Hong Kong Institute of Vocational Education
Department of Information Technology (Tsing Yi)
HD in Software Engineering
ITP4522 Software Project Management & Quality Assurance (SPMQA) (2021/2022)

Test Plan

Student	Contribution to the project (%) (Total 100%)	Signature
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We declare that this is a group project and that no part of this submission has been copied from any other student's work or from any other source except where due acknowledgement is made explicitly in the text, nor has any part been written for us by another person.

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1. Introduction

1.1. Company's Background

Better Limited which provides a completed one-series electronic appliance retail services for customers is a large-scale electronic appliance retail store. It supplies small to large electronic appliances, for instance, mobile phones, television, air conditioner for customers to choose from. After payment, customers can enjoy our free services such as delivery and installation services. Completed services are of utmost importance when it comes to achieving the purpose of the company.

Over the past few years, the business of Better Limited has been growing up. Thus, our company has a clear labour division for six departments, including retail stores, inventory, accounting, purchase, technical support, and information technology. The Retail Stores Department is responsible for two retail stores at Kowloon Bay and Tsuen Wan. The Inventory Department is in charge of a 6000 sq/feet warehouse in Kowloon. The Accounting Department, Purchase Department, Technical Support Department, and Information Technology Department are set up in the Kowloon head office.

Owing to the "Outline Development Plan for Guangdong-Hong Kong-Macau Greater Bay Area " from the Hong Kong Government, Better Limited discovered that there are opportunities to expand the business to the Greater Bay Area such as Guangdong and Macao. In order to meet the Chinese shopping boom, the company prepares to add the electronic payment functions to the order system and develop an online store.

Having huge room for improvement, Better Limited is designed to develop an efficient e-system in order to enhance the company's management. The company's target is boosting competitiveness by providing convenient services and functions for customers and staff.

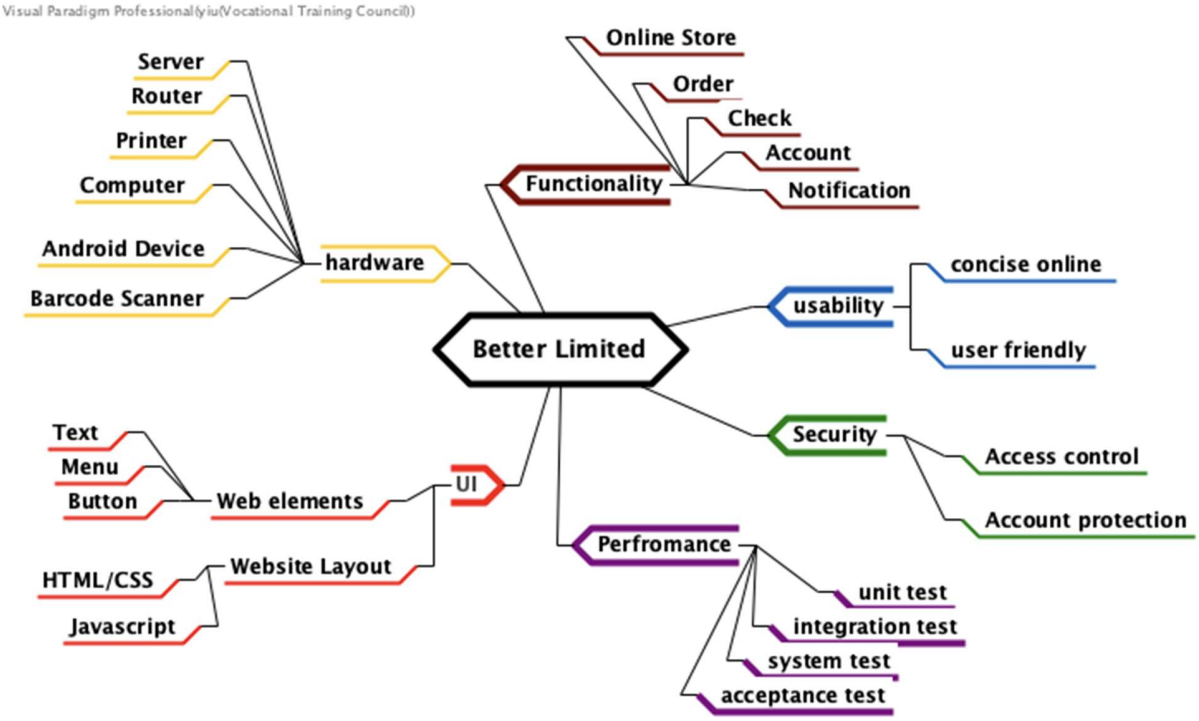
1.2. Project Background

Following technology development and business expansion, the CEO of Better Limited considered that the expenditure of the company's operation and data storage should be reduced and evolute to use the computerized management system.

