

**IMPLEMENTATION OF A WAREHOUSE MANAGEMENT  
SYSTEM IN A RETAIL WAREHOUSE: A CASE STUDY  
AT DOUBLE A BOOK TOWER ,THAILAND**

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Thesis  
entitled

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AT DOUBLE A BOOK TOWER, THAILAND**

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**ABSTRACT**

Double A Book Tower is a retail warehouse that is different from a normal warehouse because normal warehouses keep goods in a warehouse. But a retail warehouse is a warehouse which sells goods at its warehouse. Normal warehouse management systems cannot be used in this type of warehouse, as they only support the retail warehouse process. The researchers created a warehouse management system for the retail warehouse. It analyzes the differences between retail warehouses and normal warehouses and analyze this difference to apply to the normal warehouse management system and then apply to the retail management, as well as analyze the nature of books and apply this data to a new warehouse management system. Finally, the researchers created the new warehouse management system by analyzing the above data and creating the retail warehouse management system. This research can be applied to other retail warehouses world-wide.

**KEYWORDS: RETAIL WAREHOUSE; WAREHOUSE MANAGEMENT SYSTEM; BOOK.**

129 pages

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AN IMPLEMENT WAREHOUSE MANAGEMENT SYSTEM IN RETAIL WAREHOUSE: A CASE STUDY  
AT DOUBLE A BOOK TOWER

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### บทคัดย่อ

งานวิจัยนี้เป็นการจัดการคลังสินค้าของร้านหนังสือ Double A Book Tower ซึ่งมีแตกต่างจากคลังสินค้าโดยทั่วไปคือ คลังสินค้าโดยทั่วไปคือสถานที่จัดเก็บสินค้า แต่ Double A Book Tower เป็นคลังสินค้าชนิดพิเศษที่เรียกว่าคลังร้านค้าปลีก คือ เป็นคลังสินค้าที่เป็นสถานที่จัดเก็บสินค้า และต้องจำหน่ายสินค้าบนคลังสินค้าอีกด้วย จากกรณีศึกษา บริษัท : Double A Book Tower เป็นร้านหนังสือที่ไม่มี stock ในการเก็บหนังสือแต่จะวางบน shelf เพื่อพร้อมขาย ดังนั้นปัญหาของการทำงานคือ ไม่สามารถ software WMS ที่ว่าไปใช้ตามท้องตลาดได้ แต่ต้องเพิ่มรายละเอียดของการจัดการร้านค้าปลีกลงไปด้วยปัญหาดังนั้นผู้จัดทำจึงมีแนวคิดออกแบบระบบการจัดการคลังสินค้านี้ เพื่อตอบสนองร้านค้าในกลุ่มธุรกิจเดียวกัน โดยใช้กรณีศึกษาของ Double A Book Tower โดยแนวทางในการพัฒนางานวิจัยนี้คือ วิเคราะห์ความแตกต่างของการทำงานในการจัดการสินค้า โดยเท่าไป กับ retail warehouse และอีกทั้งยังพัฒนาจากโปรแกรมการจัดการสินค้าสำเร็จรูปที่ใช้ตามท้องตลาด โปรแกรม WMS สากล ที่มีการยอมรับ รวมทั้ง การ review literature ของโปรแกรมการจัดการสินค้า เพื่อนำมาพัฒนาโครงสร้างของโปรแกรมของ retail warehouse เพื่อใช้สำหรับพัฒนากลุ่มคลังสินค้าประเภทนี้ต่อไป

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## **CHAPTER I**

### **INTRODUCTION**

#### **1.1. Background and Problems statement**

Nowadays, business becomes more competitive. Any organization must improve their operation to respond to customer needs. Logistics activities become important in all departments, especially in service sector. For bookstore, not only customer service is essential, but also all activities from transporting books upstream to downstream are significant.

A warehouse is a commercial building for storage of goods. Warehouses are used by manufacturers, importers, exporters, wholesalers, transport businesses, customs, etc. The warehouse is important in any business industries for Storage and put before the goods sent to other places. Many organizations have their own warehouse management system in order to increase the efficiency of their warehouses and equal to competitors both their business inventories or warehouse for rent. By bring software system to support the concept of warehouse management system. Software system not only use a single system but also includes the steps of running and managing in several international standard warehouse which many organizations have applied to their organizations.

Double A Book Tower is stem from concept of "Eslite" a bookstore in Taiwan which there are 8 floors and open 24 hours - - 1<sup>st</sup> floor is for fashion product; 2<sup>nd</sup> floor is space for Magazine, novel and new arrival titles; 3<sup>rd</sup> floor is for special collection books, rare books and collectible books; 4<sup>th</sup> floor is for Japanese books; 5<sup>th</sup> floor is space for restaurants and 6<sup>th</sup> floor is area for meeting rooms which use for encourage reading activities.

Due to Eslite bookstore has a large number of books, therefore, there is warehouse in bookstore. Major features of Double A Book Tower likes Eslite but different on management products.

In general, business bookstores in Thailand such as Chula Books, Se-ed, Phrae Pittaya that there are bookstores with a number of branches from 10 to 300 branches nationwide. They have their warehouses and distribution centers to distribute books to various branches throughout the country. But Double A Book Tower is only one shop, therefore, there is no warehouse for distribution. If compare the nature of the books sales, Double A book Tower is the same manner as a small bookstore which is no IT system to support that do not need a management system. Because Double A Book Tower is the largest bookstore in the country, IT systems is necessary in every functions of the work.

For the type of warehouse, Double A Book Tower is similar to Makro which is sales on warehouse. But the difference is that Makro distributes volume per time, resulting high discount can give customer per time that easy to manage inventory management, we called the store as Makro that “Warehouse store”. But differ in that Double A Book Tower is retail shop and more diverse number of products, must have management products to meet customer needs in time that similar to the 7-11 convenient store or others. Therefore, Double A Book Tower likens it to a store between 7-11 and Makro. Moreover, the difficulty of managing not only the nature of the business but also the difficulty of managing the inventory that based on the major factor is nature of the book. Which is different from general industry business such as have a high diversity of SKU titles, Turn Over high rate, None of the age but demand for goods is seasonable, It cannot be fixed location due to many new books are issued and change position frequently, Picking books depending on the needs of customers that want to what titles of books. But step actions can be applied to similar work that means Double A Book Tower is includes both Se-ed, Makro and 7-11 together.

From company case studies: Double A Book Tower is a bookstore with no inventory to stock the books but a shop is for sales and for stock in the same place is called a bookstore on warehouse. Therefore, the difficulty of running a warehouse management can not manage the special warehouse system with a single normal. But need to add details of the management of retail shops for management.

Problems from occurring that result organizer have created ideas for the design of warehouse management system stores that selling books on the warehouse to be a standard work of the same business group by using case studies of Double A

Book Tower as a warehouse management system development. Which the same type of business can bring this approach to inventory management in their organizations.

## **1.2 Objective**

To design a warehouse management system on receiving process, put-away process, storage process , order picking process and shipping process in the retail warehouse business.

## **1.3 Scope of Work**

Study at Double A Book Tower that is warehouse retail business.

## **1.4 Expected Results**

1.3.1 A Design of a prototype of warehouse management systems in retail warehouse : A case study at Double A Book Tower (Book business)

1.3.1 Can be summary the difference between WMS of retail warehouse and ordinary warehouse management system for support new system to implement in a case study company.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1 Warehousing.**

The definition of warehouses that are crucial components of most supply chain. They are likely to be involved in various states of the sourcing, production and distribution of goods. As the dispatch point serving the next customer in the chain. They are critical to the provision of high customer service level. (Alan Rushton 2006) Warehouses are an essential component of any supply chain. Their major roles include: buffer the material flow along the supply chain to accommodate variability caused by factors such as product seasonality and/or batching in production and transportation; consolidation of products from various suppliers for combined delivery to customers; and value-added-processing such as kitting, pricing, labeling, and product customization. (Gu, Goetschalckx, & McGinnis, 2007) In the most organizations are use warehouse management systems to manage a warehouse efficiently, that is have to know; where is stock your product in their organization. The former is called inventory, and is established by stocktaking. In past, warehouse management involved reading the labels on the different items and counting them in warehouse, and recording the information on a clipboard for later analysis. Nowadays, to management warehouse are use different types of labels such as bar codes, 2D data codes and radio frequency identification (RFID) facilitate automatic reading, and operatives can carry hand-held scanners around the warehouse. That to help worker to management various many warehouses. (Connolly, 2008 ) Jinxiang Gu, Marc Goetschalckx , Leon F. McGinnis explain problem of activity in warehouse, show in this figure.

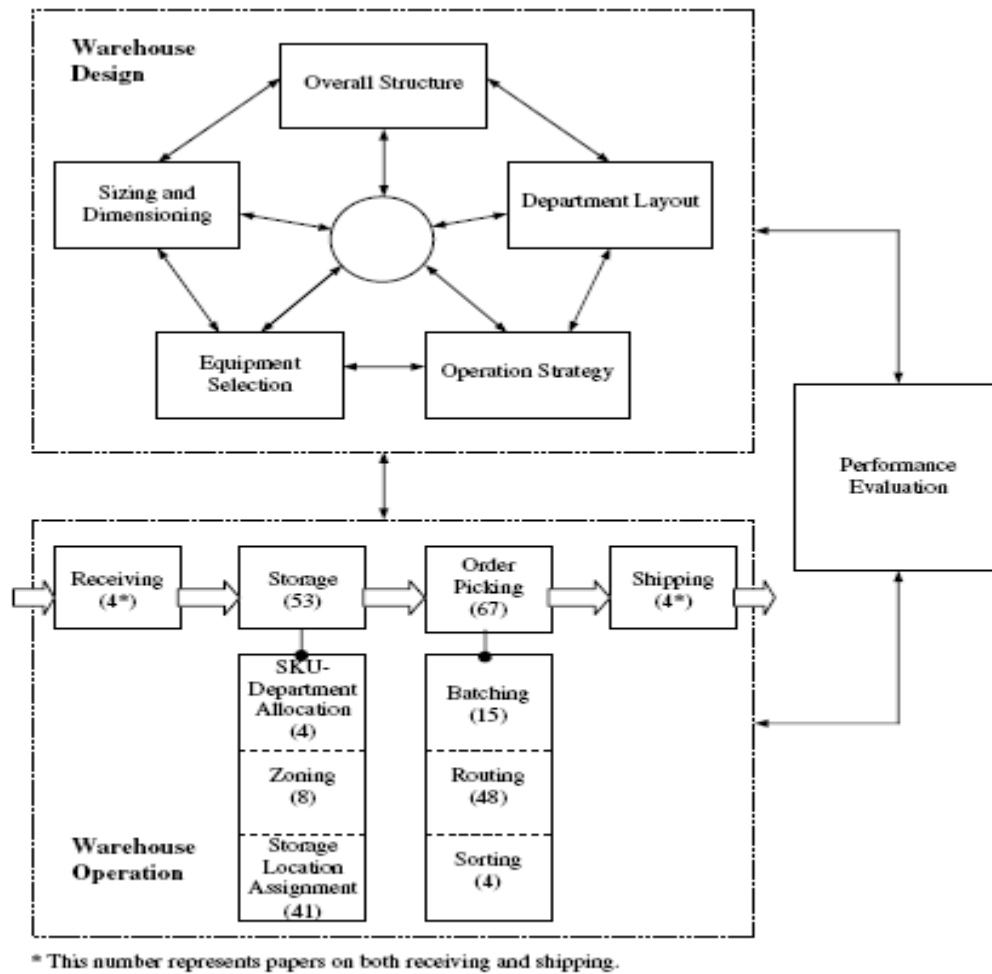


Fig. 1. Framework for warehouse design and operation problems.

Figure 2.1 Framework for warehouse design and operation problem (Bo, Yiyun, & Xiaosheng, 2008)

A scheme to classify warehouse design and operation planning problems and the corresponding literature is shown in Fig. 2.1 number in this picture show number of review paper and Jinxiang Gu can be show detail of this problems. The most of problem happen in warehouse. They show activity in warehouse by review many research as follow this table.

Table 2.1 Problem of activity in warehouse management systems. (Bo, et al., 2008)

Warehouse design	Overall structure	<ul style="list-style-type: none"> <li>• Material flow</li> <li>• Department identification</li> <li>• Relative location of departments</li> </ul>
	Sizing and dimensioning	<ul style="list-style-type: none"> <li>• Size of the warehouse</li> <li>• Size and dimension of departments</li> </ul>
	Department layout	<ul style="list-style-type: none"> <li>• Pallet block-stacking pattern (for pallet storage)</li> <li>• Aisle orientation</li> <li>• Number, length, and width of aisles</li> <li>• Door locations</li> </ul>
	Equipment selection	<ul style="list-style-type: none"> <li>• Level of automation</li> <li>• Storage equipment selection</li> <li>• Material handling equipment selection (order picking, sorting)</li> </ul>
	Operation strategy	<ul style="list-style-type: none"> <li>• Storage strategy selection</li> </ul>
(e.g., random vs. dedicated)		
<ul style="list-style-type: none"> <li>• Order picking method selection</li> </ul>		

Table 2.1 Problem of activity in warehouse management systems. (Cont.)

Warehouse operation	Receiving and shipping		• Truck-dock assignment
			• Order-truck assignment
			• Truck dispatch schedule
	Storage	SKU-department assignment	• Assignment of items to different warehouse departments
			• Space allocation
			• Assignment of SKUs to zones
		Zoning	• Assignment of pickers to zones
			• Storage location assignment
		Storage location assignment	• Specification of storage classes (for class-based storage)
	Order picking	Batching	• Batch size
			• Order-batch assignment
		Routing and sequencing	Routing and sequencing of order picking tours
			• Dwell point selection (for AS/RS)
Sorting	• Order-lane assignment		

Cheng L. write for apply AOP to stocking in module in WMS can be show in figure 2.2. This is standard WMS that anlyze from ordinary WMS but Bo Yan can be describe in detail of WMS of activity in warehouse management.

Yan B. analyze on warehouse management for apply RFID Technology in Warehouse Management System. They analyze activity in warehouse management show by flow chart.(Bo, et al., 2008)

### 2.2 Activity in warehouse

Activity of warehouse management systems in the most origination contain of receiving process , put away process , storage process , order picking process and shipping process. The most researcher refer in those active as follow as ;

For overall warehouse manage systems, Luo Cheng, Xu Didi, Lai Mingyong, and Wang Yan can be show in figure 2.2

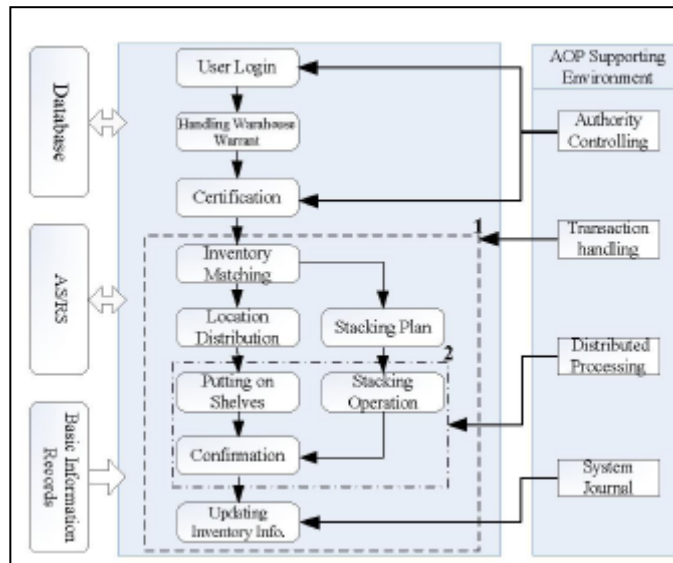


Figure 2.2 WMS structure by Cheng L.

Cheng L. write for apply AOP to stocking in module in WMS can be show in figure 2.2. This is standard WMS that anlyze from ordinary WMS but Bo Yan can be describe in detail of WMS of activity in warehouse management.

Yan B. analyze on warehouse management for apply RFID Technology in Warehouse Management System. They analyze activity in warehouse management ,show by flow chart.

### **2.2.1 Receiving Process**

In warehouse receiving may begin with advance notification of the arrival of goods. The schedule receipt is creating at the specific time. The good are physically moved from the transport vehicle to the receiving dock. The items are checked against the purchase order (P/O) to verify that the items received are the same as those ordered. Goods will be inspected and expectation noted, such as damage, incorrect count, and wrong description. The goods typically arrive packaged on the larger scale. Warehouse may be break scale of goods before storage. Finally, the warehouse inventory records are updated. (John J. Coyle, 2003) Step of receiving is in bound trucker phones warehouse to deliver appointment and provide information the cargo. Warehouse receiving person verifies in the Advance Shipping Notice (ASN) and confirms with information receiving by phone. Trucker arrives and is assign to a specific receiving door .Vehicle secured by the dock. Seal is inspected and broken in presence of carrier representative. Load is inspected and either accepted or refused. Floor loaf or loose me is unloaded. All unloaded material is staged for contain final inspection. Proper disposal made of carrier damage. Load is stored in ad assigned location. (Tompkins., 1998) Receiving process in the bookstore is similar to the system for inventory of goods in general. It may be added the function of the details of products which can be adaptable.

### **2.2.2 Put – away**

The put-away operation physically moves the items from receiving location to the storage area of the warehouse. When product is put-away, the storage location should also be scanned to record where the product has been placed. This information will subsequently be used to construct efficient pick-lists to guide the order-pickers in retrieving the product for customers.(John J. Coyle, 2003) Put-away in warehouse Can continue to have a system since the storage location does not

change. But in the retail warehouse can not fix location it's adjusted to match the place of location of the retail warehouse.

### **2.2.3 Order Picking**

Order picking refers to the operation of retrieving items from storage locations to fulfill customer orders. Order picking has been identified as the highest priority activity in a DC for productivity Improvement due to its relatively high contribution to the total DC operating cost. There are five order picking terms commonly used: discrete, batch, zone, bucket brigade, and wave picking. In discrete picking a picker is responsible for picking all the items in a single order during a pick-tour. In batch picking several orders are batched (or grouped) together and a picker picks all the items in a given batch. Zone picking requires that each picker is assigned to a specific region of the storage area and is responsible for picking the items in that region only. Bucket brigade picking, which is actually a control policy for executing discrete order picking, requires that as soon as the most downstream picker completes an order, he/she walks back to take over the order the picker immediately upstream of him/her is currently picking. The latter, in turn, takes over the order of his/her predecessor, and so on until the most upstream picker begins a new order. So, If orders are required to be picked in a predefined time-window (known as a wave), then it is referred to as wave picking. (Parikh & Meller, 2008)The order information is given to the warehouse personnel on a pick slip. The AS/R process is an automated storage and retrieval materials-handling system that will do the picking process, when the order arrives at the shipping preparation area; the items are placed in an exterior (shipping) package or placed on a pallet. Then, a shipping label indicating the ship-to person/firm and address is attached to the package. Finally, the complete customer order is staged for loading into the transport vehicle.(John J. Coyle, 2003) This system of automated order system calculated by the program in each existing warehouse. Therefore, if the application program that calculates the order is able to automatic calculation. In the business section of the Retail warehouse order picking is similar Discrete Picking but converted to a customer picking adapt to the business of the Double A Book Tower.

### **2.2.4 Storage**

Storage policies assign items to warehouse storage locations. Items may be assigned randomly, or similar items may be grouped in the same area of the warehouse, or items may be assigned based on order or picking volume. Volume-based storage places high volume items close to the pick-up/drop-off (p/d) point to minimize picker travel. Volume-based storage is particularly noteworthy as it results in less picker travel. (John J. Coyle, 2003) Warehouses use random storage and use volume-based storage for only a few high volume items. In volume-based storage, items are assigned storage locations based on the expected volume, usually with high volume items located closest to the p/d point. Because it is rare that demand is known with certainty, items are located in the warehouse based on their expected volume. The advantage of volume based storage is the reduction in travel time and distance. However, aisle congestion and an unbalanced utilization of the warehouse can result. Random storage implies that items are randomly assigned to a single location for the entire planning horizon. The advantages of random storage are the uniform utilization of the warehouse and reduced aisle congestion. The disadvantage is the possibility of large travel times from having to traverse the entire warehouse. Random storage is the most common storage policy used in warehouses today even though it results in longer pick routes than volume based storage. (Petersen., 1999) Type of storage; Block stacking storage on floor that is favor in a small SKU but more volume of product., Stacking frame keeps a small SKU but more volume of product , Single-deep selective rack is keeping a small SKU., Double-deep rack is keeping a small SKU and should to use special folk lift , drive in rack, Pallate flow rack, mobile pallet rack cantilever rack is keeping a long product such as masts etc. (Tayanuwat, 2009) General storage have to divide the storage location as said that. Therefore, the storage area of the retail warehouse store locations will be areas on the shelves only as the products are on shelves.

### **2.2.5 Shipping**

The final movement process occurs at the shipping operation. Product is likely to be staged if it must be loaded in reverse order of delivery or if shipping long distances, when one must work because staged freight must be double handled. The

trailer is likely to be scanned here to register its departure from the warehouse. (John J. Coyle, 2003) The step to design a shipping systems in organization is define current requirement of customer and future plan , select appropriate mode of transportation , select base no customer need. The characteristics of Transportation mode; common carrier (that is the most popular method, Private fleet truck can save time and space), Rail transport (the large carrying capacity in rail car .it large volume and low-value commodity), Air transport (the trend toward is smaller. More frequent shipment of good). Customer initiative such as Just in Time (JIT) and an Efficient Consumer Respond (ECR) have resulted in example responsibilities for the warehouse traffic manager. No longer is it acceptable to simply that this product is shipped on time. (Tompkins., 1998) Process of Shipping is based on the nature of each warehouse. Tompkins J. mentioned to shipping but does not mention to Shipping in the nature of retail warehouse that is the cashier shipping.

### **2.3 The retail warehouse**

The current methods used in classifying retail outlets and areas devoted to retailing, in the geographical and town planning. For retail outlets, classifications based upon types of goods sold, and types of shopping trip. But at the present classifications based upon physical development characteristics and type of shopping trip are recommended. Finally, classifications of urban retail location are examined. If shop types classified by trip purpose and size consist of ; Under 250 square meters is convenience store and fashion boutique. 250–1000 square meters is small supermarket , Hardware store and bookshop. 1000–2500 square meters Large supermarket Retail warehouse. And the last type, Over 2500 square meters is hypermarket ,Retail warehouse, Department store. (Guy, 1998)

In China are classifying the retail business by Chinese government. Retail formats are officially categorized into eight groups. These classifications consist of mode of operation ,convenience stores is Mainly self-service , department stores is Counter sales and self-service (open-shelf display) , general merchandise stores is Self-service , professional stores is Fixed prices, open shelf , shopping centers is Unified planning by project manager with shops operating independently, specialty

stores is Fixed prices, open shelf, supermarkets is Self-service, and warehouse-style supermarkets is Warehouse-style product display and self-service (Saeed Samiee, 2004)

In this research is combine bookshop and retail warehouse. UK has focused on the retail business; in 1970 retail warehouse has initial by selling discount warehouse by focusing on high volume. Such as Mullard Furniture Industries (MFI), Queensway (carpets), But this view has now changed is not required to lower the price on the distribution warehouse only. But can sell almost all types of products. The major products during the first stage of retail warehouse product are furniture or carpet, etc. Currently, retail warehouse perspective has changed to develop continued for quality. Not only just to sell the lower price. (Brown, 1990) Single-storey retail stores selling non-food goods with at least 1,000 square meters of floor space, occupying a warehouse-type building and having on site car parking facilities. In UK retail, the retail warehouse is fast growing. In few British towns and cities of any size do not now process several of these large scale retail facilities and, indeed, In 1980s retail comes to be written, “ shopping is a storehouse” , the retail warehouse have attracted relatively little attention from academics, property analysts and data collection agencies alike. As a consequence, there is little in way of detailed documentation on the development of the institution. Nevertheless, it has been estimate that there were just over 2000 retail warehouse in Great Britain in mid-1989, compare to 1350 in 1987 and less than 700 at the start of the decade. (Brown, 1981)

In several countries have said the retail warehouse management by focus on products in stores and said to trends and the future of retail warehouse. Nowadays, whether any business, nobody mentioned to the inventory management of retail warehouse.

#### **2.4. Retail management in retail warehouse.**

In this thesis is mentioned of the retail warehouse that is principles of work as follows ; the outlets themselves were almost universal in their cut-price trading philosophy, show product clearly , lack of customer services and cash-and-

carry sales policy (Brown, 1990) So researcher will be refer in same type of store types such as .

Makro bulk discount store was established in 1989, it has become one of the most spectacular business successes in the country and synonymous with this type of retailing. Although its target market is in theory limited to members buying wholesale, the range of goods under one roof and the low prices have made it a household name and in practice a large proportion of sales are said to be retail to individuals. (Antony Feeny, 1996)

Carrefour; the retail concept of Carrefour Paris was based on three key elements: one-stop shopping; large car parking lots; and low prices. Decentralization of the management became in order to be close to consumer requirements and to be more reactive to local competition. This option had consequences for logistics, in that many goods were delivered directly from the suppliers. In the initial concept, hiring, retail prices, and even assortment were widely decentralized at shop level.(Marc Dupuis, 1996)

In many retail type haven't the retail warehouse that researcher can use method to implement in the thesis.

7-11 has both influenced and been influenced by a new emerging lifestyle. In the future, the convenience stores may be anonymous compared to the corner shops, the operators have tried to create a friendly atmosphere with efficient staff. Key to their success has been location in strategic places such as bus stops, together with bright lighting, cleanliness, efficient service and a limited range of reliable goods – including especially drinks and other easy take-away items. (Antony Feeny, 1996)

Tesco in US will not appear to be particularly innovative to the UK grocery retail sector. With the progressive adoption of the enabling technologies, the major multiple retail groups have made significant improvements in cutting inventories and reducing lead times. Tesco, the acknowledged industry leader, has the best stock turnover of any grocery retailer with an average of 30 turns per year. (Fernie, 1994)

A B2B example is Grainger where customers can order online, by phone, or in person and pick up their order at one of the Grainger retail outlets.

Alberstons stores its inventory at the pickup location itself. In the case of Grainger, some items are stored at the pickup location while others may come from a central location.

Apple has decided to open some retail stores and actually carry product for sale at these stores. If Apple uses these retail stores to sell the fast moving items and display the configurable items (which can be drop shipped), it will be a good use of their retail network.

Dell distributes its PCs directly to end consumers, Dell customers wait several days to get a PC while customers can walk away with an HP from a reseller. Gateway opened Gateway Country stores where customers could check out the products and have sales people help them configure a PC that suited their needs.(Chopra, 2003)

Finally, The most importance in the retail warehouse is fast delivery that is used in many retail supply chains. The advantages are enjoyed mainly by the retailers as they can operate in a just-in-time mode: they need fewer inventories on-site which reduces operational costs (both holding and storage costs) and investment costs (through less warehouse space required). When they call orders, they can rely on rapid fulfillment. This works well if the order lead times and production time allow the manufacturer to operate on a make-to-order basis such as the furniture business IKEA. (Pohl, Meller, & Gue, 2009)

In retail warehouse, most research was mentioned the management category of each type of product is sold on the warehouse. Depending on the model of management products which based on each store's inventory management. By Chopra S. has mentioned to the management of retail business and Pourakbar M. is focused on speed to response customer needs.

In many countries focused on retail business such as China or even Thailand. The researchers said of the retail store, but focused on the development and management products primarily including focused supermarket management principles of each country. In Thailand will be highlighted convenient stores such as 7-11 which success in Thailand but not yet focused in the business of retail bookstores. Many researches have described the successful country's retail business and ways to manage such as 7-11 will focus on areas where the Bus station, The Carrefour Paris

will be a primary focus on low price. Organizer brings the concept of each application in the concept of retail Book business to increase sales in the management of bookstores.

## **2.5 The Plano gram Theories.**

A Plano gram is a diagram of fixtures and products that illustrates how and where retail products should be displayed, usually on a store shelf in order to increase customer purchases. A Plano gram is often received before a product reaches a store, and is useful when a retailer wants multiple store displays to have the same look and feel. Nowadays, pangrams are used in a variety of retail areas. A Plano gram defines which product is placed in which area of a shelving unit and with which quantity. The rules and theories for the creation of a Plano gram are set under the term of merchandising. Primary targets which should be achieved with pangrams are creation of an optimal visual product placement and creation of an optimal commercial product placement. (Ruibin Bai, 2008)

In many store are use program analyze Plano gram to improve their retail store. To design planograms generally be related to assortment differences, location differences, or facing differences. Assortment differences are related to the composition of the category: store managers have the possibility to add or drop items from the category which will have an effect on the planograms. Location differences are related to the place in the shelf: the item is in the assortment but is on a different position than the one allocated in the planogram. Facing differences give an indication whether the assigned facings are correct in the realized plans and whether the correct side of the item is placed forward to the customer. planogram usually had sufficient slackspace to accommodate for these extra items. (T. van Woensel, 2003)

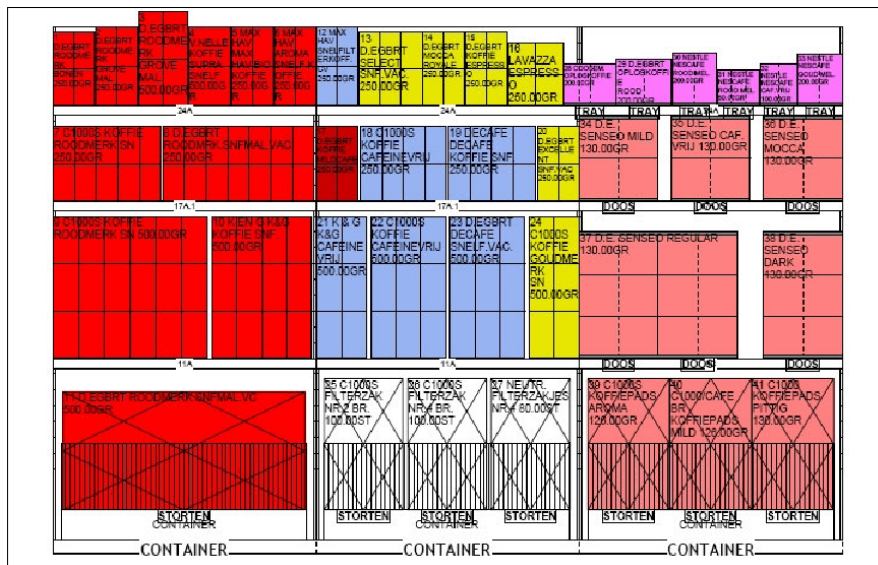


Fig 2.3 A Plano gram example (T. van Woensel, 2003)

Giving new products prime space, implementing pangrams to reflect needs of customers, giving bestsellers the most facings and putting them at eye-level, and analyzing their influences periodically, are some of the accepted norms for successful retailing and merchandising strategies..(Gladson., 1993)

Plano-gram principles are used in many countries in management products in stores to stimulate sales and create interest including used to create cross merchandise products in place and administrative process in bookstores Retail warehouse. Plano-gram principles can be applied to the overall activity of the warehouse management processes, to be a part of warehouse management in retail warehouse.

