CASHIER AND INVENTORY MANAGEMENT SYSTEM WITH BARCODE SCANNER

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Software Development) with Honours.

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
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DECLARATION

I hereby declare that this project report entitled

CASHIER AND INVENTORY MANAGEMENT SYSTEM WITH BARCODE SCANNER

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date : 27 June 2021
(NUR KHAIRUNNISA BINTI IDRUS)

I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Software Development) with Honours.

SUPERVISOR : _____ Date : 13 September 2021
(EMALIANA BINTI KASMURI)

DEDICATION

To my beloved parents, thank you for supporting me through this journey from the beginning until the end. Both of you have been supporting me without any complaint and always encourage me to finish this journey. Also, to my friends who helping me to complete this journey, thank you very much for the never-ending helps. Once again, thank you everyone

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I would like to give appreciation to my supervisor, Madam Emaliana Binti Kasmuri for her supervision and constant support. Her comments and suggestions during the tentative and proposal works have contributed to the success to complete this project.

ABSTRACT

The Cashier and Inventory Management System with Barcode Scanner is specifically developed to provide a systematic sales and inventory recording services. Cashier and Inventory Management System with Barcode Scanner system is a desktop system developed that it is focused on managing the activities running in convenience store that includes managing suppliers, managing stocks, and sales. This system also uses a barcode scanner to speed up the process of sales transaction. It can be accessed with two users which is the admin who is the store manager and cashier. Only authorized user can access and use the system. The admin can manage the suppliers by adding and updating the suppliers list using the system. The admin also could add the product and update the products using the system. They are also able to update the product stock anytime they want. There is also a function that allow the admin to add new users using the system. The admin could also specify the role of user. Then, they are also able to use the cashier function. Sales report function also included in the system. As for the user type cashier, they can only view and update their personal detail and access the cashier function. On the other hand, this system is also focused on database management of the product inventory. The methodology used to develop this system is Waterfall which is a standard process to conduct all the steps necessary to analyses, design, implement, and maintain information systems. An analysis study has been done based on the current existing system and all the problems statements and requirements have been identified. The interfaces for this system have been designed according to the requirement and needs of the current market. This Cashier and Inventory Management System with Barcode Scanner will help to improve the performance of current situation and overcome the problems that arise nowadays.

ABSTRAK

The Cashier and Inventory Management System with Barcode Scanner dibangunkan secara khusus untuk menyediakan perkhidmatan merekod jualan dan inventori yang sistematik. Sistem Cashier and Inventory Management System with Barcode Scanner adalah sistem desktop yang dikembangkan yang difokuskan untuk menguruskan kegiatan yang berjalan di kedai serbaneka yang merangkumi menguruskan pembekal, menguruskan stok, dan transaksi penjualan. Sistem ini juga menggunakan pengimbas kod bar untuk mempercepat proses transaksi penjualan. Ia dapat diakses dengan dua pengguna iaitu admin yang merupakan pengurus kedai dan juruwang. Hanya pengguna yang sah yang dapat mengakses dan menggunakan sistem. Admin boleh menguruskan pembekal dengan menambahkan dan mengemas kini senarai pembekal menggunakan sistem. Admin juga dapat menambahkan produk dan mengemas kini produk menggunakan sistem. Mereka juga dapat mengemas kini stok produk bila-bila masa sahaja mereka mahukan. Terdapat juga fungsi yang membolehkan admin menambah pengguna baru menggunakan sistem. Admin juga dapat menentukan peranan pengguna. Kemudian, mereka juga dapat menggunakan fungsi juruwang. Fungsi laporan penjualan juga termasuk dalam sistem. Bagi juruwang jenis pengguna, mereka hanya dapat melihat dan mengemas kini perincian peribadi mereka dan mengakses fungsi juruwang. Sebaliknya, sistem ini juga tertumpu pada pengurusan pangkalan data inventori produk. Metodologi yang digunakan untuk mengembangkan sistem ini adalah “Waterfall” yang merupakan proses standard untuk melakukan semua langkah yang diperlukan untuk menganalisis, merancang, menerapkan, dan memelihara sistem informasi. Satu kajian analisis telah dibuat berdasarkan sistem yang ada sekarang dan semua pernyataan dan keperluan masalah telah dikenal pasti. Antaramuka untuk sistem ini telah dirancang mengikut kehendak dan keperluan pasaran semasa.Cashier and Inventory Management System with Barcode Scanner ini akan membantu meningkatkan prestasi keadaan semasa dan mengatasi masalah yang timbul pada masa kini.

