STOCKING MANAGEMENT SYSTEM:
A CASE STUDY OF HOKSENG COMPANY

TRAIRAT LIEWSIRIANAN

**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE
(TECHNOLOGY OF INFORMATION SYSTEM MANAGEMENT)
FACULLTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2014**

Thematic Paper
entitled
STOCKING MANAGEMENT SYSTEM :
A CASE STUDY OF HOKSENG COMPANY

…………………………………………
Mr.Trairat   Liewsirianan
Candidate

…………………………………………
Asst. Prof. Adisorn Leelasantitham,
Ph.D. (Electrical Engineering)
Major advisor

…………………………………………
Lect. Sotarat Thammaboosadee,
Ph.D. (Information Technology)
Co-advisor

………………… ………………
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

…………………………………………
Asst. Prof. Supaporn Kiattisin,
Ph.D. (Electrical and Computer Engineering)
Program Director
Master of Science Program in
Technology of Information System
Management
Faculty of Engineering
Mahidol University

Thematic Paper
entitled
STOCKING MANAGEMENT SYSTEM :
A CASE STUDY OF HOKSENG COMPANY

was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Science
(Technology of Information System Management)
on
July 17, 2014

……………………………………………
Mr.Trairat   Liewsirianan
Candidate

……………………………………………
Asst. Prof. Supaporn Kiattisin,
Ph.D. (Electrical and Computer Engineering)
Chair

………………………………….…...
Asst. Prof. Adisorn Leelasantitham,
Ph.D. (Electrical Engineering)
Member

………………………………… | …………...……………………………
Lect. Sotarat Thammaboosadee,
Ph.D. (Information Technology)
Member

Asst.Prof. Kairoek Choeychuen,
Ph.D. (Electrical and Computer Engineering)
Member

………………… ……………… | ……………………………………………
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

Lect. Worawit Israngkul,
M.S.(Technical Management)
Dean
Faculty of Engineering,
Mahidol University

ACKNOWLEDGEMENTS

STOCKING MANAGEMENT SYSTEM A CASE STUDY OF HOKSANG COMPANY

TRAIRAT LIEWSIRIANAN 5136054 EGTI/M

M.Sc. (TECHNOLOGY OF INFORMATION SYSTEM MANAGEMENT)

THEMATIC PAPER ADVISORY COMMITTEE : ADISORN LELASUNTITUM, ASST. PROF., SUPAPORN KIATTISIN, ASST. PROF.

ABSTRACT

The Objectives of this thematic paper were to improve the business processes and develop a web application for a stock management system with a case study at Hokseng Company. This aplication would increase the efficiency of management in ordering and stocking to reduce products in inventories which will depreciate in value including redundancy of products and being out of fashion. The system module is compromised of ordering, selling, notifications, statistical reports that can be exported to Word and Excel files, generate graphs to forecast the product price quickly and depreciation in the value of products.

The application was developed using The Apache HTTP Server as a web server and My SQL as a database management system. PHP and html with css as the server were side script languages for the interface design. Microsoft Windows Server 2003version has been installed for this application and was tested by participants on various internet browsers.

KEY WORDS : STOCKING MANAGEMENT / DEPRECIATION SYSTEM

86 pages

ระบบบริหารจัดการสินค้าคงคลัง กรณีศึกษาบริษัทฮกเซ้ง

STOCKING MANAGEMENT SYSTEM A CASE STUDY OF HOKSANG COMPANY

ไตรรัตน์ หลิวศิริอนันต์ 5136054 EGTI/M

วท.ม. (เทคโนโลยีการจัดการสารสนเทศ)

คณะกรรมการที่ปรึกษาสารนิพนธ์: อดิศร ลีลาสันติธรรม, สุภาภรณ์ เกียรติสิน

บทคัดย่อ

สารนิพนธ์นี้มีวัตถุประสงค์เพื่อปรับปรุงกระบวนการทำงานและพัฒนาระบบการจัดการสินค้าคงคลังด้วยกรณี ศึกษาของบริษัทฮกเซ้ง ในรูปแบบ Web Application โดยมุ่งหวังว่าระบบที่พัฒนาขึ้นมาจะช่วยเพิ่มประสิทธิภาพการจัดการสินค้าคงคลัง ป้องกันการสั่งซื้อที่ซ้ำซ้อนเพื่อช่วยลดจำนวนสินค้าในคลังสินค้าที่จะเกิดการเสื่อมมูลค่าตามเวลาและความนิยม ระบบประกอบไปด้วยระบบย่อยที่มีการทำงานที่สอดคล้องกันหลายระบบย่อยด้วยกันเช่น ระบบสั่งซื้อ ระบบสั่งขาย ระบบแจ้งเตือนและระบบงานสรุปผลที่สามารถจำลองข้อมูลออกมาแสดงเป็นรูปกราฟ

ระบบถูกพัฒนาขึ้นด้วยภาษา PHP ร่วมกันฐานข้อมูล MySQL และใช้โปรแกรม Apache HTTP Server เป็นเว็บเซอร์เวอร์บนระบบปฏิบัติการ Microsoft Windows Server 2000 โดยมีการทดสอบผ่านเว็บเบราเซอร์หลายตัวด้วยกันและพบว่าสามารถทำงานได้เป็นอย่างดี

86 หน้า

CONTENTS

CONTENTS (cont.)

LIST OF TABLES

LIST OF FIRURES

LIST OF FIRURES (cont.)

LIST OF FIRURES (cont.)

CHAPTER I
INTRODUCTION

1.1 Project name

Stocking Management System

1.2 Background

Since Hoksang Company was established about 20 years, the growth rate of business profit has been growing rapidly. There were the numerous products circulating in and out. Most companies end up with surplus merchandises and bankrupt stock. This can be a costly problem. The management system should be wider strategic advantage than previous to support them. With new products arriving all the time we are constantly having to make more space in warehouse and also being easy to check. In order to make the progress smoothly, the company should have the effective stocking system solved the released goods and the re-checked product.

1.3 Objective

- To manage stocking product system
- To rechecking product easily

1.4 Path of working

Stocking Management System
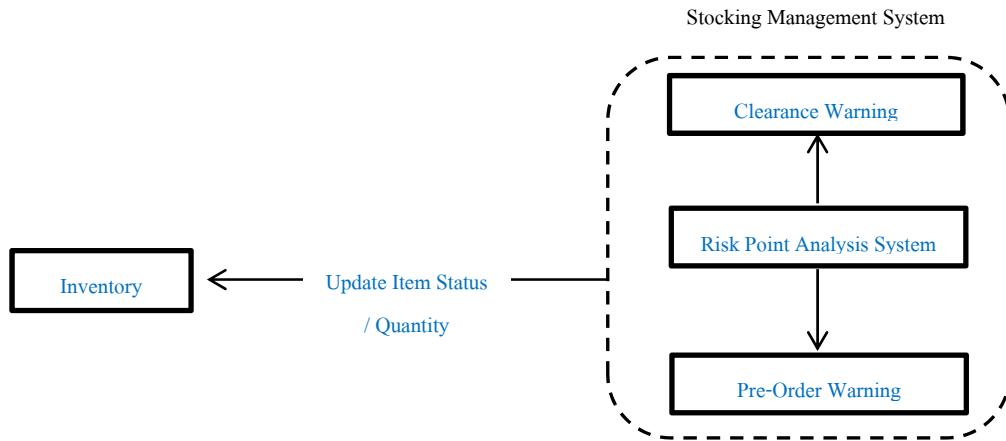
Figure1.1 Overview system

In the overview system, the inventory stock connects the stocking management system which consists of three main block diagrams; clearance warning, risk point analysis system and pre-order warning. If the quantities of products in the inventory stock reach to the risk point, the system will send the pre-order warning back to the inventory stock to process other steps via the risk point analysis system. In part of clearance warning, when the products in the inventory stock exceed the set point in the clearance warning, the risk point analysis system will warn to the inventory stock to process next step.

1.5 Structure of Product

Form this study that there are use many time to keeping the records because Hoksang Company has many types of commodities sure as that each type there are various series, sizes, colors or qualities. From that records can been known that there are many main product types such as a car audio, alloy wheel for a car, film, tire, fiberglass canopy, car skirt and others. All above are analyzed and illustrated to below chart.
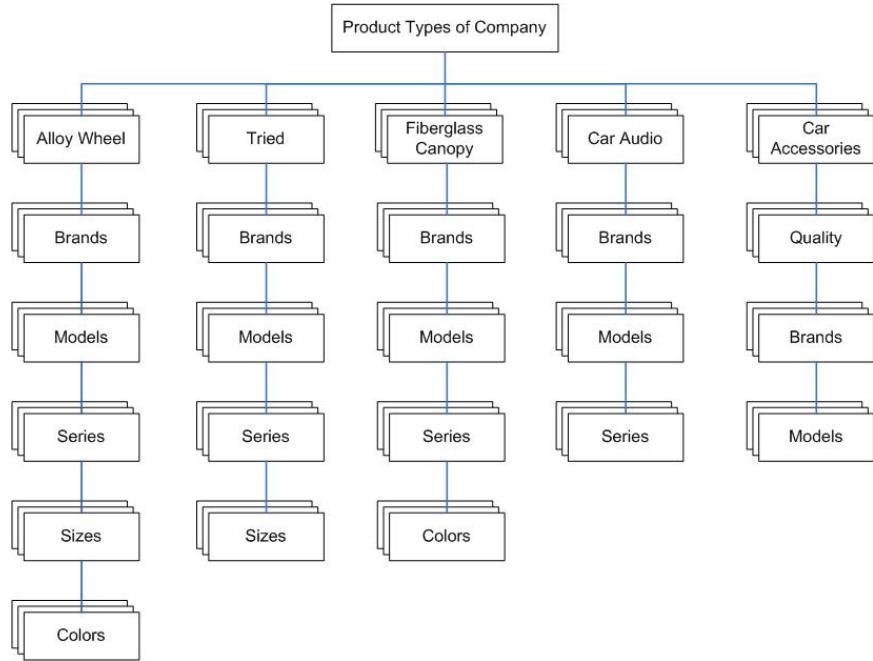
Figure1.2 Structure of Product Types

From above is implied, the company has a lot of various and too hard for separated to each fill and use long term to development. The concentrate of the research focus to the alloy wheel because it is the most complicate and detailed, there are the most layer to divide the product in each fraction. This system is the core model that can use to adept and develop to another product.

1.6 Scopes of work

The stocking management system consists of the followings:

1.6.1 Clearance warning – will operate in clearing stocks if the inventory stocks are over the set point. The clearing stocks are determined by time which is set in the system to calculate the amount of discount rate definite that the longer end of line stock time is in inventory stock, the more discounts is added to.

1.6.2 Risk point analysis system – obtains the number of product data in the inventory stock and checks them. If the data reach to the risk point, the risk point analysis system will approach the warning scores in the next step which is clearance warning or pre-order warning.

1.6.3 Pre-order warning – will work to order more product if the inventory stock lacks of the quantity of products.

1.7 Expecting result

The stocking system releases and orders the quantity of product appropriately according to the available stock. In addition, it can be managed in the inventory stock to facilitate rechecking.

CHAPTER II
LITERATURE REVIEW

The study was conducted for the purpose of learning cycle consumption of Car Alloy Wheel at Hoksang Company. Beginning with sale data collecting and of the goods, Car Alloy Wheel began data collecting from the past two years. Then the collected information is used to analyze and process the behavior of consumers with the product. After that, take the data obtained from the analysis of the decision to stocking for prepare the demand of the market. By without a stocking for reduce the risk of excessive inventories conditions which is resulted in the depreciation of the products that many business owners are experiencing now and difficult to solve. This system will be helps the owner to be able to predict the amount of product for ordering in the next time and a reasonable time to release products before the product is more than the depreciation in value or depreciation in value eventually. This system consists of the following topics:

2.1 Inventory System

      2.1.1 Database System

      2.1.2 Product Management

      2.1.3 Information Retrieval

2.2 Methods of depreciation

      2.2.1 Straight-line depreciation

      2.2.2 Declining Balance Method

      2.2.3 Activity Depreciation Method

      2.2.4 Sum-of-years-digits method

      2.2.5 Units-of-production depreciation Method

      2.2.6 The depreciation of a case study at Hokseng Company

2.3 Inventory Management

      2.3.1 Inventory Control

2.3.2 The appropriate amount of inventory

2.4 Notification

2.4.1 Discount Alert

2.4.2 Pre-Order Alert

2.5 Related Thesis

2.1 Inventory System

About the inventory system, almost of problems that are often encountered is the lack of stock when a customer wants the product which caused the loss of revenue that should have and could cause a loss of customers or product delivery delays as a result. I can get the entity may be fined or lose the trust of the businesses. The neglect to check the stock in the inventory is due to a pending item in stock, which is the cause of the loss, no matter the accounting or the decline in value of the inventories.

The components of system is used in an inventory system that consists of several components together, which will be comprised of many subsystems and working together to achieve maximum potential. Inventory management system with the Alloy used in the Clearance System is comprised of the following subsystems.

2.1.1 Database System

Database is a collection of information that is relevant. Brought together a collection of systems and data that makes up a new information that required to meet the objectives of the organization as well as to collect more detailed inventory, which may have to include, number of products, products name, product price per unit. Further specify that the employee who is a seller and sold out to whom, customers or the members who may be included a history of the customer. It can be seen that the collection of all pollutants that are extremely important. The information in each section will have a relative can be linked to each other. To be used later on. The groups of data were collected by reciprocity. Without forcing that all information is correct. Stored in the same data file, or keep a separate file.

Database System refers to the system that collects information related well together or have the relation which systematic between different information clear.

Database will contain the data files containing information which can related to together as a system and allow the user to use and maintain with the protection of these data with effectively. The information stored in the computer, it is also required to build up the data files for storing information related to the subject. Each file contains a subset or fields, many fields that are closely related to each other and each data set stored in files or records. Collected in this manner is similar to a separate file to store paper documents in file normally but there are more effective uses and maintenance will be easier. The objective is to reduce duplication of data and permitting the developer to lead to further development. Through a database management system, called DBMS, which will also features.

2.1.1.1 Database Application

Database Application is an application that helps a user can easily interact to the database, which is a form of communication with the database. Users need not have knowledge about of database or how to implementation but they can run the database such as ATM Machines.

2.1.1.2 Database Management System or DBMS

Database management system is a group of one program or software that is created to manage the database directly for the most effective for to be a tool that helps the user to access the information easier. The users do not need to know about the details within the database structure, DBMS as an intermediary in the link between users and programs that associated with the database and show in the easy interface. The examples of commonly are used today include DBMS, Microsoft Access, FoxPro, SQL Server, Oracle, Informix and DB2. The reason to choose Microsoft SQL Server is a DBMS system for the preparation of the Clearance System, Microsoft SQL Server is a relational database management system (RDBMS) developed by Microsoft. It is a software product whose primary function is to store and retrieve data as requested by other software applications, be it those on the same computer or those running on another computer across a network (including the Internet). There are at least a dozen different editions of Microsoft SQL Server aimed at different audiences and for different workloads and have developed. Because of low price and easy to find, it is the main factors that make the Microsoft SQL database system is very well known.

2.1.1.3 Database Server

A database server is a computer program that provides database services to other computer programs or computers, as defined by the client–server model. The term may also refer to a computer dedicated to running such a program. Database management systems frequently provide database server functionality, and some DBMSs (e.g., MySQL) rely exclusively on the client–server model for database access. Such a server is accessed either through a "front end" running on the user's computer which displays requested data or the "back end" which runs on the server and handles tasks such as data analysis and storage. In a master-slave model, database master servers are central and primary locations of data while database slave servers are synchronized backups of the master acting as proxies. Some examples of proprietary database servers are Oracle, DB2, Informix, and Microsoft SQL Server. Examples of GNU General Public License database servers are Ingres and MySQL. Every server uses its own query logic and structure. The SQL query language is more or less the same in all the database servers.

2.1.1.4 Data

Data are the values of variables that belong to a set of items. Data in computing (or data processing) are represented in a structure, often tabular (represented by rows and columns), a tree (a set of nodes with parent-children relationship) or a graph structure (a set of interconnected nodes). Data are typically the results of measurements and can be visualized by using graph or images. Data as an abstract concept can be viewed as the lowest level of abstraction from which information and then knowledge are derived. Raw data, unprocessed data, refers to a collection of numbers, characters and is a relative term, data processing commonly occurs by stages, and the processed data from one stage may be considered the raw data of the next. Field data refers to the raw data that collected in an uncontrolled in situ environment. Experimental data refers to the data that generated within the context of a scientific investigation by observation and recording.

2.1.1.5 A database administrator (DBA)

A database administrator (DBA) is a person who responsible for the installation, configuration, upgrade, administration, monitoring and maintenance of databases in an organization. DBA is very importance for every organization because

DBA will be query information which will be reported to manager or someone who can make a decision or marketing planning which can be related to clearance system.

2.1.2 Product Management

Product management is an organizational lifecycle function within a company dealing with the planning, forecasting, or marketing of a product or products at all stages of the product lifecycle.

Product life-cycle management (PLCM) is the succession of strategies that used by business management as a product goes through its life-cycle. The condition of a product is sold (advertising, saturation) changes over time and must be managed as it moves through its succession of stages. It is very important for marketing managers to understand the limitations of the PLCM model and difficult for marketing management to gauge accurately where a product is on its life cycle. A given product may hold a unique PLCM shape such that uses of typical PLCM models are only useful as a rough guide for marketing management.

For specific products, the duration of each PLCM stage is unpredictable and it's difficult to detect when maturity or decline has begun. Because of these limitations, strict adherence to PLCM can lead a company to misleading objectives and strategy prescriptions.

