

CHAPTER V

WAREHOUSE DATABASE SYSTEM

This is the last activity of storage function which is a paper work or record keeping of all activities in warehouse. The warehouse database system is the record keeping system and bringing the record information to use in warehouse activities. Warehouse database system is a supporting system that supports main operation in a warehouse with useful information.

There are 6 activities that require information from warehouse database system which following this:

Receiving activity: To ensure that the products that are received from suppliers have a good quality, a warehouse operator requires the information about the previous record of product's quality checking at the receiving area. Then he can select the appropriate quality checking method for particular product based on the previous record of the result from product's quality checking.

Identifying item activity: As it's mentioned earlier, all products in the warehouse must be stored in the unit type that is shipped to customers. Although most of product's receiving unit type is the same as it is stored, there are some items that there is different on this both unit type. If unit type of product while it is receiving is different from its specification unit type while it is stored, a warehouse operator must change the unit type while it is receiving to the unit type that is stored. Therefore, the operator requires the information of the specification of product's storage unit type in term of container type, capacity, weight and size of unit load.

Dispatching products to storage location activity: An operator must move products to its appropriate storage location so they require information about the current storage location (if it has) and the allocation system code of products. This information is a guide for an operator to bring the products to their suit storage locations.

Order picking product from storage location activity: An operator must pick the products that are ordered by customers from the storage area so he requires the information about the storage locations that products are kept and quantity of products in each storage location of each item to the operators by the storage location addresses.

Inventory checking operation activity: An operator requires information about products and quantity in each storage location and this information is used as a comparison to the data that they can count in each storage location. This operation assures the tracking system of the warehouse work properly and if there are any errors in tracking system, it can be found immediately.

Order products from supplier activity: This is an activity in inventory management that concerns about order product from suppliers but it requires information from the warehouse operation to perform this activity efficiently. This activity is done by an administrator. An administrator must know the current stock level of products in a warehouse, safety stock level and lead time of each product so he can decide that what products that should be ordered. How many and the when to order each product must be decided also to achieve this activity. Warehouse database must be able to provide the information about the stock level of each product in a warehouse to an administrator anytime that he needs.

To achieve above requirement from operation by manual system surely makes a load of administration work and the efficiency in term of time and accuracy is quite low. Then the computerized approaches must be considered to be used in this system. Because pure computerized approach such as bar coding scanner that information is uploaded into the computerized database either through the communications ports on the scanner and computer, requires many activity and corporation from supplier to achieve it and it is not worth for investment. 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 already.

Although these programs can help storing the data and sorting it, the key is the data that keyed into database system and how to collect data which is required to make the database system to achieve its task.

5.1 Design the database of the allocation system code

5.1.1 Function of the database- the database must be able to link the item identifiers with the allocation system code of each item.

5.1.2 Data collection - The appropriate storage locations that items should be kept of each item in term of the allocation system code.

Then the information that is required to be keyed into this database following this:

5.1.2.1 Item identifier of each item According to 4.3.1, item identifier is the name of item that is marked at exterior so there is no problem to get this data. All items' names have been demonstrated in the table A.2 of the appendix A already.

5.1.2.2 Allocation system code of each item The allocation system code is a guiding code for operators to recognize where item should be stored and some items have more than 1 code. The allocation system code of each item has been demonstrated in the table E.3 of the appendix E so this data can be imported from the appendix E.

5.1.3 Activity that uses this database- Dispatching product to storage location operation requires the information about the appropriate storage locations that items should be kept of each item to the operators so they can put item to its suit storage location.

5.1.4 Form of database- This database consists of 2 columns of data. The first column is the item identifier which is the key column. The second column is the allocation system code of item

Database of Allocation system code

Key Filter	Allocation system code				
Item Identifier					
Mosquitoes wiping joss stick: Dragon	R	B	08-10	N	L
Mosquitoes wiping reagent: Ko-Yo-15	R	B	08-10	N	H
Refilled Gas: Buca, Small	R	B	08-10	M	H
A gas oven: lighter grade A	R	B	08-10	M	M
A gas oven: lighter grade C	R	B	08-10	N	M
Indigo: Big bottle, Crown	R	B	08-10	F	M
Indigo: Small bottle, Chicken	R	B	08-10	F	L
Indigo: Big bottle, Chicken	R	B	08-10	F	H
Indigo: Liquid, Chicken	R	B	08-10	F	L
Indigo: Medium bottle, Chicken	R	B	08-10	F	L
Indigo: big square shape, Crown	R	B	08-10	M	L
Fabric Softener: Pink	R	B	08-10	N	L
Fabric Softener: Sky-blue	R	B	08-10	N	L
Fabric cleaning soap: 3 stars	R	B	08-10	F	L
Fabric cleaning soap: Carus crane	R	B	08-10	F	L
Shoe polish: big, black	R	B	08-10	M	M

Figure 5.1-Form of the database allocation system code

5.1.5 How to use database - In this thesis, the database system uses the Microsoft Excel program to store and sort data. Then when operators want to know the information about the appropriate storage locations that items should be kept, they must access this database by using the Microsoft Excel. After they have accesses to the database, they can search the allocation system code of item by using filter function in Microsoft Excel. Following this is the method to use database of Allocation system code in Excel format to find the Allocation system code of specific item.

5.1.5.1 Using database to find the allocation system code of particular item

Step1. Key the item identifier of product that into the database

1.1 Key the item identifier of product that into the database by selecting item identifier in the scroll bar of item identifier.

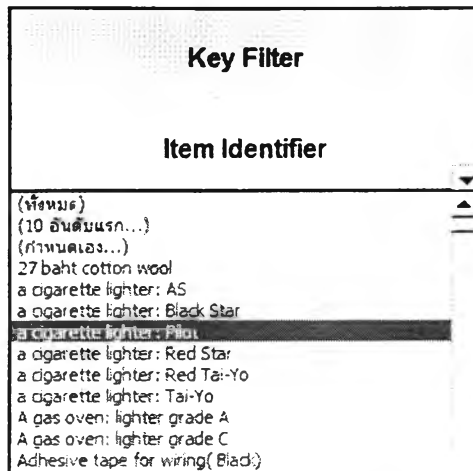


Figure 5.2-Select the item identifier from the scroll bar of item identifier

1.2 Key the item identifier of product that into the database by typing item identifier in the customize box of item identifier column.