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LIST OF ABBREVIATIONS

FYP	**-**	**Final Year Project**
PSM	**-**	**Projek Sarjana Muda**
SDLC	**-**	**Software Development Life Cycle**
NRIC	**-**	**National Registration Identity Card Number**
ID	**-**	**Identification**
UI	**-**	**User Interface**
DDL	**-**	**Data Definition Language**
UTeM	**-**	**Universiti Teknikal Malaysia Melaka**
FTMK	**-**	**Fakulti Teknologi Maklumat dan Komunikasi**

LIST OF ATTACHMENTS

CHAPTER 1: INTRODUCTION

1.1 Introduction

Cashier and Inventory System with Barcode Scanner is a desktop-based system to be developed that it is focused on managing the activities running in convenience store such as managing the product stock and sales transaction. Before, the store manager used manual way to manage the convenience store. Among the problems of the manual system are loss of stock data and data redundancy. To overcome this problem, Cashier and Inventory System with Barcode Scanner is the right step because it can store data safely and avoid data redundancy by storing the data in database. It also uses a barcode scanner that can speed up the payment process at the cashier.

1.2 Problem Statement

On the current system, the store manager and cashier of the convenience store handle all the process regarding the sales and inventory management. This approach has given a lot of problems to the manager. It is not efficient as all the process regarding the management is slow. It also wasted a lot of paper because the information of the stock and supplier are recorded and kept manually by the store manager. When finding certain information regarding the stock availability or supplier, it also wasted the store manager time and effort because it took so much time for them to find it manually one by one. The manual system also always causes data loss. Since it is stored on paper, human error could happen and the loss of the paper can lead to data loss. In conclusion, this manual system does not seem to be reliable anymore. To overcome this problem, we can use computerized system to manage all this processes and

solve this problem. With the barcode scanner, the cashier does not have to key in the barcode manually.

1.3 Objective

- To analyze the business process running by the convenient store.
- To design a system that can store all the stock and supplier data in one place without consuming a lot of physical space in the store
- To develop a system that can manage the stock and supplier data of in one place without redundancy
- To test the barcode scanner by tracing the stock with barcode assigned

1.4 Scope

1.4.1 System Module

(a) User Management Module

In this module, the admin can manage the users who can access inside the system. The admin can register a new user to give them permission to access the system

(b) Point of Sale Module

This module is responsible in calculating the items purchased by the customer. This module will be used by the cashier. To speed up the process, this module will be integrated with barcode scanner. The cashier can simply input the barcode inside the system with one single scan for each product purchased by the customer.

(c) Product Management Module

This is a module created specifically for the admin. The aim of this module is to help the admin to keep track with the product inventory. In this module, the admin can add new product details. They also can update the existing product

(d) Supplier Management Module

This is another module created specifically for the admin. The aim of this module is to help the admin to manage the store supplier information. In this module, the admin can add new supplier details. They also can update the existing supplier.

(e) Report Generation Module

This module can generate the sales and log report. The user who can access this module is the admin.

1.4.2 System Target User

(a) Cashier

The cashier can do the following action

i. Login into system

ii. Update account detail

iii. Record sales transaction

(b) System Administrator

The store administrator can do the following action

i. Login into system

ii. Add new user

iii. View user list

iv. Update user detail

v. Record sales transaction

vi. Add new product

vii. View product list

viii. Update product detail

ix. Add new supplier

x. View supplier list

xi. Update supplier detail

xii. View report

1.5 Project Significant

This project will be beneficially for the convenience store management as it can helps them to manage the product stock and supplier digitally. This system also will be helpful for the cashier to speed up their task with the use of barcode scanner. Other than that, the management also can view the sales report.

1.6 Expected Output

The expected output for this project is to develop a desktop system that can be use by the convenience store to manage their business activities such as cashier system, stock management, supplier management and generate report in one place

1.7 Conclusion

As a conclusion, Cashier and Inventory Management System with Barcode Scanner would be helpful for convenience store to run their business activity smoothly. The system will let the admin to manage their supplier and inventory detail one place. The system also will speed up the sales transaction process between the cashier and customers

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Cashier is a person who record the sales transaction through a cash register for the items that the customer wishes to purchase at the convenience store. The items are scanned by a barcode reader positioned on the item with the use of a laser scanner. After all the items are being scanned, the cashier will be received either bank notes for cash or cash or debit or credit card for electronic payment for the goods or services exchanged, Balance will be returned to the customer that option for cash transaction. Whereas for customer that choose electronic transaction, a copy of electronic transaction will be printed and given to customer.