2.1.3 Information Retrieval

The information retrieval is the activity of obtaining information resources that relevant to an information need from a collection of information resources. Searches can be based on metadata or on full-text indexing.

Automated information retrieval systems are used to reduce the information overload. Many universities and public libraries use IR systems to provide access to products, journals, books and other documents. Web search engines are the most visible IR applications.

An information retrieval process begins when a user enters a query into the system. Queries are formal statements of information needs, for example search strings in web search engines. In information retrieval, a query does not uniquely

identify a single object in the collection. Instead of several objects may match the query, perhaps with different degrees of relevancy.

An object is an entity that is represented by information in a database. The queries are matched against the database information. Most IR systems compute a numeric score on how well each object in the database matches the query, and rank the objects according to this value. The top ranking objects are then shown to the user. The process may then be iterated if the user wishes to refine the query.

2.2 Methods of depreciation

The depreciation of the products and businesses, each one has with different ideas out. If a business is involved with the machines will have depreciation. But each business has to charge for their depreciation according to different factors in each business.   If the business of the Car Alloy Wheel, there are many factors that come into effect depreciation is the time when the product opening on the market and about timing. Trend, popularity and the new version of products that come out for sale at the market. Included the materials used to make products and product brand, well known or not, as the affect the degradation products. In general, the depreciation of the product can be found in many types, it is up to the product type and business type but it can separate into five main types.

2.2.1 Straight-line depreciation

Straight-line depreciation is the simplest method and most often used. In this method, the company estimates the salvage value of the product at the end of the period during which it will be used to generate revenues (useful life). (The salvage value is an estimate of the value of the product at the time it will be sold or disposed of; it may be zero or even negative. Salvage value is also known as scrap value or residual value.) The company will charge the same amount to depreciation each year over that period, until the value shown for the product has reduced from the original cost to the salvage value.

Straight-line method:

Annual Depreciation Expense = (Purchase Price of Product - Approximate Salvage Value) ÷ Estimated Useful Life of Product (years)

Figure 2.1 Example for Straight-line depreciation

2.2.2 Declining Balance Method

The declining balance depreciation method is an accelerated method since a large part of the fixed product cost that expensed at the beginning of the product life. To calculate declining balance depreciation is multiplied by a factor. The depreciable basis is the product value of the fixed product, cost less accumulated depreciation.

Suppose a business has an asset with THB 1,000 beginning cost, THB 100 salvage value, and 5 years of useful life. First, the straight-line depreciation rate would be 1/5, i.e. 20% per year. Under the double-declining-balance method, double that rate and 40% depreciation rate would be used. The table below can describe this:

Table 2.1 Example of Under the double-declining-balance method

Product value at beginning of year	Depreciation rate	Depreciation expense	Accumulated depreciation	Product value at end of year
1,000 THB*	40%	400 THB	400 THB	600 THB
600 THB	40%	240 THB	640 THB	360 THB

Table 2.1 Example of Under the double-declining-balance method (cont.)

360 THB	40%	144 THB	784 THB	216 THB
216 THB	40%	86.40 THB	874.40 THB	129.60 THB
129.60 THB	129.60 - 100	29.60 THB	900 THB	100 THB **

* Beginning cost
** Scrap value

$$depreciation\ rate = 1 - \sqrt[n]{\frac{residual\ value}{cost\ of\ fixed\ asset}}$$

N is the estimated life of the product (for example, in years).

2.2.3 Activity Depreciation Method

The activity depreciation methods are not based on time, but depend on a level of activity. This method could be miles driven for a vehicle, or a cycle count for a machine. When the asset is acquired, its life is estimated in terms of this level of activity. Assume the vehicle above is estimated to go 50,000 miles in its lifetime. The per-mile depreciation rate is calculated as: (฿170,000 cost − ฿20,000 salvage) / 500,000 miles = ฿ 3.00 per mile. Each year, the depreciation expense is then calculated by multiplying the number of miles driven by the per-mile depreciation rate.

2.2.4 Sum-of-years-digits Method

Sum-of-years-digits is a depreciation method which results in a more accelerated write-off than the straight line method, and typically also more accelerated than the declining balance method. Under this method of the annual depreciation is determined by multiplying the depreciable cost by a schedule of fractions.

Depreciable cost　　= initial cost − salvage value

Product value　　　= initial cost − accumulated depreciation

2.2.5 Units-of-production depreciation Method

Under the units-of-production method, useful life of the asset is expressed in terms of the total number of units expected to be produced:

$$\text{Annual Depreciation Expense} = \frac{\text{Cost of Fixed Asset} - Residual\ Value}{\text{Estimated Total Production}} * \text{Actual Production}$$

Suppose, an asset has initial cost ฿70,000, salvage value ฿10,000, and is expected to produce 6,000 units.

Depreciation per unit = ($70,000−10,000) / 6,000 = $10

10 × actual productions will give the depreciation cost of the current year.

The table below illustrates the units-of-production depreciation schedule of the asset.

Table2.2 Example of the units-of-production depreciation

Product value at beginning of year	Units of production	Depreciation cost per unit	Depreciation expense	Accumulated depreciation	Book value at end of year
*฿ 70,000	1,000	฿ 10	฿ 10,000	฿ 10,000	฿ 60,000
฿ 60,000	1,100	฿ 10	฿ 11,000	฿ 21,000	฿ 49,000
฿ 49,000	1,200	฿ 10	฿ 12,000	฿ 33,000	฿ 37,000
฿ 37,000	1,300	฿ 10	฿ 13,000	฿ 46,000	฿ 24,000
฿ 24,000	1,400	฿ 10	฿ 14,000	฿ 60,000	**฿ 10,000

* initial cost
** Scrap value

Depreciation will stop when the book value is equal to the scrap value of the asset. In the end, the sum of accumulated depreciation and scrap value equals the original cost.

2.2.6 The depreciation of a case study at Hokseng Company

The depreciation of a case study at Hokseng Company uses a period time in the main of depreciation. The information form study and analyzed can summary that product values will be depreciate every 5% - 10% in each 6 months; depend on brands and series of products. Of cause that the owner or administrator will study the life circle of product before identify the depreciation of each product. The depreciation Method of a case study at Hokseng Company uses the query of the detail of product to generate by identify variable as show in document1 on page   .

The example of the depreciation Method of a case study at Hokseng Company, the discount rate is 5% for first 6 months and then the product will depreciate 5% of the product value every year. Such as the initial value is 3,500 baht after 6 months the value will be 3,325 baht. Then after a year the vavlue of product will depreciate to 3158.75 baht as show below table2.3

Table2.3 Production depreciation in each circle

Baht\Time	6th month	1st circle	2nd circle	3rd circle	4th circle
Order Price	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00
Value Price	3,500.00	3,325.00	3,158.75	3,000.81	2,850.77
Profit	1,000.00	825.00	658.75	500.81	350.77

Order Price : Product cost that the company has ordered from the subpliers.

Value Price : Sell price that the company has sell to the customer

1st circle   : 1st circle will count after pass first 6 monthes, 1 year per circle.

2.3 Inventory Management

2.3.1 Inventory Control System

An important function of inventory management is the recording which will be right and accurate of units in the database of inventory. Each business has a difference product in the inventory and structure of database. About checking the product stock, there are use a lot of so people and time to solve this problem. It will be

known the unit of each product that should be in an inventory. There can be control the right amount. Inventory control system has 3 ways.

2.3.1.1 Continuous Inventory System Perpetual System

This inventory system has methods to record every invoice that has been ordered and received to the store. It is an important control system that is necessary to every organization. This system must be use a lot of people to run through. Now a day, there is a barcode or the International Code for the product.

The advantages of continuous inventory system

1. There has less the product in the inventory for specific waiting period.

2. Using a fixed number of orders which have quantity discount easily.

Consider the purchase model of inventory system which is as shown in Figure 2.2
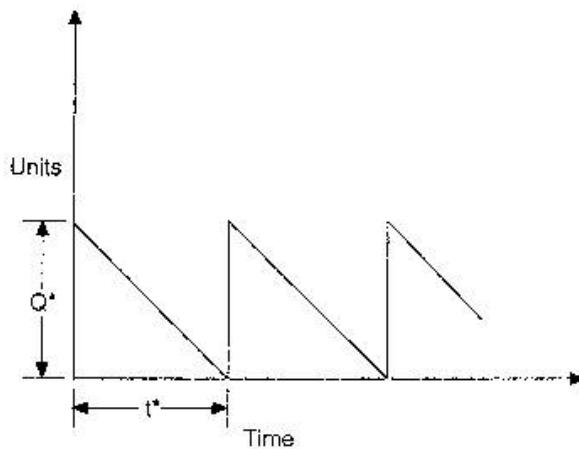
Figure 2.2 Operation of inventory system

Q^* is the number of product and t^* is the waiting time. If we operate with the system (shown above) such as without any provision to take care of fluctuations in demand and lead time, we will encounter stock out situation very often.

2.3.1.2 The system with constant demand and lead time

Even if we consider the model with constant demands and constant lead time we will have to place order well before the end of cycle time, so

that the items are received exactly at the end of the present cycle or at the beginning of the next cycle.

Let DLT be the demand during lead time.

DLT   = demand rate × lead time period

= (d/day) × (LT in days)

If there is no variation in lead time and demand, then it is sufficient to have a out of stock of DLT at the time of placing order. This is as shown in **Figure 2.3**

Reorder level (ROL) = DLT
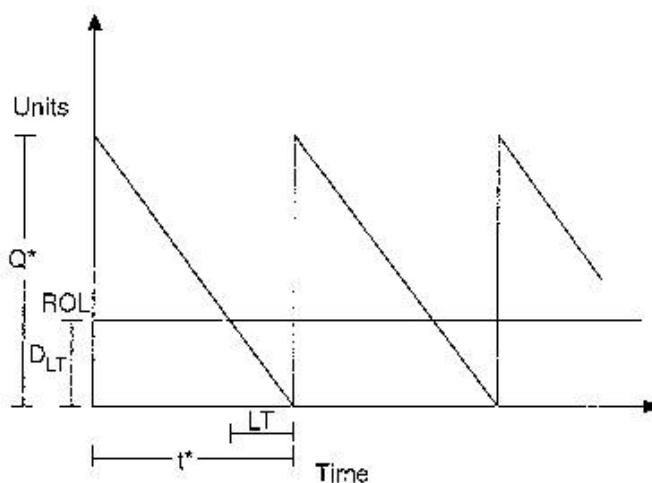
Figure 2.3 Inventory systems with constant demand and constant lead time

2.3.1.3 Inventory system with safety stock for variation in lead time demand

Reorder level is the stock level at which an order is placed so that we receive the items against the order at the beginning of the next cycle.

If the demand is varying, then the ROL is as given below.

ROL = DLT + SS

SS is the safety stock, which acts as a cushion to absorb the variation in demand.

SS = Kσ where σ is the standard deviation of demand and K is the standard normal statistic value for a given service level. The corresponding chart is shown in Figure 2.4
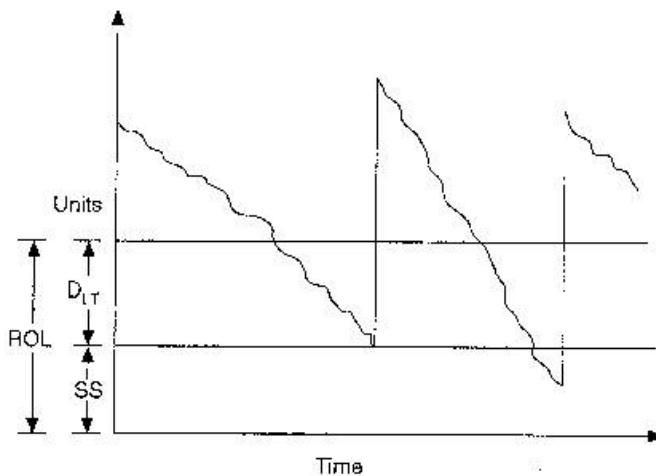
Figure 2.4 Inventory systems with safety stock for variation in lead time demand

2.3.2 The appropriate amount of inventory

To calculate the appropriate number in the hoard is so difficult and take time to study the spending habits of consumers. Because of the product is a product that is quite overgrown verbosity. Economic stability is another important factor and could not be controlled. Therefore, the operator must be experienced and have a strong decision to avoid the depreciation of the product. This system uses data from the collection and made out a report for consideration.

2.4 Notification

Notification System is a combination of software and hardware that provides a means of delivering a message to a set of recipients via multiple mediums. The basic purpose of notification system is alerting the person who is a particular event has happened. Notification System can help us in remembering something that automates the delivery of notices to groups using simultaneous voice, text, SMS, instant messaging and email broadcasts.

2.4.1 Discount Alert

Notification system for discount alert is designed to reduce product inventory in the warehouse before depreciation, or the product is less popular. As a result, the liquidity of management budget to the administration. Funds used to operate

the business so sparse. Every business owner who lacks good management systems are often has with these problems. This system is intended to protect the products which may be depreciated. There are many levels which are as important in the various levels. This system will be alert that is up to the owners need to be reminded. Used as a guide to make the decision and strategic thinking to marketing.

2.4.2 Pre-Order Alert

The pre-order system is to facilitate the business owners in the inspection of the goods in the inventory so that the business has a product to the market needs accordingly. This system will alert business owners that now is the amount of product in the warehouse should be ordered as much. System is a priority of alert to a level such as. If the unit of the inventory down to 10%, it will be alerting to order and increase unit to 50% or setting before and if there is only 5% or 0%, the alerting system will be notified again. Each time to alert is up to the type of product and the unit in the inventory and the owners' argument.

2.5 Related Thesis

Gökhan Eğilmez (2009) developed Consumption-Driven Finite Capacity Inventory Planning and Production Control. This system can display the appropriate period in order to fill the reservoir to meet the increasing market demand for timely information on file and can be predicted to reduce the time to market for products. The system is the Optimized Production Technology (OPT) that is advancement over MRP system because, it's a sophisticated shop floor control system which combines MRP logic and finite capacity loading for utilization of both bottleneck and non-bottleneck resources.

Selvameenal Chokkalingam (2006) developed Database and query Analysis tools for MySQL : Exploiting Hypertree and Hypergraph Decomposition.

This system was developed on MySQL database. The database is used to link the relationship with data, information that is linked to those presented in the form of Hypertree and Hypergraph Decomposition. Data has to be made aware of the guidelines for the decision to release products or orders for the time to come.

Abdul B. A. Munasib (2005) developed Lifecycle of Social Networks: A dynamic Analysis of Social Capital Accumulation. A study of the life cycle of a product that is popular in many directions, and has studied the relationship between the rates of return and receive money for invested in the business. Value of the rate of return is a measure of the number of items in the warehouse as a reduction or increase in any direction.

CHAPTER III
MATERIALS AND METHODS

The objective of this case study is to study the life cycle of a product that the store sells. The data collected for the relationship to assist in inventory to be adapted in the future in ordering to reduce the burden of bearing the cost of the goods does not drain away. Moreover, the reduced value of the goods as well. Inventory system is necessary to prevent damage to the business due to the lack of state flexibility to deploy new products into the warehouse. That conditions which may cause a shortage of space for storage. Therefore, the management of the product line between the current inventory, order entry and discharge. It is indispensable to a business that has inventory system. The development of an inventory system separates operation procedure as following steps.
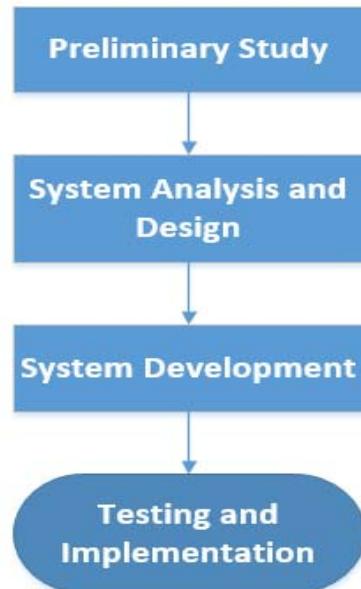
Figure 3.1 System development life cycles

3.1 Preliminary Study

Data from the study show that the goods have been received from several partners by the partners themselves. It also has a wide variety to choose from Brand. Each Brand has several models and each model can also be divided into several series. Each series also has a variety of colors to choose. From these data it can be determined that inventory management is necessary because of a variety of products such as these should not be stockpiled goods at all. It must also consider how much product you should stockpile sufficient to meet the needs of the market.

The retrospective information which be collected is very especially important to adept the system. That information will be parsed into parts and analysis information which have been related and take them to develop the system and during data recording from the sale for to be used in the analysis of system design. The results of the detect system for lack of business management, there are a number of products and categories that are still pending in the warehouse and the worse is that some products are already outdated and difficult to drain into a product. Some products are stored in warehouses for more than five years but not yet sold and make those products in disrepair does not look like new and may be increased the cost of cleaning, but they cannot be restored to look like the new. These products are especially a problem for business owners.

3.2 System Analysis and Design

From the studying of the product information by carefully, there is a designed database to use to store data to fit the data is complex to be used in combination with a database designed to work together seamlessly. It is starting from the design process to work in the following sections.

According to learning of current work system, system developer will analyze and design the new work process of asset management by Use Case Diagram and Sequence Diagram.

The System Analysis and Design is consist of

3.2.1 Use Cases Diagram

3.2.2 Sequence Diagram

3.2.3 Database Design

3.2.4 Data Flow Diagram

3.2.1 Use cases diagram

The use case diagram shows the operation of the person's involvement in any process and which system. The system is divided into two parts, first is the recipient of the goods into the warehouse and the other system is a finding system that can check the number of product in the warehouses. The system can report to the executive to state the product is bending the warehouse to the executive decision to order the next time. The system collects all information for analysis and predicts the direction of the desired product as a reference and as a guide to decision making.

