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**Date:** 30/08/2016

**Date:** 30/08/2016

**YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM**

**BY**

**TEH SOON KEONG**

**A REPORT**

**SUBMITTED TO**

**Universiti Tunku Abdul Rahman**

**in partial fulfillment of the requirements**

**for the degree of**

**BACHELOR OF INFORMATION TECHNOLOGY (HONS)**

**BUSINESS INFORMATION SYSTEMS**

**Faculty of Information and Communication Technology**

**(Perak Campus)**

**MAY 2016**

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Signature : \_\_\_\_\_

Name : TEH SOON KEONG

Date : 30/08/2016

## **ACKNOWLEDGEMENT**

First of all, I would like to express my sincere gratitude to my project supervisor, Ms. Chan Lee Kwun for her demonstration of guidance, providing useful advice, conceptualize the project which enabled me to more understand the requirement of the final year project, and supervise me in completing the final year project .

In addition, I would like to thank to Mr Su Lee Seng for his useful suggestion which enable me to more understand about the business process of a real world company which is useful in completing the final year project.

Besides that, I would like to thanks to my family members and my friends for who are giving caring, supporting, and useful advice to me that inspired me a lot to coming out new ideas that useful to complete the final year project.

Last, but not least, thanks again to all who are helped me a lot in completing this final year project and I wishes to acknowledge the unwavering support shown by Ms. Chan and my project moderator, Mr. Aamir Amin.

## **Abstract**

This proposed project is called Yak Xin Fisheries Hardware Management System. It is order management system in the sense that only applicable to Yak Xin Enterprise. The proposed project can help to manage Yak Xin Enterprise daily business operation in order to reduce paper work and easy for keep tracking business transaction. With this project, user can keep track of their current stock rather than manually perform stock count. Based on the records that maintained by the users, the proposed system will generate report for user to view in term of sale report, purchase order report, customer report and so forth.

The scope of the project will covers customer module, order management module, supplier module, product management module, payment module, stock management module and report management module.

The project methodologies are the Waterfall SDLC model and the Incremental Prototyping. Since Waterfall model has a few drawbacks, by just utilizing it as the advancement of this proposed system is insufficient. Since Waterfall model has a few drawbacks, by just utilizing it, as the advancement of this proposed system is insufficient. Through Increment Prototyping will let the users to test first prototype and get feedback from this. In addition, this project also utilized of UML (Unified Model Language) to design the system process or flow and to define the relationship between user and a system such as use case diagram, activity diagram, sequence diagram and class diagram. Furthermore, Entity-Relationship Diagram (ERD) and data dictionary will be prepared to the relationship between each database table and the connectivity of it. Besides that, the proposed system are develop by Visual Studio 2010, Microsoft SQL Server and C# as a programming language.

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## LIST OF ABBREVIATIONS

<i>RMS</i>	Microsoft Dynamics Retail Management System
<i>POS</i>	Point of sale
<i>PO</i>	Purchase Order
<i>SDLC</i>	System Development Life Cycle
<i>C#</i>	C-sharp
<i>XML</i>	Extensible Markup Language
<i>SOAP</i>	Simple Object Access Protocol
<i>WPF</i>	Windows Presentation Foundation
<i>OS</i>	Operating System

# Chapter 1: Introduction

## **1.0 Introduction**

Yak Xin Enterprise have been founded and established in Alor Setar, Malaysia in 1997. As the company developed to supply all sort of fishing hardware such as fishing rod, reels, hard bait, fishing line, fishing plier, fishing bag, fishing accessories and etc in order to cater the need of the surrounding fisherman. From the business start until now, Yak Xin Enterprise operation are all depends on humans work in other word is manually work.

### **1.1 Problem Statements**

Yak Xin Enterprise is at currently confronting troubles in overseeing paper work. All customer orders are handled through their procedure completion cycle on paper documents. By dealing with all these documents which also called "records" in a vast number expand the general request preparing e.g. to verify document, creating reports, reordering and payments. Following quite a while of business, the information or data has developed much for Yak Xin Enterprise. It is turning into a challenge for Yak Xin Enterprise to deal with that information or data in an efficient way. In order to be more efficient in order processing, Yak Xin Enterprise needs an effective ways which can systematic their present processes with utilization of technology and software.

#### **1.1.1 Customer and Supplier Management**

Yak Xin Enterprise is currently facing very troublesome work flow for managing customers, which is deal with the vast of paper records due to lack of computerized processes. Customers and suppliers are connected directly to or by Yak Xin Enterprise. There is no software or system currently at place to support Yak Xin Enterprise which can manage customer order and supplier related transaction.

#### **1.1.2 Stock traceability**

Yak Xin Enterprise always faced a big problem which are unable to trace the current remaining stock. The owner of Yak Xin Enterprise manually perform stock count on a weekly basis according to a paper list but sometimes human may make mistakes that leads to inaccurate stock level record and not sure when to need to reorder from supplier.

### **1.1.3 Invoicing**

Yak Xin Enterprise is handling all of its records on physical documents. Invoices are manage in paper document formats, somehow orders get from a phone call and walk-in customers. There is no such system to assist Yak Xin Enterprise to generate customer invoice automatically while the customer place an order and the owner have to do it manually by writing an invoice bills. In some special cases, some customers will take the goods first and then pay later. So that, the owners have to manually calculate customer credit one by one and record in a paper format, which is time consuming. Besides that, the owners have to manually record the supplier invoice in a paper format and keep it in a physical file.

### **1.1.4 Order traceability**

When the owner of Yak Xin Enterprise need to trace back the customer order or purchase order history. What they do is just looking back the big stack of file and then start to searching the information one by one, which is not an efficient way.

### **1.1.5 Unable Generate Report**

Yak Xin Enterprise cannot generate a proper report automatically according to stock on hand level, customer report, supplier report and etc.

## **1.2 Project Objectives**

Objective is a projected state of affairs that a system plans to achieve. The objective of this project is created with several objectives for solving the problems as stated above in order to automate and streamline the Yak Xin Enterprise daily business process and the operation of the business.

### **1.2.0 Help to manage Yak Xin Enterprise daily business operation**

After implement the proposed system, Yak Xin Enterprise is able to computerize their day to day business procedure which allow them to record customer, supplier, product detail information and also keep track of the customers and suppliers payment.

### **1.2.1 Reduce paper work to keep track the business**

All the daily transaction in term of customer invoice/receipt, customer credit status, supplier quotation, supplier debt and related data will be save in database for retrieval purpose. At the same time, reduce the usage of paper.

### **1.2.2 Help to keep track of the stock item**

More accurate reorder quantity will be provided in order to prevent too much stock being stuck in the storeroom and after some time become an obsolete stock item. Moreover, keep fulfilling customer demand on time without any out of stock situation.

## **1.3 Project Scope**

The proposed project will include such as Customer Module, Order Management Module, Supplier Module, Purchasing Module, Product Management Module, Payment Module, Stock Management Module and Finance Management Module. Each of the features or functionalities will have their own data and function in order to help Yak Xin Enterprise to manage their day to day business procedures. Descriptions of the features:-

### **1.3.1 Customer Module**

User able to add new customer, edit customer, search customer details so that all the data that related to customer will be include on this module.

### **1.3.2 Order Management Module**

The customer can place the order via call-in or walk-in. The proposed system will record down all the customer order detail like (product, quantity, product specification, etc). In addition, the proposed system will automatically generate customer invoice regards the detail of order. All the customer invoice will be represent with a unique invoice order and store inside the proposed system database. At whatever point customer needs to perform order inquires he/she needs to give order number to view his order details.



### **1.3.3 Supplier Module**

User able to add new supplier, edit existing supplier, search supplier details so that all the data that related to supplier will be include on this module. In addition, all received supplier invoice will be recorded inside the proposed system regards the invoice amount, invoice detail and invoice credit terms.

### **1.3.4 Product Management Module**

This module is able to help the user record all the sales product in term of price, description, images, colors, measurement, quantity and etc. Basically, this module will directly link to stock management module so that real-time updating can be perform quickly and accurately. User will be able to know the availability of the product by just enter a product number.

### **1.3.5 Payment Module**

All payment records that related to a certain or number of orders can be view under this segment. Client will be demonstrated rundown of all the placed order, with the most current placed order at the top. By clicking an order, the proposed system will create the payment (Paid or Unpaid) details because of the clicked order. In addition, frequent customer can choose to pay the partial amount instead of full amount.

### **1.3.6 Stock Management Module**

User can able to keep track of the stock on hand level for all the product in term of size, color, quantity and types. All the sales quantity will be updated to this module and the stock in quantity from supplier. Moreover, by entering the product number user is able to find out the product , view product supplier information, view product stock in date and others information related to the particular product.

### **1.3.7 Finance Management Module**

All the customer payment and debt payment will be include under this module. In addition, user can check customer order payments, as well as the payments consists in multiple order by a certain customer. User can trace back the payments according to received date, amount. Moreover, customer receivable account will be generate in this

module so that user can easily keep track of their credit status by just key in customer id.

### **1.3.8 Report management Module**

Some necessary report will be include on this module for example sales report, customer debt report, supplier details report, stock quantity report and so forth.

### **1.4 Project Innovation**

In this project will included two innovation features such as compare supplier quotation to get the best price and quality as well and alert users when stock level are below the set threshold .

#### **1.4.1 Purchasing Module**

In this module, the proposed system is able to generate purchase order based on available stock and reorder point. When the particular stock is lower than reorder point then the system will alert users to replenish the stock. In addition, user is allow inserting multiple suppliers for each item and suggests the supplier with the best price.

Besides that, all the purchase order will be provided with a purchase order number and store in system database so that user can easily trace back the past purchases order by just entering the PO number.

# Chapter 2:

# Literature Review

## 2.1 Similar Existing Systems

### 2.1.1 Microsoft Dynamics Retail Management System (RMS)

Microsoft Dynamics Retail Management System (RMS) offers small and medium retailers a whole readily point of sale (POS) arrangement that can be modify according to user special requirements. This review software include computerizes POS procedures and store operations, gives centralized control to multi-store retailers, and incorporates with Microsoft Office framework programs, Microsoft Dynamics GP, and other famous applications(Microsoft, n.d.).

#### **Advantages :**

- ✓ Minimize interruptions with a retail management arrangement designed for fast establishment and convenience.
- ✓ Track the movement of product item and supplier histories, rapidly create purchase orders, and include things the fly(Microsoft, n.d.).
- ✓ Review, search, and print every day transaction reports and records by register, group, and receipt number, and also close clerk moves rapidly and precisely.

#### **Disadvantages :**

- ✓ Unable to support customer refunds whenever the goods has return.
- ✓ Unable support tax exemption.
- ✓ Unable support stock check.

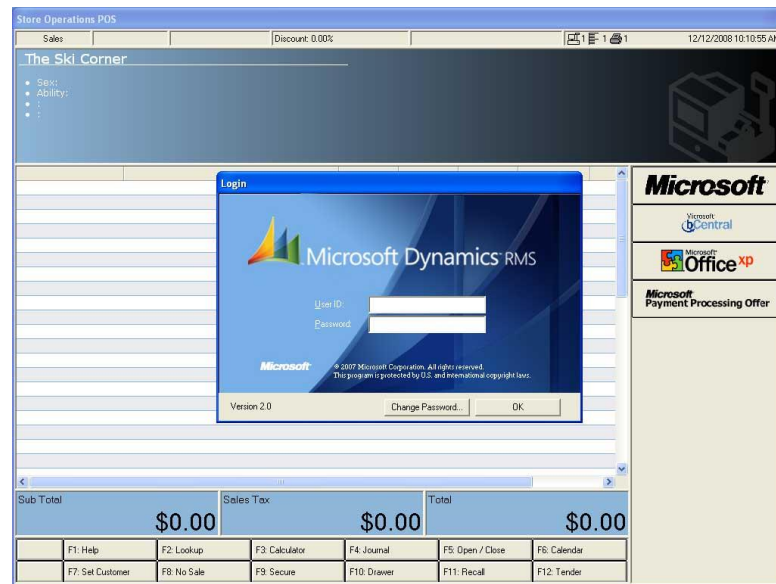


Figure 2.1 The screenshot of the login screen of RMS.

### 2.1.2 ShopKeep System

ShopKeep is a straightforward, exquisite type of software. It is pointed decisively at small organizations. The organization is the brainchild of Jason Richelson, a businessperson who has to be disappointed with his low quality Windows POS software. His story is abnormal as in he was, and still is, a retailer, instead of a software designer. Most POS software are composed by software engineers with little experience of really maintaining a business. Richelson's hands-on comprehension of the issues confronted by store-proprietors frequently radiates through in certain unique components, for example, first-rate customer service and an undemanding interface.

ShopKeep currently released version 2.6.0 of its application, with another configuration that offers enhanced usability, more dynamic elements, and all around expanded proficiency. The latest version definitely executes as advertised— it's brisk and responsive – however it's not totally without its defects. ShopKeep is frequently celebrated for its simple valuing structure.(ShopKeep, n.d.)

#### Advantages:

- ✓ The register's capacities are thorough: ringing up things, including modifiers, taking installments, part tenders, fast discounting (thing and order level), simple returns and discounts.

- ✓ Provide ease of passage to a system that manage clients stock, client customers, and client workers' period, keeps a record of all client daily transaction, offers an assortment of reporting choices for dissecting this information, and gives boundless technical support by telephone, live-chat, and email.
- ✓ Able to stored items as raw materials, and then assemble these raw materials based on this information.

### Disadvantages:

- ✓ Lack of elements that are currently part of the application which are onscreen tipping for credit exchanges.
- ✓ Does not support much tax rates.

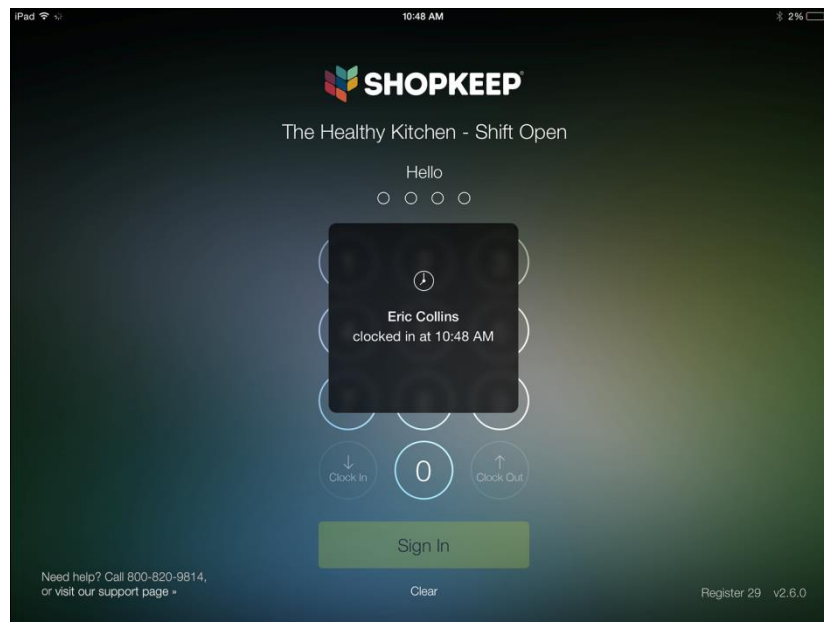


Figure 2.2 The screenshot of the login screen of ShopKeep.

### 2.1.3 Vend System

Vend POS is a POS system that utilized by retailers of numerous types and sizes to handle sales, clients, prizes, stock and more for a low price of subscription. Vend is intended to work with the equipment and hardware which already been set up, including receipt printers, barcode scanners, money drawers and so forth. Client are required to run the product is a Web program on any gadget (Mac, PC, iPad or Android). The iPad POS application is accessible from Apple's App Store. While the

product is Web-based, it will keep on working if the Internet connectivity goes down; information consequently adjusts when the system reconnects.

Vend can flex to bolster input data with mouse and keyboard or touchscreen, and the POS system screen can be tweaked for access to well known items or activities. With Vend, retailers have access to various extra features. Not only to inventory management, retailers can likewise deal with their product items, track and sort out their client base and more. The dashboard gives real-time updated information into sales and items.

**Advantages:**

- ✓ Support customer loyalty program which permit client to make motivating force for clients to continue shopping at client store.
- ✓ Maintains a contact rundown of all client customers, which should be possible as a mass import from a CSV record.
- ✓ Without complex step to add, delete, alter stock items and continue to trace the stock level.

**Disadvantages:**

- ✓ Vend has no such function that allow employees to check-in working time and check-out after finish work, track worker hours, figure employee sales incentives, or figure rewards.
- ✓ Switching between clerks is conceivable without having to return any credentials, so one worker can change to another's login without being provoked to re-enter the password. This is a major issue keeping up inner controls with money handling.
- ✓ Vend system permits clients to continue offering product items even when they have zero or negative stock.

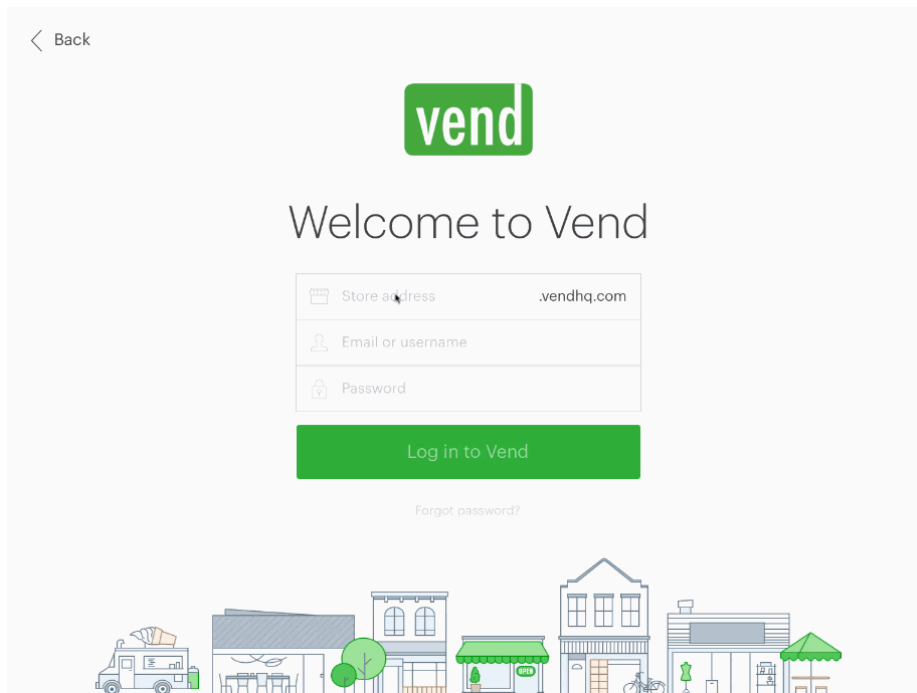


Figure 2.3 The screenshot of the login screen of Vend System.



## 2.2 Summary Comparison between Three Similar System

<b>Systems</b> <b>System</b> <b>Functions</b> <b>/Features</b>	<b>Microsoft</b> <b>Dynamics</b> <b>Retail</b> <b>Management</b> <b>System</b>	<b>ShopKeep</b> <b>System</b>	<b>Vend</b> <b>System</b>	<b>Yak Xin Fisheries</b> <b>Hardware</b> <b>Management</b> <b>System(Proposed</b> <b>System)</b>
Automated Ordering	✓	✓	✓	✓
Back Orders	✓			✓
Customer, Supplier and Product Management	✓	✓	✓	✓
Inventory Classification		✓	✓	
Employee Management		✓		
Inventory Reorder Alerts	✓	✓		✓
Generate Purchase Order	✓	✓	✓	✓
Compare Supplier Quotation				✓
Support Cash and Credit Card	✓	✓	✓	✓

Transaction				
Generate Sales Receipt	✓	✓	✓	✓
Debt Sales				✓
Discounts	✓	✓	✓	✓
Reporting	✓	✓		✓

Table 2.1: Comparison the Features of Three Similar Systems

Table 2.1 shows the comparison of the similar websites. It is clearly shows that out of three similar websites, none of them are having compare supplier quotation and support customer credit sales. However this project which is the proposed system will add these features. By having these feature, it make it distinguish from other system. Since these two features is significantly important as it will affect Yak Xin Enterprise business flow. Therefore, this project will provide these two functionalities.

## 2.3 Fact Finding

In order to develop a system that meet user satisfaction, the developer needed to accumulate all functional and non-functional requirements from the users. There are a couple of methods to assemble the requirements. The two primary techniques to be picked are Research and Interview.

### 2.3.1 Research

Research is a technique to get all the information from the other sources such as Internet, documentation, etc(Maciaszek, 2007). The existing order management system will be the main research target. The developer had studied on how those system works and what functionalities they provide. Besides, the developer had gathered the information that able to help Yak Xin Enterprise manage their daily

operation in an efficient way. Thus, the developer learned from information of the existing system and develops a more powerful system with completed features.

From the research, the developer had learned some important features for a fisheries hardware management system. Following are some explanations of these features:-

1. Compare Supplier Quotation: The fisheries hardware management system are able to help user to compare different supplier quotation by fill in all the supplier quotation details in the windows form. Then, the system will automatic compare and choose the most effective quotation in term of prices, quantity and quality.
2. Report Generating : The fisheries hardware management system can generates different type of report in term of sales report, customer credit account report, best selling product report and etc.

### **2.3.2 Interview**

The purpose of interview is to gather information during the system analysis phases to develop a system and a type of fact-finding method (Dillon, n.d.). I have make appointment with the Yak Xin Enterprise owner to conduct an interview. The purpose of this interview session is to know more details about their nature of business, problem faced in managing their daily operation and also gather some user requirements for the proposed system.

The following question is the interview question that I had been asked.

1. Yak Xin Enterprise is doing what kind of business?
2. Do you implement a system to support your daily business operation?
3. Have you encounter any problem by managing your business without a system?
4. How do you store the daily business transaction?
5. What are the functions or services that you would need for the proposed system?
6. What type of report that you would like to include in the proposed system?