2.2 Facts and findings

This section will focus on the existing of cashier and inventory management system. It will introduce the domain and the explanations of the existing system along with the applicable technique related with cashier and inventory management.

2.2.1 Domain

Cashier and Inventory Management System with Barcode Scanner is a proposed desktop system that provides most of the functionality required for a sales transaction system. The system will allow the admin to make modification in supplier and product management while the cashier can access to the sales transaction function.

2.2.2 Existing System

Convenience store manager and cashier handle all the process regarding the management manually. This manual system caused a few problems. It is not efficient as all the process regarding the management is slow. It also wasted a lot of paper because the information of the stock and supplier are recorded and kept manually by the store manager. When finding certain information regarding the stock availability or supplier, it also wasted the store manager time and effort because it took so much time for them to find it manually one by one. The manual system also always causes data loss. Since it is stored on paper, human error could happen and the loss of the paper can lead to data loss. In conclusion, this manual system does not seem to be reliable anymore.

2.3 Project Methodology

Project methodology is essentially a set of guiding principles and processes for managing a project. The purpose of project methodology is to allow for controlling the entire management process through effective decision making and problem solving, while ensuring the success of specific processes, approaches, techniques, methods, and technologies. Different project management methodologies have their own pros and cons for different project types. Some are geared for speed, some for comprehensiveness.

2.3.1 Software Development Approach

Software development approach is a process that has been used in the software development. For this project Software Development Life Cycle (SDLC) have been chosen as the development approach. The SDLC is a process that been used by software engineering to design, develop and test quality of the software. It also to define each task that been performed to complete the software

2.3.2 Software Development Model

For this project, waterfall methodology is chosen as it is the most suitable methodology for this system.

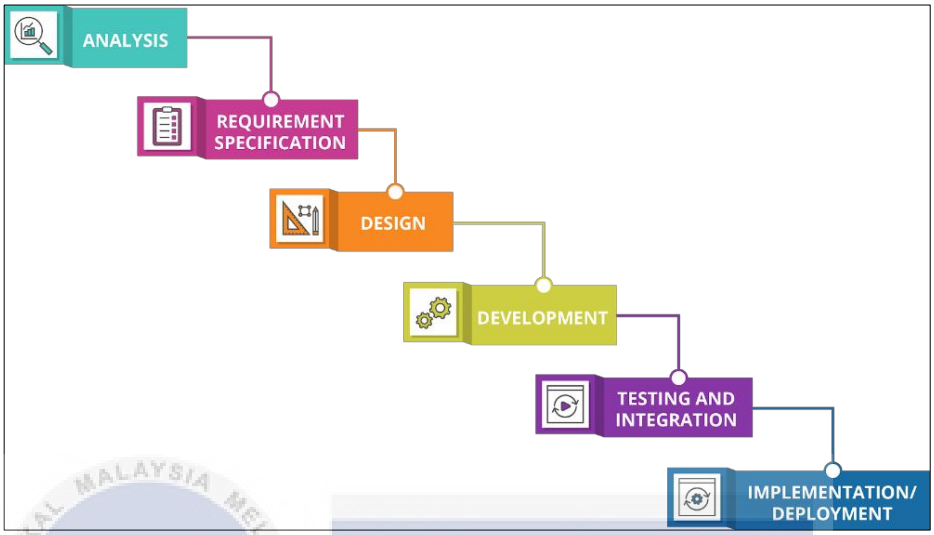


Figure 2.1: Waterfall Model Methodology

In waterfall methodology, each step must be completed before proceeding to the other steps. The waterfall model is so named because each phase of the project cascades into the next, following steadily down like a waterfall. The whole process is divided into sequential stages, and it is imperative to complete each phase successfully to move onto the next one. Table 2.1 described each activity in each phase.

Table 2.1: Waterfall Methodology Phase

Phase	**Activity**
Requirement Analysis	• Analyze existing system and identify improvement to be include in proposed system • Gather current system pros and cons.
System Design	• Focused on logical and physical specification • Determine programming language and database.