1.2.1 Select customize box in item identifier column.

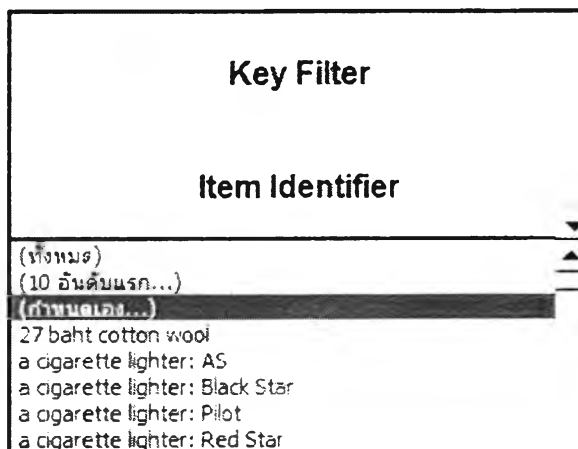


Figure 5.3-Select the customize in the scroll bar of item identifier

1.2.2 Select the “Equal” in filter bar and type the item identifier in the right box



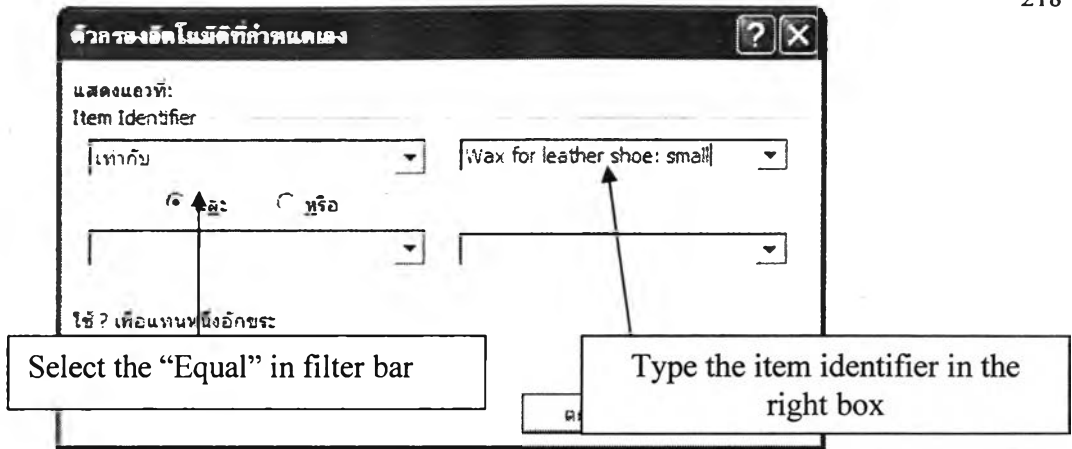


Figure 5.4- Select the “Equal” in filter bar and type the item identifier in the right box

1.2.3 Click “Yes” to start searching in the database.

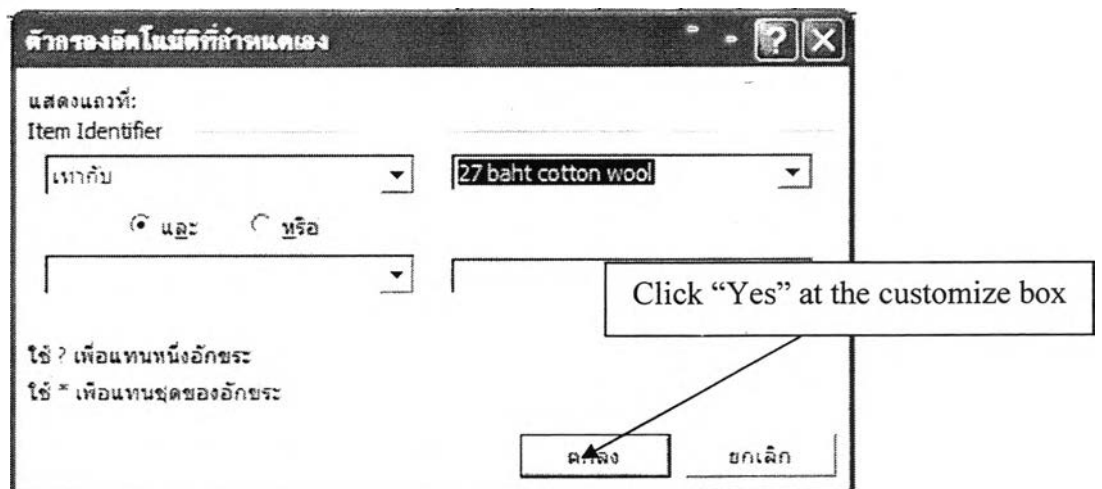


Figure 5.5-Click at the “yes” bottom at the customize box.

Step2. Read the allocation system code of each item identifier that is shown in the database.

Key Filter	Allocation system code					
Item Identifier	F	2	2	C	05	2
27 baht cotton wool						

Figure 5.6-The allocation system code of product is shown in the database.

The result of the allocation system code searching can be more than 1 allocation system code that is matched to the item identifier because some special items have more than 1 allocation system code.

As it's illustrated in above figures, the database of allocation system code can be used by the operators easily to find the allocation system code of each item.

The result of the allocation system code searching can be more than 1 allocation system code that is matched to the item identifier because some special items have more than 1 allocation system code.

5.2 Design database of item's storage location

5.2.1 Function of the database - the database bonds together an item identifier and the storage location address(s) where that item is located.

5.2.2 Data collection – The storage locations of each item and the quantity of item in that location. The item(s) and quantity of it in each storage location can be derived from this database.

Then the information that is required to be keyed into this database following this:

5.2.2.1 The storage locations of each item This data informs the operators to know where products have been kept. The item identifier can be linked to many storage location addresses and storage location address can be linked to many item identifiers. In this warehouse, products have not been putted into the same storage location all the time but they can be stored in any appropriate location. There must have the tracking system to tie item identifier and location addresses together. It means the storage location of item must be updated immediately if there is a change. Then following this is how to collect data of storage location and update it immediately in the database which is called “the tracking system”.

5.2.2.2 Tracking system Item tracking system is used to provide the data of storage locations of each item and updated it gradually. The placement of identifiers on both product and physical locations creates an infrastructure by which product and it move can be tracked already. Then the next step is bonding together an

item identifier and the location(s) where that item is located. Most of product is located by using random locator system so each item identifier must be tied to whatever location address it is in while it is there by the item tracking system.

Item tracking system can be easily done by using a simple card and paper work system. Firstly each storage location must have a card file that records the name and quantity of products in that storage location. After the operator dispatches products to the storage location, the operator must records location address of the storage location, and name and quantity of product that just been putted into that storage location to the papers form. This paper form is called “the storage recording papers”. Then the storage recording paper is brought to the administrator to key data into the database system. The data that receives from this paper are the item’s storage location and quantity of item in that storage location. When products have been picked up or moved from the storage location, the operator must records location address of the storage location, and name and the updated quantity of product that just been moved or picked into the papers form. This paper form is called “the order picking recording papers”.

The third step is to update the changes in item's storage location and quantity. If items in storage location have been moved or picked up, an operator is assigned to write the updated item identifier, storage quantity of storage item and storage location address on the order picking recording paper. The operators who move or pick up item from its storage area must write the name and quantity which is left at the storage location of the picked up item into the order picking recording paper. This step is updating the location(s) where that item is located and its quantity in storage location.

The fourth step is operator send the order picking recording paper to administrators. After that administrator updates the data in the database system with data in order picking recording paper through Microsoft excel or Access program.

As a result of the item tracking system, data about the storage locations of each item can be putted into database system correctly and updated all the time.

After all required data has been keyed into database in the form of excel table in Microsoft excel. The next step is to design how to use this program and information to achieve the warehouse database system purpose.

As it's mentioned earlier, Warehouse database system is a supporting system that supports main operation in a warehouse with useful information. Warehouse database system must provide the right information that meets the requirement of each operation. Then the data in database must be presented to the user in the right form that they can gain benefit from the system.

The process of tracking system has been illustrated in below figure. The tracking system starts after the product has been putted into storage location.