## 2.4 Data Collection

In order to proceed for system evaluation, the system requires sample data to assist in system executing. The data collection will be gathering from the owner of Yak Xin Enterprise i.e. sample customer invoice.

**益新企業**  
**YAK XIN ENTERPRISE** (AS 267560-V)  
 No. 536, Jalan Kenanga 16, Taman Sri Ampang, 05050 Alor Setar, Kedah Darul Aman.  
 Tel / Fax : 04 - 7719411 H/P : 013 - 4894688

發貨單 INVOICE

Sold To 瑞記 日期 Date: 5-5-15

数Qty.量	描 Particulars 要	价目 Unit Price	元 RM	分 sen
4个	2" 吉子	90¢	3	60
2个	以 " "	85¢	1	70
12	钢锯片	4.00	4	00
12	1/2" 7" 钢丁甲必	8.50	8	50
12	1/2" x 8" " "	9.00	9	00
43	1/2" 华吓	30¢	1	20
12	1 1/4" 高尼李	22.00	22	00
3条	57" 巴皮布	9.70	29	10
1个	670 高油鞍	40.00	40	00
1个	777 " "	42.00	42	00
5-15	6" x 36 波力回	16.00	82	60
15-45	3" x 24 " "	16.00	247	20
10-95	2 1/2" x 21 " "	16.50	179	85
32	回 棧	6.50	19	50
1-16	3" x 24 波力回	16.00	17	60
4.66	1 3/4" x 24 " "	17.50	80	50
No 3612 E. & O. E.		总共	788	15
经手人 Issued by: _____		收货人 Received by: _____		

Figure 2.4: Sample customer invoice issued by Yak Xin Enterprise.

### **2.5 Critical Remarks of previous works**

Previously, many of the fisheries hardware management system are develop with many modules or function which the user might not need it. Hence, it makes the system operation more complex which cause user reluctant to use it. However, in the proposed system have been customized just to fit with Yak Xin Enterprise so that the useless function or features will not include in the system and extra function will be added in. For example, compare supplier quotation and handle customer credit payment function will be implement in the proposed system.

# **Chapter 3:**

# **Methods/Technologies Involved**

### 3.1 Methodology

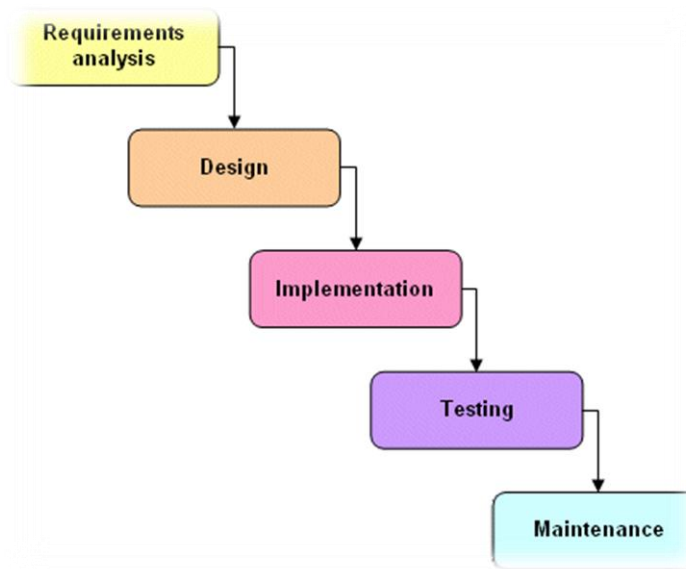


Figure 3.1 : Main phase of Waterfall Development

The proposed system will implement the combination of Waterfall model and incremental prototyping. Because of Waterfall model have few limitations, so cannot use it as a full guideline for the proposed system and just use part of it, however it is insufficient. The main limitation for Waterfall model is before start or proceed to next phase, developers must complete the previous phase first in order to step into next phase (Rouse, 2009). Since Waterfall model unable to reverse back to the previous phase, there will be risky to fully implement this model into proposed system (Model, n.d.).

On the contrast, Waterfall model has its advantages that are focus on system documentation. On the other hand, it is one of the limitation for Incremental Prototyping model.

Firstly, Increment Prototyping will collect requirements from user and start to come out a prototype according to the collected requirements. After the first prototype, user will can feel on it and also hands on because need to get the feedback and comment from the users. The feedbacks or comments that record down in the first prototype will be discuss and analyze by the developer in order to come out a solution that can meet users' requirement. (Certification, n.d.).

The process on developing and testing will be repeated until get user satisfaction. By combination of two methodologies model, the proposed system will reduce the risk to get into trouble.

### **Phase 1: Planning**

Planning is very important in developing a system. The developer expected to think logically on how the project to be produced on time .The project planning includes the use of timetable, for example, Gantt chart to allocate a duration on each single task that need to perform.

In planning stage, design the flow of system is the first one that developer need to figure it out. Developers have to work hard on studying or observe existing system in order to find out the whole system flow and some business process.

Every single task in the project might be determined the success or failure of the system. In fact, if the allocation time does not plan properly then the whole system development might lead to failure.

Next, the task is to always ask clearly users about the requirements, company business process, and common user behavior. It is important procedure because it can increase user acceptance on the proposed system.

### **Phase 2: Analysis**

During analysis stage we will need studying requirements in detail, a complete requirement will arrange accordingly and complete.

In order to make the whole system picture more clear, a few work flow diagrams will be developed. By utilizing these diagrams, developers have more clearer diagram for the system. From now on, developer should analyze the system solution, problem and process deeper in order to see the overall system flow whether logic or not.



### **Phase 3: Design**

The business flow of the proposed system, system design, database structure will be under this phase. Developers will design the system interface and present it to the user. User will give comments on the designed interface in order to reach user satisfaction.

Developers will try to convey user requirement into a system design in order to verify and clarify the requirement that stated by user. The first prototype will let user to feels on it so that they can make changes on it. Users might need to change and developers will mark down and modify the prototype again.

After the interface is done then will proceed to design database structure. All the table must organize nicely in third normalize form and sorted out.

### **Phase 4: Implementation**

#### Proposed system will be implement in Visual Studio 2010

The proposed system will be develop by C# programming so it need Visual Studio to code on it. In addition, Visual Studio also provides GUI tools to make the system UI more useful and attractive.

#### Proposed system will be implement in Microsoft SQL Server

The database tools for the proposed system will be Microsoft SQL server which embedded inside Visual Studio (Microsoft, n.d.).

#### System Testing

All stage of testing will be carrying out after the developers have done few functionalities. To avoid bugs occur together, developers have to test the system from time to time in order solve the bugs early rather than a huge bugs in the latest stage.

## 3.2 Technology Involved

### 3.2.1 Programming Language



Figure 3.2: C# Logo.

C# programming is one of the object-oriented programming and it look like Java .(TechTarget, 2007). C# is one of the language that design to work under Microsoft's .Net stage. Microsoft's target is to encourage the exchange of data and service over the Web, and to empower programmer to create exceedingly convenient applications Since developers can expand on existing code, instead of more than once copying it, C# is relied upon to make it speedier and less costly to get new product items and services to market(ChiaFong, 2006).

#### **Advantages:**

- ✓ Microsoft C# previously using Windows Form and later on WPF, C# is suitable for Rapid Application Development (RAD).
- ✓ C# is more secure to compile. Since C# system or program is running into a transitional language, the OS can simply check it to see that no vindictive code is about.
- ✓ C# joins the old and the new in a practically consummate parity. C# copies a significant part of the compact grammar of C and includes advanced, object-situated elements while holding almost no superfluous things from C(Allain, n.d.).

#### **Disadvantages:**

- ✓ C# has a slow speed to compile a program compare to others. This is to some degree dealt with when utilizing WPF application, albeit right now the starting of WPF application is still somewhat moderate. In any

case, after the project is dispatched, the animation effects are all extremely smooth.

- ✓ C# very depend to .Net framework and outside the .Net framework function will difficult to include it.

### 3.2.2 Visual Studio 2010 Professionals



Figure 3.3: The logo of Visual Studio 2010 Professionals.

Visual studio 2010 is used to develop the proposed system by using C# programming languages to run on it.

### 3.2.3 Microsoft SQL Server Compact 4.0



Figure 3.4: The logo of Microsoft SQL Server Compact 4.0.

For every system application will need a database to store application data. The proposed system choose Microsoft SQL Server Compact 4.0 as a database tools because it is free, open source and also embedded inside the Visual Studio.

### Implementation Issues and Challenges

The main challenging in this proposed project is to proposed extra features that seems to be useful for Yak Xin Enterprise. The first extra features will be compare supplier

quotation. In many situation different supplier will have their own quality of goods according to their offered price range so here is a challenging part to determine which quotation have a good quality of goods and at the same time low price range. Therefore, I will spend more time on this matter in term of do more research and discuss with some business expert. On the other side, the proposed project are designed uniquely just for Yak Xin Enterprise.

### **3.3 Project Timeline**

The timeline will start to manage the time frame of each project task from planning stage to system testing phase in order to keep track the progress of each task . The Gantt chart which records the estimated time spent for the progress of Project I and Project II can be referred to APPENDIX C-1.

### **3.4 User Requirement**

#### **3.4.1 Functional Requirements**

##### User Maintenance

- Administrator are able to add new user profile with id and passwords
- Users are able to get back their forgotten password by doing password recovery.
- Validation the input field to make sure user has fill up all the information properly.

##### Customer Maintenance

- The proposed system should automatic generates the customer id when user want to add new customer.
- Users are able to make modification on customer profile in term of their personal details.
- User can keep track whole customer profile information.

##### Supplier Maintenance

- The proposed system should automatic generates the supplier id when user want to add new supplier.
- User are able to make modification on supplier profile in term of their company information.

- User can keep track whole supplier profile information.
- The proposed system should able to generate purchase order according to user specific needs or reordering is needed.
- The proposed system should able to compare different supplier quotation in order to choose the best quotation.

#### Stock Maintenance

- The proposed system should automatic generates the product id when user want to add new product.
- User are able to make modification on product profile in term of their quantity, type or color.
- The proposed system should be able to notify user when encounter low stock by prompt out a message.
- The proposed system should allow user to update stock when stock-in and stock-out.

#### Payment Module

- The proposed system should display the payment details after order has been make. Display the payment charge must be included government sale tax of total amount charge
- The proposed system should support 3 payment method which is cash payment, debit/credit card payment and customer credit account.
- The proposed system should able to print out the receipt.

#### Report Module

- The proposed system should able to generate different kind of report for example sales report, best selling product product, customer credit account report, purchasing report and etc.
- The proposed system should allow user to print out the report or save as a PDF format.

### 3.4.2 Non-Functional Requirement

- The user interface should be simply and yet friendly where the font size should be easily accessible.
- The proposed system will run logically when users encounter error. For example, the system does not allow user to enter customer name as numeric number and will not terminate the system immediately when error message is displayed.
- The proposed system should ensure accuracy of the payment calculation.
- The proposed system should ensure the short response time of clicking a particular button and processing time.

### 3.5 System Design/Overview

#### 3.5.1 Use Case Diagram

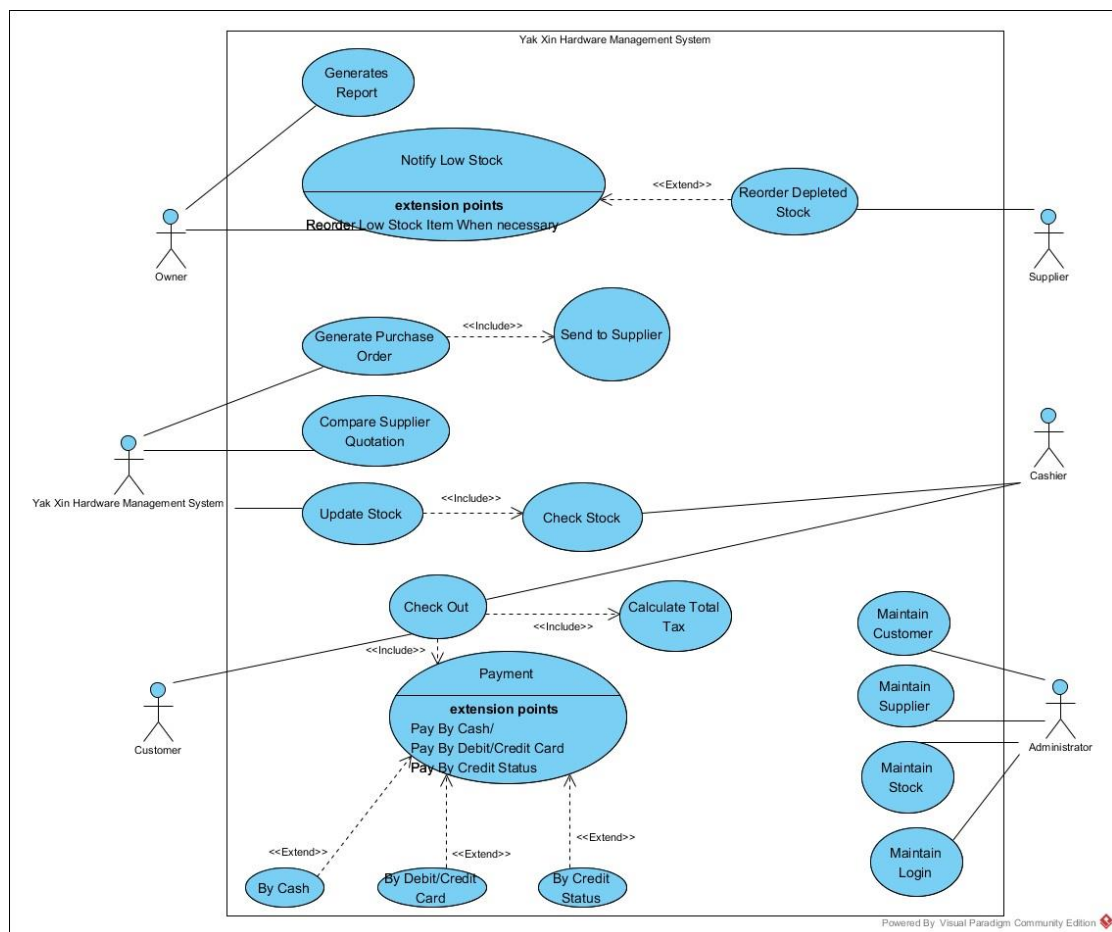


Figure 3.5: Yak Xin Fisheries Hardware Management System Overview Use Case Diagram