Implementation	• Install all requirement software for the development process • Codes the current system and integration with database
Testing	• Test the codes • Evaluate the system
Maintenance	• Upgrade and enhancement for the system

2.4 Project Requirement

There are two requirements when it comes to project development. The two major of project requirement is software and hardware requirement. This section will list put the requirements to make this project worked out.

2.4.1 Software Requirement

Software requirements describe the requirements or features of what software programs required to operate the system. It is important in order determine the best software programs to make sure the development progress smooth. Table 2.2 below shows the software used for this project.

Table 2.2: Software Requirement

Development Tools	Eclipse IDE for Java Developers Version: 2021-03 Language: Java
Operating System	Window 10
Web Server	WAMP64 Version: 3.2.2 64 bits
Editing Software	- Adobe Photoshop Version: CS6 64 bits - Draw.io

2.4.2 Hardware Requirement

Hardware requirement is a listing of what hardware required to operate the system. It is important in order determine the best hardware to make sure the development progress smooth.

Table 2.3: Hardware Requirement

Development Tools	Honor Magicbook "14" Laptop
RAM	8 GB
Processor	AMD Ryzen 5 3500U with Radeon Vega Mobile Gfx 2.10 GHz
Input Device	L&K Laser 1D Barcode Scanner Product Code: NT2012 Basic Model Input Type: EAN-13

2.5 Project Schedule and Milestone

In this project, Gantt Chart is used for the project planning and milestone. Figure 2.2 below shows the project Gantt Chart. One page view of the Gantt chart will be included in Appendix A.

Activity	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
FYP Briefing	■													
Assigned to Supervisor		■												
Proposal Preparation		■												
Submit Proposal to Supervisor		■												
System Development and Report Chapter 1			■	■										
System Development and Report Chapter 2					■	■								
System Development and Report Chapter 3							■	■						
System Development and Report Chapter 4										■	■			
Project Demo												■	■	
Final Presentation and Submission of Final Report														■

Figure 2.2: Gantt Chart

Table 2.4: PSM 1 Project Milestone

PSM 1 Project Milestone		
Week	Start Date	Deliverable
1	15/03/2021	Proposal
2	22/03/2021	Proposal Submission
3-4	29/03/2021	Chapter 1
5-6	12/04/2021	Chapter 2
7-8	26/04/2021	Chapter 3
10-11	17/05/2021	Chapter 4
12-13	25/05/2021	Project Demonstration
14	14/06/2021	PSM1 Draft Report
15	21/06.2021	Final Presentation Submission of PSM1 Report

Table 2.5: PSM2 Milestone

PSM 2 Project Milestone		
Week	Start Date	Deliverable
1	19/07/2021	Chapter 4
2	26/07/2021	Chapter 5
3-4	02/08/2021	Chapter 6
5-6	16/08/2021	Chapter 7
7	30/08/2021	PSM 2 Draft Report
8	06/09/2021	Presentation, PSM2 Logbook
9	13/09/2021	Final PSM Report, PSM2 Logbook, Plagiarism Report

2.6 Conclusion

In conclusion, this chapter discussed about the introduction of the chapter, domain for the system, and project methodology. Cashier and Inventory Management System with Barcode Scanner used the waterfall model as our development technique for the system as mentioned earlier in the subchapter. Besides, this chapter also mentioned about the project requirement which are software requirement and hardware requirement.

CHAPTER 3: ANALYSIS

3.1 Introduction

System analysis is a process of studying or analyzing a business situation for the purpose of developing a system solution to a problem or devising improvements to such a situation. It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. It is a problem-solving technique that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose. Data from various sources are gathered, reviewed, and analyzed to form some sort of finding or conclusion.

3.2 Problem Analysis

The current system operates manually from managing suppliers, stocking up products and generating reports. The way that the current system operates face a lot of errors, incompleteness, and insufficient data for analysis. The way its handle the data storage is still using pens and paper which is not properly organized and managed. These problems lead to difficulty in processing, updating, retrieving, and managing the data.

3.3 Requirement Analysis

Requirement analysis is an important stage to collect, analyses and determine the needs of high level of the system also the features need in the Cashier and Inventory

Management with Barcode System. It also involves of the data requirement, functional requirement, and non-functional requirement of the system.