## 2.6 Logistics Review.

Logistics is the collection of activities that take part on the supply, moving, storage and delivery status of all production goods. The service and information management are to help support operations such goals can be effective. Be the main gear that helps drive the operational sections of production system to rotate and move the organization's activities have driven the transmission is from one gear to another

gear. The efficiency will be dependent on the performance of the gear transmission of logistics. (Suhadamrung, 2003)




Logistics is activities in the supply chain that we will manage logistics supply chain to continue to effectively. The transportation is part of logistics. Because of activities that are about movement and storage of materials to consumers in the supply chain (Kritchanchai, 2549)



Logistics is related to distribution channels, be Activity that is about moving goods and service from manufacturers to consumers hands. Also, Steps including the preparation and storage of raw materials inventory. Or logistics is lead product and service that customers need to correct place in a timely manner. Satisfy most customers by the business will be earnings or cost savings due to efficient management. The 5 main issues for effective logistics issues are as follows; Moving product or materials, Time, Movement of information, Cost. (Ruimai, 2004)

## 2.7 Flow Chart.

Flow Process Chart: A graphical representation of the sequence of all operations, transportation, inspections, delays, and storage occurring during a process or procedure. Symbol Description see table 2.1 (Standards, 2007)

Table 2.2 Flow chart symbol.

Symbol	Name	Symbol Description
	Terminator (Terminal Point, Oval)	A complex action or process (possibly described elsewhere), often changing something
	Transport	Movement of people or things. May be accompanied by a distance measurement
	Delay	Idle time of people or machines, or temporary storage of materials.

	Storage	Longer-term storage of materials or other items.
	Inspection	Checking of items to ensure correct quality or quantity.

## 2.8 Re-engineer.

Re-engineer is starting by setting goals. The second step is to map the current business which serves as guidance for the redesign. This modeling step helps reveal deficiencies in the system design and thus highlights opportunities for improving the system performance. The final step in reengineering a business is to implement and operate the new design. (Kartam & Ibbs, 1996) It is a process of change and change leads to more change, which means that there is no clear completion point. In this environment, staff was required to move from working within a highly controlled hierarchical structure to a transparent, fluid teamwork structure. The skills which this demanded of the staff had not been encouraged or developed by the previous reporting system. Teamwork requires a totally new attitude towards work whereby all staff are encouraged to interact with greater openness. Therefore restructuring projects such as the one described above need to be seen as a long term, continuous adaptation to the environment. (Sutherland & Remenyi, 1995) Re-Engineering is reviewing the basic ideas and design processes in a totally new work to achieve large improvements or changes in work such as cost, service quality and speed. Principle of Re-Engineering: F R D P such as;

1. Fundamental rethinking: Improve by not hold or use traditional systems involved. Start from zero.
2. Radical rethinking: Commitment to transform the roots of all things. Dismantling whole old process.
3. Dramatic improvements: Improvements to make the leap in the results of operations. Want to increase grand productivity.

4. Process-oriented: Aim to change processes without regard for who is or will be conducted by any agency. Therefore, restructure, down sizing organization or a gradual change is not Re-Engineering. (Hammer & Champy)

Advantages of Re-engineering are modifying a whole new concept in the work (holistic approach), Respond the needs of customers (Customer Oriented), Officer or employee can work more independently, Concepts in information technology to improve the work. IT is not only the process used under the existing structures or is insufficient but also require benefiting fully, A way to improve the focus on process improvement as a key of improvement. (Hammer & Champy)

## **2.9 IDEF 0 diagram and swim lane diagram**

IDEF0 is a formal method that combines graphics and text in order to provide 'better analysis and communication techniques for people involved in improving manufacturing productivity'. The model describes what a system does, what controls it, what things it works on, what means it uses to perform its functions, and what it produces. Many applications of IDEF0 modeling to the construction domain have been attempted. The model is set in the context of an owner/user and adopts the viewpoint of an owner's/user's typical business operations. Its purpose is to describe idealized owner's functions and their relationships within the construction process. (Finne, 2006) In this thesis is use IDEF0 diagram to analyze activity in the retail warehouse.

A swim lane diagram is used to distinguish between activities undertaken by each role and therefore specifically identifies the occurrence of a data exchange requirement whenever a data output crosses a swim lane boundary. (Huiping Shang, 2005) That researcher can use to analyses relationship in all department in organization.

## **2.10 M-book program.**

M-book program is a complete bookstore management. Major support for bookstore with POS names m-POS (Point of Sales: which developed specifically for

book business that will help lighten the load and increase efficiency of work), as well as, support the wholesale consignment and other sales. Also, support from a sales order and invoicing system that leaves sellers cause sales only when a payment only. In addition, it supports the purchase of when the library is set to mount automatically. Leave the sale to pay debt with sales, accounts payable system and a flexible payment, management checks, ledger system and inventory management. (Millennium, 2006)

#### Prominent point of the M-Books

- Designed for book business specifically.
- Easy to learn.
- Management system in accounting Department of bookstore.
- Efficiency of the purchasing, sales and inventory system.
- Help Save the account category code and can see as Tree Structure.
- Financial help from the calculation with the accuracy and beauty such as balance sheet, profit and loss statements and etc.
- Book software that can report out a variety of beauty. Can print on both screen and printer.
- Designed to work with the m-POS system sales page shop smart.

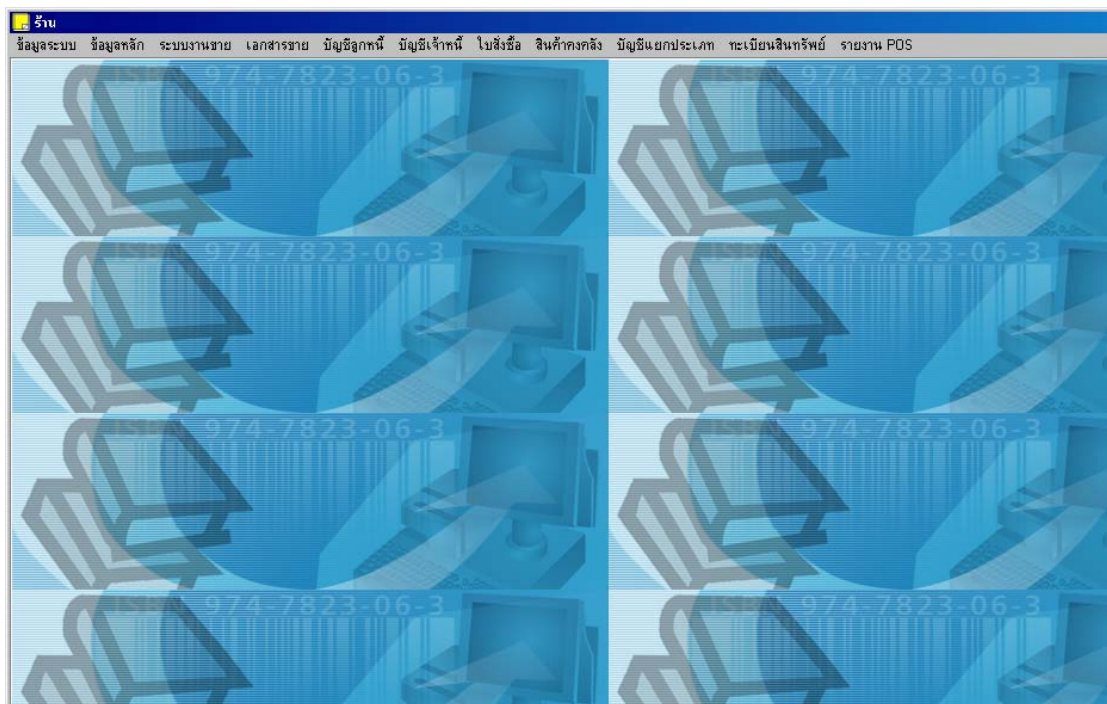


Fig 2.2 M-Book Program.

## **2.11 Analysis Systems of warehouse management.**

Many paper can analyze warehouse management software. And Yan B. can analyze about RFID Technology Applied in Warehouse Management System they use flow process chart to analyze warehouse management software based on Radio Frequency Identification (RFID), and probe into the structure and operation flow of the system. The WMS will adopt RFID middleware as the support platform, cover goods entry, picking, checking, delivery and many other operation flows, and can collect, deliver, check, and update mass data on the frequent warehouse entry and delivery. So researcher can adapt from this paper to apply in this thesis. It's for prototype of standard warehouse management systems. They analyze the structure of the WMS based on RFID by the front-end system, the back-end system (the WMS system) and operation (Bo, et al., 2008)

## **2.12 The analysis of literature.**

Warehouse operators have several types of businesses that want to use warehouse can be used to optimize the warehouse to serve as the basis to design their own warehouses. Organizer has inventory review each variation to suit the design of retail warehouses which have not been mentioned before in the warehouse. And from the literature review that, for use in the design of warehouse management, retail warehouse warehouse activity of the research will discuss the general activity in the warehouse as follows; Receiving process design in general retail warehouse system is similar to the inventory of goods in general, as Coyle J. 2003, Tompkins J., 1998 said it may increase the function of the details of products which be adaptable in receiving in retail warehouse. Put-away in the warehouse can continue as system because the storage location does not change. But in the retail warehouse can not fix location, therefore, it's adjusted to match the place of location of the retail warehouse. System of order automatically calculated by the system of programs used in each warehouse, so if the application program that calculates the order to an automated message if calculated based business. In part of order picking in the Retail warehouse will look like the Discrete Picking Parikh P. and Meller R. said, but it is adjusted by the

customer picking adapt to the business of Double A Book Tower. General storage generally must separate the storage location as said before. Therefore, the storage area of retail warehouse space on the shelves will be sold as a product on the general shelves. Process of Shipping is based on the nature of each warehouse. Tompkins J. mentioned to the manner shipping but not mentioned in the form of retail warehouse in the type of the cashier shipping. Heps and Brown said several Countries have been mentioned to retail warehouse by focus in service and future prospects to the retail warehouse. But nobody said a warehouse manager in this particular retail warehouse. Retail warehouse in book business use retail warehouse management system to manage each category of goods that are sold on retail warehouse depending on the model of management products based on each store's inventory management. Chopra S. said the management on retail business. And Pourakbar M. is focused on speed in responding to customer needs. In many countries have focused on retail business such as Taiwan or even Thailand. By several research groups have mentioned to retail store but focus on the development and products management. And focus product service of each country's supermarket. In Thailand focus in the convenient store that is a 7-11 that have been successful in Thailand. And in many countries is still not focus of retail book business. Many researches have described the business of the country's retail business success and ways to manage the way they manage that? Such as 7-11 will focus on the location that will be located near the Bus station. And, the Carrefour Paris will be a primary focus on low price. Organizer brings the concept of each application in the concept of retail Book business to generate sales in the management of the bookstore. Key principles of management is plano-gram principles that is a principle in many countries use to manage the product in stores to stimulate sales and create interest including it's principles to create a place to cross merchandise products used in process management bookstores. Retail warehouse principles in plano-gram can be applied to the overall activities of the warehouse management processes to be a part of warehouse management in retail warehouse.

As a result, the organizer has the idea of a literature review applied to many concepts and principles of management of retail products and manage inventory of each type of inventory in the world to design warehouse management system for the retail warehouse business in Chapter 4. Together with use of performance inventory

measures of Frazelle E. to generate metrics from the metrics of warehouse international standards. Applying a standard of measure of retail warehouse goods in Chapter 4.

## **CHAPTER III**

### **MATERIAL AND METHOD**

#### **3.1 Step of Research Methodology**

##### **3.1.1. Study problem of Case Study Company.**

Study problem of case study Company that what is main problem in process and consider which problem is affected to organization.

##### **3.1.2. Study mechanic to solve a problem in case study.**

Study concerned theory, what theory can be used to analyze the process.

##### **3.1.3. Analyze proceeding in case study.**

Analyze flow method in case study process. Study flow process activity by use Flow Chart to analyze concerned department in work step of the procedure in current process. Start at supplier delivers products to receiving department. To final process is products deliver to store.

Study Information Flow and information Management in ordinary warehouse management systems.

Study warehouse management systems by analyzes the existing process by study mechanic in receiving process, picking & distribute process in order to know the way to save and arrangement in database systems at Double A Book Tower.

##### **3.1.4. Summary all problem in systems.**

Summarize root cause of problem. Subsequently, this summary will be analyzed the way to solve the problem of process by use tools to solve all problem that happen in this process.

### **3.1.5. Finding improvement of WMS.**

Analyze to find improvement the occurred problem in current process but adjust procedure of problem part with the worked way.

Finding the method of improvement, researcher use tool of analysis to find new process of the retail warehouse. Researcher reviews warehouse management journals and warehouse management books in chapter 2. Researcher review many international journal for analyze method meteorology of warehouse management system. It can shown

Researcher review international journal related with warehouse management systems. From review it showed detail of all warehouse management process. Researcher will compare ordinary WMS with retail warehouse by flow process chart. it show process of front end systems and back end system including process of work. And then analyze it for develop for retail warehouse management system. This is the prototype of retail warehouse for people that want to use this program. This program can use for retail warehouse cause in retail store have many type same as retail warehouse. Summary the table to show the difference of ordinary WMS and retail warehouse in detail.

Finding program form market WMS. Check dataflow diagram of this program and then check that what it difference from retail WMS. Because program sell on website which is the normal program. So researcher can check and compare with retail WMS to develop retail WMS. Summary table from market WMS .

Analyze WMS from oracle WMS to find the difference between retail warehouse and ordinary warehouse management system.

When researcher already analyzes the difference of software between retail warehouse and ordinary warehouse and next step, we will create flow process chart to show process of retail warehouse. It can show operation in warehouse and can link to system. It is a prototype to create a WMS for retail business

### 3.1.6 User requirement.

Researcher already found the user requirement form user which use the existing WMS at double A Book Tower for implement to some function in the new system. It can be list as below;

Table 3.1 The user requirements.

Number List	User requirement
1	Books can specify by the customer need.
2	Location can support the customer behavior.
3	Product should have the grade that calculate from the sale order.
4	The system can show the location in order to display books by the customer needs.
5	When the pop grade will change, books will change location real time.
6	Customers will have the incentive to pick books.
7	Stock will save at the cashier point.
8	WMS for Double A Book tower mange from the retail principle and warehouse management system.

### 3.1.7 System analysis.

After gathering the data completely, the analysis is the next step for identifying the system. Investigating and defying the requirement if Business Activiry Model, Data flow diagram (DFD). Table 3.1 the user requirement will provide function in new WMS for this system. Researcher will create the flow chart from table 3.1 that is the work flow of retail WMS.

### 3.1.8 System Design.

The specification and requirement, the new system consisted of the database management and the warehouse management system application design. The data base design is base on the relational database management. An Entity

Relationship (E-R diagram) and Normalization are the structural represents of the database and transformed into relational tables.

### **3.1.9 The research Evaluation.**

The research evaluations are divided into categories: of the system and system performance. The questionnaire is used to collect the opinions and satisfaction toward this system from users.

This research will not create complete software for use in retail warehouse but it will create only structure for next step will use this model to create complete software. Therefore the evaluation is evaluate only structure and probability of software that will create to complete software by programmer. Questionnaire are can see in appendix 1.

### **3.1.10. Summary methodology.**

Summary all process in this research. It will show the advantage and disadvantage of new system for support retail warehouse. It can show problem of this process before implement new WMS and after implement WMS at Double Book Tower.

### **3.1.11. Proposal methodology.**

Propose new method methodology to CEO of Double A Book Tower.



## CHAPTER IV RESULT

### 4.1 Overview Organization of Business.

Double A Book Tower is a business unit in Advance Agro CPL. or aA or Double A. Double A group works on paper industry and all paper products such as paper ream for long continuously. And be the first producer in Southeast Asia that has assured ISO14001 in the sense of administration environment standard from AJA EQS in year 1997 after receiving Prime Minister's Award of the excellence and outstanding in the sense of the consciousness in environment.

Double A Book Tower, as before is Kaset Rungrueng Bldg., is established on Sathon road; address 122 Silom, Bangrak, Bangkok with net area is more 5,400 m2. by gross area is more 6,000 m2. By use area for bookstore for 9 floors (from 1st - 9th floor) from 13 floors. Map see Figure. 4.1

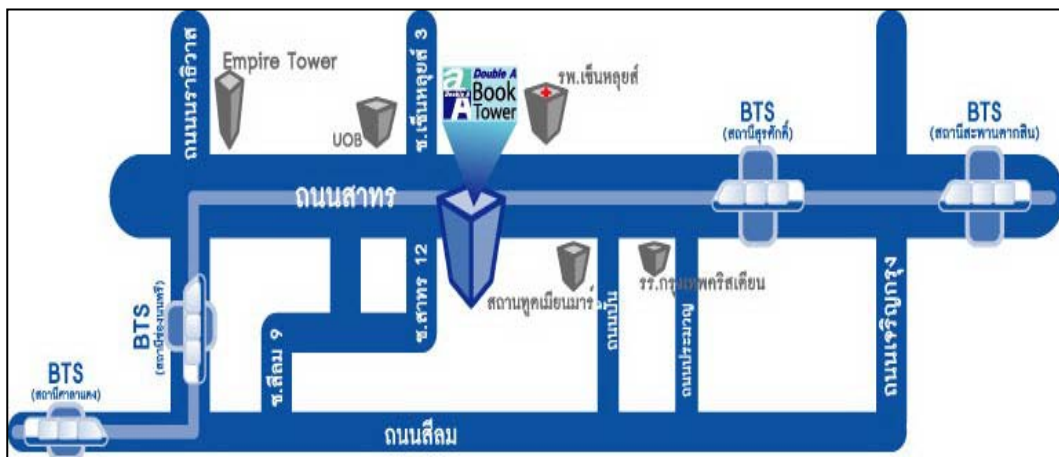


Figure 4.1 Double A Book Tower Map.

## **4.2 Organization of Double A Book Tower.**

The organization chart displays all departments of Book Tower (Thailand) Co., Ltd. The marketing department has 7 sections and 13 subdivisions as shown in figure

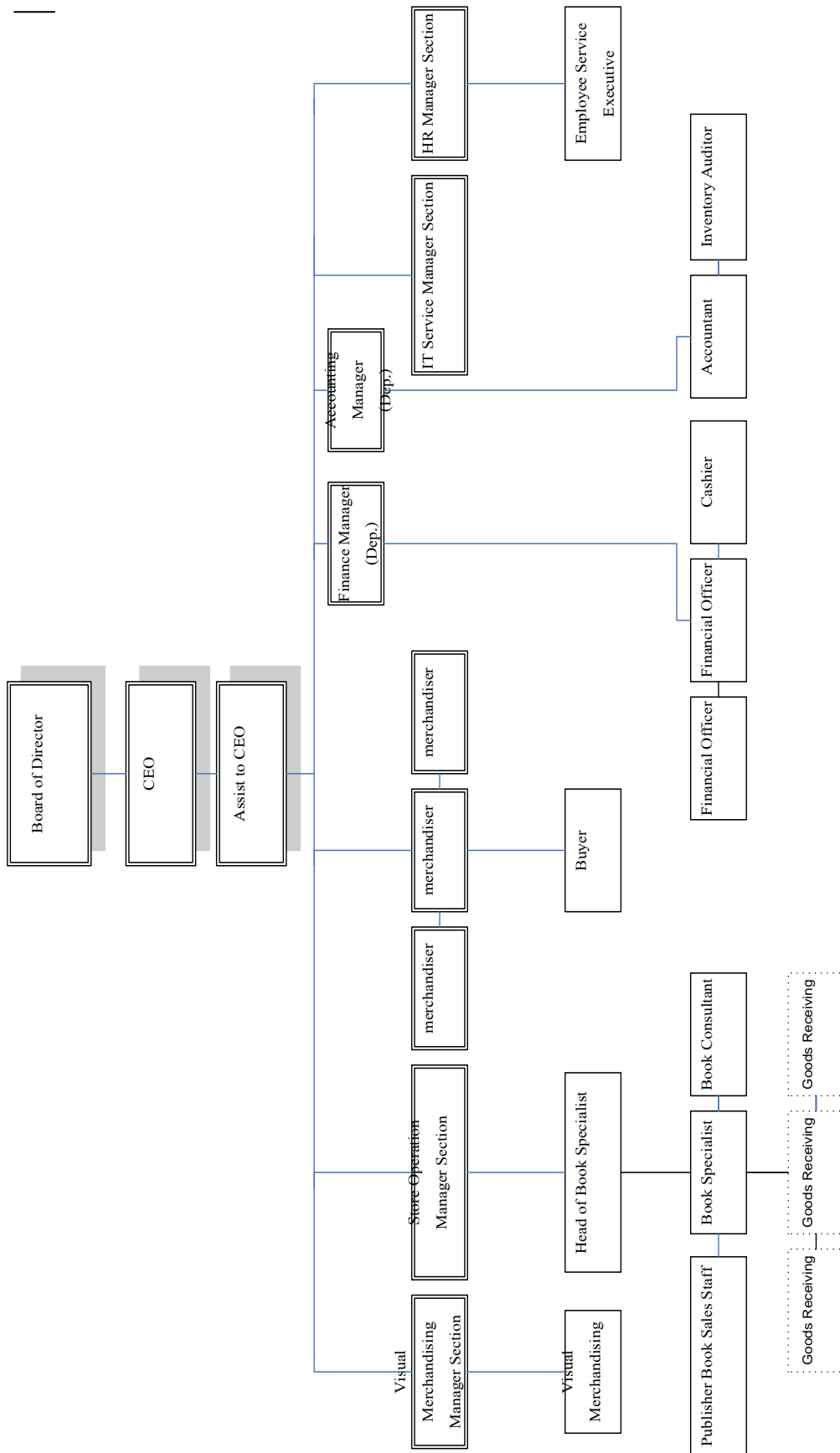


Figure 4.2: Organization Chart of Double A Book Tower

### 4.3 Current Business Process.

#### 4.3.1 Bookstore

Double A Book Tower is bookstore that each floor is classified books by category as follows.

##### - First Floor: Top Hot Zone

Net are is 800 m2. There are best seller books, new arrival books, recommended books and newspapers & magazines including stationery and beverages shops. Also, arrangement events and activities by publishers such as announce new title, events by festivals, etc., as shown in figure 4.3.



Figure 4.3: 1st Floor

##### - Second Floor: Feeling Zone.

Net are is 800 m2. It displays young novel books, literature books, poem books, all fiction and nonfiction books etc. as shown in figure 4.4



Figure 4.4: 2nd Floor

### - Third Floor: Living Zone.

Net are is 800 m2. It displays Variety, Living, Lifestyle, Health, Religion & Spirituality, Social & Economics & Politics, Documentary including arts, culture, history, music, journey, social, environment, Recreation, Astrology etc. as shown in figure 4.5



Figure 4.5: 3rd Floor

### - Fourth Floor: Kids Zone.

Net are is 600 m2. It displays parenting and children books, tale picture books, dolls and many toys, as shown in figure 4.6



Figure 4.6: 4th Floor

### - Fifth Floor: Brain Zone

Net are is 600 m<sup>2</sup>. It displays Business & Management & Investment, How-to, Technology, Computer, Educational books, as shown in figure 4.7



Figure 4.7: 5th Floor

**- Sixth Floor: Lively Zone**

Net are is 600 m<sup>2</sup>. It displays Comics, Youth literature, Cartoon, Youth Interest and cartoon etc. as shown in figure 4.8



Figure 4.8: 6th Floor

**- Seventh Floor: International Book & Food Zone**

Net are is 600 m<sup>2</sup>. It displays Foreign Book, International Book, Food & Beverage including school of art - Simple Secret Society. As shown in figure 4.8



Figure 4.9: 7th Floor

#### 4.4 Present process at Double A Book Tower.

Book receiving process has a problem as the results of there are many books both Thai and foreign books. So, book receiving process has to use long time to receive books and send them to store. Especially, the new titles are needed to send to store fast most .If they are delay in process, Double A Book Tower will loss profit. Then, researcher wants to improve this process to make efficiency and customers will satisfy in origination. Shown in fig 4.10

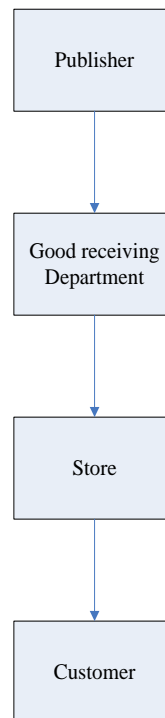


Figure 4.10 Departments involve in receiving process

#### 4.4.1 Warehouse management in Double A Book Tower.

Begin from study on work of bookstore by analyzes the overall image of the system by use Flow Chart. And, from Flow Chart we can see the work procedure by start from merchandiser places orders to publisher, then publisher delivers books to Book Receiving and send the books to store as following Double A Book Tower process;

##### - **Receiving process.**

Merchandiser receives purchase order from store operation. They place order to suppliers. And suppliers deliver books to Double A Book Tower according the orders or they deliver book by new titles automatically. Then they make books data in system. If publishers deliver book automatically, book receiving officers will make book data in system in stead. Merchandiser sends P.O. to book receiving and accounting department. Book receiving officers check delivery order. Book receiving officers check book data in system. If there is no data in system, they will make new data.

**- Put-away**

Book receiving officers classify category of books and display books on shelves each floor and category. As shown in figure 4.11

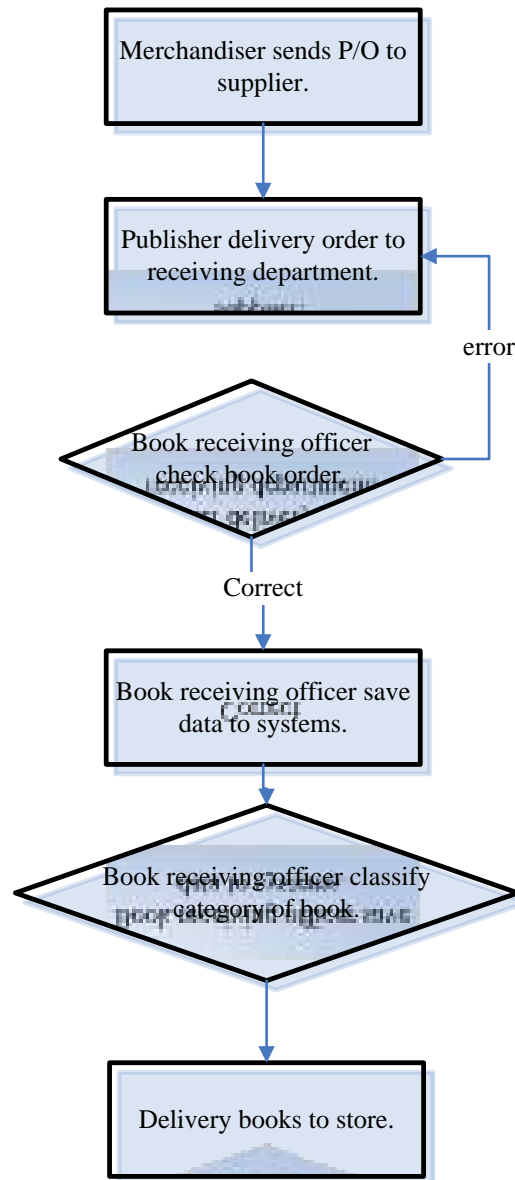


Figure 4.11 Flow chart diagram of book receiving process.

**- Order-picking**

Seller displays books on shelves. This process is confusion because it has not warehouse management in systems. And then customer will pick books on shelves.

So researcher will analyze process and implement warehouse management in book store.

#### **4.5 Problem statement in double A Book Tower.**

From the questionnaires of all relevant employees of the processes for goods receiving are placing process for example receiving officer, Merchandiser, book seller and Store Manager including data analysis above.

Double A Book Tower is a unique bookstore that sells books on stock. Warehouse is no waiting area to accommodate books on the Shelves. Concluded that problems can occur at the Double A Book Tower: due to problems caused by vendors sent the books to shop, not enough space to store books before brings the books on shelves. Therefore, the duration of the work of goods receiving is an important part since it determines the sales of books. If books are received delays, it results in loss of sales of these books should be occur.

After goods receiving process, books will be sent to the sales area. Book sellers need to specify location of individual books to display the books on shelves adhere to the categories of books from the system. If customers want to buy the product categories can select from a rack of books such as category. Therefore, if the books put in the wrong section and customers will not find the books, not result in sales that should occur. Book sellers sort books on shelves and know any books that are sold out but the order was Merchandiser. Make the book list in order to sell in store does not match requirements of customers.

Products based on customer needs and preferences of that time. So the place must be created to focus on popular products. When the product available on the shelves. This product must attract customers. So it can not generate sales as well.

#### **4.6. Way to resolve the problem.**

Problems from occurring resulted in the design of warehouse management to resolve issues arising of Double A Book Tower. But Double A Book Tower is a

bookstore with no place to store goods. Therefore, if the system must manage the operation of the warehouse management, can not provide general warehouse management systems. Must be applied during the management of the retail business with Warehouse Management System to resolve problems that occur. Also, can improve the existing system of Double A Book Tower. It also can create a Retail warehouse inventory management in books business that the inventory system is the same.

#### **4.7 The Retail Warehouse.**

Double A Book Tower is a unique bookstore that sells books on stock. Warehouse is no waiting area to accommodate books on the Shelves. When goods are received into the system, product must be sent to the store immediately including the storage area to fill Stock. Stock must be ordered to fill the order immediately, without prior to storage.

Currently, Double A Book Tower has no warehouse management system to process the Receiving process, put away process, Storage, Order-Picking and Shipping. Organizer has the idea to bring the warehouse management system to apply in the process of Double A Book Tower. Due to the inventory of Double A Book Tower is type of Retail warehouse, therefore, warehouse management can not be applied into whole process. Organizer is to create a set of Principles of Warehouse Management in retail warehouse to implement in Double A Book Tower which has no one set this principle before. Organizer uses idea from literature review concept of warehouse management system to apply with management system that sale product on retail warehouse as following principles in 4.8.

#### **4.8 The difference of retail warehouse and ordinary warehouse.**

Due to Double A Book Tower is a unique store of warehouse management by sell the product on inventory cause warehouse management characteristically different from the general inventory. Organizer shortens the different processes and functions of the program used to manage inventory as follows;

- In part of receiving process, dominant feature of retail warehouse is to be receiving with the put-away (receiving + put away) when goods receiving staff put in the data in part of data base systems have save pop-grade automatically such as if there is a new book that is required to New Arrival pop-grade to prepare to put away in the correct location. Which is different from generally normal warehouses in the receiving of goods is record for normal data product does not put away immediately continued and no longer needed to specified pop-grade when finish receiving process. Next step is preparation to send continue process.

- Put away of the general warehouse is placing products in a specified location in certainly position of the product. But in the section of the retail warehouse, put away will be according the category and pop-grade of products which consider by category on the shelves mainly. The position change is not fixed, depend on product their grades. In section of the display program must show location together with pop-grade of the product simultaneously.

- In part of storage, general warehouse is storage products based on customer demand period and no change in the storage area. However, in the storage of retail warehouse, operation must work together with monitor the products and need to change the arranged area immediately place the product grade changes. Not able to locate the fixed place, it's up to product pop-grade.

- Difference in the general warehouse picking is the staff in a warehouse will pick the products according to the order, but in the retail warehouse customers who choose and pick up goods by themselves.

- In the shipping of general warehouse, the staff will arrange scheduled transportation and warehouse delivery to customer. But in the retail warehouse, transportation is the customer come to cashier counter point that the stock of goods are sold out. According to the cut stock will be sent to the operation to affect the order and the display of goods in process to put away.

And is another important characteristic of the nature of the book. It can describe in table 4.1

Table 4.1 The difference of warehouse in book store.