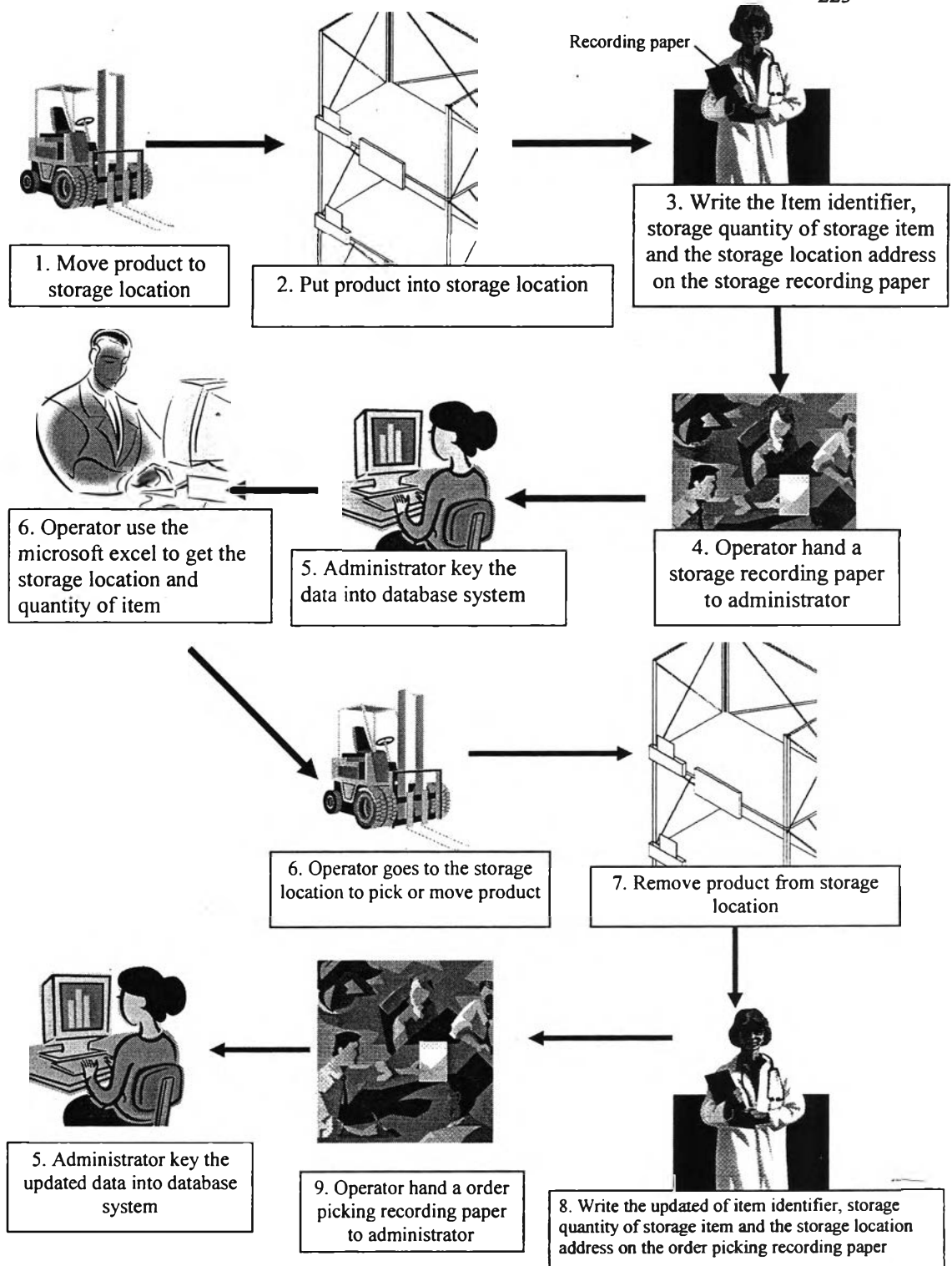


Figure 5.8-Tracking system

Database of Item's storage location

Item Key Filter	Storage location Key Filter	
Item Identifier (Name) ▾	Storage location address ▾	Storage Quantity ▾
A gas oven: lighter grade A	22B313	3
A gas oven: lighter grade C	22B313	2
Fabric cleaning soap: 3 stars	22B313	3
Fabric cleaning soap: Carus crane	22B313	2
Total Quantity of item		10

Figure 5.10-Form of the database of storage location for each item

5.2.5 How to use database - In this thesis, the database system uses the Microsoft excel program to store and sort data. Then when operators want to know the information about the storage locations of items or the items in each storage location, they must access this database by using the Microsoft excel. After they have accesses to the database, they can derive useful information by using filter function in the Microsoft excel. Following this is the method to use database of storage location for each item in the excel format to find these information. There are 2 different approaches that can gain benefit from the database, the first is the storage location addresses of item and the second is the product and quantity in each storage location.

5.2.5.1 Using database to find the storage location address(s) of particular item

Step1. Key the item identifier of that item into the database

1.1 Key the item identifier of product that into the database by selecting item identifier in the scroll bar of item identifier.

Item Key Filter
Item Identifier (Name) ▾
Hot Stick Glue: Small
Hot water pouch: Big, Kangaroo
Hot water pouch: small
Hot water pouch: stripe pattern, small
Ice canteen:Perfect, No.999-M5
Ice canteen:Star S, No. 592
Ice tray: pumpkin
Indigo: Big bottle, Chicken
Indigo: Big bottle, Crown
Indigo: big square shape, Crown
Indigo: bottle Mokey
Indigo: Medium bottle, Chicken
Indigo: Small bottle, Chicken
Indigo: square shape, Crown

Figure 5.11-Select the item identifier from the scroll bar of item identifier

1.2 Key the item identifier of that item into the database by typing item identifier in the customize box of item identifier column.

1.2.1 Select customize box in item identifier column.

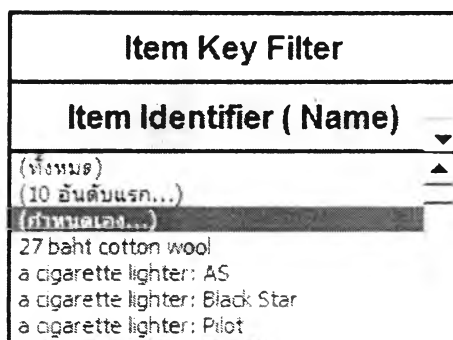


Figure 5.12-Select the customize in the scroll bar of item identifier

1.2.2 Select the “Equal” in filter bar and type the item identifier in the right box

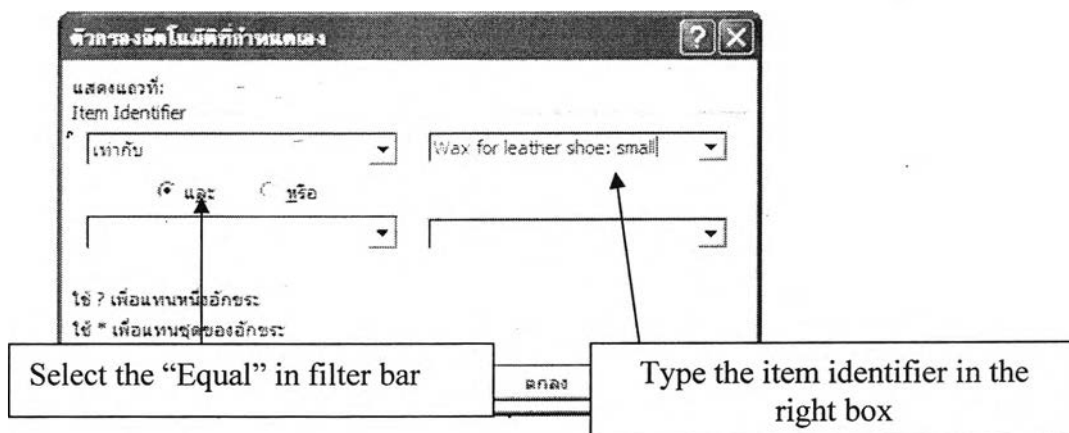


Figure 5.13- Select the “Equal” in filter bar and type the item identifier in the right box