The diagram shows all of components or overview of asset management system. The systems were divided into main parts such as borrowing, returning, notification, statistic reports, user requirements survey, and request for repair and system administration. The system divided into 2 parts according to the user authentication as follows:

1) Administrator is a person who can develop systems to support the requirements of users and also need to know the structure of the data to be able to get to know the origins to be able to modify it in the future by the admin should take the goods into the warehouse. Administrator should be generated the QR-Code and enter the product before distribution to the other branches or before sold outₐ. Administrator can also assign permissions to each officer's access to the system in any case.

2) Users are the people who know the needs of the system or lack of system. User means general officers in the department which were divided by their positions into two groups, each branch manager and that leader of sale department.
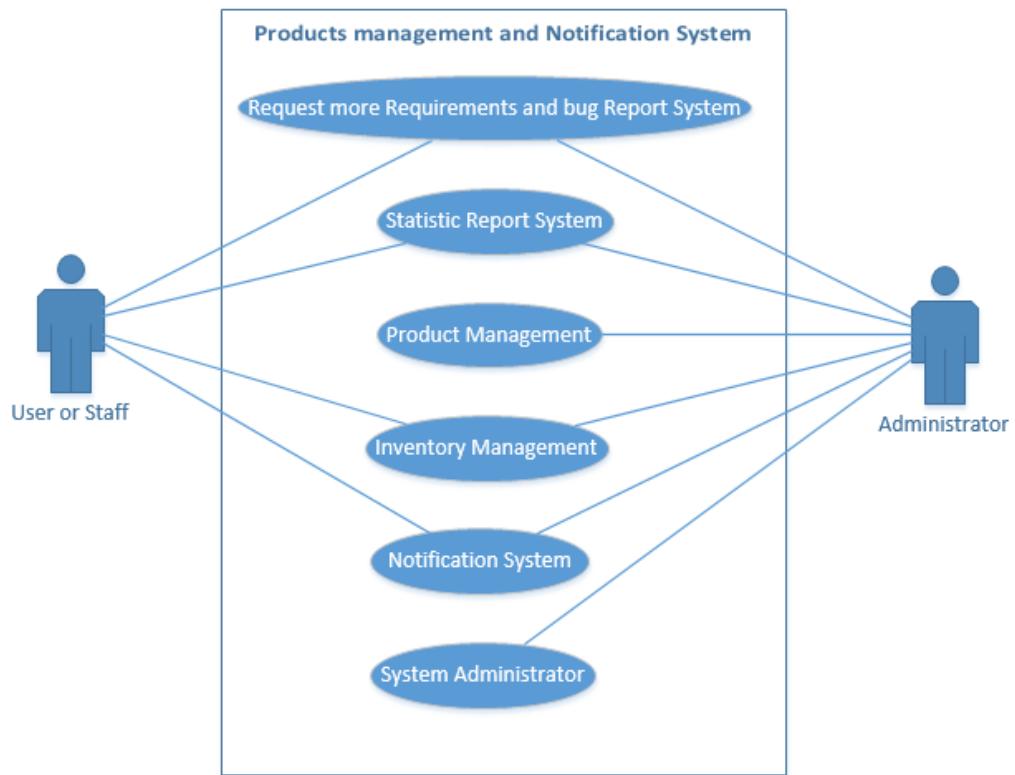
Figure 3.2 Use Case Diagrams

3.2.2. Sequence diagram

A sequence diagram is a kind of interaction diagram that shows how the processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram explains the object interactions arranged in time sequence. It depicts the objects and modules involved in the scenario and the sequence of messages exchanged between the modules needed to carry out the functionality of the scenario.

Sequence diagram is used to represent or model the flow of messages, events and actions between the objects or components of a system.

3.2.2.1 More Requirements and bug report System

Between developments, more requirements and bug reports will be appear in the system**.** It is very necessary to be sole and make it a more complete system. After login to the system, there is a Requirement and Bug report

Menu, there is an interface which user can sent report to administrator and be keeping in a main database. Administrator will receive after log in and can ignore or delete any requests that be considered, not useful or can be keep the request to develop the system in the next time. The administrator will be reply or not answer to the user about their request and describe the reasons, causes that cannot follow it that is a proposed possible and as close to the needs of the user in the case of user Requirements into administrator. If deemed appropriate, it will be very quick to respond to the user and coordinate with developer about the requests. After that, there is a report about the system progress to all users.
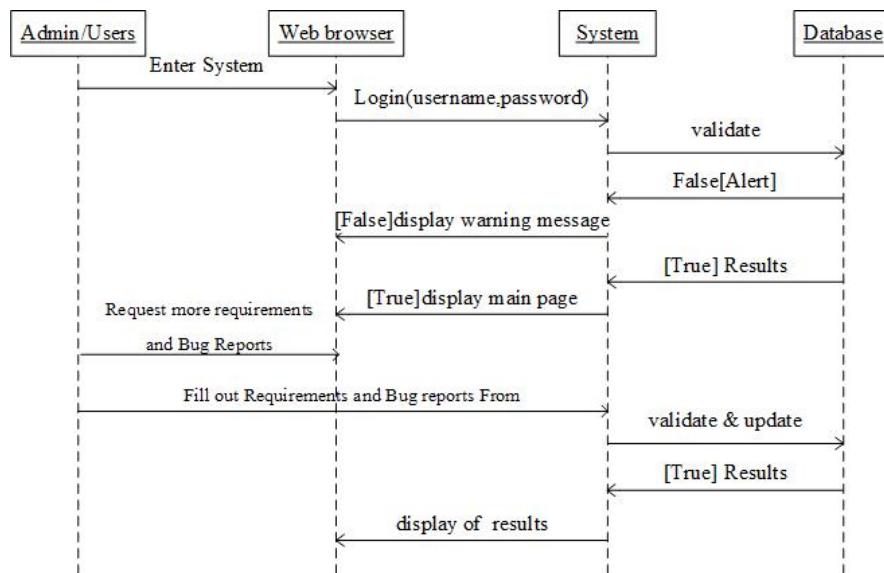
Figure 3.3 More Requirements and bug report System

3.2.2.2 Statistic Report System

This system is allowed administrator and users login to system for view the items in an inventory. The system will show status and number of the items. It sure that this system can be show the details of the items, ordered date, supplier, status and the period time that this item cannot sold out for long time. This system will be access the database for show the report.

The administrators must login before access to the system. Then, there are the menus to select type of report that have already query pattern information. Basically, there are the period times for query then the system will

display the item details between the period separate by order, sale, total of unit and branch.
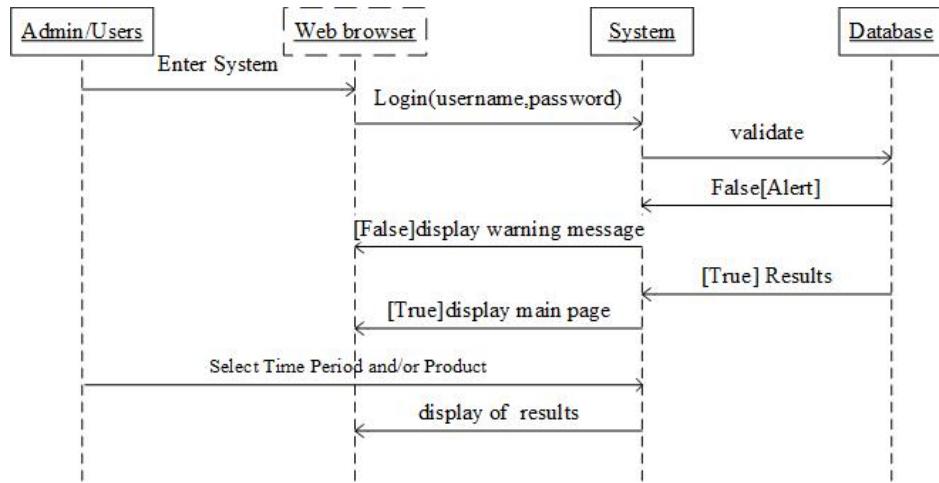
Figure 3.4 Statistic Report Systems

3.2.2.3 Product Management

This process starts from the product received into inventory by people who have the right to receive goods into inventory. Only Administrator is responsible for ensuring that the products that match the order and include the price and the number is correct or not. Then the administrator login to the system and fill out the information into the database will need to enter the correct type and amount received. Then the administrator generates a QR-Code for each product before shipping to the store inventory.
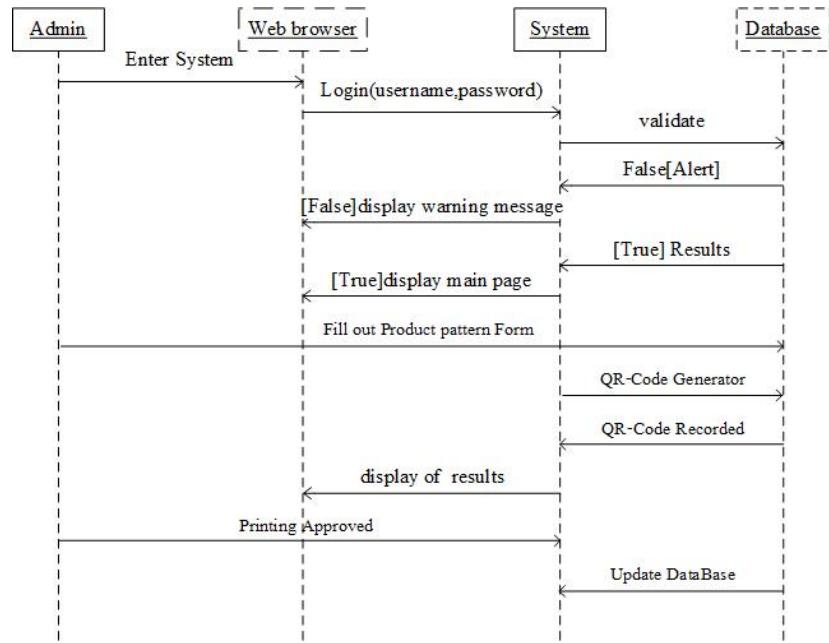
Figure 3.5 Product Management

3.2.2.4 Inventory Management

Inventory management involves a supplier details. It also involves systems and processes that identify inventory requirements, set targets, provide replenishment techniques, report actual and projected inventory status and handle all functions related to the tracking.

Inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods. The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting.

Inventory Management is created to control the amount of product in the warehouse, to reduce the cost of bearing the costs of storage beyond the needs of the market. Users and Administrator can login to view items in the warehousing and storage of each branch. This system will have an input beginning of

each product that can store the pharmacist was not more than a few pieces. This is a relevant relationship between the system and Notification. The system will send data to the Notification System to be evaluated by the product of the number and direction of the market demand for that type the system will send data to the Notification System to be evaluated by the product of the number and direction of the market demand for that type. The system can help the owners of a decision to order the next time.
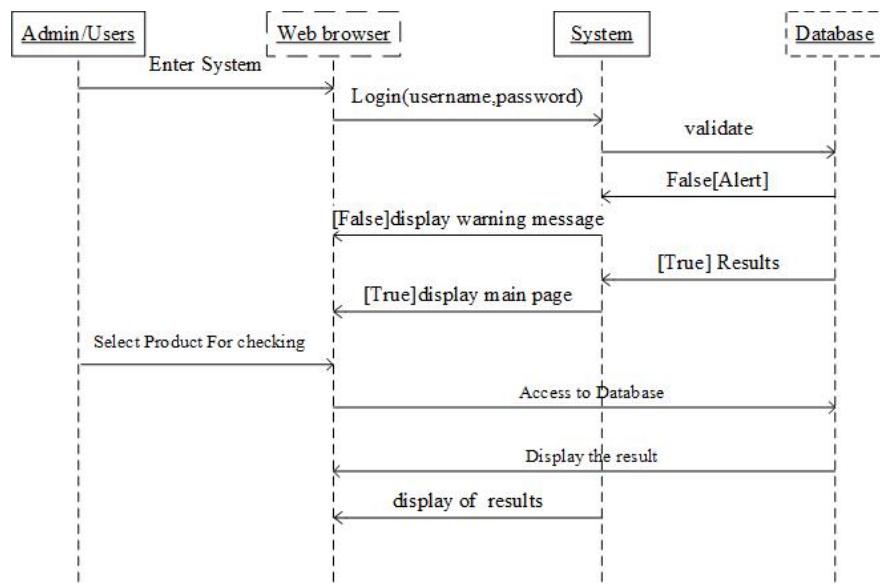
Figure 3.6 Sequence Diagram of Inventory Management

3.2.2.5 Notification System

Notification System consists of two parts, Pre-Order Alert and Discount Alert. This system appears to the user and Administrator. In order to get the product in stock that deserves to do next. Reports from the system can be used to adjust sales strategy to unload the cargo. The Owner may use lower prices to make an interested from customers or promote a big clearance sale to reduce the old inventory. This action can help to make more space to the store that will come in the next time. And reduce product that the market does not want or need to lose a little lower. This system will alert the owner to adjust their marketing strategies to meet the needs of the market.
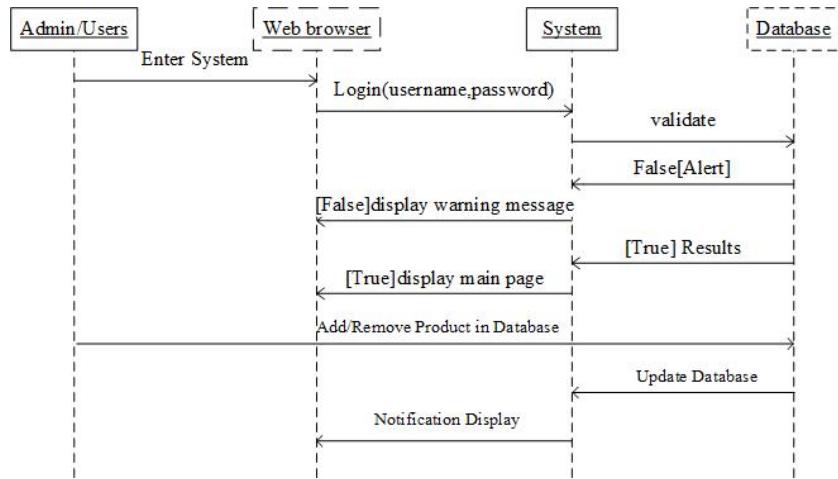
Figure 3.7 Sequence Diagram of Notification System

3.2.2.6 Administrator System

Administrator can login to the system for create the new account by typing username and password and record to the database then give them to the new user after authorization. If they are correct, the system will show the control menu. The administrator can manage the information of database such as adding, editing or delete and saving to the database.
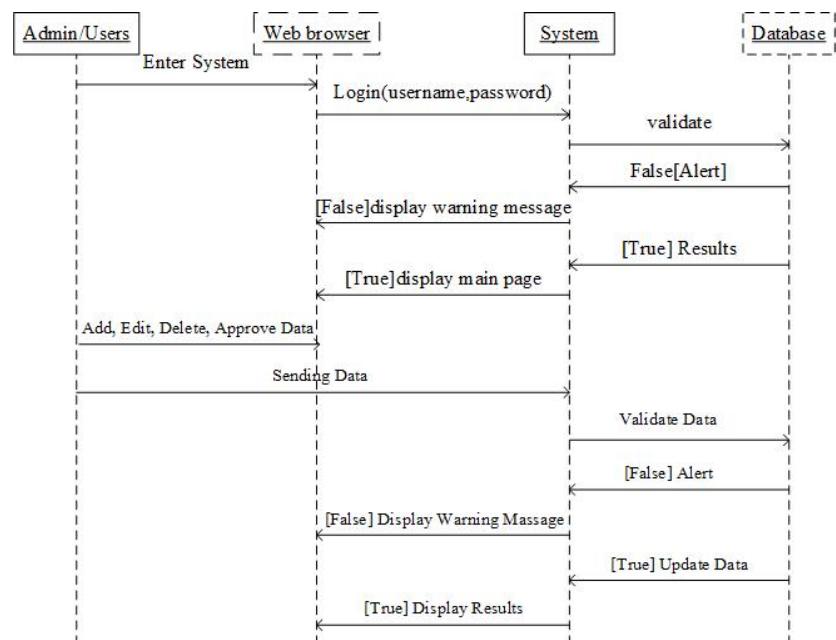
Figure 3.8 Sequence Diagram of Administrator System

3.2.3 Database Design

Database design is the process of producing a detailed data model of a database. This logical data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a Data Definition Language, which can then be used to create a database. A fully attributed data model contains detailed attributes for each entity.

The term database design can be used to describe many different parts of the design and an overall database system. Principally, and most correctly, it can be thought of as the logical design of the base data structures used to store the data. In the relational model these are the tables and views. In an object database the entities and relationships map directly to object classes and named relationships. However, the term database design could also be used to apply to the overall process of designing, not just the base data structures, but also the forms and queries used as part of the overall database application within the database management system (DBMS). In this project will develop by using MySQL to design the structure of the tables and how they relate to one another.

3.2.4 Data Flow Diagram

Data Flow Diagram (DFD) is a representation diagram of data flow and relation with each entity of system. DFD can be show the working process in each module. About this inventory system is consist of eight modules.