<b>Ordinary warehouse</b>	<b>book store</b>
<b>Receiving</b>	
Certain types of goods have expiration date.	None of the age but demand for goods is seasonable.
<b>picking &amp; shipping</b>	
FIFO , LIFO	Depending on the needs of customers that want to what titles of books?
<b>Storage</b>	
Can be fixed location of goods in the warehouse.	Cannot be fixed location due to many new books are issued and change position frequently.
Rate of Turn Over is slowly.	Turn Over high rate
SKU number is less (the new products are few).	Have a high diversity of SKU Titles

The differences as above-mentioned have arisen from the comparison of the general warehouse management and the retail warehouse which differences are apparent in the activities in section Warehouse Management to say in paragraph 4.9 The activity of the retail warehouse such as including receiving process, order picking process, storage process, put away process and shipping process.

#### **4.9 Warehouse management process in retail warehouse.**

Warehouse is essential component in supply chain. In retail warehouse can adapt new management theory such as Just in Time, Information technology. In the case study as a model for the retail warehouse in bookstore use Double A book Tower to case study to set standard. It was developed for use in general bookstores which support inventory management The design must be the main consideration is the nature of the book and the needs of customers buying books. So researcher will create function of program. From analyze the difference of ordinary warehouse and retail

warehouse that specific for retail warehouse. The warehouse management system as follows;

#### **4.9.1. Step 1: Receiving Process.**

In part of receiving process - - when the books are sent from the publishers to Goods Receiving department , receiving officer must receive goods quickly to send to bookstore immediately. The main of receiving process is The database has been created by merchandiser before and receiving officer record number of books in system by scan barcode instead of key ISBN from delivery note to speed and accuracy.

Books categories will be specified by merchandiser and this category of document will be sent to Goods Receiving department and book seller. Goods Receiving department categorize books by floors according to document from merchandiser. As for book seller, when receive document from merchandiser then sort the books on shelves as in merchandiser's document.

#### **Function of receiving process**

- Merchandisers create book database before publisher will send books to warehouse.
- Merchandiser will specified books categories when they create database.
- Receiving officers receiving books and put away on shelves immediately.
- Merchandiser create pop grade of books in systems.

#### **Factor of the process**

Is speed in receiving process due to retail warehouse system has to meet customer needs in time. Books must arrange in bookstore quickly by Goods Receiving officer and then put away immediately without rest the goods before bring to the point of sales. Which this process is including put away process simultaneously.

#### **Difference of ordinary warehouse management process**

The goods receiving process must be done quickly and things to consider in the receiving process of generally inventory is accuracy. But the retail warehouse process has to consider the accuracy and speed. The result is a metrics measurement

process must can measure the time for division of work including the accuracy of the process of goods receiving. So researcher can describe this process in fig4.12

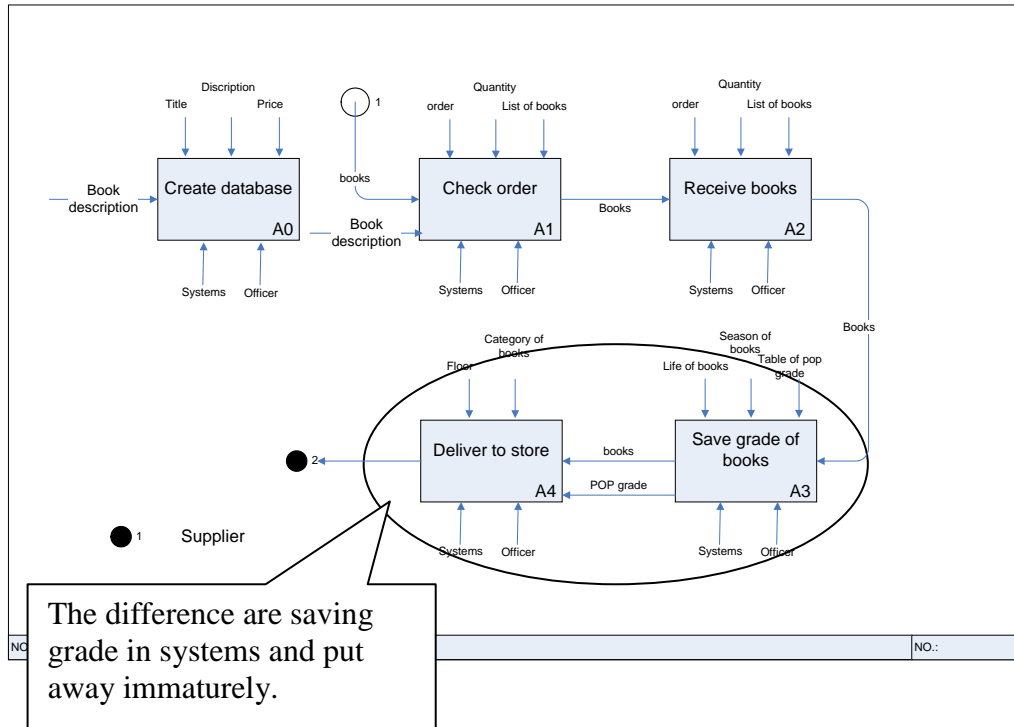


Fig 4.12 IDEF0 diagram: Receiving Process.

It can show in IDEF 0 Diagram in fig 4.12. That shows activity in receiving process in retail warehouse. In this fig, create database activity show database systems that show the difference of receiving process in ordinary warehouse and retail warehouse. It has to save POP grade of books in systems and this receiving process is include put away process in retail warehouse. Show in fig 4.13. From IDEF0 can be drawn swim lane diagram that show link of many department in warehouse. Shown in fig 4.13

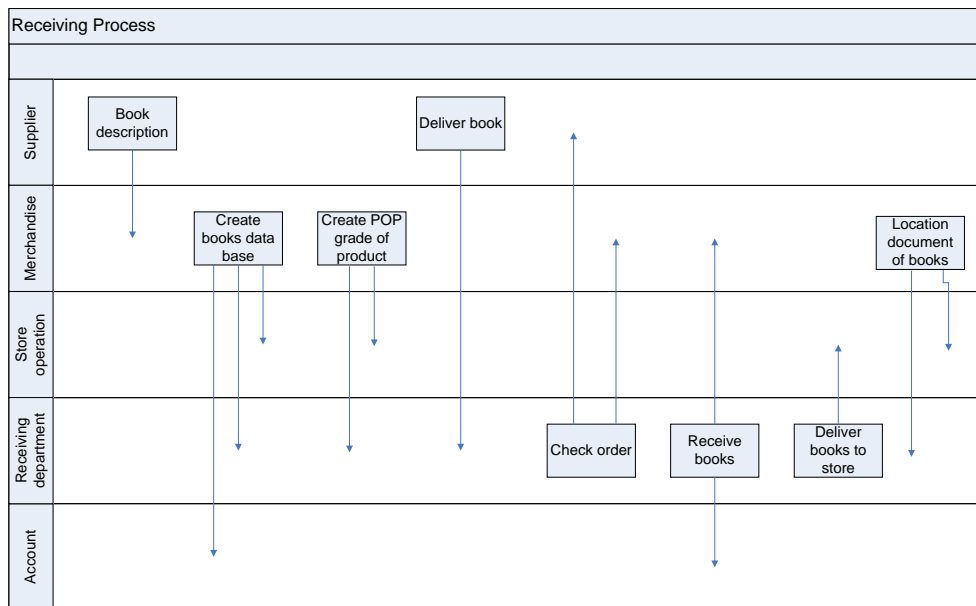


Fig 4.13 Swim lane diagram: Receiving Process.

In this figure, Supplier sends description to merchandiser. Merchandiser creates database and pop grade in systems. Then supplier delivers books to receiving department. They check order and deliver to store.

#### 4.9.1 Step 2: Put away

For the process of order picking on retail warehouse, receiving officer has to print document of placement of each location. The individual books will be specified position and shelves to be placed. The individual books are grade as popular segment of customers. POP Grade is the grade which is identified season and the popularity of product as follows;

Table 4.2: Table of grades of products required by customers' purchases

Pop No	Name	Description
0	Recommended	Recommended titles, titles in trend - may be old or new. There is time to end Recommend - Manual.
1	Basic Item	It is sold at any time, not changed pop grade to be non & slow moving - Manual
3	Variety	Should be Never Out of Stock - Manual
4	New Arrival	New titles as Bulletin of publisher (not exceeding 3 months)- Manual
5	Slow Moving	No product sales 8 weeks back - Automatic
6	Non Moving	No product sales 12 weeks back - Automatic
7	To be purged	Out of Print, Close account with vendors, Limited Edition or can not be re-order titles - Manual
10	Recommended & Hot Item	Recommended and top-selling products rank 1-2 in Sub. Dept. - automatic
11	Basic & Hot Item	Basic items and top-selling products rank 1-2 in Sub. Dept. - automatic
13	Variety & Hot Item	Variety titles and top-selling products rank 1-2 in Sub. Dept. - automatic
14*****	New Arrival & Hot Item	New titles and top-selling products rank 1-2 in Sub. Dept. - automatic
20	Recommended & Best	Recommended and top-selling products rank 3-22 in Sub. Dept. - automatic
21	Basic & Best Seller	Basic items and top-selling products rank 3-22 in Sub. Dept. - automatic
23	Variety & Best Seller	Variety titles and top-selling products rank 3-22 in Sub. Dept. - automatic
24*****	New & Best Seller	New titles and top-selling products rank 1-2 in Sub. Dept. - automatic

This above-mentioned table is recorded from system of a bookstore as the recording rate of customer acquisition. Program will calculate a grade of products automatically. When a customer changes the popularity of buying books, the system will change the POP grade automatically such as When book are logged during the first 3 months will be specified as POP Grade 4, If it has a good sale, it will change to the Bestseller grade. But over time when no record sales, system will continue to change as a POP-grade 6.

When know the popularity of the books, the book will be put in areas that have been specified grade of product by Plano-gram principle to manage product on shelves. The books that are popular will be placed in eyesight or a similar position and punching through the heads into the bottom of rack space which is the place for books that are non-moving and not very popular by customers. The position of placing books on shelves has been designed according to principle of management products based on the Plano-gram principle as below picture;

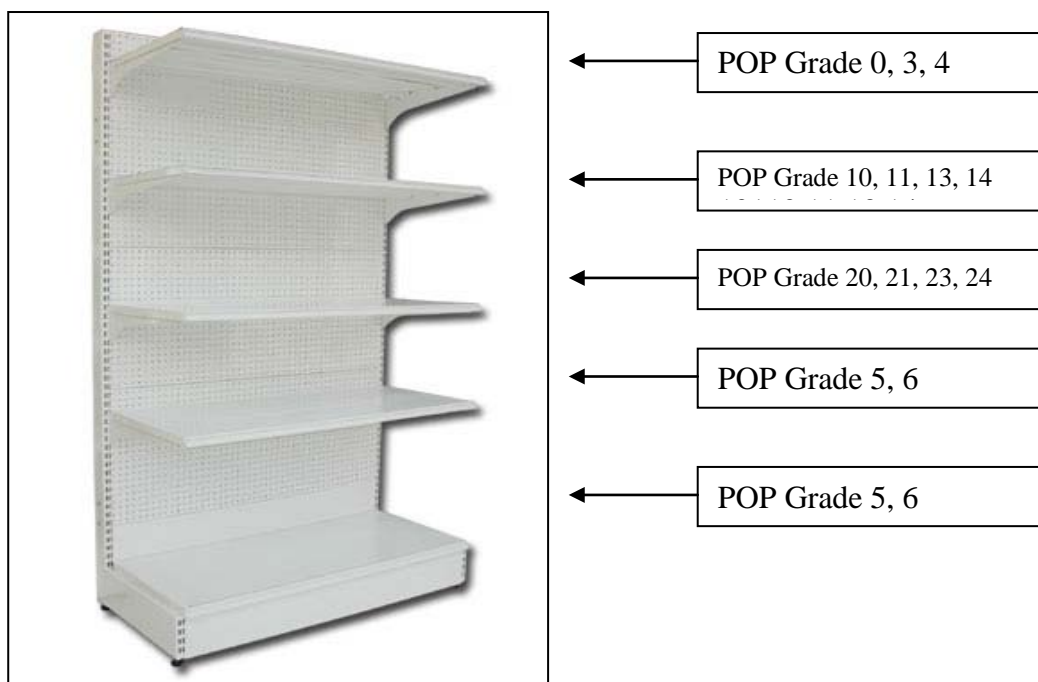


Figure 4.14: Form of books placed on shelves

When receiving officer finish the process of goods receiving, then will print out the location by grades of products to put products in the area as arrangement



Fig 4.15 put away process in retail warehouse

In this fig, operation will display books from pop grade. It is difference from ordinary warehouse that is fix location in warehouse. From IDEF0 can be drawn swim lane diagram that show link of many department in warehouse. Shown in fig 4.1

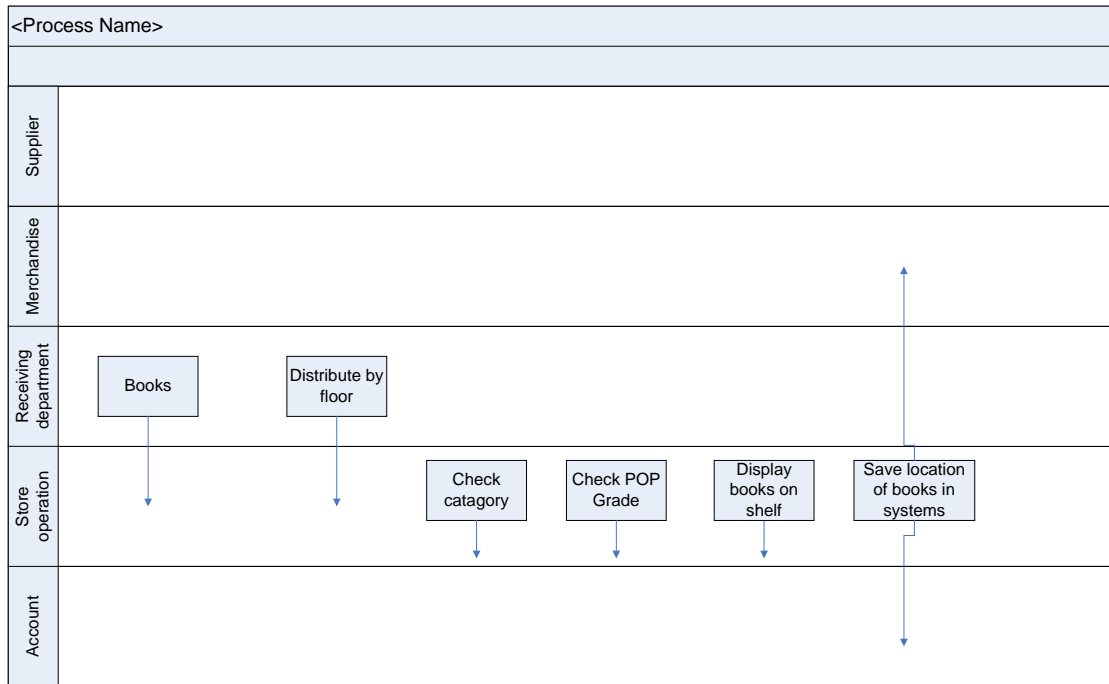


Fig 4.16 put away process in retail warehouse (swim lane diagram)

In this figure, Books are delivered by receiving officer .Seller check category and pop grade of books in systems. They display books in shelf by pop grade. Sellers save location in systems.

### 4.9.3 Step 3: Storages

In part of book storage, after the books were put in the area as specified following the Put away principles. When over time, POP grade of individual books will be changed automatically. Books will not be able to put in the same place at any time. When time passed, POP grade of the individual books will be changed automatically. **Books always will be changed the place.** Therefore, the book will be changed the placement follow the POP grade that change to such as at first books are POP Grade 4, when the 4-month period through no book is sold out. Books are

transformed into a grade 6 (Non-moving). Therefore if the original area at the eyesight, must change the level to the bottom shelves. It needs to monitor every day. When grade is changed, system has to alert book seller to change the area of product placement.

**Function of storage**

- Operation will check pop grade always.
- Operation can change location when they check pop grade.

**Factor**

Storage of goods in Retail warehouse must be dynamic depend on book pop grade. Therefore, important is the system of programs used in the Retail warehouse management must be able to accommodate changes in the grade of product.

**Difference of Ordinary warehouse management**

Normally, period of storage will depend on customer demand by will not change area of books - - that is different from Retail warehouse. Due to Retail warehouse change is always to encourage customers to buy the books.

The difficulty of working is book seller has to intend to modify the location of placement when grade is changed. Step of Storage in retail warehouse is shown in fig 4.14. So the locations of books change always. It delicate by pop grade of books and Plano gram principle.

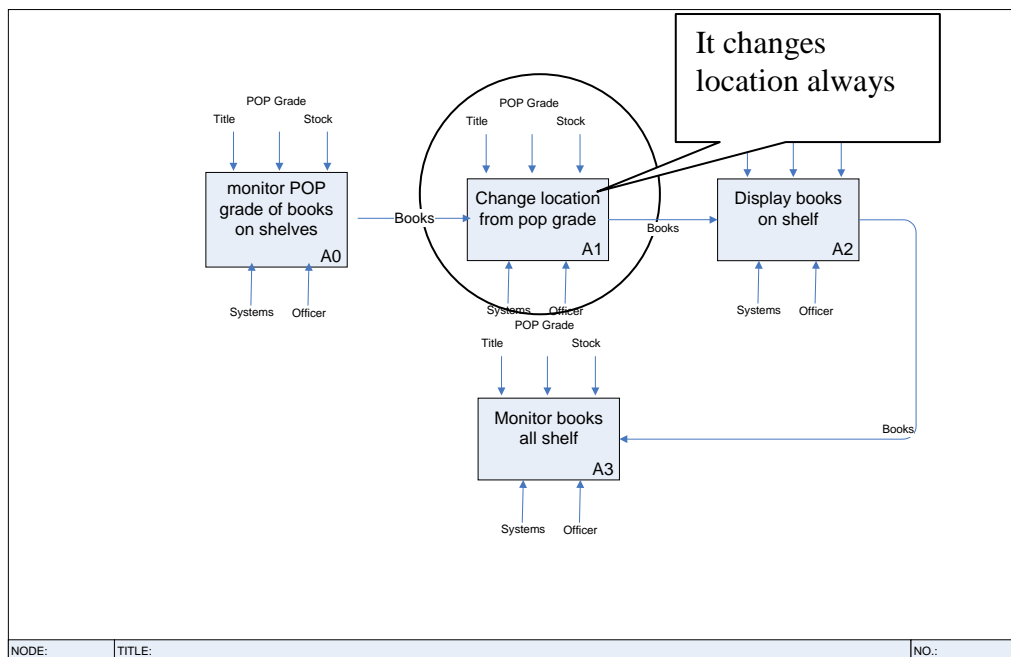


Fig 4.17 IDEF0 diagram: Storage in retail warehouse

In fig 4.7 the difference of retail warehouse is location that changes location always. When pop grade will change, location will change. In storage process can be describe in Fig 4.18. It shows relationship of any department in retail warehouse.

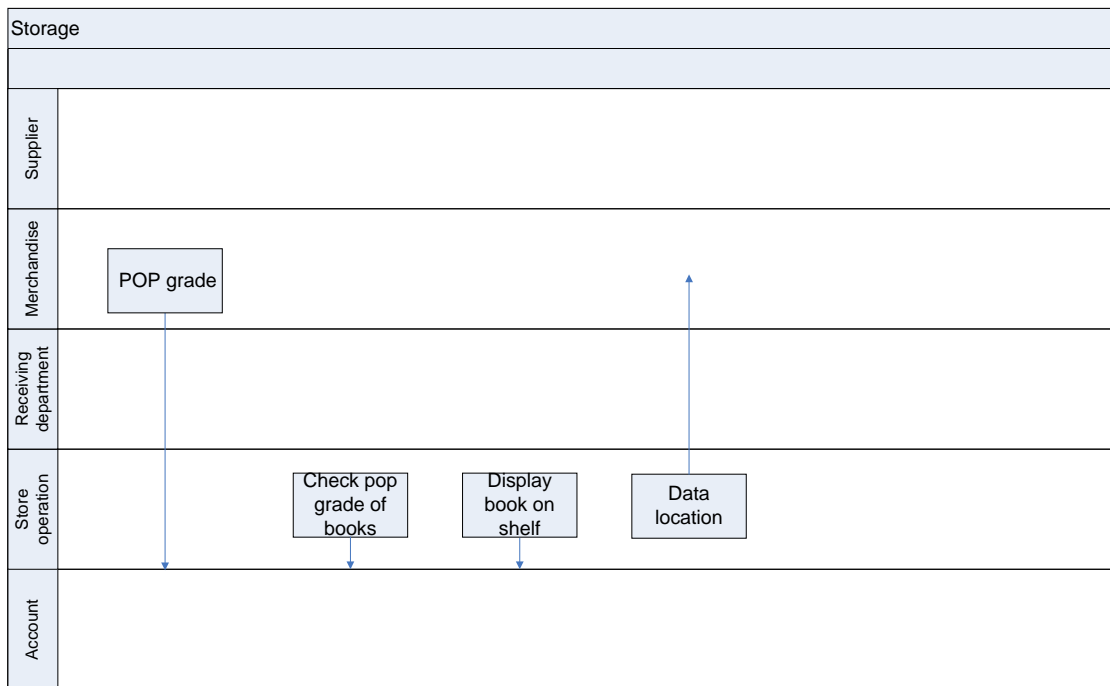


Fig 4.18 Swim lane diagram: Storage process.

In this fig ,the pop grade will be create from merchandiser. And systems can be calculate grade from total sale per title. Operation check pop grade and change location.

#### 4.9.4 Step 4: Order Picking

Order Picking of Retail warehouse is customer picking. Due to particularity of Retail warehouse is product will be stored on shelves. When customers want to buy, they own will pick it from shelf. Therefore, if customers continue to select books on shelves that are linked from the Storage Retail warehouse process. If not change the location of books, customers will not pick books according to demand.

Since most customers want to buy bestselling titles, if location does not change may lose sales opportunities.

**Function of Order Picking**

- Customers will not pick books according to demand from shelf.
- When customer pick books. Stock of books has not decreased.

**Factor of Order Picking**

Book a place to buy must be correct and match categories of goods which are linked from the section of the Receiving Put away and Storage. If a book categories are correct. Customers can select books as needed, result in satisfaction. And above is another important factor, a book must be in place by Plano-gram in order to the customer need to buy goods.

**Difference of Ordinary warehouse management**

Order Picking in Warehouse management is usually caused by a customer order. And, warehouse staff can pick products in warehouse to send to customers. But the Retail warehouse, customers continue to get more than the Order Picking also own Customer Picking. Step of Storage in retail warehouse is shown in fig 4.19

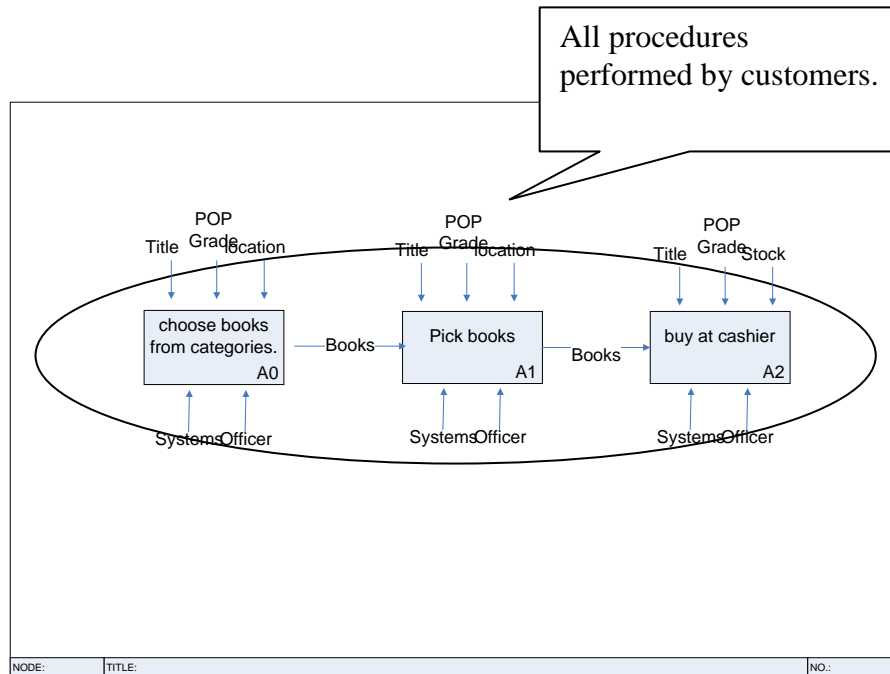


Fig 4.19 IDEF 0 diagram: order picking.

In this fig 4.9 All procedures performed by customers that ordinary warehouse is conducted by staff. In order picking process can be describe in Fig 4.20. It shows relationship of any department in retail warehouse.

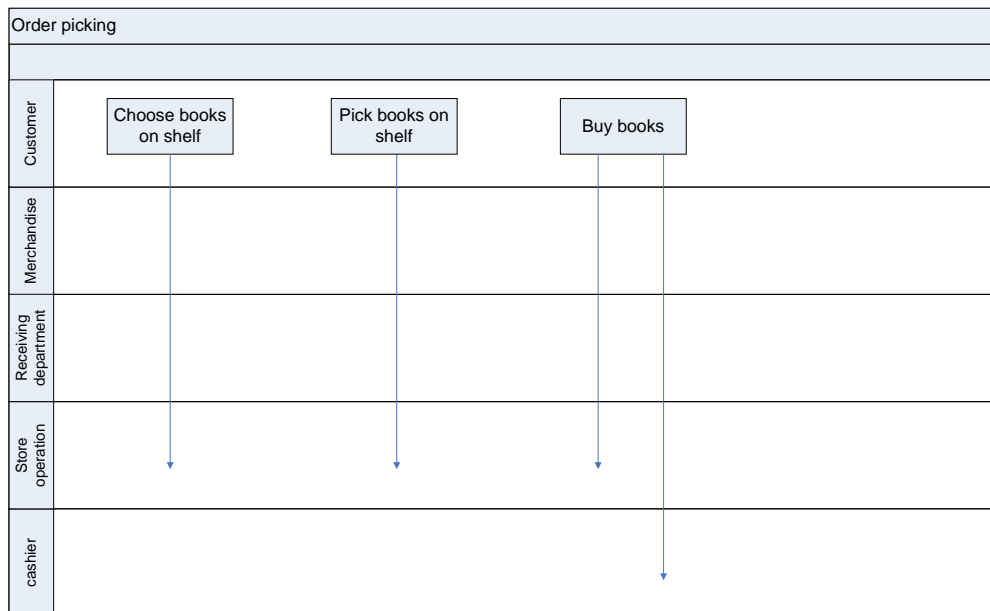


Fig 4.20 Swim lane diagram: Order picking process.

In Fig 4.20 it can show function of work in systems. Procedures performed by customers. Customer will pick books on the shelf, and they pay at cashier themselves.

#### 4.9.6 Step 5: Shipping

The shipping of the Retail warehouse is Cashier Shipping. When customers choose products from shelves, next step is to pay at Cashier before receiving goods and back home. Therefore, in the Retail warehouse Shipping is part of the purchase, books will be sold out. A recording has sold out the book. Make stock of goods decreased, area is placed books will decrease accordingly. The numbers are sold out will be saved to send data to the system to identify those space Location. Resulted in the next step is to export the data to the system. It will be ordered to replenish the shelves full again in the same location.

#### Function of shipping.

- Cashier system must be fast to customer satisfaction occurs.
- Stock of books save in systems.

**Factor is.**

Part of this process, Cashier system must be fast to customer satisfaction occurs. And sales data must be recorded with characteristics that can be used immediately. Information products that are sold to be used as part of the data and storage put away.

**Difference of Ordinary warehouse management**

Normally Warehouse management is the shipping process loaded goods onto trucks. Difficulty is the table of loaded goods. But in Retail warehouse is the Cashier Shipping, customer is to receive goods at the Cashier when receives goods and depart from the shop then. Step of Storage in retail warehouse is shown in fig 4.20

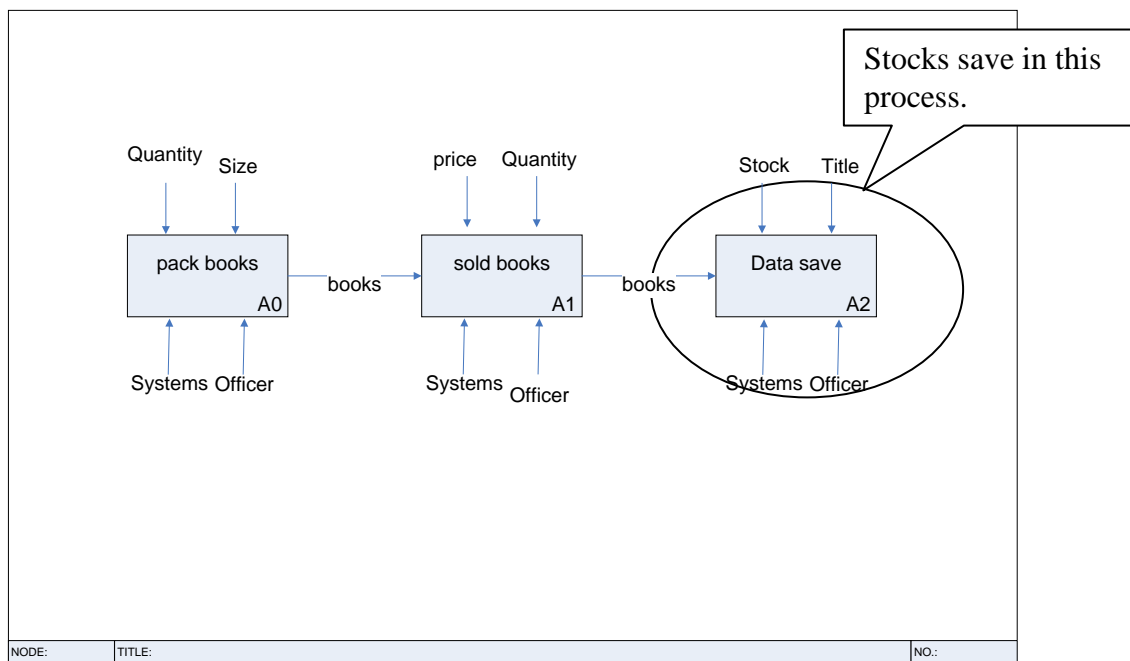


Fig 4.21 IDEF0 diagram: Shipping in retail warehouse.

In fig 4.21, The difference is the recording of stock. Ordinary warehouse, when officers will be picking the stock records immediately. But retail warehouse stock is recorded when payments are completed. In shipping process can be describe in Fig 4.22. It shows relationship of any department in retail warehouse.