### 3.5.2 Activity Diagram

#### 3.5.2.1 Check Stock

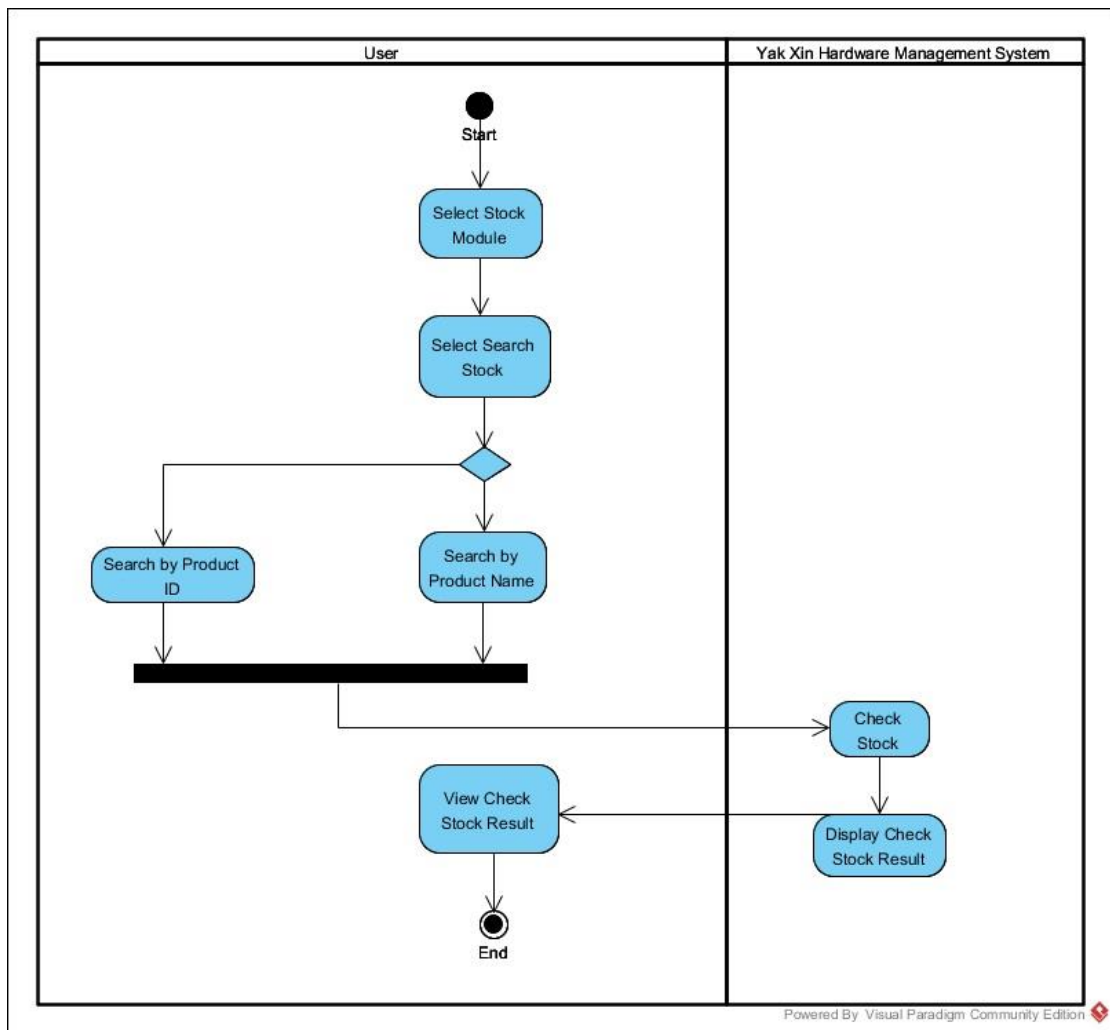


Figure 3.6: Check Stock Activity Diagram

### 3.5.2.2 Compare Supplier Quotation

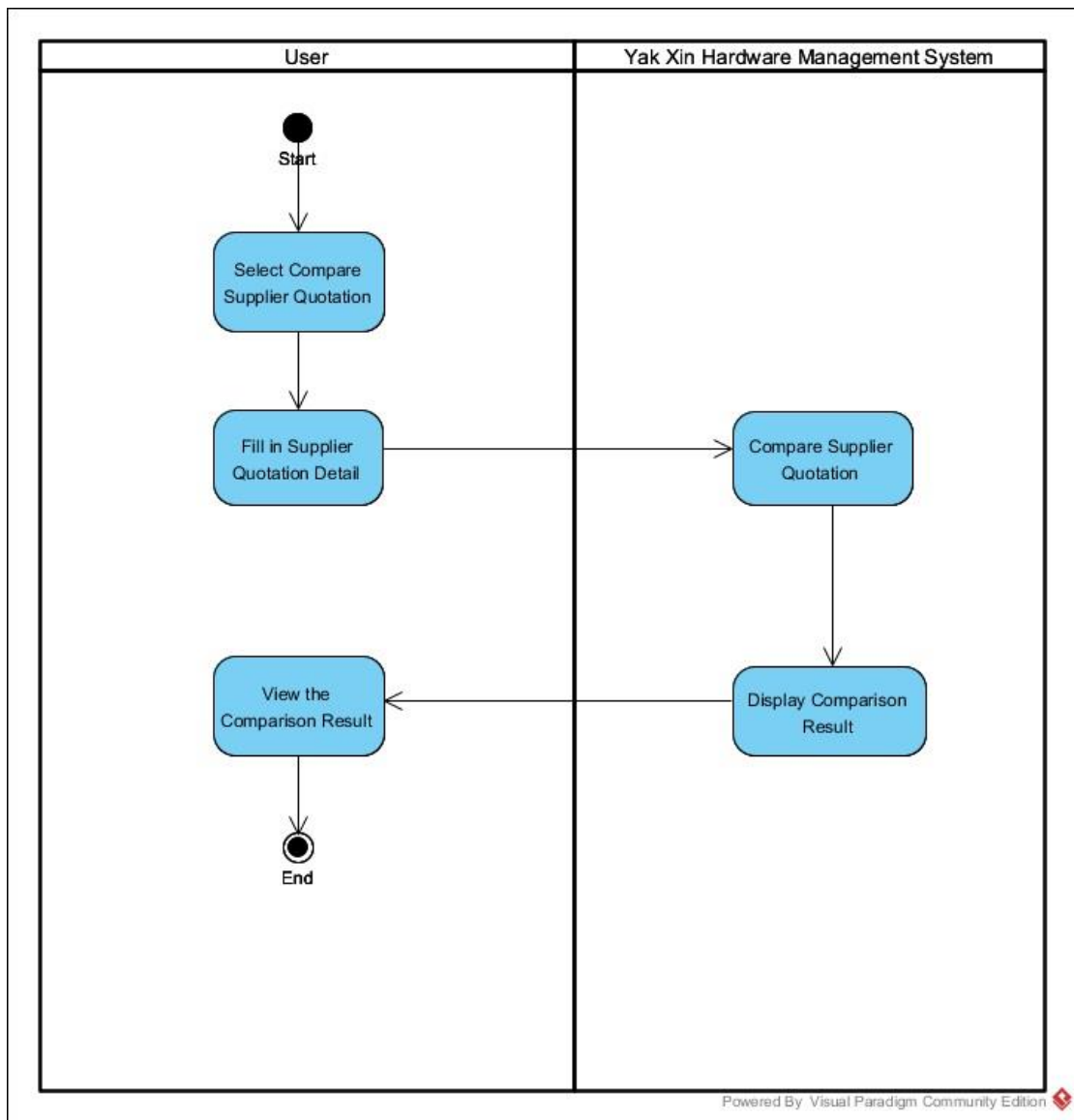


Figure 3.7: Compare Supplier Quotation Activity Diagram



### 3.5.2.3 Generates Purchase Order

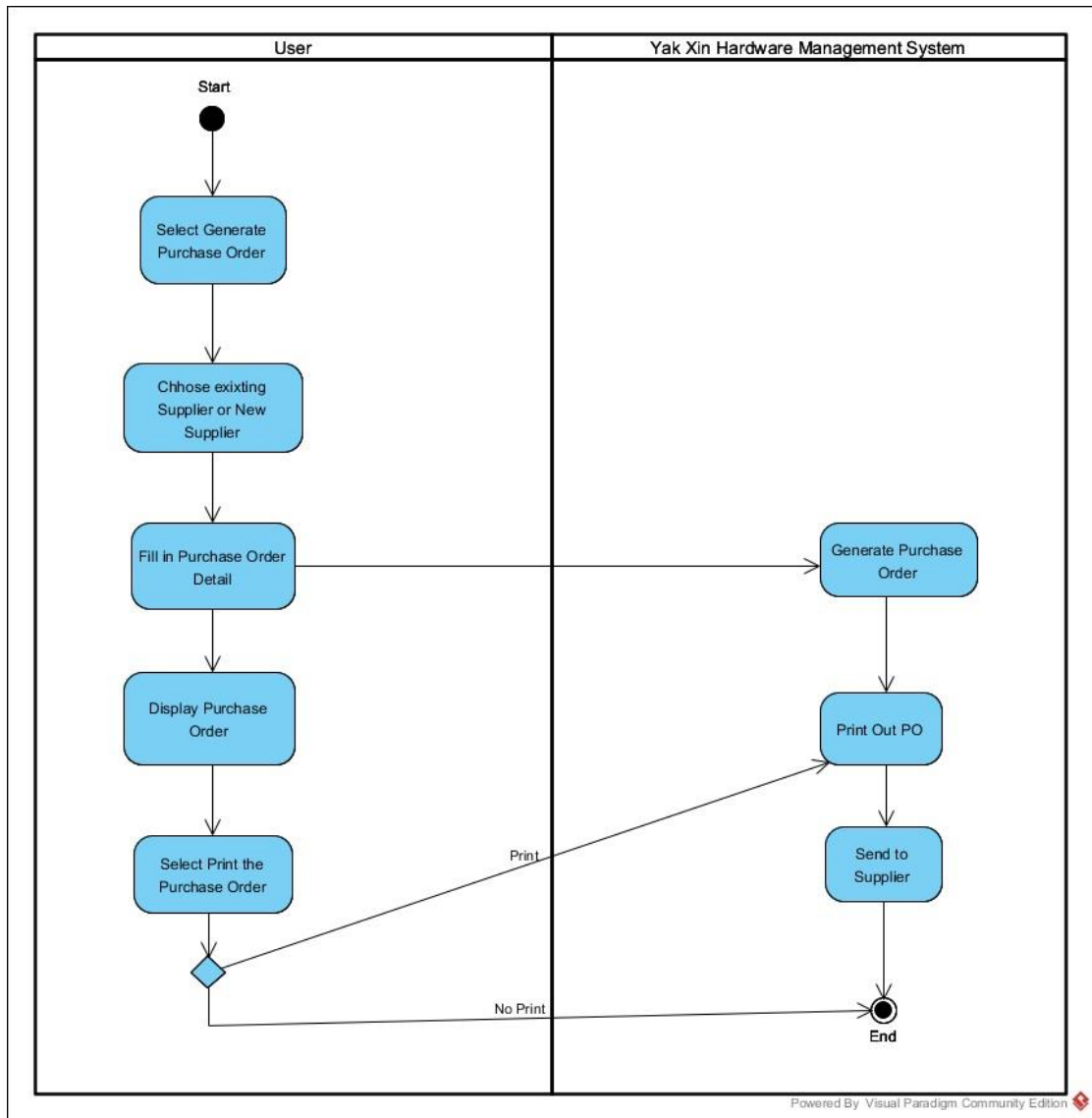


Figure 3.8: Generate Purchase Order Activity Diagram

### 3.5.2.4 Generate Report

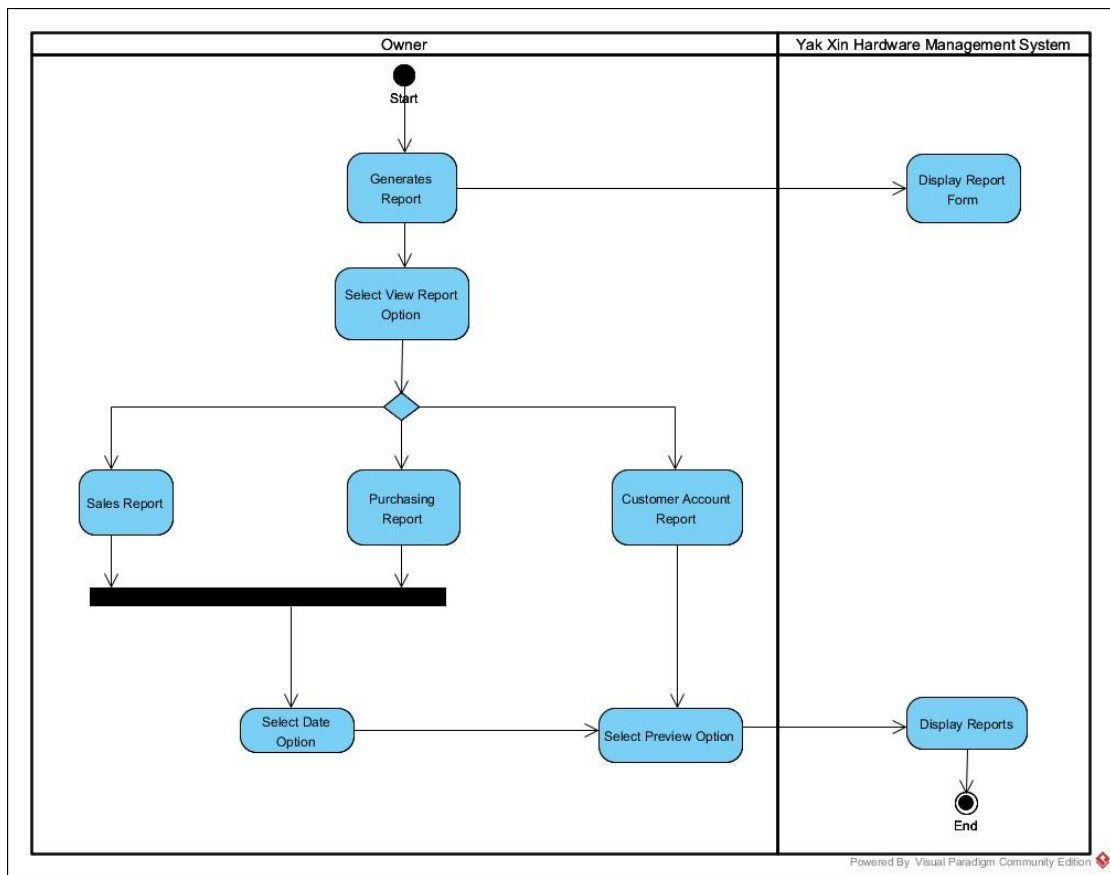


Figure 3.9: Generate Report Activity Diagram

### 3.5.2.5 Maintain Customer (Add New Customer)

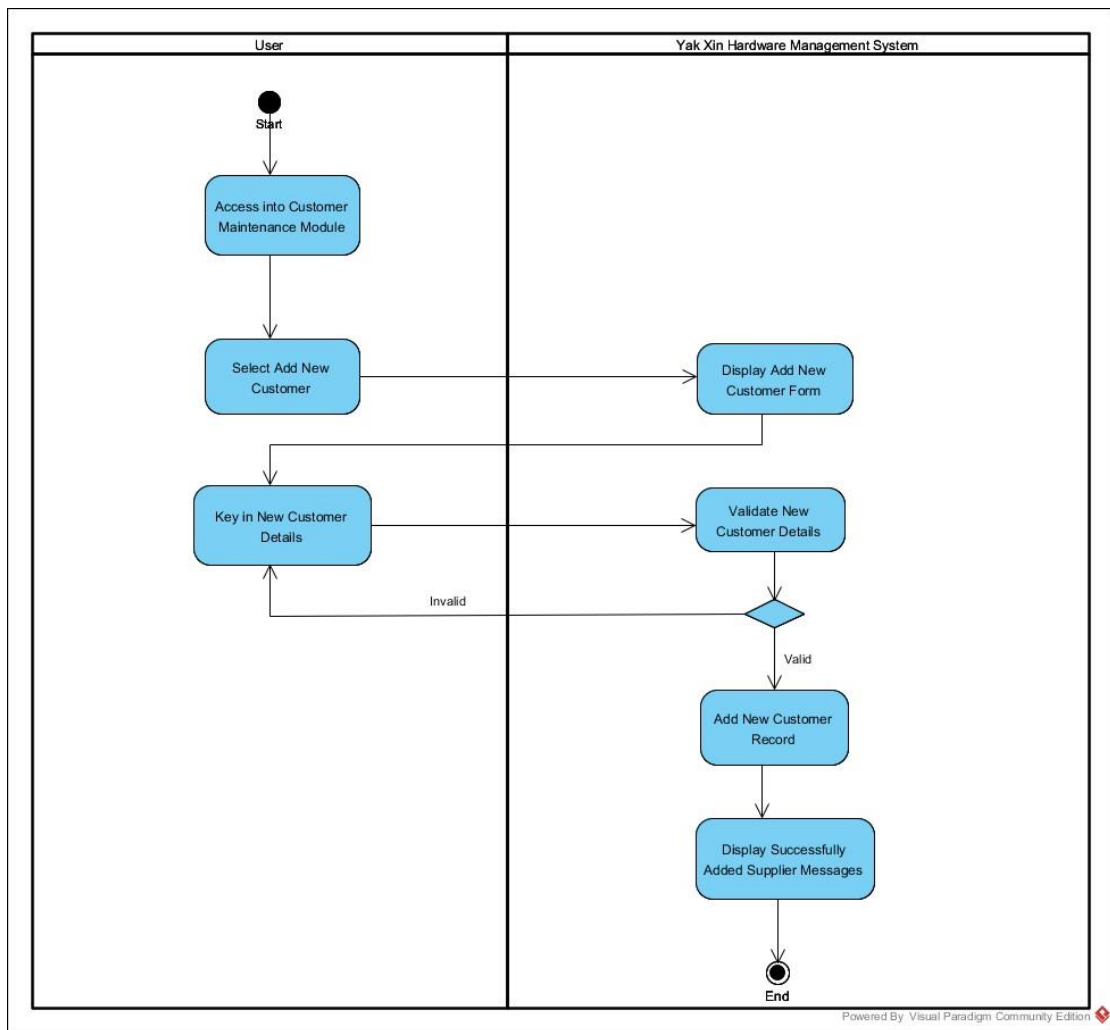


Figure 3.10: Maintain Customer For Add New Customer Activity Diagram

### 3.5.2.6 Maintain Customer (Update/View)

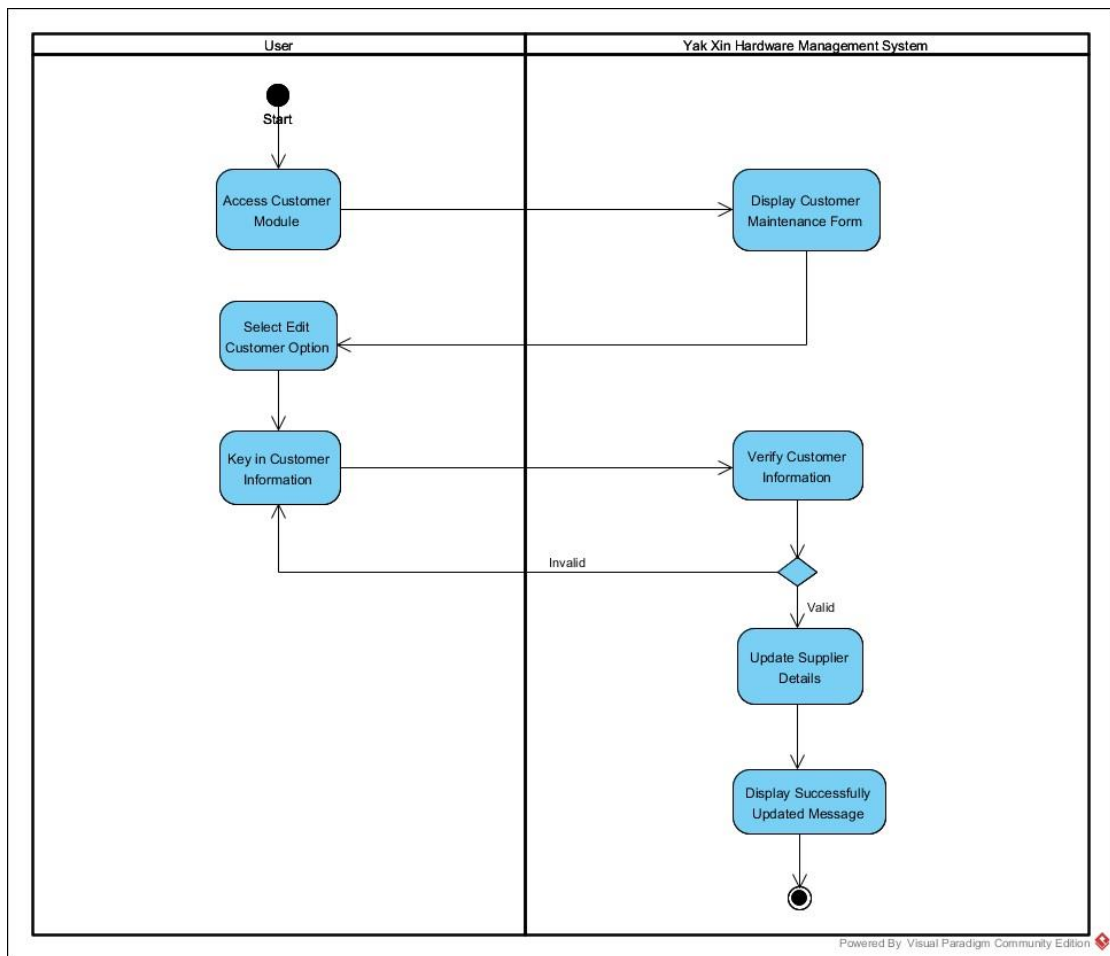


Figure3.11 : Maintain Customer For Update Customer Activity Diagram

### 3.5.2.7 Maintain Login (Add New User)

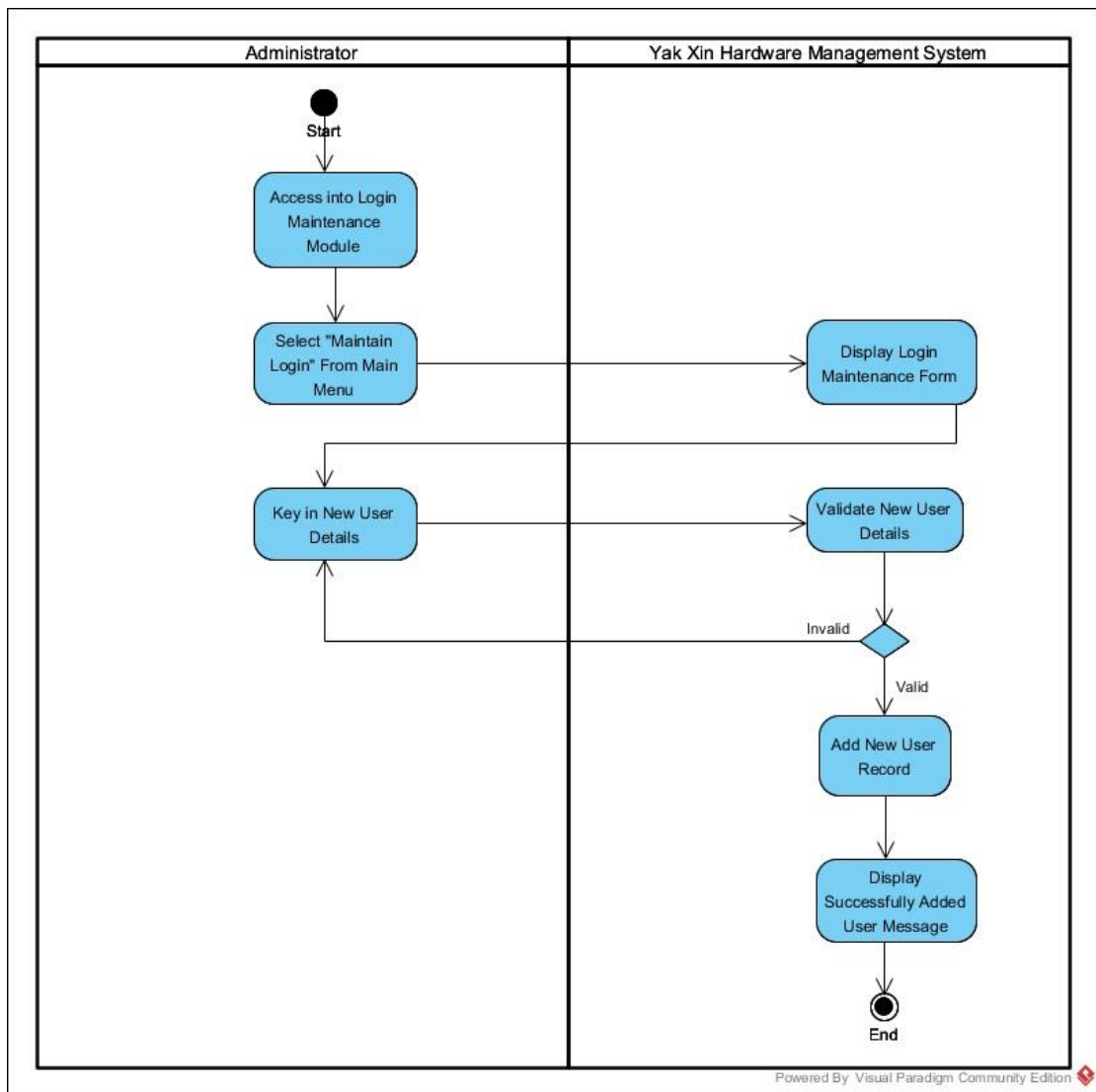


Figure3.12 : Maintain Login For Add New User Activity Diagram

### 3.5.2.8 Maintain Login (Update/View)

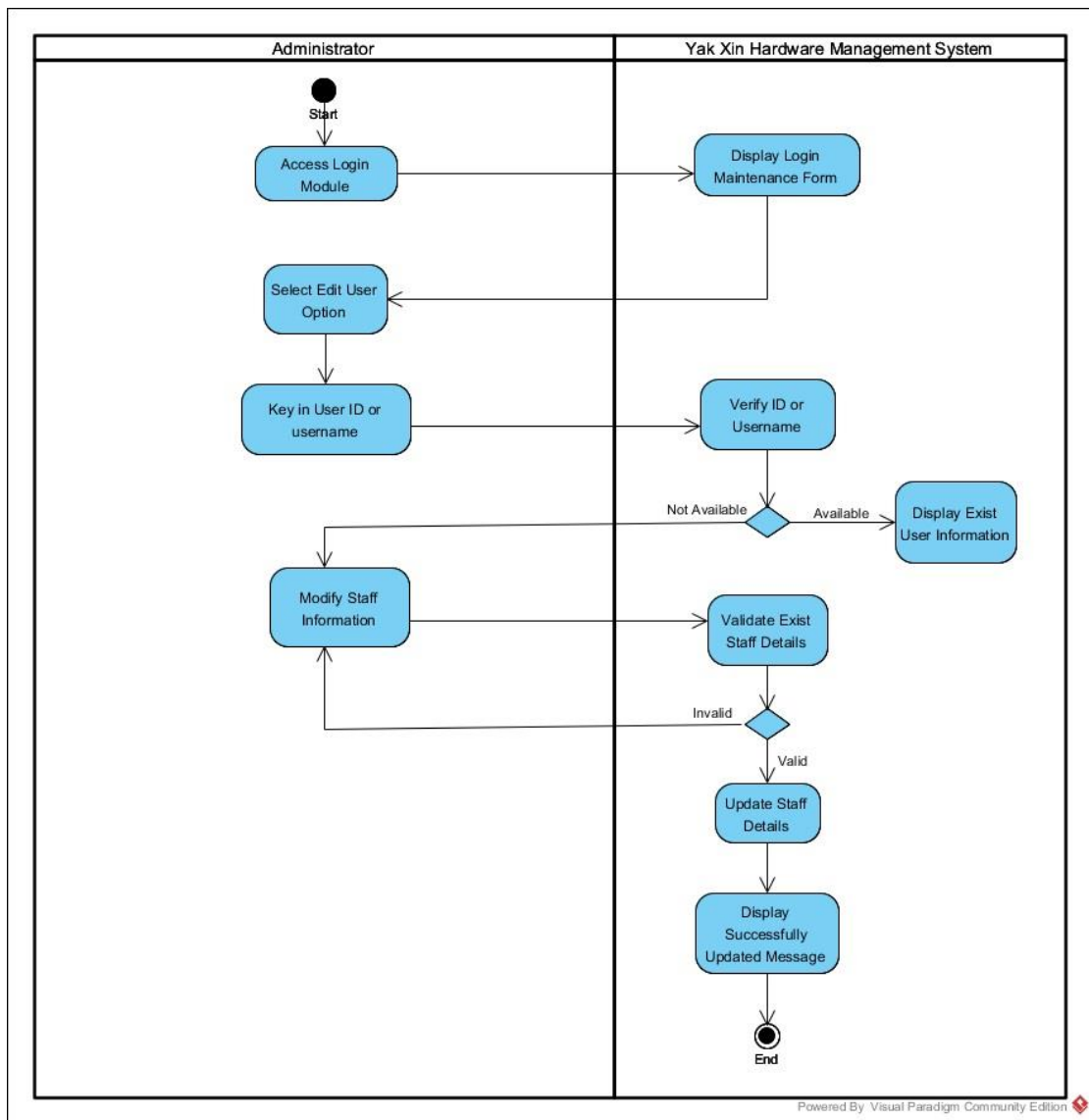


Figure 3.13: Maintain Login For Update Activity Diagram

### 3.5.2.9 Maintain Stock (Add New Stock)

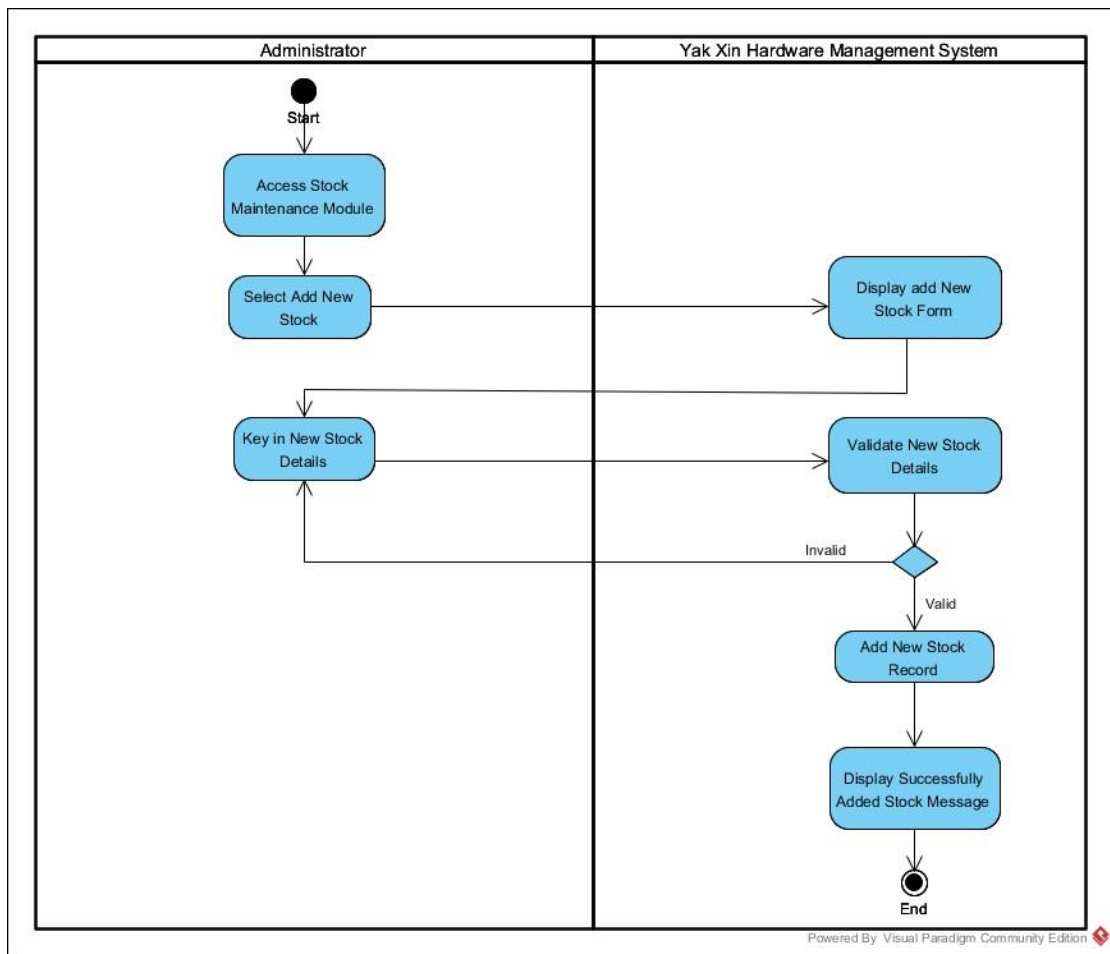


Figure 3.14: Maintain Stock For Add New Stock Activity Diagram

### 3.5.2.10 Maintain Stock (Update/View)

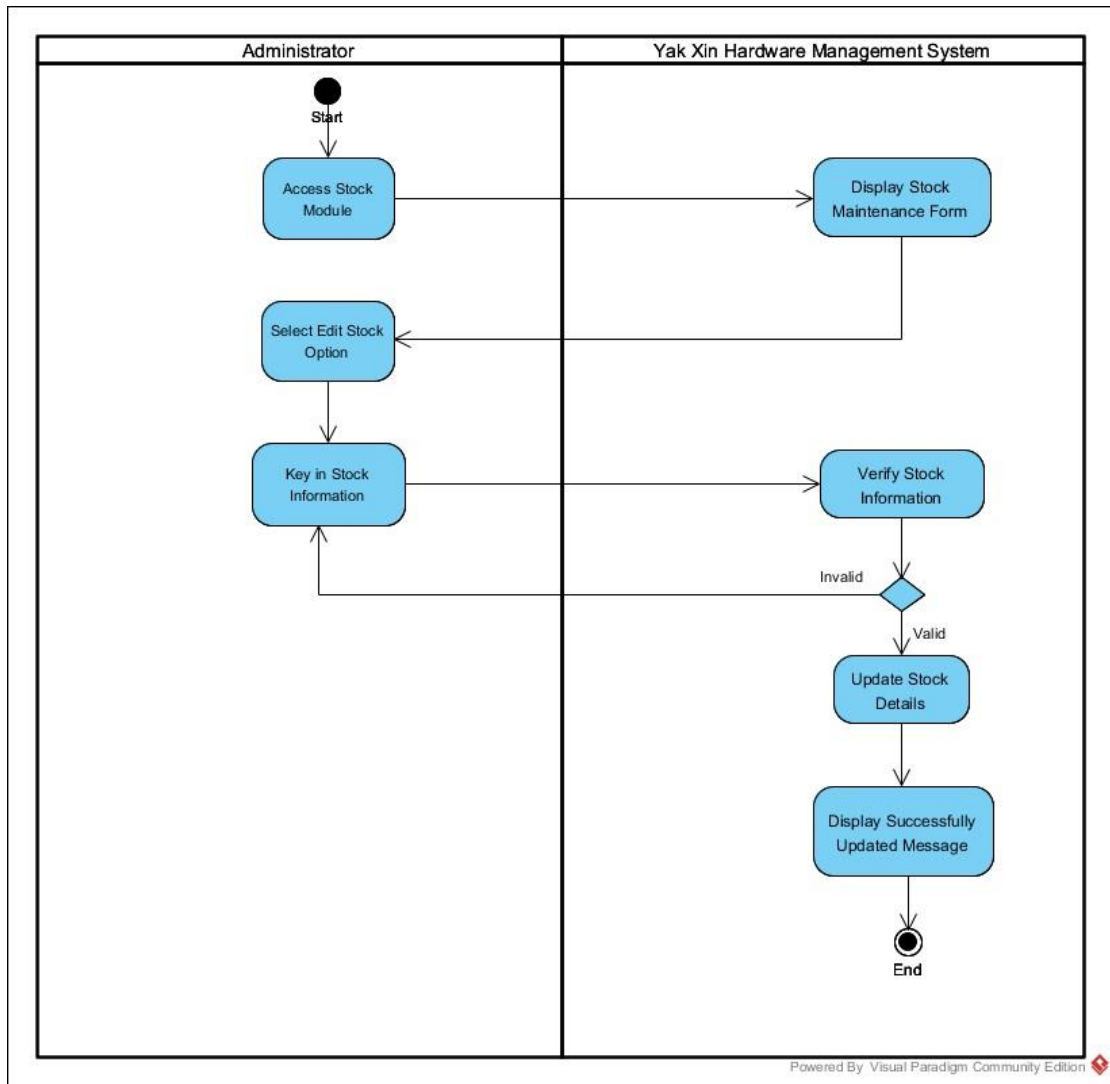


Figure 3.15: Maintain Stock for Update Activity Diagram



### 3.5.2.11 Maintain Supplier (Add New Supplier)

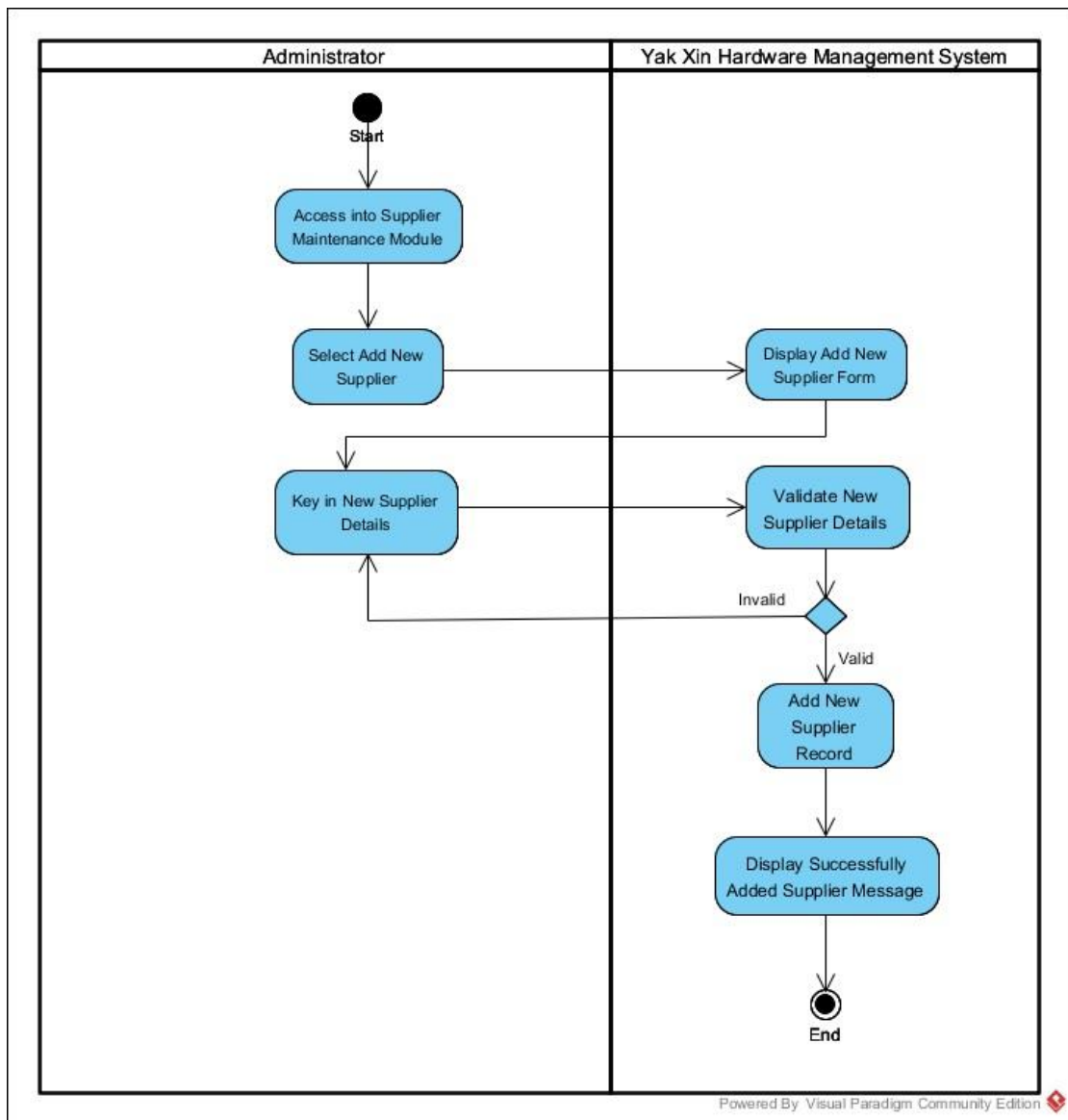


Figure 3.16: Maintain Supplier For Add New Supplier Activity Diagram

### 3.5.2.12 Maintain Supplier (Update/View)

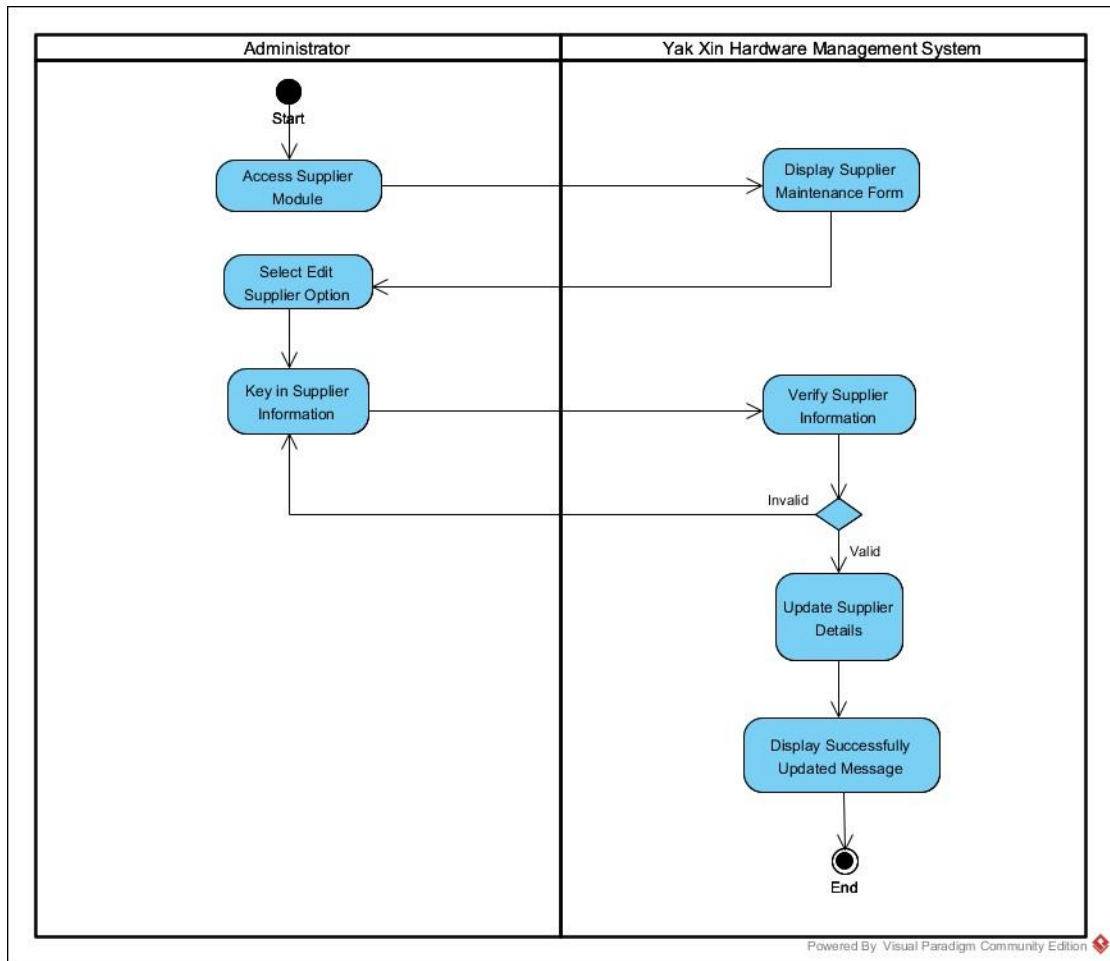


Figure 3.17: Maintain Supplier For Update Activity Diagram

## 3.5.2.13 Notify Low Stock

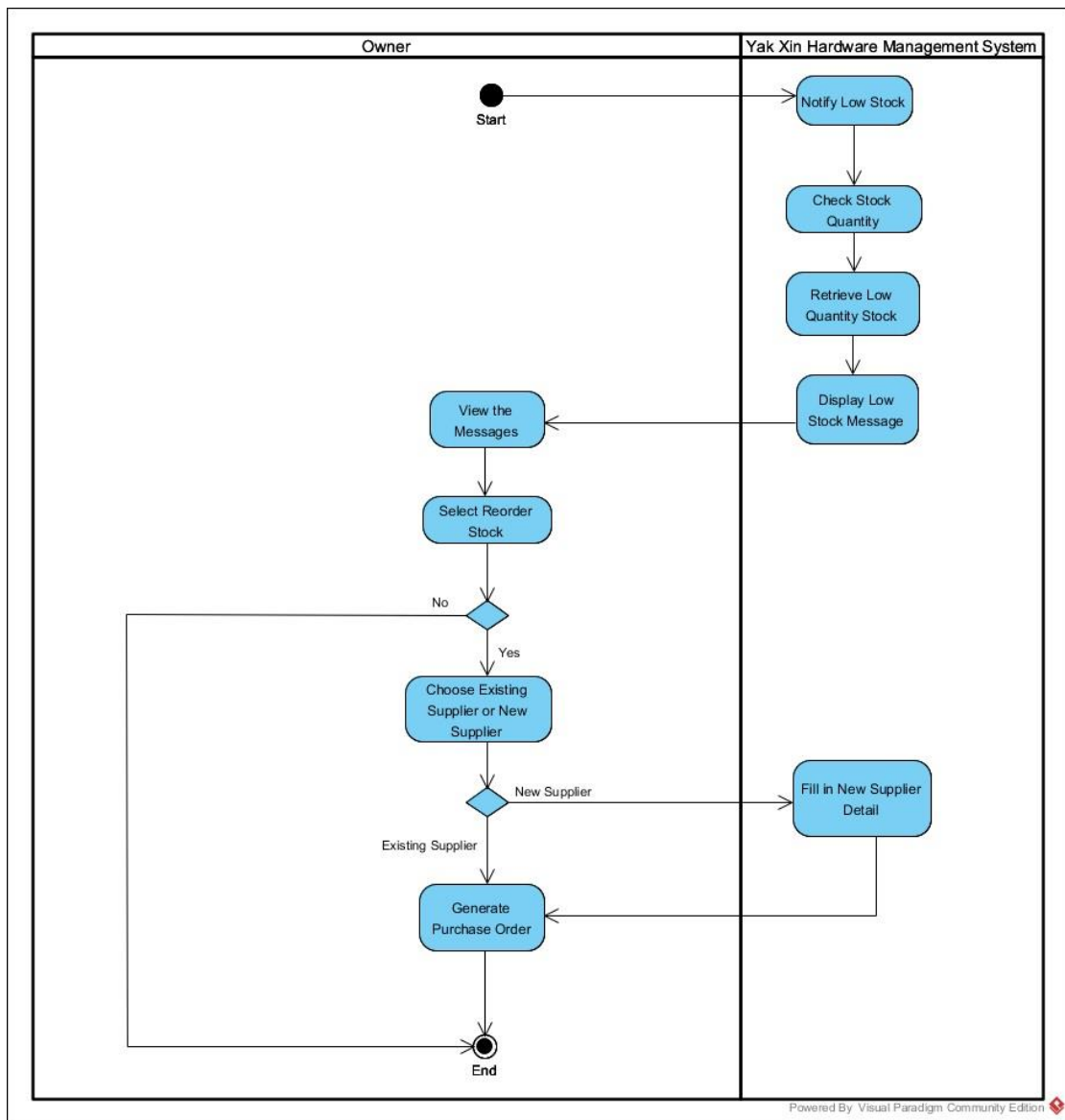


Figure 3.18: Notify Low Stock Activity Diagram

### 3.5.2.14 Payment (Customer Credit)

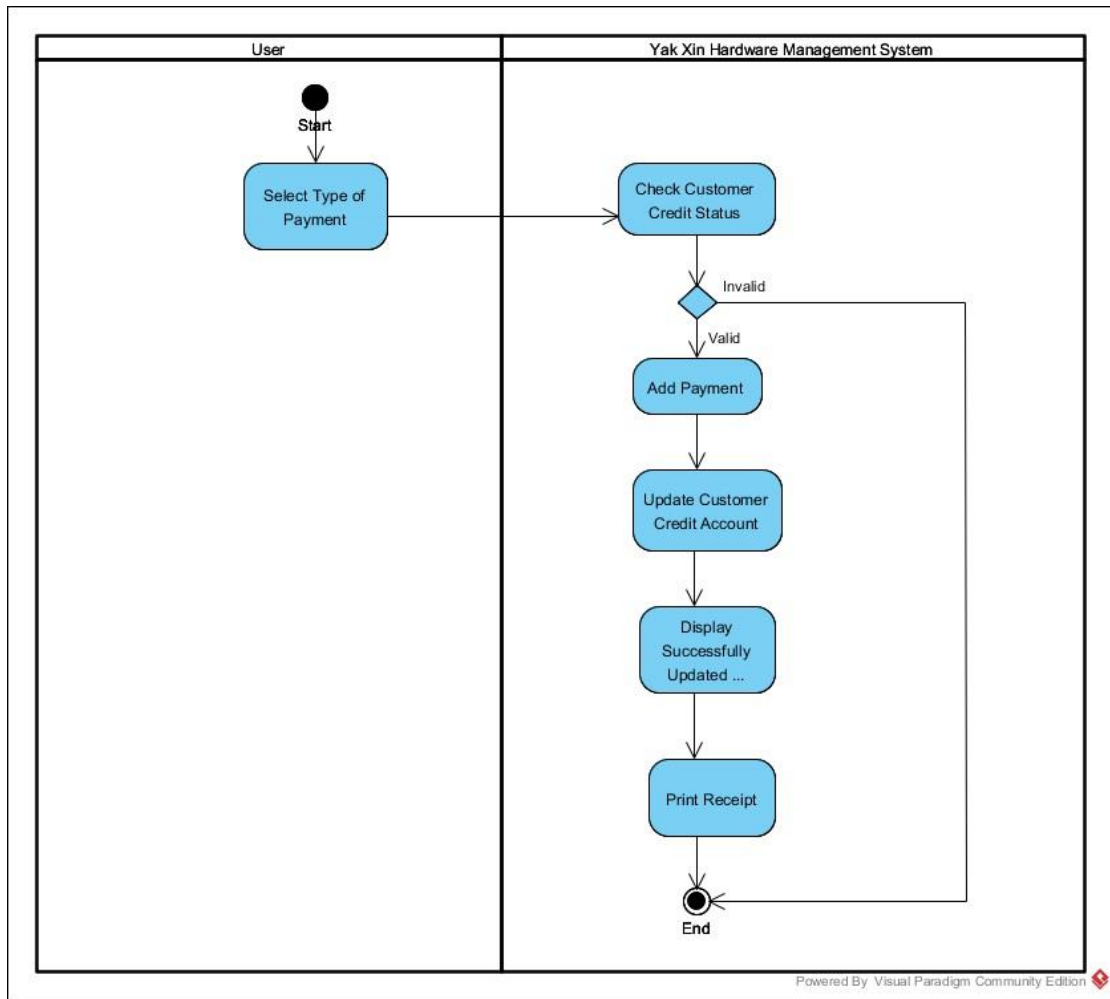


Figure 3.19: Customer Credit Payment Activity Diagram Activity Diagram

## 3.5.2.15 Payment

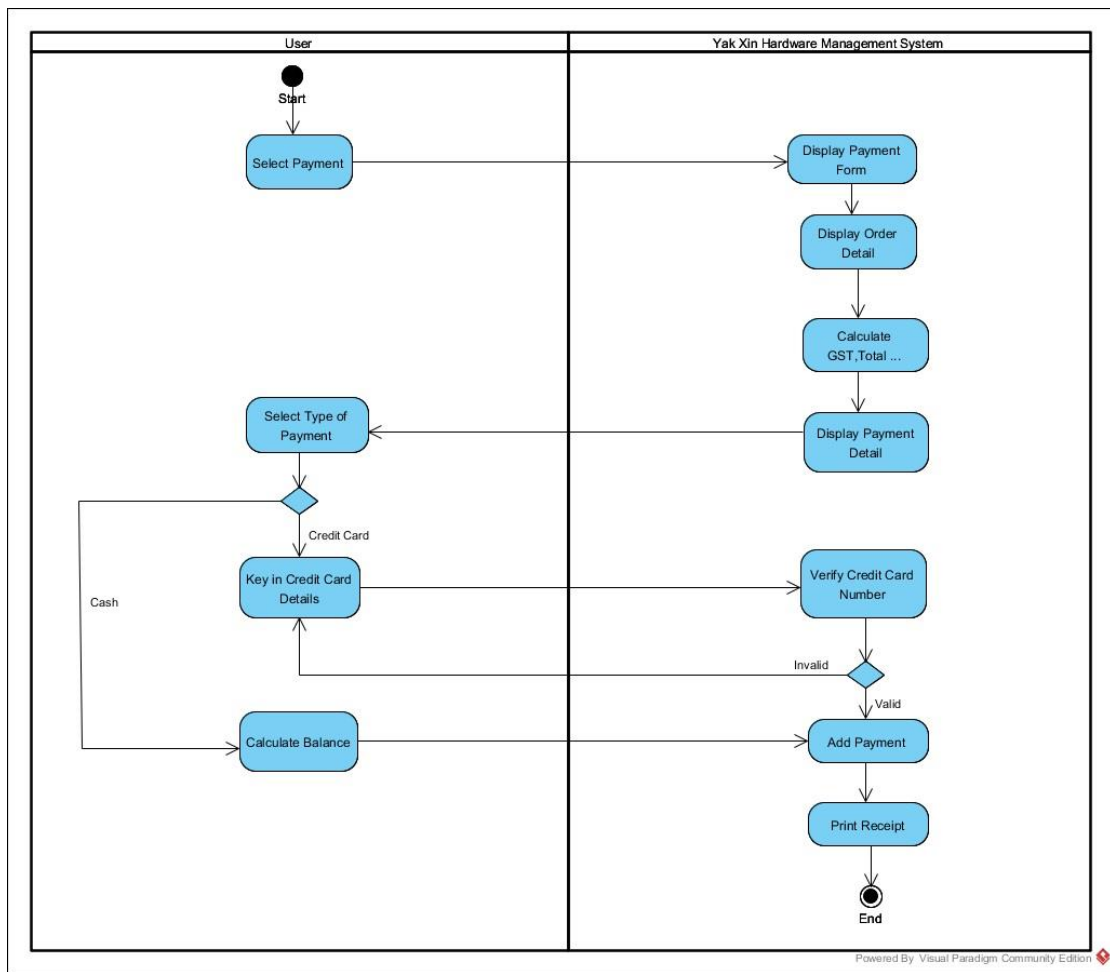


Figure 3.20: Customer Payment Activity Diagram

### 3.5.2.16 Update Stock

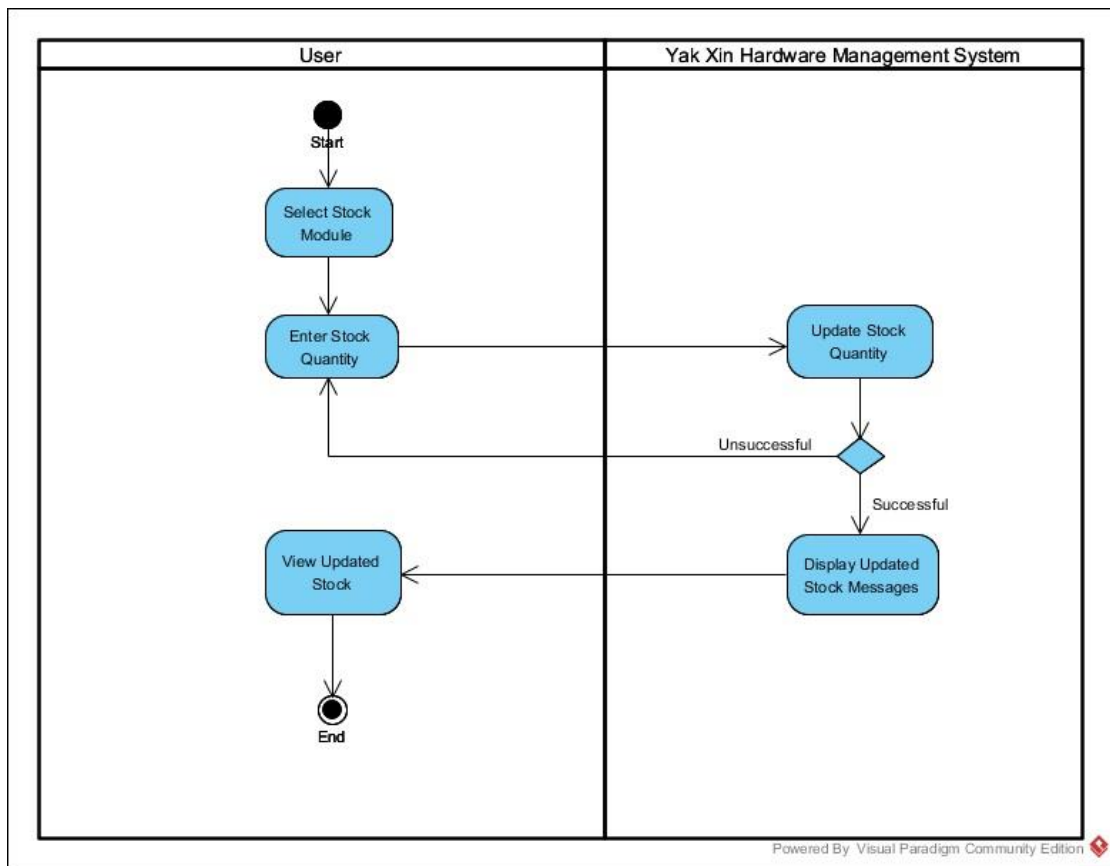


Figure 3.21: Update Stock Activity Diagram

### 3.5.3 Sequence Diagram

#### 3.5.3.1 Compare Supplier Quotation

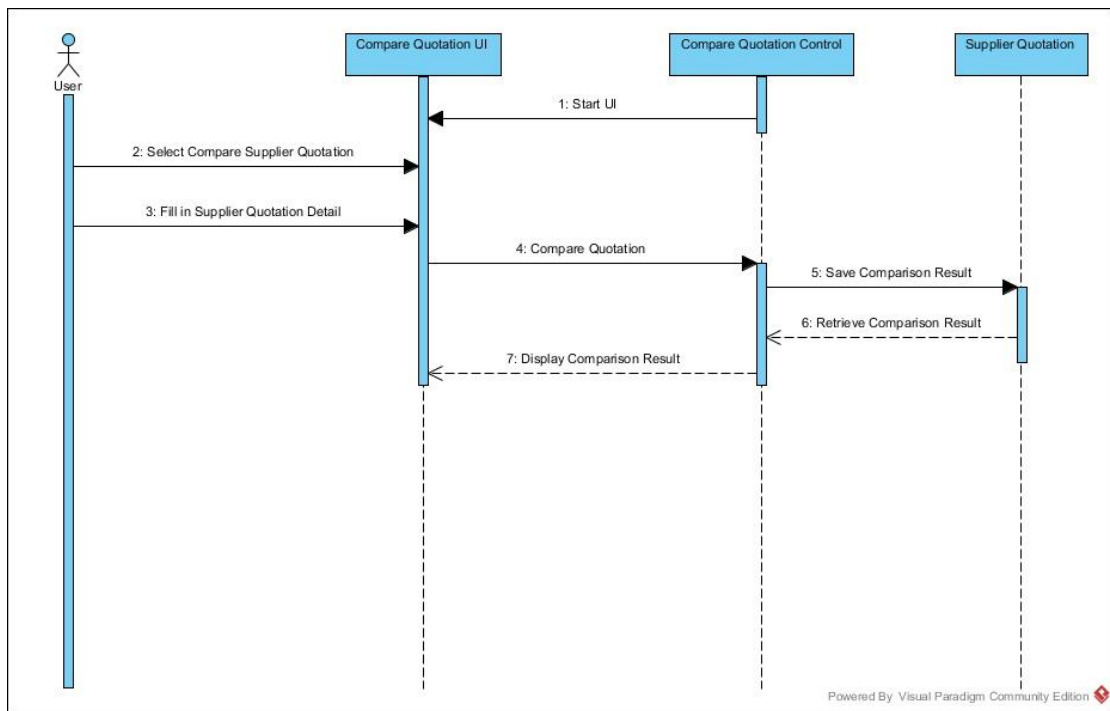


Figure 3.22: Compare Supplier Quotation Sequence Diagram

#### 3.5.3.2 Maintain Customer (Add New Customer)

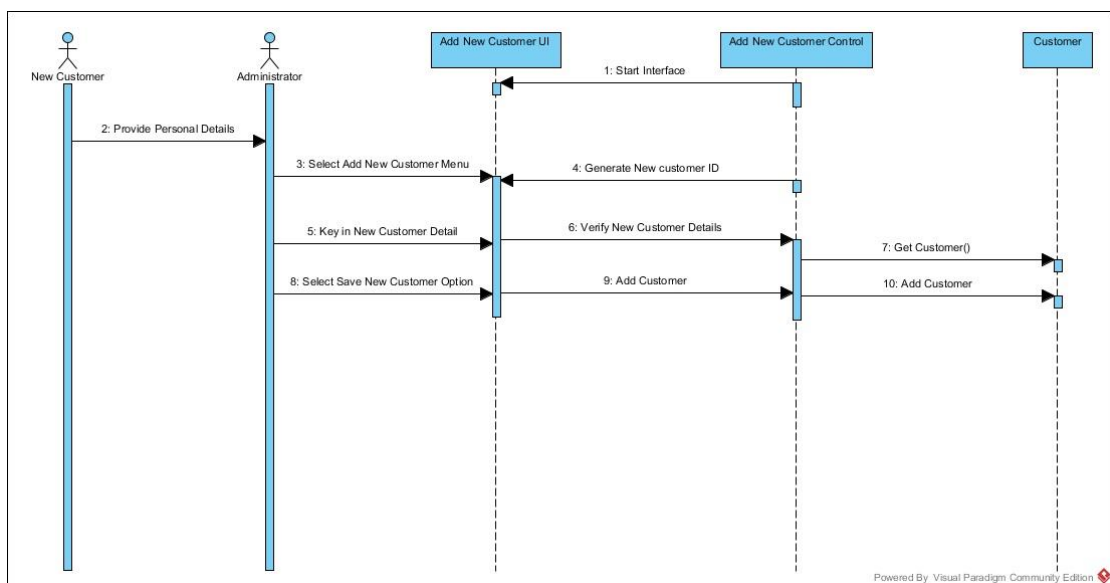


Figure 3.23: Maintain Customer For Add New Customer Sequence Diagram

### 3.5.3.3 Maintain Customer (Update/View)

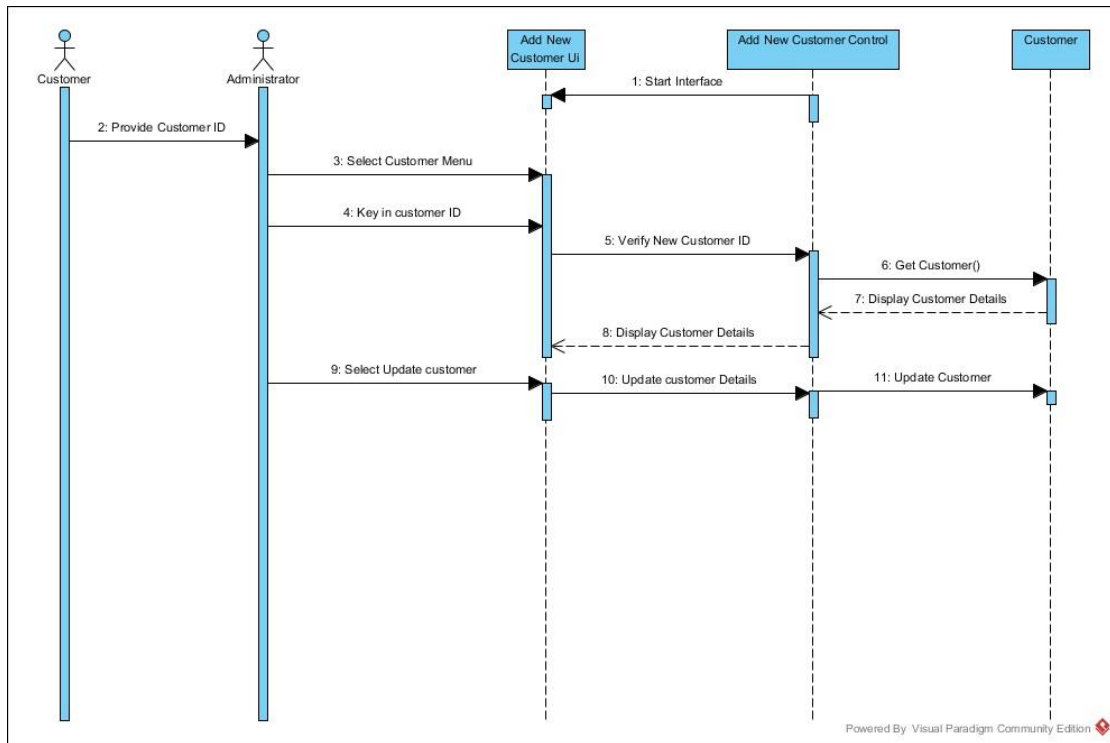


Figure 3.24: Maintain Customer For Update Sequence Diagram

### 3.5.3.4 Notify Low Stock

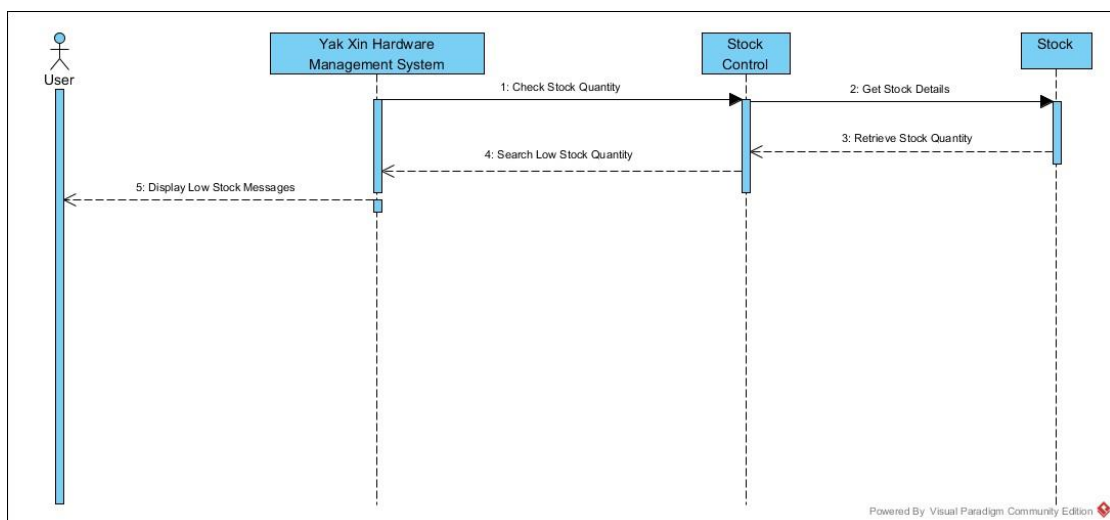


Figure 3.25: Notify Low Stock Sequence Diagram



### 3.5.3.5 Payment

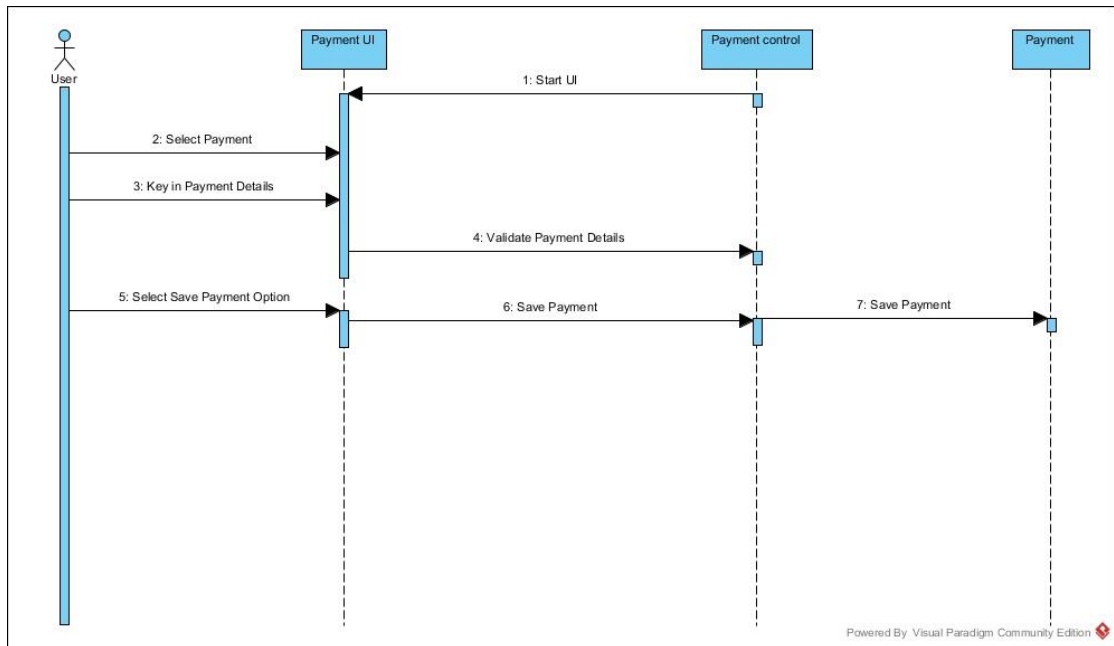


Figure 3.26: Customer Payment Sequence Diagram

### 3.5.3.6 Generates Report

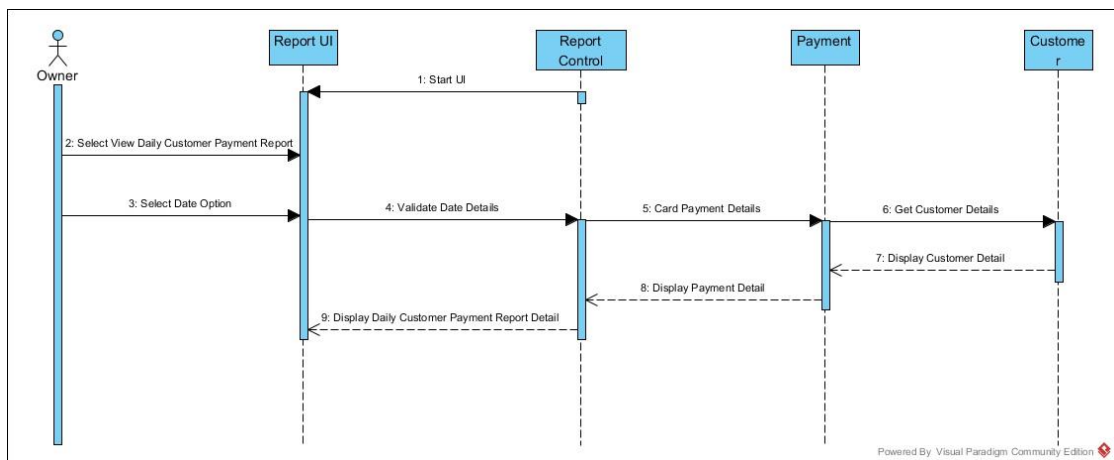


Figure 3.27: Generate Report Sequence Diagram

### 3.5.4 Class Diagram

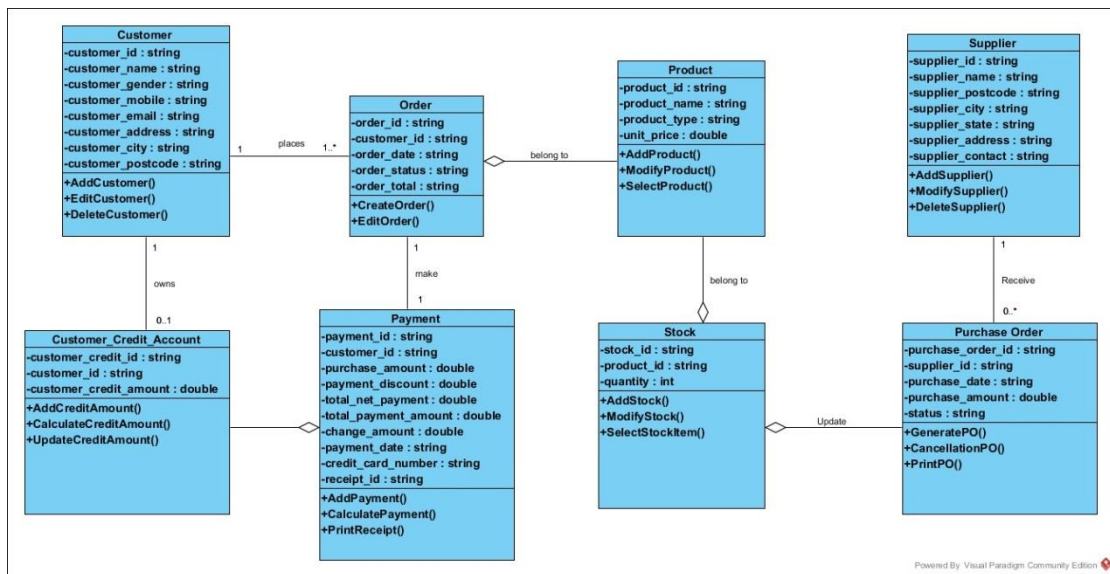


Figure 3.28: Yak Xin Fisheries Hardware Management System Overview Class Diagram

### 3.5.5 Database Design

#### 3.5.5.1 Entity-Relationship Diagram (ERD)

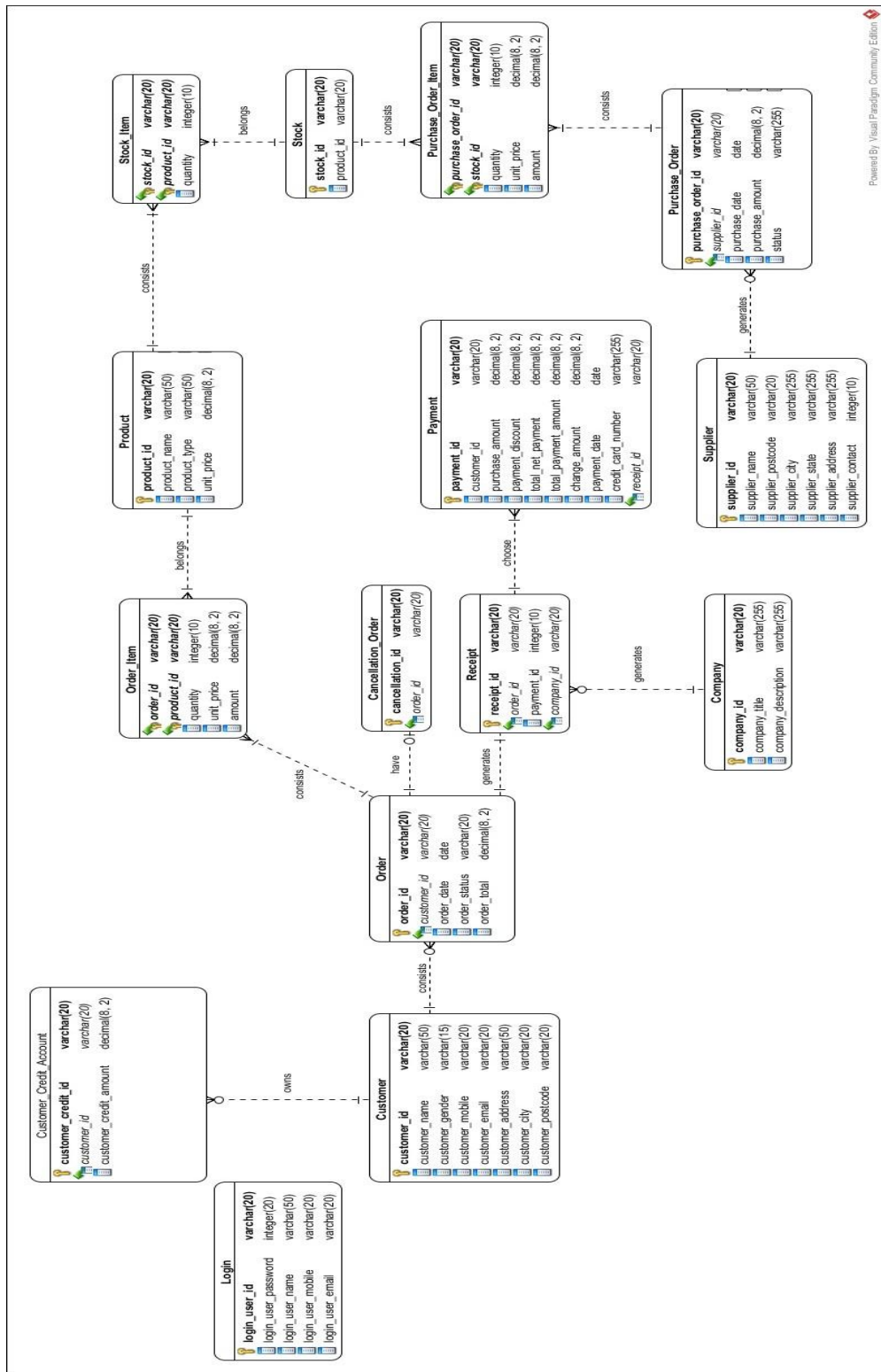


Figure 3.29: Yak Xin Fisheries Hardware Management System Overview ERD

### 3.5.5.2 Database Design Languages(DBDL)

Product(product\_id, product\_name, product\_type, unit\_price)

Stock(stock\_id, product\_id\*)

Stock\_Item(stock\_id \*, product\_id \*, quantity)

Customer(customer\_id, customer\_name, customer\_gender, customer\_mobile,  