The CEO requires our project team to build a computerized management system, an android device for the delivery team and technical support team, and digital payment for the retail stores and online store's order system. In addition, the document to the customer, information should be viewable and traceable in the new computerized system, which must be compatible with the new online store. The company also applies standalone PCs and electric spreadsheets to manage the delivery services. The data of different officers' PCs cannot be readily shared, so the new server should be purchased for the new proposed system.

The project will be divided into several parts, involving planning, analysis, design, control, testing, execution. In summary, data consistency is fundamental to building a computerized management system.

2. Objectives



3. Scope

The system test which, includes unit testing, integration testing, system testing and user acceptance testing, follows the migration plan to do conversion. Six department in Better Limited will be the testing targets.

Language

- JavaScript (react.js, node.js, react native)
- HTML
- CSS

3.1. Key Stakeholders

- CEO
- Customer

- **Sale Department**
- Sale manager
- Sale representative

- **Inventory Department**
- Inventory clerk
- Goods Inwards clerk
- Delivery workman

- **Purchase Department**
- Purchase manager
- Purchase clerk

- **Technical Support Department**
- Technical support manager
- Technical support clerk
- Installation Workman

- **Accounting Department**
- Accounting manager
- Accounting clerk

- **Information Technology Department**
- Information Technology officer

3.2. Project Milestones

This project will start on the 1st April 2022 and is expected to end on 20th December 2022. These are the highlight milestones as follow:

Milestone 1: Completed database system and POS System (24th June 2022)

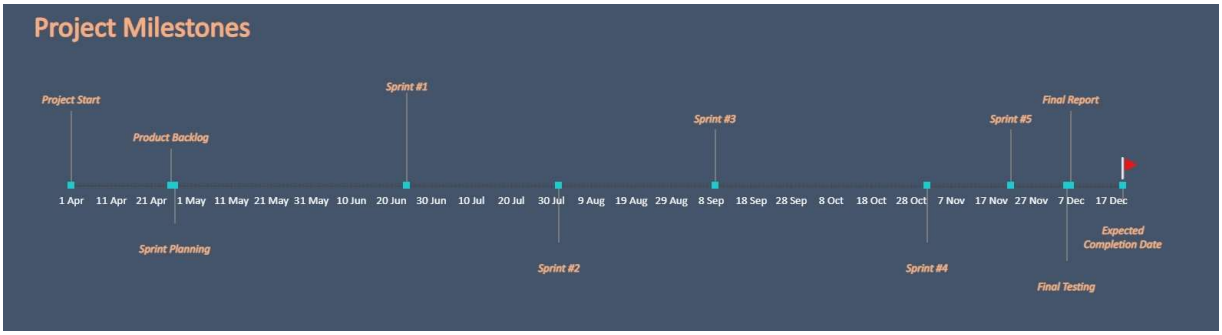
Milestone 2: Completed sales delivery note function, re-stock function, etc... (1st August 2022)

Milestone 3: Completed notification system, data analysis System, etc... (9th September 2022)

Milestone 4: Completed checking system, online store (1st November 2022)

Milestone 5: Completed final implementation (22nd November 2022)

Milestone 6: Final testing and report (Middle December)



3.3. Project Budget

All hardware and software costs are included in previous budget plan. No extra cost for the testing.

Budgeted Amount	**$4,500,000.00**
Staffing Costs	$4,074,300.00
Hardware Costs	$222,286.00
Software Costs	$6,560.00
Total Costs	**$4,303,146.00**

4. Test Environment

4.1. Hardware

4.1.1. Computer

We will use eight computers to test the system.