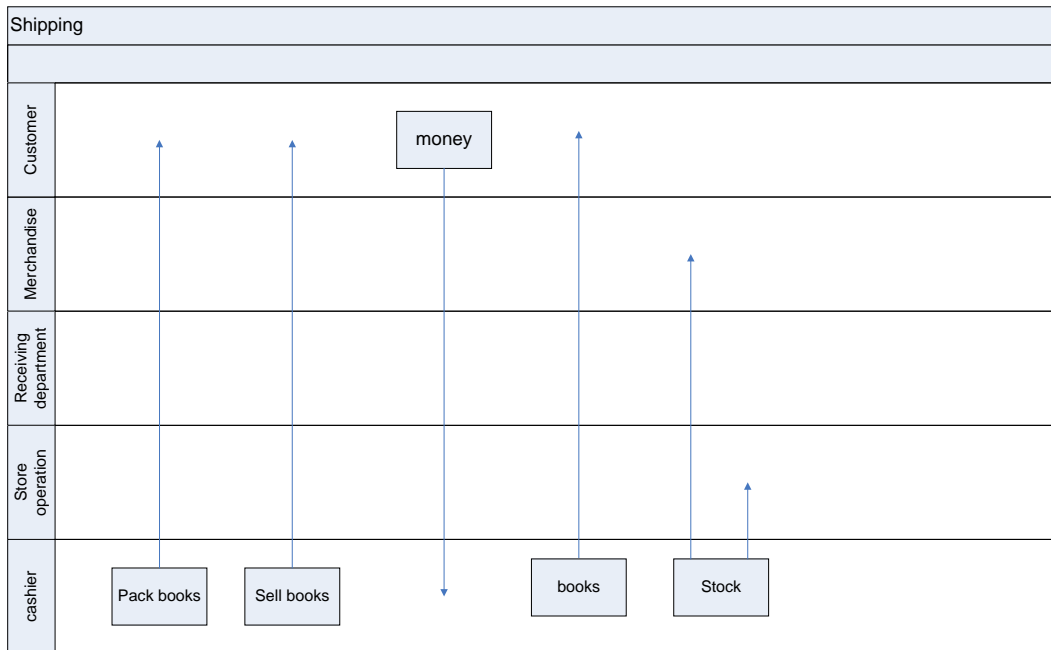


Fig 4.22 Swim lane diagram: shipping process.

In fig 4.22 the relationship in this process. Cashier selling books to customers and save stock of books. Customers pay and pick out books from store. Stock data will be recorded in the system.



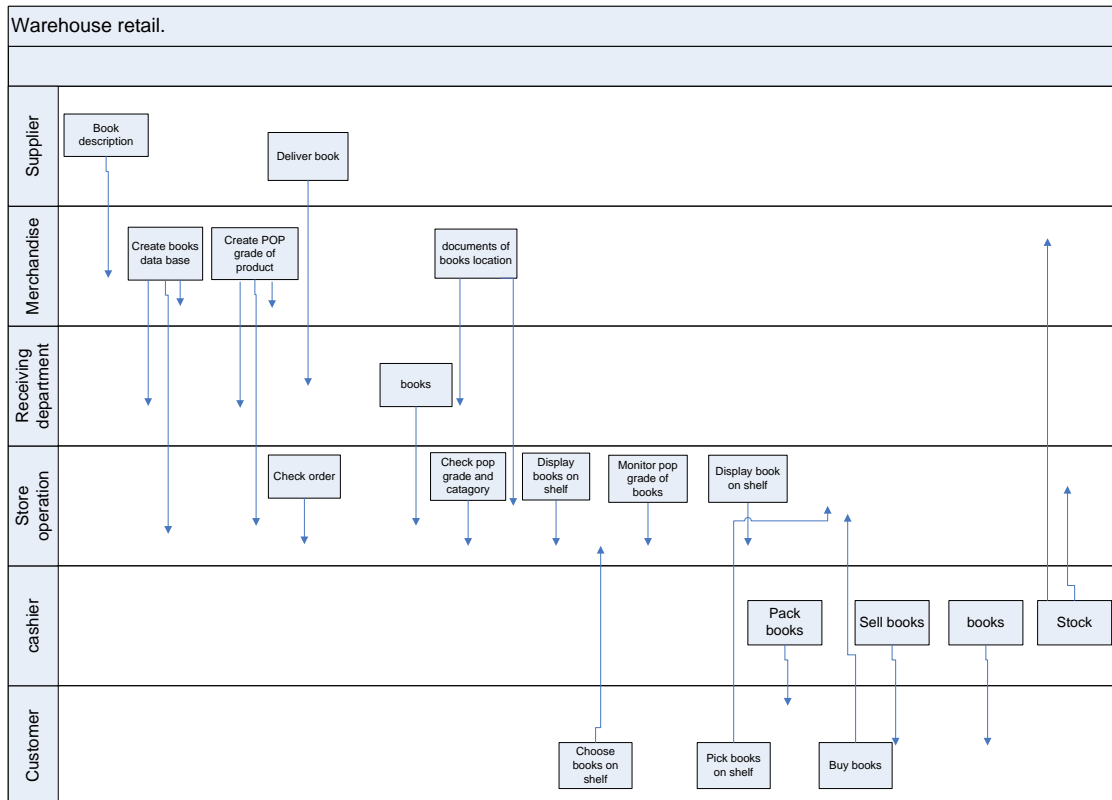


Fig 4.24 Swim lane diagram: The retail warehouse.

Figure 4.23 shows cross function of department in retail . First of all, Supplier send books description to merchandisers. Merchandiser create database of books in systems. Suppliers deliver books to receiving department. Receiving officers check books order from supplier . And then they deliver books to store. Seller displays books by category and they check pop grade of books form systems. Seller display books on shelves and change books location if books are changed pop grade. Customer will choose books by category and they pick books on shelves. Finally they pay books at cashier. Stock of books will be save in systems. Any plans to run a system. In process can delicate key performance indicator of systems that researcher will refer in next step.

Table 4.3 Summary table of differences with Ordinary Warehouse and Retail warehouse.

Warehouse Activity	Ordinary Warehouse management	Retail warehouse	Difference	As-Is	To be
Receiving	Receiving follow the PO / DO when finish, waiting for Put Away.	Receiving follow PO/DO and speed for receiving. Must be done at Put Away once per time.	Speed of Put Away due to meet the customer needs on time.	Step of process, Receiving follow the PO / DO when finish, waiting for Put Away.	Receiving and put away at the same time.
Put Away	Specify types of goods, Specified storage fixed location.	Places to put the book depends on the nature of the selected book of customers for example, best-selling series is on top of shelf and non moving books is be put in the bottom of shelf. Put away in the rack must be specified explicitly cover of each book. Books can be placed directly to the position and the arrangement must be quick.	Each book can not be fixed place. Need to modify their shelves depending on customer needs.	A specified location by type of product that is fixed.	Assigning each shelf to put Best-selling titles and non-moving titles.
Storage	Depending on order and SKU	Depending on the timing of customer needs with best-selling books are stored in the Best Zone area, but when a change of product categories. Area will change immediately.	Depending on the time of product to customer.(pop grade of books)	Space to store unchanged.	Must be modified arrangement in space all time by pop grade.

Table 4.3 Summary table of differences with Ordinary Warehouse and Retail warehouse. (Cont.)

Warehouse Activity	Ordinary Warehouse management	Retail warehouse	Difference	As-Is	To be
Order picking	Discrete order picking / batch order picking	Customer picking	Customers pick and choose products on the shelf own.	Depending on the order that officers will pick up goods themselves.	Customer picking + Customers can find books quickly themselves.
Shipping	Schedule carrier Load vehicle Bill of lading	The cashier pack and send goods to customers with calculate immediately and point of sales must know that this book come from where location.	The cashier is the only order shipping is based on the queue.	Shipping process loaded goods onto trucks by offices.	Shipping at counter cashier, and know the location of the book was sold to real time information to send along to the Put away.

Warehouse management in retail business, It can summaries in table 4.3. That can show a comparison of ordinary warehouse and retail warehouse. Summary of the activities done in the process of warehouse management in retail warehouse by diagrams.

**4.11 Analysis warehouse management software.**

From the Searcher can perform analysis Warehouse management software from International Journal. It can shown the difference ,the functionality of ordinary warehouse management system and Retail warehouse management warehouse system. The overall of process

The overall operation is in the same direction. But there are some process that are different from previous process can be described by many research, they have mentioned a number of warehouse management review (Jinxiang Gu, Marc Goetschalckx, Leon F. McGinnis.) They described the structure of the warehouse management has shown in this figure 2.1

**4.11.1 Analyze warehouse management system by literature review.**

Yan B. analyze on warehouse management for apply RFID Technology in Warehouse Management System. They analyze activity in warehouse management show by flow chart.

**Step 1; Receiving and put away process.**

Yan B. is analysis of warehouse management systems for apply in RFID Technology Applied in Warehouse Management System. It described activity in warehouse management system. Can be explain that receiving and Put away process by literature as follow as this figure.

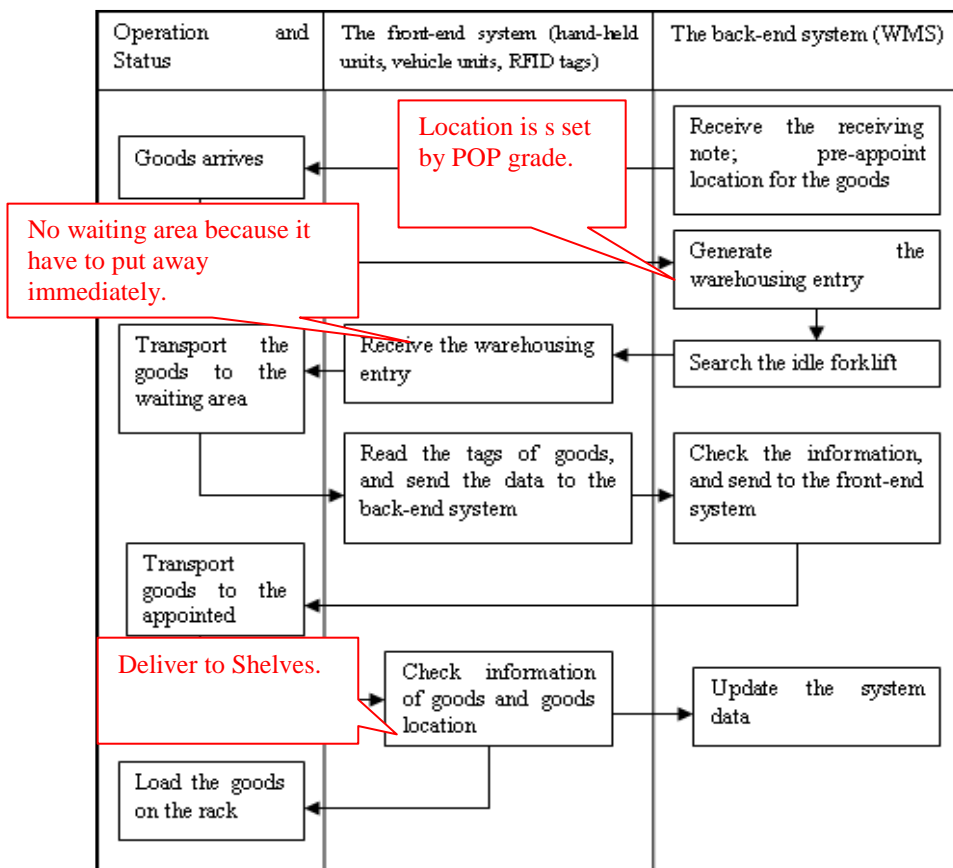


Figure 4.25 Flow of warehousing entry by literature

Researcher already analysis by this chart that can show the difference of retail warehouse and ordinary warehouse in box. The first, retail warehouse don't have waiting area because it have to put away immediately. The second, location is set by pop grade. The third, Receiving officer deliver to shelves and no need to deliver to rack before send to the warehouse.

**Step 2 ; The flow of picking operation.**

Researcher already analyzed the difference in picking operation between ordinary warehouse management system and retail warehouse management system by review literature from international journal , see in figure.

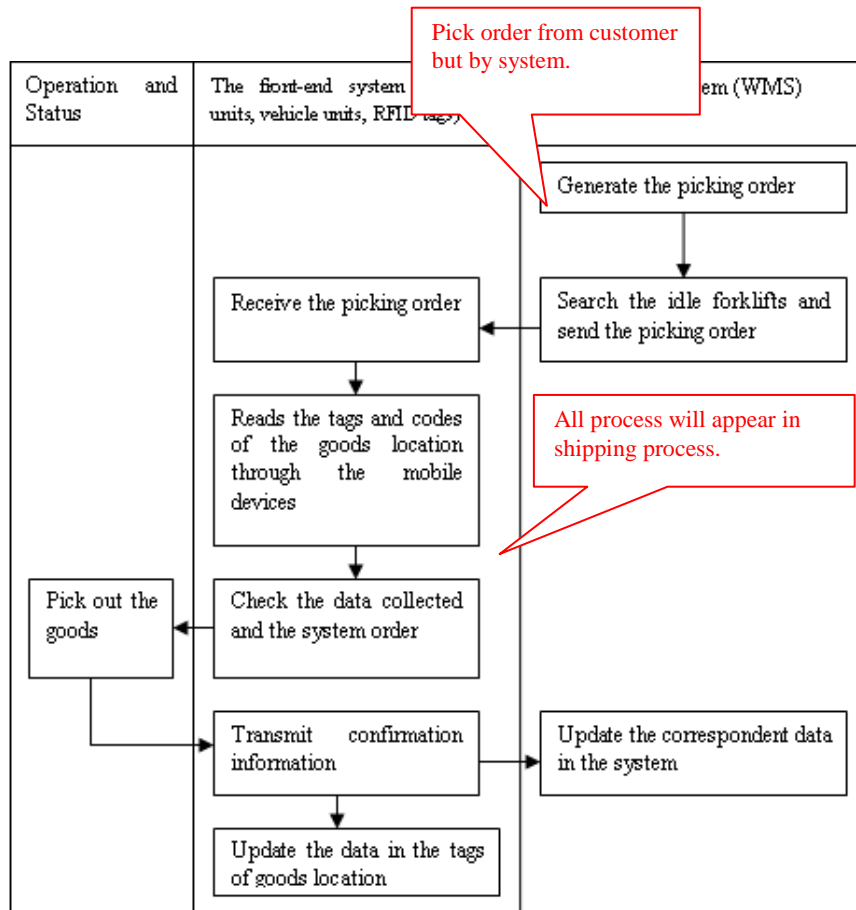


Figure 4.26 Operation flow of picking goods by literature

It can show the system of warehouse management system and the most function will be appentence in shipping process.

**Step 3 ; The flow of storage process. (stack tracking)**

Researcher already analyzed the difference in storage process in systems between ordinary warehouse management system and retail warehouse management system by review literature from international journal , see in figure

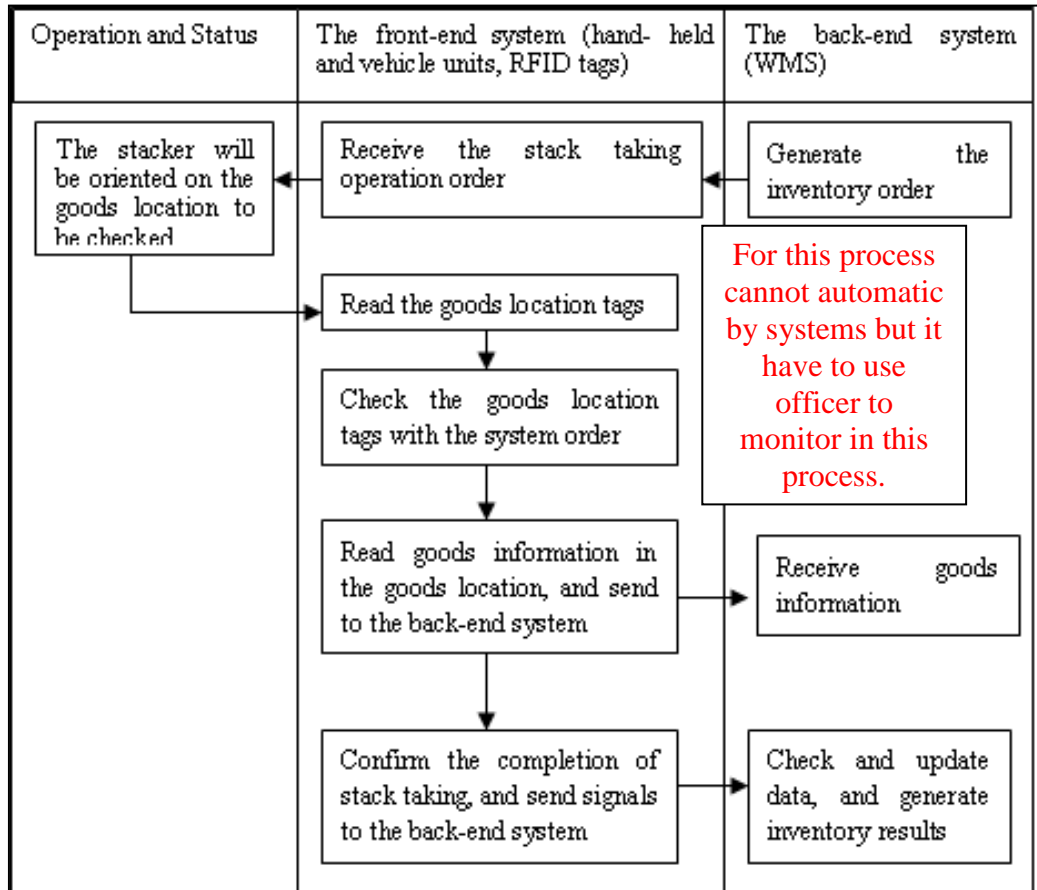


Figure 4.27 Operation flow of storage by literature

In this figure, See the process that same as retail warehouse some function but not all process. It relates with the fix location but retail warehouse cannot be fix location.

**Step 4 ; The operation flow of goods delivery**

Finally, Researcher already analyzed the difference in shipping between ordinary warehouse management system and retail warehouse management system by review literature from international journal , see in figure

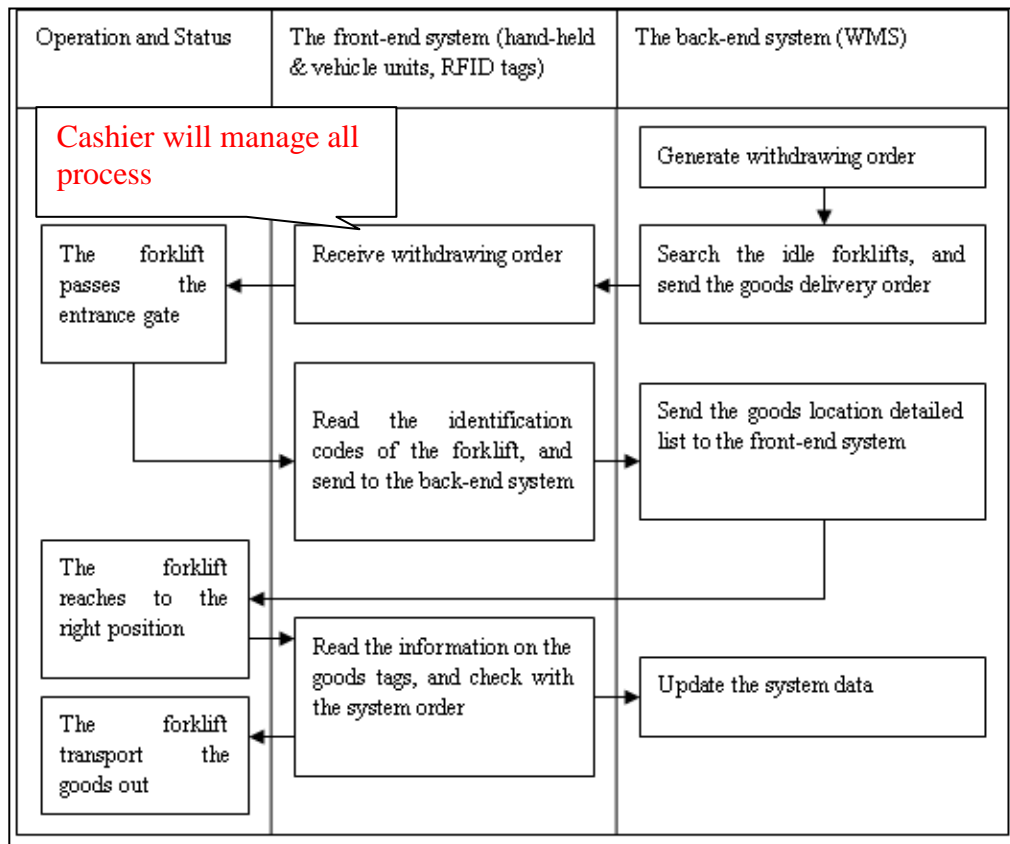


Figure 4.28 Flow of goods delivery

From the difference of shipping process. The main of operation is cashier, they will manage in all process. At back end systems, it will save stock ,data and location of good that customer already bought it from cashier point.

**4.11.2 Analyze warehouse management system by market software.**

From exiting data, researcher can be descript the difference between ordinary warehouse and retail warehouse by review literature (Bo Yan). It can summarizes ordinary warehouse process of international WMS.And researcher will analyze WMS that sold on website (market software). It can ne find on internet or general warehouse software shop. They already analyze program by data flow diagram. Then researcher will use this flow to analyze the difference of retail warehouse software as follow as.

This program are created by NANO company, NANO software. The advantage of this software as follow as ;

- Features of warehouse management systems :
- Paperless Receiving and Picking using bar Code.
- Maintain customer and vendor databases
- Items are tracked to a location
- Maintains complete history of item life cycle
- Prints bar codes: Print Item, location, and custom bar code labels
- Inventory reports
- Supports unlimited Sites, Locations, and Items
- Auto control Inventory (Automatic reminders when a new order needs to be placed)
- User Defined Fields - Facility to customize Location and Item screens.
- Database backup as per schedule.
- User Management and User Access Control
- High Security of inflow and outflow data
- Web based solution - can be accessed from intranet/internet
- Various reports like Inventory Report, Item Reports, Order Reports etc. It can be generated based on user defined criteria

**WMS Nano Details( System Requirement) :**

.Net framework 2.0 or above, IIS 5.1 or above, MS-SQL 2005, MS-SQL 2005 Compact Edition Server Tools, Microsoft ActiveSync

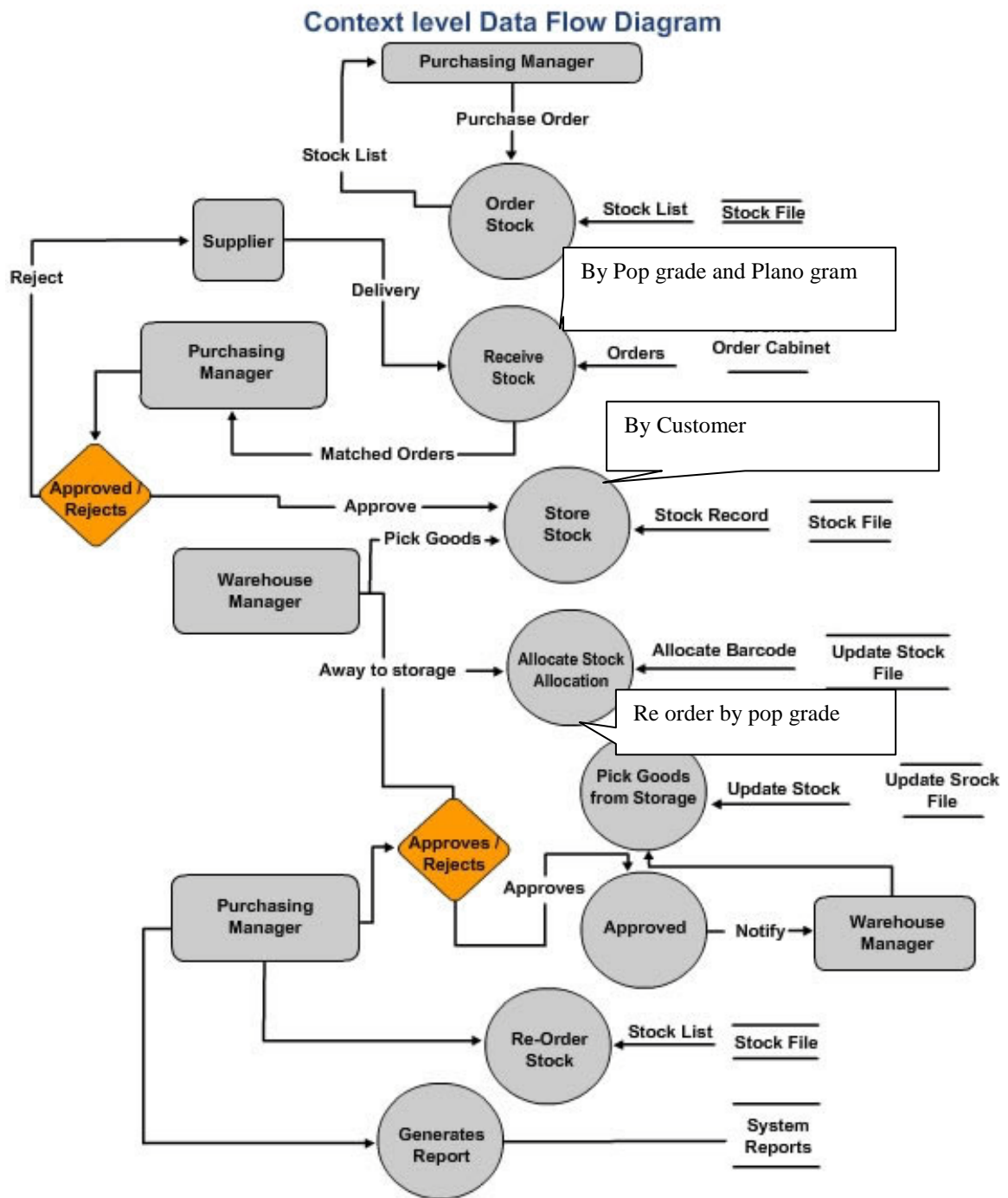


Figure 4.29 : Dataflow diagram by Nano software WMS.

Allocate stock location process in ordinary warehouse that same as retail warehouse. But retail warehouse have to use POP grade in this process. In picking

process of ordinary warehouse cannot manage by officer but have to manage by customer. Reorder process in ordinary warehouse have to manage by sale order from customer that analyze by pop grade. POP grade is major function in retail warehouse. Purchase order in retail warehouse manages by Pop grade.

But market WMS software cannot support retail warehouse. It cannot support some function in retail warehouse such as reorder in system, manage stock location. If we want to use market software in retail warehouse. Researcher have to improve in detail that can be use in this warehouse.

#### **4.11.3 Analyze warehouse management system by Oracle warehouse management system.**

Researcher will analyze basic warehouse manage system software. Many company will use in their organization such as oracle , SAP etc. Researcher will use oracle WMS for compare retail warehouse process and ordinary WMS process in this software by flow process chart.

##### **Step 1; receiving process in oracle warehouse management system.**

Researcher already analyzed the difference in picking operation between ordinary warehouse management system and retail warehouse management system by oracle WMS, see in figure

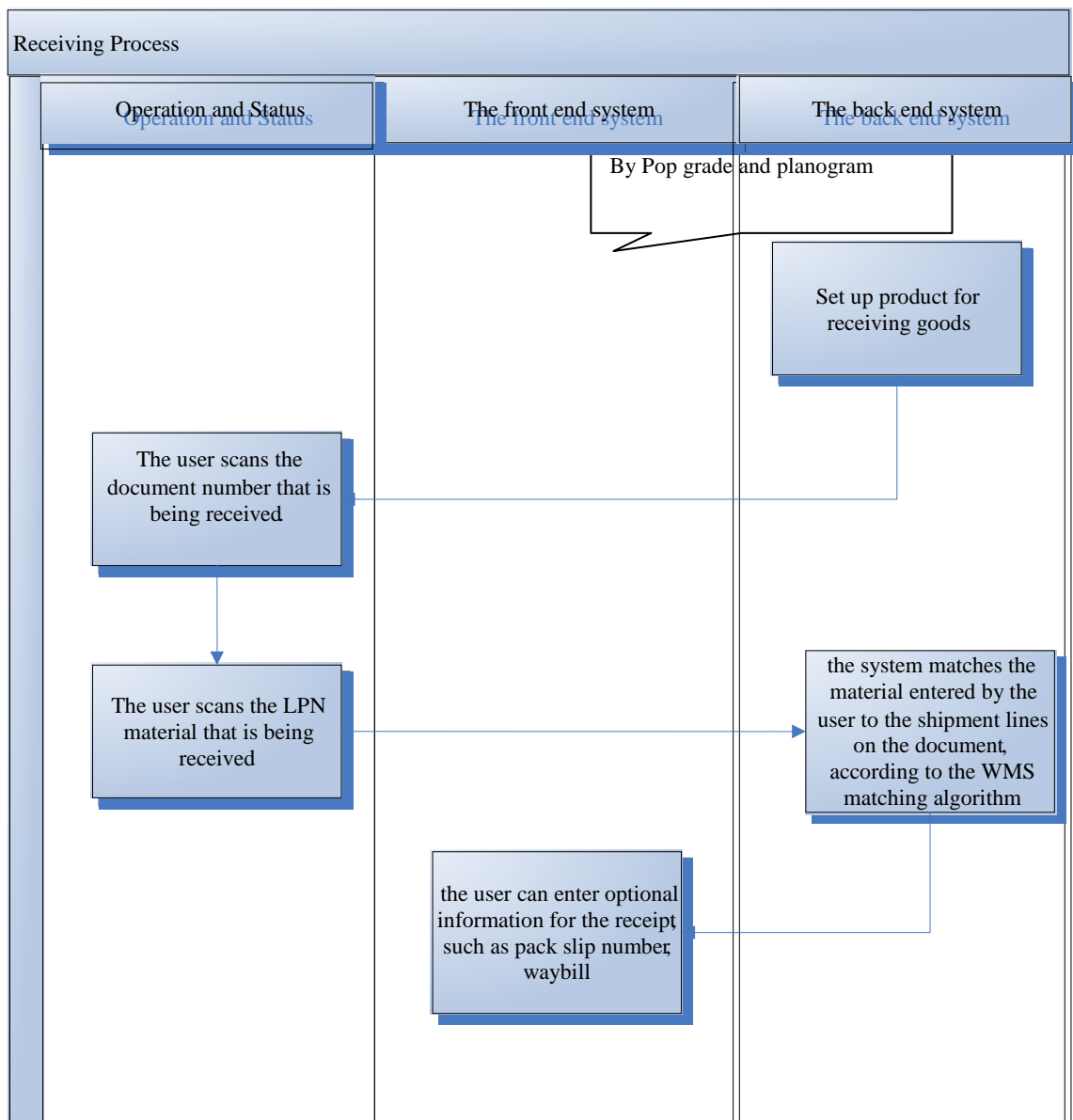


Figure 4.30 : Flow process chart of Receiving process (Oracle WMS)

From this figure, It can summary oracle WMS process in receiving process. It descript when the user interacted with the system from starting program to ending program as below,

1. The user scans the document number that is being received.
2. The user scans the LPN material that is being received into. Optionally, the user

3. Can request a new system-generated LPN through a hot key on the mobile device.

4. The received material is scanned, including the item numbers, quantities, lots and serials.

5. The user can select the <Next Item> option to continue receiving again the same document, or he or she can select the <Done> option to proceed to the receipt header.

6. At this point, the system matches the material entered by the user to the shipment lines on the document, according to the WMS matching algorithm.

7. On the receipt header page, the user can enter optional information for the receipt, such as pack slip number, waybill, and so on, or can select <Done> to complete the receipt.

