

Goods and Services (GST) Accounting for Malaysian Retailer Company
BY

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A REPORT

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DECLARATION OF ORIGINALITY

I declare that this report entitled “**GOOD AND SERVICE (GST) ACCOUNTING SYSTEM FOR MALAYSIAN RETAILER COMPANY**” is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award.

Signature : _____

Name : CHOONG CHEE MUN

Date : 29/8/2016

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I would like to express my sincere thanks and appreciation to my supervisors, Ms Chan Lee Kwun who guide me in doing this final year project and develop a system that suitable for the organization needs by looking at the real case study of what kind of system lacking in the market and issues of the system.

In this project, I learned a lot in preparing the documentation for the system development and implement knowledge I had learnt in my university semesters. Besides doing the system development for this final year project, I also learn on the business operation and activities that coupled with IT technology.

ABSTRACTS

This project is developing Goods and Service (GST) Accounting System for Malaysian Retailer Company. It focuses on the newly implemented GST into the accounting system for the retailing company. The reasons of developing an accounting system for retailing company due to there are many varieties of products for sales and purchases in the business. Therefore, it shows how GST reflects the accounting works for different products and different GST charged on products for retailing companies. Moreover, the GST method is started implemented in Malaysia started from 1st April 2015 and insufficient knowledge and understanding of GST makes many businesses do not know how to implement it into their business. Besides that, the lacking of compliance GST accounting system in the market also another issue for companies. Even though there are some available existing GST systems for foreign countries, yet it is not suitable to be used in Malaysia as the methods and implementation of GST are quite complex and different from other countries.

This project focuses on projecting the GST-03 form, record journal entries, accurate calculation on charged GST amount, generate GST report and GST cash flow statement. The innovation idea is projecting out the net cash flow statement from operating activities to evaluate the health of cash flow in the business operation. The projection of net cash flow statement is essential for company to verify the health of cash flow and make prevent action if found that the net cash flow is negative. Besides that, it also analyze on the bad debts for sales and purchase in order to avoid heavy bad debts for the business.

The methodology used for developing this project is evolutionary prototype model. The reasons of choosing this methodology due to it allows for changes to be made during any phase and each prototype will be developed and test until it fulfills the requirements. The estimated timeline for this final year project is two semesters (170 days excluded with weekends).

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LIST OF ABBREVIATION

<i>C#</i>	C-sharp
<i>GAF</i>	GST Audit File
<i>GST</i>	Goods and Service Tax

Chapter 1: Introduction

1.1 Project Background & Motivation

According to the news reported that there are 4,364 companies are failed to register Goods and Service Tax (GST). The registration for GST starting from 31st December 2014 until 28th February 2015 and there are 370,558 companies has been registered for the GST. For those companies refusal to register for GST will be fined for RM15,000 (Bernama, 2015).

There are 780 out of the 27,281 companies registered under the Goods and Services Tax (GST) in Penang had failed to submit the GST-03 tax returns by the 31 May 2015 (Bernama, 2015). The major problems that caused it happen due to the confusion part on the confusion usage of GST Tax Code, GST calculation on different products and its methods. However, for those companies who failed to submit GST tax return report within the period (1 month / 3 months / 6 months) will be charged under Section 41(6) of the GST Act 2014 (fined for RM50,000 or jailed not more than 3 years or both).

Many companies still confusing of the GST tax on different products and different industries. There are 4 different types of supply of GST: standard-rated, zero-rated, exempted, and not within the scope of GST. Due to appearance of different types of supply, companies cannot differentiate which goods and services fall into which category.

In order to overcome the failure of submit GST report by companies to CUSTOMS department, it is vital to implement an efficient GST Accounting Software. The correctness and accuracy information of GST report and information submitted to government and CUSTOMS department is very important for every company operates businesses within Malaysia. It is not allowed to make any mistake occurs in the GST taxation even though it is a small mistake. The accuracy and detailed processes is critical for GST Accounting Software to avoid the happening of incorrect taxation details, late submission, inaccurate GST calculation and so forth.

1.2 Problem Statements

1. Does not provide cash flow analysis

Many GST Accounting software available in the market provided with the cash flow projection according to the business activities. However, the analysis of the cash flow does important for the company when GST reflects the operation and work activities compared as previous. Therefore, the analysis of the cash flow will be needed in order to have better view and prediction on the cash flow statement in operating activities regarding to the GST. The prediction of cash flow can helps to monitor the cash flow activities and manage the business purchases and sales activities in order to maintain healthy cash flow.

2. Does not have analysis on bad debts

Some GST Accounting software available in the market does not provide the analysis on the bad debts for purchases and sales. The projection of bad debts data does help company to control the bad cash flow on the bad debts relief. Besides that, bad debts analysis also helps to alert upcoming unpaid invoices in order to avoid from bad debts owing the suppliers. At the same time, bad debts analysis on sales helps to collect the bad debts from customers whenever there are unpaid invoices after 6 months. Without the bad debts analysis, the company will face difficulty in collect back the bad debts after 6 months.

3. Does not know which GST tax code should be used

Companies do not clear about the GST Tax Codes to be applied in the business. They do not know how to differentiate the usage among all GST Tax Codes and which one should be use in order to prevent provide wrong information to consumers, own business operations and government CUSTOM development for submitting the GST tax return report.

Without the proper GST accounting system, the company does not understand the particular goods and / or services belong to which GST Tax Code. For retailers, the business activity involved in purchasing and supplying (sales) has confusing part of various GST Tax Code for both purchasing and supplying. Retailing companies have to differentiate which GST Tax Code should use for each products and / or services in different processes. Many companies facing the problem in selecting GST Tax Code for the particular goods and use it appropriately. GST Tax Codes is help for identifying the GST tax category for each product and / or services. Figure 1.2.1 shows GST tax codes for purchases whereas Figure 1.2.2 shows GST tax codes for supplies.

TAX CODE - PURCHASE			
No	Code	Rate	Description
1	TX	6%	Purchases with GST incurred at 6% and directly attributable to taxable supplies.
2	IM	6%	Import of goods with GST incurred.
3	IS	0%	Imports under special scheme with no GST incurred (e.g. Approved Trader Scheme).
4	BL	6%	Purchases with GST incurred but not claimable (Disallowance of Input Tax)
5	NR	0%	Purchase from non GST-registered supplier with no GST incurred.
6	ZP	0%	Purchase from GST-registered supplier with no GST incurred. (e.g. zero rated supply).
7	EP	0%	Purchases exempted from GST. E.g. purchase of residential property or financial services.
8	OP	0%	Purchase transactions which is out of the scope of GST legislation (e.g. purchase of goods overseas).
9	TX-E43	6%	Purchase with GST incurred directly attributable to incidental exempt supplies.
10	TX-N43	6%	Purchase with GST incurred directly attributable to non-incidental exempt supplies.
11	TX-RE	6%	Purchase with GST incurred that is not directly attributable to taxable or exempt supplies.
12	GP	0%	Purchase transactions which disregarded under GST legislation (e.g. purchase within GST group registration).
13	AJP	6%	Any adjustment made to Input Tax e.g.: Bad Debt Relief & other input tax adjustment.

Figure 1.2.1: GST Tax Codes for Purchases (Syed, n.d.)

TAX CODE - SUPPLY			
No	Tax Code	Tax Rate	Description
1	SR	6%	Standard-rated supplies with GST Charged.
2	ZRL	0%	Local supply of goods or services which are subject to zero rated supplies.
3	ZRE	0%	Exportation of goods or services which are subject to zero rated supplies.
4	ES43	0%	Incidental Exempt supplies.
5	DS	6%	Deemed supplies (e.g. transfer or disposal of business assets without consideration).
6	OS	0%	Out-of-scope supplies.
7	ES	0%	Exempt supplies under GST
8	RS	0%	Relief supply under GST.
9	GS	0%	Disregarded supplies.
10	AJS	6%	Any adjustment made to Output Tax e.g : Longer period adjustment, Bad Debt recover, outstanding invoice > 6 months& other output tax adjustments.

Figure 1.2.2: GST Tax Codes for Supply (Syed, n.d)

1.3 Project Scope

This project scope is to develop GST Accounting System that can address the issues stated in the problem statements and enhancing the existing accounting software in providing innovative idea to targeted companies. This project is tailored to Malaysian retailer companies to provide them with effective and accurate GST Accounting System to deal with the business operations and accounting recording.

1.4 Project Objectives

There are three main objectives to be focused in this project. The three main objectives help to provide guidance and direction for developing the project in order to fulfil the business environment and operations.

- I. To analyze the GST implementation and methods on the accounting system for Malaysian retailer companies.
- II. To design GST accounting system that addresses the problems statements of GST.
- III. To evaluate the accuracy and effectiveness of the GST accounting system in dealing with the GST tax submission and charges of GST for the business.

In order to make sure the developing of the project meets the three main objectives and tailored for Malaysian retailer companies, the GST accounting system will provide different modules in supporting the GST implementation on the accounting. This project suggested six modules for GST accounting system that will help the company to comply with GST and accounting system effectively and accurately. The following are six modules suggested in this project:

1. Issuing Tax Invoices (Purchase & Supply) module includes the following items:

- Invoice serial number in sequence
- Date of issuance of the invoice
- The words 'tax invoice' must be in a prominent place
- Name, address and GST identification number of the supplier
- Name and address of the recipient of the supply
- Description of goods and / or services supplied
- Quantity / volume of the goods and / or services supplied
- Any discount offered
- Total amount payable excluding tax
- Rate of tax and total tax chargeable as separate amount
- Total amount payable including tax chargeable

However, tax invoice module is able to generate full tax invoice and simplified tax invoice. Thus, the system will define and generate the necessary fields for different tax invoices.

2. Chart of Accounts (COA) modules to maintain the following business processes:

- i. Record general ledger and journal entry
- ii. Calculate GST amount for transactions
- iii. Maintain Chart of Accounts (Add account / maintain amount of accounts)

3. GST Reporting module to generate the following in proper format:

- i. GST-03 tax return form shows amount to be submitted to government
- ii. GST Audit File (GAF) for CUSTOM auditing to ensure the tax return amount calculate accurately

4. Cash Flow analysis module

- i. Prediction of cash flow
- ii. Projection of cash flow

5. User account management module

- i. Maintain GST tax code for products
- ii. Company Profile Maintenance (Accounting Setup)
- iii. GST Taxation Period

6. Bad debts module

- i. Purchase bad debts
- ii. Sales bad debts

1.5 Impact, significance and contribution of the project

The contribution of the project is providing cash flow analysis and bad debts analysis modules. The cash flow analysis module focuses on calculating out the cash flow from operating activities regarding to GST, project the cash flow statement, prediction of cash flow. The prediction of cash flow enables to monitor the purchases and sales volume in order to have healthy cash flow.

For the bad debts analysis, it can analyze on the purchase bad debts on unpaid invoices and sales bad debts. It will show the upcoming unpaid invoices and unpaid invoices for purchases and sales from the selected range of date. Besides that, the bad debts analysis enables to collect those unpaid bad debts after 6 months. It helps the company to reduce the bad debts relief and bad cash flow activities.

Chapter 2: Literature Reviews

2.1 Literature Review 1 – 3A Accounting System

2.1 3A Accounting System

3A Accounting system designed for business critical application which helps customers to have computerised accounting system and links to GST. The system targeted for small & medium-sized enterprises, government departments and public listed companies (CTE, 2014).

2.1.1 Strengths of the solutions

The strength of 3A Accounting system provides real time posting of data in all modules so as integrates all modules together. It enables automatic posting of general ledger and update the chart of accounts in real-time.

2.1.2 No Double Entry

3A Accounting system is designed for debtors and creditors which do not required the double entry of it. It will automatically post and correct the debit and credit accounts for each transaction.

2.1.3 Customization of designer for printing

3A Accounting system allows for customization in format designer such as invoices, receipts, statement of account, debit notes, credit notes, payment, journal ledgers and transactions. Users can design the form according to the company's preference.

2.1.4 Template

3A Accounting system provides template for all transaction types in order for easy copy & paste function that can reduce time in entering the same data for daily transactions.

2.1.5 Weaknesses / Limitations of the solutions

3A Accounting system does not provide the functions of cash flow prediction and bad debts analysis. The system does not allow users to predict on the cash flow from operating activities. Meanwhile, it does not provide detailed bad debts on projecting the upcoming and unpaid invoices.

2.2 Literature Review 2 – MYOB Accounting & MYOB Premier

2.2 MYOB Accounting & MYOB Premier

MYOB Accounting & MYOB Premier have been approved and listed as Malaysian GST accounting compliance software system. It fulfils all the needs as providing accounting software solution of GST calculation for companies.

2.2.1 Strengths of the solutions

MYOB Accounting software has designed few features that help users meet with the government GST obligation into their businesses

2.2.2 MYOB Reports

MYOB provides GST Audit File reports, GST tax return reports, and GST purchase and supply reports in the accounting system. Besides that, it also provides several inbuilt reports for users to identify potential problem areas such as:

✓ **Exception report**

A report shows all transactions if user entered tax codes which are different from default tax code and no tax code entered in the transaction.

✓ **Tax reconciliation report**

A report that compares the tax charged for the period with the amounts in the ledger accounts.

✓ **Listing of tax charged report**

A report that displays tax amount charged by supplier and charged to customer.

In additional, MYOB Accounting also provides cash flow report that helps users to keep track of Input Tax paid and Output Tax collected in business activities. It is important to

provide cash flow report that avoids the submission of wrong amount to government (MYOB 2015).

2.2.3 GST Tax Codes

MYOB Accounting software provides users with GST tax code that set by Malaysia CUSTOMS department. Those tax codes are accurate and provide description for users on which code should be selected for particular product or item. The particular product or item will then linked to the selected GST tax code and calculate the GST amount according to the tax code. Besides that, it has default tax code for customer's supplier and customer and set automatically.

2.2.4 GST Tax Invoices

MYOB Accounting software provides all relevant fields required for creating tax invoices followed the CUSTOMS regulations. It ensures the correct format of the tax invoices are generated and issued. Moreover, users can also customize the format of the tax invoices according to their needs, for example, users can change the place of displaying company logo, address and contact information.

2.2.5 Customization

MYOB Accounting software does provide user convenience in customizing the forms, reports, fonts, heading, company logo, data fields and so forth as they wanted to. It allows the users to change the accounting system outputs to be more flexible and deal to their business environment.

2.2.6 Weaknesses / Limitations of the solutions

Although MYOB does provide cash flow statement of the business activities, it does not allow for prediction of cash flow and analysis of cash flow statement from operating activities. Moreover, it also does not provide detailed analysis on bad debts for purchases and sales.

2.3 Literature Review 3 – Sage 50 2015

2.3 Sage 50 2015

Sage UBS is the most popular accounting software in Malaysia and suitable for SMEs in handling all accounting transaction. Sage 50 is new generation accounting software from Sage UBS. It is improved version to the updated requirements for Malaysia GST feature (Sage 50, 2015).

2.3.1 Strengths of the solutions

Sage 50 provides necessary solutions and processes in order to compliance with GST accounting for the company. All the processes in the Sage 50 accounting software fulfil all the necessary steps from recording GST, charging GST amounts, provide necessary GST reports, and using appropriate GST Tax Code for companies.

2.3.2 GST Report

Sage 50 provides four types of reports such as tax report, purchase and supply report, GST return report, and GST Audit File for review. Figure 2.3.2A shows the sample of purchase and supply report generated by Sage 50. All of these four reports allow users to choose the specific date for review, transaction type and tax code. This provides users with convenience and flexibility in reviewing the report they wanted to. It avoid from displaying all unrelated or unneeded information on the report instead users free to choose what kind of information should be displayed on the report.

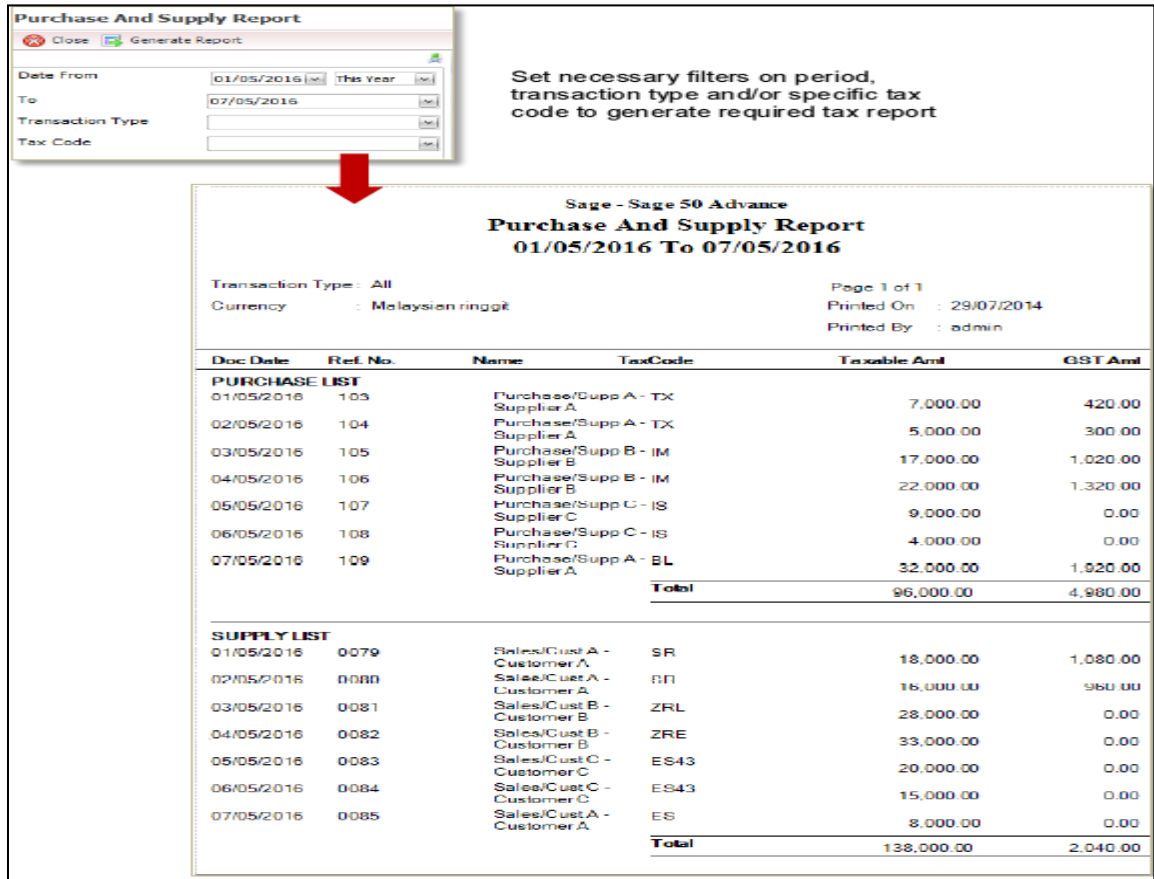


Figure 2.3.2A : Sample of Purchase and Supply Report (Sage 50, 2014)

2.3.3 GST Tax Codes Maintenance

Users required setting up the purchase and supplying GST tax code for each product within the company. This step needed to set correctly in order for further recording accurate GST accounting for the company. Users can select the appropriate GST tax code to be applied to each item product for the business activities.

2.3.4 Reclaim Input Tax Credit

Sage 50 allows for reclaim the input tax credit from CUSTOMS department. Some product items are claimable for GST Input Tax Credit charged, therefore, Sage 50 provides users the form in claiming the amount of input tax credit to CUSTOMS department.

2.3.5 GST Tax Invoices

Sage 50 provides a detailed tax invoices for both supply and purchase item for a company. It listed all detailed information such as product, description, quantity, amount, unit price, discount, GST inclusive amount, GST exclusive amount, GST tax code, total GST amount and so forth. Figure 2.3.5A shows the sample of tax invoice generated by Sage 50. Users can get more information from the detailed tax invoice and provide the accuracy data and avoiding mistake will be made in each transaction.