customer\_email, customer\_address, customer\_city, customer\_postcode)

Order(order\_id, customer\_id \*, order\_date, order\_status, order\_total)

Order\_Item(order\_id\*, product\_id\*, quantity, unit\_price, amount)

Cancellation\_Order(cancellation\_id, order\_id\*)

Supplier(supplier\_id, supplier\_name, supplier\_postcode, supplier\_city, supplier\_state,  
supplier\_address,supplier\_contact)

Purchase\_Order(purchase\_order\_id, supplier\_id \*, purchase\_date,  
purchase\_amount,status)

PurchaseOrderItem(purchase\_order\_id \*, stock\_id\*, quantity, unit\_price, amount)

Payment(payment\_id, customer\_id\*, purchase\_amount, payment\_discount,  
total\_netPayment, total\_payment\_amount, change\_amount, payment\_date,  
credit\_card\_number)

Receipt(receipt\_id, order\_id\*, payment\_id\*, company\_id\*)

Login(login\_user\_id, login\_user\_password, login\_user\_name, login\_user\_mobile,  
login\_user\_email)

Customer\_Credit\_Account(customer\_credit\_id, customer\_id,  
customer\_credit\_amount)

Company(company\_id, company\_title, company\_description)

### 3.5.5.3 Data Dictionary

#### 3.5.5.3.1 Customer Table

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Customer	customer_id	Customer ID	Required	A-9	XXXXXXXX	CUS20001	varchar(20)	Consist of alphabets and digit
Customer	customer_name	Name	Required	A-Z	XXX XXXX	Rex Wong	varchar(50)	Must be alphabets
Customer	customer_gender	Gender	Required	A-Z	XXXX	Male	varchar(15)	Must be alphabets
Customer	customer_postcode	Postcode	Required	0-9	XXXXX	39100	varchar(20)	Must be exactly 5 digit
Customer	customer_city	City	Required	A-Z	XXXX	Ipoh	varchar(20)	Must be alphabets
Customer	customer_address	Address	Required	A-9	XXXXXXXX	D46, Jalan 1	varchar(50)	Consist of alphabets and digit
Customer	customer_mobile	Contact Number	Optional	0-9	XXX - XXXXXXX	010-9999999	varchar(20)	Must be exactly 10 digit
Customer	customer_email	Email	Optional	A-Z	XXXXXXXX	soon@ hotmail.com	varchar(20)	Must be alphabets

Table 3.1: Customer table attributes and description.

**3.5.5.3.2 Product Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Product	product_id	Product ID	Required	0-9	XXXXXX	100001	varchar(20)	Must be exactly 6 digit
Product	product_name	Product Name	Required	A-Z	XXXXXX XXXXXX	Fishing Rod	varchar(50)	Must be alphabets
Product	product_type	Product Type	Required	A-Z	XXXXXXXX XX	Fishing	varchar(50)	Must be alphabets
Product	unit_price	Unit Price	Required	0-9	XXX.XX	269.99	Decimal(8,2)	All decimal number

Table 3.2: Product table attributes and description.

**3.5.5.3 Supplier Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Supplier	supplier_id	SupplierID	Required	A-9	XXXXXXXX	SUP70001	varchar(20)	Consist of alphabets and digit
Supplier	supplier_name	SupplierName	Required	A-Z	XXXX .XXX.XXX	Fisher SDN.BHD.	varchar(50)	Must be alphabets
Supplier	supplier_postcode	Postcode	Required	0-9	XXXXX	39100	varchar(20)	Must be exactly 5 digit
Supplier	supplier_city	City	Required	A-Z	XXXX	Ipoh	varchar(20)	Must be alphabets
Supplier	supplier_state	State	Required	A-Z	XXXXX	Perak	varchar(20)	Must be alphabets
Supplier	supplier_address	Address	Required	A-Z	XXXXXX XXXXXX	18, Station Fire	varchar(20)	Must be alphabets
Supplier	supplier_contact	Contact Number	Required	0-9	XXX-XXXXXXXX	012-9999999	varchar(20)	Must be exactly 10 digit

Table 3.3: Supplier table attributes and description.

**3.5.5.3.4 Order Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Order	order_id	Order ID	Required	A-9	XXXXXXXX	SO30001	varchar(20)	Consist of alphabets and digit
Order	customer_id	Customer ID	Required	A-9	XXXXXXXXXX	CUS20001	varchar(20)	Consist of alphabets and digit
