items' name and storage location: The cause of this problem is some items have no tag on their package or containers. When warehouse staff can not identify items' name, they can not decide where these items should be stored. Then, they would ask experienced operators to support them but at the present, there is only one staff which has enough experiences to do it. The new system has determined to use the name on the exterior of the product which is marked from suppliers and if any item has no mark, the operator must mark the name of item on its exterior. Then each storage location has the storage location address. The new system has the system to link the item identifier and the storage location address together. As a result, the operator knows which storage location he should put item in.

6. Transferring items from a receiving area to a storage location requires too much time. The cause of this problem is there is no specific aisle in storage area and many items are stacked on the floor all over the area. Thus, warehouse staffs hardly walk in a storage area so they need much time to carry items to its storage location. The new system has used space planning and layout planning to determine the suit space and location for each activity. The aisle in each area has been determined also and the width of aisle has depended on the type of traffic that will use the aisle. Then it will be convenient to transfer product within a warehouse.

7. Warehouse staffs hurt their muscle when they carry very heavy items into a storage area. The cause of this problem is they have not used the material handling equipment to transfer items in horizontal within a storage area. They moved it by carrying so when it is very heavy, they need to use their muscle too much which is not good for their health. The new system has determined to use the steel platform hand truck as a material handling equipment to transfer items in horizontal within a storage area.

8. In some shelves, it is difficult for an operator to put items into a shelf. : The cause of this problem is some storage equipment' top layer is too high to reach and height of each layer is not fit with the size of items. Storage equipment that used in this warehouse is not suit to store a big item and they can not store heavy item also. In the new system, the storage equipment has been determined by considering the size of storage items and ergonomic factor. It means with the new system, the product is stored in the storage equipment that is fit to it.

9. Warehouse staffs spend much time to pick an item from its storage location. The cause of this problem is that they can not recall all items' storage location so they use much time on walking and looking for targeted items in a storage area. The other reason is some items are blocked by other items because when warehouse staffs put down items in storage area, they are just looking for an available space in storage area. They have not considered about how to track and how to pick items in a storage area. They don't know that they should not put item blocking the other because there is no guide line or manual for them to follow. The new system has the standard procedure of the warehouse operation to guide the operators what they are expected to do. There is no guideline where they should put item in, no border line that indicates the area. The new system has the allocation system code that indicates where it should be stored. The new system determined that all items must be stored in the storage location so the storage area has a good house keeping. In the new system, there is the computerize database system that provide the information about where a particular product has been stored to a warehouse operator. A warehouse operator would know where he should pick items immediately.

10. It is difficult to identify items' name or their tag or mark when they are in the storage area The cause of this problem is when warehouse staffs put away items into their storage location, they had not turned the side that has tag or mark of items up to be noticed or identified easily. They don't know that they should turned the side that has tag or mark of items up to be noticed or identified easily because there is no guide line or manual for them to follow. The new system has the standard procedure of the warehouse operation to guide the operators what they are expected to do.

11. Transferring items from storage location to a shipping area takes too much time. The cause of this problem is some items are blocked by other items and most items are stacked or putted untidy all over the storage area. They don't know that they should not put item blocking the other because there is no guide line or manual for them to follow. The new system has the standard procedure of the warehouse operation to guide the operators what they are expected to do. There is no guideline where they should put item in, no border line that indicates the area. The new system has the allocation system code that indicates where it should be stored.

The new system determined that all items must be stored in the storage location so the storage area has a good house keeping.

12. Warehouse staffs pick a wrong item. The cause of this problem is customer's order that administrator records from customers, is not clear. The other reason is some items are called in a warehouse different from what they are called by an administrator. The new system has determined to use the name on the exterior of the product which is marked from suppliers and if any item has no mark, the operator must mark the name of item on its exterior. Then all staffs in the company uses the same item identifier and they called items in the same name. The new system determines to use the order picking paper to record the customer's order properly. This helps a warehouse operator clearly understand what he has to pick.

7.2. Recommendation for future study

When the warehouse management that is suit to the local wholesale business has been developed, the warehouse can perform properly and the data in a warehouse would be collected. The data from a warehouse is very useful to assist the business decision.

After the warehouse management system is implemented successfully, the other system that should be developed is the inventory management system because the key to the success of the wholesale business is an inventory control. The single largest asset of the wholesale business is inventory. Control of this investment is vital. It will eliminate a number of the problems associated with capital shortages and will also provide capital to permit expansion of operations for increased sales and profit. Inventory problems often require prompt corrective action. In wholesale company, the market life of inventory is short and if inventory is insufficient when market demand peaks, sales and profits are lost. If inventory is excessive when demand declines. the excess must be cleared, often at sharply reduced prices, again affecting profits. It can be said that the good inventory management is to store the right product, right quantity at the right time.

However, the inventory management can not be successes without the good warehouse management. Because it needs a lot information and support which only get from the warehouse that been managed properly. Therefore, after the warehouse management system is implemented successfully, the company should move to the

next step by implementing inventory management. This will help them to get the right product, right quantity at the right time. As a result, the profit will be improved hugely.