Can be showing the window of WMS in receiving process. The first step in receiving process is set up database before supplier deliver product into warehouse.

Name	Enabled
Inventory Organization	<input checked="" type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>

Others

Figure 4.31 Set up database in receiving process.

Detail in receiving process, the window of system have to fulfill data detail in system can show in this figure.

The screenshot shows the SAP Master Item (V1) configuration window for 'CLS Strawberries'. The organization is 'V1 Vision Operations'. The item is 'CLS Strawberries' with description 'CLS Strawberries Item'. The 'Display Attributes' section has 'Master' selected. The 'Physical Attributes' tab is active, showing various control options:

- Transactable
- Check Material Shortage
- Cycle Count Enabled
  - Negative Measurement Error: [ ]
  - Positive Measurement Error: [ ]
- Serial**
  - Generation: **No Control**
  - Starting Prefix: [ ]
  - Starting Number: [ ]
- Restrict Subinventories
- Restrict Locators
- Material Status Control**
  - Lot Status Enabled
    - Default Lot Status: **Active**
  - Serial Status Enabled
    - Default Serial Status: [ ]
  - Lot Split Enabled
  - Lot Merge Enabled
  - Bulk Picked
- Network Logistics**
  - Network Logistics Trackable
    - Asset Creation: [ ]

Figure 4.32 fill data of product in system.

The finally, Officer will save data base in systems. Can be show in this figure.

The screenshot shows the SAP Receiving Options (WH3) configuration window. It is divided into several sections:

- Receipt Date**
  - Days Early: **3**
  - Days Late: **2**
  - Action: **None**
- Over Receipt Control**
  - Tolerance: **10** %
  - Action: **Warning**
- Receipt Number Options**
  - Action: **Automatic**
  - Type: **Numeric**
  - Next Receipt Number: **412**
- Miscellaneous**
  - Allow Substitute Receipts
  - Allow Unordered Receipts
  - Allow Express Transactions
  - Allow Cascade Transactions
  - Allow Blind Receiving
  - Receipt Routing: **{Standard Receipt}**
  - Enforce Ship-To: **Warning**
  - ASN Control Action: **Warning**
- Receiving Inventory Account: **01.000.1412.0000.000**
- Account Description: **Operations.Balance Sheet.Inventory Assembly/FG Ma.No Sub /**

Figure 4.33 Key data for receiving process.

In oracle warehouse management system have some function that are difference. And next step researcher will analyze put away process that is normal process in warehouse management system.

**Step 2 ; put away process in oracle warehouse management system**

Researcher already analyzed the difference in put away between ordinary warehouse management system and retail warehouse management system by oracle WMS, see in figure

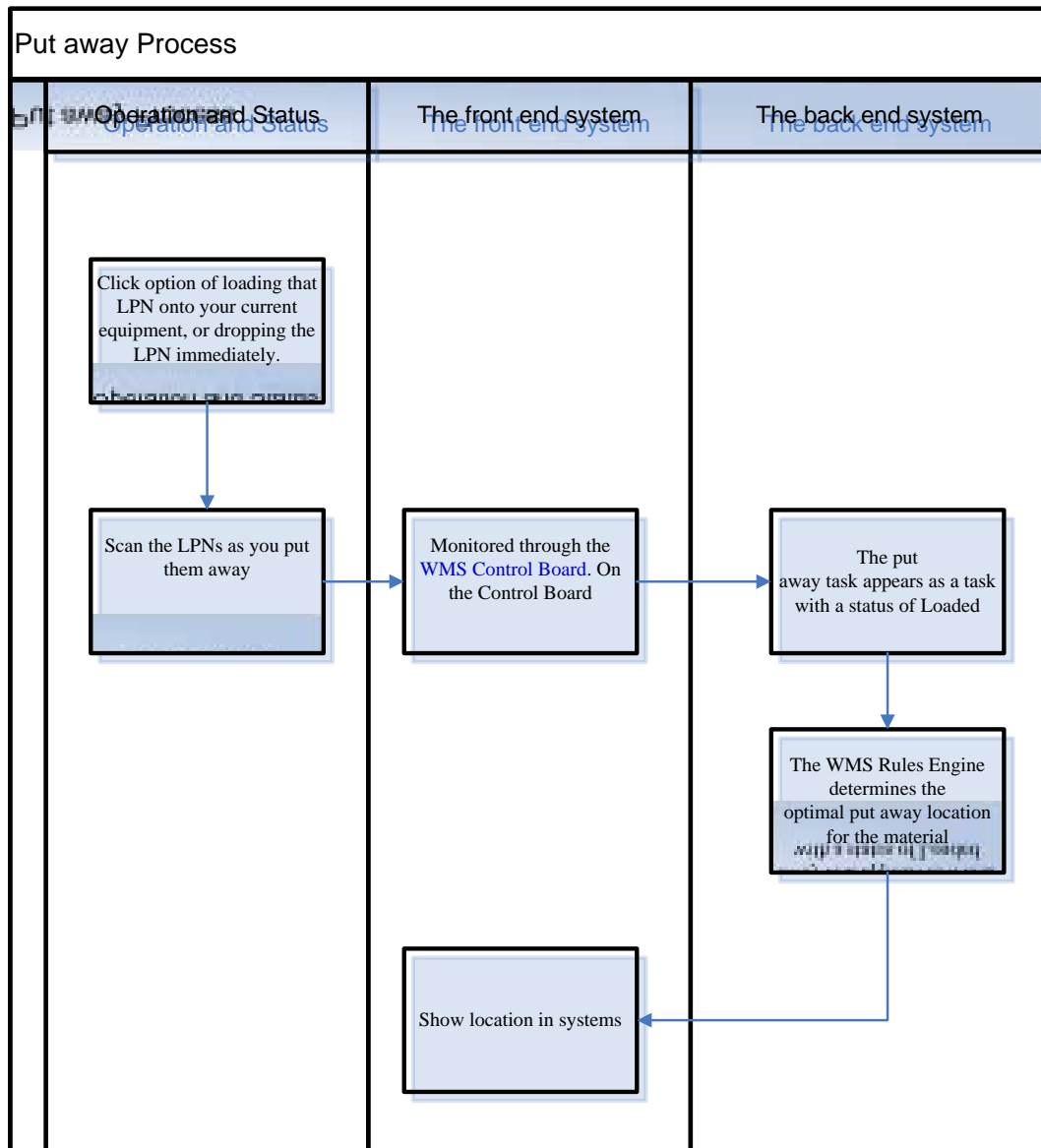


Figure 4.34 : Put away process in Oracle WMS

This process can be show in this figure, it show the step of work in systems. When officer see the window can work from this figure.

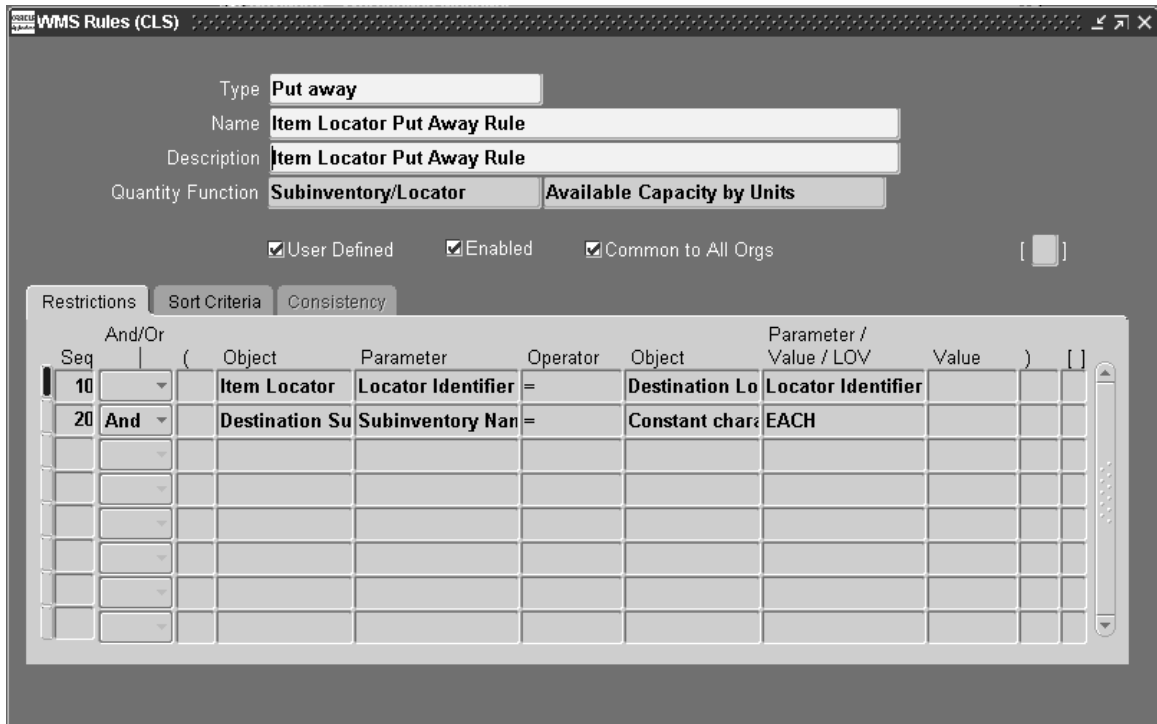


Figure 4.35 windows to show the put away process.

**Step 3: Order picking process by oracle warehouse management system.**

1. The user can confirm a pick by scanning one or more LPNs to load. If the material in the storage locator is not identified with an LPN.
2. The user must confirm the item, quantity, and the storage sub inventory, and locator to confirm the pick.
3. The user can also unpack an LPN to fulfill the pick, however if the pick units of measure are appropriately established during system setup, unpacking an LPN to fulfill a pick, should not be necessary.
4. The user can also pick the items or the whole LPN into another larger LPN (like a pallet or carton), thus building a package that can be shipped during the picking process. If carbonization is enabled, the user will also see the container suggestion in his or her task queue, can be show the window as follow as;

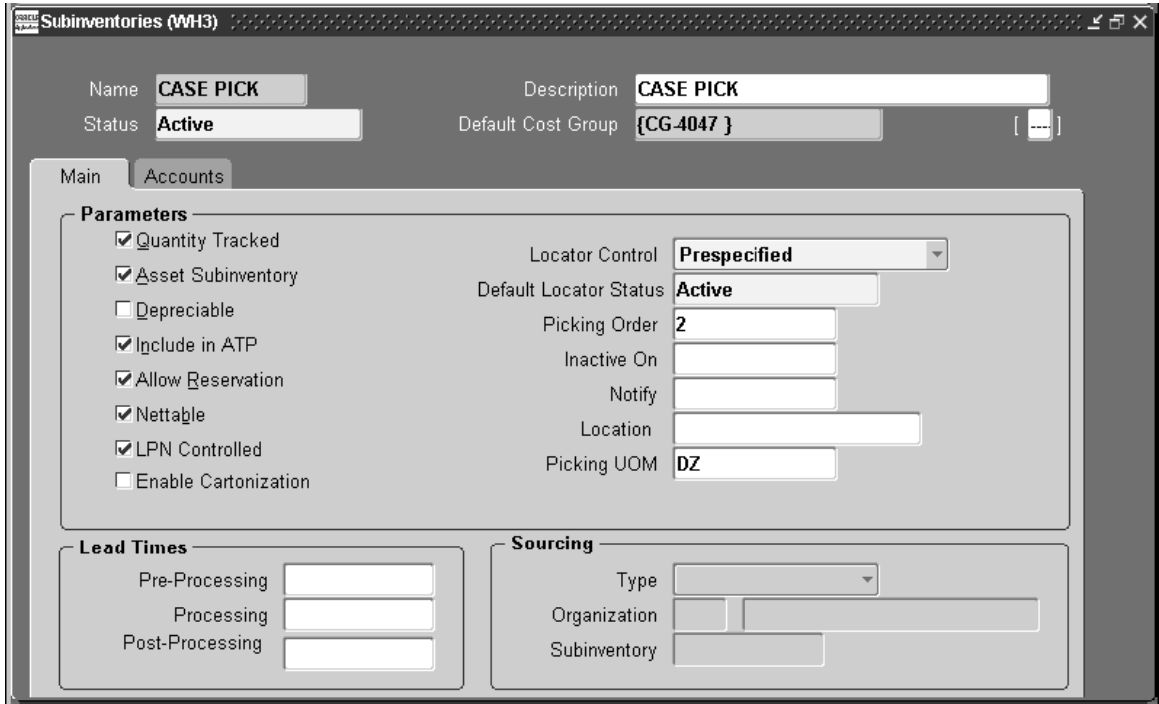


Figure 4.36 Picking operation of oracle WMS.

From this figure, It can show how to find location in systems before pick good from warehouse.

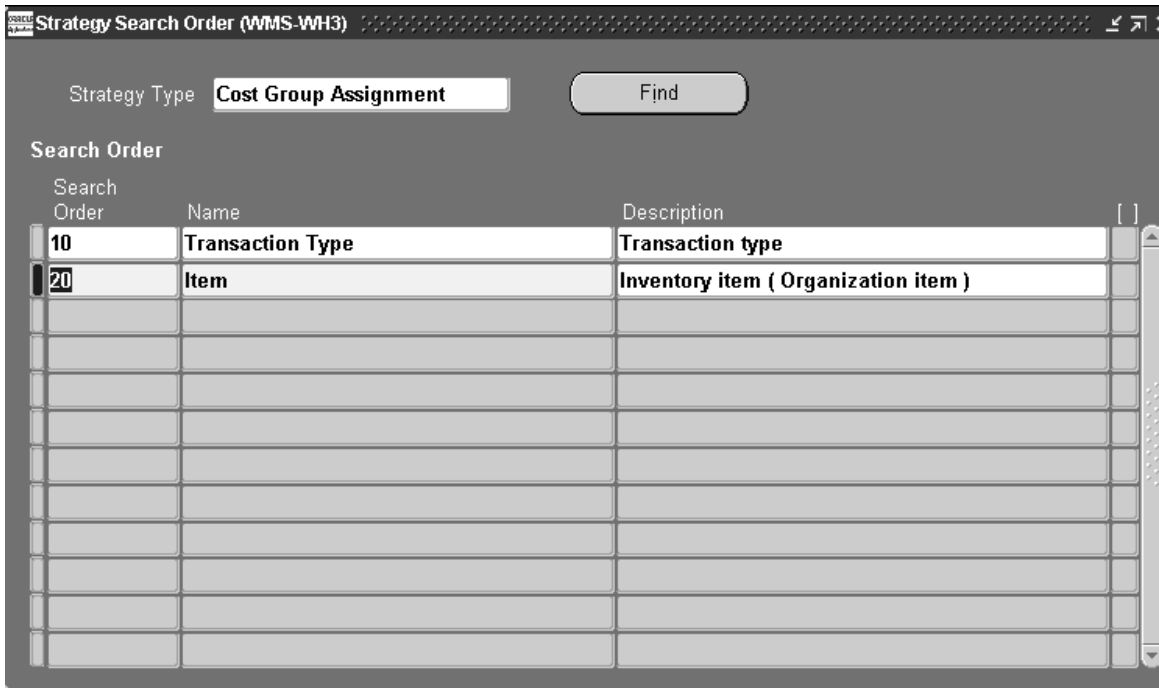


Figure 4.37 How to search data in systems.

From this figure, User will search data base of goods to find the location and then they will pick goods and save in system.

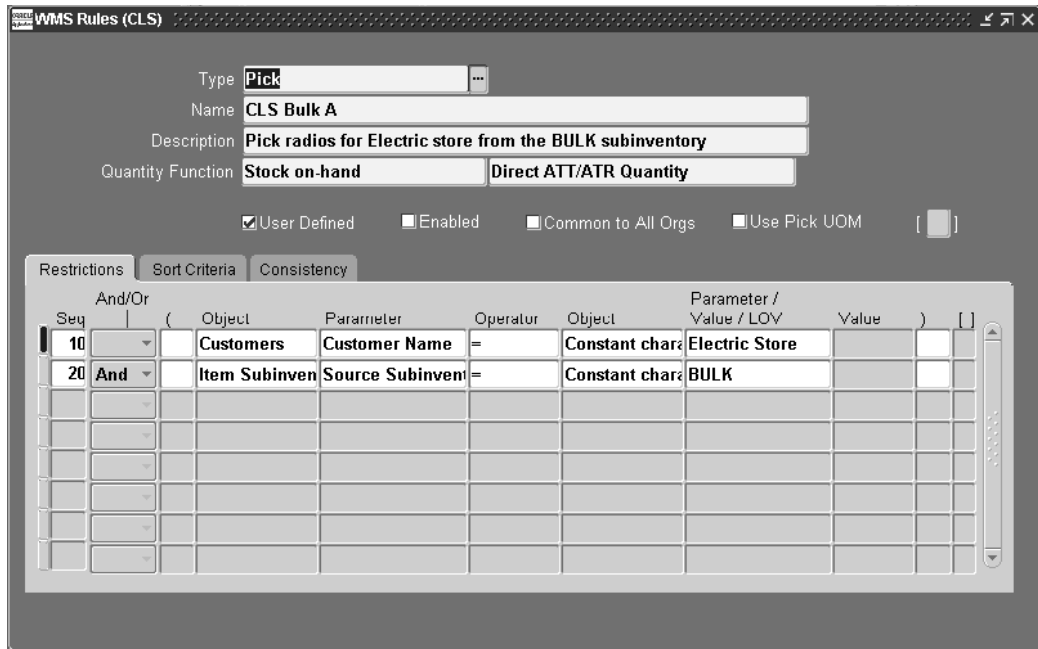


Figure 4.38 How to save customer data in system.

**Step 4 ; Shipping process of oracle warehouse manage system.**

Shipping process is the final operation in warehouse manage process. Researcher already analyzed this process from use guide of Oracle WMS and translate to flow process chart. It can be show in this figure

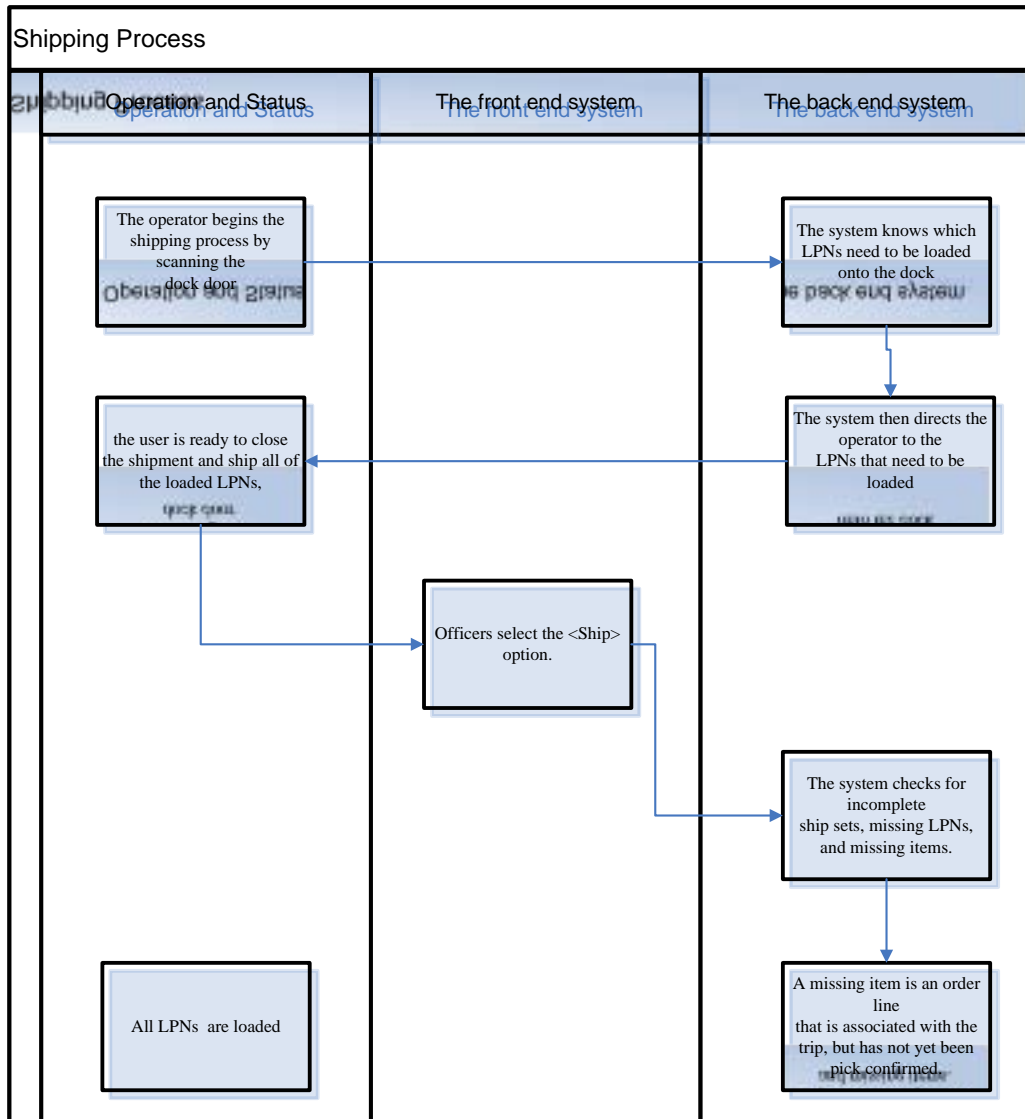


Figure 4.39 Shipping process of Oracle warehouse management system.

But in oracle warehouse management systems can describe the shipping process as follow as,

1. The operator begins the shipping process by scanning the dock door. Because that dock door is scheduled for a trip, the system knows which LPNs need to be loaded onto the dock. The system then directs the operator to the LPNs that need to be loaded. The system does not require loading in any specific order.

2. When the user is ready to close the shipment and ship all of the loaded LPNs, he or she selects the <Ship> option. At this point, the system checks for incomplete ship sets, missing LPNs, and missing items.

3. A missing LPN is a LPN that has been staged for shipment, but not loaded on the truck. A missing item is an order line that is associated with the trip, but has not yet been picking confirmed.

4. After all LPNs are loaded, the user can enter any header level information about the shipment, and the trip is then ship confirmed Shown in this figure

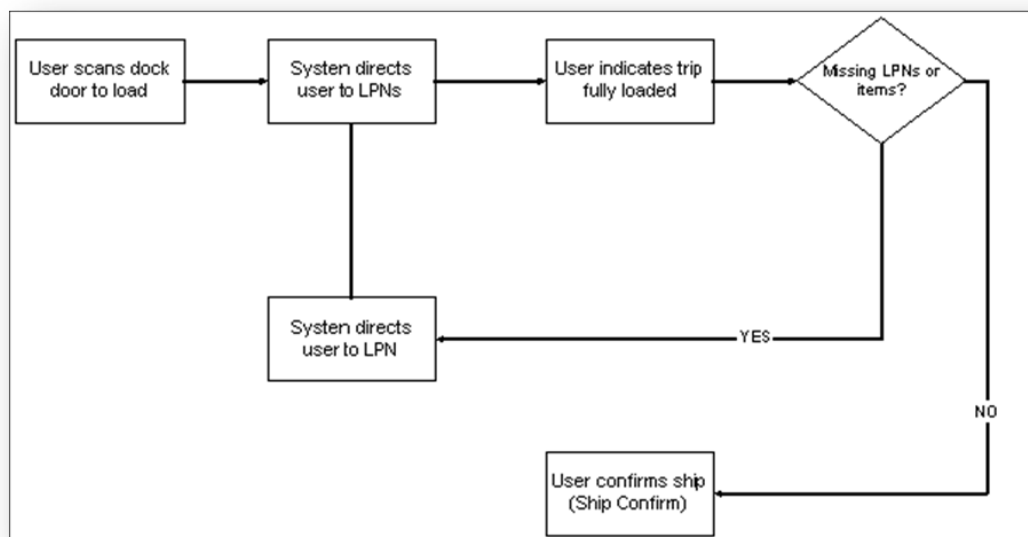


Figure 4.40 Shipping process of Oracle warehouse management system. (2)

If all of the information has been entered appropriately, the operator can enter any header level information, such as weight, waybill, or carrier (if it was not known before) and then select the Ship Confirm option to confirm the shipment.

Researcher already analyzed 3 source of warehouse management system by tool of engineering such as Flow process chart data flow diagram. When we know process of warehouse management system, next step we will create system flow diagram to describe function of retail warehouse for create prototype Retail WMS for retail warehouse.

#### 4.12 Summary the difference of retail warehouse.

Researcher already summary the difference from above between ordinary warehouse management system and retail warehouse management system. And next step, It can shown the summary process by the table as follow;

Table 4.4 The difference between ordinary warehouse and retail warehouse (Receiving Process)

The Difference WMS Receiving Process	
Ordinary Warehouse management Systems	the Difference
After receiving the delivery order from the sender, the back-end system will dispatch an electronic code for each individual goods according to the goods attributes, write in the chipset of the electronic tags, then appoint correspondent position for each goods, and generate receiving order according to the operation requirements	Characteristics for a similar product, but will focus on speed of operations using barcode will be received by the consumer is not a book was a lot like a general warehouse.
The back-end system will generate the warehousing entry, search idle forklifts through the wireless network, then write the correspondent identification electronic codes in the warehousing entry, and send to the front-end system.	The back-end system will generate the warehousing entry by adding POP grade of product identification electronic codes in the warehousing entry, and send to the front-end system.
When the front-end system receives the warehousing entry, the driver will drive the forklift to transport the goods to the waiting area. When the forklift passes the antenna area, the fixed reader will read the goods tags in batch and send to the back-end system, which will check the goods information with the warehousing entry, then send the detailed statement of the goods to the control computer on the vehicle units through the wireless network according to the goods storage position pre-set in the system, and open the navigation light on all appointed goods locations.	When the front-end system receives the warehousing entry, Officer will send goods to store by manual and seller will cheak with document to spicify the location. And no Waiting area for docking but retail warehouse must deliver immediatly. It manage by POP grade and Planogram in retail warehouse system.

Table 4.5 The difference between ordinary warehouse and retail warehouse (Put away Process)

The Difference WMS Put away Process	
Ordinary Warehouse management Systems	the Difference
The driver will reach the appointed position according to the indication of the navigation light and the detailed statement of the goods displayed on the vehicle display, read the goods tags of the waiting area through mobile devices, and send data to the front-end system, which will check the data collected with the system order, then instruct the driver to transport the goods to the appointed waiting area.	Products will be sent to the Shelf instantly available from the specified POP grade and Plano gram.
The front-end system will send the confirmed data to the back-end system. After obtaining the data, the back-end system will update the correspondent system data, indicate the current position of goods, and close the correspondent navigation light.	-
After all goods loaded, the driver will push the “Affirmation” button, indicating all goods have been received. The back-end system will obtain the identification electronic codes of the forklift, check whether all goods are loaded or not, whether the forklift is idle or not. After confirmation, the system will dispatch the forklift into the “idle forklift”, and wait for the next order.	-

Table 4.6 The difference between ordinary warehouse and retail warehouse (order picking Process)

The Difference WMS Order picking Process	
Ordinary Warehouse management Systems	the Difference
The back-end system will generate picking orders according to business requirements	Not generate from system but from customer
The back-end system will search idle forklifts through the wireless network, and send picking operation order to the forklifts	Customers will search from systems themselves.
The front-end system will receive the picking order. The driver reads the tags and codes of the goods location through the mobile devices, and sends to the front-end system	Customers pick from goods form shelf.
The front-end system checks whether the data collected are matched with the system order or not. If confirmed, the system will send order to the driver to transport the goods out of the warehousing area	Customer search location and find good them selves.
The RFID system will update the data in the tags of goods location in the warehousing area. The front-end system will send the results to the back-end system through the wireless network, and the back-end system will update the correspondent data in the system.	When customer pick. Systems cannot be save stock real-time.