Computer Specifications

Item	Description	Qty
CPU	Intel® Core™ Rocket Lake i5-11400 Processor 2.60 GHz Cache 6 Core 12 Thread LGA1200	1
Motherboard	ASRock B560M-HDV R2.0 M.ATX	1
RAM	Kingston ValueRam DDR4 2666MHz 8GB Ram KVR26N19S6/8	2
PSU	FSP HV PRO 550 80Plus 550W Bronze PSU	1
HDD	WD Blue WD10EZEX 1TB 7200rpm 64MB 3.5 Inch HDD	1
SDD	Kingston KC2500 500GB M.2 NVMe PCIx4 SSD	1
Case	AeroCool Corporate Series CS 103 M.ATX $199	1
Monitor	ASUS VP248H 24" 1920x1080 1ms Monitor	1
Keyboard	Logitech K780	1
Mouse	Logitech M585 Multi-Tasking Mouse	1

4.1.2. Printer

We will use four printers to test the system.

EPSON WF-C5790 x 4

4.1.3. Router

We will use four routers to test the system.

ASUS ZenWifi AX (XT8) Mesh Wifi System x 4

4.1.4. Android Device

We will use five android device to test the system.

Samsung Galaxy Tab S6 Lite (LTE) P615 x 5

4.1.5. Barcode Scanner

We will use five barcode scanners to test the system.

Honeywell 1300G Laser Barcode scanner x 5

4.1.6. Server

There will be four servers, including a web server, application server, database server.

Lenovo ThinkSystem ST250

DESCRIPTION	SPECIFICATIONS
Form Factor	4U chassis: Height: 430mm (16.9 inches), Width: 175mm (6.9 inches), Depth: 566mm (22.3 inches) Optional ST250 rack-mount kit
Processors	1x Intel® Xeon® E-2200 processors, up to 6 cores at 95W.
Memory	Up to 128GB in 4x DIMM slots using 32GB DIMMs 2666MHz TruDDR4
Expansion Slots	x1 lane PCIe Gen3 in x1 slot; x16 lane PCIe Gen 3 in x16 slot (for GPU); x4 PCIe Gen3 in x4 slot; x4 PCIe Gen3 in x8 slot
Network Interface	2x 1GbE ports standard; 1x 1GbE dedicated management port
Power	Dual-redundant 80 PLUS power supply unit (PSU) 550W; fixed PSU 250W; power efficiency up to Platinum; Energy Star 2.1 compliant
Operating Systems	Microsoft, SUSE, Red Hat, VMware vSphere. Microsoft Windows Client OS – Win10 tested