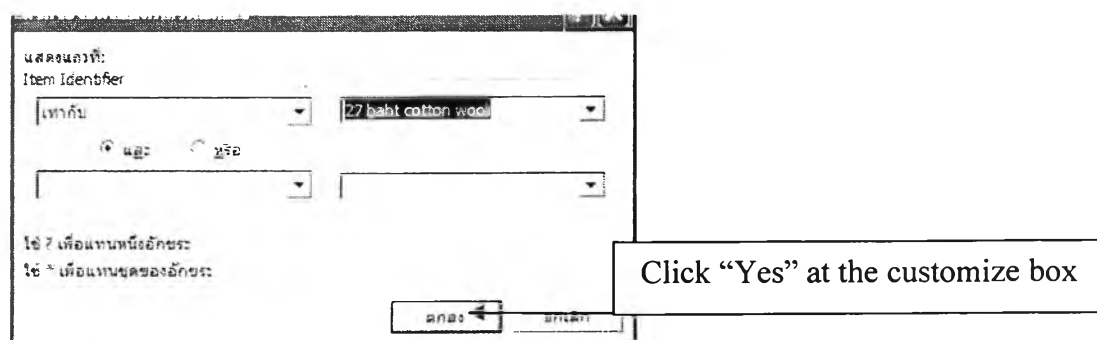


Figure 5.14-Click at the “yes” bottom at the customize box.

Step2. Read the storage location address(s) and quantity of item identifier that is shown in the database.

Database of Item's storage location

Item Key Filter	Storage location Key Filter	
Item Identifier (Name) ▾	Storage location address ▾	Storage Quantity ▾
Indigo: Big bottle, Chicken	12A143	6
Indigo: Big bottle, Chicken	12A133	3
Indigo: Big bottle, Chicken	12A154	6
Total Quantity of item		15

Figure 5.15-The storage location address(s) and quantity of particular item have shown in the database.

5.2.5.2 Using database to find the items and quantity of them in particular storage location

Step1. Key the storage location address of that storage location into the database

1.1 Key the storage location address of that storage location database by selecting the storage location address in the scroll bar of the storage location column

Storage location Key Filter
Storage location address ▾
(ทั้งหมด)
(10 อันดับแรก...)
(กำหนดเอง...)
12A115
12A116
12A122
12A133
12A143
12A154
12A164
15A561
21B313
24B162
24B163
2FC011
2FR011
(ว่าง)
(ไม่มี)

Figure 5.16- Selecting the storage location address in the scroll bar of the storage location column

1.2 Key the storage location address of that storage location into the database by storage location address in the customize box of the storage location column.

1.2.1 Select customize box in the storage location column.

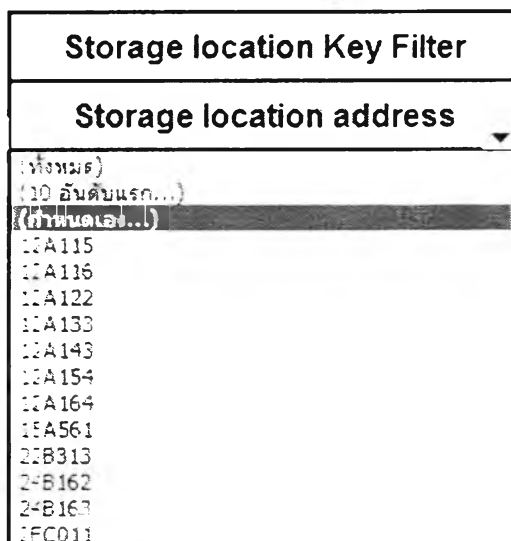


Figure 5.17-Select the customize in the scroll bar of the storage location column

1.2.2 Select the “Equal” in filter bar and type the storage location address in the right box

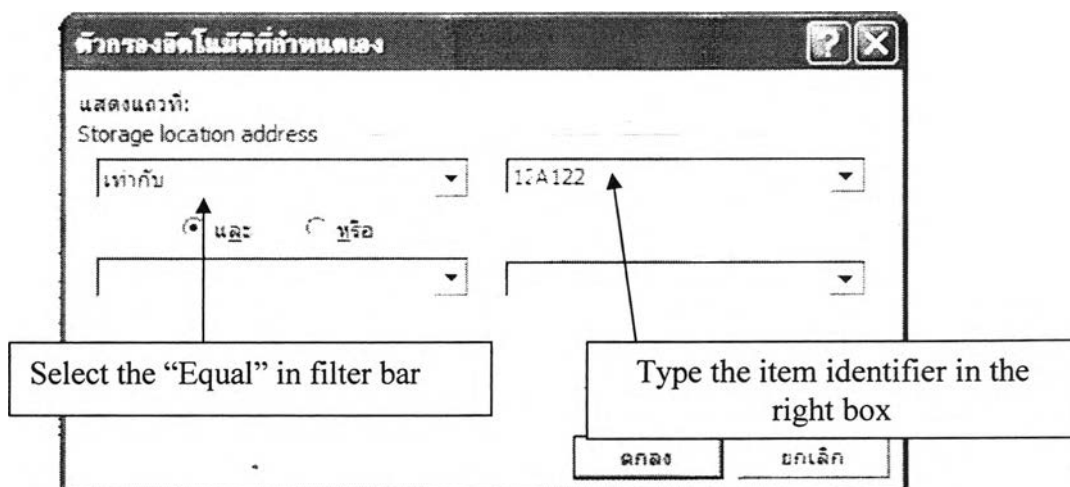


Figure 5.18- Select the “Equal” in filter bar and the storage location address in the right box

1.2.3 Click “Yes” to start searching in the database.

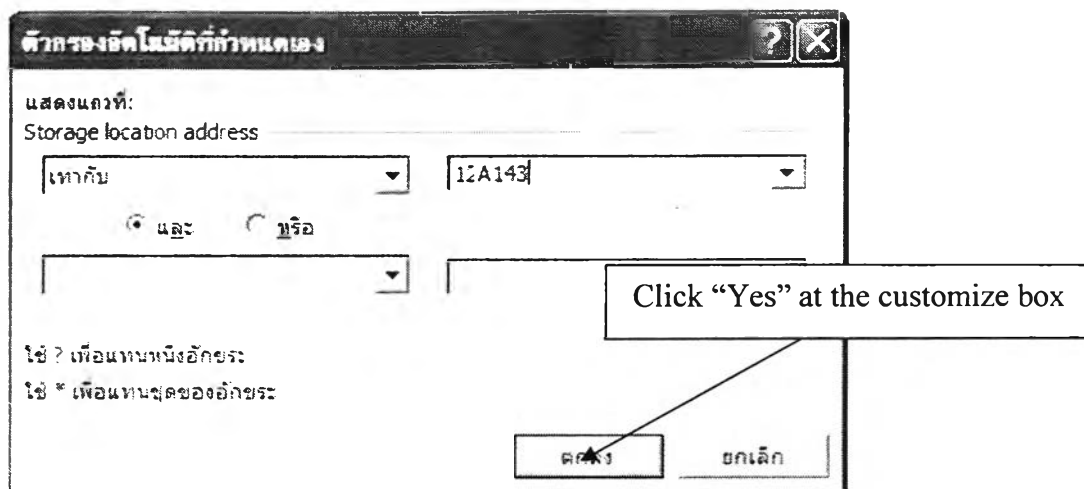


Figure 5.19-Click at the “yes” bottom at the customize box.