Joe's Bikes Enterprise(123456) No 8, Jalan Cheas., Cheras, 50088, Kuala Lumpur, Wilayah Persekutuan, Malaysia TEL : +60-3-40410001 FAX : +60-3-40410002 (GST Reg No : GST1001)										
STAR BEST SDN BHD No 21, Jalan Telawi 88,, Bangsar Baru, Kuala Lumpur Wilayah Persekutuan, Malaysia TEL : +60-3-22830001 FAX : +60-3-22830003 A/C NO. : C0000001					TAX INVOICE No. : SI-00000017 Date : 15/11/2014 Terms : 60 DAYS Page : 1/1 Printed On : 15/08/2014 12:15:41 Printed By : admin					
No	Item	Description	Quantity	UOM	Unit Price	Disc Amt	Total Excl. GST	Tax Amt	Total Incl. GST	Tax Code
1	Bike-26-TORNADO	Bike 26/TORNADO	15	UNIT	7,140.00	0.00	107,100.00	6,426.00	113,526.00	SR
2	Bike-26-TYPHOON	Bike 26/TYPHOON	15	UNIT	7,320.00	0.00	109,800.00	6,588.00	116,388.00	SR
MALAYSIAN RINGGIT : TWO HUNDRED AND TWENTY-NINE THOUSAND NINE HUNDRED AND FOURTEEN ONLY										
							SUB Total 216900.00 Total Discount 0.00 Total Excl. GST 216900.00 Add GST 13014.00 Rounding Adjustment 0.00 Total Payable incl. GST (MYR) 229914.00			
GST Summary		Amount			Tax					
SR @ 6.00%		216900.00			13014.00					
AUTHORISED SIGNATURE(S)					RECEIVED BY					

Figure 2.3.5A: Sample of Tax Invoice (Sage 50, 2014)

2.3.6 Weaknesses / Limitations of the solutions

Sage 50 2015 does not provide the cash flow and bad debts detailed analysis as it shows only the cash flow statements from the business activities. Besides that, it does not show detailed bad debts and alert for collect bad debts after 6 months and upcoming unpaid invoices.

2.4 Literature Review 4 - QNE Accounting Software

2.4 QNE Accounting Software

QNE Accounting Software is designed specially to meet the business requirements and local regulations for the SMEs in Malaysia. It compliances with GST and approved by CUSTOMS department as validated accounting software for companies (QNE, 2014).

2.4.1 Strengths of the solutions

QNE Accounting software provides real-time processing and handling huge amount data of daily transactions for the businesses. All modules are integrated so that the information flow within the business is updated and accurate. The database recovery provides user contingency plan for recovery from any disaster plan such as server down, natural disaster, hacking and so forth. High performance of the accounting software generates faster response time in handling accounting transactions (QNE, 2014).

2.4.2 GST Reports

The reports provided in QNE Accounting software is sufficient and allows for customization to choose the appearance of the report format. Besides that, QNE Accounting software provides GST audit file report, GST tax return report to be submitted to government and GST purchase and supply reports. All these reports are necessary to be included in accounting software to compliance with the GST rules and regulations.

2.4.3 GST Tax Codes

Users of QNE Accounting software can add new tax code, description, type, rate and posting account for the company. Users are freely to maintain the GST tax code in the system. Users only have to add those tax codes they needed for their business activities.

2.4.4 Reclaim GST Input Tax Credit

QNE Accounting software allows users to reclaim GST input tax credit whenever the item is refundable under the GST regulations. Users only have to select those refundable items into the form and then it will prepare for submit to the CUSTOMS department to claim back the input tax paid for suppliers.

2.4.5 GST Tax Invoices

QNE Accounting software provide feature in generating tax invoices for purchase and supply processes. Users can key in all the data related for the tax invoice and the final tax invoice will be generated for report or issue to customers.

2.4.6 Customization

Customizations allowed in the accounting system that users can customize the format and appearance of the outputs. QNE Accounting software provides default format of appearance of output will be displayed on the screen. However, users can freely customize it according to their preferences, business environment and needs.

2.4.7 Weaknesses of the solutions

The QNE Accounting Software does not provide cash flow analysis and prediction of the business operating activities. Besides that, it also does not provide bad debts alert feature that projecting the bad debts on purchases and sales in order for users to collect and monitor bad debts in the business operation.

2.5 Comparison Table Between 4 Accounting Software

Functions	3A Accounting Software	MYOB Accounting & MYOB Premier	Sage 50 2015	QNE Accounting Software
GST Reports	<ul style="list-style-type: none"> ✓ GST Audit File ✓ GST-03 Tax Return Report 	<ul style="list-style-type: none"> ✓ GST-03 Tax Return Report ✓ Cash Flow Report ✓ Exception Report ✓ Tax Reconciliation Report ✓ GST Audit File ✓ Purchase & Supply Tax Report 	<ul style="list-style-type: none"> ✓ Tax Report ✓ Purchase & Supply Tax Report ✓ GST Audit File ✓ GST-03 Tax Return Report 	<ul style="list-style-type: none"> ✓ Purchase & Supply Tax Report ✓ GST Audit File ✓ GST-03 Tax Return Report
Tax Invoices	Detailed, customizable	Detailed, customizable	Detailed	Detailed, customizable
GST reclaim Input Tax Credit	Yes	Yes	Yes	Yes
Tax Code Maintenance	Yes	Yes	Yes	Yes
Cash flow analysis & prediction	Limited, no cash flow prediction	Yes, no cash flow prediction	Yes	Yes, no cash flow prediction
Bad Debts analysis	Limited, no detailed bad debts	Limited, no detailed bad debts	Limited, no detailed bad debts	Limited, no detailed bad debts

Table 2.5.1 Comparison Table Between 4 Accounting Software

2.6 Fact Finding

In order to make sure the proposed project system works well for Malaysian Retailer company, the analysis and understanding of GST methods and implementation in accounting system needed to be further well understood. Therefore, the fact finding for this project will review on the existing system manuals on how to implement the GST into the accounting system and make effects to the business operation. The review manual is from Mr Accounting software on learning how to submit GST-03 form and make GST payment in the accounting system. The manual helps to understand how to deal with GST and accounting works from system perspective (Mr Accounting, 2016).

Due to the newly implementation of GST in Malaysia, it does affect many companies operation and business in taxing the GST to consumers, pay tax to suppliers and pay the tax to the government department. Besides that, the research of different GST tax codes and the policies of GST also necessary before developing the project. The full and deep understanding of GST knowledge are needed in order to prevent making error submission of GST to government department. Thus, research on CUSTOM department website about the GST and different methods of GST help to understand on the targeted business activity for the project. The procedures before and after submission of GST also does affect the usual accounting system works in the past.

Moreover, the working of cash flow and prediction of it will be furthered analysis and understand on how to generate it through the learning of financial accounting. The knowledge and understanding of cash flow needed before hands on the make it as system.

Chapter 3: Proposed Method / Approach

3.1 Design Specifications

3.1.1 Methodology

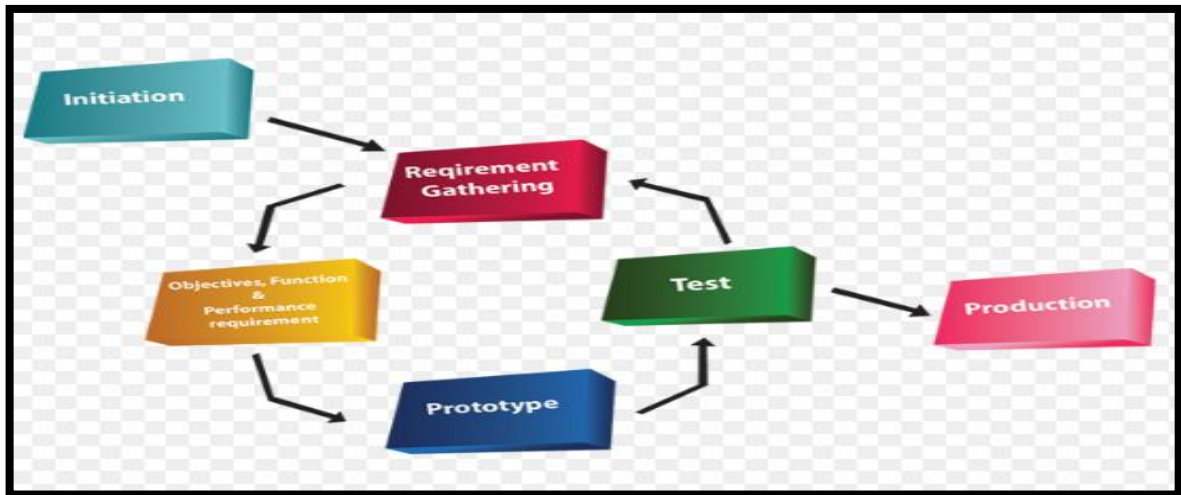


Figure 3.1.1 : Six phases in Evolutionary Prototyping Methodology (SlideShare, 2012)

The methodology for developing the GST Accounting System is using Evolutionary Prototyping together with Incremental Prototype. The combination of evolutionary and incremental prototype is to develop the system incrementally and refine the prototype of the system until it meets the final requirements and specifications. The evolutionary prototype focused on building the final system with minimal requirements and functionalities in the beginning. It will make changes until to the further development of the finalized entire system for the target users. The requirements will be added or changed as well understood requirements produced and converted it into final system (TeachICT, n.d.).

The final product of the proposed system will be developed modules by modules separately and incrementally. Therefore, it allows for change requirements during the prototype phase and make iteration of the prototype until it meets the user requirements. Once the system prototype is agreed and finalized as meet with the requirements, the system prototype will be converted into the production of final system by integration of different modules together. There are 6 phases included in the Evolutionary Prototyping:-

1. Initiation

During the first phase before the developing the prototype of the system, it is needed to identify and gather the target users, usage of the system, procedures and methods, problems statements and motivation to develop the system. It is important to make sure the first phase is accurate in order to prevent the conflict between the system developments with the users' requirements.

2. Requirement Gathering

All though the requirements gathered at this phase are not finalized and accurate, the basic requirements will be gather and collect as needed to develop the GST Accounting System. During this phase, the general requirements of target users in using the system will be recorded as a guideline for developing the system prototype. However, the requirements can be changed after prototype produced to verify the correctness of the users' requirements.

3. Objectives, Function & Performance Requirements

After the gathered the users' requirements, the objectives, function and performance requirements of the system needed to be identify in order to easier the production of system prototype. Those functions necessary to have in the proposed system will be recorded down and developers will produce the prototype accordingly. Meanwhile, the objectives, functions and performance requirements of the proposed system can be changed and enhanced after the prototype.

4. Prototype

After gathered the basic and initial requirements, the developing of the system prototype will be started. System prototype will develop according to the recorded information and requirement. The prototype phase is easier for develop and user to look at the system prototype and make necessary modifications and enhancements. Enhancement of system prototypes will be created during this phase and it will change according to the updated requirements. At the same time, each module will also develop stage by stage in order to make sure the requirements are met. The changes of the prototype will be made whenever the prototypes are unsatisfactory or insufficient. The system prototype will make further iteration until it meets the updated requirements.

5. Test

After completed the system prototypes, it will start with testing those prototypes in order to verify the correctness and accurate of the produced prototypes in whether meet the real users' requirements. However, if the requirements are not meet and change requirements added, the process will start over from the phase 2 to phase 5 until the system prototype meets the real and updated requirements. Thus, the prototype and testing phase will keep going to identify and convert the requirements and information gathered into system view for clarify the accuracy of the requirements. Besides that, it is also flexible to allow for change requirements if necessary and refine the requirements, objectives, prototype and test it all over again until it meets with the change requirements. The finalized system prototype will be converted into the final product of the system.

6. Production

Once the testing phase has been finalized and met the requirements, the production of the final system will be started to convert all system prototypes and integrates all modules together into one system.

3.1.2 Pros and Cons using Evolutionary Prototyping Model (TutorialPoints, 2016)

Pros	Cons
✓ Good for change requirements	✓ Unable to identify real requirements at the beginning
✓ Capable for make iteration of prototype	
✓ Easy to go back to previous phase	✓ Project scope and requirements may expand
✓ Final system more likely to meet the requirements	
✓ Errors can be detected early and easy to make changes	✓ Inadequate requirement and problem analysis
✓ Better understanding of system being developed	

Table 3.1.2: Pros and Cons of Evolutionary Prototype Model

3.1.3 Technologies (Tools) involved

The technology involved in developing Goods and Services Accounting software will be using Microsoft Visual Studio in constructing the programming part whereas the Microsoft SQL Server 2008 will be used in storing database collected from daily transactions in the system.

The programming language needed to develop this project is using C# and SQL for storing data into the SQL server. Besides that, the integration of C# with database is needed in order to store and find records in database for the system.

For the PDF generation of document in the system, iTextSharp component library will be added to the Microsoft Visual Studio.

Operating System: window 7

Memory Space: at least 4GB Ram

Software: Microsoft Visual Studio 2010, Microsoft SQL Server 2008

Programming Languages: C#, SQL Server

3.2 System Design

3.2.1 Logical Design (Data Dictionary)

In the logical design of the database tables, there are 24 tables necessary for this project. Each of the table responsible to store records on the related field and easier for later recall from the system. Below are the data dictionary for 24 database tables, each of the table will list out the data fields, type of data field, format, primary key / foreign key and range of the data field.

3.2.1a: Chart of Account

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Chart of Account	AccountID	Account ID	VARCHAR(10)	XXXXXXXX	PK	-
	AccountName	Account Name	VARCHAR(50)	XXXXXXXX		-
	AccountType	Account Type	VARCHAR(30)	XXXXXXXX		-
	Amount	Total amount of the Account	DECIMAL(8,2)	99999999.99		-

Table 3.2.1a: Chart of Account

3.2.1b: GST Tax

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
GST_Tax	TaxCode	GST Tax Code	VARCHAR(6)	XXXXXXXX	PK	-
	TaxType	GST Tax Type	VARCHAR(8)	XXXXXXXX		PURCHASE / SALES
	Rate	GST Tax Rate (%)	NUMBER(2)	99		0 - 99
	Description	GST Tax Description	VARCHAR(80)	XXXXXXXX		-

Table 3.2.1b: GST_Tax

3.2.1c: Company Info

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Company Info	CGSTNo	Company GST No	VARCHAR(30)	XXXXXX	PK	-
	CompanyName	Company Name	VARCHAR(50)	XXXXXX		-
	RegistrationNo	Company Registration No	VARCHAR(50)	XXXXXX		-
	Address	Company Address	VARCHAR(80)	XXXXXXXX		-
	FinancialYear	Company Financial Year	NUMBER (4)	9999		-
	TaxablePeriod	Company GST Taxable Period	VARCHAR(8)	MONTHLY / QUATERLY		-
	SoftwareVersion	GST Software Version	VARCHAR(10)	X.X.X.XXX		-
	GAFVersion	GST Audit File Version	VARCHAR(10)	XX.XX.XX		-
	OwnerName	Name of the owner of the company	VARCHAR(80)	XXXXXXXXXX		-
	IC	IC no of the owner	VARCHAR(14)	999999-99-9999		-
	Logo	Company Logo	IMAGE			-

Table 3.2.1c: Company_Info

3.2.1d: Staff

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Staff	StaffID	Staff ID	VARCHAR(8)	STXXXXXX	PK	ST000001 – ST999999
	StaffName	Staff Name	VARCHAR(50)	XXXXXXXXXX		-
	StaffIC	Staff IC No	VARCHAR (14)	999999-99-9999		-
	Gender	Staff Gender	CHAR(1)	X		M / F
	Address	Staff Address	VARCHAR(80)	XXXXXX		-
	ContactNo	Staff Contact No	NUMBER(10)	9999999999		-
	Position	Staff Position	VARCHAR(50)	XXXXXXXXXX		-
	Department	Department	VARCHAR(50)	XXXXXXXXXX		-
	LoginID	Staff Login ID	VARCHAR(10)	XXXXXXXXXX		-
	Password	Login Password	VARCHAR(10)	*****		-
	Status	Staff Status	VARCHAR(30)	XXXXXXXXXX		Permanent / Resigned / Inactive
	RecoverQuestion	Password recovery question	VARCHAR(MAX)	XXXXXXXXXX		-
	RecoverAnswer	Password recovery answer	VARCHAR(MAX)	XXXXXXXXXX		-

Table 3.2.1d: Staff

3.2.1e: Supplier

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Supplier	SupplierID	Supplier ID	VARCHAR(8)	SXXXXXXXX	PK	S0000001 – S9999999
	SupplierName	Supplier Name	VARCHAR(50)	XXXXXXXX		-
	SupplierBRN	Supplier Business Registration No	VARCHAR(30)	XXXXXXXX		-
	SupplierGSTNo	Supplier GST No	VARCHAR(30)	XXXXXXXX		-
	BillAddress	Supplier Billing Address	VARCHAR(80)	XXXXXXXX		-
	ShipAddress	Supplier Shipping Address	VARCHAR(80)	XXXXXXXX		-
	Telephone	Supplier Telephone No	NUMBER(10)	9999999999		-
	Fax	Supplier Fax No	NUMBER(10)	9999999999		-
	Website	Supplier website	VARCHAR(50)	www.xx.com.my		-
	Email	Supplier email address	VARCHAR(50)	xxx@gmail.com		-
	CreditDays	Supplier credit days	NUMBER(2)	99		-
TaxCode	SupplierTaxCode	VARCHAR(6)	XXX	FK	-	

Table 3.2.1e: Supplier

3.2.1f: Customer

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Customer	CustomerID	Customer ID	VARCHAR(8)	CXXXXXXXX	PK	C0000001 – C999999
	CustomerName	Customer Name	VARCHAR(50)	XXXXXXXX		-
	CustomerGSTNo	Customer GST No	VARCHAR(30)	XXXXXXXX		-
	BillAddress	Customer Billing Address	VARCHAR(80)	XXXXXXXX		-
	ShipAddress	Customer Shipping Address	VARCHAR(80)	XXXXXXXX		-
	Telephone	Customer Telephone No	NUMBER(10)	9999999999		-
	Fax	Customer Fax No	NUMBER(10)	9999999999		-
	Website	Customer website	VARCHAR(50)	www.xx.com.my		-
	Email	Customer Email Address	VARCHAR(50)	xxx@gmail.com		-
	CreditDays	Customer Credit Days	NUMBER(2)	99		-
	TaxCode	Customer Tax Code	VARCHAR(6)	XXX	FK	-

Table 3.2.1f: Customer

3.2.1g: Journal

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Journal	JournalID	Journal ID	VARCHAR(8)	JXXXXXXXX	PK	J0000001 – J9999999
	Description	Description of the Journal	VARCHAR (80)	XXXXXXXX		-
	PostDate	Journal Posting Date	DATE	DDMMYYYY		-
	TransDate	Transaction Date	DATE	DDMMYYYY		-
	TotalAmount	Journal Total Amount	DECIMAL(8,2)	99999999.99		

Table 3.2.1g: Journal

3.2.1h: Journal Account (resolving many-to-many relationship)

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Journal_Account	JournalID	Journal ID	VARCHAR(8)	JXXXXXXXX	PK, FK1	J0000001 – J9999999
	AccountID	Account ID	VARCHAR(10)		PK,FK2	-
	CreditAmount	Credit Amount	DECIMAL(8,2)	99999999.99		-
	DebitAmount	Debit Amount	DECIMAL(8,2)	99999999.99		-
	TaxCode	GST Tax Code	VARCHAR(6)	XXXXXX	FK	-
	TaxInclusive	Inclusive of Tax	CHAR(1)	X		Y / N
	TaxAmount	Total Tax Amount	DECIMAL(8,2)	99999999.99		-
	TotalCreditAmount	Total Credit Amount	DECIMAL(8,2)	99999999.99		-
TotalDebitAmount	Total Debit Amount	DECIMAL(8,2)	99999999.99		-	

Table 3.2.1h: Journal Account

3.2.1i: Product

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Product	ProductID	Product ID	VARCHAR(8)	PXXXXXXXX	PK	P0000001 – P9999999
	SupplierID	Supplier ID	VARCHAR(8)	SXXXXXXXX	FK	S0000001 – S9999999
	ProductName	Product Name	VARCHAR(80)	XXXXXXXX		-
	Category	Product Category	VARCHAR(50)	XXXXXXXX		-
	PurchasePrice	Product purchase price	DECIMAL(5,2)	99999.99		-
	SellingPrice	Product selling price	DECIMAL(5,2)	99999.99		-
	Quantity	Quantity	NUMBER(3)	999		-
	ReorderLevel	Product Reorder Level	NUMBER(2)	99		-
	ReorderQuantity	Product Reorder Quantity	NUMBER(2)	99		-
	InputTaxCode	GST Tax Code for product purchase	VARCHAR(6)	XXXXXX	FK	-
	OutputTaxCode	GST Tax Code for product sales	VARCHAR(6)	XXXXXX	FK	-
	Discount	Product discount	NUMBER(2)	99		-

Table 3.2.1i: Product

3.2.1j: OnHold

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
OnHold	OHID	OnHold ID	VARCHAR(10)	OHXXXXXXXXXX	PK	OH00000001 – OH99999999
	OHDate	OnHold Date	DATE	DDMMYYYY		-
	Status	OnHold Status	VARCHAR(10)	XXXXXXXXXX		OnHold / Purchased