Order	order_date	Date	Required	0-9	XX/XX/XXXX	11/14/2013	Date	Must be date format
Order	order_total	Total Amount	Required	0-9	XXXX.XX	213.99	Decimal(8,2)	All decimal number
Order	order_status	Status	Required	A-Z	XXXXXX	Cancel	varchar(20)	Must be alphabets

Table 3.4: Order table attributes and description.



**3.5.5.3.5 Order Item Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Order_Item	order_id	Order ID	Required	A-9	XXXXXXXX	SO30001	varchar(20)	Consist of alphabets and digit
Order_Item	product_id	Product ID	Required	0-9	XXXXXX	100001	varchar(20)	Must be exactly 6 digit
Order_Item	quantity	Quantity	Required	0-9	XX	13	Integer	Must be digit
Order_Item	unit_price	Unit Price	Required	0-9	XXX.XX	111.99	Decimal(8,2)	All decimal number
Order_Item	amount	Amount	Required	0-9	XXX.XX	111.99	Decimal(8,2)	All decimal number

Table 3.5: Order Item table attributes and description.

**3.5.5.3.6 Stock Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Stock	stock_id	Stock ID	Required	A-9	XXXXXX XXXXXX	Rod10001WH	varchar(20)	Consist of alphabets and digit
Stock	product_id	Product ID	Required	0-9	XXXXXX	100001	varchar(20)	Must be exactly 6 digit

Table 3.6: Stock table attributes and description.

**3.5.5.3.7 Stock Item Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Stock_Item	stock_id	Stock ID	Required	A-9	XXXXXX XXXXXX	Rod10001WH	varchar(20)	Consist of alphabets and digit
Stock_Item	product_id	Product ID	Required	0-9	XXXXXX	100001	varchar(20)	Must be exactly 6 digit
Stock_Item	quantity	Quantity	Required	0-9	XX	99	Integer(10)	Must be digit

Table 3.7: Stock Item table attributes and description.

**3.5.5.3.8 Receipt Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Receipt	receipt_id	Receipt ID	Required	A-9	XXXXXX	R00001	varchar(20)	Consist of alphabets and digit
Receipt	order_id	OrderID	Required	A-9	XXXXXXXX	SO30001	varchar(20)	Consist of alphabets and digit
Receipt	payment_id	PaymentID	Required	A-9	XXXXXX	P00001	varchar(20)	Consist of alphabets and digit
Receipt	company_id	Company ID	Required	A-9	XXXXXX	COM00001	varchar(20)	Consist of alphabets and digit

Table 3.8: Receipt table attributes and description.

**3.5.5.3.9 Purchase Order Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Purchase Order	purchase_order_id	Purchase Order ID	Required	A-9	XXXXXX XX	PO50001	varchar(20)	Consist of alphabets and digit
Purchase Order	supplier_id	Supplier ID	Required	A-9	XXXXXX XXX	SUP70006	varchar(20)	Consist of alphabets and digit
Purchase Order	purchase_date	Purchase Date	Required	0-9	XX/XX/ XXXX	01/01/2013	Date	Must be date format
Purchase Order	purchase_amount	Purchase Amount	Required	0-9	XXX.XX	333.33	Decimal(8,2)	All decimal number
Purchase Order	status	Status	Required	A-Z	XXXXXXXX	Confirm	varchar(20)	Must be alphabets

Table 3.9: Purchase Order table attributes and description.

**3.5.5.3.10 Purchase Order Item Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Purchase_Order_Item	purchase_order_id	Purchase Order ID	Required	A-9	XXXXXXXX	PO50001	varchar(20)	Consist of alphabets and digit
Purchase_Order_Item	stock_id	Stock ID	Required	A-9	XXXXXX XXXXXX	Rod10001BK	varchar(20)	Consist of alphabets and digit
Purchase_Order_Item	quantity	Quantity	Required	0-9	XX	13	Integer	Must be digit
Purchase_Order_Item	unit_price	Unit Price	Required	0-9	XXX.XX	111.99	Decimal(8,2)	All decimal number
Purchase_Order_Item	amount	Amount	Required	0-9	XXX.XX	111.99	Decimal(8,2)	All decimal number

Table 3.10: Purchase Order Item table attributes and description.

**3.5.5.3.11 Company Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Company	company_id	Company ID	Required	A-9	XXXXXX	COM00001	varchar(20)	Consist of alphabets and digit
Company	company_title	Company Name	Required	A9	XXXXXX	Yak Xin Enterprise	varchar(20)	Consist of alphabets and digit