Table 4.7 The difference between ordinary warehouse and retail warehouse (Storage Process)

The Difference WMS Storage Process	
Ordinary Warehouse management Systems	the Difference
The back-end system will generate stack taking orders according to the business requirements, and send the inventory order to the front-end system to conduct stack taking on some part or the whole warehouse.	Systems change POP grade status always from sale of good.
After the front-end system receives the inventory order, the stacker will be located on the goods location to be checked, and the back-end management system will control the reader to begin its operation through the wireless network, and read the data in the pallet tags wirelessly.	When operation read pop grade from system. They can change location from pop grade by planogram.
The readers will read the tags of the goods locations in the warehousing area, obtain the book quantity of goods in the current goods location, and send to the front-end system. The front-end system will check whether the data collected is matched with the system orders. If confirmed, the system will continue to send orders to read the bar codes of goods in the goods location.	Operation always check pop grade and location.
The real quantity of goods and other information will be sent to the back-end system through the wireless network.	POP grade can analyze from sale order.
The front-end system will send operation completion signals to the back-end system after operations are finished according to the stack taking operation order.	Operation save data when location are changed.
After receiving the signals, the back-end system will process the data collected, and check with the original storage record, then generate the inventory result.	-

Table 4.8 The difference between ordinary warehouse and retail warehouse (Shipping Process)

The Difference WMS Storage Process	
Ordinary Warehouse management Systems	the Difference
The back-end system will generate the withdrawing order based on business requirements, search idle forklifts through the wireless network, and then assign the withdrawing operation order.	-
After the front-end system receives the withdrawing order, the back-end system will obtain the identification electronic codes when idle forklifts are driven through the warehouse entry gate with readers, send the detailed list of goods to be delivered to the vehicle computer, displaying to the driver on the vehicle screen, and open the goods location navigation light.	Cashier check goods from customer. And they pack goods
The vehicle antenna will identify the goods location navigation indicator on each rack, and the display will display the detailed list of goods to be unloaded when reaching the right position.	It will show the slip when customer purchase and it will send the stock in back end systems. System save quantity of good.
The vehicle units will read the tag information of goods in the goods location according to the direction of the display, and send to the front-end system. The front-end system will check whether the data collected are matched with the system order. If confirmed, the system will direct the driver to transport the goods to the appointed delivery area.	Customer receiving goods from cashier. No need to calculate the truck schedule.
The front-end system will send the data confirmed to the back-end system, and then the latter will update the system data, and close the navigation light on the goods location that goods have been delivered.	-

### **4.13 The flow of the retail warehouse system.**

The flow chart is a schematic representation an algorithm or a process. It is a visual representation about the sequence of the content in the new system. A box is used to indicate the process step. A diamond represents a logical condition and arrows show control as illustrated. Researcher already analyzed the flow process in retail warehouse management system from the difference from above. It shown the process of activity in retail WMD between system and human that happen in this process.It can shown in this chart as below;

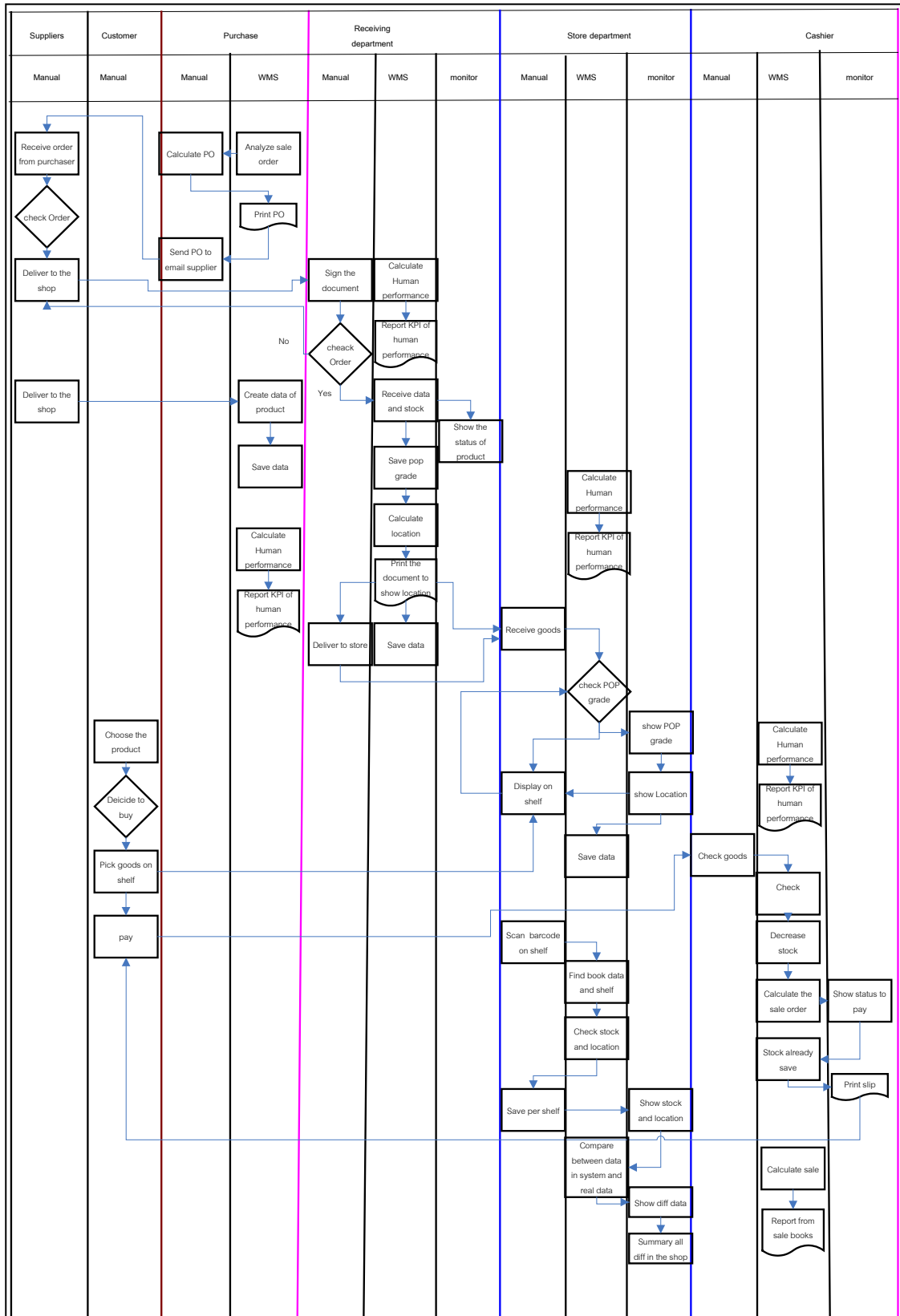


Figure 4.41 flow chart of all process in retail warehouse

This flowchart to show inter act between manner and WMS. It can show the status of process in the retail warehouse that is the new system. And then researcher create the flow of process but it separate to sub process including receiving process, put away process, storage process, order picking process and shipping process. The first process is receiving process, can be analyzed by this figure as below;

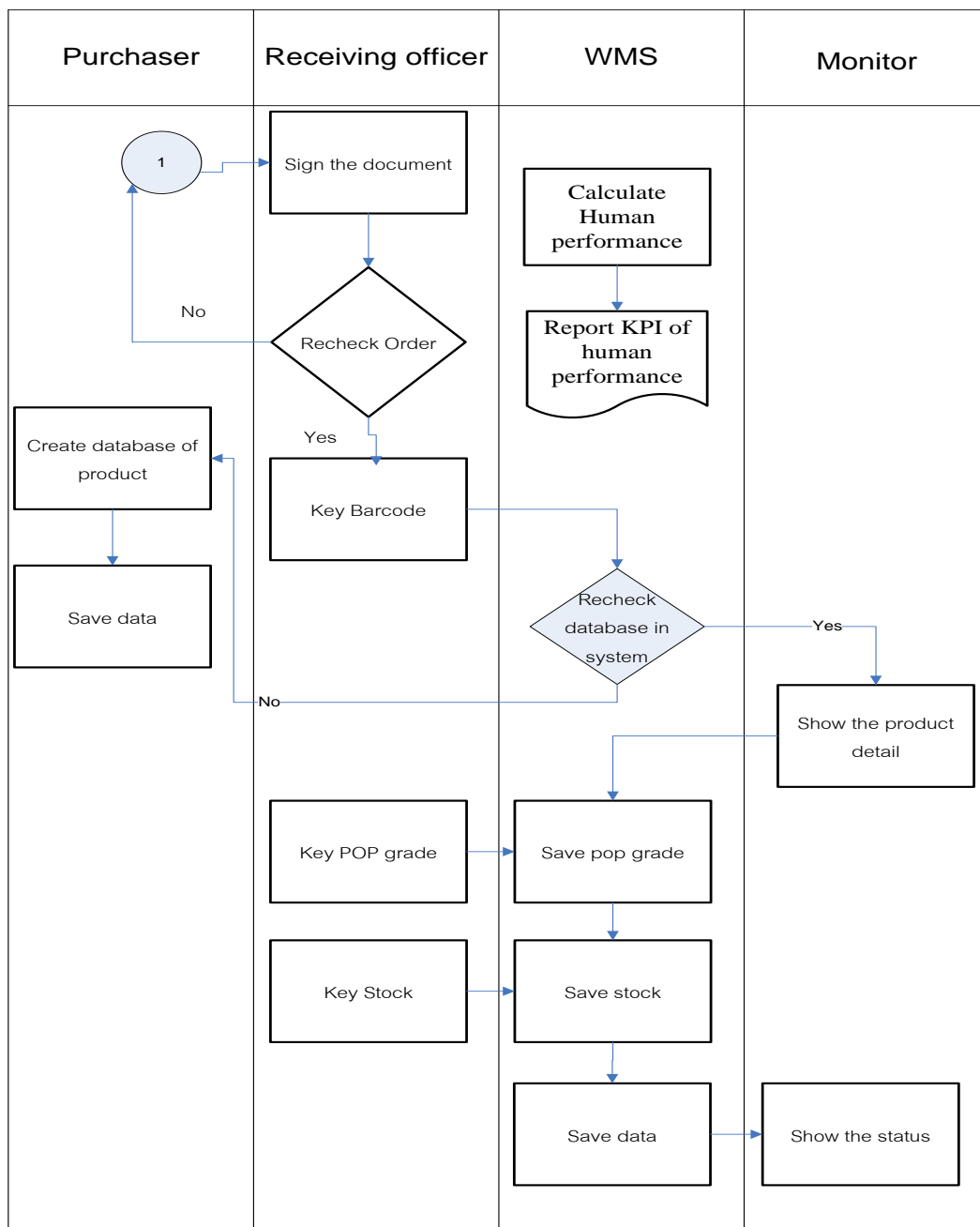


Figure 4.42 flow chart of receiving process in retail warehouse

1= Supplier

This figure can be explained the receiving process. It have the user interact with system consist of purchaser and receiving officer. The second process in retail warehouse is put away process , the key of this process is “receiving officer saves pop grade in system. The system can be calculate the human performance and will show in the window. Next process is away process, shown in this figure as below;

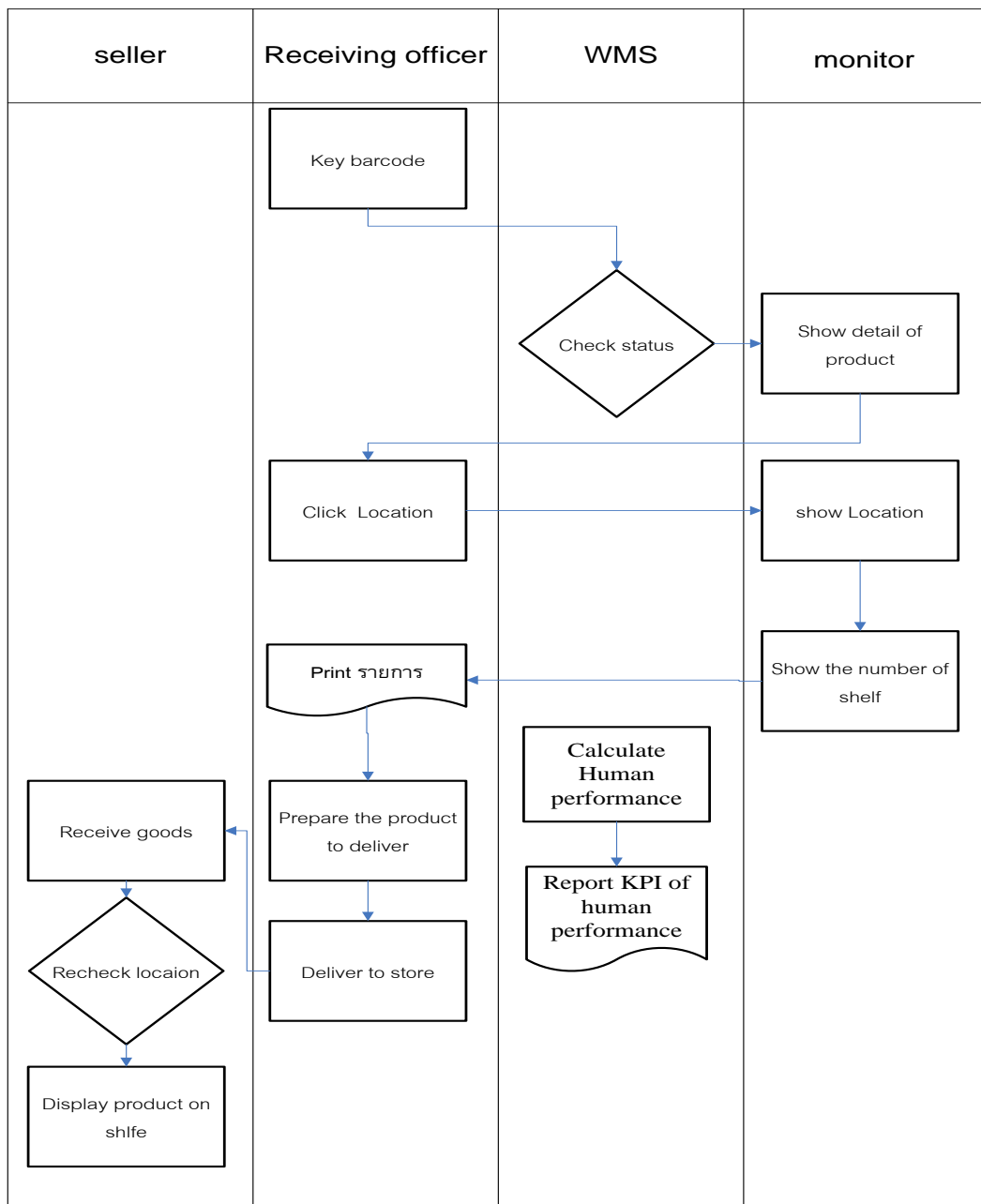


Figure 4.43 flow chart of put away process in retail warehouse.

From figure, the flow system in retail warehouse between seller and receiving officer with the system that interacted with retail WMS. The key of this process is “seller places books by pop grade”. The system can be calculate the human performance and will show in the window. And the next step can show the storage process see in this figure as below;

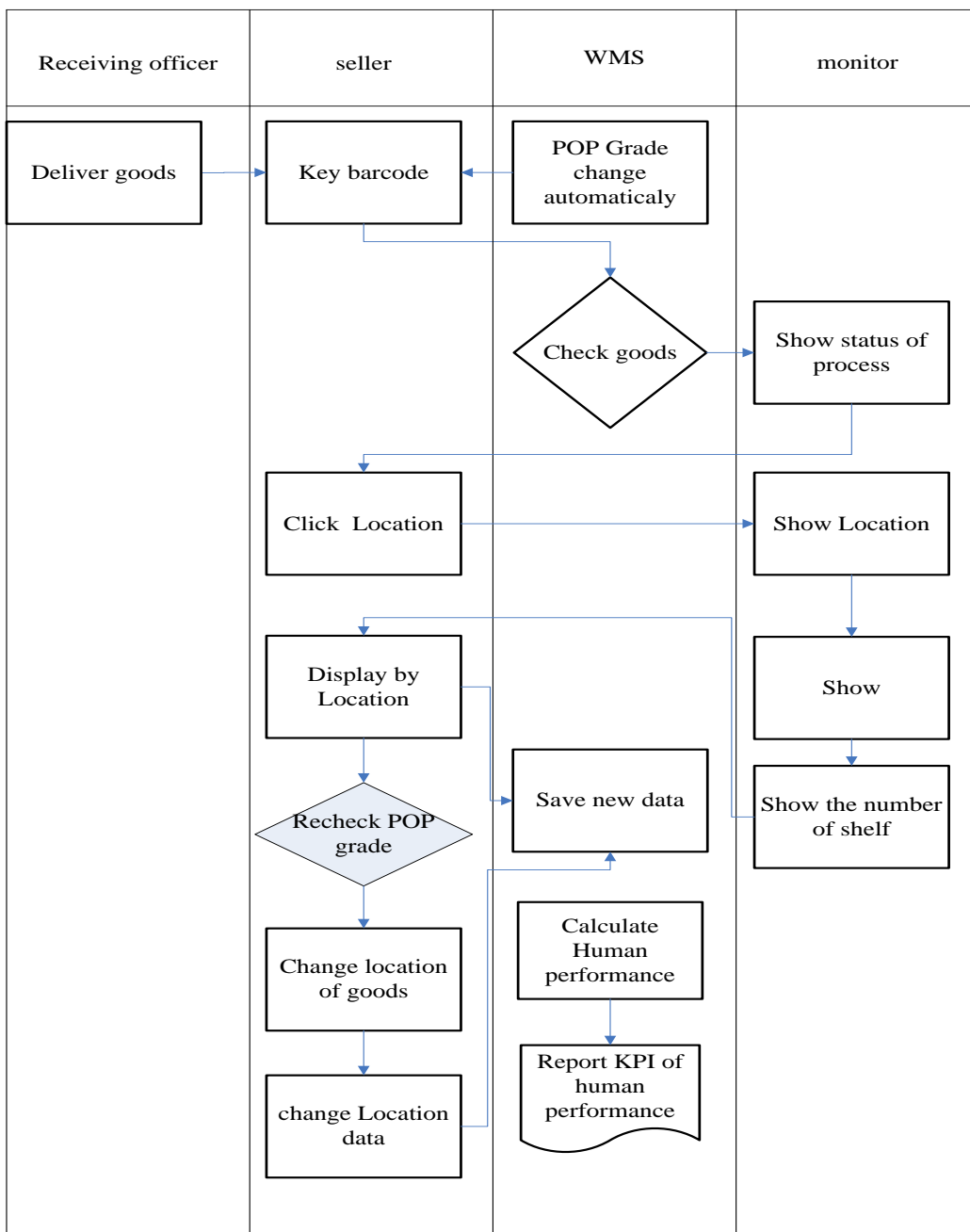


Figure 4.44 Flow chart of storage process in retail warehouse.

This figure can be shown the interacted between seller and receiving officer with system. Seller has to check themselves to manage the pop grade of books and have to change location all time because the season of books always change. The key of this process is “seller has to change book location by pop grade”. The system can be calculate the human performance and will show in the window. The final process is order picking and shipping process, can shown in this figure as below;

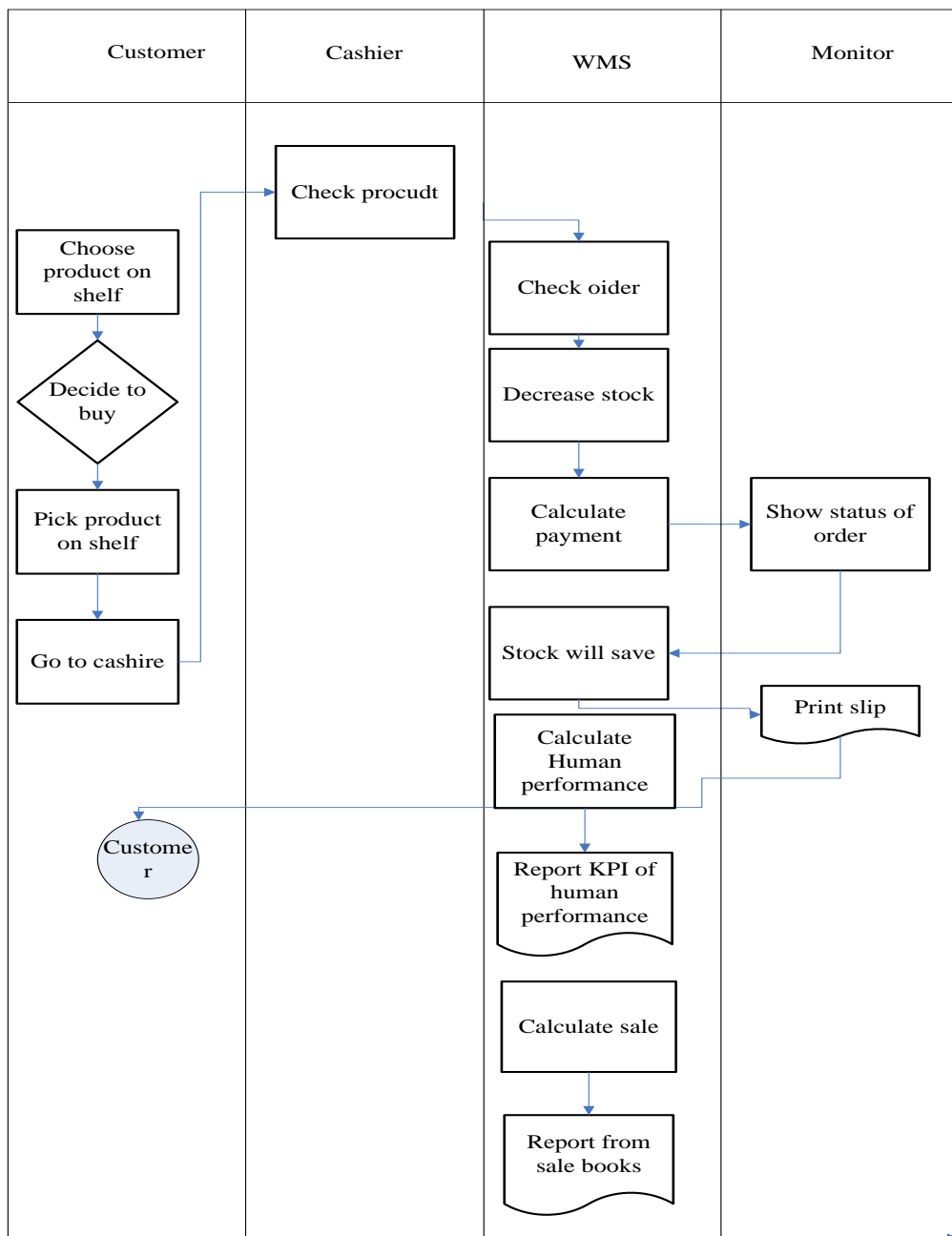


Figure 4.45 Flow chart of order picking and shipping process in retail warehouse

From this figure, the customer will choose themselves and will shipping by cashier shipping at the cashier point it have deference with normal WMS. The key of this process is “stock will save in this process”. The system can be calculate the human performance and will show in the window. If user want to see the report books, this system will show the report by calculate sell order in this process. Next process is cyclic counting process, can see as below;

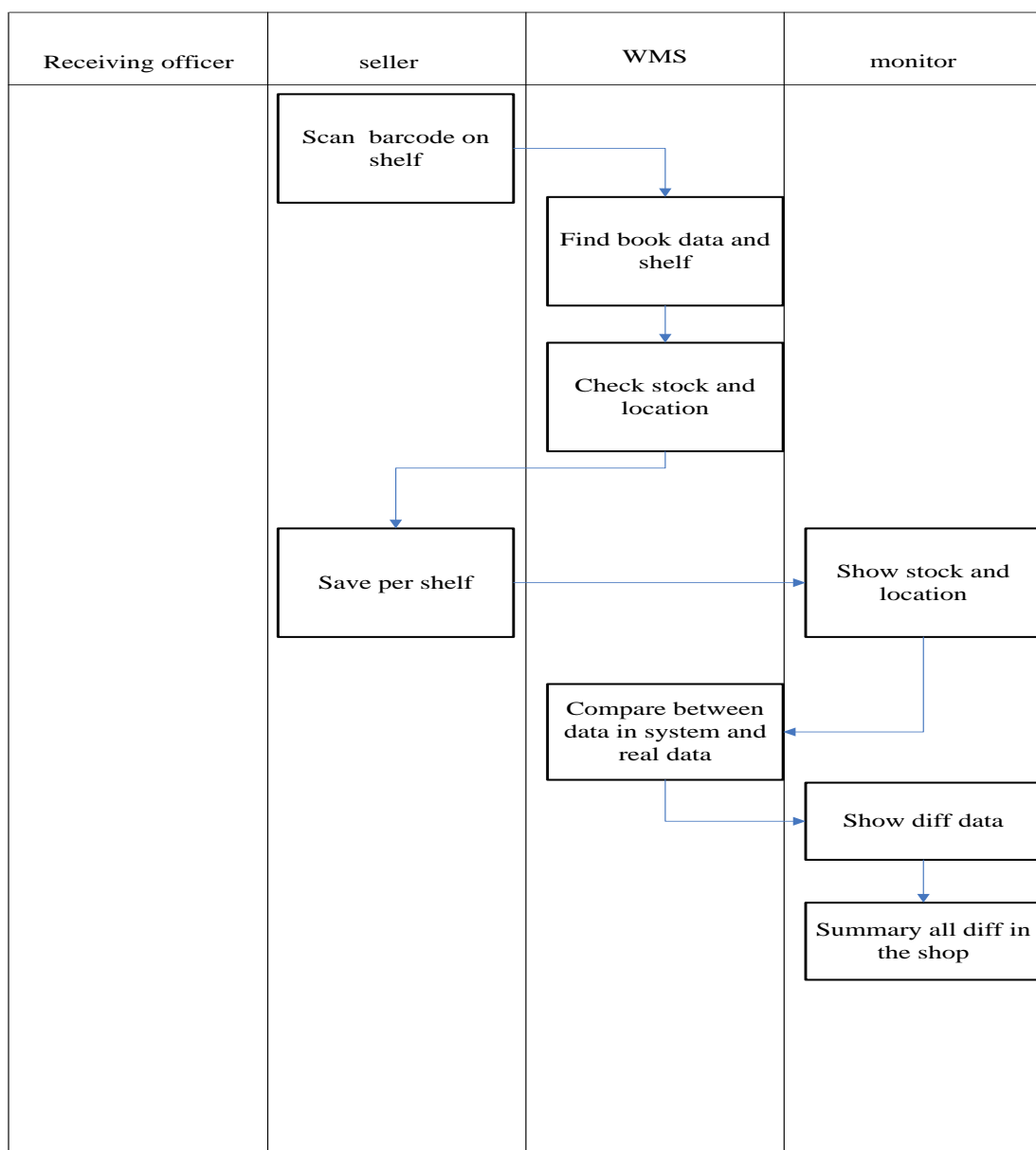


Figure 4.46 Flow chart of cyclic counting process in retail warehouse.

In this process, It will show that how to check stock in retail warehouse. This process will help stock diff problem. Stock diff problem can be described that Stock in system not match with real data. Seller will count stock every day, it will manage this problem.

From all of flow chart can show the process in retail warehouse that is new system. It shown status in process and it shown interaction between human and systems . All of process are implemented from the difference between the retail warehouse and ordinary warehouse management system. When researcher already implemented and create flow of process in retail warehouse management system, it can create the dataflow diagram for this process also.

#### 4.14 Data flow diagram of retail warehouse.

The data flow diagram enables the software engineer to develop model of the information and function domain. A Context Diagram is shown figure 5.21. It connect with purchase, good reviving officer, warehouse section and operation.

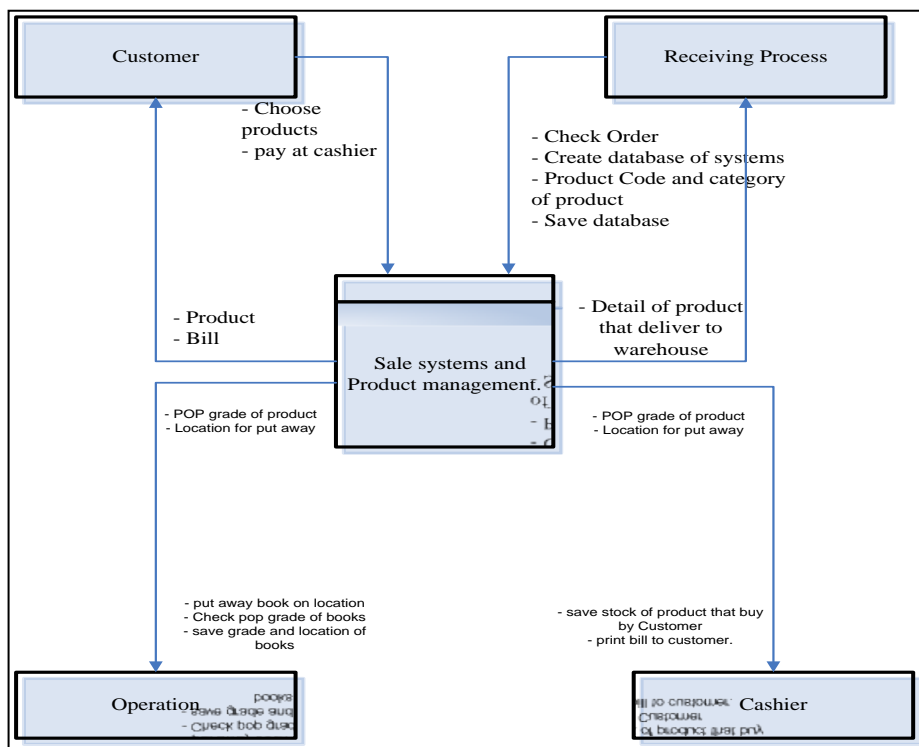


Figure 4.47 DFD Level 0 of Retail warehouse.

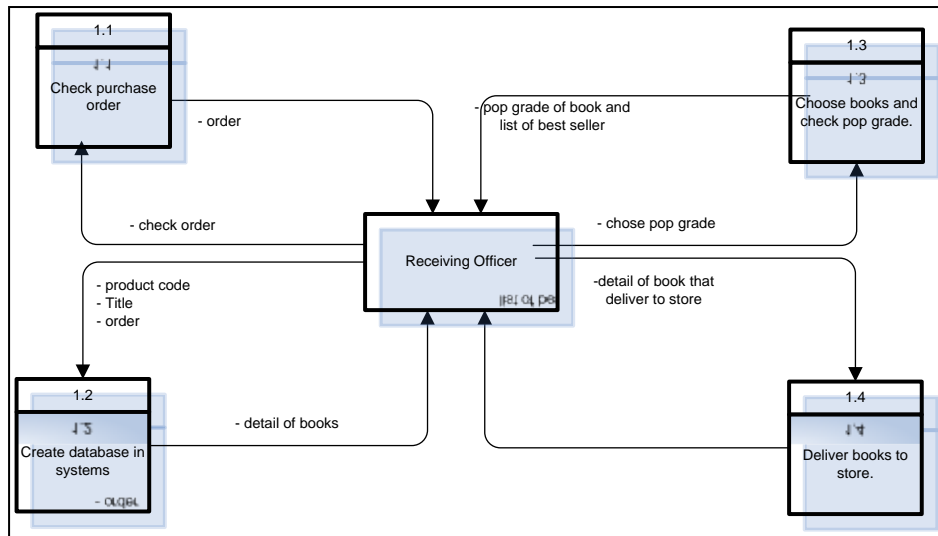


Figure 4.48 DFD Fragment 1: Receiving process

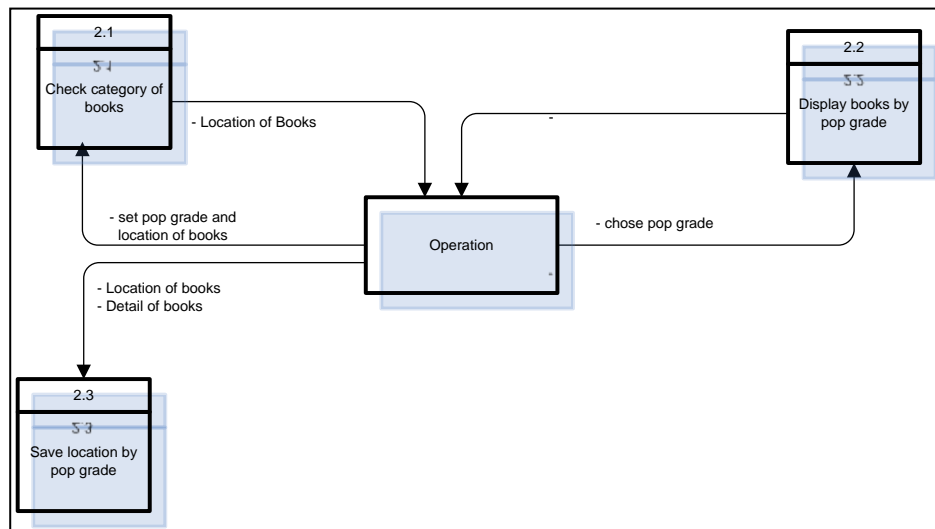


Figure 4.49 DFD Fragment 1: Put away process

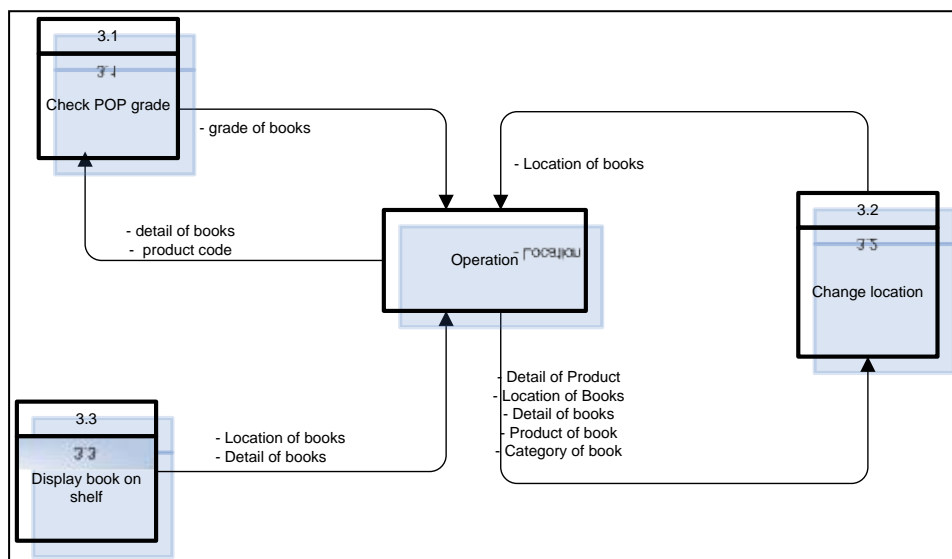


Figure 4.50 DFD Fragment 1: inventory process.