Table 3.2.1j: OnHold**3.2.1k: OnHold Items**

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
	OHID	OnHold ID	VARCHAR(10)	OHXXXXXXXXXX	PK, FK1	OH00000001 – OH99999999
	SOID	Sales Order ID	VARCHAR(10)	SOXXXXXXXXXX	PK, FK2	SO00000001 – SO99999999
	ProductID	Product ID	VARCHAR(8)	PXXXXXXXXX	PK, FK3	P0000001 – P9999999
	Quantity	Product Quantity	NUMBER(2)	99		-

Table 3.2.1k: OnHold Items

3.2.1i: Purchase Order

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Purchase Order	POID	Purchase Order ID	VARCHAR(10)	POXXXXXXXXXX	PK	PO00000001 – PO999999999
	SupplierID	Supplier ID	VARCHAR(8)	SXXXXXXXXXX	FK	S0000001 – S9999999
	GrossTotal	Gross Total include GST	DECIMAL(8,2)	99999999.99		-
	PODate	Purchase Order Date	DATE	DDMMYYYY		-
	CreditDay	Purchase Order Credit Days	NUMBER(2)	XX		-
	TaxPayAmount	Total Tax Payable Amount	DECIMAL(5,2)	99999.99		-
	Description	Purchase Description	VARCHAR(50)	XXXXXXXXXXXXXX		-

Table 3.2.1i: Purchase Order

3.2.1m: Purchase Invoice

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Purchase Invoice	PInvoiceID	Purchase Invoice ID	VARCHAR(10)	PIXXXXXXXXXX	PK	PI00000001 – PI999999999
	POID	Purchase Order ID	VARCHAR(8)	POXXXXXXXXXX	FK	PO00000001 – PO999999999
	InvoiceDate	Purchase Invoice Date	DATE	DDMMYYYY		-
	OrderDate	Purchase Date	DATE	DDMMYYYY		-
	DeliveryDate	Delivery Date	DATE	DDMMYYYY		-
	Status	Invoice Status	VARCHAR(10)	XXXXXXXXXXXXXX		Paid / Unpaid

Table 3.2.1m: Purchase Invoice

3.2.1n: Purchase Items

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Purchase_Items	POID	Purchase Order ID	VARCHAR(10)	POXXXXXXXXXX	PK,FK1	PO00000001 – PO999999999
	ProductID	Product ID	VARCHAR (8)	PXXXXXXXXXX	PK,FK2	P0000001 – P9999999
	Quantity	Quantity	NUMBER(3)	999		-
	Discount	Discount (%)	NUMBER (2)	99		-
	DiscountAmount	Total Discount Amount	DECIMAL(5,2)	99999.99		-
	TaxCode	GST Tax Code for purchase	VARCHAR(6)	XXXXXX	FK	-
	TaxAmount	Total Tax Amount	DECIMAL(5,2)	99999.99		-
	NetTotal	Net Total	DECIMAL(8,2)	99999999.99		-

Table 3.2.1n: Purchase_Items

3.2.1o: Sales Order

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Sales_Order	SOID	Sales Order ID	VARCHAR(10)	SOXXXXXXXX	PK	SO00000001 – SO99999999
	CustomerID	Customer ID	VARCHAR(8)	CXXXXXXXX	FK	C0000001 – C9999999
	GrossTotal	Gross Total include GST	DECIMAL(8,2)	99999999.99		-
	SODate	Sales Order Date	DATE	DDMMYYYY		-
	CreditDay	Sales Order Credit Days	NUMBER(2)	XX		-
	TaxPayAmount	Total Tax Payable Amount	DECIMAL(5,2)	99999.99		-
	Status	Sales Order Status	VARCHAR(10)	XXXXXXXXXX		-
	Type	Sales Order Type	VARCHAR(20)	XXXXXXXXXX		Walk-in / Non walk-in
	Description	Sales Order Description	VARCHAR(50)	XXXXXXXXXX		-

Table 3.2.1o: Sales Order

3.2.1p: Sales Invoice

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Sales_Invoice	SInvoiceID	Purchase Invoice ID	VARCHAR(10)	SIXXXXXXXXXX	PK	SI00000001 – SI99999999
	SOID	Purchase Order ID	VARCHAR(8)	SOXXXXXXXXXX	FK	SO00000001 – SO99999999
	InvoiceDate	Sales Invoice Date	DATE	DDMMYYYY		-
	OrderDate	Sales Date	DATE	DDMMYYYY		-
	DeliveryDate	Delivery Date	DATE	DDMMYYYY		-
	Status	Invoice Status	VARCHAR(10)	XXXXXXXXXX		Paid / Unpaid

Table 3.2.1p: Sales Invoice

3.2.1q: Sales Items

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Sales_Items	SOID	Sales Order ID	VARCHAR(10)	SOXXXXXXXXXX	PK, FK1	SO00000001 – SO99999999
	ProductID	Product ID	VARCHAR (8)	PXXXXXXXX	PK,FK2	P0000001 – P9999999
	Quantity	Quantity	NUMBER(3)	999		-
	Discount	Discount (%)	NUMBER (2)	99		-
	DiscountAmount	Total Discount Amount	DECIMAL(5,2)	99999.99		-
	TaxCode	GST Tax Code for sales	VARCHAR(6)	XXXXXX	FK	-
	TaxAmount	Total Tax Amount	DECIMAL(5,2)	99999.99		-
	NetTotal	Net Total	DECIMAL(8,2)	99999999.99		-

Table 3.2.1q: Sales Items

3.2.1r: Debit Note

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Debit_Note	DNID	Debit Note ID	VARCHAR(10)	DNXXXXXXXXXX	PK	DN00000001 – DN99999999
	InvoiceID	Invoice ID	VARCHAR(10)	PIXXXXXXXXXX / SIXXXXXXXXXX	FK	PI00000001 – PI99999999 / SI00000001 – SI99999999
	TaxPayAmount	Total Tax Payable Amount	DECIMAL(5,2)	99999.99		-
	GrossTotal	Total Amount	DECIMAL(8,2)	99999999.99		-
	Remark	Debit Note Reason	VARCHAR(50)	XXXXXXXXXX		-
	DNDate	Debit Note Date	DATE	DDMMYYYY		-
	Status	Debit Note Status	VARCHAR (50)	XXXXXXXXXX		DRAFT / SENT / REJECTED
	Type	Debit Note Type	VARCHAR(10)	XXXXXXXXXX		Purchase / Sales

Table 3.2.1r: Debit Note

3.2.1s: Credit Note

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Credit_Note	CNID	Credit Note ID	VARCHAR(10)	CNXXXXXXXXXX	PK	CN00000001 – CN99999999
	InvoiceID	Invoice ID	VARCHAR(10)	PIXXXXXXXXXX / SIXXXXXXXXXX	FK	PI00000001 – PI99999999 / SI00000001 – SI99999999
	TaxPayAmount	Total Tax Payable Amount	DECIMAL(5,2)	99999.99		-
	GrossTotal	Total Amount	DECIMAL(8,2)	99999999.99		-
	Remark	Credit Note Reason	VARCHAR(50)	XXXXXXXXXX		-
	CNDate	Credit Note Date	DATE	DDMMYYYY		-
	Status	Credit Note Status	VARCHAR (50)	XXXXXXXXXX		DRAFT / SENT
	Type	Credit Note Type	VARCHAR(10)	XXXXXXXXXX		Purchase / Sales

Table 3.2.1s: Credit Note

3.2.1t: NoteItems

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
NoteItems	NoteID	Note ID	VARCHAR(10)	XXXXXXXXXX	PK, FK1	CN00000001 – CN99999999 / DN00000001 – DN99999999
	ProductID	Product ID	VARCHAR (8)	PXXXXXXX	PK, FK2	P0000001 – P9999999
	Quantity	Quantity	NUMBER(3)	999		-
	TaxCode	GST Tax Code	VARCHAR(6)	XXXXXX	FK	-
	TaxAmount	Total Tax Amount	DECIMAL(5,2)	99999.99		-
	NetTotal	Net Total	DECIMAL(8,2)	99999999.99		-

Table 3.2.1t: NoteItems

3.2.1u: Payment

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Payment	PaymentID	Payment ID	VARCHAR(10)	PXXXXXXXXXX	PK	PA00000001 – PA99999999
	FromAccount	Account ID	VARCHAR(10)	XXXXXXXXXX	FK	-
	ToAccount	Account ID	VARCHAR(10)	XXXXXXXXXX	FK	-
	Description	Payment Description	VARCHAR(50)	XXXXXXXXXXXX		-
	PaymentType	Payment Type	VARCHAR (20)	XXXXXXXXXX		-
	ChequeNo	Cheque No	VARCHAR(10)	XXXXXXXXXX		-
	Change	Change Amount	DECIMAL(5,2)	99999.99		-
	GrossTotal	Gross Total include GST	DECIMAL(8,2)	99999999.99		-
	PaymentDate	Credit Note Date	DATE	DDMMYYYY		-
	Type	Payment Type	VARCHAR(10)	XXXXXXXXXX		-

Table 3.2.1u: Payment

3.2.1v: Payment Items

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
Payment _Items	PaymentID	Payment ID	VARCHAR(10)	PXXXXXXXXX	PK	PA00000001 – PA99999999
	AccountID	Account ID	VARCHAR(10)	XXXXXXXXXX	FK	-
	Description	Payment Description	VARCHAR(50)	XXXXXXXXXXXX		-
	TaxCode	GST Tax Code	VARCHAR(6)	XXXXXX	FK	-
	TaxInclusive	Inclusive of Tax	CHAR(1)	X		Y / N
	TaxAmount	Total Tax Amount	DECIMAL(8,2)	99999999.99		-
	NetTotal	NetTotal	DECIMAL(8,2)	99999999.99		-
	GrossTotal	Gross Total include GST	DECIMAL(8,2)	99999999.99		-

Table 3.2.1v: Payment Items

3.2.1w: CashFlow

Table Name	Attribute Name	Contents	Type	Format	PK / FK	Range
CashFlow	CFID	Cash Flow ID	VARCHAR(10)	CFXXXXXXXXX	PK	CF00000001 – CF99999999
	CashCustomer	Cash Amount received from customer	DECIMAL(8,2)	99999999.99		-
	GSTCustomer	GST amount received from customer	DECIMAL(8,2)	99999999.99		-
	GSTSupplier	GST amount paid to supplier	DECIMAL(8,2)	99999999.99		-
	GSTGovernment	GST amount paid to government	DECIMAL(8,2)	99999999.99		-
	GSTRefund	GST refund amount	DECIMAL(8,2)	99999999.99		-
	CashFlow	Total cashflow amount	DECIMAL(8,2)	99999999.99		-
	Period	Cash Flow period	DATE	DDMM		-
	Year	Cash Flow year	YEAR	YYYY		-

Table 3.2.1w: CashFlow

3.2.2 Conceptual Design (Entity Relationship Diagram)

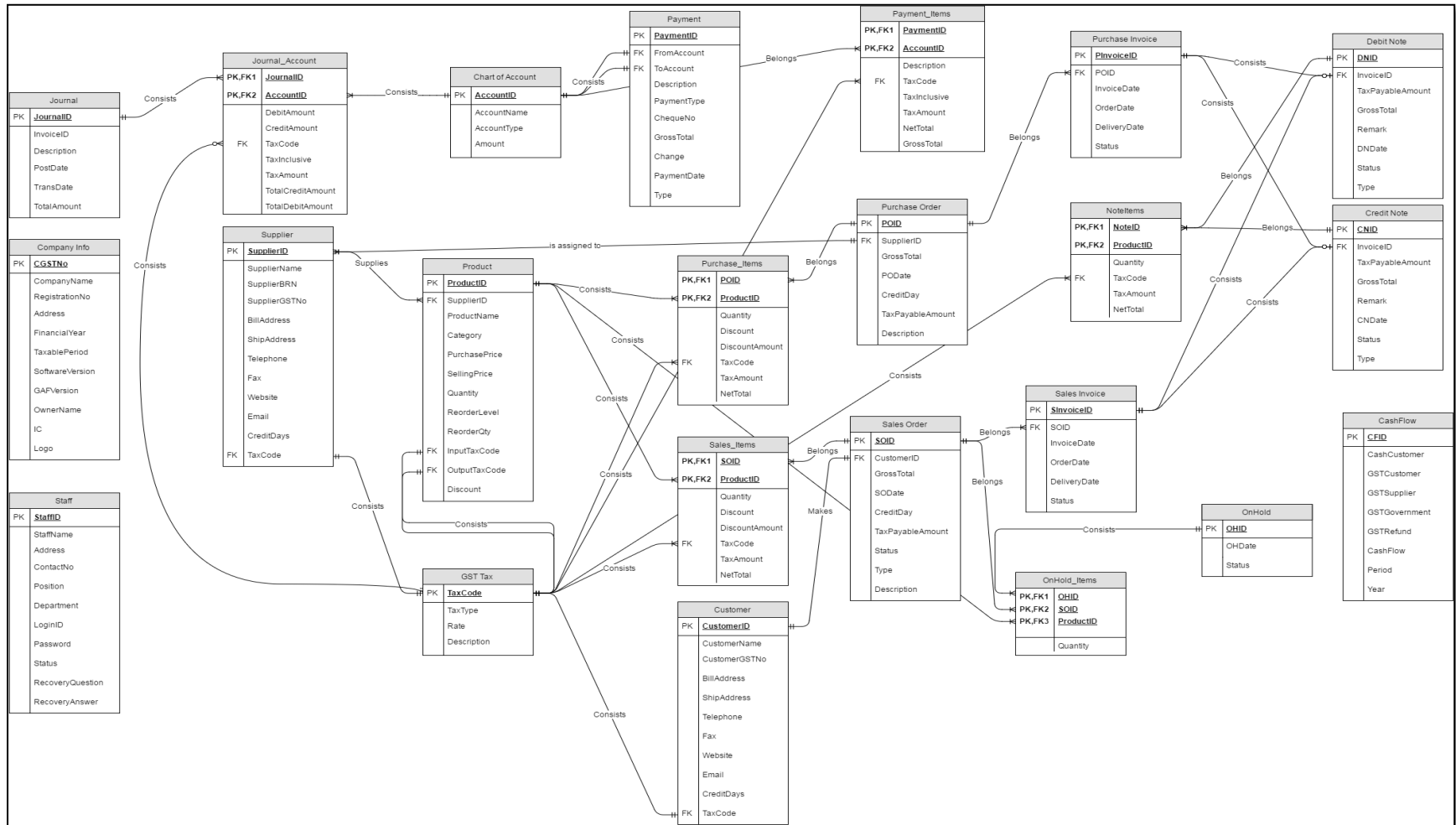


Diagram 3.2.2a Entity Relationship Diagram

3.2.2 Entity Relationship Diagram (ERD) Business Rules

I. Product

1. One supplier supplies one or many products.
2. Each product supplies by one and only one supplier.
3. One product consists of one and only one input tax code.
4. One input tax code can be found in one and only one product.
5. One product consists of one and only one output tax code.
6. One output tax code can be found in one and only one product.

II. Purchase Order

9. One purchase order is assigned to one and only one supplier.
10. One supplier can handle one or many purchase order.
11. One purchase order consists of one or many products.
12. Each product can be found in one and only one purchase order.
13. One purchase order consists of one or many tax code.
14. Each tax code can be found in one and only one purchase order.

III. Purchase Invoice

15. Each purchase invoice belongs to one and only one purchase order.
16. One purchase order can has one or many purchase invoice.
17. One purchase invoice consists of one or many products.
18. Each product can be found in one and only one purchase invoice.
19. One purchase invoice consists of one or many tax code.
20. Each tax code can be found in one and only one purchase invoice.

IV. Sales Order

21. One sales order makes by one and only one customer.
22. One customer can has one or many sales order.
23. One sales order consists of one or many products.
24. Each product can be found in one and only one sales order.
25. One sales order consists of one or many tax code.
26. Each tax code can be found in one and only one sales order.

V. Sales Invoice

- 27. Each sales invoice belongs to one and only one sales order.
- 28. One sales order can has one or many sales invoice.
- 29. One sales invoice consists of one or many products.
- 30. Each product can be found in one and only one sales invoice.
- 31. One sales invoice consists of one or many tax code.
- 32. Each tax code can be found in one and only one sales invoice.

VI. Journal

- 33. One journal account consists of one or many journals.
- 34. One journal account consists of one or many accounts.
- 36. Each account can be found in one
- 35. One journal consists of one or many tax code.
- 36. Each tax code can be found in one and only one journal.

VII. Payment

- 37. One payment consists of one or many account.
- 38. Each account can be found in one and only one payment.
- 39. One payment consists of one or many tax code.
- 40. Each tax code can be found in one and only one payment.

VIII. Debit Note

- 41. One debit note is belongs to one and only one invoice.
- 42. One invoice can be found in one and only one debit note.
- 43. One debit note consists of one or many products.
- 44. Each product can be found in one and only one debit note.
- 45. One debit note consists of one or many tax code.
- 46. One tax code can be found in one and only one debit note.

IX. Credit Note

- 47. One credit note is belongs to one and only one invoice.
- 48. One invoice can be found in one and only one credit note.
- 49. One credit note consists of one or many products.
- 50. Each product can be found in one and only one credit note.
- 51. One credit note consists of one or many tax code.
- 52. One tax code can be found in one and only one credit note.

X. OnHold

- 53. Each onhold belongs to one and only one sales order.
- 54. One sales order belongs to one or many onhold.
- 55. One onhold consists of one or many products.
- 56. Each product can be found in one or many onhold.

3.2.4 UML Diagrams

3.2.4a Use Case Diagram



Diagram 3.2.4a Use Case Diagram

3.2.4b Use Case Description

In the GST Accounting System, there are authorize for four types of users in using it such as accountant, accounting manager, sales staff and purchasing staff. Different role of users can perform different usage with the system.

For the accountant, they can maintain chart of account (COA), record journal entry, generate GST-03 form, claim input tax credit, make payment, generate GST Audit File (GAF) and record credit note. Accountant can add new account for the business and do so maintain it. Besides that, accountant can generate the GST-03 form in the system that to be submitted to CUSTOM department. The GAF file needed to be generated in order for CUSTOM department auditing the company accounting accuracy in reporting GST. All accounting works deal with GST can be done by accountant.

For the accounting manager, they can view GST cash flow, view accounting report, maintain company account information and maintain product information. Accounting manager can use the system in analyzing the accounting works with GST. The GST cash flow provides manager with the cash flow from operating activities that deal with GST and provide the net cash flow for the particular month / year.

For the sales staff, they can generate sales orders and receive debit note in the system. Sales staff will use the system to generate the sales order and sales invoice for customers. The invoices are important for GST accounting system that must fill in with necessary fields and issue to customers. Furthermore, sales staff may also receive debit note from customers to report on the received damaged goods and ask for returning money. When the debit note is fulfill the requirements and condition of return goods, sales staff will issue credit note to customer and accountant will update the accounting journal entry.

For the purchasing staff, they can generate purchase order and record purchase invoice in the system. Purchasing staff can purchase product from supplier and record received purchase invoice from supplier for accountant to make payment on it. However, purchasing staff will issue debit note to supplier for replace it if found any damaged goods.

3.2.5 Activity Diagrams

Accountant of the company will handle the following activities in the accounting system such as diagram 3.2.5a, 3.2.5b, 3.2.5c, 3.2.5d, 3.2.5e, 3.2.5f and 3.2.5g. In the accounting system, accountant can maintain chart of account (COA), record journal entry, generate GST-03 form, claim input tax credit, make payment, generate GST Audit File (GAF) and record credit note. Accountant has to login to the system before using it and the system will verify and restrict the usage of the system according to the role of user.

In diagram 3.2.5a, accountant can maintain chart of account (COA) which allows for maintain existing accounts information or add new account for the business. The system will then update the chart of account in the system so as the database of the system.

In diagram 3.2.5b, accountant can record the journal for transactions. Once accountant completed with recording the journal for transactions and posted to the system, the system will then save the journal entry and update to the database at the same time.

In diagram 3.2.5c, accountant can generate GST-03 form in the system. The system will then figure out those transactions related to GST and calculate the total amount to be submitted in GST-03 form for accountant. After the system calculated the total amount for paying GST amount to CUSTOM department, the system will fill up all necessary data field in GST-03 form and display to accountant.