Company	company_description	Description	Optional	A-9	XXXXXX	Fisheries Hardware Business	varchar(20)	Consist of alphabets and digit

Table 3.11: Company table attributes and description.

**3.5.5.3.12 Payment Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Payment	payment_id	Payment ID	Required	A-9	XXXXXX	P00001	varchar(20)	Consist of alphabets and digit
Payment	customer_id	Customer ID	Required	A-9	XXXXXXXX	Cus20001	varchar(20)	Consist of alphabets and digit
Payment	purchase_amount	Purchased Amount	Required	0-9	XXX.XX	999.99	Decimal(8,2)	All decimal number
Payment	payment_discount	Payment Discount	Required	0-9	XX.XX	99.99	Decimal(8,2)	All decimal number
Payment	total_net_payment	Total Net Amount	Required	0-9	XXX.XX	999.99	Decimal(8,2)	All decimal number
Payment	total_payment_amount	Total Payment Amount	Required	0-9	XXX.XX	111.11	Decimal(8,2)	All decimal number
Payment	change_amount	Change Amount	Required	0-9	XX.XX	11.11	Decimal(8,2)	All decimal number



Payment	payment_date	Payment Date	Required	0-9	XX/XX/ XXXX	16/02/2013	Date	Must be date format
Payment	credit_card_number	Credit Card Number	Required	0-9	XXXXXXXX XXXXXXXX	12348974 33316471	Integer	Must be digit
Payment	receipt_id	Receipt ID	Required	0-9	XXXXXX	R00001	varchar(20)	Consist of alphabets and digit

Table 3.12: Payment table attributes and description.

**3.5.5.3.13 Cancellation Order Table**

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Cancellation_Order	cancellation_id	Cancellation ID	Required	A-9	XXXXXX	CAN00001	varchar(20)	Consist of alphabets and digit
Cancellation_Order	order_id	Order ID	Required	A9	XXXXX	SO30001	varchar(20)	Consist of alphabets and digit

Table 3.13: Cancellation Order table attributes and description.

### 3.5.5.3.14 Customer Credit Amount Table

Entity Field	Data Entity	Description	Mandatory	Scale	Format	Display Output	Data Type	Constraints
Customer_Credit_Amount	cancellation_id	Cancellation ID	Required	A-9	XXXXXX X	CCA0000 1	varchar(20)	Consist of alphabets and digit
Customer_Credit_Amount	customer_id	Customer ID	Required	A-9	XXXXXX	CUS30001	varchar(20)	Consist of alphabets and digit
Customer_Credit_Amount	customer_credit_amount	Customer Credit Account	Required	0-9	xxx.xx	215.00	Decimal(8,2)	All decimal number

Table 3.14: Customer credit amount table attributes and description.

# Chapter 4: User Interface of System

## 4.1 User Manual Guideline

### 4.1.1 Login Form

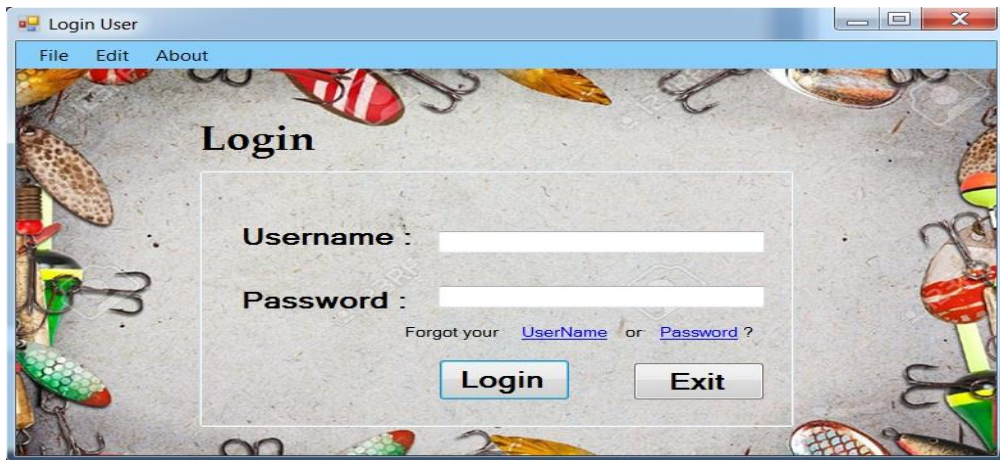


Figure 4.1: User Login Form

- User key in their registered username and password in a white text place in order to log into the system.

### 4.1.2 Recover User Name Form

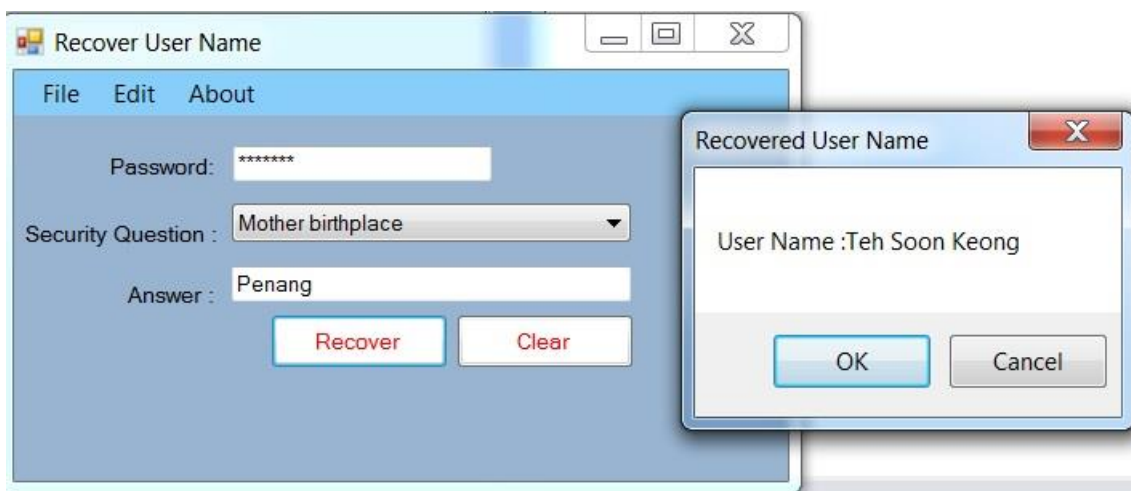


Figure 4.2: Recover User Name Form

- In case user forgotten their log in username can directly click on the blue hyperlink provided in the login page. After clicked it then will proceed to recover user name form and user need to input all related data. The user name will be recover by displaying a message box.

### 4.1.3 Recover User Password Form

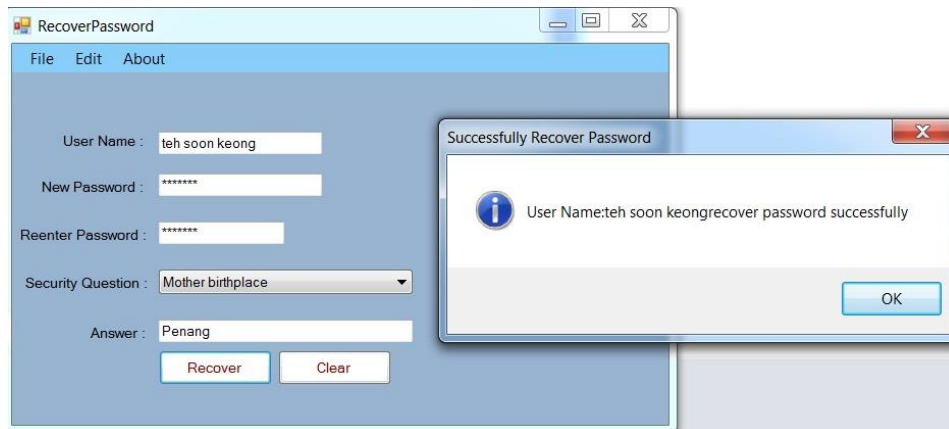


Figure 4.3: Recover User Password Form

- In case user forgotten their log in password can directly click on the blue hyperlink provided in the login page. After clicked it then will proceed to recover user password form and user need to input all related data. The new user password will be creating by entering a new password.

### 4.1.4 Main Menu Form



Figure 4.4: Main Menu Form

- The above figure shows the main menu form after user log into the system. Firstly, I will go through step-by-step of creating a sales order.