3.2.4.1 System Context Diagram (SCD) that represents the actors outside of system and invoke with the system.
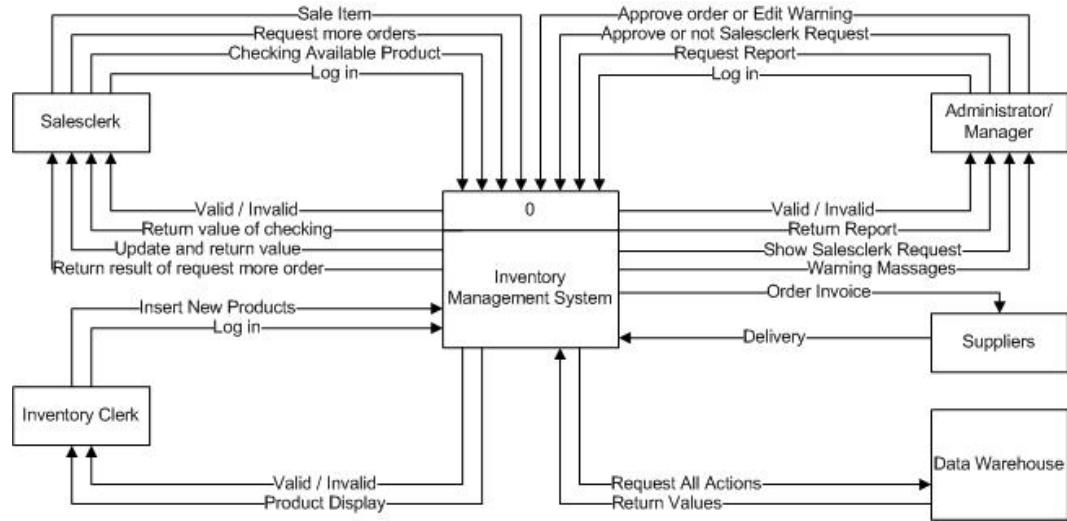
Figure 3.9 System Context Diagram of Inventory Management System

3.2.4.2 Data Flow Diagram Level 1 show the overview of the full system which is consists of all processes and modules. The Inventory Management System has eight main modules that show below in Figure 3.10
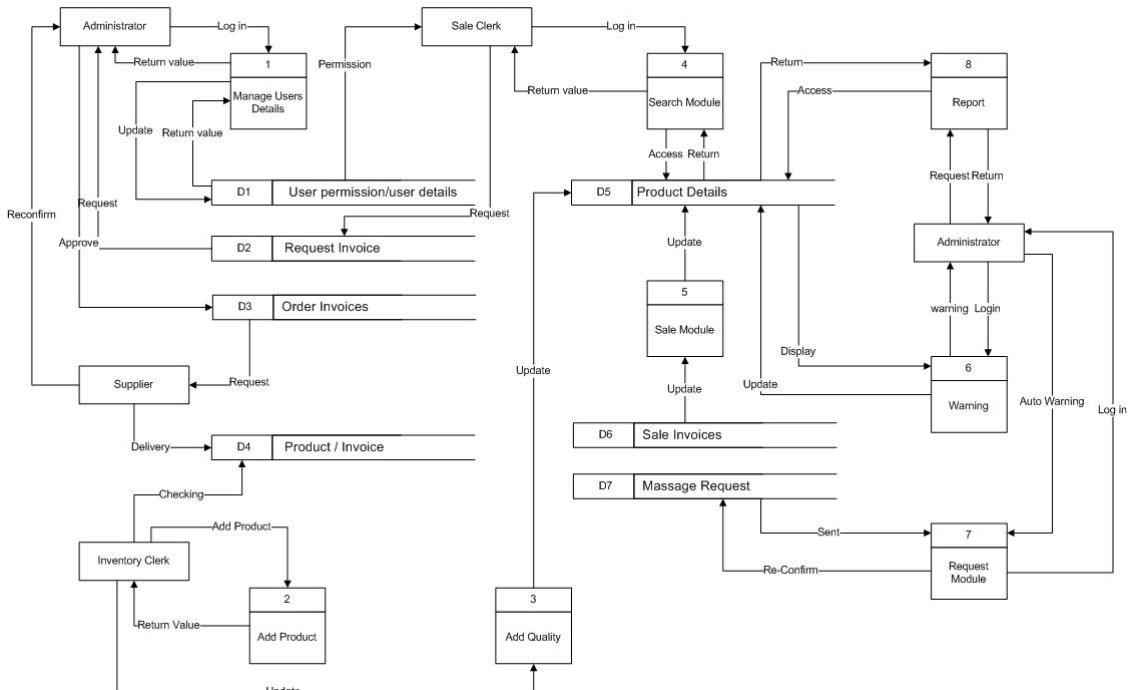
Figure 3.10 Data Flow Diagram Level 1 of Inventory Management System

3.2.4.3 Data Flow Diagram Level 2 describe the work flow and data transfer in each module and explain the work step of process in the system consists of eight modules in below Figure 3.11 – Figure 3.18
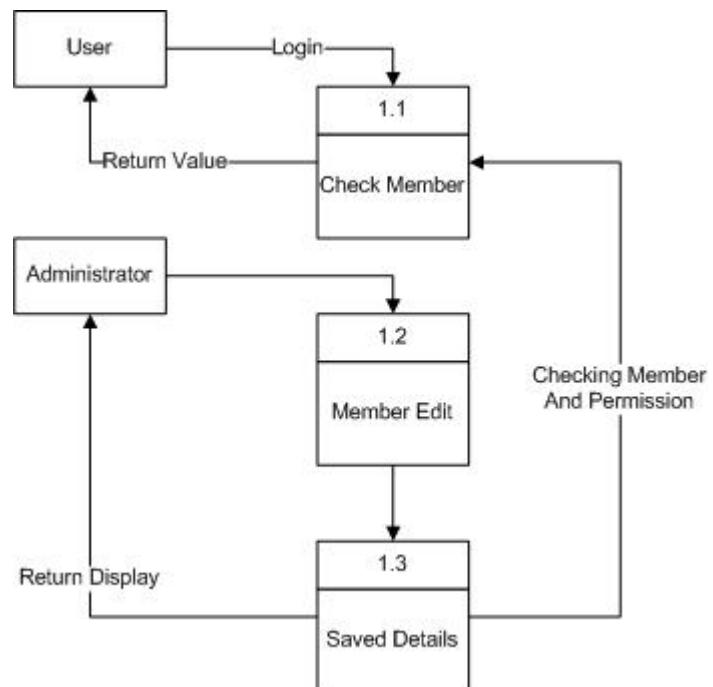
Figure 3.11 Data Flow Diagram Level 2 (Manage User Data)
of Inventory Management System
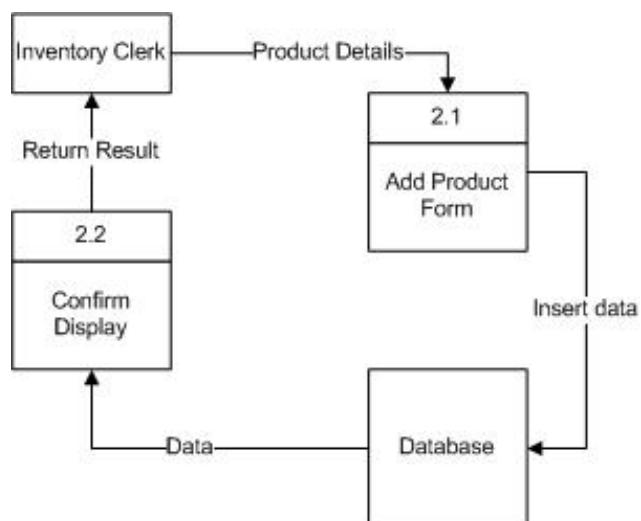
Figure 3.12 Data Flow Diagram Level 2 (Add Product)
of Inventory Management System
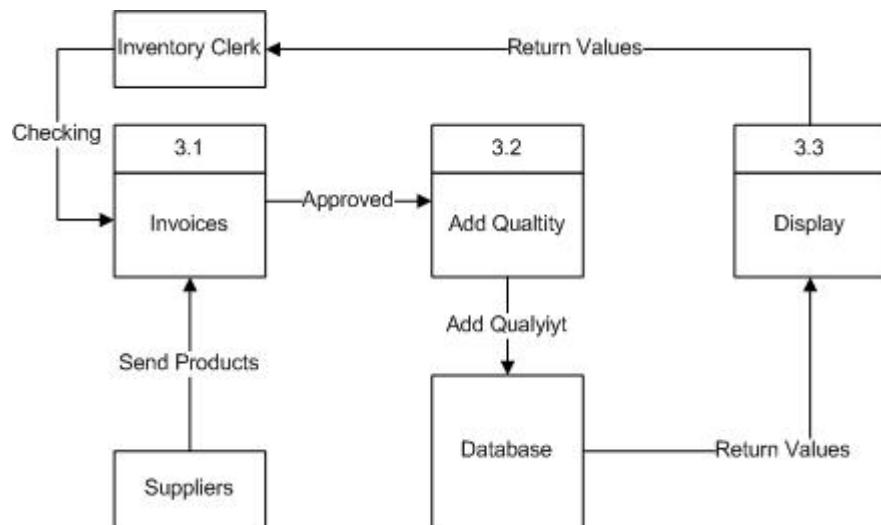
Figure 3.13 Data Flow Diagram Level 2 (Add Quality from Suppliers)

of Inventory Management System
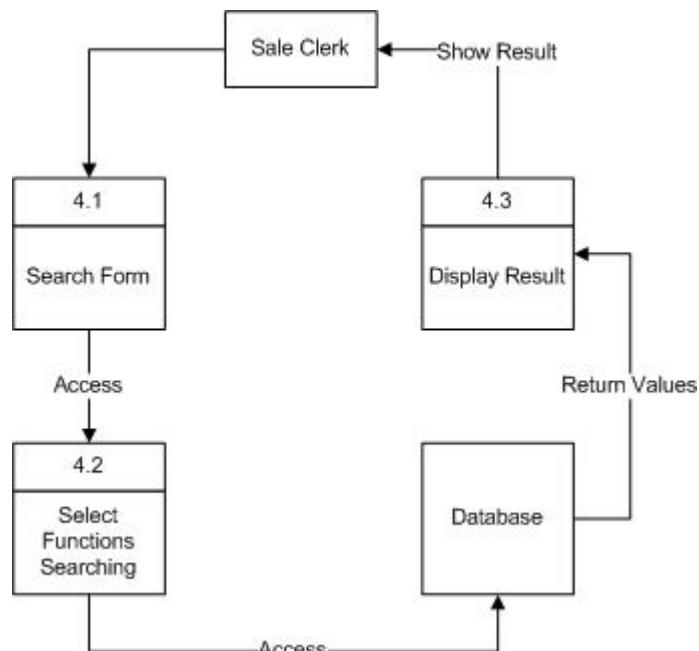
Figure 3.14 Data Flow Diagram Level 2 (Searching)

of Inventory Management System
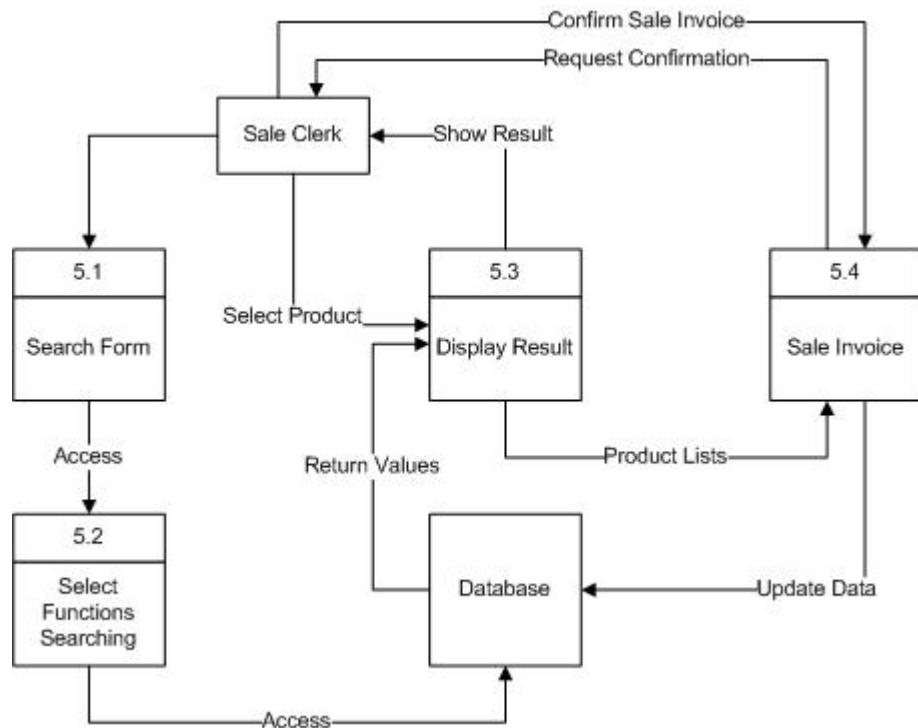
Figure 3.15 Data Flow Diagram Level 2 (Sale)

of Inventory Management System
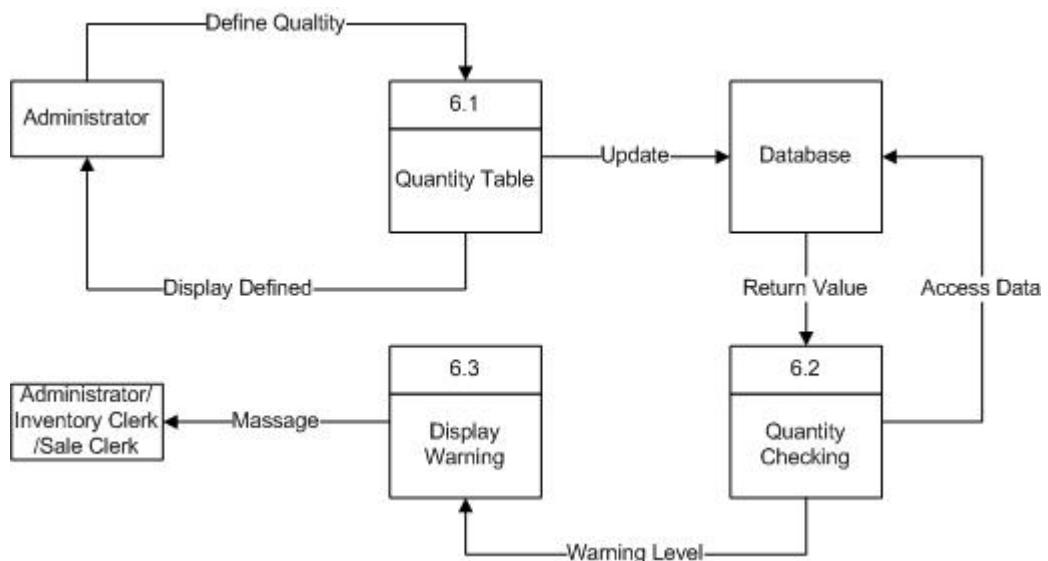
Figure 3.16 Data Flow Diagram Level 2 (Warning)

of Inventory Management System
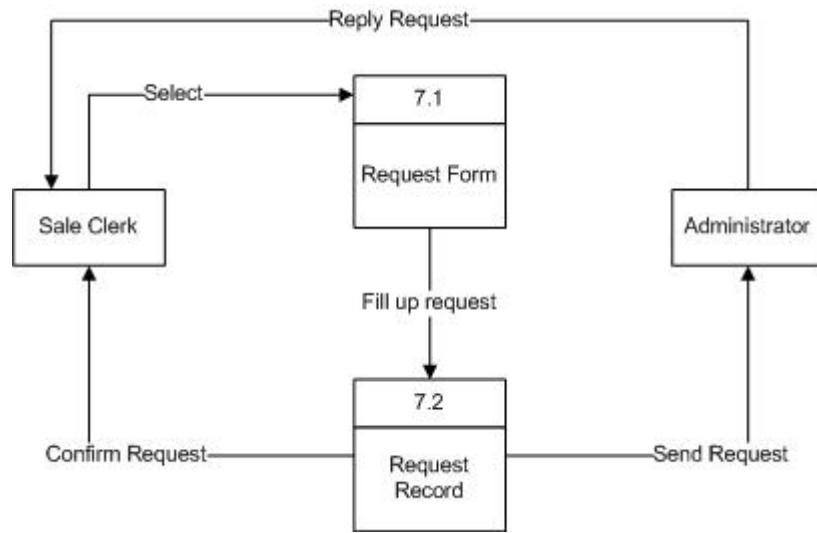
Figure 3.17 Data Flow Diagram Level 2 (Request)

of Inventory Management System
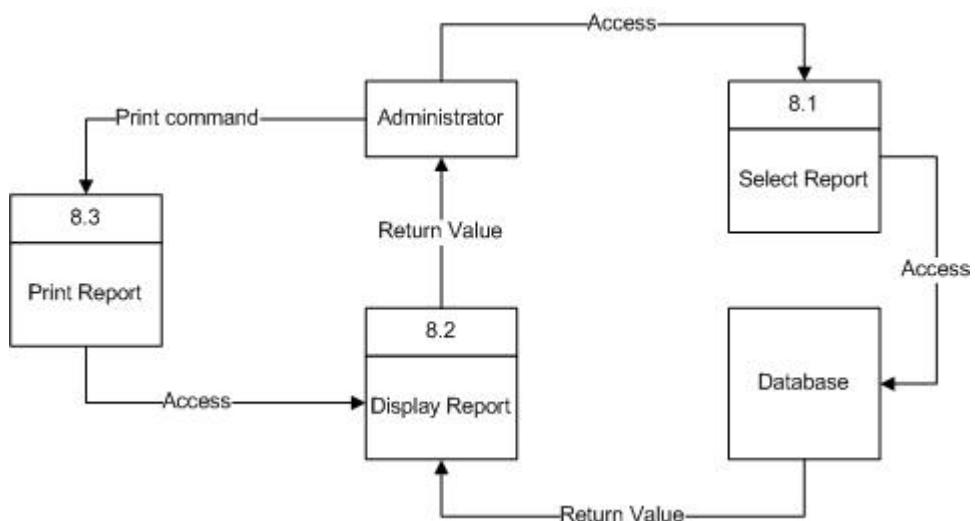
Figure 3.18 Data Flow Diagram Level 2 (Report)

of Inventory Management System

3.2.5 ER-Diagram

ER-Diagram is crucial to creating a good database design. It is used as a high-level logical data model, which is useful in developing a conceptual design for databases.