In diagram 3.2.5d, accountant can record and make payment using the system. Accountant can make invoice payments and / or expense payments in the system. Accountant will fill up total amount to be paid in the payment and record it in the system. The system will then save the payment made and update the account database.

In diagram 3.2.5e, accountant can claim input tax credit using the system. The system will check for claimable input tax credit in the business. If there is exist of claimable input tax credit, the system will calculate the total amount to claim for GST refund. Next, the system will generate document for accountant to claim on GST refund. However, the system will inform accountant with no GST refund if there is no claimable input tax credit in the business.

Chapter 3: System Design

In diagram 3.2.5f, accountant can generate the GST Audit File (GAF) to government department for auditing the correctness of charging GST in the business. Accountant needed to set the date period of GAF in the system. The system will then list out all transactions included general ledgers, purchases and sales recorded in the system database and save it as text file.

In diagram 3.2.5g, accountant can record credit note to be sent to customers and / or sent by suppliers in the system. The system will update the chart of account whenever received / issued the credit note from suppliers and / or to customers.

The following activity diagrams show the steps involved in those activities can be performed by accountants.

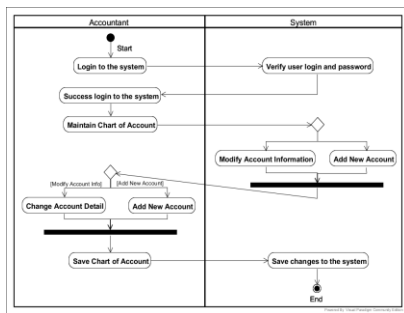


Diagram 3.2.5a: Maintain Chart of Account

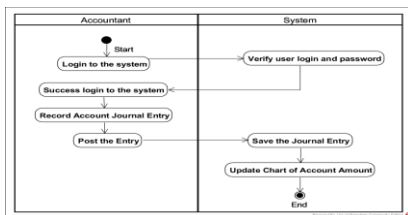


Diagram 3.2.5b: Record Journal Entry

Chapter 3: System Design

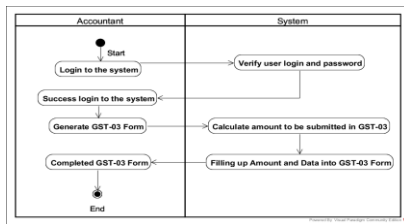


Diagram 3.2.5c: Generate GST-03 form

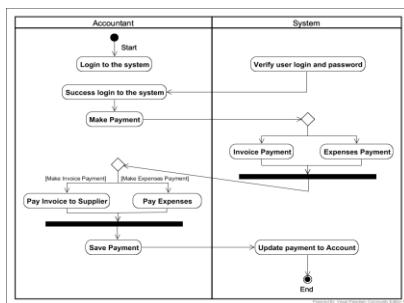


Diagram 3.2.5d: Make Payment

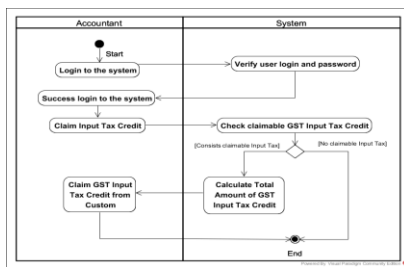


Diagram 3.2.5e: Claim Input Tax Credit

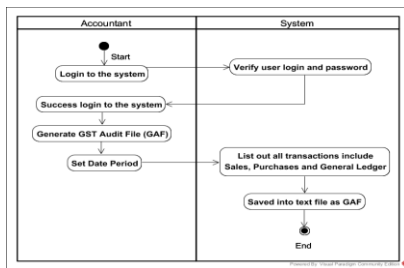


Diagram 3.2.5f: Generate GST Audit File (GAF)

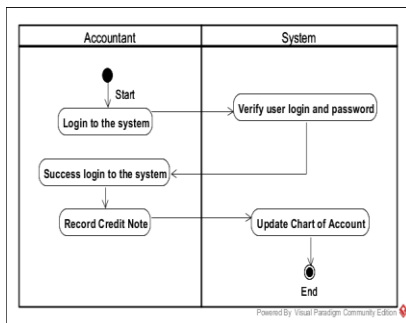


Diagram 3.2.5g: Record Credit Note

Accounting manager of the company will handle the following activities in the accounting system such as diagram 3.2.5h, 3.2.5i, 3.2.5j, and 3.2.5k. In the accounting system, accounting manager can view GST cash flow, view accounting report, maintain company account information and maintain product information. Accounting manager has to login to the system before using it and the system will verify and restrict the usage of the system according to the role of user.

In diagram 3.2.5h, accounting manager can view GST cash flow in the system. The system will calculate total cash flow from operating activities. Those cash flows from operating activities included purchases, sales, GST payment to government and GST refund from CUSTOM. The system will calculate those cash flows from operating activities and then generate the net cash flow from operating activities. Accounting manager can view on the cash flow statement to identify the health of cash flow in the business.

In diagram 3.2.5i, accounting manager can maintain company accounting information that related to the registration of GST for the business. Once accounting manager completed with maintaining the company accounting information, the system will save the record and update it to the database.

In diagram 3.2.5j, accounting manager can view on accounting report such as monthly report and quarterly report. The system will capture the type of accounting report request by accounting manager and generate the report with the help of stored database records.

In diagram, 3.2.5k, accounting manager can maintain product and / or add new product for business in the system. Accounting manager has to set industrial code, GST input tax code and GST output tax code for the newly added product in the system. Besides that, accounting manager can maintain the existing added products information. The system will then saves and update the product information to the database.

The following activity diagrams show the steps involved in those activities can be performed by accounting manager.

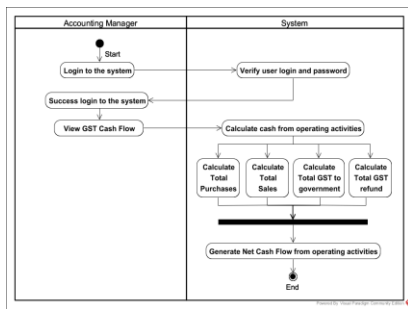


Diagram 3.2.5h: View GST Cash Flow

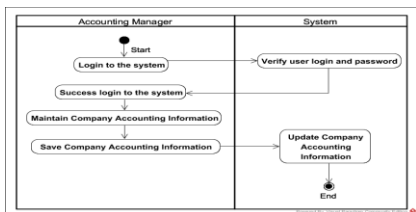


Diagram 3.2.5i: Maintain Company Accounting Information

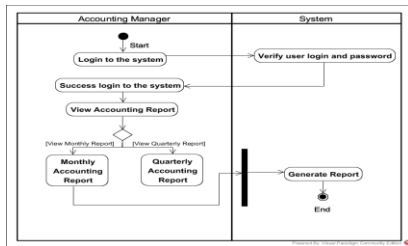


Diagram 3.2.5j: View Accounting Report

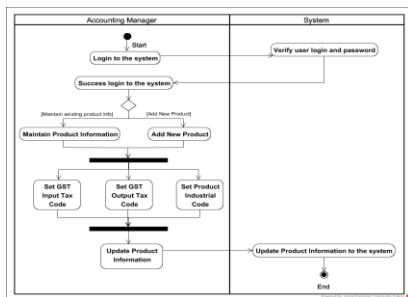


Diagram 3.2.5k: Maintain Product

Sales staff of the company will handle the following activities in the accounting system such as diagram 3.2.5l and 3.2.5m. In the accounting system, sales staff can generate sales order, generate sales invoice and record debit note. Sales staff has to login to the system before using it and the system will verify and restrict the usage of the system according to the role of user.

In diagram 3.2.5l, sales staff can generate the sales order for customers in the system. The sales staff will start at adding purchase items for customer. Once the sales staff confirmed the sales order for customer, the system will generate the sales order so as the sales invoice to be issued to customer. The system will save the sales record into the database.

In diagram 3.2.5m, sales staff can record debit note sent by customer. The system will check for the condition of issuing debit note. If the condition is acceptable, the system will generate credit note to customers. However, the system will reject the debit note if the condition of the debit note is unacceptable.

The following activity diagrams show the steps involved in those activities can be performed by sales staff.

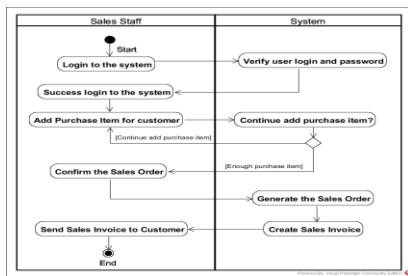


Diagram 3.2.5l: Generate Sales Order

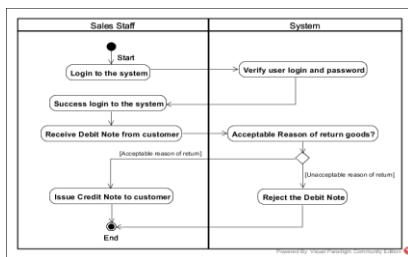


Diagram 3.2.5m: Record Debit Note

Purchasing staff of the company will handle the following activities in the accounting system such as diagram 3.2.5n and 3.2.5o. In the accounting system, purchasing staff can generate purchase order and record purchase invoice. Purchasing staff has to login to the system before using it and the system will verify and restrict the usage of the system according to the role of user.

In diagram 3.2.5n, purchasing staff can generate the purchase order for the company. The purchasing staff will start on selecting supplier for the purchase order. Next, purchasing staff will add purchase items into the purchase order. The system will then generate the purchase order once purchasing staff confirm the purchase.

In diagram 3.2.5o, purchasing staff can record purchase invoice received from suppliers. The purchasing staff will check for the goods condition and issue debit note when necessary. The system will then generate the debit note as needed and record the purchase invoice into the database.

The following activity diagrams show the steps involved in those activities can be performed by purchasing staff.

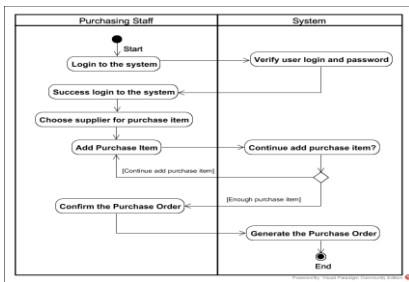


Diagram 3.2.5n: Generate Purchase Order

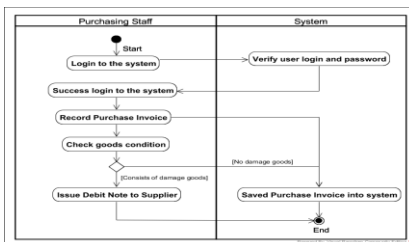


Diagram 3.2.5o: Record Purchase Invoice

3.2.6 Sequence Diagrams

Diagram 3.2.6a shows the sequence diagram of accounting manager request for GST Cash Flow analysis in the system. The system will calculate the amount of cash flow from operating activities and generate the net cash flow statement to accounting manager.

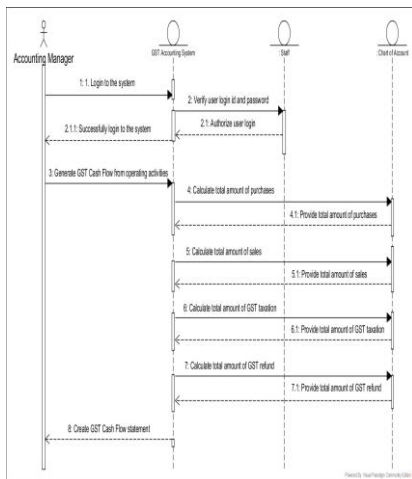


Diagram 3.2.6a: GST Cash Flow

Chapter 3: System Design

Diagram 3.2.6b shows the sequence diagram of accountant generate GST-03 form in the system. The system will calculate and selecting necessary data to be filled into the GST-03 form and display the form to accountant on the submission of GST Tax to CUSTOM.

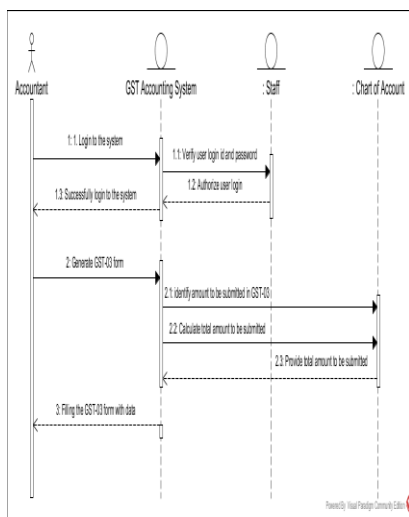


Diagram 3.2.6b: Generate GST-03 form

3.2.7 Class Diagram

In the class diagram, there are 11 classes needed for the project such as product, sales, purchase order, purchase invoice, payment debit note, credit note, chart of account, GST, reporting and journal entry.

The sales works as recording the sales order, generate sales invoice, calculate the total amount in the sales invoice and sales order and receive payment from customers.

The purchase order and purchase invoice deal with purchases in the company. It generates purchase order, record purchase invoice, calculate total amount in the purchase order, issue debit note when necessary and pay for the purchase invoice.

The product works as maintain product information, add new product and view on the product information. The debit note and credit note are for issuing return goods and claiming for recompense. The received credit note will update the chart of account amount and record the entry of journal.

The payment works as record payment, receive payment and make payment. The chart of account deals with maintains the chart of account, add new account and update the amount of the accounts. Journal entry records all transaction in the business and make reflects to the chart of account. It works to save journal entry and calculate total amount of the journal.

The GST deals with generate GST-03 form, claim GST refund, generate GST cash flow, maintain GST tax code and calculate GST amount. The reporting works with GST that generate accounting report regarding to the GST charged.



Diagram 3.2.7a Class Diagram

Chapter 4: User Interfaces

4.1 Login Form

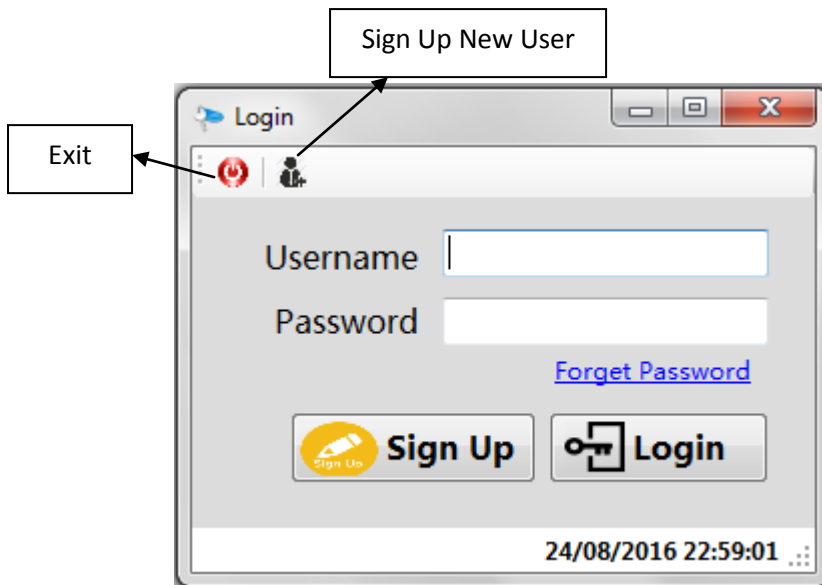


Figure 4.1.1: Login Form

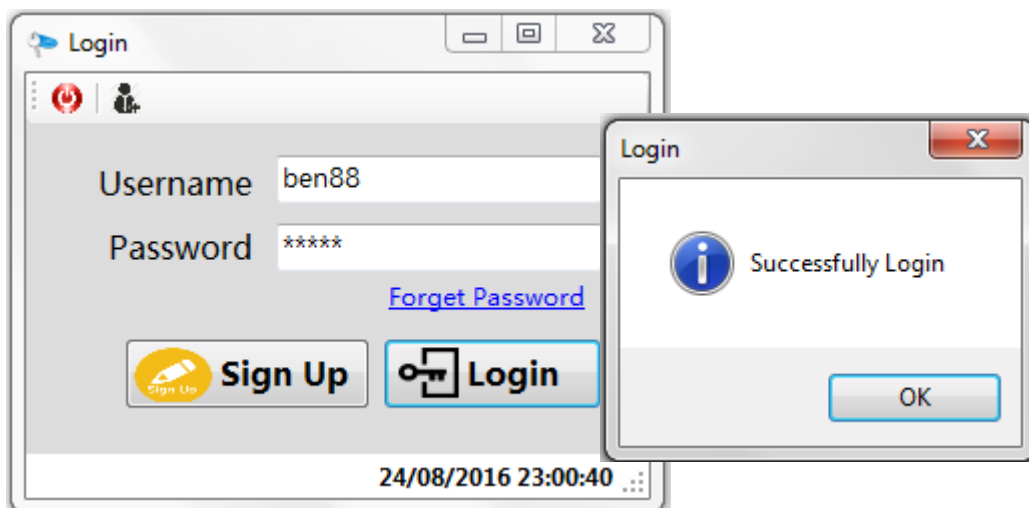


Figure 4.1.2: Successful Login Form

Login form allows for different users to login, sign up and password recovery.

4.2 Sign Up Form



Figure 4.2.1: Sign Up – Step 1

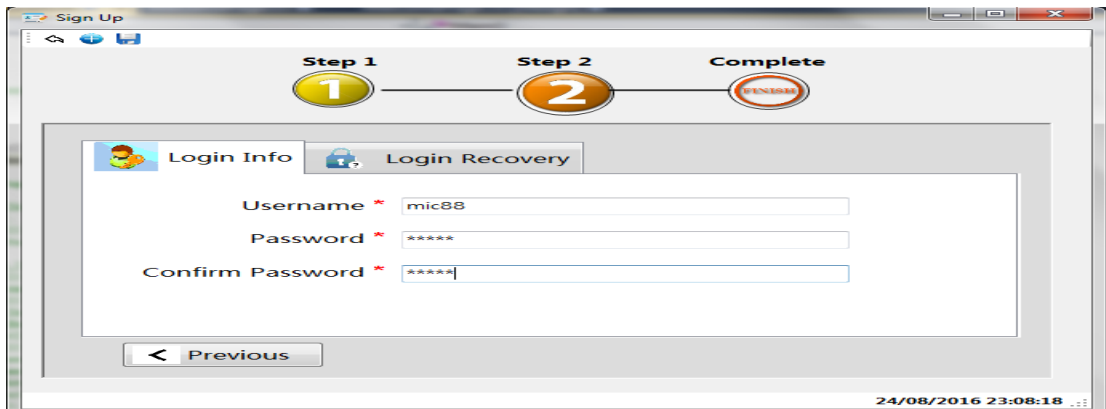


Figure 4.2.2: Sign Up – Step 2

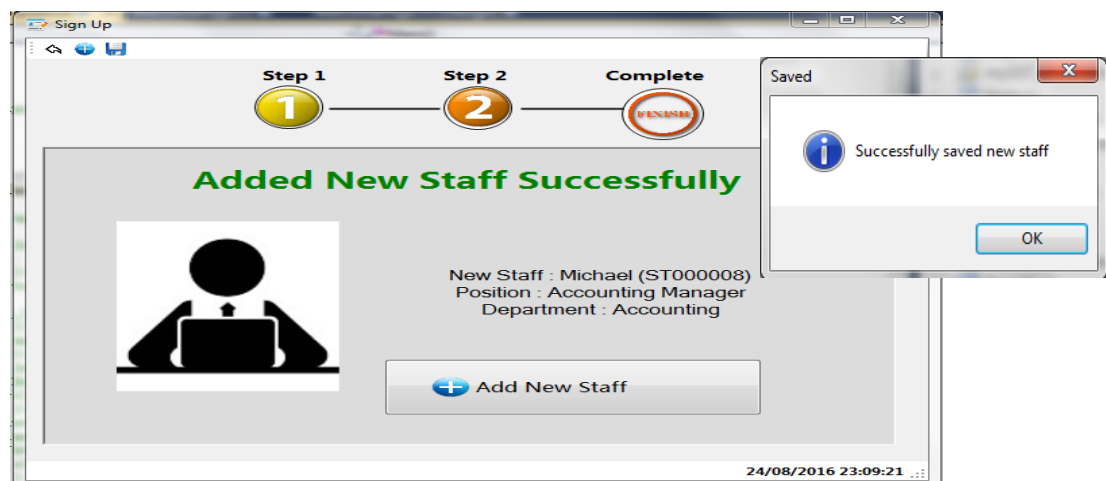


Figure 4.2.3: Sign Up – Finish

Sign up form for register new user, login ID, password and position into the system.