3.3.1 Data Requirement

This section will analyze how the data is stored inside the database. For this project, MySQL have been chosen as the database to store all the required information of the system.

3.3.1.1 Data Dictionary

Based on the proposed system flow chart, this section will illustrate the data should the system store internally using data dictionary.

(a) Table login

Table 3.1: Login Table Data Dictionary below show the data dictionary for login table

Table 3.1: Login Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	staff_id	Varchar	6	Yes	Staff unique id	Yes
2.	password	Varchar	16	No	Staff login account password	Yes

(b) Table role

Table 3.2: Role Table Data Dictionary below show the data dictionary for role table

Table 3.2: Role Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	role_id	Int	2	Yes	Role unique id	Yes
2.	role_title	Varchar	10	No	Role title	Yes

(c) Table staff

Table 3.3: Staff Table Data Dictionary below show the data dictionary for staff table

Table 3.3: Staff Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	staff_id	Varchar	6	Yes	Staff unique id	Yes
2.	staff_name	Varchar	250	No	Staff name	Yes
3.	staff_icnum	Varchar	12	No	Staff identification number	Yes
4.	staff_phonenum	Varchar	11	No	Staff phone number	Yes
5.	role_id	Int	2	No	Staff role	Yes

(d) Table supplier

Table 3.4: Supplier Table Data Dictionary below show the data dictionary for staff table

Table 3.4: Supplier Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	supplier_id	Varchar	4	Yes	Supplier unique id	Yes
2.	supplier_name	Varchar	80	No	Supplier name	Yes
3.	supplier_email	Varchar	12	No	Supplier email	Yes
4.	supplier_phonenum	Varchar	11	No	Supplier phone number	Yes

(e) Table product

Table 3.5: Product Table Data Dictionary below show the data dictionary for staff table.

Table 3.5: Product Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	product_barcode	Varchar	13	Yes	Product barcode	Yes
2.	product_name	Varchar	150	No	Product name	Yes

3.	product_descp	Varchar	200	No	Product description	Yes
4.	product_weightvol	Decimal		No	Product weight	Yes
5.	product_price	Decimal		No	Product price	Yes
6.	category_id	Varchar	5	No	Product category	Yes
7.	product_image	BLOB		No	Product image path	No
8.	supplier_id	Varchar	4	No	Supplier unique id	Yes

(f) Table product_category

Table 3.6: Product Category Table Data Dictionary below show the data dictionary for product_category table.

Table 3.6: Product Category Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	category_id	int	2	Yes	Category id	Yes
2.	category	Varchar	50	No	Category name	Yes

(g) Table transaction

Table 3.7: Transaction Table Data Dictionary below show the data dictionary for transaction table.

Table 3.7: Transaction Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	transaction_id	Int	3	Yes	Transaction id	Yes
2.	staff_id	Varchar	4	Yes	Staff unique id	Yes
3.	transaction_ datetime	Datetime		No	Transaction time and date	Yes
4.	transaction_ total	Double		No	Total payment	Yes

(h) Table log

Table 3.8: Log Table Data Dictionary below show the data dictionary for log table

Table 3.8: Log Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	log_id	Int	3	Yes	Log id	Yes
2.	log_timedate	Datetime		Yes	Log time and date	Yes
3.	staff_id	Varchar	6	No	Staff unique id	Yes
4.	log_status	Varchar	20	No	Log status (LOOGED IN / LOGGED OUT)	Yes

3.3.2 Functional Requirement

This part will describe the business model and its activities process to produce a specific outcome. This part also will describe the details of the functional requirement of Cashier and Inventory Management System with Barcode Scanner will offer. It is also will show a use case diagram of the system to show the major of the business flow of the system.

The summary of the functional requirement of the Cashier and Inventory Management System with Barcode Scanner are as below:

(a) Login

(b) User Search

(c) View User

(d) Add User

(e) Update User

(f) Supplier Search

(g) View Supplier

(h) Add Supplier

(i) Edit Supplier

(j) Product Search

(k) View Product

(l) Add Product

(m) Edit Product

(n) Cashier

(o) Generate Report

(p) Logout

3.3.2.1 Use Case Diagram

Use Case is perfect diagram to describe the process and the flow of the system. Figure 3.1: Use Case Diagram shows the major elements of the system.