Step2. Read the storage location address(s) and quantity of item identifier that is shown in the database.

Item Key Filter	Storage location Key Filter	
Item Identifier (Name)	Storage location address	Storage Quantity
Mosquitoes wiping reagent: Ko-Yo-15	12A143	9
Indigo: Small bottle, Chicken	12A143	5
Indigo: Big bottle, Chicken	12A143	6
Leather polish: Kiwi, Black	12A143	5
Leather polish: Kiwi, Classic Black	12A143	6
Total Quantity of item		31

Figure 5.20- The item identifier(s) and quantity of storage products in that storage location have shown in the database.

As it's illustrated in above figures, the database of storage location of item can be used by the operators easily to find the location of particular item so they know where they should go to pick up products. The operators can use this database to check the items in particular storage location and this information can compare to the real products counting at the storage location. The operators use this data when they do inventory checking and to monitor the accuracy of the item tracking system.

Data from the database and from the real counting must be the same. If it is not similar, there must be some error in tracking system.

5.3 Design database of the quality checking record

5.3.1 Function of the database- the database must bonds together the historical quality checking result of each item to the item identifier.

5.3.2 Data collection – the previous quality checking result of each product that has been received into the storage area must be recorded and kept in the database. Then the information that is required to be keyed into this database is the quality checking result of each product that has been received into the storage area.

Therefore, the data must be collected at the receiving area by an operator and an operator must record the result of quality checking into the paper. The operator must record the item identifier, supplier's name and the result of checking into the paper and this paper must be transferred to an administrator. The administrator must read the result of quality checking in the paper and he is assigned to input the data in the paper into the database and informs the suppliers to know that their products have been accepted or not. The paper that the operator uses to record the result of quality checking is called “the quality checking paper”.

5.3.3 Operation that uses this database- There is only 1 activity that need to use this data from the database.

Receiving activity must be sure that the products that are received from suppliers have good quality. A warehouse operator uses the database to know the previous record of product's quality checking at the receiving area. Then he can select the appropriate quality checking method for particular product based on the previous record of the result from product's quality checking.

5.3.5 How to use database - In this thesis, the database system uses the Microsoft excel program to store and sort data. Then when operators want to know the information about the storage locations of items or the items in each storage location, they must access this database by using the Microsoft excel. After they have accesses to the database, they can derive useful information by using filter function in the Microsoft excel. Following this is the method to use database of quality checking record for each item in the excel format to find these information. The only approach to gain benefit from this database is to see the previous result of particular product quality checking.

5.3.5.1 Using database to find the previous result of particular product quality checking

Step1. Key the item identifier of that item into the database

1.1 Key the item identifier of product that into the database by selecting item identifier in the scroll bar of item identifier.

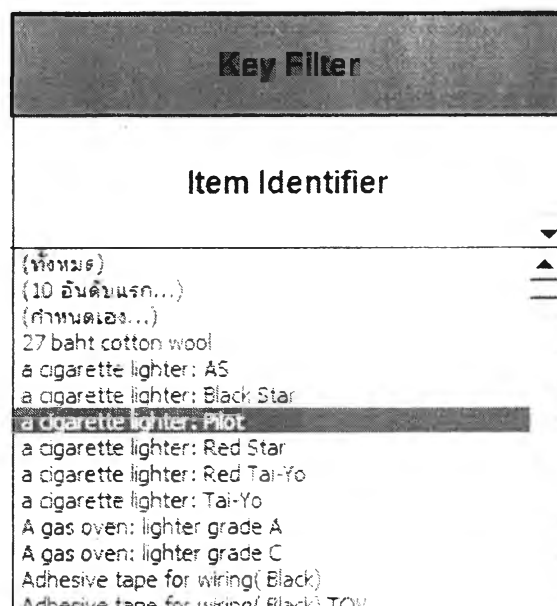


Figure 5.23-Select the item identifier from the scroll bar of item identifier

1.2 Key the item identifier of that item into the database by typing item identifier in the customize box of item identifier column.

1.2.1 Select customize box in item identifier column.

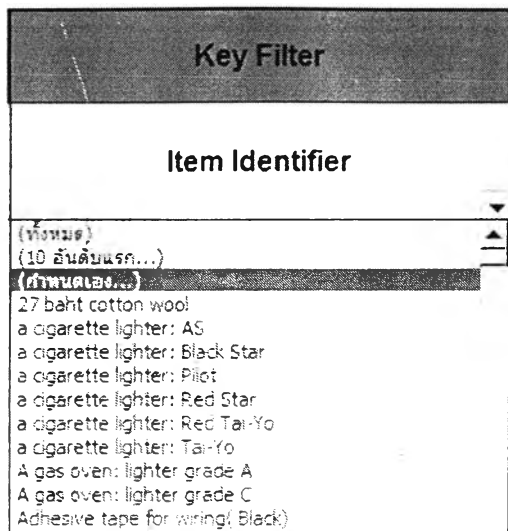


Figure 5.24-Select the customize in the scroll bar of item identifier

1.2.2 Select the “Equal” in filter bar and type the item identifier in the right box

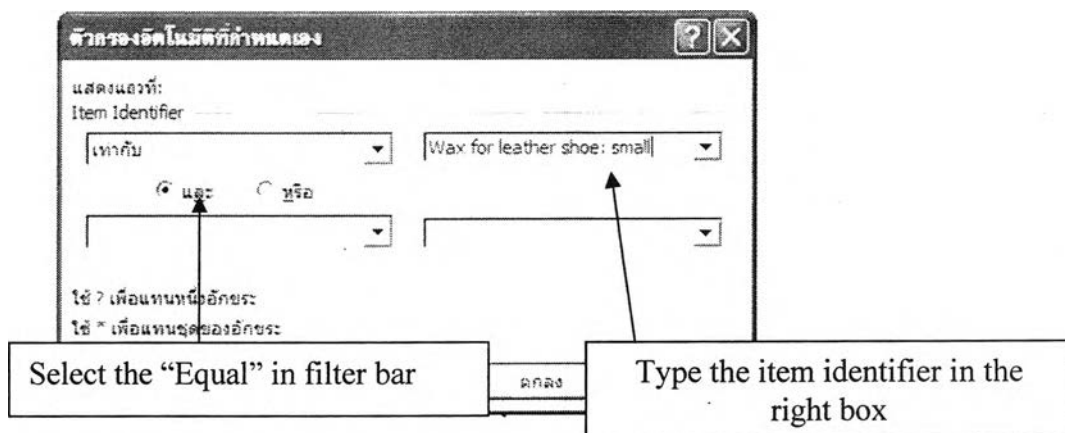


Figure 5.25- Select the “Equal” in filter bar and type the item identifier in the right box

1.2.3 Click “Yes” to start searching in the database.

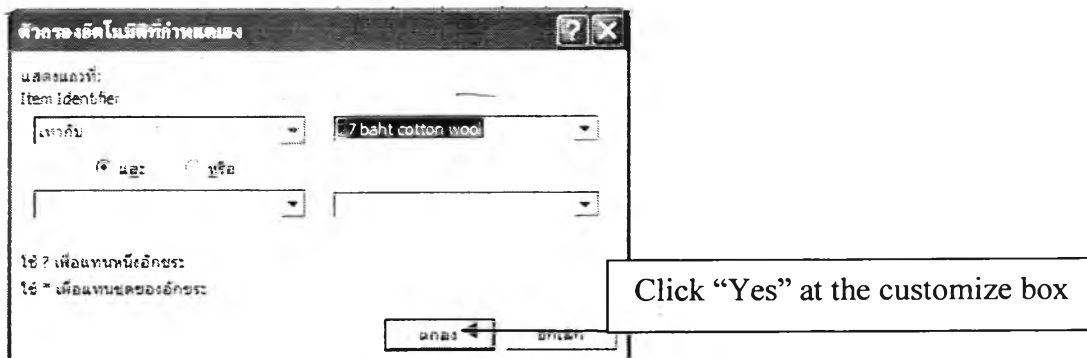


Figure 5.26-Click at the “yes” bottom at the customize box.