4.2. Software

4.2.1. Windows OS

Windows 10 Pro Operation System

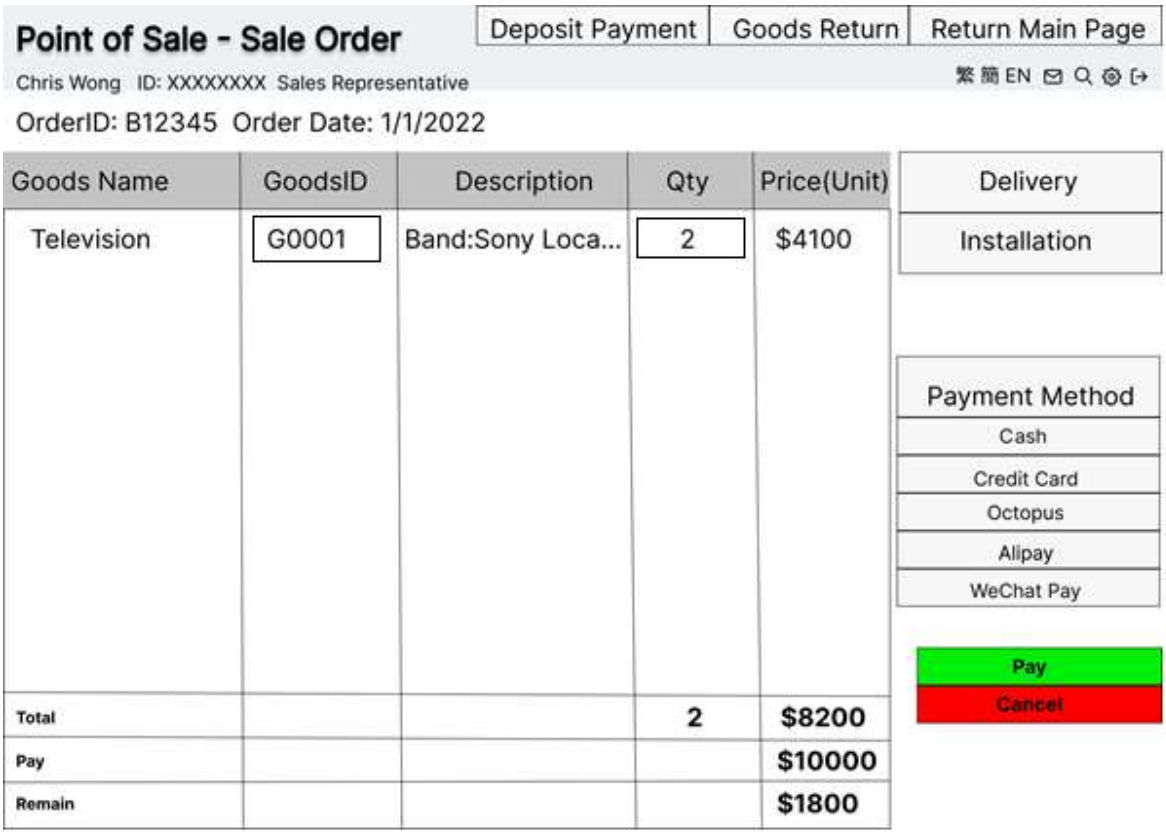
4.2.2. MS Office

Microsoft Office Business Version

5. Testing Stages

5.1. Unit Testing

We are using black-box testing to test the place sales order in POS, this test plan is developed directly from the program specification.



Check System behaviour when a valid Goods ID is entered.

Check System behaviour when an invalid Goods ID is entered.

Check System behaviour when a valid Quantity is entered.

Check System behaviour when an invalid Quantity is entered.

Check System behaviour when an item is inputted and click Pay button to place the order.

Check System behaviour when no item is inputted and click Pay button to place the order.

Check System behaviour when an item is inputted and click Pay button to pay with Cash.

Check System behaviour when an item is inputted and click Pay button to pay with Credit Card.

Check System behaviour when an item is inputted and click Pay button to pay with Octopus Card.

Check System behaviour when an item is inputted and click Pay button to pay with Alipay.

Check System behaviour when an item is inputted and click Pay button to pay with WeChat Pay.

Check System behaviour when an item is inputted and click Cancel button to cancel the order.

Check System behaviour when an item is inputted and the total price is correct.

Check Deposit Payment button.

Check Goods Return button.

Check Return Main Page button.

Check Delivery button.

Check Installation button.

Check Language Switcher button.

Check Message button.

Check Search button.

Check Setting button.

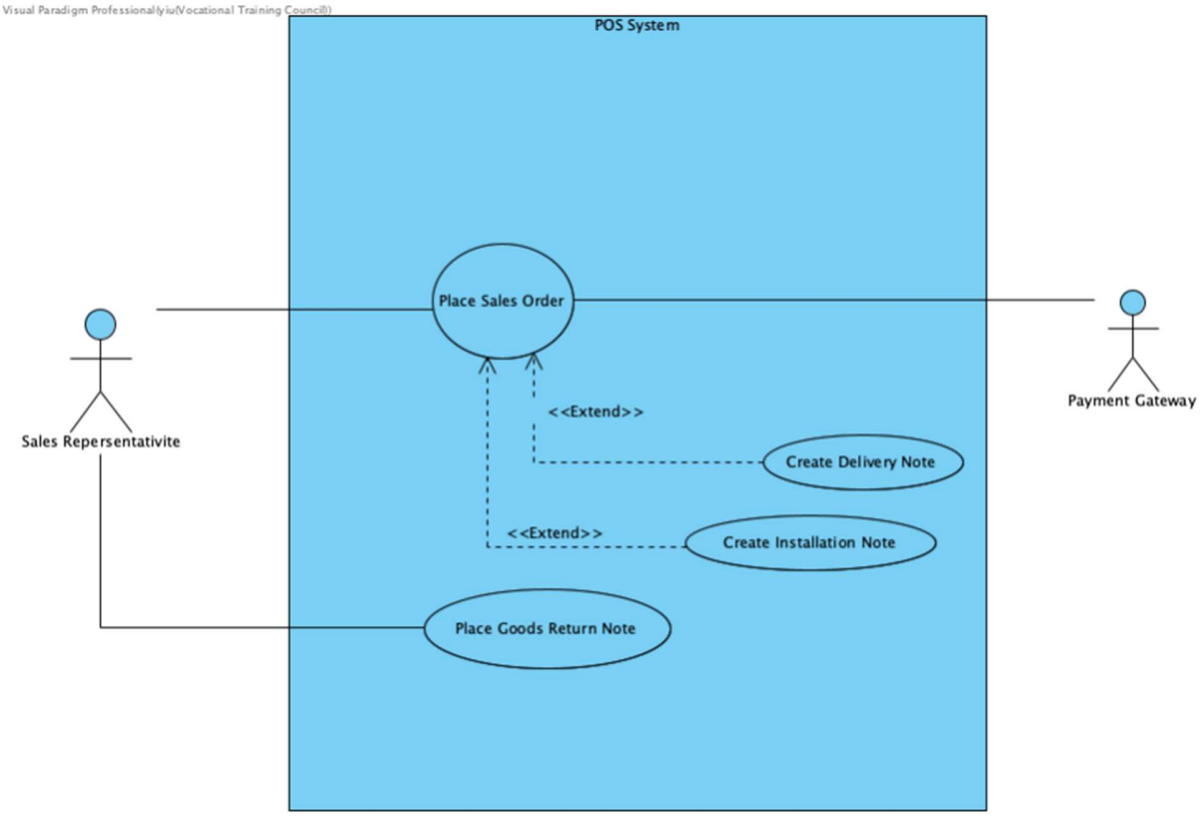
Check Logout button.