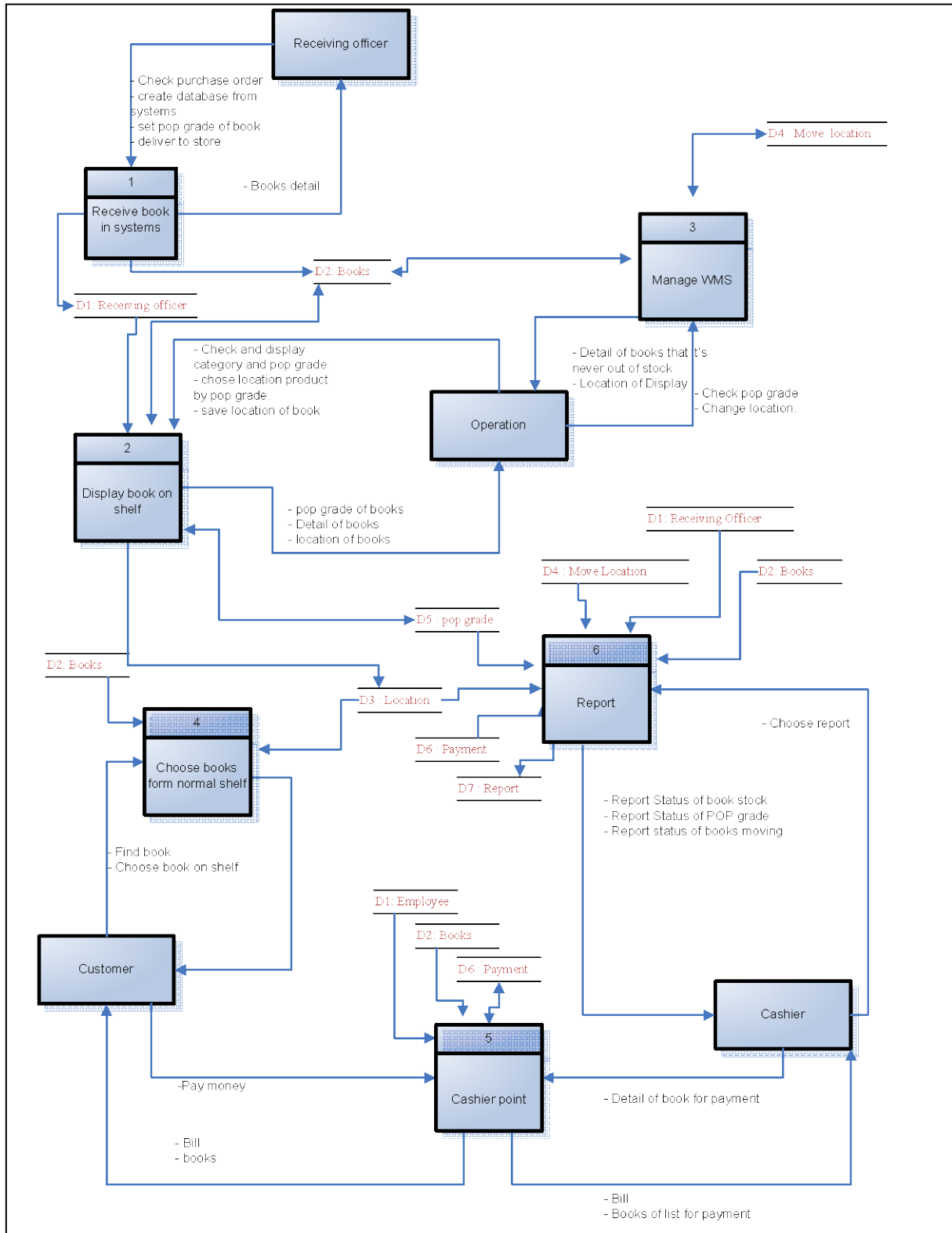


Figure 4.51 DFD Fragment 1: retail warehouse.

### 4.15 Database Design of retail warehouse management system

The focuses if database will support warehouse retail operation and objectives in retail warehouse. WMS making sure that it would meet user and system requirements. An Entity-Relationship (E-R diagram) is used for represent the representation of structure data. The complete normalized E-R diagram is show in figure 5.26 and 5.27. Researcher apply from Entity-Relationship (E-R diagram) of ordinary warehouse management to retail warehouse management.

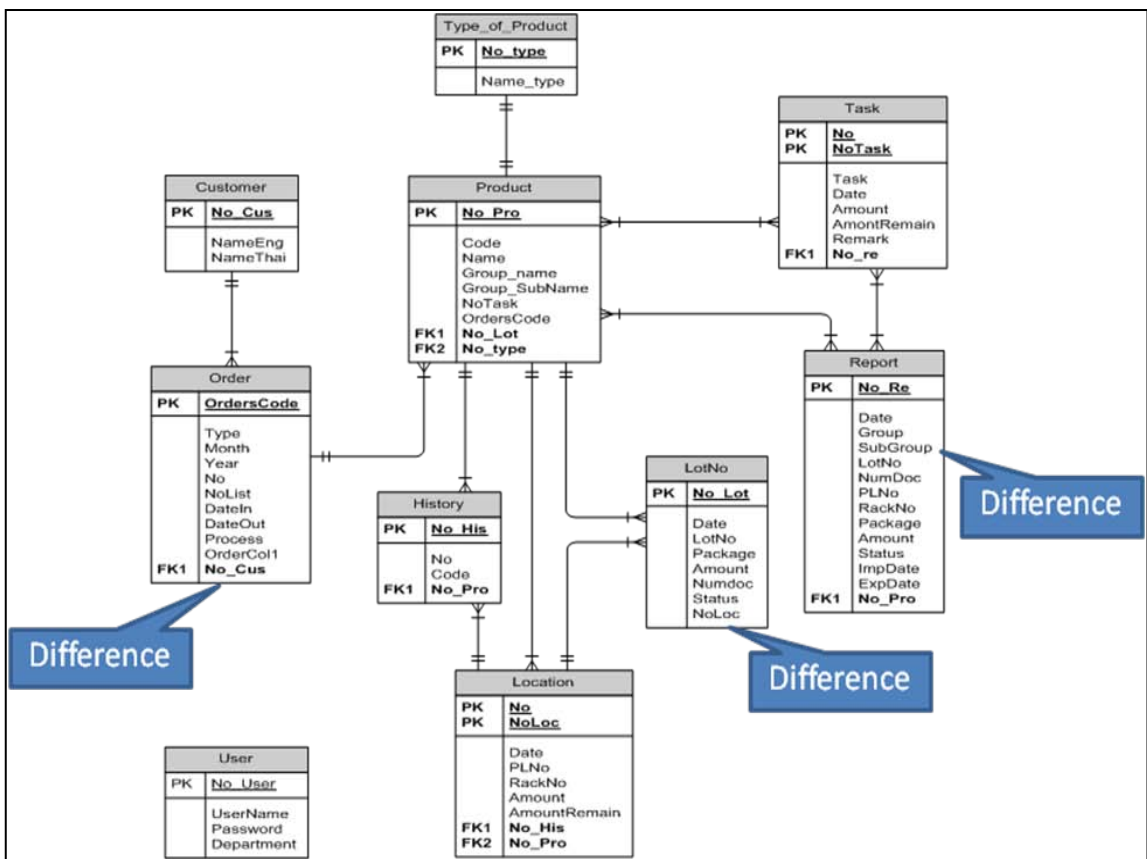


Figure 4.52 ER-diagram of ordinary warehouse management systems

From this figure can create to new diagram by analyze the difference of ordinary function. It can created by check detail and transform to new Entity-Relationship (E-R diagram) that can support only retail warehouse. It can show in this figure.

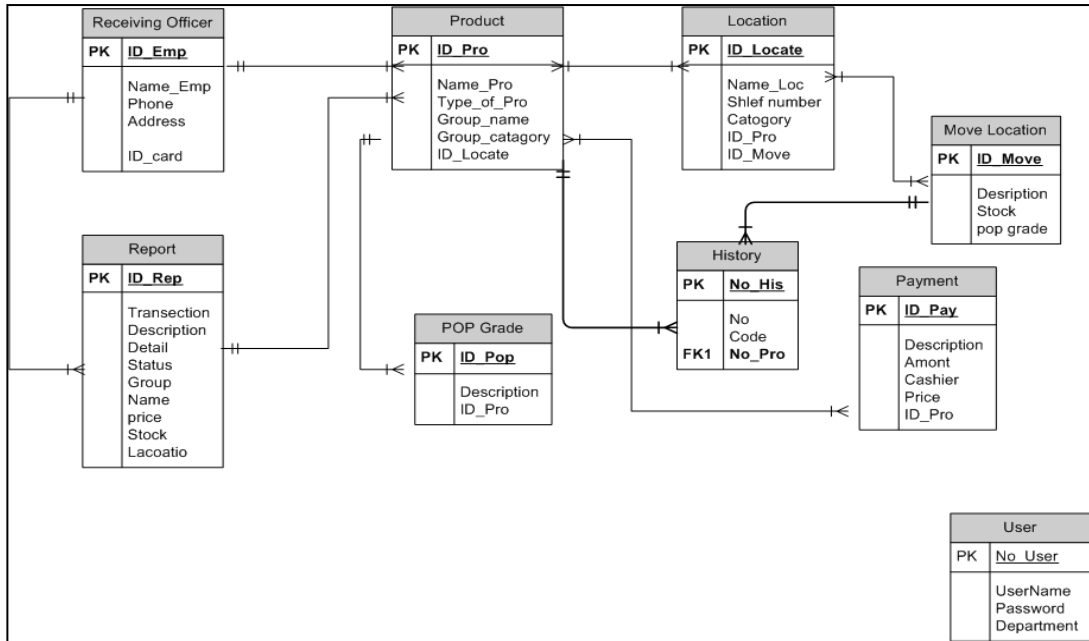


Figure 4.53 ER-diagram of retail warehouse management systems

#### 4.16 Checking the retail warehouse system.

Prepare the questionnaire of the possibility of adding functionality to this process when it change to retail warehouse management. The main objective of evaluation the system that can be apply in old system from the opinions from officers using WMS application. The questionnaire contained 2 parts: Profile and opinions of evaluators as shown in Appendix A. Which are used for gathering the information which evaluated agree or un agree and then will translate to percentage of probability from users who using existing warehouse management system in a case study (At double A Book Tower ). Can be summarized as follow

Table 4.9 The criteria of this evaluate

Domain Value	Meaning
1.00 - 1.50	Strongly disagree opinion
1.51 - 2.50	Disagree opinion
2.51 - 3.50	Undecided opinion
3.51 - 4.50	Agree opinion
4.51 - 5.00	Strongly agree opinion

From this table (see in attachment ) this questionnaire, the researcher created the questionnaire to IT department at Double A Book Tower. IT department is a service of existing software that can be separated two parts as follow as; Part 1, the mention of warehouse management systems if it will be change, evaluated from new function that adding in the program by existing warehouse management system development such as POP grade adding and specify location by planogram in system . The result from this questionnaire is agreed that can add this function in system. And this system can develop to the prototype of retail management systems and can be use in this company.

If the system will change to retail warehouse management system, the worker will be accept this system. The result of this process is 4.11 point and user will agree with this systems. Then it can implement this systems to this process.

Information technology department have other comments about changing in pop grade to system, to be manual (can change automatically and can change by user). It have to add other function in this system in systems. If it can change pop grade manual that meaning it 's too flexible and easy to use when the customer needs change immediately. Because sometimes sellers want to change POP grade by seasonal with themselves . Another importance function , In systems can be create location by planogram. IT say that it can apply this function to systems but the worker have to had knowledge about retail warehouse systems. And they have to know about method of product placement in retail warehouse. If they don't have any knowledge, it will cannot place to correct location. Then this systems will not success when it already improved to this process.

#### 4.17 Information-to-actor-matrix in retail warehouse.

Researcher already analyzed software and will be implement to a care study process. This software is to be a prototype of retail warehouse. Researcher will check this process as is and to be when it already implement this system to process by created the table to show information link between organization ( Information-to-actor-matrix).It can check the information data in organization after this system is implemented. Table 5.5 Information-to-actor-matrix AS IS; it show the information between supplier sales as follow;

Table 4.10 Information-to-actor-matrix AS IS

<b>Information / Actors</b>	<b>Supplier</b>	<b>Sales</b>	<b>Purchasing</b>	<b>Warehouse</b>	<b>Cashier</b>	<b>Customer</b>
<b><u>Sales Department</u></b>						
Purchasing Request		X				
Purchasing Order			O			
<b><u>Purchasing Department</u></b>						
Purchasing Order	O		X			
<b><u>Supplier</u></b>						
Item	X			O		
Delivery Order	X			O		
Product Description	X		O			
<b><u>Warehouse</u></b>						
Quantity	X	O				O
Product Placement		O		X		
<b><u>Cashier</u></b>						
Stock Inventory		O			X	
Product Sold		X				

X = Information Owner

O = Information to be sent to other departments

Table 4.11 Information-to-actor-matrix (to be)

Information / Actors	Supplier	Sales	Purchasing	Warehouse	Cashier	Customer
<b><u>Sales Department</u></b>						
Purchasing Request		X				
Purchasing Order		X	O	I		
POP grade		X	I	I		
Product Placement Report ( <b>Planogram</b> )		X	I			
<b><u>Purchasing Department</u></b>						
Purchasing Order	O		X			
<b><u>Supplier</u></b>						
Item	X		I			
Delivery Order	X			O		
Product Description	X		O			
<b><u>Warehouse</u></b>						
Quantity	X	O				O
Product Placement		O		X		
<b><u>Cashier</u></b>						
Stock Inventory	I				X	
Product Sold	I					
Product Sold Category	I					

Pop-grade data to manage location.

Location changed, must inform concerned departments know to evaluate data.

Send to Purchasing to create database in advance.

Send items in report to inform Sales.

X = Information Owner      O = Information to be sent to other departments  
 I = Data links to additional departments

Summary of the changes shows the system changes when adding Function of work.

Increased data is POP-grade. Program will determine automatically for New Arrival or defined by purchasing. The POP grade data will be sent to sales to manage goods arrangement to meet Plan-O-gram of POP grade that is formatted.

When cashier cut customers purchased list from the system, information will be expressed as in the report. Then the product information that removed from the system, product distribution and category of product sold out will shows to product sales to arrange following Plan-O-gram principle and the sales will manage the space to arrange lay-out other products.

Data items sent from the supplier is created in system by purchasing department to prepare for goods receiving by warehouse department in order to achieve faster performance.

Data to change the location of product placement. Due to be product placement on the retail warehouse. The change location placement report can be calculated to purchasing trends and customer behavior analysis.

#### **4.18 Functional and design in system**

After all of analyzed process in retail warehouse and can create the detail interaction in retail WMS with officer in warehouse. The researcher design the window of retail management system. The window of system can describe the detail of function step by step. First step, the window of receiving this process will show the status of product for a case study company (Double A Book Tower) can see as below

The image shows a software window for book description with the following elements:

- Buttons:**
  - 11 เพิ่ม (Add) - yellow background
  - 12 ลบ (Delete) - yellow background
  - 13 เลขที่ (Number) - white background
  - 7 ชื่อผู้แก้ไข (Editor Name) - white background
  - 8 บันทึก (Save) - white background
  - 9 Print - white background
  - 10 สถานที่จัดเก็บ (Storage Location) - white background
- Input Fields:**
  - 1 ชื่อหนังสือ (Book Title) - long text box
  - 2 ชื่อผู้แต่ง (Author Name) - long text box
  - 3 ราคา (Price) - long text box
  - 4 Stock - short text box
  - 5 POP Grade - short text box
  - 6 Barcode - medium text box

Fig 4.54 The window show the detail of book description.

It can describe the detail in each function per box. User will fill the data from product in each box can see above figure. The data can be explained in this table

Table 4.12 Detail of book description on window.

Number	Name	Description
1	ชื่อเรื่อง	Books description
2	ชื่อผู้แต่ง	Author that specify in each book
3	ราคา	Price of book. Per item
4	Stock	Inventory stock of book per title.
5	POP Grade	POP grade that create by season of book or the customer needs. Grade of book will specify when receiving officer received book.
6	Barcode	Barcode can be key by scanner
7	ชื่อผู้แก้ไข	Name of officer that the latest login in this function. It will show and easy to manage
8	บันทึก	Click save when users finish process.
9	Print	Print the document in this process
10	สถานที่จัดเก็บ	Specify the location of books and it will link to the location window
11	เพิ่ม	Add another book
12	ลบ	delete this data from system
13	NO	Specify the number of books by arrange the book when officer receive book in system

Next step user will input the data that related with put away process .Users are receiving officer and seller that will input the data on this window. The window to show the location of books ,see as below,

12  13  14

1  4

2 Stock 3 POP grade

8 

Shelf .....		

 5 Location

6 Category

7 Number of shelf

9  10  11

Fig 4.55 The window show location of book

It can describe the detail in each function per box. User will fill the data from product in each box can see above figure. The data can explain by the table as below;

Table 4.13 Detail of location on window.

Number	Name	Description
1	ชื่อหนังสือ	Books description Book title
2	Stock	inventory stock of book per title.
3	POP Grade	POP grade that create by season of book or the customer needs. Grade of book will specify when receiving officer received book.
4	Barcode	Barcode can be key by scanner
5	Location	Specify the location of books and it will link to the location window
6	Category	Specify the category of book in system
7	Number of shelf	System will calculate the number of shelf and location of shelf for user will see the location to display on shelf.(User can be change manual)
8	รูปชั้นวาง	System will show the location by picture of planogram.
9	ชื่อผู้แก้ไข	Name of officer that the latest login in this function. it will show and easy to manage
10	บันทึก	Click save when user finish process.
11	Print	Print the document in this process
12	เพิ่ม	Add another book
13	ลบ	delete this data from system
14	NO	Specify the number of books by arrange the book when officer receive book in system.

When user want to know the location of the book. User can click at the location button. The system will link the window to show the book display on shelf. Use will monitor in this window if pop grade change, the location will change also. Use will change location by this window ,see as below

Table 4.14 Detail of location on window per shelf.

Shelf 6A-12		
Barcode	ชื่อเรื่อง	คงคลัง
9789745228	การจัดการสินค้า เล่ม 1	5
9789745228	การจัดการสินค้า เล่ม 2	6
9789745228	การจัดการสินค้า เล่ม 3	7
9789745228	การจัดการสินค้า เล่ม 4	8
9789745228	การจัดการสินค้า เล่ม 5	9
9789745228	การจัดการสินค้า เล่ม 6	10
9789745228	การจัดการสินค้า เล่ม 7	11
9789745228	การจัดการสินค้า เล่ม 8	12
9789745228	การจัดการสินค้า เล่ม 9	13
9789745228	การจัดการสินค้า เล่ม 10	14
9789745228	การจัดการสินค้า เล่ม 11	15

User will see the status on shelf and book title including stock of book in this window. This window link from the location window in system. This window will help the user to manage the location when pop grade will change. It easy to manage .And the last window to show the shipping process in retail warehouse. Shipping process in retail warehouse is cashier shipping that can mange stock in warehouse at this process. The customer will pay at here and user will use cashier window ,can see as below;

9  10  11

1	ชื่อหนังสือ		Barcode		จำนวน	
	ชื่อหนังสือ		Barcode		จำนวน	
	ชื่อหนังสือ		Barcode		จำนวน	
	ชื่อหนังสือ		Barcode		จำนวน	

3

4   บาท

5  6  7  8

Figure 4.56 Cashier window in retail warehouse.

From this figure, It can shown detail of sale order per customer (or per slip)  
 The slip will show the data of books that customer buy from store (Title, number and price) Each box can descript as below;

Table 4.15 Detail of cashier system on window.

Number	Name	Description
1	ชื่อหนังสือ	Books description Book title
2	Barcode	Barcode can be key by scanner
3	จำนวน	The number of book that customer already bought
4	ส่วนลด	Discount when have some promotion.
5	ราคารวม	Total sale form slip (per slip)
6	ชื่อผู้แก้ไข	Name of officer that the latest login in this function. It will show and easy to manage
7	บันทึก	Click save when user finish process.
8	Print	Print the document in this process
9	เพิ่ม	Add another book
10	ลบ	delete this data from system
11	NO	Specify the number of books by arrange the book when officer receive book in system

From the user requirement, they want to know the summary report of the day and of the month. The report should be show the list of book title.

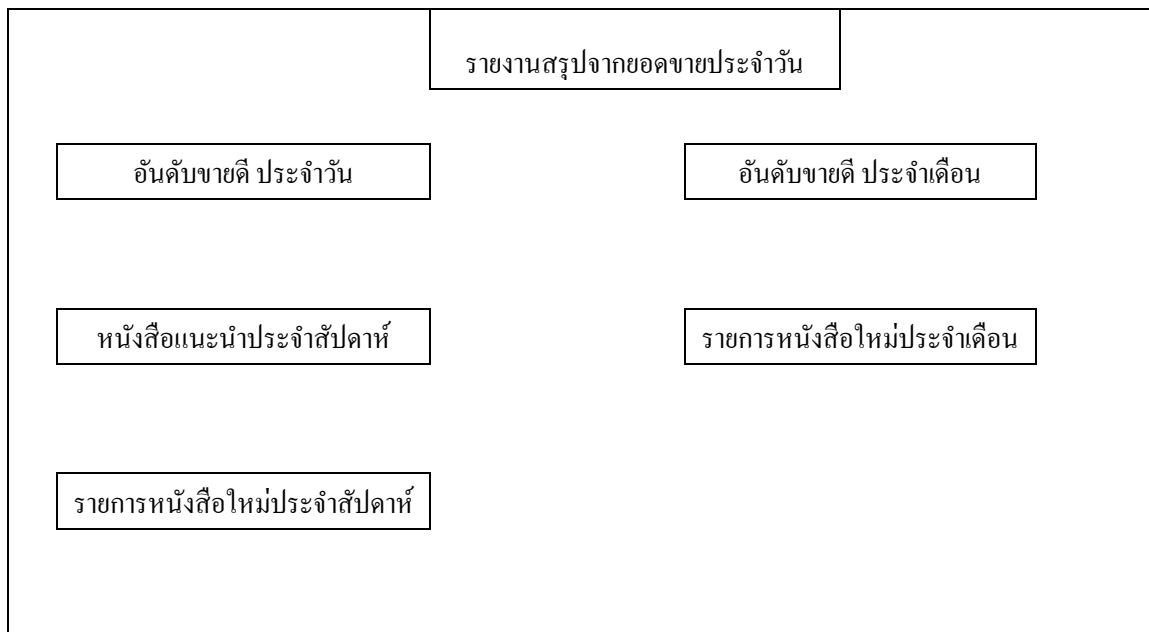


Figure 4.57 Summary reports in the shop

Table 4.16 Detail of report on window.

Number	Name	Description
1	อันดับขายดี ประจำวัน	Summary the best seller in the shop per day
2	อันดับขายดี ประจำเดือน	Summary the best seller in the shop per month
3	หนังสือแนะนำประจำสัปดาห์	List of recommend book per day
4	รายการหนังสือใหม่ประจำเดือน	List of new title books per month
5	รายการหนังสือใหม่ประจำสัปดาห์	List of new title books per week

From the table when user click at the box, it will show the rating of book that calculated from sale order the end of day including the list of best seller that show the maximum seal per day (or moth) .Recommended button will show the recommend book by automatic system. New books button will show the list of new books per day (or month). This is the report to show the summary from the user requirement.

It only the draft of window, researcher draft for guideline the user to know that how to key the data to this system. Because it will change the new process and new work flow process in warehouse management system. It's more easy to understand If we can understand the box on window. Overall process will change the new job description in a case study company, already attached on appendix.

#### **4.19 Estimate cost for implement the system.**

Researcher already estimated cost for implement this system into the retail warehouse by calculate from a case study. The result can be show in this table as below;

Table 4.17 Estimated cost for implement in system.

	Quantity	Price per unit	Price
Computer for Receiving process.	1	25000	25000
Computer for store (& floors)	7	25000	175,000.00
Computer for purchase.	1	25000	25000
Scanner Barcode (LS2208 Scanner Handheld (Quality scanner) LS2208 SCNR + USB cable with stand )	3	5000	15000
Printer	2	3000	6000
Cost for the implementation in a case study.			246,000.00

Form this table can be show cost of system for implementation, about 246,000 bath. It estimated from a case study. The system resource have the requirement including in this table as below;

<b>The system requirement.</b>
Windows XP , Vista , Windows 7
Database Management) MS Access program.
CPU Pentium 4 1.8 GHz
Memory 1 GB
Monitor SVGA (1024x768)
Hard disk 50 MB (free space)
.Net Frame work 2.0
Network ( Lan : local area network ) *

#### 4.20 Summary Proceedings.

The organization can communicate with the process due to the function can be done systematically which affect the employees accept the changes and can generate sales for causing the Maximized Profit in organization.

For the case study when the system uses the inventory to match the type of inventory, the warehouse operations will be systematically. System will help manage

work to meet the needs of the customer that can increase sales to the Double A Book Tower eventually.

## **CHAPTER V**

### **DISCUSSION**

#### **5.1 Problem during Development.**

The problem during develop of warehouse management system. As follow  
as

Ordinary warehouse management cannot support retail warehouse

- In detail, the retail warehouse have to respond customer all time because customer needs will change every time.

The detail of book have many problem.

- Books have new title every day. Therefore it will have many SKU and have to manage SKU of book day by day.
- Books have short life cycle cause when new books come, customer will interest new books more than old books. Seller have to manage title day by day. None of the age but demand for goods is seasonable

The detail of book store can be explain the difference between nature of book store and ordinary warehouse, see this table

Table 5.1 the difference between Ordinary warehouse and bookstore.

<b>Ordinary warehouse</b>	<b>bookstore</b>
<b>Receiving</b>	
Certain types of goods have expiration date.	None of the age but demand for goods is seasonable.
<b>picking &amp; shipping</b>	
FIFO , LIFO	Depending on the needs of customers that want what titles of books?
<b>Storage</b>	
Can be fixed location of goods in the warehouse.	Cannot be fixed location due to many new titles are issued and changed position frequently.
Rate of Turn Over is slowly.	Turn Over is high rate.
SKU number is less (the new products are few).	Have high diversity of SKU titles.

## 5.2 Advantage

The advantage of the WMS are found and discussed as follow:

- The WMS can support location decision for operation and reduce time for decision making to choose the location.
- The WMS automatically select location for place book in the shelves for support customer needs.
- The WMS can support operation in retail warehouse.
- Staff can forecast stock controlling and mange customer sale.

### **5.3 Disadvantage**

- Officers in retail warehouse have to check monitor in system every time because POP grade will change from customer sale order.
- The WMS cannot show map location but can see only number of shelf and category.

### **5.4 Future Research**

From this research, this prototype should implement to the retail warehouse. It will complete by use the work flow of this process to create the complete system by programmer. The result of this research complete at work flow of retail warehouse (Interaction between human and system) .But in future this work flow should create the retail warehouse software and implement in retail warehouse. If it have problem in some function by implementation, it will easy to solve and revise some function that meaning this warehouse management system will complete. It can use to retail warehouse style for the standard WMS for retail warehouse.

## **CHAPTER VI**

### **CONCLUSION AND RECOMMENDATION**

#### **6.1 Conclusion**

A result obtained from this research is data analysis system can be analyzed the concept of working on detailed structure of the program by analyze from warehouse management system that are used in general. The users can learn how to work the system that the researcher can read the work function of the program to develop creating instruction on the function of the analysis of the work program, which resulted in the development system of case study to change to the work faster. And meet customer needs including increase revenue for the case study company. Concept of organized development can create the visual style of case study company that are unique and make the idea of creating a management system that has supported this difference.

In the process in Retail warehouse management, the most important thing is being able to take the concept of the principle of retail management that normally will use in The retail stores. And applied to the warehouse management system, which is in the execution of the warehouse, so that they can simultaneously based on the most important including the customer needs and quick responds the customers. The major of this system is the customer focus that encourages to buying. Will result in the other hand, customer will buy continuously and product integrity of the organization.

From the objective of the work of Double A Book Tower warehouse that is different from other warehouse inventory due to selling books on warehouse to manage the sales and manage warehouse in the same time. Therefore, to improve the process of work, the researcher designs the inventory management to improve the inventory management system as...

Bookstore must to meet the requirement of a customer who have changed the time of reading books. Researcher has thought POP-grade function that can be

added in database to be an indicator of customer needs. And can encourage the sales from demand of products.

WMS generally not developed in accordance with the purchasing behavior of customers appropriately. It is not created to support management system of retail store. Inventory generally focuses management speed of work but WMS Retail is a management to response purchasing behavior of customers by using the plan-o-gram principles that will result to increased sales for this type of stores.

Researcher creates POP-grade to meet customer behavior. Grade will be calculated from the rate of customer acquisition that can be calculated the pop-grade sales of that book.

WMS of the retail shop can be applied in the development of kind same stores addition to bookstore.

Important variables in the WMS system or control operator of the work in order to comply with the requirements of this kind of inventory are Plan-O-gram and POP-grade that is developed from retail management principles into the development process of the general warehouse system WMS.

Difficulty of working is not the integration of the system works only, but main variable of the case study is books. Because books are the product differs from common Mass product as demonstrated in the following table.

At the present, WMS is essential for management because it can support operation and solve problem that happen in your organization. This application will succeed will succeed in the objective. Moreover, User will accept new change and satisfy to use it.

The most importance thing in this thesis that can be summary that ordinary WMS cannot be use in the retail warehouse because.

The customer need will change all time and retailer have to support the customer need. If retailer can support that will get maximum profit form customer sale order. Then WMS should support it but ordinary WMS don't have this function in software.

Ordinary WMS do not have function to support customer behavior in retail shop. Because normal WMS will use in warehouse that will create to support officer behavior, how to manage warehouse speedily by warehouse officer. But in retail

warehouse do not focus at warehouse officer but focus on customer, how to manage product in warehouse and can be respond the customer needs immediately.

Researcher created POP grade function to support the retail WMS. It can respond the customer needs by calculate from customer sale order.

Plano gram will add in the retail WMS function that link with POP grade function and location of books in system.

The retail WMS can use in the retail shop not only in bookstore but it can use in same type of this shop.

Many book stores can use this software but should apply some function to be match with their store.

POP grade and Plano gram are main function in the retail WMS because it will specify location in book store.

## **6.2 Recommendation**

When applied to an organization ,CEO need to participate in understanding. And support the cause and driving force employees to understand. The only employees who are involved with the application of this new system, the key to making this process has driven that have the cooperation between receiving officer and seller at sore, they need to understand that the principles of this concept ,the main objective is the customer needs. As a case study of company is a book store. That can generate profits and revenue for the organization that is the main target company.

After an analysis process that has already new knowledge that is the principle is normally used after the store inventory. But It can use to manage the retail stores .It is a retail warehouse management system that is used in the Software as a sales goods on the warehouse, particularly business books. The format is unique. The sale management can be manage together on the warehouse. And can control both systems simultaneously. It will match in this process that the result in the organization will successful as expected.

The improvement process will succeed when all parties work together, from executives to officers. The executive management must be to educate employees to understand the algorithm of working to adapt and accept changes that occur in the

process. The first change would be facing some problems but when employees can accept and understand the benefits that will be able to manage work until achieve corporate goals.