An entity is a real-world item or concept that exists on its own. Entities are equivalent to database tables in a relational database, with each row of the table representing an instance of that entity.

An attribute of an entity is a particular property that describes the entity. A relationship is the association that describes the interaction between entities. Cardinality, in the context of ERD, is the number of instances of one entity that can, or must, be associated with each instance of another entity. In general, there may be one-to-one, one-to-many, or many-to-many relationships. This system consists of 6 attributes:

3.2.5.1 ER-Diagram of Request more Requirement System

After user log in to the system, there are authenticate the user by separate to the user level from user ID and displays user details. Each level can access to difference functions and can manage difference modules in system. The request more requirement system will sends the message to destination.
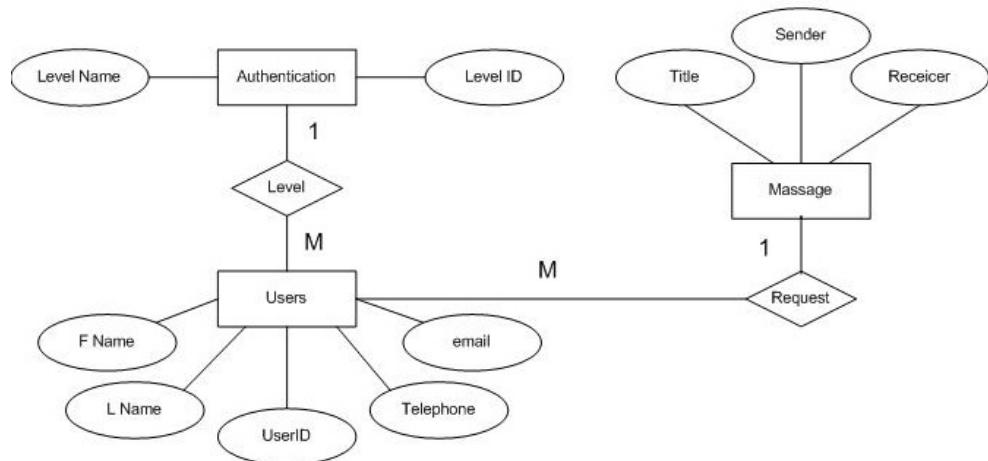
Figure 3.19 ER-Diagram of Request more Requirement System

3.2.5.2 ER-Diagram of statistic Search Report

User will send the request to statistic system then the system will access to the inventory and product then the system will query the user command for show data when the user request.
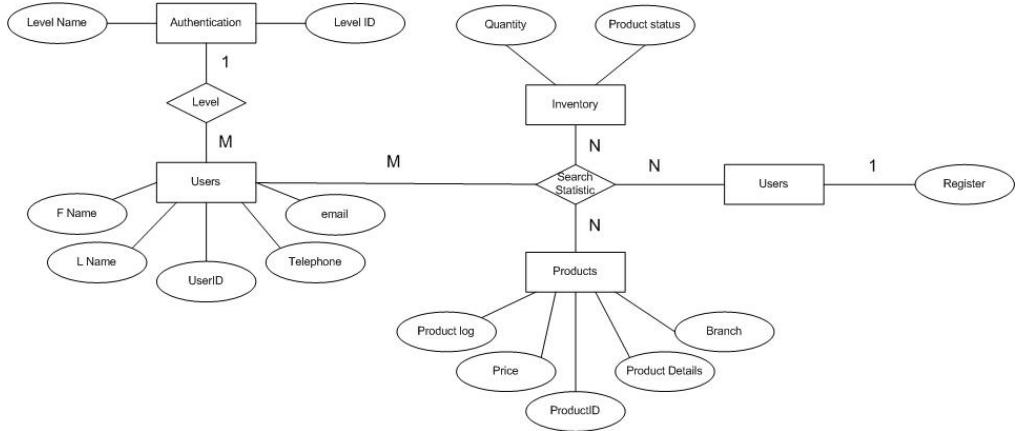
Figure 3.20 ER-Diagram of statistic Search Report

3.2.5.3 ER-Diagram of Product Management

User, owner or administrator, accesses to the system by log in already. The system shows the user details. The user will manage the product with carefully and has a product table before.
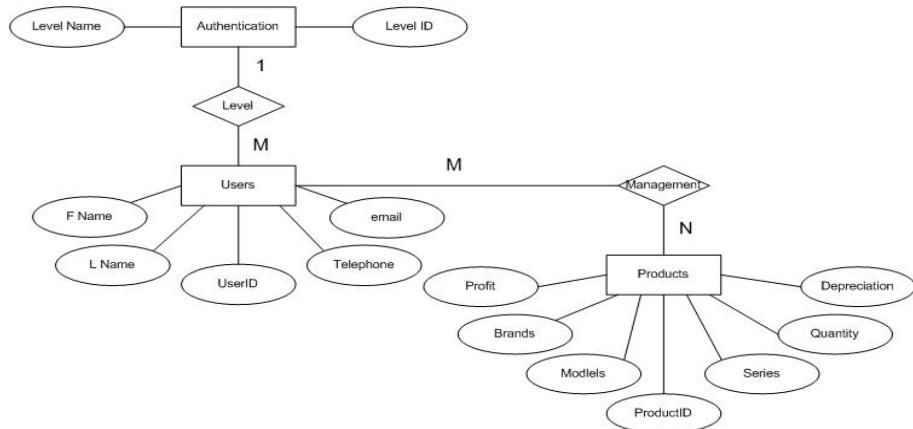
Figure 3.21 ER-Diagram of Product Management

3.2.5.4 ER-Diagram of Inventory Management

This system allows only the user who is the administrator or the owner. The user will manage all identified values of inventory module and product module. The identified values link with notification system that will be alert when the user log in to the system.
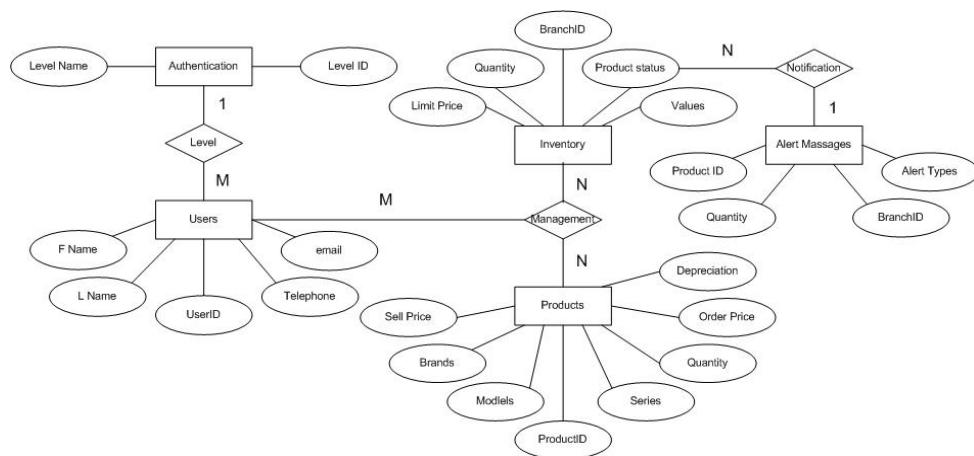
Figure 3.22 ER-Diagram of Inventory Management

3.2.5.5 ER-Diagram of Notification System

The notification system links with inventory and product details. After log in to the system, the massage will alert on the window.
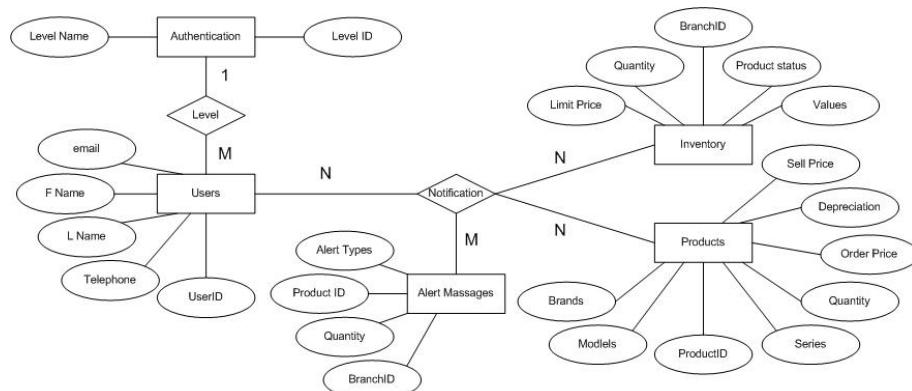
Figure 3.23 ER-Diagram of Notification System

3.2.5.6 ER-Diagram of Administration System

This function allows only administrator because this function can control over all of system and links with all together.
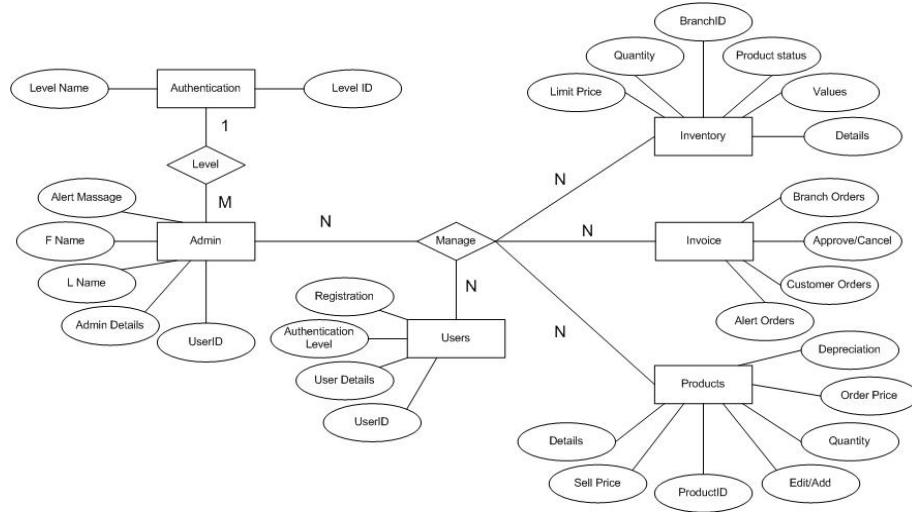
Figure 3.24 ER-Diagram of Administration System

3.3 System Development

It is sure that all systems will be developed after implement or using. If it is a new the developer will be create and design everything of the system. Sure that Human interface which should be easy to understand is very important but will be cover the requirements. The researcher has used many tools such as Microsoft SQL Server as a database management PHP as a server side script language for developing system.

The system development will take the requirements from system analysis and design them by using appropriate technologies. The researcher has used new tools; MySQL as a database management system, and PHP as a server side script language for developing system, AJAX and jquery tools used to create web effects and build user interfaces easily with few lines of coding.

3.4 Testing and Implementation

System testing is a testing that conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing which is a method of software testing that examines the functionality of an application without peering into its internal structures or workings. This method of test can be applied to virtually every level of software testing: unit, integration, system and acceptance. It typically comprises most if not all higher level testing, but can also dominate unit testing as well. The implementation will be parallel tasks of testing system because of the implementation is the realization of an application, or execution of a plan, ideal , model, design, specification, algorithm, or policy.

System testing is the process of running a system with the intention of finding errors before the actual work. Testing enhances the integrity of a system by detecting deviations in design and errors in the system. This helps in the prevention of errors in a system. Summary of system development that meets the desired objectives and evaluation come from user's satisfaction.

3.5 Materials

System requirement for window server 2008 are as follow:

3.5.1 Hardware

Component   Requirement

Processor   - Minimum: 1 GHz (x86 processor) or 1.4 GHz (x64 processor)

                 - Recommended: 2 GHz or faster

                  Note: An Intel Itanium 2 processor is required for Windows

Server

                  2008 for Itanium-Based Systems.

Memory   - Minimum: 512MB RAM

                 - Recommended: 2 GB RAM or greater

                 - Maximum (32-bit systems): 4 GB (Standard) or

                  64 GB (Enterprise and Datacenter)

         - Maximum (64-bit systems): 32 GB (Standard) or 1 TB

          (Enterprise and Datacenter) or 2 TB (Itanium-Based System)

Disk Space   - Minimum: 10 GB

         - Recommended: 40 GB or greater

          Note: Computers with more than 16 GB of RAM will require

more disk

          space for paging, hibernation, and dump files.

Drive   - DVD-ROM Drive

Display   - Super VGA (800 x 600) or higher-resolution monitor

         - Microsoft Mouse or compatible pointing device

         - Keyboard

3.5.2 Tool and Software

Programming Language & Tools   : PHP, AJAX, Jquery

Database Management System   : MySQL

Operating System   : Microsoft Windows Server 2008

Web Server Application   : Apache HTTP Server

Web Browser Application   : Google Chrome , Firefox, Safari

CHAPTER IV
RESULTS

This chapter describes the resulted on development and testing of the Stocking Management System web based system and 6 main modules which are:

4.1 Administration System

4.2 Inventory Management

4.3 Product Management

4.4 Statistic Report System

4.5 Notification System

4.1   Administration System

This module will appears after user login to the system, show as figure 4.1, and show status of user, admin, and more information of user as figure 4.2. This system is the core system that can control overall so the user will beware and have more knowledge of procedure of system.
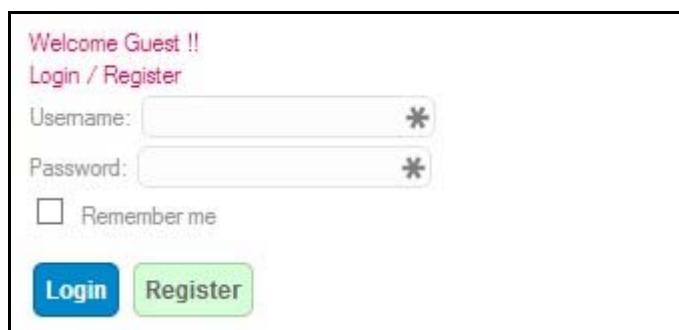
Figure 4.1 Display the user login window

Figure 4.2 Display the user status after login

The administration system consists of many of menu to manage overall of system such as

4.1.1 Add Branch: The process of Add Branch Menu show as figure 4.3, figure 4.4 and figure 4.5

4.1.2 View/Edit/Delete Branch: The process of View/Edit/Delete Branch Menu show as figure 4.6, figure 4.7 and figure 4.8

4.1.3 Add Brand

4.1.4 View/Edit/Delete Brand

4.1.5 Add Model

4.1.6 View/Edit/Delete Model

4.1.7 Add Series

4.1.8 View/Edit/Delete Series

4.1.9 Add Product Details

4.1.10 View/Edit/Delete/Order Product

4.1.11 Order History

4.1.12 Sale History

4.1.13 Add Member Group

4.1.14 View/Edit/Delete Member Group

4.1.15 Add Member

4.1.16 View/Edit/Delete Member
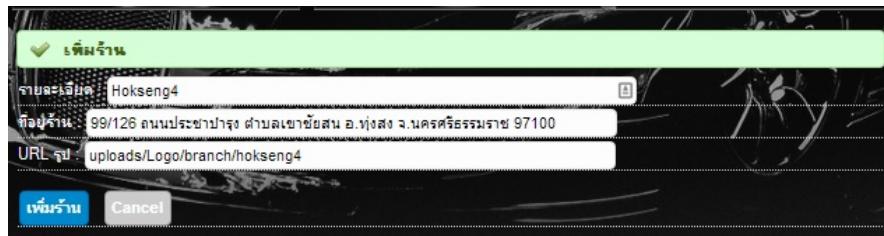
Figure 4.3 Display of Add Branch Menu Window

Figure 4.3 shows Add Branch Menu Window, administrator will uses this menu to add branch.

Figure 4.4 Display of Add Branch Approved Window

After click add Branch Details button on Figure 4.3. It will shows the add Branch Approved Window, Figure 4.4.

Figure 4.5 Display of the Details of Add Branch Window

This window displays the Details of Add Branch Window, after clicks details on Figure 4.4.
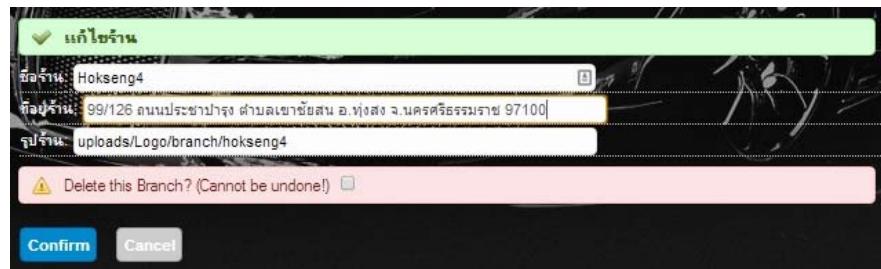
Figure 4.6 Display of View/Edit/Delete Branch Menu Window

User can edit Branch details on View/Edit/Delete Branch Menu. After entrance this menu, it will display the window as show on Figure 4.6.
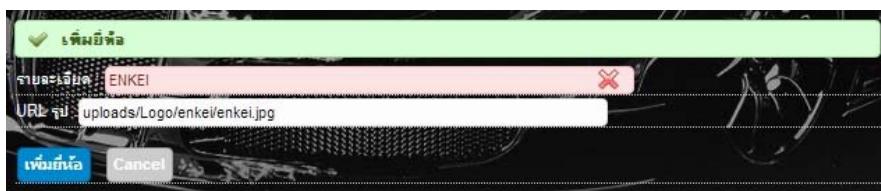
Figure 4.7 Display of Add Brand Menu Window

User can add product brand on Add Brand Menu and upload a brand picture on this menu, show as Figure 4.7.
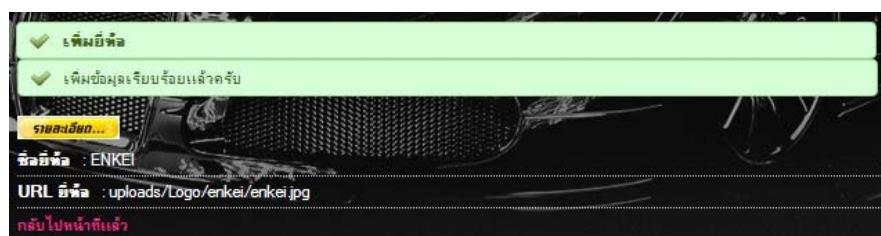
Figure 4.8 Display of Add Brand Menu Approved Window

After select add Brand button on Figure 4.7, the system will show Add brand of products have approved on window that show as Figure 4.8.