Test Case ID:	TC-001
Test Suite Name:	Test Place Sales Order In POS System
Description:	Test the sales order feature in POS with the valid and invalid Goods ID to place sales order, different payment method, the total price calculation, the Delivery and Installation arrangement.

Steps	Test Data	Expected Result	Actual Result	Pass/ Fail	Remarks
1	Goods ID: G0001	Display Television			Valid Goods ID
2	Goods ID: GGGGG	No Item Found			Invalid Goods ID
3	Quantity: 2	Display correct price			Valid Quantity
4	Quantity: ABC	Display error message: Incorrect Quantity			Invalid Quantity
5	Pay with Cash $10000	Calculate the remaining $1800			
6	Pay with Cash $1000	Insufficient payment			Not enough money
7	Pay with Credit Card	Payment Successful			
8	Pay with Credit Card with transaction is declined	Payment Declined			Transaction is declined
9	Pay with Octopus Card	Payment Successful			
10	Pay with Octopus Card with insufficient balance	Payment Declined			Insufficient balance
11	Pay with Alipay	Payment Successful			
12	Pay with Alipay with insufficient balance	Payment Declined			Insufficient balance
13	Pay with WeChat Pay	Payment Successful			
14	Pay with WeChat Pay with insufficient balance	Payment Declined			Insufficient balance
15	Total Price	Items price * qty			
16	Deposit Payment	Ask user to input deposit amount			

17	Goods Return	Jump to Goods Return Page			
18	Return Main Page	Back to Main Page			
19	Delivery	Delivery arrangement			
20	Installation	Installation arrangement			
21	Language Switcher	Switch to selected language			
22	Message	Show message			
23	Search	Search function			
24	Setting	Open system setting page			
25	Logout	Logout account			

5.2. Integration Testing



Use case name:	Place Sales Order
Use case ID:	UC-200
Primary actor:	Sales Representative
Secondary actor(s):	Payment Gateway
Brief description:	The Sales Representative helps customer to place sales order. The Sales Representative and customer check out the goods. The Sales Representative asks the customer to select the payment method and offers the required information.
Preconditions:	The Sales Representative has logged in system.
Flow of events:	1. A Sales Representative enters keywords of the goods. The system displays list of goods matching the keywords. 2. The Sales Representative selects goods. The system displays the detail information and stock level of goods. 3. The Sales Representative screens or enters goods ID into the sales order. The system displays goods in the sales order. 4. The Sales Representative and the customer check out the goods. 5. The Sales Representative asks the customer whether to select delivery option and install option. If the customer selects the delivery service and installation service, the Sales Representative asks customer to offer personal information to fill the delivery note and installation. 6. The system displays the total amount. 7. The Sales Representative asks customer to select the payment method. 8. The system confirms the transaction and place and print the receipt following sales order. 9. The system sends the order request to the inventory department and sends receipt to accounting department. It also updates inventory list in retail store.

Postconditions:	• If the goods is unavailable over $5000, the customer can pay at least 20% of the sold price to make pre-order of goods. After received the goods, the customer pays remaining cost. • If customer doesn't select delivery and installation service, the Sales Representative does no need to collect the customer information. • A new receipt is created and stored in the sale department system. • The amount is charged to the customer's credit card, Alipay or WeChat Pay if they choose these payment methods.
Alternative flows and exceptions:	Steps 1-3 can be repeated until the Sales Representative proceeds to step 4. In step 7, if the customer selects credit card, Alipay or WeChat Pay, the amount is charged to the customer's credit card through the payment gateway.
Non-behavior requirements:	The unavailable goods is not over $5000, the pre-order will not be placed.