Step2. Read previous quality checking result from the database. If there is “NOK” in the last 5 times, it means this product must be checked quality strictly. If there is “OK” in the last 5 times, it means this product must be checked quality normally

Quality Checking record

Key Filter		Delivery date										
Item Identifier	Supplier's name	1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan
Screw driver 2 pieces in set	B				OK			NOK		OK		

Figure 5.27- the previous quality checking result shows in database with the supplier name also.

As it's illustrated in above figures, the database of the quality checking record can be used by the operators easily to find the previous quality checking result of particular item so they know what method they should approach to do quality checking for each product. The database must be updated gradually by using the result of quality checking in the quality checking paper.

5.4 Design database of the product movement record

5.4.1 Function of the database- the database must contain the updated data of movement in and out of each item in a warehouse then calculates the total quantity of each product in a warehouse.

5.4.2 Data collection – the product's movement data comprises with 2 data. The first data is the product moving into a warehouse and this data can be collected from the “storage recording paper” which contains item identifier and quantity of product(s). The other data is the product moving out of a warehouse and this data can be collected from the “order picking recording paper” that is handed to an administrator so the person who is responsible for collect the data and key into the database is an administrator.

5.4.3 Operation that uses this database- There is many activity that need to use this data from the database but it is not activity in warehouse management. The

product movement data plays an important role in inventory management and basic activity that must know the product movement is ordering products from supplier activity. This is an activity in inventory management that concerns about order product from suppliers but it requires information from the warehouse operation to perform this activity efficiently. This activity is done by an administrator. An administrator must know the current stock level of products in a warehouse, safety stock level and lead time of each product so he can decide that what products that should be ordered. How many and the when to order each product must be decided also to achieve this activity. Then database of the product movement record must provide the information about the stock level of each product in a warehouse to an administrator anytime that he needs.

5.4.4 Form of database- This database consists of 3 columns of data. The first column is the item identifier which is the key column. The second column is the total quantity of the product in a warehouse and the third column is the date that movement occurs. Movement of product is putted into the table on the date column that occurs and the row that contain its item identifier. There are 2 signs in the database. If the product is moved into a warehouse, an administrator key “+” and following by the quantity that is moved into the warehouse into the block under the date and the same row of the product’ item identifier. But if the product is moved out of a warehouse, an administrator key “-” and following by the quantity that is moved out of a warehouse into the block under the date and the same row of the product’ item identifier.

Product Movement Record

Key Field		Movement record											
Item Identifier	Total	Stock from last year	1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan
pincer diamond	10	5	5	-2	-1	-1	-1	-1	-1	-1	0	7	-2
pincer with cutting head diamond	3	3		-1							4		
pincer with sharp head diamond	13	4				15		-2	1				
Screw driver 2 pieces in set	16	5		10	-1	-1		-2		-5		-2	
Screw driver 4 pieces in set	4	3				-2			4				-3
Screw driver for watch	8	6			-2				-1				5
Screw driver with 3 inches punch head	9	7			-2			-1				1	
Screw driver with 4 inches punch head	3	0	10			-2				-2			
Screw driver for electrical test	8	9		-1			-1			-3			4
Screw driver with switching head	2	5				-2						-1	
Adhesive tape for wiring(Black) TOV	2	0	6			-1				-2			-1
Adhesive tape for wiring(Black)	2	0		8			-2		-1			-3	
shrink adhesive tape 1 inche	7	3		-1		-1				9			-2
shrink adhesive tape 3/4 inche	5	2			-2					6			-1

Figure 5.28- Form of the product movement record database

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5.4.5 How to use database - In this thesis, the database system uses the Microsoft excel program to store and sort data. Then when an administrator wants to know the information about the product movement of items they must access this database by using the Microsoft excel. After they have accesses to the database, they can derive useful information by using filter function in the Microsoft excel. Following this is the method to use database of the product movement record in the excel format to find the information. The only approach to gain benefit from this database is to see the product movement record of particular product.

5.4.5.1 Using database to find the product movement record of particular item

Step1. Key the item identifier of that item into the database

1.1 Key the item identifier of product that into the database by selecting item identifier in the scroll bar of item identifier.

Key Filter	
Item Identifier	Total
(ทั้งหมด)	10
(10 อันดับแรก...)	3
(กำหนดเอง...)	
27 baht cotton wool	13
a cigarette lighter: AS	16
a cigarette lighter: Black Star	4
a cigarette lighter: Pist	8
a cigarette lighter: Red Star	9
a cigarette lighter: Red Tai-Yo	3
a cigarette lighter: Tai-Yo	8
A gas oven: lighter grade A	2
A gas oven: lighter grade C	2
Adhesive tape for wiring(Black)	2
Adhesive tape for wiring(Black) TOV	2

Figure 5.29-Select the item identifier from the scroll bar of item identifier

1.2 Key the item identifier of that item into the database by typing item identifier in the customize box of item identifier column.

1.2.1 Select customize box in item identifier column.

Key Filter	
Item Identifier	Total
(ทั้งหมด)	10
(10 อันดับแรก...)	3
(กำหนดเอง...)	
27 baht cotton wool	13
a cigarette lighter: AS	16
a cigarette lighter: Black Star	4
a cigarette lighter: Pilot	8
a cigarette lighter: Red Star	9
a cigarette lighter: Red Tai-Yo	3
a cigarette lighter: Tai-Yo	8
A gas oven: lighter grade A	2
A gas oven: lighter grade C	2
Adhesive tape for wiring(Black)	2
Adhesive tape for wiring(Black) TO	2
Adhesive tape for wiring(Blue)	7
Adhesive tape for wiring(Green)	5
Adhesive tape for wiring(Red)	6
Adhesive tape for wiring(White)	4
Aluminum foil: long	