Figure 4.9 Display of View/Edit/Delete Brand Menu Window

User can edit Product Brand details on View/Edit/Delete Brand Menu. After entrance this menu, it will display the window as show on Figure 4.9.

Figure 4.10 Display of Add Model Menu Window

User can add Product Model on Add Model Menu and upload a Model picture on this menu but the user must have to add a product brand before, show as Figure 4.10.
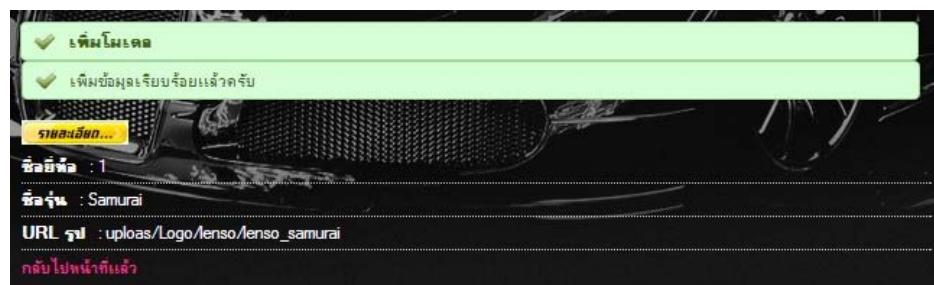
Figure 4.11 Display of Add Model Menu Approved Window

After select add Model button on Figure 4.10, the system will show Add model of products have approved on window that show as Figure 4.11.
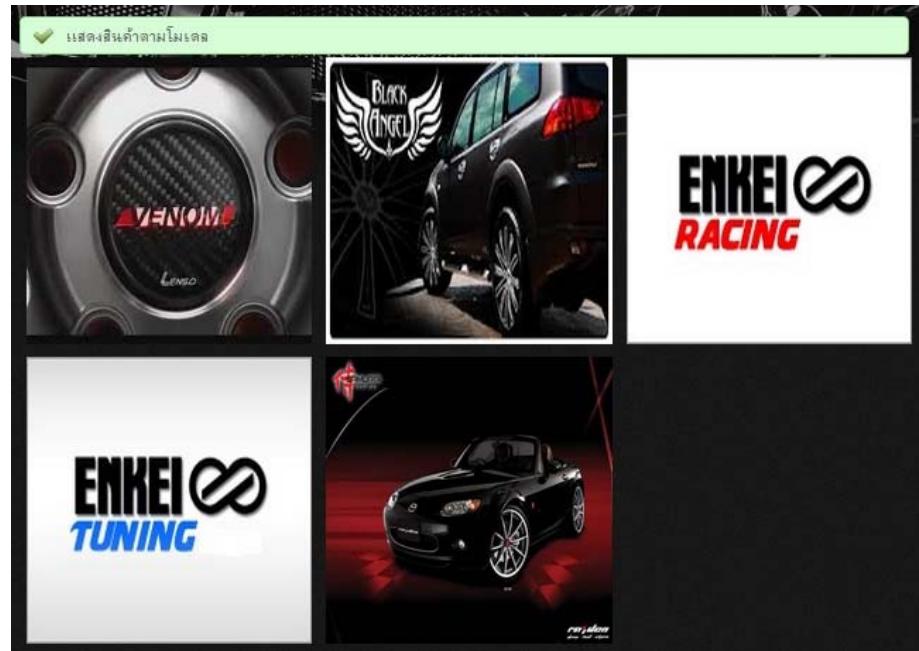
Figure 4.12 Display of View/Edit/Delete Model Menu Window

User can edit Product Model details on View/Edit/Delete Brand Menu. After entrance this menu, it will display the window as show on Figure 4.12. This window will display after user add product model already.

Figure 4.13 Display of View/Edit/Delete Model Menu Window (Cont.)

User can edit Product Model details on View/Edit/Delete Model Menu. This window will display after user add product brands already because there are the product brands in drop down menu. After entrance this menu, it will display the window as show on Figure 4.13.

Figure 4.14 Display of Add Series Menu Window

User can add Product Series details on Series Menu. This window will display after user add product brands and product models already because there are the product brands and product series in drop down menu. After entrance this menu, it will display the window as show on Figure 4.14.

Figure 4.15 Display of Add Series Menu Approved Window

After select add Series button on Figure 4.14, the system will show Add series of products have approved on window that show as Figure 4.15.

Figure 4.16 Display of View/Edit/Delete Series Menu Window

User can edit Product Series Details on View/Edit/Delete Series Menu. This window will display after user add product brands already because there are the

product brands and product models in drop down menu. After entrance this menu, it will display the window as show on Figure 4.16.
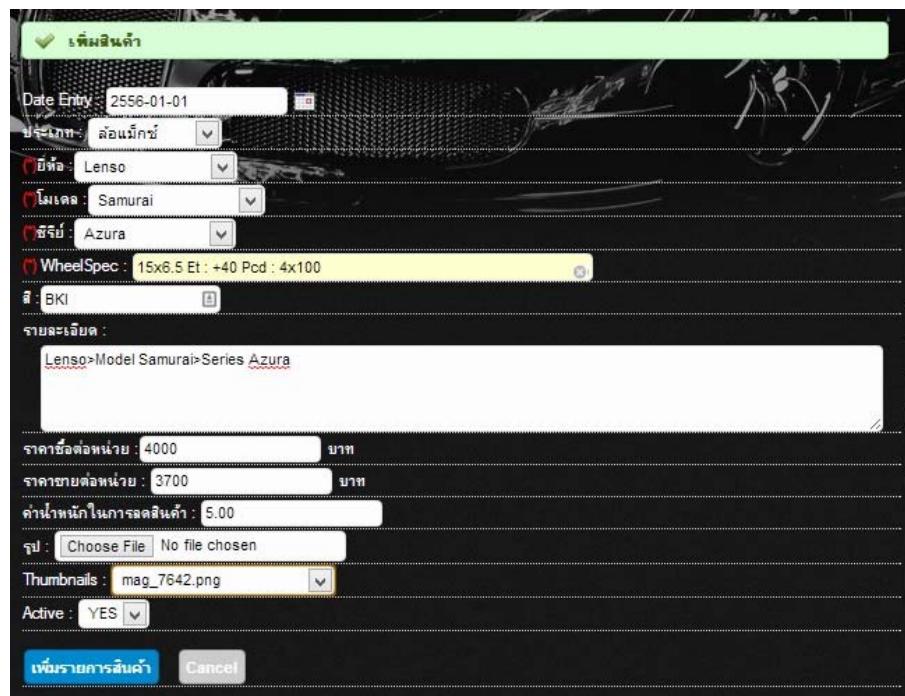
Figure 4.17 Display of Add Product Details Menu Window

User can add Product Details on Add Product Menu. This window will display after user add product types, brands, models, series already because there are the drop down menus for select. After entrance this menu, it will display the window as show on Figure 4.17.
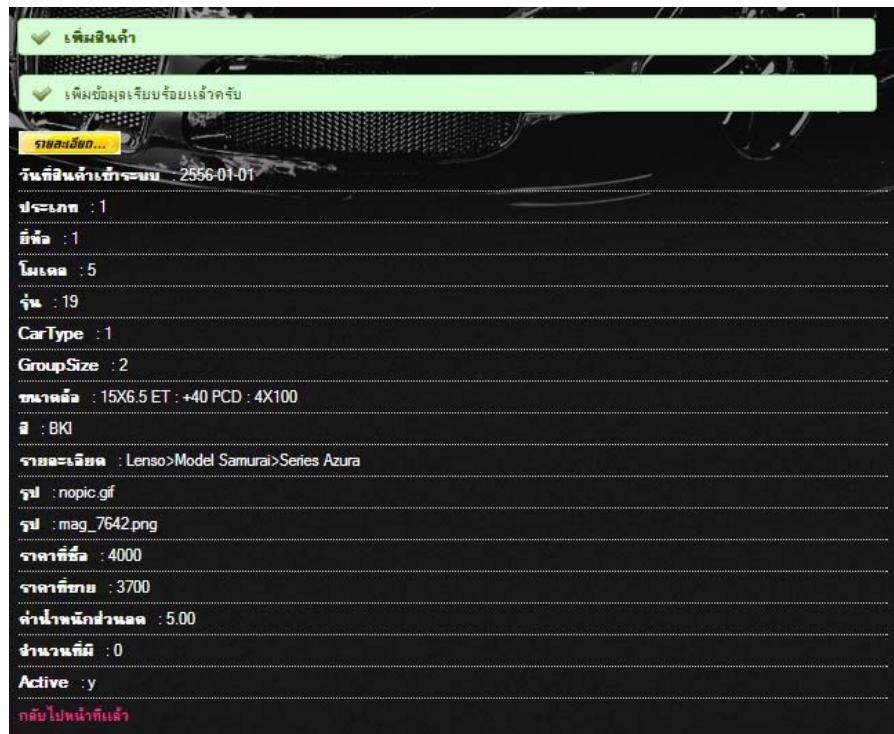
Figure 4.18 Display of Add Product Details Menu Approved Window

After select Add Product button on Figure 4.17, the system will show Add Details of products have approved on window that show as Figure 4.18.

Figure 4.19 Display of View/Edit/Delete/Order Product Menu Window

User can use View/Edit/Delete/Order Product Menu to order products as show as Figure 4.19 then user clicks order button, there are many branches for select again as show as Figure 4.20.
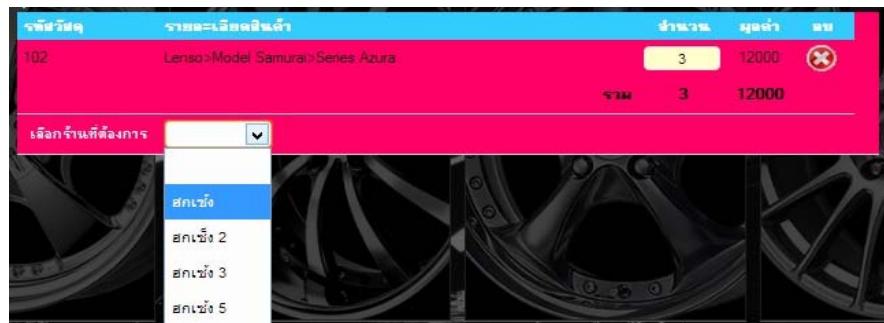
Figure 4.20 Display of View/Edit/Delete/Order Product Menu Window (Cont.)

Figure 4.20 shows drop down menu of branches where supplier sends the products orders.

Figure 4.21 Display of Order History Menu Window

Figure 4.21 shows the order history that contain with date of order, branch name, the order and status of order invoices.

Figure 4.22 Display of Order History Details Window

Figure 4.22 shows the details of order history that consist of more details from Order History Menu which have shown on Figure 4.21

Figure 4.23 Display of Sale History Menu Window

Figure 4.23 shows the sell history that contain with date of sell, branch name, the seller and status of sell invoices.

Figure 4.24 Display of Sale History Details Window

Figure 4.24 shows the details of sell history that consist of more details from Sell History Menu which have shown on Figure 4.23

Figure 4.25 Display of Add Member Group Menu Window

User can add Member Group on Add Member Group Menu. User has to identify Level Number and Level Name of the Level Group. After entrance this menu, it will display the window as show on Figure 4.25.
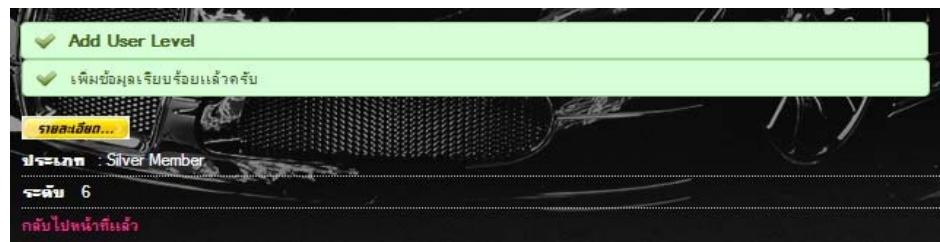
Figure 4.26 Display of Add Member Group Approved Window

After select Add Member Group button on Figure 4.25, the system will show Add Details of Member Group have approved on window that show as Figure 4.26.

Figure 4.27 Display of Member Group Window

Figure 4.27 shows the Member Group that consists of User Level Name, User Level Number, Number of Active Users and User Status.

Figure 4.28 Display of View/Edit/Delete Member Group Menu Window

After select on User Level Name on Figure 4.27, it will show the View/Edit/Delete Member Group Menu Window as show as Figure 4.28. User can edit level of group name and level number.

Figure 4.29 Display of Add Member Menu Window

User can add Member Details on Add Member Menu. This window will display after user add member groups and branches because there are the drop down menus for select. User can insert member details on Add Member Menu as show as Figure 4.29.

Figure 4.30 Display of Add Member Menu Approved Window

After select Register button on Figure 4.29, the system will show the details of member already insert and have approved on window that show as Figure 4.30.

Figure 4.31 Display of all Member Window

Figure 4.31 shows the Member List that consists of Username, Real Name, e-mail address and registered date.
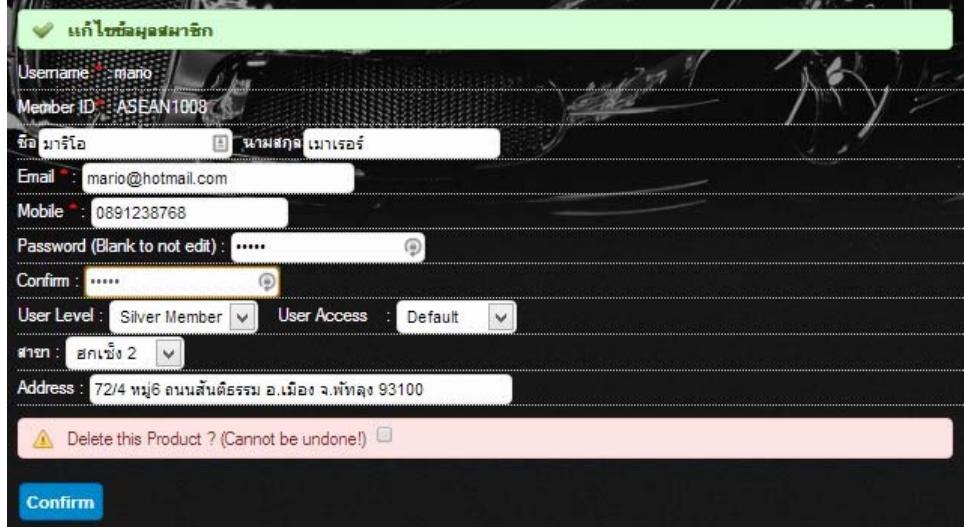
**Figure 4.32 Display of View/Edit/Delete Member Menu Window**

User can edit Member Details on View/Edit/Delete Member Menu. This window will display after user add member groups and branches because there are the drop down menus for select. After user edit the member details already then click "Confirm Button" to finish edit member details as show as Figure 4.32.

Table 4.1 Test Results of the System Administration

Scenario	System Administration	
Authentication	Administrator, Owner	
Pre-condition	Users must be logged in as an administrator	
Post-condition	Administrator can use this module to create and manage the system	
Expected Results	Administrator can add, edit, view and delete the data	
Main Success Scenario		**Results**
1.Administrator can add branch to the system		Pass
2.Administrator can view, edit and delete branch		Pass
3.Administrator can add brand to the system		Pass
4.Administrator can view, edit and delete brand		Pass
5.Administrator can add model to the system		Pass
6.Administrator can view, edit and delete model		Pass
7.Administrator can add series to the system		Pass
8.Administrator can view, edit and delete series		Pass
9. Administrator can add product details		Pass
10. Administrator can view, edit, order and delete product		Pass
11. Administrator can view order history		Pass
12. Administrator can view sale history		Pass
13. Administrator can add member group		Pass

Table 4.1 Test Results of the System Administration (cont.)

14. Administrator can view, edit and delete member group	Pass
15. Administrator can add member	Pass
16. Administrator can view, edit and delete member	Pass

4.2 Inventory Management

Inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods.

The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting and also by replenishment or can be defined as the left out stock of any item used in an organization.