4.3 Welcome Page

Welcome page consists of 6 modules such as accounts, sales, purchase, product, GST and analysis. Each of the modules is being restricted for different position of user to use. For example, purchasing staff only can use purchase and product modules, accounting and accounting manager can use accounts, GST and analysis modules, sales staff can use sales module only.

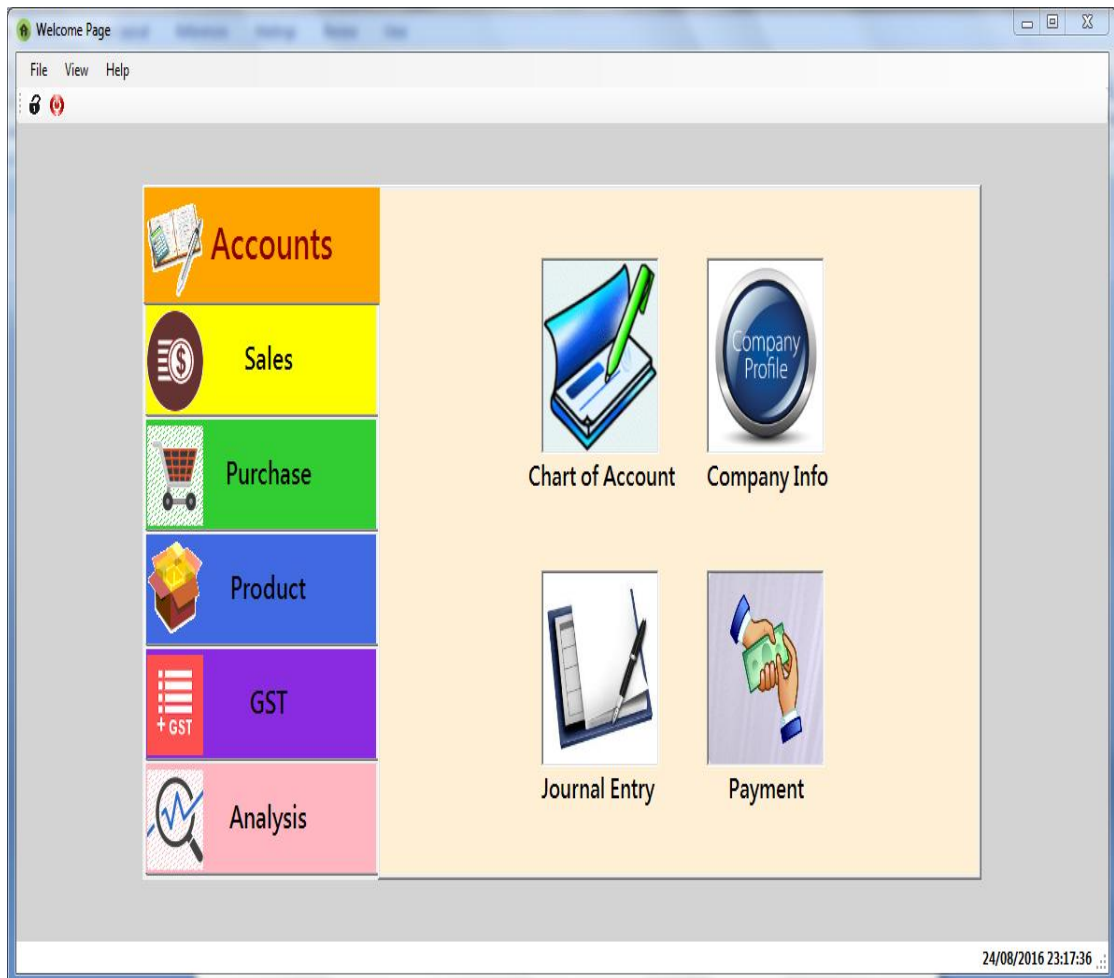


Figure 4.3.1: Welcome Page

4.4 Supplier

Figure 4.4.1 shows all the suppliers information and purchasing staff can search the supplier through the supplier name.

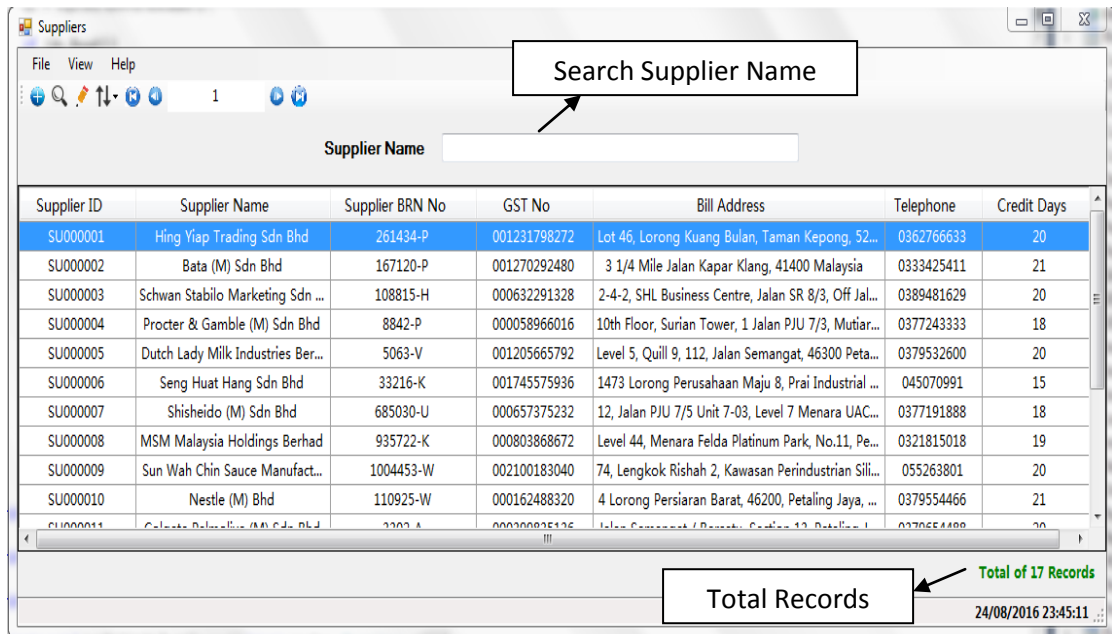


Figure 4.4.1: Supplier

Figure 4.4.2 shows the detailed supplier information.

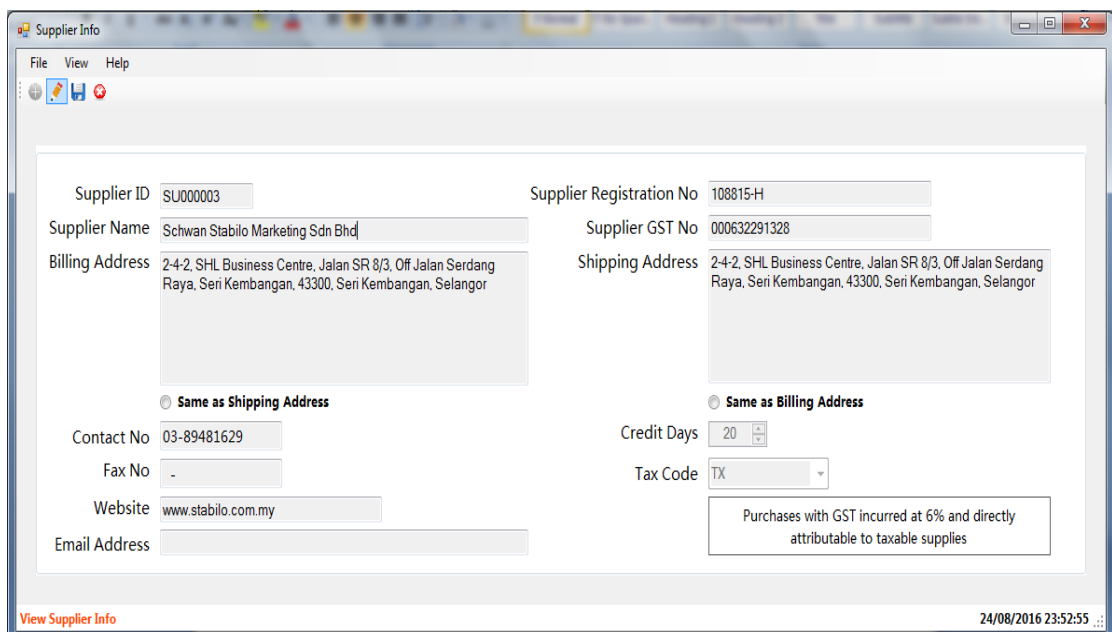


Figure 4.4.2: Supplier Info

4.5 Customer

Figure 4.5.1 shows all the customers information and sales staff can search the customer through the customer name.

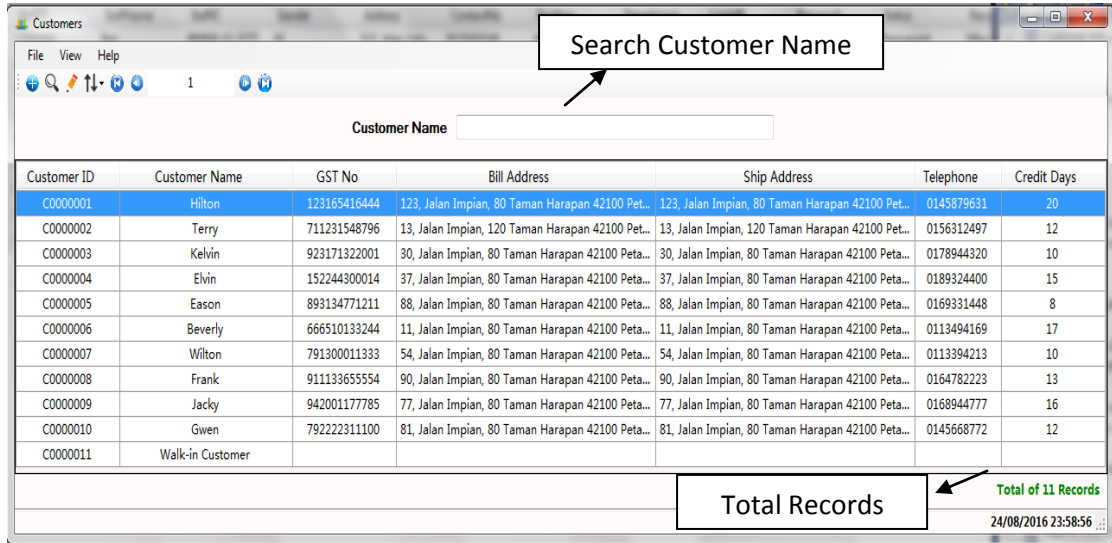


Figure 4.5.1: Customer

Figure 4.5.2 shows the detailed customer information.

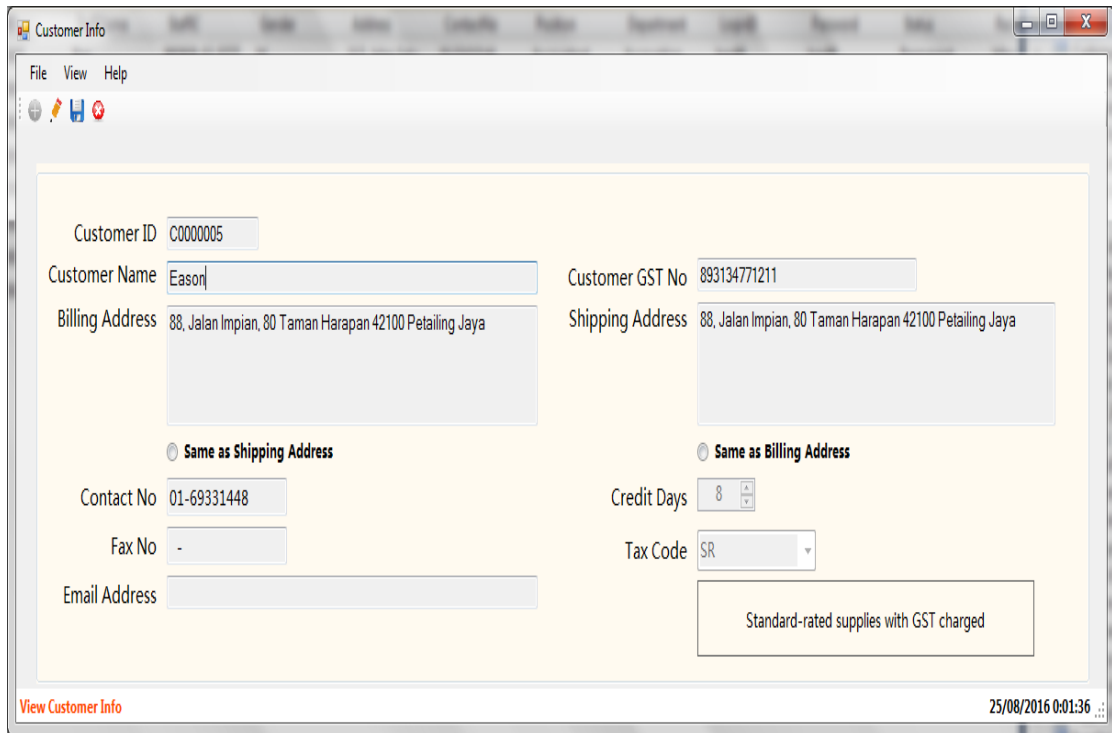


Figure 4.5.2: Customer Info

4.6 Product

Figure 4.6.1 shows all products information and purchasing staff can search product through enter product name.

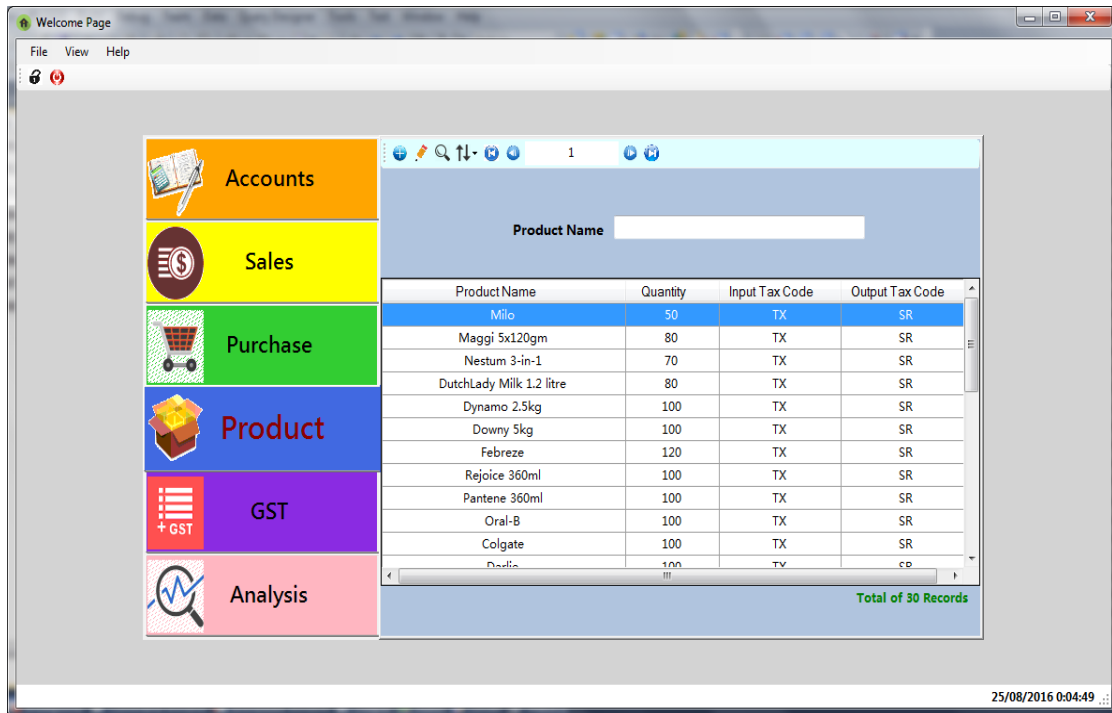


Figure 4.6.1: Product

Figure 4.6.2 shows the detailed product information

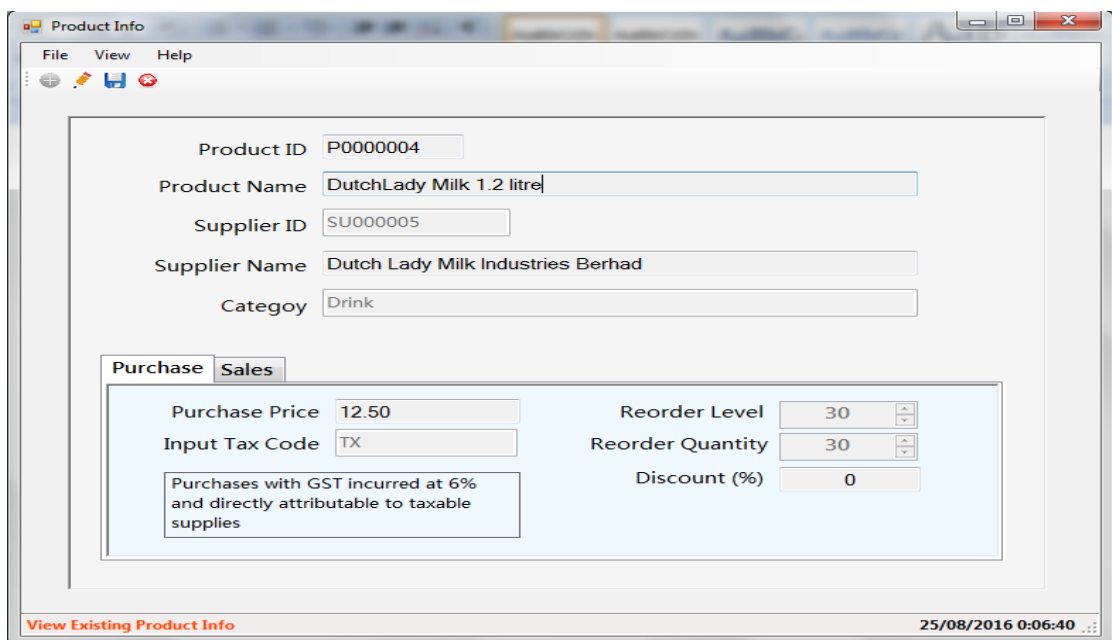


Figure 4.6.2: Product Info

4.7 Chart of Account

Figure 4.7.1 shows all accounts listed in chart of account. Accountants can edit and add account in this form.