Use Case Test Scenario for this use case

- Check the search functionality
- Check the item list
- Check add item functionality
- Check the check out functionality
- Check Delivery Note and Installation Note
- Check Sales Order amount accuracy
- Check the payments functionality
- Check the print receipt functionality
- Check Inventory handling

Steps	Test Case	Expected Result	Actual Result	Pass/ Fail	Remarks
1	Search functionality	Able to search item that match the keyword			
2	Item list	Display item details and stock level			
3	Add item functionality	Able to add item into Sales Order			
4	Check out functionality	Able to check out the Sales Order			
5	Delivery Note and Installation Note	Delivery and Installation arrangement			
6	Sales Order amount	Show the correct total amount			
7	Payments functionality	Able to select different type of payment			
8	Print receipt functionality	Able to print the receipt			
9	Inventory handling	Able to send the order to Inventory			

5.3. System Testing

5.3.1. Usability (Inventory Department)

Exist Test

- Check the Search Functionality
- Check Goods List Pages
- Check Warehouse Inventory List (Stock Level) Pages
- Check out of stock level's Notification
- Check Customer List Pages
- Check Re-stock Pages
- Check Re-order Pages
- Check Goods Received Note Pages
- Check Delivery Sessions Timetable Pages
- Check Online Store Service Pages

Assumption Test

- Check Inventory List (Stock Level) updating history
- Check Daily Delivery Completed Pages
- Check Online Store Views Page

5.4. User Acceptance Testing

Alpha Test

Inventory Department

Steps	Use Case	Tester	Expected Result	Actual Result	Pass/Fail	Remarks
1	Goods /Inventory/ Customer List Searching	Inventory Department Staff	Able to search information of goods/ Inventory/Customer through keyword			
2	Goods Received Note Creation	Goods Inwards Clerk	Able to create			
3	Re-stock Request Receiving	Inventory Clerk	Able to receive Re-stock Request on message box			
4	Re-order Request Creation	Inventory Clerk	Able to create			
5	Delivery Note Creation (From warehouse to retail store)	Inventory Clerk	Able to create			
6	Delivery Sessions Timetable Checking	Inventory Clerk & Delivery Workman	Able to search delivery sessions time			
7	Sales Delivery Note (for customer)	Delivery Workman	Able to set the status to “completed” and let customer to sign			
8	Retail Store Delivery Note	Delivery Workman	Able to set the status to “completed” and let sales manager to sign			

Purchase Department

Steps	Use Case	Tester	Expected Result	Actual Result	Pass/Fail	Remarks
1	Goods List Searching	Purchasing Department Staff	Able to search information of goods			
2	Supplier List Searching	Purchasing Department Staff	Able to search information of supplier			
3	Re-order Request Receiving	Purchasing Department Staff	Able to receive Re-order Request on message box			
4	Good Received Note Checking	Purchasing Department Staff	Data synchronize with inventory department			
5	Purchase Order Creation	Purchasing Department Staff	Able to create			

6. Features to be tested

The following list shows all the features to be tested

- Login Account
- Logout Account
- POS System
- Place Sales Order
- Create Delivery Note
- Create Installation Note
- Create Goods Return Note
- Notification
- Check Retail Store Inventory List
- Check Warehouse Inventory List
- Check Goods List
- Check Customer List
- Re-stock Request
- Sales Data Analysis
- Re-order Request
- Create Goods Received Note
- Delivery Arrangement
- Installation Arrangement
- Online Store
- Inventory Data Analysis
- Supplier List
- Purchase Order
- Print Receipt
- Create Goods Return Note

7. Features not to be tested

The following list shows all the features not to be tested with a particular reason.