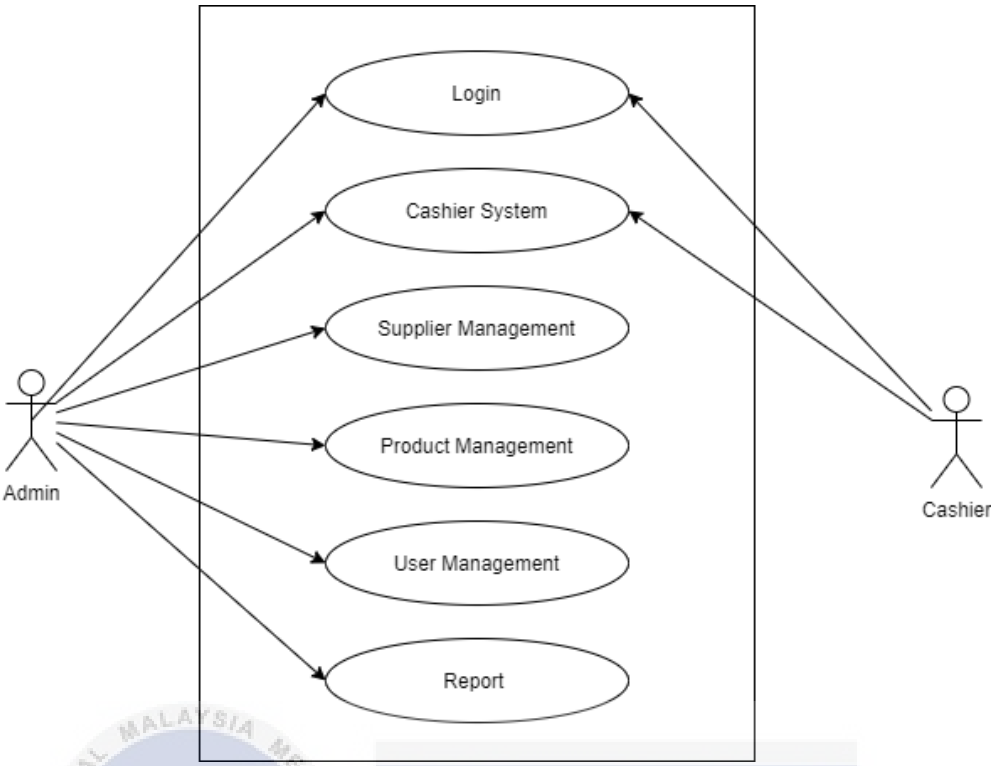


Figure 3.1: Use Case Diagram

3.3.2.2 Details Functional Requirement

Functional Requirement is a description of the service that the Cashier and Inventory Management System with Barcode Scanner offer. It describes a functions of software system or its component, where a function is described as a specification of behavior between outputs and inputs. Table 3.8: Detailed Functional Requirement below shows the detailed functional requirement.

Table 3.9: Detailed Functional Requirement

Requirement Number	Requirement	Description
F-001	Login	The system only give permission to the authorized user only to enter the system by using staff id and password.

F-002	User Search	The system only allow admin to find user by the staff name, NRIC number, and phone number.
F-003	View User	The system only allow admin to view the system user list.
F-004	Add User	The system only allow admin to add new user by clerk in staff id, NRIC, phone number and role.
F-005	Update User	The system only admin to update existed user details in the system and the system will display updated details in the system
F-006	Supplier Search	The system only allow admin to find supplier by the supplier's name and phone number.
F-007	View Supplier	The system only allow admin to view the supplier list.
F-008	Add Supplier	The system only allow admin to add new supplier by clerk in supplier name, phone number and email.
F-009	Update Supplier	The system only admin to update existed supplier details in the system and the system will display updated details in the system
F-010	Product Search	The system only allow admin to find product by the product barcode
F-011	View Product	The system only allow admin to view the product list.
F-012	Add Product	The system only allow admin to add new product.
F-013	Update Product	The system only admin to update existed product details in the

		system and the system will display updated details in the system
F-014	Cashier	The system allows authorized user to perform transaction
F-015	View Report	The system allow admin to view the reports.
F-016	Logout	The system allows users to logout from the system.

3.3.3 Non-functional Requirement

Non-functional requirement is a requirement that specifies criteria that can be used to judge the operation of the Cashier and Inventory Management System with Barcode Scanner, rather than specific behaviors of the system which is contrasted with functional requirements. Table 3.9: Non-Functional Requirement below show the non-functional requirement for this system.