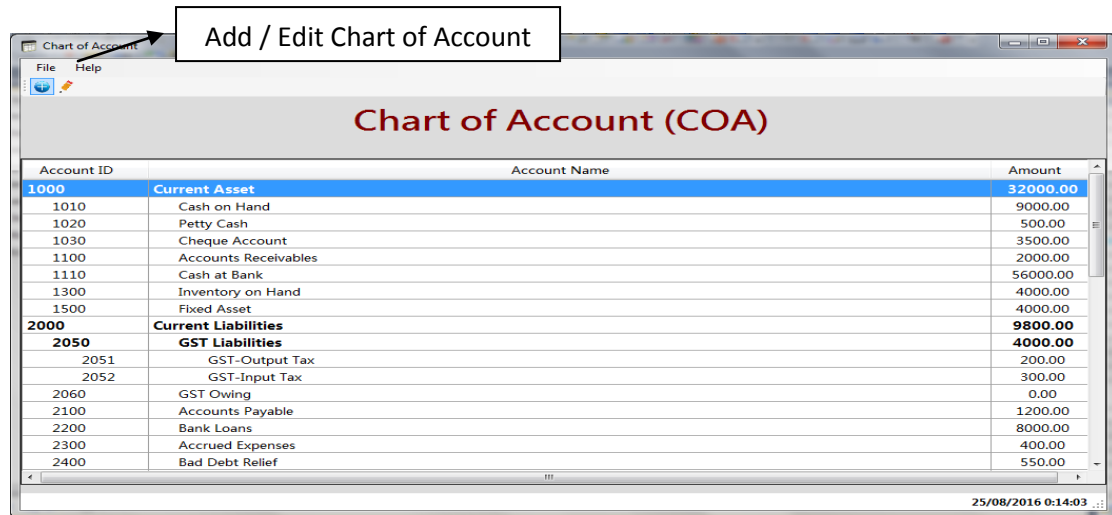


Figure 4.7.1: Chart of Account

4.8 Sales

Figure 4.8.1 shows the sales order for walk-in customer

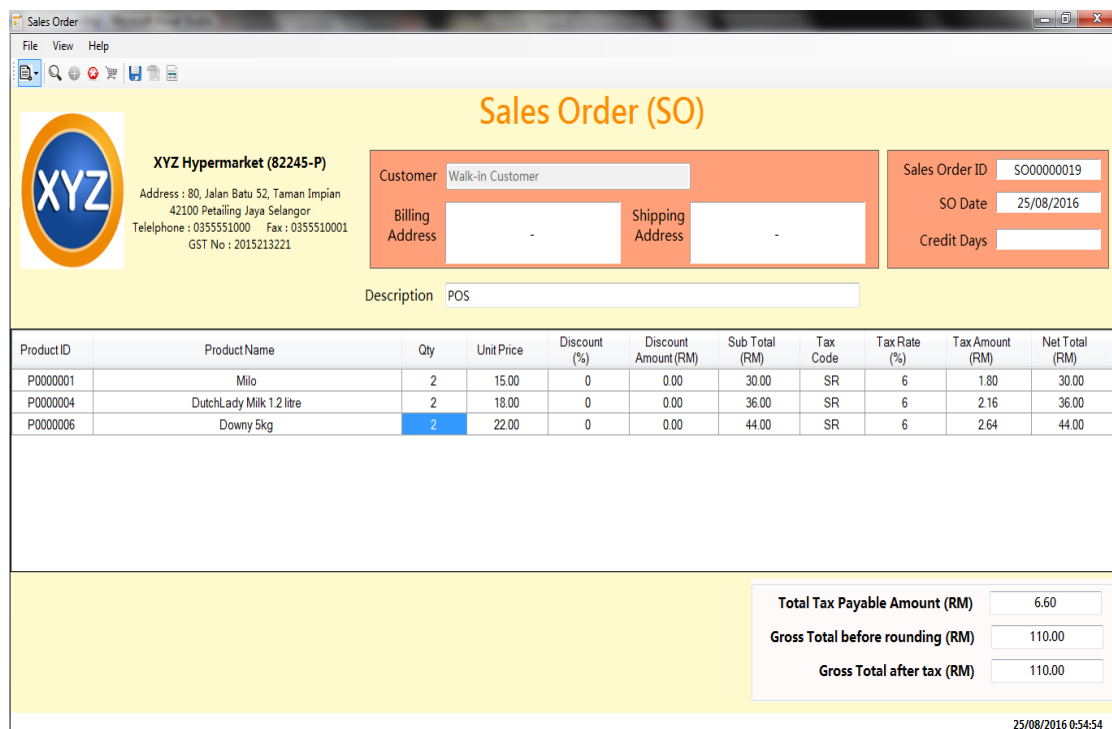


Figure 4.8.1: Sales Order (Walk-in Customer)

Figure 4.8.2 shows the PDF of the sales order

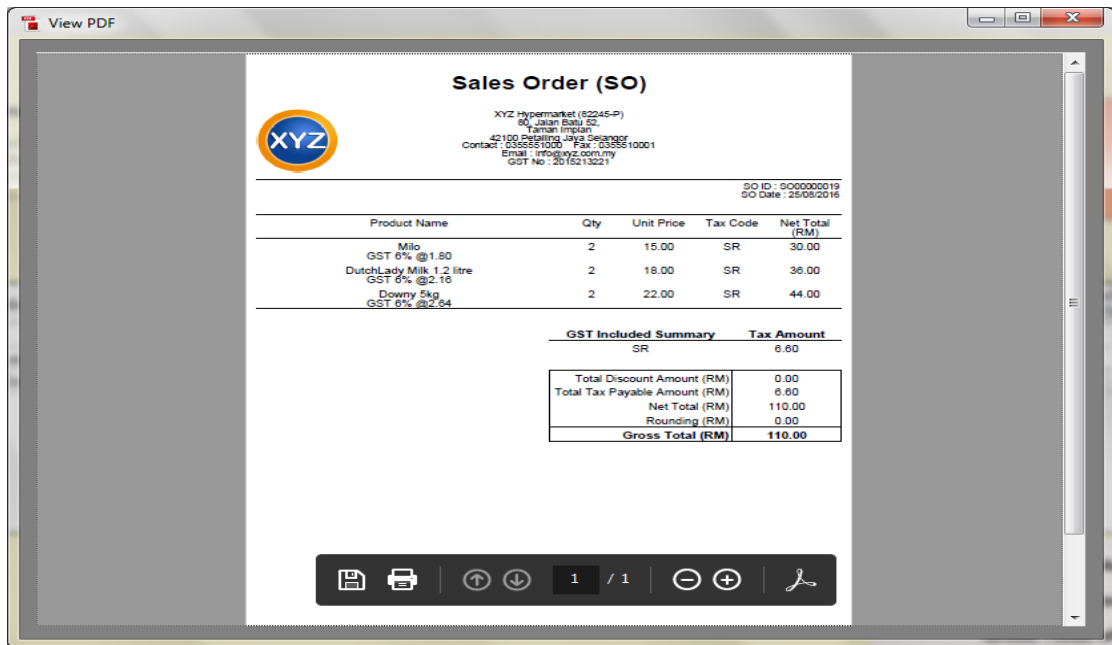


Figure 4.8.2: PDF Sales Order

Figure 4.8.3 shows PDF of sales invoice transfer from sales order SO00000019

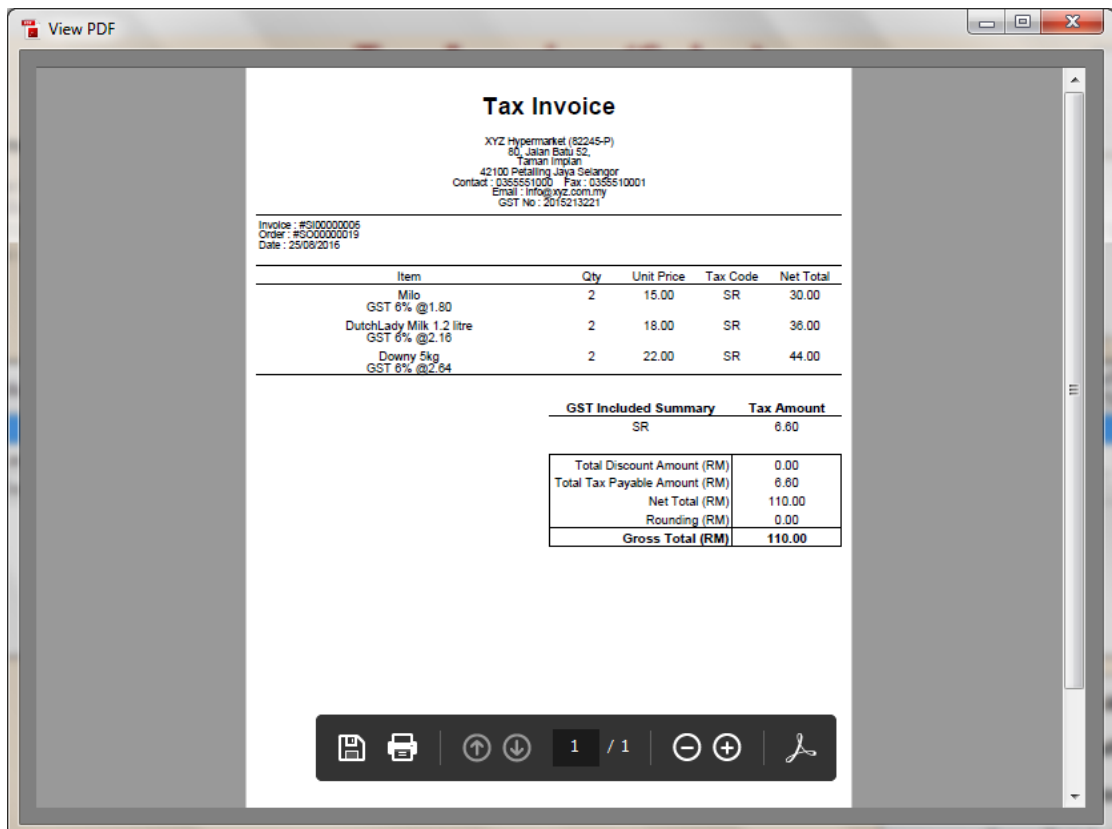


Figure 4.8.3: PDF Sales Invoice

Figure 4.8.4 shows the payment receipt of walk-in customer

Tax Invoice				
XYZ Hypermarket (82245-P) 80, Jalan Batu 52, Taman Implan 42100 Petaling Jaya Selangor Contact : 0355551000 Fax : 0355510001 Email : info@xyz.com.my GST No : 2015213221				
Invoice : #S100000006 Order : #S000000016 Receipt : #P00000001 Date : 17/08/2016				
Item	Qty	Unit Price	Tax Code	Net Total
BUM Jeans GST 6% @14.39	2	119.90	SR	254.19
Pensil Color (X24) GST 6% @5.99	1	99.90	SR	105.89
Stabilo BallPen GST 6% @12.96	12	18.00	SR	228.96
PadiBeras 10kg GST 6% @8.40	5	28.00	SR	148.40
Zebra Container GST 6% @21.54	10	35.90	SR	380.54
GST Included Summary				Tax Amount
SR				63.28
Total Discount Amount (RM)				0.00
Total Tax Payable Amount (RM)				63.28
Net Total (RM)				1,117.98
Rounding (RM)				0.02
Gross Total (RM)				1118.00
Cash (RM)				1500.00
Change (RM)				382.00
Goods sold are non-refundable. Exchange is allowed for normal priced items within 3 days from date of purchase with original receipt. Strictly no exchange for discounted items. Items exchange must be in original condition. Thank you for shopping with us				

Figure 4.8.4: Payment Receipt

4.9 Purchase

Figure 4.9.1 shows the purchase order

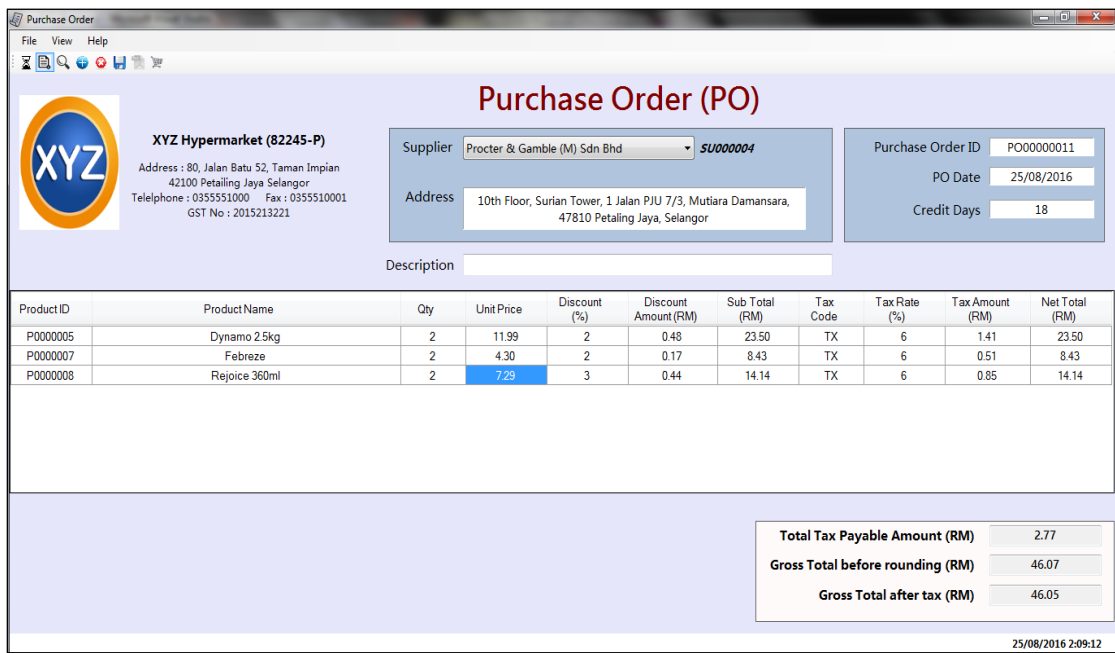


Figure 4.9.1: Purchase Order

Figure 4.9.2 shows PDF of purchase order

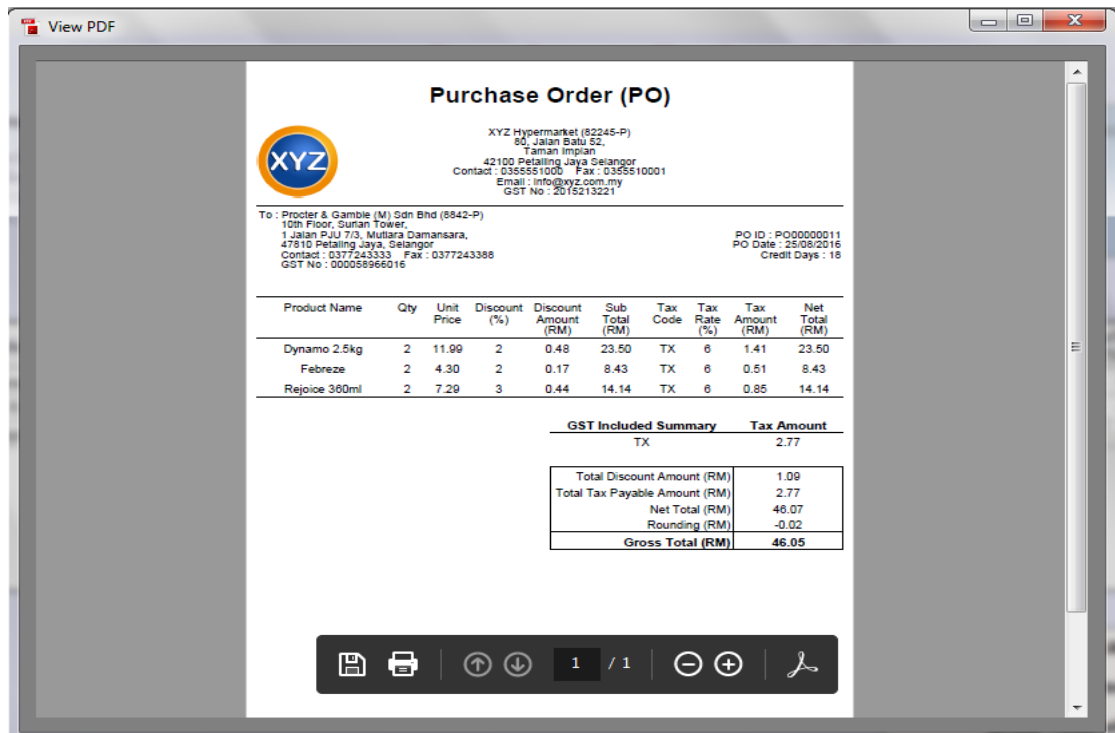


Figure 4.9.2: PDF Purchase Order

Figure 4.9.3 shows PDF of purchase invoice

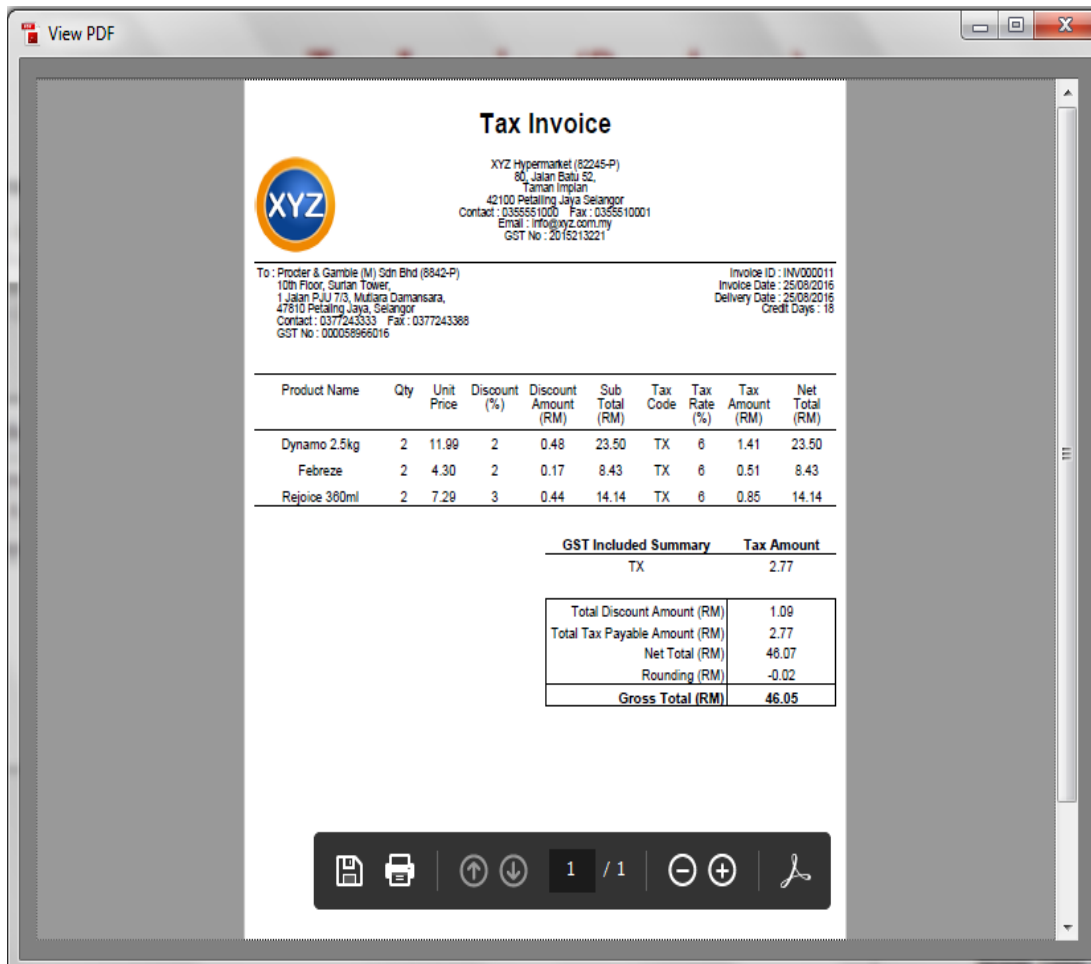


Figure 4.9.3: PDF Purchase Invoice

4.10 Cash Flow

Figure 4.10.1 shows cash flow analysis which can analyze cash flow statement from operating activities and predict cash statement value