Figure 5.30-Select the customize in the scroll bar of item identifier

1.2.2 Select the “Equal” in filter bar and type the item identifier in the right box

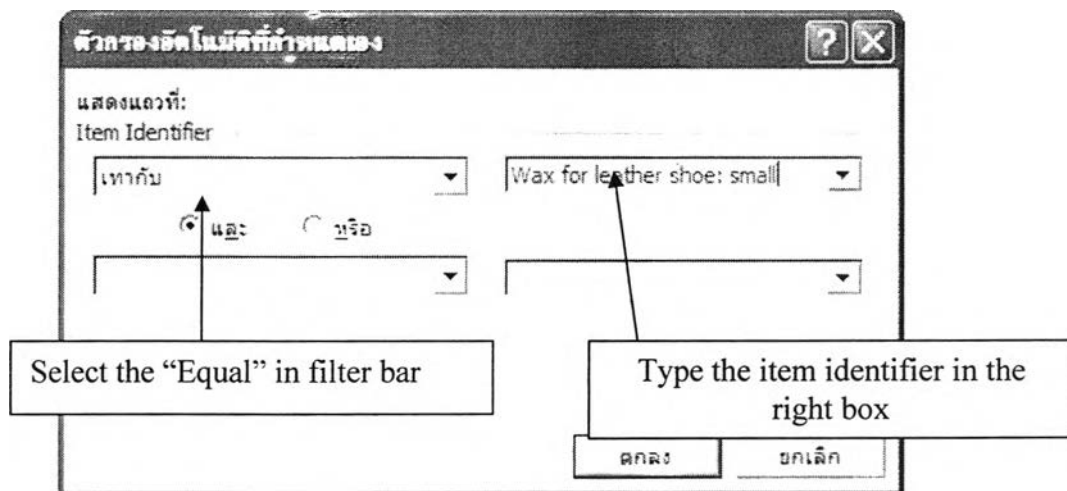


Figure 5.31- Select the “Equal” in filter bar and type the item identifier in the right box

1.2.3 Click “Yes” to start searching in the database.

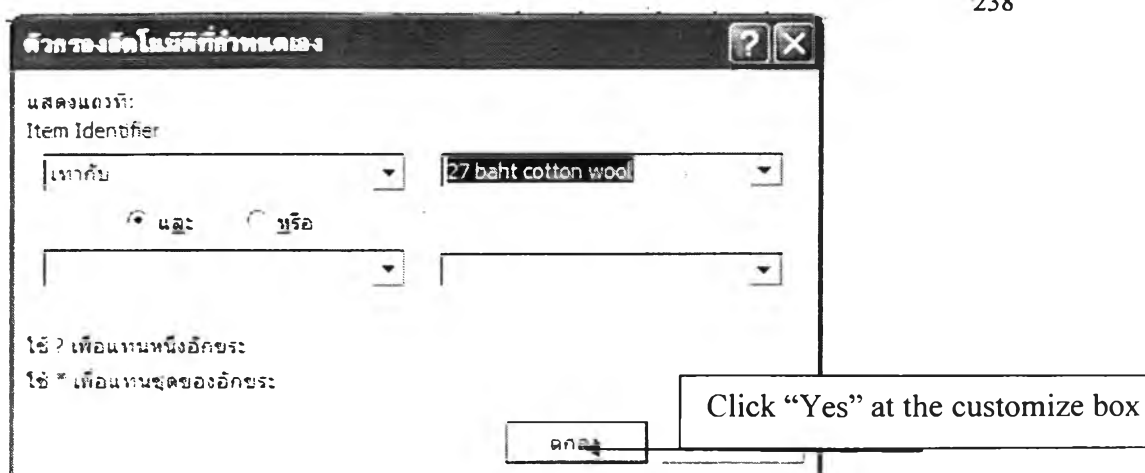


Figure 5.32-Click at the “yes” bottom at the customize box.

Step2. Read the product movement record of particular item. There is “total column” that informs the quantity of product and the number show in the term of shipping unit. Another column is “stock from last year” which informs the quantity of product that was left in the stock last year and it means the database of product movement record must begin at the 1st of January and end at the end of the year then the cycle must be done every year to keep the product movement record gradually. The last year database is a very useful data to support inventory management and business decision on this year.

The “-“ sign in front of the number in the block under the date column means the product was moved out of warehouse and the number indicates the quantity that was moved out on that date. The “+“ sign in front of the number in the block under the date column means the product was moved into a warehouse and the number indicates the quantity that was moved into on that date.

Product Movement Record

Key Filter		Movement record											
Item Identifier	Total	Stock from last year	1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan
Screw driver with 3 inches punch head	9	7											

Figure 5.33- The product movement record of particular item shows in database with the total quantity of product in a warehouse.

As it's illustrated in above figures, the database of the product movement record is used to support an administrator job and other inventory management and business activities. The database must be updated gradually by using the data from the storage recording paper and the order picking recording paper.

5.5. Design database of the specification of storage unit type

5.5.1. Function of the database- the database must bonds together the data of specification of storage unit type to the item identifier of product

5.5.2. Data collection – the specification of storage unit type is determined to use the same unit type that is shipped out of a warehouse. These data has never been collected before and the only method to get these data is to measure all products manually. However, the data collection method of this data has been done already. Then the specification of storage unit type of all item have been demonstrated in the table B.3 of the appendix B

5.5.3. Operation that uses this database- There is only one activity that need this data and it is identifying item activity. As it's mentioned earlier, all products in the warehouse must be stored in the unit type that is shipped to customers. Although most of product's receiving unit type is the same as it is stored, there are some items that there is different on this both unit type. If unit type of product while it is receiving is different from its specification unit type while it is stored, a warehouse operator must change the unit type while it is receiving to the unit type that is stored. Therefore, the operator requires the information of the specification of product's storage unit type in term of container type, capacity, weight and size of unit load.

5.5.4. Form of database- This database consists of 4 main columns of data. The first column is the item identifier which is the key column. The second column is the category of the item. The third is the unit load type which includes capacity, weight and type of container. The fourth column is the size of unit type which includes the width, length and height of unit type.

Database specification of storage unit type

Key Filter		Storage: Unit Load			Size of Storage: Unit type		
Item Identifier	Category of item	Type	Capacity	Weight	Wide(cm)	Length(cm)	Height(cm)
pincer, diamond	Mechanical	carton (small)	6.00	3.50	8.00	17.00	3.50
pincer with cutting head, diamond	Mechanical	carton (small)	6.00	0.80	9.00	17.00	3.50
pincer with sharp head, diamond	Mechanical	carton (small)	6.00	3.50	8.00	17.00	3.50
Screw driver 2 pieces in set	Mechanical	carton	160.00	24.00	28.00	28.00	40.00
Screw driver 4 pieces in set	Mechanical	carton (small)	12.00	1.20	8.50	17.50	12.00
Screw driver for watch	Mechanical	carton	120.00	16.00	31.00	43.00	26.50
Screw driver with 3 inches punch head	Mechanical	carton (small)	12.00	0.50	6.50	16.50	4.00
Screw driver with 4 inches punch head	Mechanical	carton (small)	12.00	0.90	7.00	19.00	4.50
Screw driver for electrical test	Mechanical	carton (small)	12.00	0.50	7.50	19.50	4.50

Figure 5.34- Form of the specification of storage unit type database

5.5.5. How to use database - In this thesis, the database system uses the Microsoft excel program to store and sort data. Then when a warehouse operator wants to know the information about the product movement of items they must access this database by using the Microsoft excel program. After they have accessed to the database, they can derive useful information by using filter function in the Microsoft excel. Following this is the method to use database of the specification of storage unit type to find the information. The only approach to use this database is to see the specification of storage unit type and compares it to the receiving unit type of the item.

5.5.5.1 Using database to find the specification of storage unit type of particular item

Step1. Key the item identifier of that item into the database

1.1 Key the item identifier of product that into the database by selecting item identifier in the scroll bar of item identifier.