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## **APPENDICES**

## APPENDIX A

แบบสอบถามความคิดเห็นสำหรับผู้ใช้งานระบบการจัดการคลังสินค้า

**คำชี้แจง** แบบประเมินการวิเคราะห์ระบบการจัดการคลังสินค้าของ คลังสินค้านำปลีก ( The retail warehouse ) มีวัตถุประสงค์ในการสอบถามความคิดเห็นของผู้ใช้เพื่อนำไปวิเคราะห์ความเป็นไปได้ของการสร้างระบบ และ ปรับปรุงแก้ไขให้เหมาะสมต่อไป

ระดับคะแนนความพึงพอใจ

1; เห็นด้วยอย่างยิ่ง, 2: เห็นด้วย, 3.เฉยๆ, 4. ไม่เห็นด้วย , 5. ไม่สามารถดำเนินการได้

ส่วนที่ 1: ข้อมูลของผู้ตอบแบบสอบถาม

1.1 เพศ                    ( ) ชาย ( ) หญิง

ส่วนที่ 2 : ความคิดเห็น จากการวิเคราะห์โครงสร้างของระบบการจัดการคลังสินค้า

โปรดทำเครื่องหมาย ✓ ในช่องว่างที่ตรงกับความคิดเห็น

ข้อคำถาม	สามารถดำเนินการได้	ไม่สามารถดำเนินการได้	ระดับคะแนน 1-5 (กรณีที่สามารถดำเนินการได้)
1. ความเห็นในส่วนการเปลี่ยนแปลงของระบบ			
- การเพิ่มส่วน POP grade ลงในระบบ			
- ความเป็นไปได้ในการสร้าง Software จากโครงสร้างของโปรแกรมนี้			
- การคำนวณยอดขายเพื่อปรับเป็นค่า POP grade			
- การ update status pop grade อัตโนมัติ			
- สามารถเปลี่ยนแปลง POP grade แบบ manual ได้			
- Match pop grade with location in system.			
- สามารถ Create Plano gram ในระบบเป็นลักษณะ Location ของ retail warehouse.			
- สามารถเพิ่มเติมเพื่อปรับ POP grade เพื่อให้			

ตรงกับ Plano gram			
- บันทึกจำนวนสินค้าที่ตัดออกจากระบบเมื่อมีการจำหน่ายสินค้ายังลูกค้า โดยสามารถ Update ได้โดยอัตโนมัติ			
2. ความคิดเห็นเกี่ยวกับการเปลี่ยนแปลงการทำงานของพนักงาน			
- ความสอดคล้องกับระบบงานปัจจุบัน			
- ขั้นตอนและวิธีการทำงานของระบบไม่ยุ่งยาก			
- พนักงานสามารถทำความเข้าใจและสามารถปรับปรุงการทำงานแบบใหม่ได้			
- สามารถลดขั้นตอนการทำงานในระบบปัจจุบันเมื่อเทียบกับระบบเก่า			
- แนวโน้มในการเพิ่มยอดขายให้กับลูกค้า			
- ลดเวลาการทำงานของการส่งสินค้าและการนำสินค้าจำหน่าย			
- แนวโน้มในการเพิ่มยอดขายให้กับลูกค้า			
- สามารถลดขั้นตอนการทำงานในระบบปัจจุบันเมื่อเทียบกับระบบเก่า			
- สามารถลดเพิ่มการจัดวางได้เป็นระบบมากยิ่งขึ้น			

ข้อเสนอแนะ อื่นๆ :

## APPENDIX B

### Job Description (As is)

Good receiving officer ; คำบรรยายลักษณะงาน (Job Description)
-ตรวจสอบจำนวนสินค้าให้ครบตามจำนวนตามใบส่งของ
-ตรวจสอบสภาพของสินค้า, บรรจุภัณฑ์ที่ร้านค้านำมาส่งเพื่อให้มั่นใจว่าอยู่ในสภาพสมบูรณ์ ไม่บุบสลายหรือเสียหายหรือมีร่องรอยถูกเปิด
-ไม่รับสินค้าที่ชำรุดจนไม่สามารถยอมรับได้ รวมถึงบรรจุภัณฑ์ที่ชำรุดเสียหาย
-ดูแลการตรวจสอบขั้นต้นให้เป็นไปตามข้อกำหนด
-แนะนำคนขับรถขนสินค้าให้นำสินค้ามาไว้ที่บริเวณที่รอการตรวจรับสินค้า
-ตรวจสอบเอกสารว่าสินค้าที่นำมาส่งถูกต้องตามสถานที่และวันส่งของที่ระบุใน P/O รวมถึงราคาทุนรวมที่ปรากฏใน P/O และ D/O
-ประทับตราการรับสินค้าขั้นต้นลงในใบ D/O ทุกใบพร้อมทั้งลงรายละเอียดการรับสินค้าให้ครบถ้วน
-ดำเนินการจัดส่งเอกสารต่างๆ เช่น ใบส่งของ (D/O) และอื่นๆ ให้ถูกต้องตามที่กำหนด
-ระบุปัญหาในการรับสินค้าลงในใบบันทึกปัญหาการส่งของ (Delivery Problem Note) และส่งให้ผู้เกี่ยวข้องเพื่อดำเนินการแก้ไขพร้อมติดตาม
-สามารถใช้รายงานต่างๆ จากระบบฯ เพื่อวิเคราะห์, ทำงาน ได้อย่างมีประสิทธิภาพยิ่งขึ้น
-ช่วย, ประสานงานขนย้ายสินค้าจากรถส่งของลงวางที่รับสินค้า
-ขนย้ายสินค้าที่ผ่านการตรวจรับสินค้าเป็นรายชิ้นขึ้นไปส่งยังแผนกขาย
-ขนย้ายสินค้าที่ส่งคืนร้านค้าจากแผนกขายมายังแผนกรับ-ส่งสินค้า
-ดูแลความสะอาดเรียบร้อยบริเวณที่จอดรถรับส่งสินค้าให้ปราศจากกล่องสินค้าและขยะอื่นๆ
-จัดสินค้า, กล่องสินค้าจากบริเวณที่ตรวจนับสินค้ารายชิ้นลงในรถขนของ (Security Trolleys)
-นำสินค้าไปส่งแผนกขายพร้อมทั้งให้มีการลงชื่อรับสินค้าในสมุด/ เอกสารเช่นรับสินค้า
-ดูแลและบำรุงรักษาอุปกรณ์การทำงาน
-ระมัดระวังทรัพย์สินในการขนย้ายสาขา
-ดูแลการขนย้ายสินค้าเข้าออกของคลังสินค้า
-ทำการรับสินค้าตามระบบ, ขั้นตอนที่กำหนด รวมถึง scan ป้าย barcode การนับสินค้าและการติดป้ายราคา

-พิมพ์แผ่นป้ายราคาบาร์โค้ดสินค้าภายใน (Internal Barcode), ตรวจสอบความถูกต้องของการติดป้ายราคาสินค้า
-จัดสินค้าให้พร้อมใบรับสินค้าเพื่อขนย้ายขึ้นรถส่งของนำไปส่งแผนกขาย
-ทำการส่งคืนสินค้าให้ร้านค้าอย่างถูกต้องตามขั้นตอน
-จัดระบบการจราจร (เช่นรถบรรทุกสินค้า) และการรักษาความปลอดภัยในบริเวณพื้นที่รับ-ส่งสินค้า

Seller at Store ;คำบรรยายลักษณะงาน (Job Description)
ขาย, ให้คำแนะนำหนังสือ, สินค้าแก่ลูกค้า
ทำความสะอาด, ดูแลความเรียบร้อยของพื้นที่ขาย, stock โดยจัด โชว์, จัดเรียงสินค้าอย่างเป็นระบบ, ระเบียบ
มี product knowledge สามารถให้คำแนะนำ, ให้ความช่วยเหลือ, สนับสนุนลูกค้าในการหาหนังสือ, สินค้าที่สนใจ เพื่อตัดสินใจซื้อ
จัดทำเอกสารการขายที่กำหนดอย่างถูกต้อง, รวดเร็วตามระยะเวลาที่กำหนด
รายงานปัญหาที่พบในพื้นที่ขาย, ข้อคิดเห็นจากลูกค้า ถึงผู้บังคับบัญชาทราบและติดตามผลดำเนินการอย่างใกล้ชิดและต่อเนื่อง
ดำเนินการรับเปลี่ยน, คืนสินค้าที่ลูกค้าต้องการคืน, เปลี่ยนอย่างรวดเร็วและถูกต้อง
ตรวจนับสินค้าด้วยความรอบคอบและรวดเร็วทั้งใน stock และพื้นที่ขาย
จัดสินค้าเข้าชั้นวางให้ครบอย่างเป็นระเบียบและสวยงามตามมาตรฐานที่กำหนดเมื่อแผนกรับส่งสินค้านำสินค้ามาส่งที่พื้นที่ขายแล้ว
ตรวจสอบความถูกต้อง, เรียบร้อยและประสานงาน, ดำเนินการเปลี่ยนป้ายราคาสินค้าในกรณีที่ป้ายราคาชำรุด, มีการปรับราคาถาวร
ช่วยป้องกันและระมัดระวังมิให้สินค้าถูกขโมย, สูญหาย โดยสังเกตพฤติกรรมลูกค้าที่ผิดปกติและแจ้งแผนก Loss Prevention ตามขั้นตอน
รับชำระค่าสินค้าโดยใช้เครื่อง POS ทุกประเภทตราสารอย่างถูกต้อง,รวดเร็ว, เป็นมิตร และถือปฏิบัติตามข้อกำหนดในการรับชำระค่าสินค้า
อย่างเคร่งครัด และดำเนินการเกี่ยวกับเครื่อง POS ที่กำหนดไว้ เช่นการเปิด-ปิดเครื่อง เป็นต้น
จัดเตรียมเงินรอบและจัดส่งเงินรอบตามข้อกำหนด
ทำความเข้าใจและถือปฏิบัติตามเงื่อนไขรายการส่งเสริมการขายต่างๆ โดยเฉพาะในส่วนที่ต้องเกี่ยวข้องโดยตรง เช่นรับ
coupon เงินสด, coupon ส่วนลด
ตรวจสอบความเรียบร้อยของป้ายราคาสินค้าเพื่อป้องกันการชำรุดและสับเปลี่ยนป้าย

ทำการ scan ป้ายราคา barcode สินค้า
นำสินค้าใส่ถุงให้ถูกต้องตามระเบียบการขึ้นที่ขอดขยายที่กำหนด
ประทับตรา job ที่ตัวสินค้าด้วยตนเองเมื่อได้รับค่าสินค้าแล้ว
เข้าใจและสามารถปฏิบัติเกี่ยวกับวิธีการเปลี่ยนราคา ณ จุด POS ได้ในทุกกรณี
สามารถจดจำราคาสินค้าที่ขายดีได้
รวบรวมเงินสด ตราสารและเอกสารต่างๆ ส่งมอบตามเวลาและขั้นตอนที่กำหนด
ทำรายงาน, แจ้งปัญหาที่เกิดขึ้นในการทำงานถึงผู้บังคับบัญชาทราบอย่างต่อเนื่อง
ดูแลบริเวณแคาน์เตอร์ที่ทำงานให้สะอาด ง่ายต่อการปฏิบัติงาน
ดูแลการใช้โทรศัพท์และเครื่องรูดบัตรเครดิตให้ทำงานได้อย่างมีประสิทธิภาพตลอดเวลา
ดูแลการใช้ถุง - พลาสติกบรรจุสินค้าให้ถูกต้องและรัดกุม
ดูแลและเก็บรักษาเอกสารสำคัญทางการเงินไม่ให้สูญหายหรือเกิดการทุจริตขึ้น
ให้บริการลูกค้าด้วยความยิ้มแย้มแจ่มใส, เป็นมิตร
งานอื่นๆ ที่ได้รับมอบหมาย

Information technology (IT) : คำบรรยายลักษณะงาน (Job Description)
ควบคุม, ดูแล, ดำเนินการบำรุงรักษางานระบบคอมพิวเตอร์, อุปกรณ์และสินทรัพย์ต่างๆ ให้พร้อมใช้งานและสามารถใช้งานได้มีประสิทธิภาพ
ตามมาตรฐานที่กำหนด
ให้คำแนะนำทางด้าน Application, LAN, Facilities และประสานงานกับบริษัทผู้ให้บริการด้าน software กับ DABT เพื่อกำกับดูแลงานระบบคอมพิวเตอร์
ให้ทำงานอย่างมีประสิทธิภาพตามที่กำหนดอยู่ตลอดเวลา
ตรวจสอบ, ดูแลระบบงานที่เกี่ยวข้องตามตารางเวลาที่กำหนดอย่างเคร่งครัด
เปิด-ปิดงานในแต่ละวันตามกำหนดเวลาและขั้นตอนที่กำหนดอย่างเคร่งครัด
ดำเนินการสรุปรายงาน, การจัดทำเอกสารต่างๆ, การจัดส่งผู้เกี่ยวข้อง อย่างครบถ้วนพร้อมสรุปรายงานปัญหาและแนวทาง, สิ่งที่ต้องดำเนินการแก้ไข
รายสัปดาห์ถึง Operation Manager
งานอื่นๆ ที่ได้รับมอบหมาย

Cashier at DABT : คำบรรยายลักษณะงาน (Job Description)
รับชำระค่าสินค้าโดยใช้เครื่อง POS ทุกประเภทตราสารอย่างถูกต้อง,รวดเร็ว, เป็นมิตร และถือปฏิบัติตามข้อกำหนดในการรับชำระค่าสินค้า
อย่างเคร่งครัด และดำเนินการเกี่ยวกับเครื่อง POS ที่กำหนดไว้ เช่นการเปิด-ปิดเครื่อง เป็นต้น
จัดเตรียมเงินรอบและจัดส่งเงินรอบตามข้อกำหนด
ทำความเข้าใจและถือปฏิบัติตามเงื่อนไขรายการส่งเสริมการขายต่างๆ โดยเฉพาะในส่วนที่ต้องเกี่ยวข้องโดยตรง เช่นรับ
coupon เงินสด, coupon ส่วนลด
ตรวจสอบความเรียบร้อยของป้ายราคาสินค้าเพื่อป้องกันการชำรุดและสับเปลี่ยนป้าย
ทำการ scan ป้ายราคา barcode สินค้า
นำสินค้าใส่ถุงให้ถูกต้องตามระเบียบการขึ้นทึกยอดขายที่กำหนด
ประทับใจ job ที่ตัวสินค้าด้วยตนเองเมื่อได้รับค่าสินค้าแล้ว
เข้าใจและสามารถปฏิบัติเกี่ยวกับวิธีการเปลี่ยนราคา ณ จุด POS ได้ในทุกกรณี
สามารถจดจำราคาสินค้าที่ขายดีได้
รวบรวมเงินสด ตราสารและเอกสารต่างๆ ส่งมอบตามเวลาและขั้นตอนที่กำหนด
ทำรายงาน, แจ้งปัญหาที่เกิดขึ้นในการทำงานถึงผู้บังคับบัญชาทราบอย่างต่อเนื่อง
ดูแลบริเวณเคาน์เตอร์ที่ทำงานให้สะอาด ง่ายต่อการปฏิบัติงาน
ดูแลการใช้โทรศัพท์และเครื่องรูดบัตรเครดิตให้ทำงานได้อย่างมีประสิทธิภาพตลอดเวลา
ดูแลการใช้ถุง - พลาสติกบรรจุสินค้าให้ถูกต้องและรัดกุม
ดูแลและเก็บรักษาเอกสารสำคัญทางการเงินไม่ให้สูญหายหรือเกิดการทุจริตขึ้น
ให้บริการลูกค้าด้วยความยิ้มแย้มแจ่มใส, เป็นมิตร
งานอื่นๆ ที่ได้รับมอบหมาย

## Job Description (To be)

Good receiving officer ; คำบรรยายลักษณะงาน (Job Description)
ด้านการตรวจสอบสินค้า
-ตรวจสอบสินค้าว่าอยู่ในเกรดใดของ POP grade
-ตรวจสอบจำนวนสินค้าให้ครบตามจำนวนตามใบส่งของ
-ตรวจสอบสภาพของสินค้า, บรรจุภัณฑ์ที่ร้านค้านำมาส่งเพื่อให้มั่นใจว่าอยู่ในสภาพสมบูรณ์ ไม่บุบสลายหรือเสียหายหรือมีร่องรอยถูกเปิด
-ไม่รับสินค้าที่ชำรุดจนไม่สามารถยอมรับได้ รวมถึงบรรจุภัณฑ์ที่ชำรุดเสียหาย
ด้านความรวดเร็วในการตรวจสอบสินค้า
-ดูแลการตรวจสอบขั้นต้นให้เป็นไปตามข้อกำหนด
-แนะนำคนขับรถขนสินค้าให้นำสินค้ามาไว้ที่บริเวณที่รอการตรวจรับสินค้า
ด้านงานเอกสาร
-ตรวจสอบเอกสารว่าสินค้าที่นำมาส่งถูกต้องตามสถานที่และวันส่งของที่ระบุใน P/O รวมถึงราคาทุนรวมที่ปรากฏใน P/O และ D/O
-ประทับตราการรับสินค้าขึ้นต้นลงในใบ D/O ทุกใบพร้อมทั้งลงรายละเอียดการรับสินค้าให้ครบถ้วน
-ดำเนินการจัดส่งเอกสารต่างๆ เช่น ใบส่งของ (D/O) และอื่นๆ ให้ถูกต้องตามที่กำหนด
-ระบุปัญหาในการรับสินค้าลงในใบบันทึกปัญหาการส่งของ (Delivery Problem Note) และส่งให้ผู้เกี่ยวข้องเพื่อดำเนินการแก้ไขพร้อมติดตาม
-สามารถใช้รายงานต่างๆ จากระบบฯ เพื่อวิเคราะห์, ทำงานได้อย่างมีประสิทธิภาพยิ่งขึ้น
ด้านการขนย้ายสินค้า
-ช่วย, ประสานงานขนย้ายสินค้าจากรถส่งของลงวางที่รับสินค้า
-ขนย้ายสินค้าที่ผ่านการตรวจรับสินค้าเป็นรายชิ้นขึ้นไปส่งยังแผนกขาย
-ขนย้ายสินค้าที่ส่งคืนร้านค้าจากแผนกขายมายังแผนกรับ-ส่งสินค้า
-ดูแลความสะอาดเรียบร้อยบริเวณที่จอดรถรับส่งสินค้าให้ปราศจากกล่องสินค้าและขยะอื่นๆ
ด้านการดูแลรักษาสินค้า
-จัดสินค้า, กล่องสินค้าจากบริเวณที่ตรวจนับสินค้านำขึ้นลงในรถขนของ (Security Trolleys)
-นำสินค้าไปส่งแผนกขายพร้อมทั้งให้มีการลงชื่อรับสินค้าในสมุด/ เอกสารเช่นรับสินค้า
ด้านการดูแลทรัพย์สินและอุปกรณ์การทำงาน

-ดูแลและบำรุงรักษาอุปกรณ์การทำงาน
-ระมัดระวังทรัพย์สินในการขนย้ายสาขา
ด้านประสิทธิผลในการทำงาน
-ดูแลการขนย้ายสินค้าเข้าออกของคลังสินค้า
ด้านการรับ-ส่งสินค้า
-ทำการรับสินค้าตามระบบ, ขั้นตอนที่กำหนด รวมถึง scan ป้าย barcode การนับสินค้าและการติดป้ายราคา
-พิมพ์แผ่นป้ายราคารหัสสินค้าภายใน (Internal Barcode), ตรวจสอบความถูกต้องของการติดป้ายราคาสินค้า
-จัดสินค้าให้พร้อมใบรับสินค้าเพื่อขนย้ายขึ้นรถส่งของนำไปส่งแผนกขาย
-ทำการส่งคืนสินค้าให้ร้านค้าอย่างถูกต้องตามขั้นตอน
-จัดระบบการจราจร (เช่นรถบรรทุกสินค้า) และการรักษาความปลอดภัยในบริเวณพื้นที่รับ-ส่งสินค้า

Seller at Store ;คำบรรยายลักษณะงาน (Job Description)
ด้านการบริหารการจัดการคลังสินค้าน้ำร้าน และการขาย
ขาย, ให้คำแนะนำหนังสือ, สินค้าแก่ลูกค้า
ติดตาม, สั่งซื้อเพิ่มเติม, บริหารหนังสือ, สินค้าขายดี ให้มีจำหน่ายตลอดเวลา และดำเนินการเปลี่ยนสินค้าขาย ชำหรือไม่เคลื่อนไหว คืนร้านค้า ตามหลัก <b>POP grade</b>
ตรวจสอบสินค้าด้วยวิธีการต่างๆ รวมถึงแจ้งผู้บังคับบัญชา จัดหาสินค้าที่ลูกค้าต้องการแต่ไม่มีขายหรือหมด และติดตาม ตามหลักการ Plano gram.
จัดโชว์สินค้าตามหลัก Visual Display หนังสือ และรักษาสภาพการจัด โชว์ให้ถูกต้องเหมาะสมอย่างเคร่งครัด ตามหลัก การของ Plan o gram
ปรับการจัดเรียงสินค้าตามหลัง POP grade และ Plano gram
ที่ลูกค้าแต่ละคนสนใจได้อย่างถูกต้อง, แม่นยำ ให้บริการลูกค้าด้วยความรวดเร็วและถูกต้อง
ติดตาม, รับข้อมูลข่าวสารหนังสือใหม่, ข่าวสารในแวดวงหนังสือ, นักเขียนอย่างใกล้ชิดจากทุกช่องทาง เพื่อ ให้บริการที่เป็นเลิศ
บริหารสินค้าได้อย่างมีประสิทธิภาพ เมื่อมีการเปลี่ยนแปลงแนวโน้มของความนิยมของสินค้า เมื่อมีแนวโน้ม การเปลี่ยนแปลงสินค้า ทำให้ดำเนินการเปลี่ยนแปลง POP grade แบบ Manual ในระบบ เพื่อจัดวางสินค้า ตามหลักการ ของ Planogram
มี product knowledge สามารถให้คำแนะนำ, ให้ความช่วยเหลือ, สนับสนุนลูกค้าในการหาหนังสือ, สินค้าที่ สนใจเพื่อตัดสินใจซื้อ

ด้านการดูแลทรัพย์สินและอุปกรณ์การทำงาน
ทำความสะอาด, ดูแลความเรียบร้อยของพื้นที่ขาย, stock โดยจัด โชว์, จัดเรียงสินค้าอย่างเป็นระบบ, ระเบียบ
ดูแลบริเวณเคาน์เตอร์ที่ทำงานให้สะอาด ง่ายต่อการปฏิบัติงาน
ด้านการปฏิบัติงาน
จัดทำเอกสารการขายที่กำหนดอย่างถูกต้อง, รวดเร็วตามระยะเวลาที่กำหนด
รับชำระค่าสินค้า โดยยึดตามมาตรฐานการให้บริการที่กำหนด
ตรวจนับสินค้าด้วยความรอบคอบและรวดเร็วทั้งใน stock และพื้นที่ขาย
จัดสินค้าเข้าชั้นวางให้ครบอย่างเป็นระเบียบและสวยงามตามมาตรฐานที่กำหนดเมื่อแผนกรับส่งสินค้านำสินค้ามาส่งที่พื้นที่ขายแล้ว
ตรวจสอบความถูกต้อง, เรียบร้อยและประสานงาน, ดำเนินการเปลี่ยนป้ายราคาสินค้าในกรณีที่ป้ายราคาชำรุด, มีการปรับราคาถาวร
ช่วยป้องกันและระมัดระวังมิให้สินค้าถูกขโมย, สูญหาย โดยสังเกตพฤติกรรมลูกค้าที่ผิดปกติและแจ้งแผนก Loss Prevention ตามขั้นตอน
รับชำระค่าสินค้าโดยใช้เครื่อง POS ทุกประเภทตราสารอย่างถูกต้อง, รวดเร็ว, เป็นมิตร และถือปฏิบัติตามข้อกำหนดในการรับชำระค่าสินค้า
อย่างเคร่งครัด และดำเนินการเกี่ยวกับเครื่อง POS ที่กำหนดไว้ เช่นการเปิด-ปิดเครื่อง เป็นต้น
จัดเตรียมเงินรอบและจัดส่งเงินรอบตามข้อกำหนด
ทำความเข้าใจและถือปฏิบัติตามเงื่อนไขรายการส่งเสริมการขายต่างๆ โดยเฉพาะในส่วนที่ต้องเกี่ยวข้องโดยตรง เช่นรับ
coupon เงินสด, coupon ส่วนลด
ตรวจสอบความเรียบร้อยของป้ายราคาสินค้าเพื่อป้องกันการชำรุดและสับเปลี่ยนป้าย
ทำการ scan ป้ายราคา barcode สินค้า
นำสินค้าใส่ถุงให้ถูกต้องตามระเบียบการยื่นที่ขอดขายที่กำหนด
ประทับใจ job ที่ตัวสินค้าด้วยตนเองเมื่อได้รับค่าสินค้าแล้ว
เข้าใจและสามารถปฏิบัติเกี่ยวกับวิธีการเปลี่ยนราคา ณ จุด POS ได้ในทุกกรณี
สามารถจดจำราคาสินค้าที่ขายดีได้
รวบรวมเงินสด ตราสารและเอกสารต่างๆ ส่งมอบตามเวลาและขั้นตอนที่กำหนด
ทำรายงาน, แจ้งปัญหาที่เกิดขึ้นในการทำงานถึงผู้บังคับบัญชาทราบอย่างต่อเนื่อง
ด้านการบริการกับลูกค้า

รายงานปัญหาที่พบในพื้นที่ขาย, ข้อคิดเห็นจากลูกค้า ถึงผู้บังคับบัญชาทราบและคิดตามผลดำเนินการอย่างใกล้ชิดและต่อเนื่อง
ดำเนินการปรับเปลี่ยน, คัดสินค้าที่ลูกค้าต้องการคืน, เปลี่ยนอย่างรวดเร็วและถูกต้อง
ดูแลการใช้โทรศัพท์และเครื่องรูดบัตรเครดิตให้ทำงานได้อย่างมีประสิทธิภาพตลอดเวลา
ดูแลการใช้ถุง - พัสศุบรรจุสินค้าให้ถูกต้องและรัดกุม
ดูแลและเก็บรักษาเอกสารสำคัญทางการเงินไม่ให้สูญหายหรือเกิดการทุจริตขึ้น
ให้บริการลูกค้าด้วยความยิ้มแย้มแจ่มใส, เป็นมิตร
งานอื่นๆ ที่ได้รับมอบหมาย

Information technology (IT) : คำบรรยายลักษณะงาน (Job Description)
ด้านการจัดการ system
ให้ความรู้เรื่องการใช้งานและการเปลี่ยนแปลงการทำงานของระบบเมื่อมีการ Implement ระบบการจัดการคลังสินค้าของ คลังร้านค้าปลีก
ติดตามการใช้งาน ปัญหาที่เกิดขึ้นจากใช้งานคลังร้านค้าปลีก เพื่อปรับปรุงระบบ software หรือปรับให้ตรงกับความต้องการของ User มากยิ่งขึ้น
ด้านการดูแลรักษา
ควบคุม, ดูแล, ดำเนินการบำรุงรักษาระบบคอมพิวเตอร์, อุปกรณ์และสินทรัพย์ต่างๆ ให้พร้อมใช้งานและสามารถใช้งานได้มีประสิทธิภาพ
ตามมาตรฐานที่กำหนด
ให้คำแนะนำทางด้าน Application, LAN, Facilities และประสานงานกับบริษัทผู้ให้บริการด้าน software กับ DABT เพื่อกำกับดูแลงานระบบคอมพิวเตอร์
ให้ทำงานอย่างมีประสิทธิภาพตามที่กำหนดอยู่ตลอดเวลา
ด้านอื่นๆ
ตรวจสอบ, ดูแลระบบงานที่เกี่ยวข้องตามตารางเวลาที่กำหนดอย่างเคร่งครัด
เปิด-ปิดงานในแต่ละวันตามกำหนดเวลาและขั้นตอนที่กำหนดอย่างเคร่งครัด
ดำเนินการสรุปรายงาน, การจัดทำเอกสารต่างๆ, การจัดส่งผู้เกี่ยวข้อง อย่างครบถ้วนพร้อมสรุปรายงานปัญหาและแนวทาง, สิ่งที่ต้องดำเนินการแก้ไข
รายสัปดาห์ถึง Operation Manager
งานอื่นๆ ที่ได้รับมอบหมาย

Cashier at DABT : คำบรรยายลักษณะงาน (Job Description)
รับชำระค่าสินค้าโดยใช้เครื่อง POS ทุกประเภทตราสารอย่างถูกต้อง,รวดเร็ว, เป็นมิตร และถือปฏิบัติตามข้อกำหนดในการรับชำระค่าสินค้า
อย่างเคร่งครัด และดำเนินการเกี่ยวกับเครื่อง POS ที่กำหนดไว้ เช่นการเปิด-ปิดเครื่อง เป็นต้น
จัดเตรียมเงินรอบและจัดส่งเงินรอบตามข้อกำหนด
ทำความเข้าใจและถือปฏิบัติตามเงื่อนไขรายการส่งเสริมการขายต่างๆ โดยเฉพาะในส่วนที่ต้องเกี่ยวข้องโดยตรง เช่นรับ
coupon เงินสด, coupon ส่วนลด
ตรวจสอบความเรียบร้อยของป้ายราคาสินค้าเพื่อป้องกันการชำรุดและสับเปลี่ยนป้าย
ทำการ scan ป้ายราคา barcode สินค้า
นำสินค้าใส่ถุงให้ถูกต้องตามระเบียบการขึ้นทึยกยอดขายที่กำหนด
ประทับใจที่ตัวสินค้าด้วยตนเองเมื่อได้รับค่าสินค้าแล้ว
เข้าใจและสามารถปฏิบัติเกี่ยวกับวิธีการเปลี่ยนราคา ณ จุด POS ได้ในทุกกรณี
สามารถจดจำราคาสินค้าที่ขายดีได้
รวบรวมเงินสด ตราสารและเอกสารต่างๆ ส่งมอบตามเวลาและขั้นตอนที่กำหนด
ทำรายงาน, แจ้งปัญหาที่เกิดขึ้นในการทำงานถึงผู้บังคับบัญชาทราบอย่างต่อเนื่อง
ดูแลบริเวณเคาน์เตอร์ที่ทำงานให้สะอาด ง่ายต่อการปฏิบัติงาน
ดูแลการใช้โทรศัพท์และเครื่องรูดบัตรเครดิตให้ทำงานได้อย่างมีประสิทธิภาพตลอดเวลา
ดูแลการใช้ถุง - พัสศุบรรจุน้ำให้ถูกต้องและรัดกุม
ดูแลและเก็บรักษาเอกสารสำคัญทางการเงินไม่ให้สูญหายหรือเกิดการทุจริตขึ้น
ให้บริการลูกค้าด้วยความยิ้มแย้มแจ่มใส, เป็นมิตร
งานอื่นๆ ที่ได้รับมอบหมาย

**BIOGRAPHY**

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<b>PUBLICATIONS</b>	Buawadthana S. and Kritchanchai, D. (2008). การประยุกต์ใช้การจัดการโลจิสติกส์ในกระบวนการรับเข้า หนังสือ, Proceeding of VCML Conference , November 2008. Buawadthana S. and Kritchanchai, D. (2010). Implementation of A Warehouse Management System In A Retail Warehouse: A Case Study at Double a Book Tower, THAILAND, Proceeding of national grad research Conference Mahidol University, February 2010