- Payment Gateway (We do not need to test the payment method)
- Re-order Items (We do not need to order items from supplier)
- Online Store (We do not need to test the workable of the online store)

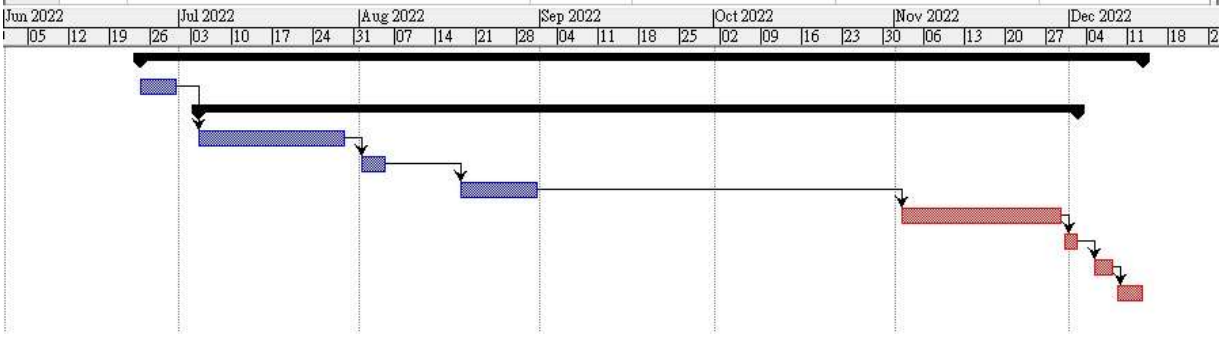
8. Resources/ Roles & Responsibilities

Actor name	**Description**
User	**User can be staff from different department or customer to access online store**
Public user	They can be a registered customer of an online store. They can browse goods.
Customer	They can log in to their account. Then, they can buy goods and request services including delivery and installation.
Staff	They have personal staff accounts. After logging in, they can use the function in the interface.
Sales Department Staff	**They can check information such as goods, stock level, customer and receipt to service customers. They also need to do data analysis.**
Sale Manager	They need to place re-stock requests and are included by sales department staff
Sales Representative	Sales representatives use the POS system and part of the sales department system.
Inventory Department Staff	**They can check part of the information from the inventory system.**
Inventory Clerk	Their main work is placing re-order requests and placing delivery notes for retail stores. They inherit inventory department staff.
Goods Inwards Clerk	They need to place goods received note. They inherit inventory department staff.
Delivery Workman	They complete delivery notes and inherit inventory department staff.
Technical Support Department Staff	**They check the inventory list and delivery sessions timetable.**
Technical Support Manager	They inherit technical support department staff.

Technical Support Clerk	They arrange installation timetables and inherit technical support department staff.
Installation Workman	They complete installation notes and inherit technical support department staff.
Purchase Department Staff	**They use all functions from the purchasing department system.**
Purchase Manager	They inherit the purchasing department staff.
Purchase Clerk	They inherit the purchasing department staff.
Accounting Department Staff	**They use all functions from the accounting department system.**
Accounting Manager	They inherit the accounting department staff.
Accounting Clerk	They inherit the accounting department staff.

9. Test Schedule

	Name	Duration	Start	Finish	Predecessors
1	**Testing Phase**	120 days?	**6/24/22 8:00 AM**	**12/13/22 5:00 PM**	
2	Making Test Specification	5 days?	6/24/22 8:00 AM	6/30/22 5:00 PM	
3	**Perform Test Execution**	108 days	**7/4/22 8:00 AM**	**12/2/22 5:00 PM**	
4	Test Task 1 - Database, POS, Print Receipt	20 days	7/4/22 8:00 AM	7/29/22 5:00 PM	2
5	Test Task 2 - Delivery Note, Purchasing Order, Re-stock	5 days	8/1/22 8:00 AM	8/5/22 5:00 PM	4
6	Test Task 3 - Notification, Delviery, Installation	10 days	8/18/22 8:00 AM	8/31/22 5:00 PM	5
7	Test Task 4 - Checking, Online Store	20 days	11/2/22 8:00 AM	11/29/22 5:00 PM	6
8	Final Testing	3 days	11/30/22 8:00 AM	12/2/22 5:00 PM	7
9	Test Report	4 days	12/5/22 8:00 AM	12/8/22 5:00 PM	8
10	Test Delivery	3 days?	12/9/22 8:00 AM	12/13/22 5:00 PM	9



10. Migration Plan

Test plan work through parallel conversion, so the both old and new systems including paper-based system and computerized management system are used simultaneously for a period of time. The paper-based system is discontinued when the new system is proven fully capable to prevent influencing customer services. For conversion location, we use simultaneous conversion. Due to having two retail stores only, the converting time is not spent a lot. According to agile development sprint cycle, we use modular conversion to convert from old system to new system one module at a time.