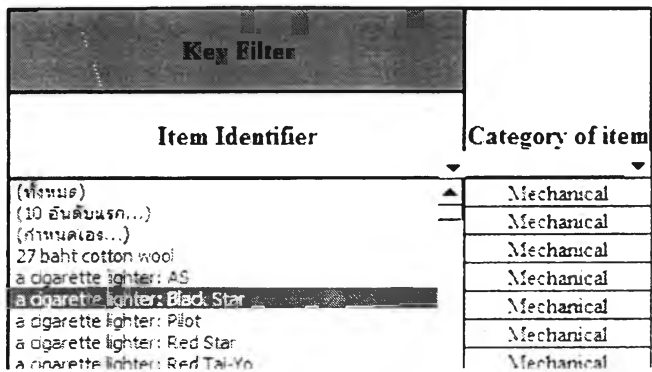


Figure 5.35-Select the item identifier from the scroll bar of item identifier

1.2 Key the item identifier of that item into the database by typing item identifier in the customize box of item identifier column.

1.2.1 Select customize box in item identifier column.

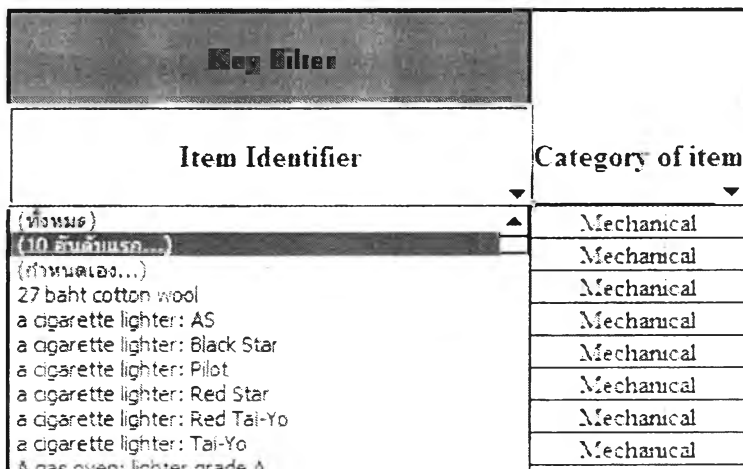


Figure 5.36-Select the customize in the scroll bar of item identifier

1.2.2 Select the “Equal” in filter bar and type the item identifier in the right box

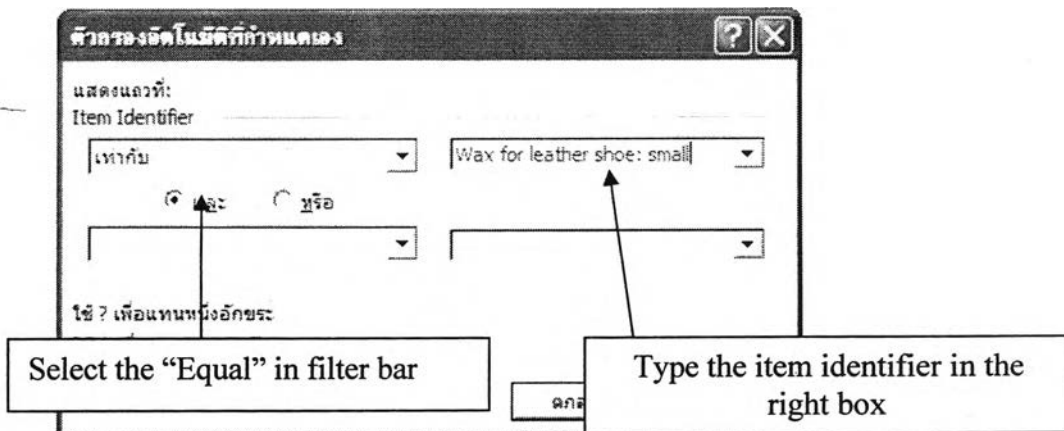


Figure 5.37- Select the “Equal” in filter bar and type the item identifier in the right box

1.2.3 Click “Yes” to start searching in the database.

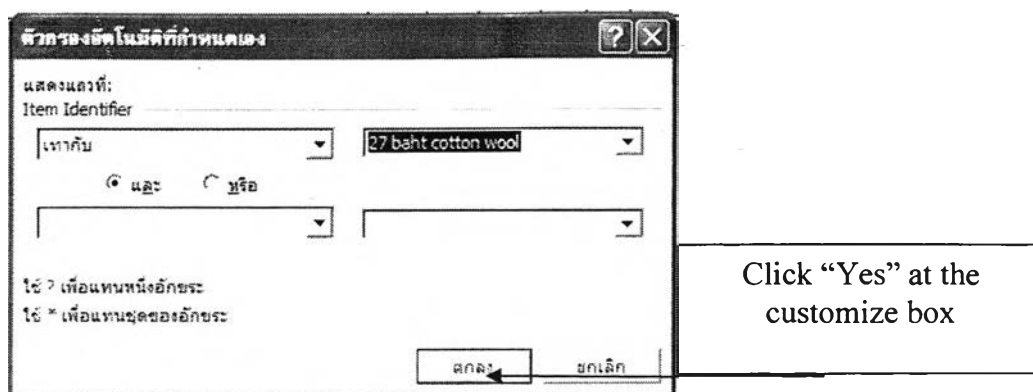


Figure 5.38- Click at the “yes” bottom at the customize box.

Step2. Read the specification of storage unit type of particular item.

There is “category column” that informs the category of product. Another column is “storage: unit load” which informs the type of unit load, capacity and weight. The last column is the “size of storage unit type” which informs the width, length and height of storage unit type.

Database specification of storage unit type

Key Filter		Storage: Unit Load			Size of Storage: Unit type		
Item Identifier	Category of item	Type	Capacity	Weight	Width(cm)	Length(cm)	Height(cm)
a cigarette lighter: Pilot	Chemical product	carton	1000	22	27	—	28

Figure 5.39- The specification of storage unit type shows in database with the total quantity of product in a warehouse.

As it’s illustrated in above figures, the database of the specification of storage unit type is used to support item identifying activity so an operator can know the storage unit of item. The database must be updated only when there is a change from the supplier’s shipping unit.

5.6 Requirement to use the warehouse database system in the warehouse

The first requirement to use this warehouse database system is a computer with Microsoft office program at the receiving and shipping area. The operators need to use it to access the warehouse database.

The second requirement is the administrator who is assigned to key data into the database must be only 1 person to prevent confusing and errors in the data entry process.

The third requirement is the warehouse must set up the small office network between the computer at administration office and the computer at the receiving and shipping area. This network can help the computer shares the database file that is in administrator's computer with other computers. Then the operators can access the warehouse database system to access the information from it but they would not be able to change the data in the warehouse database.

Warehouse database system uses the manual paper to collect data mix with computer system that stores and sorts data. The software that uses to help users getting information that they need from the database to do their work, is Microsoft excel which is very basic and cheap and most of users know how to use it quite well. As a result, the operators and administrators are provided the right information that meets the requirement of each operation by this warehouse database system.

5.7 Cost of implementing the warehouse database system

The first requirement of the warehouse database system implementation is a computer with Microsoft office program at the receiving and shipping area. The operators need to use it to access the warehouse database. The specification of computer that is suit to the system is not necessary to be so good because the operator needs to use only the Microsoft office program. The price of a normal computer in Thai market is around 20,000 Baht and the Microsoft window XP plus with Microsoft office program is estimated around 6,500 Baht (<http://www.microsoft.com/thailand>). Then the total cost of implementing the warehouse database system is 26,500 Baht.