This module have a word and excel report that can export for keep to make an annual report or make a decision to improve the strategy in the next time or solve the problem about over product that can be out of trend. Those reasons are the causes of depreciation, the loss of business. So user, owner will study and understand this module for predict to release commodities on time the result shown as figure 4.33

Figure 4.33 Display of Inventory management Window

4.3 Request More Requirements and bug report System

To be used efficiently, all system needs certain components or other module to be present on the system. These prerequisites are known as system requirements, included bugs details, and are often used as a guideline as opposed to an absolute rule. Most system defines two sets of system requirements: minimum and recommended. With increasing demand for higher processing power and module in newer versions of system, system requirements tend to increase over time. Industry analysts suggest that this trend plays a bigger part in driving upgrades to existing the systems than technological advancements. A second meaning of the term of System requirements, is a generalization of this first definition, may be some mistake of work process of system, giving the requirements to be met in the design of a system or sub-system. Typically an organization starts with a set of Business requirements and then derives the System requirements from there.

Request More Requirements and bug report System settled in the system is for collect the user requirement. The system will keep the information that users fill in the requirement form then the massage is sent to the staff that related, different departments. All users can communicate to each other through this system. Users must fill in the user requirements and bug report form that consist of receiver, subject, detail and reference of desired assets shown as figure 4.34 and the system will process data and demonstrate result as figure 4.35 Test results of the user requirements and bug report form as table 4.34

Figure 4.34 Displays of User Requirements and Bug Report Form

After user sending, the massage will be send to the staff who chosen. When the staff, included owner and administrator, logs in to the system there will be

appear the coming massage notification that shown as figure 4.35 and show more details below page as figure 4.36 Figure 4.37 shows the full detail of massage from sender.
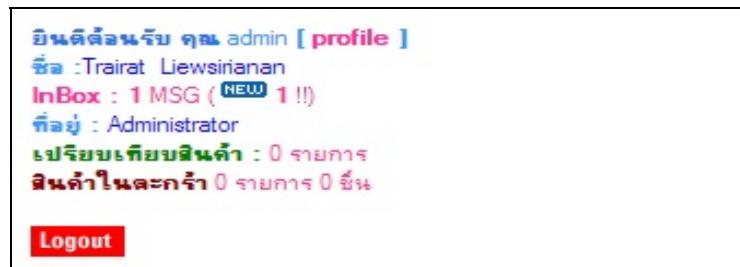
Figure 4.35 Displays of Coming Massage Notification

Figure 4.36 Displays of more massage details

Figure 4.37 Displays of the full detail of massage from sender

Table 4.2 Test Results of the User Requirement bug report System

Scenario	User Requirement bug report System
Authentication	User
Pre-condition	Users must be logged in to the system

Table 4.2 Test Results of the User Requirement bug report System (cont.)

Post-condition	The system will record the User Requirements or bug reports as a massage and notification on the display of receiver. Receiver can connect with each other by phone or e-mail. Summary report for further purchasing process and for urgent request when the assets or office supplies is not available for user's need at the present.	
Expected Results	Users can communicate with each other, the business owner, administrator or staff by sending short massage that users' need at the present or some mistakes of system that they have found. That information will take to develop the system.	
Main Success Scenario		**Results**
1. The massage from users appears on the notification display and more details in the subject headings.		Pass

4.4 Statistic Report System

In statistic report module, there is collect all details in database and summary to the report for easy to understanding but this module allows only administrators and owner to access. There are 2 sub-menus in this module, statistic report and identifying report. The statistic report, users can search for products statistic report and select the specific period of time they desire shown as figure 4.38. After that the system will process data and demonstrate the result shown as figure 4.39 and be able to export the report to Microsoft Word and Microsoft Excel. Test results of the statistic reports system as table 4.3

Figure 4.38 Display of Statistics Search Page

Table 4.3 Test Results of Statistic Reports

Scenario	Statistic Reports	
Authentication	Owner / Administrator	
Pre-condition	Users must be logged in to the system	
Post-condition	Users can search and view statistic reports successfully	
Expected Results	Users can search and view statistics reports	
Main Success Scenario		**Results**
1. All Users can search, view and export the statistic reports		Pass

4.4.1 Statistic Report

After log in to the system, users can search the report by using time period. The results of searching will display the report which can divide in 2 main parts, sale history report and order history report. Part of sale history report separates to 2 mains sections:

1. Statistic of sale, by branches, brands, models, series, items.
2. Statistic of ordering, by branches, brands, models, series, items.

Figure 4.39 Result of Statistics Search Display

Figure 4.39 shows many details of product in inventory such as statistic of selling, buying, brands of buying and selling which can import to word and excel file. The statistic of buying and selling can be generating to line graph that show as below Figure 4.40 and Figure 4.41
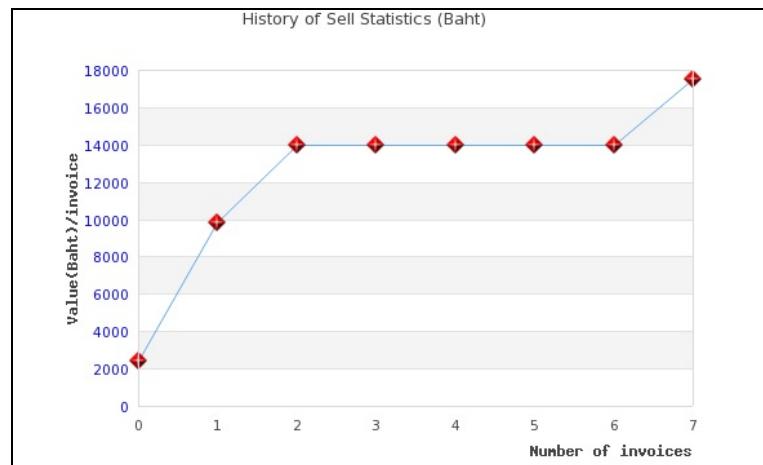
Figure 4.40 Result of Selling Statistic Graph
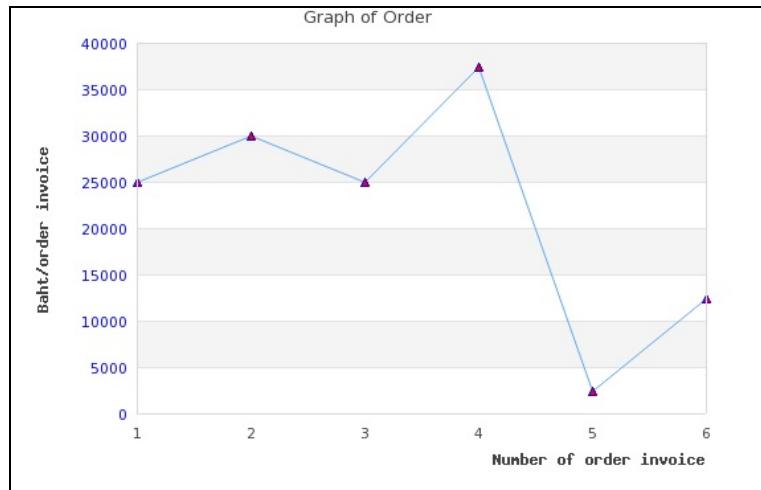
Figure 4.41 Result of Buying Statistic Graph

4.2.2 Identifying report

This module can show in by identify the product series between period times that have chosen before. Then the system will show the report which divide by branch and item in term of sale and order.

4.5 Product Management

There are separate each product in suitable state with the best step from the complication of product, the product management is very essential that can be done the complete system. The complication of product begin from this product type has many brands, each brand has many models, each model has many series, each series has many sizes and each size has many colors. From above problems can imply that if anyone would like to do this business, they will use too much stocking place, stocking and money for this business. But it is not finish because the risk point is could not release products in the inventory on time or trend, finally it will be devalued and may be could not release in the worst case.

For this case study, there are three brands for show the system working, Lenso, RAYS and ENKEI because these brands are very well known and easy to explain.

Table 4.4 Show all details of products for easier to understand the structure of database.

Brand	Model	Series	Size	Color	Detail
Lenso	Venom	Venom Zero	15"	EB	15x6.5ET : +38 PCD : 4x100
			15"	EW	15x6.5ET : +38 PCD : 4x100
			17"	MB	17x7.0 ET : +40 PCD : 4x100
			17"	GD	17x7.0 ET : +40 PCD : 4x100
Lenso	Venom	Venom One	19"	HS	19x8.5 ET : +45 PCD : 5x114.3
			19"	HD	19x8.5 ET : +45 PCD : 5x114.3
			19"	MB	19x8.5 ET : +45 PCD : 5x114.3
			19"	HS	19x9.5 ET : +45 PCD : 5x114.3
			19"	HD	19x9.5 ET : +45 PCD : 5x114.3
			19"	MB	19x9.5 ET : +45 PCD : 5x114.3
Lenso	Black Angel	Black Angel V1	20"	BKI	20x9.0 ET : +20 PCD : 6x139.7
			20"	HSI	20x9.0 ET : +20 PCD : 6x139.7
			20"	SI	20x9.0 ET : +20 PCD : 6x139.7
Lenso	Black Angel	Black Angel V2	20"	HDF	20x9.0 ET : +20 PCD : 6x139.7
			20"	MBF	20x9.0 ET : +20 PCD : 6x139.7
Enkei	Racing	GTC01	17"	HS	17x8.0 ET : +40 PCD : 6x114.3
			18"	HS	18x8.0 ET : +40 PCD : 6x114.3
Enkei	Racing	RS05	15"	S	15x6.5 ET : +38 PCD : 6x100
			15"	SBC	15x6.5 ET : +38 PCD : 4x100
			17"	SBC	17x7.0 ET : +38 PCD : 4x100
			17"	S	17x7.0 ET : +45 PCD : 5x114.3
			17"	CS	17x8.0 ET : +42 PCD : 5x114.3
			17"	S	17x8.0 ET : +42 PCD : 5x114.3
			18"	CS	18x8.0 ET : +48 PCD : 5x114.3
Enkei	Tuning	Fujin	17"	B	17x7.5 ET : +40 PCD : 5x100
			17"	B	17x7.5 ET : +45 PCD : 5x112
			17"	B	17x7.5 ET : +40 PCD : 5x114.3
			17"	B	17x7.5 ET : +50 PCD : 5x114.3
			17"	S	17x7.5 ET : +40 PCD : 5x100
			17"	S	17x7.5 ET : +45 PCD : 5x112
			17"	S	17x7.5 ET : +40 PCD : 5x114.3
			17"	S	17x7.5 ET : +50 PCD : 5x114.3
			18"	B	18x8.0 ET : +40 PCD : 5x100
			18"	B	18x8.0 ET : +45 PCD : 5x112
			18"	B	18x8.0 ET : +40 PCD : 5x114.3
			18"	B	18x8.0 ET : +50 PCD : 5x114.3
			18"	S	18x8.0 ET : +40 PCD : 5x100
			18"	S	18x8.0 ET : +45 PCD : 5x112
			18"	S	18x8.0 ET : +40 PCD : 5x114.3
			18"	S	18x8.0 ET : +50 PCD : 5x114.3
RAYS	Volk Racing	Triniti-V	14"	HS	14x5.0 ET : +44 PCD : 4x114.3
			14"	B	14x5.0 ET : +44 PCD : 4x114.3
			15"	HS	15x6.0 ET : +44 PCD : 4-5x114.3
			15"	B	15x6.0 ET : +44 PCD : 4-5x114.3
			16"	HS	16x6.5 ET : +44 PCD : 4-5x114.3
			16"	B	16x6.5 ET : +44 PCD : 4-5x114.3
RAYS	Volk Racing	TE37V	17"	GM	17x7.5 ET : +45 PCD : 4-5x114.3
			17"	HS	17x7.5 ET : +45 PCD : 4-5x114.3
			17"	B	17x7.5 ET : +45 PCD : 4-5x114.3
			17"	S	17x7.5 ET : +45 PCD : 4-5x114.3

Table 4.4 Show all details of products for easier to understand the structure of database (cont.)

RAYS	VERSUS	DUEX	17"	DFC	17x7.0 ET : +45 PCD : 4-5x114.3
			18"	DFC	18x8.5 ET : +45 PCD : 4-5x120
			18"	DFC	18x9.5 ET : +45 PCD : 4-5x120
		EU Line VD	15"	DFC	15x6.5 ET : +20 PCD : 4x114.3
			15"	DFC	15x6.5 ET : +42 PCD : 5x114.3
			16"	DFC	16x7.0 ET : +42 PCD : 4-5x120
			17"	DFC	17x7.5 ET : +42 PCD : 4-5x120
		BL-10 GENOMA	15"	DFC	15x6.5 ET : +42 PCD : 4-5x114.3
			16"	DFC	16x7.0 ET : +45 PCD : 4-5x114.3
			17"	DFC	17x7.0 ET : +42 PCD : 4-5x114.3

Table 4.5 Test Results of Statistic Reports

Scenario	Statistic Reports	
Authentication	User / Administrator	
Pre-condition	Users must be logged in to the system	
Post-condition	Users can search and view statistic reports successfully	
Expected Results	Users can search and view statistics reports	
Main Success Scenario		**Results**
1. All Users can search, view and export the statistic reports		Pass

CHAPTER V
CONCLUSION

The conclusion chapter will describes the overall of system performances and further developments of the stocking management system for more efficiency and answers the business needs. There are 2 main parts in this chapter.

5.1 Summary
5.2 Future work

5.1 Summary

According to the results in chapter4, it is demonstrated that the developed stocking management system can provide an easy, quick and comfortable stocking management system for both users and officers. After system set up and test all modules found that users can search for the products and officers can know the product status and all details. If there are some massages form customers or branches, it will show on the window after log in to the system. Massage box can help the users to save time process and make the chance for the customers to leave to comments. All comments will be used for develop the system in the next time.

The section of administration system is the core of system which can link every module that is very sensitive and essential. Users will need to configure the initial information of system through administration menu. Product details, rate of depreciation, user levels, ordering or approved order invoice will be allowed only this system. Only administrator and the owner can access this section because it is very importance system. Administrator can modify user level and set permission to other users. This section can show overall of the system.

Main problem of Hoksang company is stocking because of the products are very diverse and numerous. Many times, there are too much orders and duplicate

of the existing order. That cause of the owner does not know the exact number of items that are available in each store. As a result, the existing is not being sold out and the new orders were excessive unsold goods, resulting in a condition such depreciation. In the section of inventory management will be solve this problems because it will show the number of products in each branch and this system supports an organization which has more branches too. The product management section, it is the ideal to separate each product in suitable state. It is the planning before develop the system. This step is very essential because there should be designed to accommodate the stacking of products with the best step from the complication of product, the product management is very essential that can be done the complete system. The complication of product begin from this product type has many brands, each brand has many models, each model has many series, each series has many sizes and each size has many colors. Of course that every product prices are up and down according to the needs of the market, times, trend, etc. For this case study, developer retrospective and make understand the life cycle of the product. That study can help the developer to analyze and know this product will deteriorate over time. However, each brand of product will have a different percentage to decline as well, so it needs to be fixed depreciation in each product as well as the data in order to establish the inventory in time.

Stocking management system is a system that has controlled everything from the central part, administration system for easy management and monitoring. Previously, there are the officials who can order with supplier directly and many times together with a unique order number. Stocking management system can solve those problems such as the right to order the supplier though the system. The Officials must send the order invoice to the system for waiting the approval form administrator, to help resolve the redundancy of ordering and can know the existing products in inventory that can help to order in the appropriate amounts. Above performance can help the administrator can determine the amount of product in the stores and can move some products from the branch to the other branch where having order without open new invoice to supplier. These actions can reduce the stocking that is the purpose of development this system, to reduce the amount of inventory and release before the product will be depreciated down indefinitely.

5.2 Future work

Stocking management system is a prototype system that was developed to responds the business's needs, Hoksang Company that is the small businesses. So stocking management system can also be further developed in many functions and can be divided into the following major topics.

5.2.1 Pre order and online order system can be used in stocking management system. The owner can give the special prices or more discounts for the customers who order though this system, more attractive to use new system.

5.2.2 Systems can be developed further by separating the members to many level by using the ordering and collect score point for get some gifts or vouchers.

5.2.3 Messaging system of stocking management system is one-way communication system which is used to collect additional requirement for improve the system. But stocking management system can be developed to be able to communicate and interact with each other. The messaging system may have a sending confirmation massages via SMS or email.

5.2.4 The QR-Code system can be used together with the system and can enhance the functionality. The label is used to receive goods into inventory and check the product details on the packaging. At this point, the QR-Code system can accommodate with the users to sort the items in a box.

5.2.5 In terms of detail can be adjusted to modify the system to retrieve the item description is displayed before making changes.

5.2.6 In the depreciation analysis system of stocking management system uses only a time period to process. In this section that can be developed further by adding other factors that can affect to each type of business. Because of each business, there are many factors that affect the different depreciation and each factor would affect the rate of decline of prices vary. So this system can be has more developments and more functions adding.

5.2.7 The commodity transfer system between each branch should be developed to be able to communicate with the Branch Manager via SMS or develop the system that can better alert.

5.2.8 The depreciation simulating system of products through the graph should be developed to more useful and added functionality of browsing the system.

REFERENCES

Accountingexplained.com.[Internet].   Units of Production Method of Depreciation.
        Available from: http://accountingexplained.com/financial/non-current-assets

Accounting-simplified.com. [Internet]. Declining balance method formula. Available
        from:http://www.accounting-simplified.com/financial/fixed-assets/depreciation-
        methods/declining-balance.html

Bacel Maddah. Pricing, Variety, and Inventory Decisions in Retail Operations
        Management. [thesis]. Dissertation submitted to the Faculty of Virginia
        Polytechnic Institute and State University. ; 2005

Calculatorsoup.com. [Internet]. Declining balance method of depreciation. Available
        from:http://www.calculatorsoup.com/calculators/financial/depreciation-
        declining-double.php

Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze. Introduction to
        Information Retrieval, Cambridge University Press. 2008.