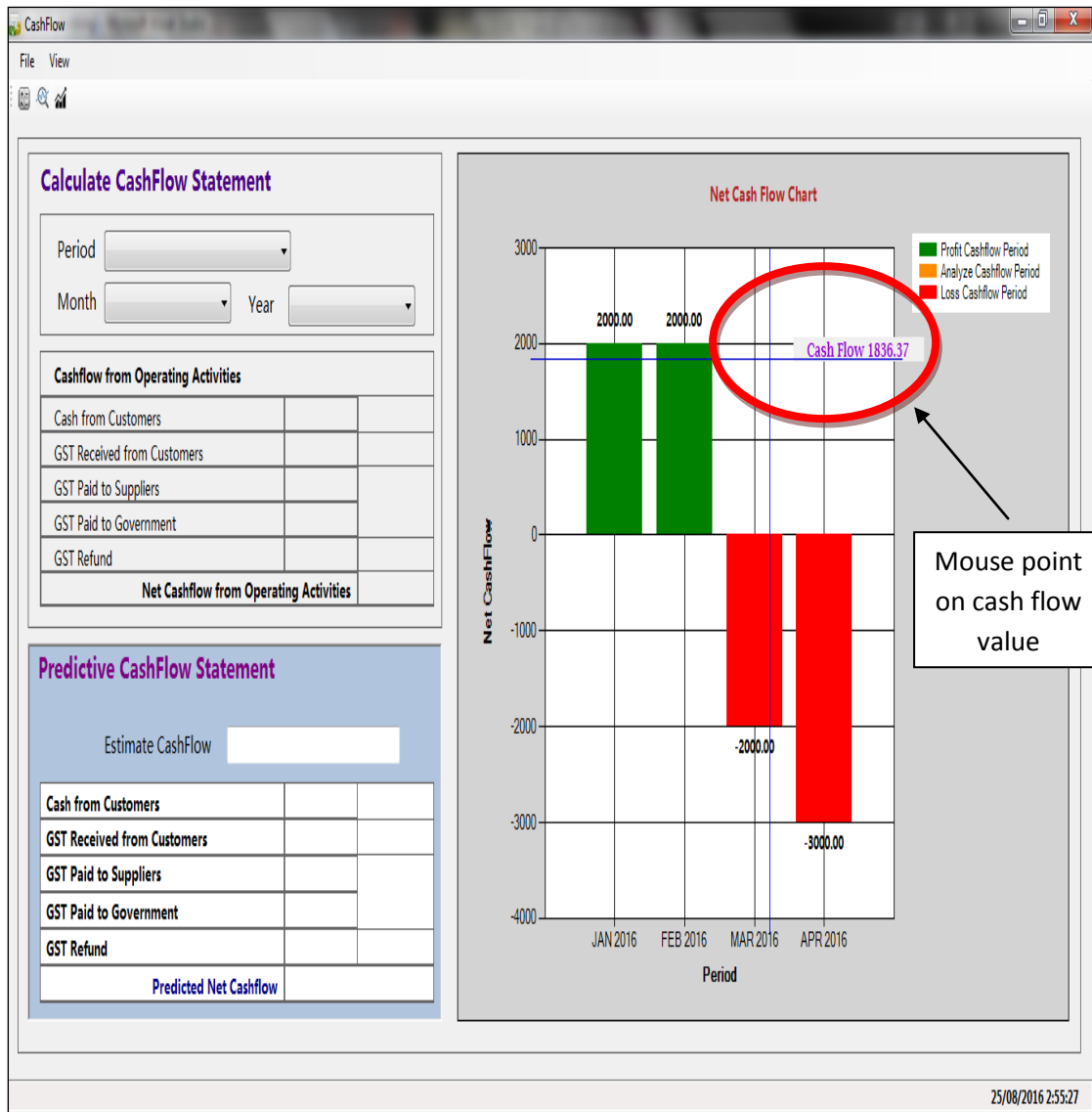


Figure 4.10.1: Cash Flow Analysis

Figure 4.10.2 shows all cash flow chart

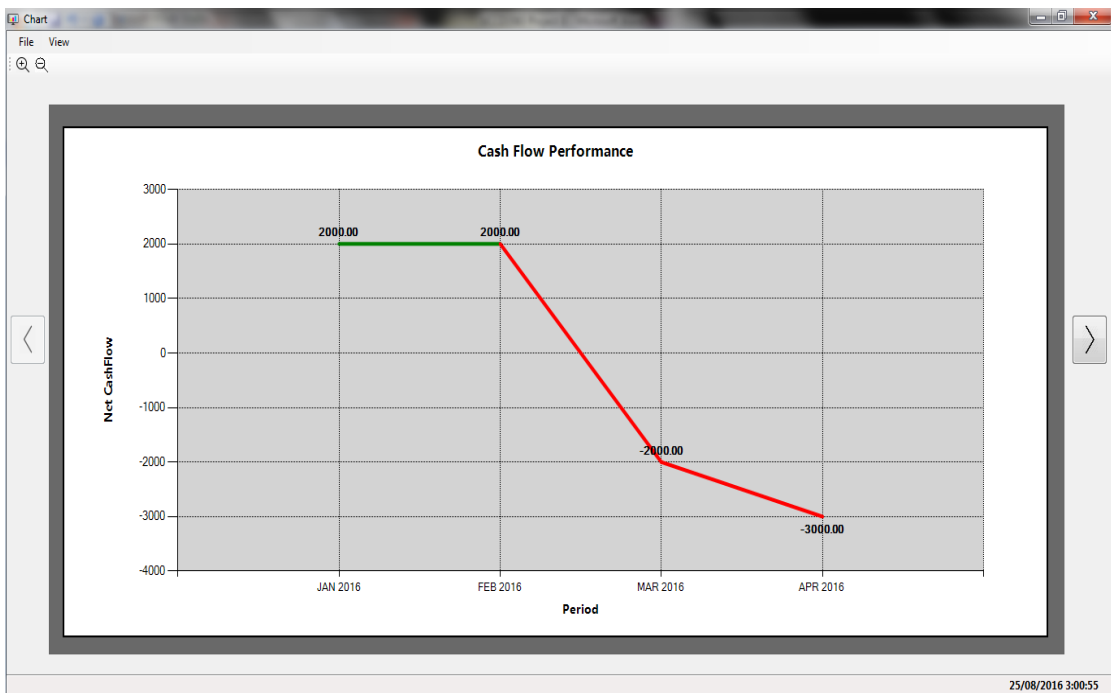


Figure 4.10.2: Cash Flow Chart 1

Figure 4.10.3 shows cash flow chart



Figure 4.10.3: Cash Flow Chart 2

4.11 Bad Debts

Figure 4.11.1 shows bad debts analysis on upcoming and unpaid sales and / or purchase invoices for the selected period of time.

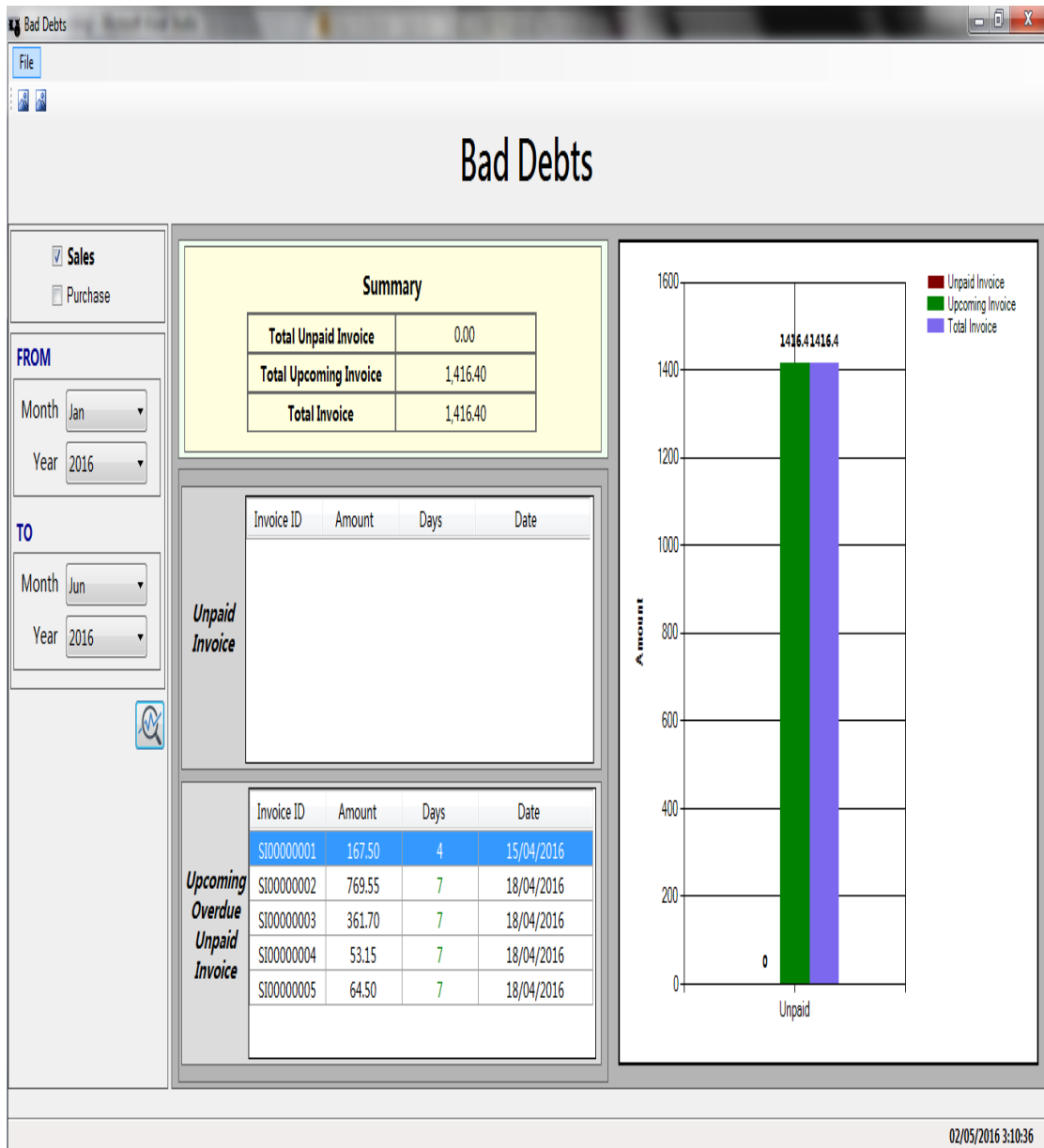


Figure 4.11.1: Bad Debts Analysis

4.12 GST-03

Figure 4.12.1 shows generate of GST-03 form by selecting the period of time

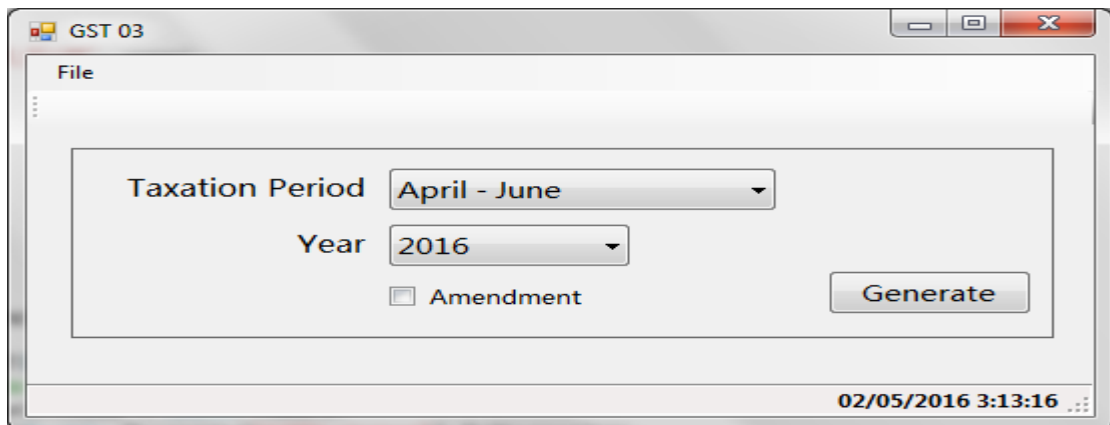


Figure 4.12.1: GST-03

Figure 4.12.2 shows generated GST-03 form

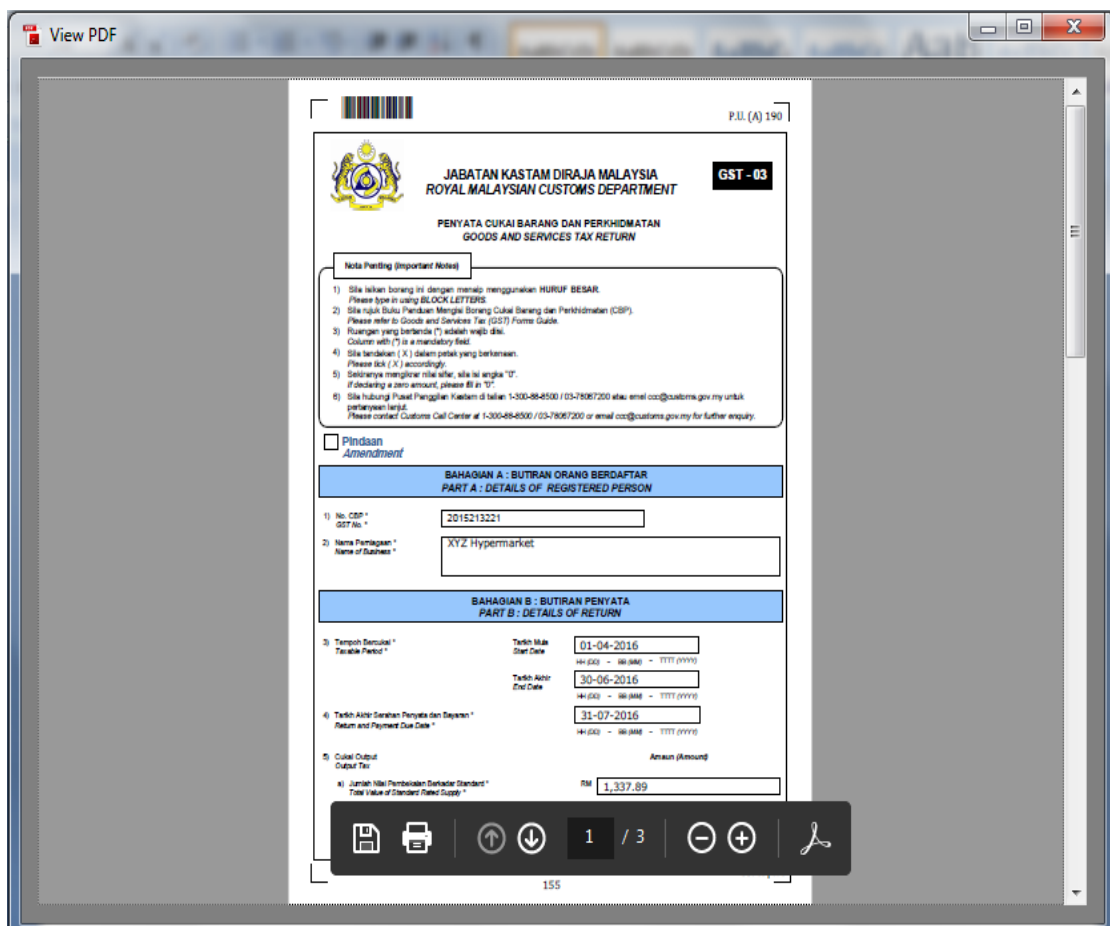


Figure 4.12.2: GST-03 form

4.13 GAF

Figure 4.13.1 shows GAF text file

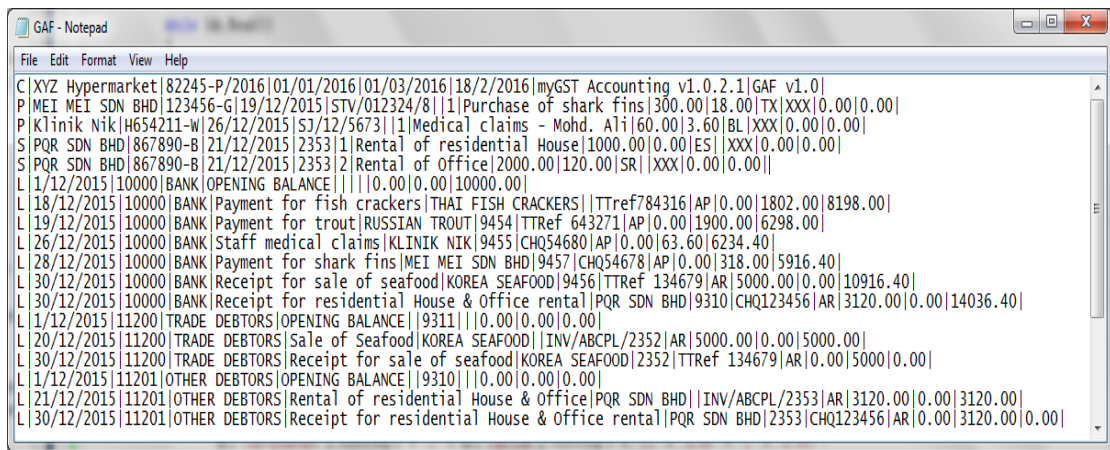


Figure 4.13.1: GAF File

4.14 Journal Entry

Figure 4.14.1 shows journal entry

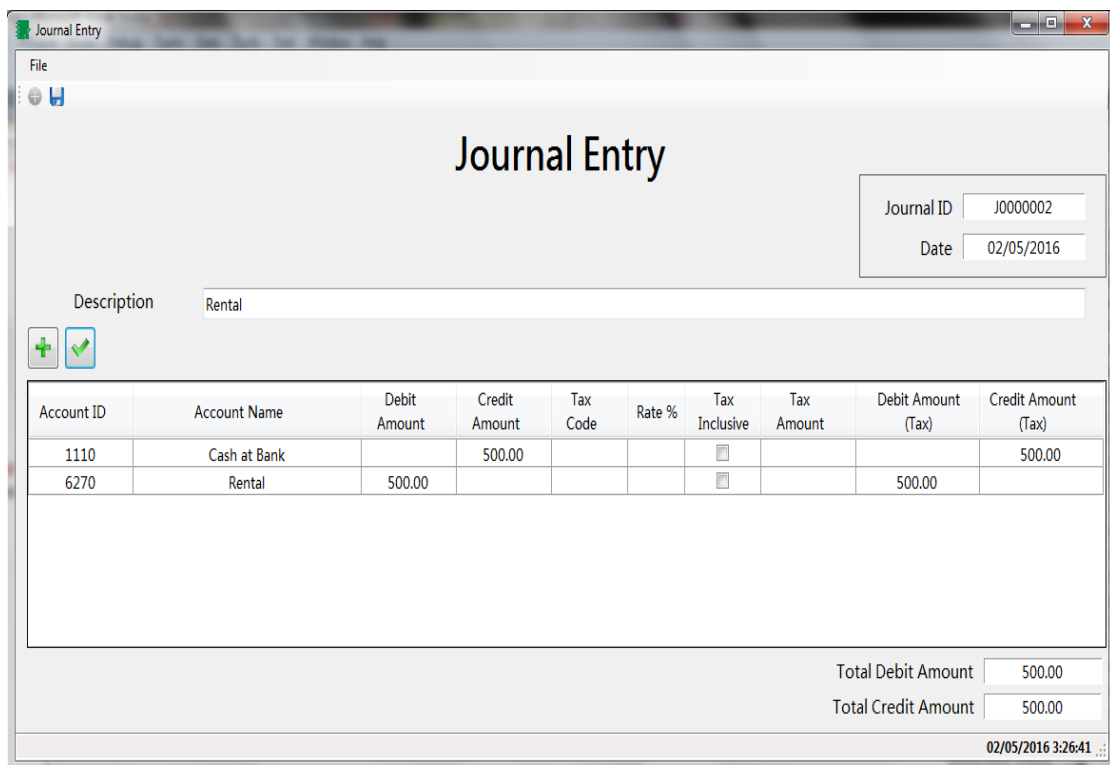


Figure 4.14.1: Journal Entry

Chapter 5: Testing and Implementation

5.1 Verification Plan

The verification plan for the system is through 3 phases such as unit testing, integration testing and system testing. The verification plan of the system will be carry out in order to ensure the prototype of each modules developed as satisfy the requirements. Verification plan is important as errors and unsatisfied of the program will be identified and changes can be made on the prototype. Besides that, it also ensures the final proposed system is being tested and minimized the errors or bugs in the system.

5.1.1 Unit Testing

Unit testing is test on the individual units of the prototype in order to ensure the operating and usage of each unit is being satisfied. Test cases will be carrying on for each individual units of the prototype to ensure the validation of the individual units. The result of the test cases will be recorded down for make changes to those unsatisfied units of prototype. Below are those unit test cases of the proposed system.