### 4.1.5 Sale Order Form

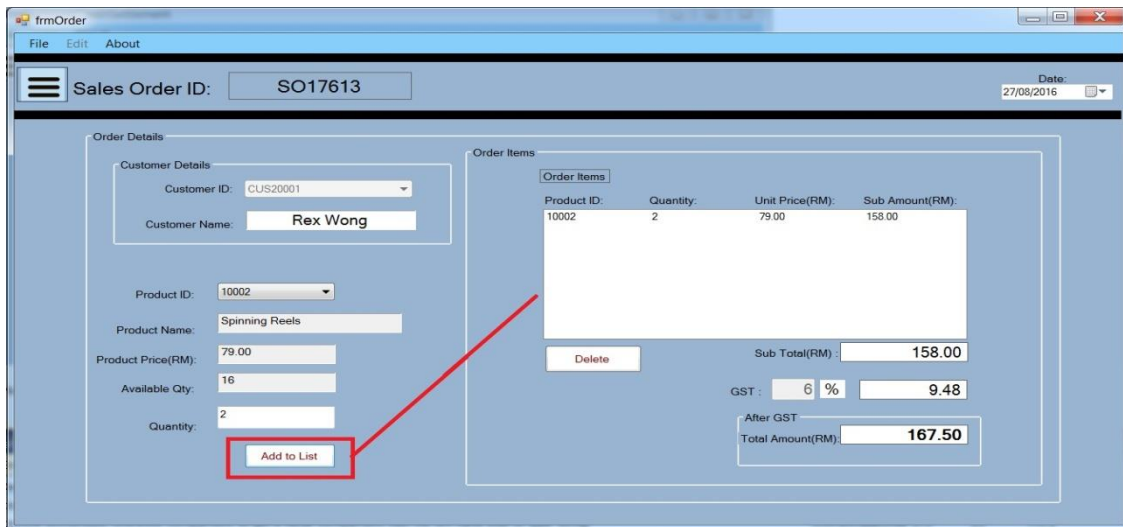


Figure 4.5: Sale Order Form

- User has to select a customer and at least one product to create a sales order and create "Add to List" button in order to add the ordered product into a list table. After that, the sub total and total amount will be display out.

### 4.1.6 Sale Order Form (Generate Invoice)

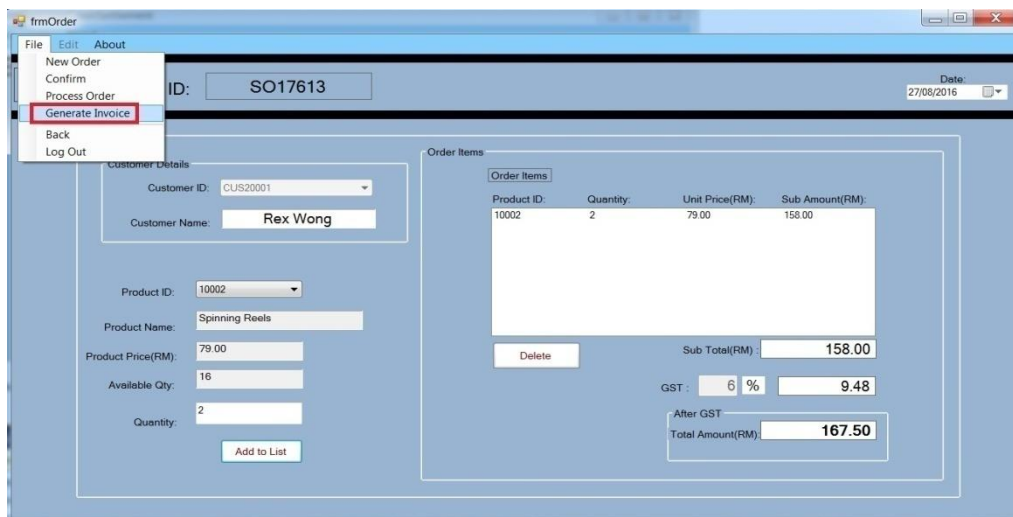


Figure 4.6: Sale Order Form (Generate Invoice)

- Before generate an invoice, user must confirm the sale order first in order proceed to generate invoice by clicking from menu strip.

### 4.1.7 Display Invoice Form

Invoice No.	IN38576	Invoice Date	27/08/2016
Customer ID	CUS20001		
Customer Name	Rex Wong		
Address	B-3-2, Carnation Park, Tana		
City	Kuantan		
PostCode	39100		
Phone	017-5667891		

Order Items	Unit Price	Quantity	Total Price(RM)
10002	79.00	2	158.00

TOTAL (RM)	158.00
GST 6%	9.48
TOTAL AMOUNT (RM)	167.50

Figure 4.7: Display Invoice Form

-The above figure show the example of invoice and user can print out the invoice or save the invoice into PDF format.

### 4.1.8 Process Order Form

Order ID	Customer ID	Order Date	Total Amount(RM)	Status
SO17129	CUS20002	26/08/2016	266.00	PartialPaid
SO17613	CUS20001	27/08/2016	158.00	Unpaid

Figure 4.8: Process Order Form

- After the sales orders have been created then will proceed to payment, the above figure shows all the unpaid or partial paid sale order. Firstly, we will proceed to unpaid order by clicking "Process" button.



### 4.1.9 Billing Form

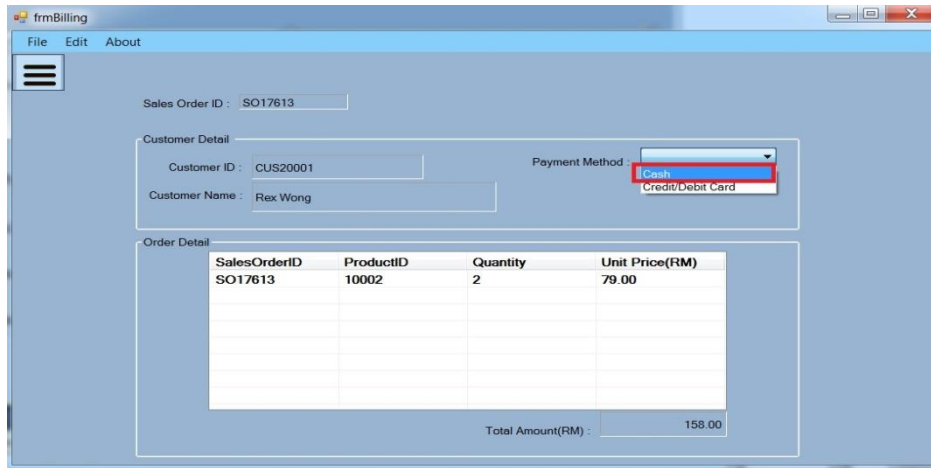


Figure 4.9: Billing Form

- This billing form allow user to choose the payment method either pay by cash or pay by credit card. Firstly, I will proceed to pay by cash.

### 4.1.10 Payment Form (Cash)

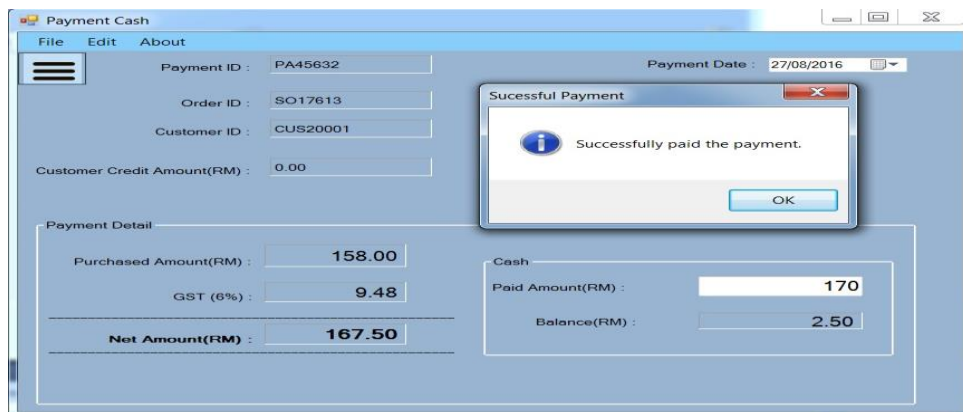



Figure 4.10: Payment Form (Cash)

- User will be direct to cash payment by entering customer paid amount in a white text box and then click on pay menu strip button that located under "File" menu strip. Then, payment paid successfully.

### 4.1.11 Display Customer Receipt

 **Yak Xin Enterprise** 27/08/2016  
No.536, Jalan Kenanga 16, Taman Sri Ampang, 05050 Alor Setar, Kedah Darul Aman .  
Tel/Fax : 04-7719411 H/P : 013-4894688

**Payment Receipt**

Receipt No. :	RE76822
Payment No. :	PA68964
Customer ID :	CUS20001
Payment Method :	Cash

---

Product ID :	Quantity :	Unit Price(RM) :
10002	2	79.00

---

Total Amount (RM) :	158.00
GST (6%) :	9.48
Net Amount (RM) :	<b>167.50</b>
Total Payment (RM) :	170.00
Balance (RM) :	2.50

Figure 4.11: Display Customer Receipt

- When user click on generate receipt then the receipt viewer will be display out.

### 4.1.12 Payment Form (Credit Card)

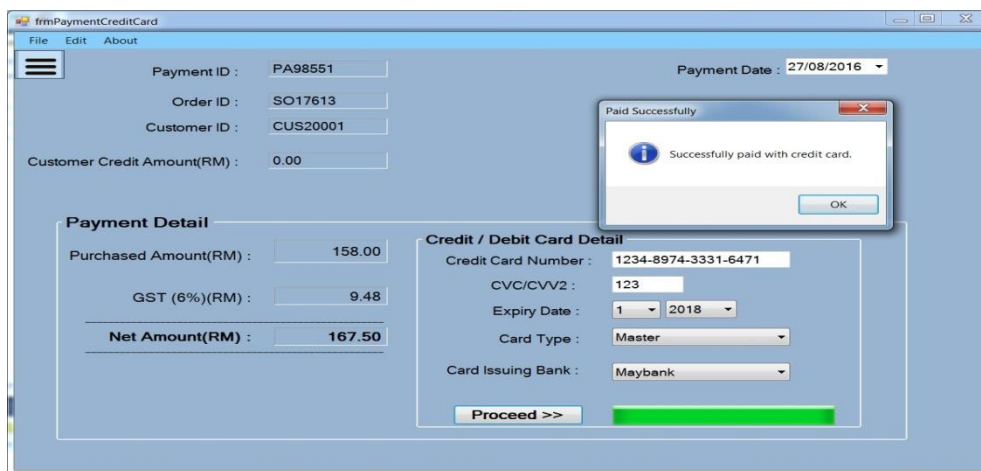


Figure 4.12: Payment Form (Credit Card)

- In figure 4.10 is cash payment but now I will proceed to credit card payment which shown in figure 4.12. User has to key in customer credit card detail and click on "Proceed" button to validate entered credit card details.

### 4.1.13 Payment Form (Pay Partial Payment)

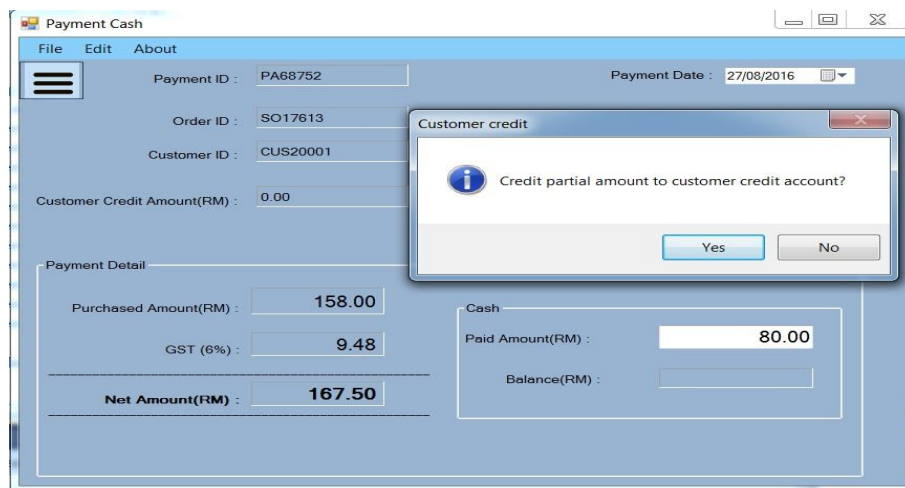


Figure 4.13: Payment Form (Pay Partial Payment)

- User are allow customer to pay partial amount instead of full amount. After customer paid partial amount then the rest of balance will be debit to customer credit account.

### 4.1.14 Customer Credit Settlement Form

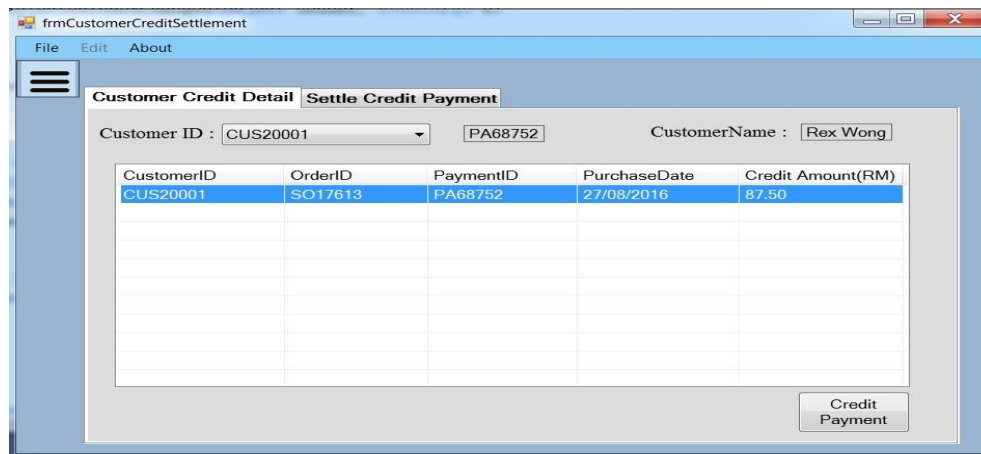


Figure 4.14: Customer Credit Settlement Form

- Now we will proceed to settle customer credit, the above figure shows that customer "CUS20001" have one partial payment and still have balance have not clear off. User has to click on "Credit Payment" button in order to pay the credit balance.

### 4.1.15 Settle Credit Payment Form

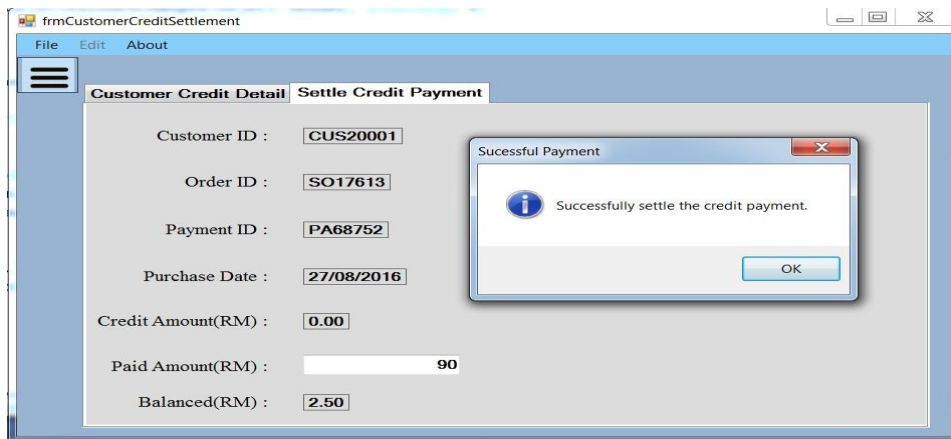


Figure 4.15: Settle Credit Payment Form

- By entering the paid amount into white text amount then customer credit payment have been paid.

### 4.1.16 Stock Form (Insufficient Stock)

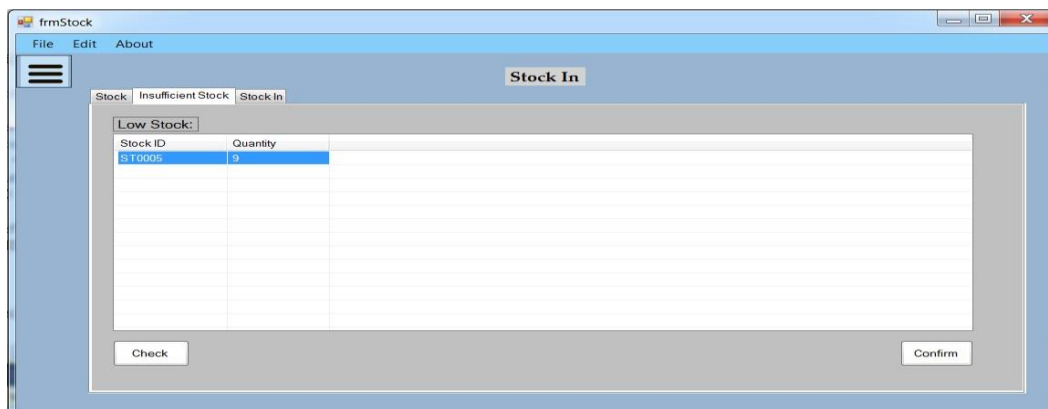


Figure 4.16: Stock Form (Insufficient Stock)

- User can check insufficient stock in order to replenish low quantity stock by clicking the "Check" button and then click "Confirm" button to proceed.

### 4.1.17 Compare Supplier Form

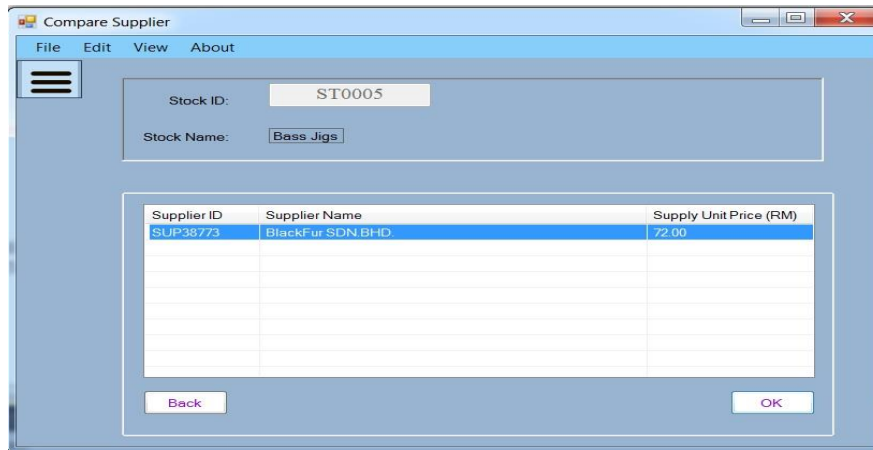


Figure 4.17: Compare Supplier Form

- User now can view those suppliers that supply this particular product.

### 4.1.18 Purchase Order Form

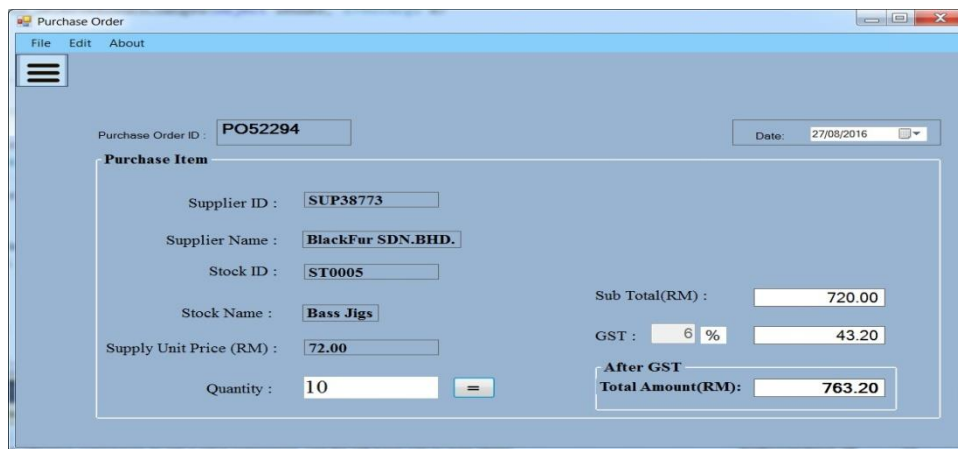


Figure 4.18: Purchase Order Form

- User now create a purchase order by entering the purchase quantity and click on "=" button to calculate the total purchase amount.

### 4.1.19 Example of Purchase Order

**Purchase Order**  
**Yak Xin Enterprise**  
No.536, Jalan Kenanga 16, Taman Sri Ampang, 05050 Alor Setar, Kedah Darul Aman .  
Tel/Fax : 04-7719411 H/P : 013-4894688

---

**Purchase Order ID :** PO52294                      **Purchase Date :** 27/08/2016  
**Supplier Name :** BlackFur SDN.BHD.  
**Shipping Address :** No.536, Jalan Kenanga 16, Taman Sri Ampang, 05050 Alor Setar, Kedah Darul Amar

---

Purchase Items	Unit Price	Quantity	Amount(RM)
Bass Jigs	72.00	10	720.00

<b>SUB TOTAL (RM)</b>	720.00
<b>GST 6%</b>	43.20
<b>TOTALAMOUNT (RM)</b>	763.20

Figure 4.19: Example of Purchase Order

- User can generate the purchase order as show in the figure 4.19.

### 4.1.20 Stock Form (Stock In)

The screenshot shows the 'frmStock' application window. It has a menu bar with 'File', 'Edit', and 'About'. Below the menu bar are three tabs: 'Stock', 'Insufficient Stock', and 'Stock In'. The 'Purchase Order List' form contains the following fields: Purchase Order (PO52294), Supplier ID (SUP38773), Supplier Name (BlackFur SDN.BHD.), Stock ID (ST0005), Stock Name (Bass Jigs), and Purchase Quantity (10). The 'Stock In' form contains: Stock ID (ST0005), Stock Name (Bass Jigs), Quantity In Stock (9), and Stock In Quantity (10) with an 'Update' button. A 'Successfully updated' dialog box with an 'OK' button is overlaid on the forms.