Eric Elwer. [Internet]. A Product Management Evolution. Available from:
        http://www.pragmaticmarketing.com/resources/a-product-management-evolution.

Investopedia.com. [Internet]. Declining Balance Method. Available from:
        http://www.investopedia.com/terms/d/decliningbalancemethod.asp   connect.
        mcgraw-hill.com. [Internet]. Activity Depreciation Method. Available from:
        http://connect.mcgraw-hill.com/sites/0077328787/student_view0/ebook/
        chapter11/chbody1/depreciation.htm

James A. Heintz,Robert W. Parry. College Accounting : sum-of-years-digits method.
        Accounting Department Head at the University of Connecticut. ; 2007

Jung, Doris , Hinze, Annika. Event notification services: analysis and transformation of
        profile definition languages. Department of Computer Science   The
        University of Waikato, Hamilton. ; 2004.

Kingkan Kamonsakpitak. Analysis and Design Database of Inventory System. [thesis].
          Bangkok : Department of   Information Technology King Mongkut's
          University of Technology Thonburi. ; 2009

Kris Rowland Martin. The Effect of Accounting Method Choice on Earnings Quality: A
          Study of Analysts' Forecasts of Earnings and Book Value. [thesis].
          Dissertation submitted to the Faculty of the Virginia Polytechnic Institute
          and State University. ; 2002

Salim, Marc A. Timmerman. Software to Simulate and Optimize Asset Management in
          Construction and Manufacturing. [thesis]. Department of Electrical
          Engineering Technology at the University of Arkansas at Little Rock, Little
          Rock, Arkansas, USA. ; 2001

Sigal, Jacob R. Creating a Market Paradigm Shift with Quality Function Deployment
          [thesis]. Department of Industrial and Manufacturing Systems Engineering
          (Engineering) Ohio University. ; 2004,

Veliporn Learmahakeit. The innovation of multiple relations information retrieval.
          [thematic paper]. Bangkok : King Mongkut's Institute of Technology North.
          ; 2010

Yossakorn Arsukstaporn. The Inventory Database System for Construction Work.
          [thesis].Bangkok : Department of Information Technology King Mongkut's
          University of Technology Thonburi. ; 2006

APPENDICES

APPENDIX A

DATA DICTIONARY

Attribute : tblbranch

Description : ตารางแสดงรายละเอียดสาขา

Attribute Name	Contents	Type	PK/FK	Referenced
BranchID	Auto Number	int(10)	PK	
BranchName	ชื่อระดับสมาชิก	varchar(100)		
BranchAddress	รหัสระดับสมาชิก	text		
BranchImages	สถานะการใช้งาน	varchar(100)		

Attribute : login_levels

Description : ตารางแสดงรายละเอียดระดับสมาชิก

Attribute Name	Contents	Type	PK/FK	Referenced
id	Auto Number	int(11)	PK	
level_name	ชื่อระดับสมาชิก	varchar(255)		
level_level	รหัสระดับสมาชิก	int(1)		
level_disabled	สถานะการใช้งาน	tinyint(1)		

Attribute : login_users

Description : ตารางแสดงข้อมูลสมาชิก

Attribute Name	Contents	Type	PK/FK	Referenced
user_id	Auto Number	Int(8)	PK	
User_level	รหัสระดับสมาชิก	Int(1)	FK	login_levels User_level
restricted	สิทธิ์การใช้	Int(1)		
memberid	รหัสมาชิก	varchar(20)		
fname	ชื่อ	varchar(255)		
lname	นามสกุล	varchar(255)		
email	อีเมลล์	varchar(255)		
BranchID	รหัสสาขาที่ทำงาน	Int(10)	FK	tblbranch BranchID
address	ที่อยู่	varchar(255)		
telephone	เบอร์โทรศัพท์	varchar(20)		
avatars	รูปประจำตัว	varchar(255)		
username	ชื่อล็อกอิน	varchar(20)		
password	รหัสผ่าน	varchar(32)		
timestamp	ปรับปรุงเวลาล่าสุด	timestamp		

Attribute : tblbrand

Description : ตารางแสดงข้อมูลยี่ห้อสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
BrandID	Auto Number	Int(10)	PK	
BrandName	ชื่อยี่ห้อสินค้า	varchar(100)		
BrandImages	รูปภาพยี่ห้อสินค้า	varchar(100)		

Attribute : tblcartype

Description : ตารางแสดงข้อมูลประเภทของรถยนต์

Attribute Name	Contents	Type	PK/FK	Referenced
CarTypeID	Auto Number	Int(10)	PK	
CarType	ชื่อประเภทรถยนต์	varchar(20)		

Attribute : tblgroupsize

Description : ตารางแสดงข้อมูลยี่ห้อสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
GroupSizeID	Auto Number	Int(10)	PK	
CarTypeID	ประเภทรถยนต์	Int(10)	FK	tblcartype CarTypeID
GroupSize	ขนาดสินค้า	varchar(100)		

Attribute : tblmessages

Description : ตารางแสดงข้อความส่วนตัว

Attribute Name	Contents	Type	PK/FK	Referenced
messageid	Auto Number	Int(10)	PK	
user_id	รหัสผู้รับ	Int(10)	FK	login_users User_id
from_id	รหัสผู้ส่ง	mediumint(8)		
from_username	ล็อกอินผู้ส่ง	varchar(64)		
subject	หัวข้อที่ส่ง	varchar(255)		
message	ข้อความ	text		
date	วันที่ส่ง	timestamp		
is_read	สถานะการเปิดอ่าน	tinyint(1)		

Attribute : tblmodel

Description : ตารางแสดงรูปแบบสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ModelID	Auto Number	Int(10)	PK	
BrandID	ชื่อยี่ห้อสินค้า	Int(10)	FK	Tblbrand BrandID
ModelName	ชื่อเรียกรูปแบบสินค้า	varchar(100)		
ModelImages	ภาพรูปแบบสินค้า	varchar(100)		

Attribute : tblorderstatus

Description : ตารางแสดงสถานะการสั่งสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ProductOrderStatusID	Auto Number	Int(10)	PK	
ProductOrderStatusDetails	สถานะการสั่งสินค้า	varchar(100)		

Attribute : tblproduct

Description : ตารางแสดงข้อมูลสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ProductID	Auto Number	Int(10)	PK	
DateEntry	วันลงทะเบียนสินค้า	date		
ProductTypeID	รหัสประเภทสินค้า	Int(10)	FK	tblproducttype ProductTypeID
BrandID	รหัสยี่ห้อสินค้า	Int(10)	FK	tblbrand BrandID
ModelID	รหัสรูปแบบสินค้า	Int(10)	FK	tblmodel ModelID
SeriesID	รหัสรุ่นสินค้า	Int(10)	FK	tblseries SeriesID
CarTypeID	รหัสประเภทรถยนต์	Int(10)	FK	tblcartype CarTypeID
GroupSizeID	รหัสขนาดสินค้า	Int(10)	FK	tblbranch BranchID
WheelSpec	ขนาดสินค้า	varchar(100)		

CodeColor	รหัสสีของสินค้า	varchar(10)		
ProductDetails	รายละเอียดสินค้า	varchar(250)		
ProductPictures	รูปภาพสินค้า	varchar(250)		
ProductThumb	รูปภาพสินค้า	varchar(100)		
ProductPricePurchase	ราคาต้นทุน	Float(10,2)		
ProductPriceUnit	ราคาขาย	Float(10,2)		
DiscountRate	อัตราส่วนลด	Float(10,2)		
ProductQuantity	จำนวนสินค้า	Int(10)		
Active	สถานะสินค้า	Varchar(10)		

Attribute : tblproductorders

Description : ตารางแสดงการสั่งซื้อสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ProductOrderID	Auto Number	Int(10)	PK	
ProductOrderDate	วันที่สั่งซื้อสินค้า	date		
BranchID	สาขาที่สั่งสินค้า	Int(10)	FK	tblbranch BranchID
ProductOrderStatusID	สถานะการสั่งซื้อสินค้า	Int(10)	FK	tblorderstatus ProductOrderStatusID
user_id	รหัสผู้สั่งสินค้า	Int(10)	FK	login_users user_id

Attribute : tblproductordersview

Description : ตารางแสดงรายละเอียดการสั่งซื้อสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ProductOrderViewID	Auto Number	Int(10)	PK	
ProductOrderID	รหัสใบสั่งซื้อสินค้า	Int(10)	FK	Tblproductorders ProductOrderID
ProductID	รหัสสินค้า	Int(10)	FK	tblproduct ProductID
ProductOrderQuantity	จำนวนการสั่งซื้อสินค้า	Int(10)		
ProductOrderPrice	ราคาสินค้า	Float(10,2)		

Attribute : tblproductsell

Description : ตารางแสดงการขายสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ProductSellID	Auto Number	Int(10)	PK	
ProductSellDate	วันที่จำหน่ายสินค้า	date		
BranchID	รหัสสาขา	Int(10)	FK	Tblbranch BranchID
ProductSellStatusID	รหัสสถานะการขายสินค้า	Int(10)	FK	tblsellstatus ProductSellStatusID
user_id	รหัสสมาชิก	Int(10)		login_users user_id

Attribute : tblproductstock

Description : ตารางแสดงสินค้าในคลัง

Attribute Name	Contents	Type	PK/FK	Referenced
ProductStockID	Auto Number	Int(10)	PK	
BranchID	รหัสสาขา	Int(10)	FK	Tblbranch BranchID
ProductID	รหัสสินค้า	Int(10)	FK	tblproduct ProductID
ProductStockQuantity	จำนวนสินค้าในคลัง	Int(10)		

Attribute : tblproductsellview

Description : ตารางแสดงรายละเอียดการขายสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ProductSellViewID	Auto Number	Int(10)	PK	
ProductSellID	รหัสใบสั่งขายสินค้า	Int(10)	FK	Tblproductsell ProductSellID
ProductID	รหัสสินค้า	Int(10)	FK	tblproduct ProductID
ProductSellQuantity	จำนวนสินค้าที่ขาย	Int(10)		
ProductSellPrice	ราคาสินค้าที่ขาย	Int(10)		

Attribute : tblproductstock

Description : ตารางแสดงสินค้าในคลัง

Attribute Name	Contents	Type	PK/FK	Referenced
ProductStockID	Auto Number	Int(10)	PK	
BranchID	รหัสสาขา	Int(10)	FK	Tblbranch BranchID
ProductID	รหัสสินค้า	Int(10)	FK	tblproduct ProductID
ProductStockQuantity	จำนวนสินค้าในคลัง	Int(10)		

Attribute : tblproducttype

Description : ตารางแสดงประเภทสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
ProductTypeID	Auto Number	Int(10)	PK	
ProductTypeName	ชื่อประเภทของสินค้า	varchar(255)		

Attribute : tblsellstatus

Description : ตารางแสดงสถานะการขาย

Attribute Name	Contents	Type	PK/FK	Referenced
ProductSellStatusID	Auto Number	Int(10)	PK	
ProductSellStatusDetails	สถานะการขาย	varchar(100)		

Attribute : tblseries

Description : ตารางแสดงรุ่นสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
SeriesID	Auto Number	Int(10)	PK	
ModelID	รหัสรูปแบบสินค้า	Int(10)	FK	tblmodel ModelID
SeriesName	ชื่อรุ่นสินค้า	varchar(100)		
SeriesImages	รูปภาพรุ่นสินค้า	varchar(255)		

Attribute : tblwheelspec

Description : ตารางแสดงรุ่นสินค้า

Attribute Name	Contents	Type	PK/FK	Referenced
WheelSpecID	Auto Number	Int(10)	PK	
GroupSizeID	รหัสกลุ่มขนาดสินค้า	Int(10)	FK	tblgroupsize GroupSizeID
WheelSpec	รายละเอียดขนาดสินค้า	varchar(100)		

APPENDIX B

CODE STATEMENT OF DEPRECIATION

```
$strSQL = "SELECT *  FROM tblproduct WHERE ProductID = $ProductID";

$objQuery = mysql_query($strSQL) or die ("Error Query [".$strSQL."]");

while($objResult = mysql_fetch_array($objQuery))

{

        $ProductPricePurchase = $objResult['ProductPricePurchase'];

        $ProductPriceUnit =$objResult['ProductPriceUnit'];

        $DateEntry = $objResult['DateEntry'];

        $DiscountRate = $objResult['DiscountRate'];

        $today =  date("$yearfull-m-d");

        $month =  date("m");

        $diffyears00 = $yearfull - substr($DateEntry, 0, 4) ;

        {

                if($diffyears00 <= '0')

                { $newmonth00 == 0 ; }

                else if($diffyears00 == '1')

                { $newmonth00 = 12 ; }

                else if($diffyears00 == '2')

                { $newmonth00 = 24 ; }

                else if($diffyears00 == '3')

                { $newmonth00 = 36 ; }

                else if($diffyear00 == '4')
```

```
                { $newmonth00 = 48 ; }

            else if($diffyears00 == '5')

                { $newmonth00 == 60 ; }

    }

    $diffmonth0 =  $month - substr($DateEntry, 5, -3) ;

    $diffmonth = $newmonth00 + $diffmonth0 ;

            {

    if($diffmonth <= '1')

                { $rating = 0 ; }

            else if($diffmonth > '1' AND $diffmonth <='6')

                    { $rating = 1 ; }

            else if($diffmonth > '6' AND $diffmonth <='12')

                    { $rating = 2 ; }

            else if($diffmonth > '12' AND $diffmonth <='24')

                    { $rating = 3 ; }

            else if($diffmonth > '24' AND $diffmonth <='36')

                    { $rating = 4 ; }

            else if($diffmonth > '36' AND $diffmonth <='48')

                    { $rating = 5 ; }

            else if($diffmonth > '48')

                    { $rating = 6 ; }

            }

    $diffrate1 = 1 * $DiscountRate ;

    $ProductSellPriceUnit1 = $ProductPriceUnit * ( 100 - $diffrate1) / 100 ;

      $diffrate2 = 2 *  $DiscountRate ;
```

```
$ProductSellPriceUnit2 = $ProductPriceUnit * ( 100 - $diffrate2) / 100 ;

$diffrate3 = 3 *  $DiscountRate ;

$ProductSellPriceUnit3 = $ProductPriceUnit * ( 100 - $diffrate3) / 100 ;

$diffrate4 = 4 *  $DiscountRate ;

$ProductSellPriceUnit4 = $ProductPriceUnit * ( 100 - $diffrate4) / 100 ;
$diffrate5 = 5 *  $DiscountRate ;

$ProductSellPriceUnit5 = $ProductPriceUnit * ( 100 - $diffrate5) / 100 ;
$diffrate6 = 6 *  $DiscountRate ;

$ProductSellPriceUnit6 = $ProductPriceUnit * ( 100 - $diffrate6) / 100 ;

         {

         if($rating <= '1')

         {
                              $ydata = array($ProductPriceUnit ,
$ProductSellPriceUnit1);

                              $datacost = array($ProductPricePurchase ,
$ProductPricePurchase);

         }

                 else if($rating =='2')

         {

         $ydata = array($ProductPriceUnit , $ProductSellPriceUnit1 ,
$ProductSellPriceUnit2);

         $datacost = array($ProductPricePurchase , $ProductPricePurchase ,
$ProductPricePurchase);                                                  }

         else if($rating =='3')

         {

                              $ydata = array($ProductPriceUnit , $ProductSellPriceUnit1 ,
$ProductSellPriceUnit2 , $ProductSellPriceUnit3);

                              $datacost = array($ProductPricePurchase ,
$ProductPricePurchase , $ProductPricePurchase, $ProductPricePurchase);

         }
```

```php
        else if($rating == '4')

         {


            $ydata = array($ProductPriceUnit , $ProductSellPriceUnit1 ,
$ProductSellPriceUnit2 , $ProductSellPriceUnit3, $ProductSellPriceUnit4);

            $datacost = array($ProductPricePurchase , $ProductPricePurchase ,
$ProductPricePurchase, $ProductPricePurchase, $ProductPricePurchase);

         }
        else if($rating =='5')

         {

            $ydata = array($ProductPriceUnit , $ProductSellPriceUnit1 ,
$ProductSellPriceUnit2 , $ProductSellPriceUnit3, $ProductSellPriceUnit4 ,
$ProductSellPriceUnit5);

            $datacost = array($ProductPricePurchase , $ProductPricePurchase ,
$ProductPricePurchase, $ProductPricePurchase, $ProductPricePurchase,
$ProductPricePurchase);

            //$ydata = array($ProductPriceUnit , $ProductSellPriceUnit , 9999);

         }
        else if($rating = '6')
                {

            $ydata = array($ProductPriceUnit , $ProductSellPriceUnit1 ,
$ProductSellPriceUnit2 , $ProductSellPriceUnit3, $ProductSellPriceUnit4 ,
$ProductSellPriceUnit5  , $ProductSellPriceUnit6);

            $datacost = array($ProductPricePurchase , $ProductPricePurchase ,
$ProductPricePurchase, $ProductPricePurchase, $ProductPricePurchase,
$ProductPricePurchase , $ProductPricePurchase);

        //$ydata = array($ProductPriceUnit , $ProductSellPriceUnit , 9999);
```

BIOGRAPHY

NAME	Mr. Trairat Liewsirianan
DATE OF BIRTH	05 September 1984
PLACE OF BIRTH	Phattalung
INSTITUTIONS ATTENDED	King Mongkut's University of Technology Thonburi, Bangkok, 2003-2006
	Bachelor of Engineering
	(Computer Engineering)
	Mahidol University, Nakhonphatom, 2008-2014
	Master of Science
	(Technology of Information System Management)
HOME ADDRESS	99/416 City Home Tapra, Bangkok, Thailand
	Tel. 089-134-8345
	E-mail : loungaur@hotmail.com