Unit Testing 1: Login

Objective: Test on whether login form can handle different inputs and accept correct user login

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Login to the system with empty username and password	Username : null Password : null	Display error message <i>"Please complete the login"</i>	Display error message <i>"Please complete the login"</i>	Pass
2	Login to the system with wrong username and wrong password	Username : aaa Password : aaa	Display error message <i>"Invalid username and password"</i>	Display error message <i>"Invalid username and password"</i>	Pass
3	Login to the system with correct username and wrong password	Username : ben88 Password : xxx	Display error message <i>"Invalid password entered"</i>	Display error message <i>"Invalid password entered"</i>	Pass
4	Login to the system with wrong username and correct password	Username : ben Password : ben88	Display error message <i>"Invalid username entered"</i>	Display error message <i>"Invalid username entered"</i>	Pass
5	Login to the system with correct username and password	Username : ben88 Password : ben88	Display error message <i>"Successfully login to the system"</i>	Display error message <i>"Successfully login to the system"</i>	Pass

Table 5.1.1a – Unit Testing 1: Login

Unit Testing 2: Sign Up New User

Objective: Test on whether login form can handle sign up new user

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Sign up new user by complete all fields	Register new user's details	Successfully signed up new user	Successfully signed up new user	Pass
2	Submit without complete fill up user's details	Register new user without complete the form fills	Display error message <i>"Please complete the fields"</i>	Display error message <i>"Please complete the fields"</i>	Pass
3	Password and confirm password not match	Enter password not same as confirm password	Display error message <i>"Password not match"</i>	Display error message <i>"Password not match"</i>	Pass

Table 5.1.1b – Unit Testing 2: Sign Up New User**Unit Testing 3: Forget Password**

Objective: Test on whether login form can handle forget password

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Forget password	Forget password	Recover password by answering recover question	Recover password by answering recover question	Pass
2	Forget password and enter wrong recover answer	Wrong recover answer	Display error message <i>"Recover answer not match"</i>	Display error message <i>"Recover answer not match"</i>	Pass

Table 5.1.1c – Unit Testing 3: Forget Password

Unit Testing 4: Add Account

Objective: Test on whether chart of account form can handle add new account info

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Add new chart of account by complete all fields	Enter new account info	Successfully added account	Successfully added account	Pass
2	Add new account with duplicate account ID	Enter same account ID as contained in database	Display error message <i>“Duplicate account ID found”</i>	Display error message <i>“Duplicate account ID found”</i>	Pass
3	Account ID not under the account category	Enter account ID not under the account type category	Display error message <i>“Invalid Account ID”</i>	Display error message <i>“Invalid Account ID”</i>	Pass

Table 5.1.1d – Unit Testing 4: Add Account

Unit Testing 5: Add New Product

Objective: Test on whether product form can handle add new product info

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Add new product info by complete all fields	Enter new product info	Successfully added new product	Successfully added new product	Pass
2	Add new product with incomplete info	Enter new product by incomplete the form fills	Display error message <i>“Incomplete Fields. Please complete before save”</i>	Display error message <i>“Incomplete Fields. Please complete before save”</i>	Pass

Table 5.1.1e – Unit Testing 5: Add New Product

Unit Testing 6: Add New Supplier

Objective: Test on whether supplier form can handle add new supplier info

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Add new supplier info by complete all fields	Enter new supplier info	Successfully added new supplier	Successfully added new supplier	Pass
2	Add new supplier by incomplete fields	Enter new supplier by incomplete the form fills	Display error message <i>“Incomplete Fields. Please complete before save”</i>	Display error message <i>“Incomplete Fields. Please complete before save”</i>	Pass

Table 5.1.1f – Unit Testing 6: Add New Supplier

Unit Testing 7: Add New Customer

Objective: Test on whether customer form can handle add new customer info

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Add new customer info by complete all fields	Enter new customer info	Successfully added new customer	Successfully added new customer	Pass
2	Add new customer by incomplete fields	Enter new customer by incomplete the form fills	Display error message <i>“Incomplete Fields. Please complete before save”</i>	Display error message <i>“Incomplete Fields. Please complete before save”</i>	Pass

Table 5.1.1g – Unit Testing 7: Add New Customer

Unit Testing 8: Create Sales Order

Objective: Test on whether sales order form can handle creation of new sales order

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Creation of new sales order with complete fields	Create new sales order by filling all fields	Successfully created and saved sales order	Successfully created and saved sales order	Pass
2	Creation of new sales order with empty purchase item and save	Create new sales order without adding purchase item	Display error message <i>“Invalid sales order. Please insert purchase item”</i>	Display error message <i>“Invalid sales order. Please insert purchase item”</i>	Pass
3	Creation of new sales order with insufficient quantity	Create new sales order with insufficient quantity	Display message <i>“Insufficient product quantity. Confirm to save as onhold save order?”</i>	Display message <i>“Insufficient product quantity. Confirm to save as onhold save order?”</i>	Pass
4	Creation of new sales order for walk-in customers	Create new sales order for walk-in customers	Successfully created and saved walk-in sales order	Successfully created and saved walk-in sales order	Pass
5	Non numeric quantity of purchase item entered	Enter alphabetic quantity of purchase item, eg. aaa	Unable non numeric quantity to be entered	Unable non numeric quantity to be entered	Pass

Table 5.1.1h – Unit Testing 8: Create Sales Order

Unit Testing 9: Create Sales Invoice

Objective: Test on whether sales invoice form can handle creation of new sales invoice

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Transfer sales order into sales invoice and save	Transfer sales order into sales invoice	Successfully created and saved sales invoice	Successfully created and saved sales invoice	Pass
2	Creation of full tax invoice for non walk-in customers	Get full tax invoice for non walk-in customers	Display pdf of full tax invoice	Display pdf of full tax invoice	Pass
3	Creation of simplified tax invoice for walk-in customers	Get simplified tax invoice for walk-in customers	Display pdf of simplified tax invoice	Display pdf of simplified tax invoice	Pass
4	Make payment for walk-in customer	Enter pay amount	Calculate total amount and change amount	Calculate total amount and change amount	Pass

Table 5.1.1i – Unit Testing 9: Create Sales Invoice

Unit Testing 10: Create Purchase Order

Objective: Test on whether purchase order form can handle creation of new purchase order

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Creation of new purchase order with complete fields	Create new purchase order by filling all fields	Successfully created and saved purchase order	Successfully created and saved purchase order	Pass
2	Creation of new purchase order with empty purchase item and save	Create new purchase order without adding purchase item	Display error message <i>“Invalid purchase order. Please insert purchase item”</i>	Display error message <i>“Invalid purchase order. Please insert purchase item”</i>	Pass
3	Generate purchase order from onhold sales order	Create new purchase order from onhold sales order	Successfully created and saved purchase order	Successfully created and saved purchase order	Pass
4	Non numeric quantity of purchase item entered	Enter alphabetic quantity of purchase item, eg. aaa	Unable non numeric quantity to be entered	Unable non numeric quantity to be entered	Pass

Table 5.1.1j – Unit Testing 10: Create Purchase Order

Unit Testing 11: Create Purchase Invoice

Objective: Test on whether purchase invoice form can handle creation of new purchase invoice

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Transfer purchase order into purchase invoice and save	Transfer purchase order into purchase invoice	Successfully created and saved purchase invoice	Successfully created and saved purchase invoice	Pass
2	Creation of tax invoice for purchase invoice	Get tax invoice for purchase invoice	Display pdf of tax invoice	Display pdf of tax invoice	Pass
3	Duplicate tax invoice no	Enter duplicate tax invoice no	Display error message <i>“Duplicate invoice no found. Please enter again”</i>	Display error message <i>“Duplicate invoice no found. Please enter again”</i>	Pass

Table 5.1.1k – Unit Testing 11: Create Purchase Invoice

Unit Testing 12: Make Payment

Objective: Test on whether payment form can make payment.

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Receive customer payment of sales invoice	Enter payment received from customer	Record payment received from customer	Record payment received from customer	Pass
2	Pay supplier invoice	Select supplier invoice to pay	Successfully paid supplier invoice	Successfully paid supplier invoice	Pass
3	Receive bad debts recovered from customer	Enter bad debts recovered from customer	Record bad debts recovered from customer	Record bad debts recovered from customer	Pass
4	Enter alphabetic amount into payment	Enter alphabetic amount into payment, eg. Aaa	Unable to enter alphabetic amount	Unable to enter alphabetic amount	Pass
5	Generate payment receipt	Print payment receipt	Display payment receipt	Display payment receipt	Pass

Table 5.1.11 – Unit Testing 12: Make Payment

Unit Testing 13: Record Journal

Objective: Test on whether journal form can record journal

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Record new journal with complete fields	Enter new journal with complete fields	Successfully save new journal and update chart of account	Successfully save new journal and update chart of account	Pass
2	Record new journal with imbalance credit debit amount	Enter imbalance credit debit amount	Display error message <i>“Imbalance credit debit amount. Please change”</i>	Display error message <i>“Imbalance credit debit amount. Please change”</i>	Pass
3	Enter alphabetic amount	Enter alphabetic amount	Unable to enter alphabetic amount	Unable to enter alphabetic amount	Pass
4	Record new journal with incomplete fields	Enter new journal with incomplete fields	Display error message <i>“Incomplete journal entry. Please complete it”</i>	Display error message <i>“Incomplete journal entry. Please complete it”</i>	Pass

Table 5.1.1m – Unit Testing 13: Record Journal

5.1.2 Integration Testing

Integration testing takes part to test on each individual units of the system can integrate and pass value and / or data to each other form. Besides that, integration testing also ensure the functions and features can link among each individual units of program. It will test on the functionalities, performance and linkage among modules. Below are test cases of integration testing among each individual units of the system.

Integration Testing 1: Sales Order → Sales Invoice → Payment

Objective: Test on the integration between sales order, sales invoice and payment

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Transfer sales order into sales invoice	Transfer sales order into sales invoice	Successfully created sales invoice based on sales order	Successfully created sales invoice based on sales order	Pass
2	Receive payment of sales invoice	Record payment received from customer	Successfully received payment of sales invoice	Successfully received payment of sales invoice	Pass
3	Update sales invoice status after made payment	-	Update sales invoice status to "paid" after received payment from customer	Update sales invoice status to "paid" after received payment from customer	Pass

Table 5.1.2a – Integration Testing 1: Sales

Integration Testing 2: Purchase Order → Purchase Invoice → Payment

Objective: Test on the integration between purchase order, purchase invoice and payment

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Record purchase order from onhold sales order	Create new purchase order from onhold sales order	Successfully retrieve onhold sales order and generate purchase order	Successfully retrieve onhold sales order and generate purchase order	Pass
2	Record purchase invoice based on purchase order	Record purchase invoice based on purchase order	Saved purchase invoice	Saved purchase invoice	Pass
3	Make payment of purchase invoice	Make payment to purchase invoice	Successfully paid the purchase invoice	Successfully paid the purchase invoice	Pass
4	Update purchase invoice status after made payment	-	Update purchase invoice status to “paid” after paid to supplier	Update purchase invoice status to “paid” after paid to supplier	Pass

Table 5.1.2b – Integration Testing 2: Purchase

Integration Testing 3: Journal → Chart of Account

Objective: Test on the integration between journal and chart of account

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Record journal entry and update chart of account amount	Record new journal entry	Successfully recorded new journal entry, amount of chart of account updated	Successfully recorded new journal entry, amount of chart of account updated	Pass

Table 5.1.2c – Integration Testing 3: Journal Entry

Integration Testing 4: Debit Note → Invoice → Credit Note

Objective: Test on the integration between debit note, invoice and credit note

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Record debit note received from supplier	Record debit note from supplier	Successfully recorded debit note and update invoice respectively	Successfully recorded debit note and update invoice respectively	Pass
2	Create credit note according to debit note	Retrieve debit note and generate credit note	Saved credit note	Saved credit note	Pass

Table 5.1.2d – Integration Testing 4: Debit Note

Integration Testing 5: Company Info + Purchase Invoice + Sales Invoice + Journal Ledger —→ GAF file

Objective: Test on the integration between company info, purchase invoice, sales invoice and journal ledger to create GAF file

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Retrieve company info, purchase invoice, sales invoice and journal entry for particular date range	Date range	Created GAF file	Created GAF file	Pass

Table 5.1.2e – Integration Testing 5: GAF file

Integration Testing 6: Login —→ Welcome Page

Objective: Test on the integration between login and welcome page on the user access right

NO	Test Cases	Inputs	Expected Result	Actual Result	Result
1	Login as accountant	Accountant login	Access to accounting only	Access to accounting only	Pass
2	Login as accountant manager	Accountant manager login	Access to accounting, analysis and reporting only	Access to accounting, analysis and reporting only	Pass
3	Login as purchasing staff	Purchasing staff login	Access to purchasing, supplier and product only	Access to purchasing, supplier and product only	Pass
4	Login as sales staff	Sales staff login	Access to sales and customer only	Access to sales and customer only	Pass

Table 5.1.2f – Integration Testing 6: User Access Right

5.1.3 System Testing

System testing can be performed once completed the integration testing. System testing is testing on the entire system performance and functionalities on whether it fulfils the functional requirements and system required as documented. During the system testing, the navigational of the user interfaces and among modules will be carrying out. The navigational testing is test on the performance of the user interfaces, functionalities of user interfaces and ease of navigating among user interfaces.

There are few types of system testing will be carrying out such as installation testing, performance testing, documentation testing, functionality testing and usability testing. Installation testing will carry out to make sure the proposed system can be supported as defined system and operating requirements. Performance testing is to ensure the performance of the proposed system is under satisfactory condition and meet the requirements as documented. Documentation testing is test on the system whether it fulfils and follows the documented in the documentation. The usability testing is test on how ease of use and learn of the proposed system. Moreover, it also test on the operation of the entire system to ensure it meets the requirements.

Chapter 6: Conclusion

6.1 Project Reviews

In the review of the proposed system, there are some limitations and contributions to the project.

6.1.1 Achieved in the project

In the project, there are achieved modules as documented early in project scope and project objectives.

✓ **Purchase module**

In the purchase module, it able to create purchase order, generate purchase invoice, add / edit supplier info, record purchase debit note, record purchase credit note and purchase onhold sales order. Besides that, it also allows for print out the PDF of purchase order, purchase invoice, debit note and credit note.

✓ **Sales module**

In the sales module, it able to create sales order, generate sales invoice, add / edit customer info, record sales debit note and record sales credit note. At the same time, it also allows for create walk-in customer and non walk-in customer and creation of simplified tax invoice and full tax invoice accordingly. Moreover, it also able to print out the PDF of sales order, simplified tax invoice, full tax invoice, debit note and credit note.

✓ **Accounting module**

In the accounting module, it able to maintain chart of account, company information, record journal entries and make payment. In the chart of account, it allows for add new account and edit existing account. In the journal entry, it able to update the chart of account amount and check balance of credit and debit amount for each journal entries.

✓ **Analysis module**

In the analysis module, it able to generate report, cash flow analysis and bad debts analysis. In the cash flow analysis, it will generate the cash flow statement from operating activities from the selected date range. Besides that, it also allows for cash flow prediction by monitor the cash flow value. In the bad debts analysis, it will display all upcoming unpaid sales / purchase invoices and unpaid sales / purchase invoices. It comes together with bar chart for comparing the health level of bad debts.

✓ **GST module**

In the GST module, it able to generate GST-03 form filled with all data and GAF text file from selected date range.

6.1.2 Limitations

The limitations of the proposed system as it is a simplified version of GST Accounting system due to it is time consuming for one person to complete a full GST Accounting system. The proposed system is unable to generate income statement and balance sheet. Besides that, the business operation of the system focuses on the local supply of goods and services, standard supply of goods and services and taxable supplier whereas imports and exports will not included in the system.

Moreover, the system cannot work with barcode scanner as the creation of sales invoice for walk-in customers. At the same time, the system not allowed for partial payment of invoices as it only accepts for full payment of the invoice.

6.1.3 Personal Insights

The experience in developing and documenting the project is quite challenging while it also gains knowledge on how to program a system and prepare a full documentation for the proposed system.

In the project, the knowledge of GST and Accounting work in Malaysia learnt and it helps to understand more on the GST policies, work and operation in the Malaysia. Besides that, the accounting knowledge learnt is something which is not learnt in the course and it provides the chance of learning the accounting stuffs for the retailing company. Although the knowledge of GST and Accounting are not complete and master on it, it does increase my knowledge on how GST reflects the accounting works in Malaysia as compared to before GST came in Malaysia.

At the same time, this project helps to increase the knowledge of C# coding on developing the system. Moreover, there are many problems faced at the developing stage as unfamiliar with C# and linkage with Microsoft SQL Server to retrieve data from multiple databases. Yet, the problems are being solved from time to time as the knowledge and understanding of using the C# and linking with Microsoft SQL Server become deeper.

Lastly, I would like to thank to those friends and lecturers who assist me in completing the project. Meanwhile, I would also like to thank for my supervisor and moderator in tolerating the submission of the documentation due to family issues happen. I learnt a lot of things regarding to knowledge of accounting, GST, C#, documentation of a proposed system and how to develop a proposed system.

6.2 Contribution achieved

The contribution achieved in the project is the interactive and real time cash flow analysis & prediction feature provided to users. Users can use mouse to point on the line chart of cash flow to predict the cash flow statement and value for the particular period. The effort of the cash flow analysis and prediction feature is helps user to monitor the cash flow statement and value from operating activities. By pointing on the health cash flow value, user can predict the volume of sales and purchase should be made in order to keep the healthier cash flow.

At the same time, the bad debts analysis feature is to analysis the upcoming and unpaid invoices for sales and purchases. It helps to alert the unpaid invoices after 6 months in order to collect back.

6.3 Future Work

In the future work, the enhancement of the project will be able solve the limitations of the project. The generate of income statement and balance sheet shall included in future work of this project as it can shows the profit and loss of the business operation from the given period of time.

Besides that, the future enhancement of the project is it can support for those retailing companies allow for imports and exports of items in the business. At the same time, the proposed system can be enhanced into webpage and mobile application as it will not restrict on the workload to be done on the personal computers and laptops.

Meanwhile, the barcode scanner could integrate with the system in order to increase the work capacity and reduce the errors entered with keyboard. The barcode scanner can work in sales for walk-in customers as Point of Sales that increase the accuracy of the sales invoice and payment made on the counter.

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***Appendix A: Final Year Project
Weekly Reports***

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 1
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- FYP1 Documentation
- Prototype of few modules

2. WORK TO BE DONE

- Refine fyp1 documentation
- Re-identify project contribution
- Refine methodology
- Study GST and Accounting works

3. PROBLEMS ENCOUNTERED

No

4. SELF EVALUATION OF THE PROGRESS

- Progress on schedule
- Need more understanding on GST methods and implementation

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 2
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Refine fyp1 documentation

2. WORK TO BE DONE

- Review and compare existing systems
- Enhance prototypes
- Develop prototype

3. PROBLEMS ENCOUNTERED

No

4. SELF EVALUATION OF THE PROGRESS

- Need do more research on different existing system and compare each other
- Progress on schedule

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 4
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Prototyping

2. WORK TO BE DONE

- Test prototyping
- Link with database
- Enhance prototyping
-

3. PROBLEMS ENCOUNTERED

- Need time to conduct testing and evaluate prototype

4. SELF EVALUATION OF THE PROGRESS

- Need more time to carry on the developing prototype

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 6
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Prototype Testing
- Prototype enhancement

2. WORK TO BE DONE

- Continue develop prototype

3. PROBLEMS ENCOUNTERED

- Lack of accounting and GST knowledge

4. SELF EVALUATION OF THE PROGRESS

- Need further study on accounting and GST works
- Continue with prototyping

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 8
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Prototyping

2. WORK TO BE DONE

- Design module prototypes
- Test module prototype

3. PROBLEMS ENCOUNTERED

- Require more time to develop module prototype
- Difficult to link module together, need more validation and function

4. SELF EVALUATION OF THE PROGRESS

- Need to develop well integrated module linkage with each other

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 10
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Developed module prototype

2. WORK TO BE DONE

- Module testing
- Prototype Testing
- Module linkage

3. PROBLEMS ENCOUNTERED

- Need further testing and evaluate the prototypes

4. SELF EVALUATION OF THE PROGRESS

- Further enhancement of the prototype will be needed

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 11
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Tested module prototype, working modules

2. WORK TO BE DONE

- Further testing and enhancement of the system

3. PROBLEMS ENCOUNTERED

- Continue testing of the prototype will be needed

4. SELF EVALUATION OF THE PROGRESS

- Further testing of the prototype needed

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 12
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Working modules
- Working system

2. WORK TO BE DONE

- Prepare verification plan of the system
- Print screen of important user interface as documentation

3. PROBLEMS ENCOUNTERED

No

4. SELF EVALUATION OF THE PROGRESS

- Progress on schedule

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	Study week no.: 13
Student Name & ID: Choong Chee Mun	13ACB07922
Supervisor: Ms Chan Lee Kwun	
Project Title: Good and Service (GST) Accounting System for Malaysian Retailer Company	

1. WORK DONE

- Working system
- Done verification plan
- Done print screen of user interfaces

2. WORK TO BE DONE

- Make conclusion of the documentation
- Limitations of the project
- Future work for enhancement
- Personal insights

3. PROBLEMS ENCOUNTERED

- Testing and validation will be carrying on and prepare for demonstration

4. SELF EVALUATION OF THE PROGRESS

- Prepare for demonstration

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


Turnitin Plagiarism Check Report

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Chapter 1: Introduction

Chapter 1: Introduction

1.1 Project Background& Motivation

According to the news reported that there are Goods and Service Tax (GST). The registration 2014 until 28th February 2015 and there are 3 the GST. For those companies refusal to register (Bernama, 2015).

There are 780 out of the 27,281 companies registered (GST) in Penang had failed to submit the GST (Bernama, 2015). The major problems that cause the confusion usage of GST Tax Code, GST methods. However, for those companies who within the period (1 month / 3 months / 6 months the GST Act 2014 (fined for RM50,000 or jailed

Many companies still confusing of the GST industries. There are 4 different types of supply, companies cannot differentiate which

In order to overcome the failure of submit department, it is vital to implement an correct and accuracy information of government and CUSTOMS department is businesses within Malaysia. It is not allowed taxation even though it is a small mistake. The for GST Accounting Software to avoid the submission, inaccurate GST calculation and so

BIS(Hons) Business Information Systems
Faculty of Information and Communication Technology

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