Figure 4.20: Stock Form (Stock In)

- Whenever the purchase item has reach user doorstep then user has to check the purchase item quantity whether tally with purchase order. If tally then user have to key in stock in quantity in order to update stock quantity.

# Chapter 5: System Testing

## 5.0 System Testing

### 5.1 Unit Testing

Unit testing is the testing that test part by part before integrate with other part. The purpose of this testing is to let developer more easily to find out the bug or error that might miss catch during development stage. In unit testing, the developer will only test all those input fields with some validation detector, for example prompt an error message for empty input value. Each part of the system will be test separately by entering some input value in term of valid or invalid input value in order to see how system react.

#### 5.1.1 : User Login Form

Testing Objective: To check whether user can successful log into the system

NO	Action	Input	Expected Result	Result
1	Check the value entered by user.	The username will be "Teh Soon Keong" and password "1308072"	Successful log into the main menu screen.	Pass
2	Check invalid value entered by clicking "Login" button.	The username will be "Teh Soon Kit" and password "1308073"	Display error message regards wrong user name or password.	Pass
3	Check null value entered by clicking "Login" button.	The username will be "Empty" and password "Empty"	Display error message regards wrong user name or password.	Pass

Table 5.1.1: User login form



**5.1.2 :Add New Customer**

Testing Objective: To ensure all the input value in customer form work properly.

<b>NO</b>	<b>Action</b>	<b>Input</b>	<b>Expected Result</b>	<b>Result</b>
1	Key in new customer details into input box.	New customer information	Display successfully create new customer message.	Pass
2	Left empty fields in one of the input box.	Customer information with empty fields	Display error message.	Pass
3	Check duplicate customer to ensure do not have same customer detail.	Key in same customer information	Display error message.	Pass
4	Search new customer.	Search through table.	Display searched customer details.	Pass
5	Update existing customer details after complete editing.	Edit and replace customer current details.	Display customer information updated successful message.	Pass
6	Delete existing customer details.	Delete selected customer details	Display customer information delete successful message.	Pass

Table 5.1.2: Add New Customer

**5.1.3 : Add New Supplier**

Testing Objective: To ensure all the input value in supplier form work properly.

<b>NO</b>	<b>Action</b>	<b>Input</b>	<b>Expected Result</b>	<b>Result</b>
1	Key in new supplier details into input box.	New supplier information	Display successfully create new supplier message.	Pass
2	Left empty fields in one of the input box.	Supplier information with empty fields	Display error message.	Pass
3	Check duplicate supplier to ensure do not have	Key in same supplier information	Display error message.	Pass

	same supplier detail.			
4	Search new supplier details.	Search through table.	Display searched supplier details.	Pass
5	Update existing supplier details after complete editing.	Edit and replace supplier current details.	Display supplier information updated successful message.	Pass
6	Delete existing supplier details.	Delete selected supplier details	Display supplier information delete successful message.	Pass

Table 5.1.3: Add New Supplier

#### 5.1.4: Creating New Sales Order

Testing Objective: To ensure all the input value in sales order form work properly.

NO	Action	Input	Expected Result	Result
1	Key in new sales order details into input box.	New sale order information	Display successfully create new Sale order message.	Pass
2	Left empty fields in one of the input box.	Sale order information with empty fields	Display error message.	Pass
3	Check duplicate sale order to ensure do not have same sale order.	Key in same sale order information	Display error message.	Pass
4	Search new sale order details.	Search through table.	Display searched sale order details.	Pass
5	Update existing sale order details after finish editing.	Edit and replace sale order current details.	Display sale order information updated successful message.	Pass
6	Cancel existing sale order details.	Cancel selected sale order details	Sale order successfully delete.	Pass

Table 5.1.4: Creating New Sales Order

**5.1.5 : Creating New Purchase Order**

Testing Objective: To ensure all the input value in purchase order form work properly.

<b>NO</b>	<b>Action</b>	<b>Input</b>	<b>Expected Result</b>	<b>Result</b>
1	Key in purchase order details into input box.	New purchase order information	Display successfully create new purchase order message.	Pass
2	Left empty fields in one of the input box.	Purchase order information with empty fields	Display error message.	Pass
3	Check duplicate purchase order to ensure does not have same purchase order detail.	Key in same purchase order information	Display error message.	Pass
4	Search new purchase details.	Search through table.	Display searched purchase order details.	Pass
5	Update existing purchase order details after finish editing.	Edit some of the purchase order detail.	Purchase order successfully edited.	Pass

Table 5.1.5: Creating New Purchase Order

**5.1.6: Add New Product**

Testing Objective: To ensure all the input value in product form work properly.

<b>NO</b>	<b>Action</b>	<b>Input</b>	<b>Expected Result</b>	<b>Result</b>
1	Key in new product details into input box.	New product information	Display successfully create new product message.	Pass
2	Left empty fields in one of the input box.	Product information with empty fields	Display error message.	Pass
3	Check duplicate product to ensure does not have same product details.	Key in same product information	Display error message.	Pass
4	Search newly added product details.	Select one product from combo box.	Display searched product details.	Pass

5	Update product detail information.	Edit one of the product detail.	Display product information updated successful message.	Pass
6	Delete existing product details.	Delete selected product details.	Display product information delete successful message.	Pass

Table 5.1.6: Add New Product

### 5.1.7: Sales Order Payment

Testing Objective: To ensure all the input value in payment for sales order form work properly.

NO	Action	Input	Expected Result	Result
1	Check sales order id belong to which customer.	Select one sales order id.	Display successfully paid by customer.	Pass
2	Check customer debt amount.	Check the amount entered.	Successfully calculate total amount.	Pass
3	Check the amount calculation whether is correct or not.	Total Debt: RM500 Payment Make: RM 200 Total Debt Left : RM 300	Successfully update customer debt into database	Pass

Table 5.1.7: Sales Order Payment

## 5.2 Functional Testing

Next, proceed to functional testing which slight same with unit testing but the only different is functional testing will test on the functionalities whether workable or not. The test will run according to the input value and expected result should tally with the real result.

### 5.2.1 : Forgotten User Name or Password

Test Objective: To ensure user can recover their user name or password whenever they forgotten their login information.

NO	Action	Input	Expected Result	Result
1	Forgotten user name.	Key in user password and security question and answer to proceed recover.	Successfully recover user name by displaying a message box.	Pass
2	Forgotten user password.	Key in new user password and security question and answer to proceed recovers.	Successfully save the new user passwords into database.	Pass

Table 5.2.1: Forgotten User Name or Password

### 5.2.2 : Customer Credit Payment

Test Objective: To keep track all the customer credit payment.

NO	Action	Input	Expected Result	Result
1	Check customer credit amount.	Select a customer id from combo box.	Successfully get customer debt detail into list view table.	Pass

Table 5.2.2: Customer Credit Payment

**5.2.3: Generate Report**

Test Objective: To check every report can view and generate properly.

<b>NO</b>	<b>Action</b>	<b>Input</b>	<b>Expected Result</b>	<b>Result</b>
1	Select a report to be generate from a report list.	Select the specific type report to be generate.	Successfully display report in a report viewer.	Pass
2	Report generated and ready to print out.	Click on the print button.	Printed out expected report.	Pass
3	Report generated and waiting for export to PDF format	Choose to export purchase order to PDF format.	Successful save as PDF format.	Pass

Table 5.2.3: Generate Report

**5.2.4 : Make Payment (Cash)**

Test Objective: To check every cash payment is workable according to system flow.

<b>NO</b>	<b>Action</b>	<b>Input</b>	<b>Expected Result</b>	<b>Result</b>
1	Select a customer account	Customer ID: CUS20001	Successfully retrieve data and display in list view table	Pass
2	Choose payment method	Payment Method: Cash	Direct to cash payment screen.	Pass
3	Insert customer paid amount to make calculation.	Debt: RM1000 Payment: RM500 Total Debt: RMRM500	Update customer latest debt amount into database.	Pass

Table 5.2.4: Make Payment (Cash)

**5.2.5: Make Payment (Credit Card)**

Test Objective: To check every credit card payment is workable according to system flow.

NO	Event	Attribute and Value	Expected Result	Result
1	Select a customer account	Customer ID: CUS20001	Successfully retrieve data and display in list view table	Pass
2	Choose payment method	Payment Method: Credit Card	Direct to credit card payment screen.	Pass
3	Insert customer paid amount to make calculation.	Purchase Amount: RM1000 Payment: RM1000	Successful make the payment with valid credit card.	Pass

Table 5.2.5: Make Payment (Credit Card)

**5.2.6: Stock Quantity Checking**

Test Objective: To check the stock quantity whether in reorder point or not.

NO	Action	Input	Expected Result	Result
1	Select a stock from combo box.	Stock ID: ST20001	Successfully retrieve data and display in list view table.	Pass
2	Check stock quantity.	Stock Quantity : Lower than 10	Display an alert message regards low stock level.	Pass

Table 5.2.6: Stock Quantity Checking

**5.2.7: Compare Supplier Supply Price**

Test Objective: To find out the cheapest supply unit price.

NO	Action	Input	Expected Result	Result
1	Select a stock from combo box.	Stock ID: ST20001	Successfully retrieve data and display in list view table.	Pass
2	Compare cheapest supplier supply unit price.	Supplier 1: RM35.00 Supplier 2: Rm34.50 Cheapest : Supplier 2(RM34.50)	Display a message regards cheapest supplier supply price.	Pass

Table 5.2.7: Compare Supplier Supply Price

### 5.3 Integration Testing

Integration testing will proceed after the unit testing have been successfully done. From now on, developers will test the few part together as integrated part . Although in the unit testing all part are work properly but when come to this stage the data might need pass to each other in order to work as integrated part. This time error may occur during data passing and developers need to test out and solve it. In some situation, different part might develop by different developers so few developer may discuss together about the flow and bug fix.

### 5.4 System Testing

System testing will test the system as a whole complete system which consider as last testing before launch the system. Although in system testing all work well but cannot guarantee there is no bug or error occur in the future. Whenever user find out any error or bug in the future will report to developer to solve immediately. In addition, the system also will test on different operating system machine in order to ensure the system will work properly on each machine.



# Chapter 6: Conclusion

## 6.1 Introduction

In this chapter will conclude about Final Year Project documentation. Strengths and weakness and suggestions will be discussed in this chapter.

## 6.2 Evaluation of Project

### 6.2.1 Strengths

- **More efficient way of handle daily business process will be improve and enhance from time to time**

After implement the proposed system, Yak Xin Enterprise is able to computerize their business flow that allow them to store customer, supplier, product and stock information and also keep track of the customers payment and supplier purchase order.

- **Reduce paper work to keep track the business**

All the daily transaction in term of customer invoice/receipt , customer debt status, supplier purchase order will be record in database for retrieval purpose. At the same time, paper work will be reduce from time to time.

- **Help to keep track of the stock item**

More accurate reorder quantity will be provided in order to prevent too much stock being stuck in the storeroom and after some time become an obsolete stock item. Moreover, keep fulfilling customer demand on time without any out of stock situation.

### 6.2.2 Limitation

- **Unable use bar code generator**

This proposed system able to differentiate each product or stock item by entering product or stock id but not automatically scan the bar code through bar code scanner.

- **Unable generate advance report**

The proposed system only can generate normal report but not advance report, for example. include a graph or chart into a report.

➤ **Limited Payment Method**

The proposed system only support cash payment and credit card payment.

### 6.3 Suggestion for Future Improvement

➤ **Able use bar code generator**

In the future will include a bar code scanner that connect to a system in order to speed up the work of processing.

➤ **Able generate advance report**

Make use of the data mining concept in order to let user choose to display every type of report included graph representation.

➤ **Limited Payment Method**

Add more payment method for example online banking and PayPal.

### 6.4 Personal Reflection

From the proposal writing until system implementation, it took me almost 1 year preparation and finishing this final year project. During the time doing this project, I had faced many problems and I try to solve it by searching online or go to library to refer more reference books. During solving problem period. I found myself thinking become more mature and think more logically.

While developing this project I faced a lot of problem because I not familiar with C# programming because normally I used Visual Basic programming to develop program. In order to get more understanding on C#, I have consult few lecturer regards the problem faced and go through some online tutorial C# practical in order broader my undestanding.

Last but not least, I would like to thank my friends for helping me solve some problem and also appreciate the support from family members so that I can complete the project on time. I also would like to express my sincere gratitude to my project supervisor, Ms.Chan who is very helpful and supporting to me. She was always giving me opinions and feedback to my project.

## **6.5 Conclusion**

In a conclusion, this proposed system is developed to Yak Xin Enterprise to manage their daily business operation instead of dealing with numerous physical documents. Not only this, all the transaction records will be stored in a database and kept track by the system in order to avoid storing a big stack of records on paper. Since the proposed system will fully satisfy users' requirements, then truly said that users will get a lot of help from this proposed system in an efficient way.

On the other hand, due to the limitation of time, the part for the bar code scanner to scan products is unable to be implemented on the proposed system but will be taken into consideration for future improvement. Although the basic function application is finished on time, but some of the features will not be included due to limited time. Last but not least, by going through the whole system development life cycle is a good exploration and experience before really stepping into the reality situation.

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# **Appendix A : FYP Bi-Weekly Reports**

**A-1 FYP Weekly Report (Week 2)****FINAL YEAR PROJECT WEEKLY REPORT***(Project II)*

Trimester, Year : 3, 3	Study week no. : 2
Student Name & ID : TEH SOON KEONG (13ACB08072)	
Supervisor : CHAN LEE KWUN	
Project Title : YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM	

<p><b>1. WORK DONE</b></p> <p>-Plan to revise back the prototype and advice from modulator and supervisor in order to make some changes and add in more parts.</p>
<p><b>2. WORK TO BE DONE</b></p> <p>-Successfully make some minor changes on the project objectives.</p>
<p><b>3. PROBLEMS ENCOUNTERED</b></p> <p>-Currently do not encounter any problem yet.</p>
<p><b>4. SELF EVALUATION OF THE PROGRESS</b></p> <p>- The progress of making changes of the prototype is quite slow.</p>

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**A-2 FYP Weekly Report (Week 4)****FINAL YEAR PROJECT WEEKLY REPORT***(Project II)*

Trimester, Year : 3, 3	Study week no. : 4
Student Name & ID : TEH SOON KEONG (13ACB08072)	
Supervisor : CHAN LEE KWUN	
Project Title : YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM	

<p>1. WORK DONE</p> <p>-Plan to have some modification on project scope whether is workable or not.</p>
<p>2. WORK TO BE DONE</p> <p>-Successfully make some minor changes on the project scope.</p>
<p>3. PROBLEMS ENCOUNTERED</p> <p>-Some project scope might difficult to done.</p>
<p>4. SELF EVALUATION OF THE PROGRESS</p> <p>- Work very hard to study hard the existing system and mark down their strengths and weakness.</p>

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**A-3 FYP Weekly Report (Week 6)****FINAL YEAR PROJECT WEEKLY REPORT***(Project II)*

Trimester, Year : 3, 3	Study week no. : 6
Student Name & ID : TEH SOON KEONG (13ACB08072)	
Supervisor : CHAN LEE KWUN	
Project Title : YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM	

<p><b>1. WORK DONE</b></p> <p>-Finished most of the document part. Read back others taken subject to revise how to draw the diagram.</p>
<p><b>2. WORK TO BE DONE</b></p> <p>-Start to work on system design. Start to draw the relevant diagram. Complete Gantt Chart.</p>
<p><b>3. PROBLEMS ENCOUNTERED</b></p> <p>-Most of the existing system are very powerful and advanced which can challenge the proposed system.</p>
<p><b>4. SELF EVALUATION OF THE PROGRESS</b></p> <p>- Overall process are still running smooth.</p>

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**A-4 FYP Weekly Report (Week 8)****FINAL YEAR PROJECT WEEKLY REPORT***(Project II)*

Trimester, Year : 3, 3	Study week no. : 8
Student Name & ID : TEH SOON KEONG (13ACB08072)	
Supervisor : CHAN LEE KWUN	
Project Title : YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM	

<p>1. WORK DONE</p> <p>-Plan to add in more project innovation which is useful for Yak Xin Enterprise.</p>
<p>2. WORK TO BE DONE</p> <p>-Designed some extra feature that ready to add in the proposed system.</p>
<p>3. PROBLEMS ENCOUNTERED</p> <p>-Extra features are challenging which require a lot of technical skill to complete it.</p>
<p>4. SELF EVALUATION OF THE PROGRESS</p> <p>- Overall process is a bit slow due to most of the time spent in designing new features.</p>

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**A-5 FYP Weekly Report (Week 10)****FINAL YEAR PROJECT WEEKLY REPORT***(Project II)*

Trimester, Year : 3, 3	Study week no. : 10
Student Name & ID : TEH SOON KEONG (13ACB08072)	
Supervisor : CHAN LEE KWUN	
Project Title : YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM	

<p>1. WORK DONE</p> <p>-Continue on the programming for system features.</p>
<p>2. WORK TO BE DONE</p> <p>- Continue on the programming for system features.</p>
<p>3. PROBLEMS ENCOUNTERED</p> <p>-Use quite some time for technical solving problem.</p>
<p>4. SELF EVALUATION OF THE PROGRESS</p> <p>- Briefly, the preparation of the documentation is quite smooth although there are some difficulties parts but I had tried my best to solve it.</p>

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**A-6 FYP Weekly Report (Week 12)****FINAL YEAR PROJECT WEEKLY REPORT***(Project II)*

Trimester, Year : 3, 3	Study week no. : 12
Student Name & ID : TEH SOON KEONG (13ACB08072)	
Supervisor : CHAN LEE KWUN	
Project Title : YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM	

<p><b>1. WORK DONE</b></p> <p>- Finished all of the documentation part. Prepared to meet Ms.Chan Lee Kwun for submission on next week.</p>
<p><b>2. WORK TO BE DONE</b></p> <p>- Summarize whole project, do a conclusion. Arrange the the report. Sectioning the report according to FYP guideline. Submit project proposal for plagiarism checking. Print 2 set of project report. Submit to the supervisor with two set of project report with softcopy. Do the last weekly report.</p>
<p><b>3. PROBLEMS ENCOUNTERED</b></p> <p>- No problems encounter.</p>
<p><b>4. SELF EVALUATION OF THE PROGRESS</b></p> <p>Put in a lot of effort for final checking the content of the project documentation report to make sure no big mistake.</p>

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**A-7 FYP Weekly Report (Week 13)****FINAL YEAR PROJECT WEEKLY REPORT***(Project I)*

Trimester, Year : 3, 3	Study week no. : 13
Student Name & ID : TEH SOON KEONG (13ACB08072)	
Supervisor : CHAN LEE KWUN	
Project Title : YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM	

<p><b>1. WORK DONE</b></p> <p>Finished 80% of the coding parts.</p>
<p><b>2. WORK TO BE DONE</b></p> <p>- Almost complete the proposed system</p>
<p><b>3. PROBLEMS ENCOUNTERED</b></p> <p>Time is limit for the coding parts. Have to abandon some of the features since not much time left. Need to have better time management on next time.</p>
<p><b>4. SELF EVALUATION OF THE PROGRESS</b></p> <p>- Put in a lot of effort for the coding parts.</p>

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# **Appendix B : FYP Plagiarism Check Report**

**B-1 Report Originality Checking Report**

<b>UniversitiTunkuAbdulRahman</b>			
<b>FormTitle :Supervisor'sCommentson OriginalityReportGenerated by Turnitin</b>			
FormNumber:FM-IAD-005	RevNo.:0	Effective Date:01/10/2013	Page No.:1of1

**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY**

<b>FullName(s)of</b>	TEH SOON KEONG
<b>ID Number(s)</b>	13ACB08072
<b>Programme /Course</b>	FICT-IB
<b>Title ofFinalYear Project</b>	YAK XIN FISHERIES HARDWARE MANAGEMENT SYSTEM

Similarity	Supervisor's Comments
<b>Overall similarity index: 10 %</b> <b>Similarity by source</b> Internet Sources: 3% Publications: 1% Student Papers: 8%	
<b>Number of individual sources listed of more than 3% similarity: _____</b>	
<b>Parametersoforiginalityrequired andlimits approved by UTARareasfollows: (i)</b> <b>Overall similarity index is 20% and below, and</b> <b>(ii) Matching of individual sources listed must be less than 3% each, and</b> <b>(iii) Matching texts in continuous block must not exceed 8 words</b>	

*Note* Supervisor/Candidate(s) is/are required to provide soft copy of full set of the originality report to Faculty/Institute

***Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.***

\_\_\_\_\_  
Signature of Supervisor

\_\_\_\_\_  
Signature of Co-Supervisor

Name: TEH SOON KEONG

Name: TEH SOON KEONG

Date: 30/08/2016

Date : 30/08/2016



**B-2 Turnitin Check Plagiarism Report**

FYP2 - Teh Soon Keong(13ACB08072)

## ORIGINALITY REPORT

% <b>10</b>	% <b>3</b>	% <b>1</b>	% <b>8</b>
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

## PRIMARY SOURCES

<b>1</b>	Submitted to Universiti Tunku Abdul Rahman Student Paper	% <b>4</b>
<b>2</b>	spod.tarc.edu.my Internet Source	% <b>2</b>
<b>3</b>	Submitted to RMIT University Student Paper	% <b>1</b>
<b>4</b>	eprints.utar.edu.my Internet Source	% <b>1</b>
<b>5</b>	Submitted to Baze University Student Paper	% <b>1</b>
<b>6</b>	www.pointsalesoftware.com.au Internet Source	<% <b>1</b>
<b>7</b>	Submitted to University of KwaZulu-Natal Student Paper	<% <b>1</b>

<b>8</b>	strategic.asia Internet Source	<% <b>1</b>
<b>9</b>	Submitted to KMD Computer Center Student Paper	<% <b>1</b>
<b>10</b>	Submitted to Middlesex University Student Paper	<% <b>1</b>

# Appendix C : Gantt Chart

C-1 Gantt Chart