Table 3.10: Non-Functional Requirement

Requirement Number	Requirement	Description
NF-001	Availability	The system must be available for user to use when user wants to.
NF-002	Usability	The error message that will appears to user after user making some error action and inform user about the error they make.

3.4 Conclusion

This chapter discuss the analysis of current system and proposed system. The use case provided show the overview of the system. This chapter also provide detailed understanding of every process and flow of the system.

CHAPTER 4: DESIGN

4.1 Introduction

In this chapter describe the high-level design and detail design of a proposed Cashier and Inventory Management System with Barcode Scanner. On part of the detail design going to explain the details design of classes and operation that used in the system.

4.2 High-Level Design

A high-level design is to explain the architecture that will be used to develop the Cashier and Inventory Management System with Barcode Scanner. It also provides overview of the entire system and identify the main component of the system. System Architecture

A system architecture is a conceptual model that defines the structure, behavior and view of the system. Figure 4.1: System Architecture Layer Diagram shows the system architecture view.

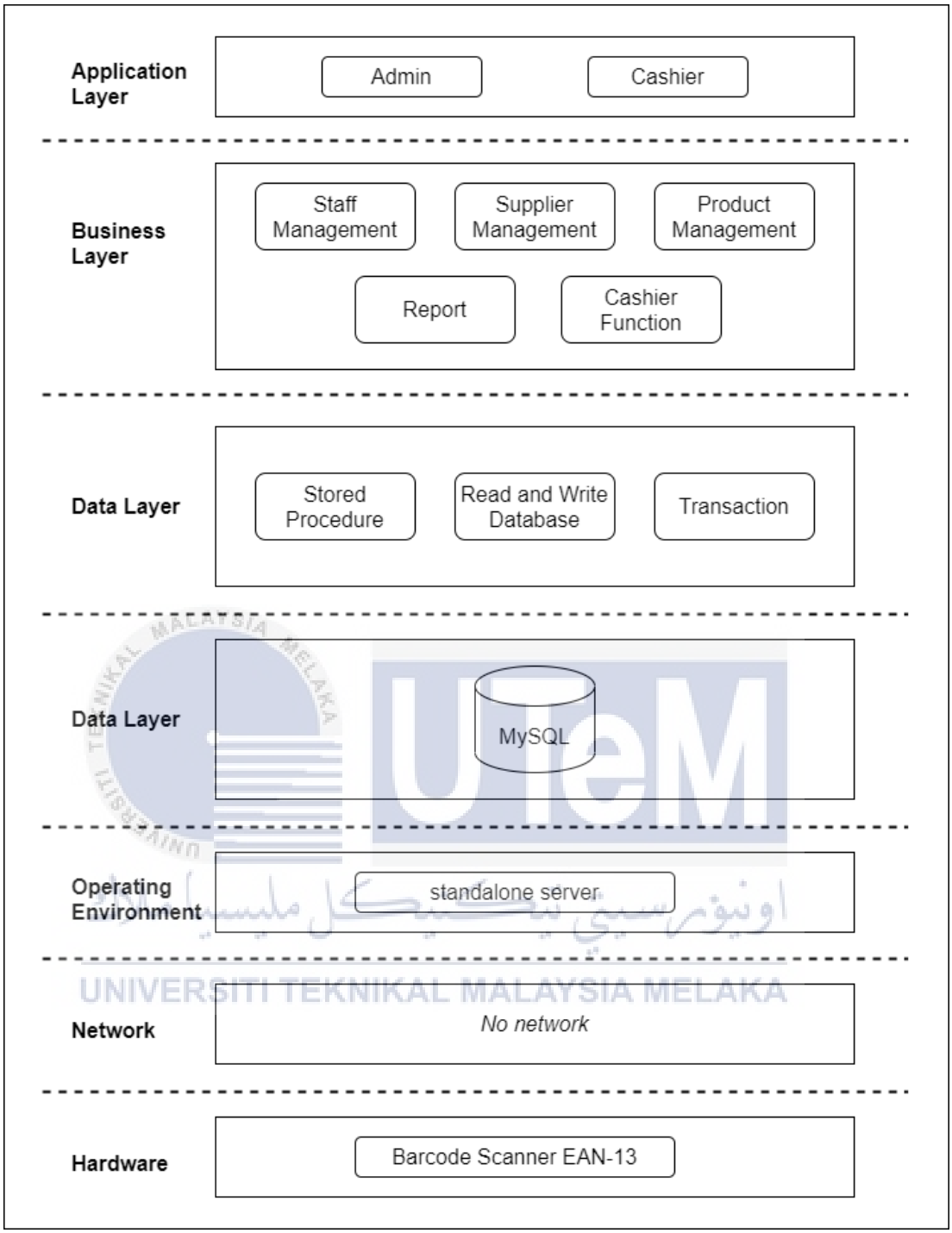


Figure 4.1: System Architecture Layer Diagram

4.2.1 User Interface Design

User interface is the point of human-computer interaction and communication on a device, webpage, or app. This can include display screens, keyboards, a mouse, and the appearance of a desktop. This section will explain the user interface of of

Cashier and Inventory Management System with Barcode Scanner for every use case along with the explanations of each property.

- ***Navigation Design***

This section will explain the navigation or path from one user interface to another user interface of the system.

Figure 4.3: Login UI Navigation below shows the UI navigation for login process

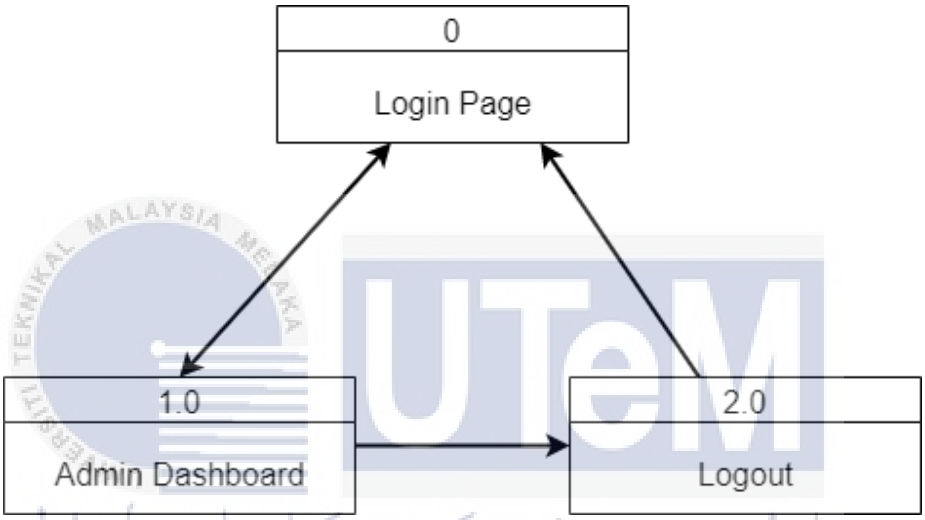


Figure 4.2: Login UI Navigation

Figure 4.4: Manage Staff UI Navigation below shows the UI navigation for manage staff process

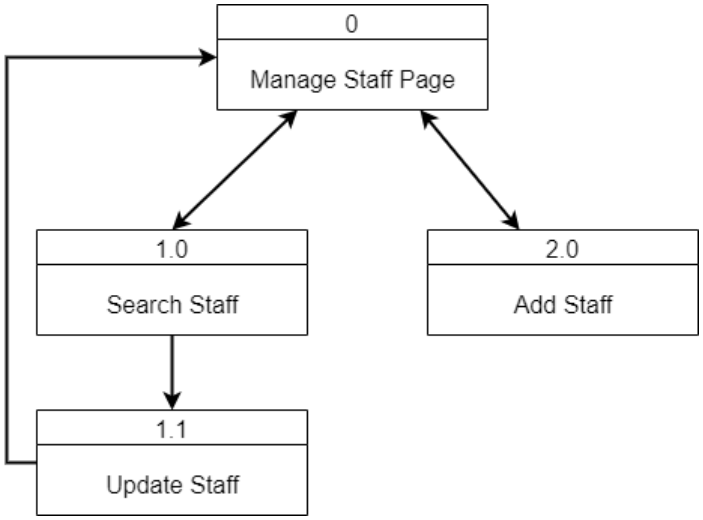


Figure 4.3: Manage Staff UI Navigation

Figure 4.5: Manage Supplier UI Navigation below shows the UI navigation for manage staff process

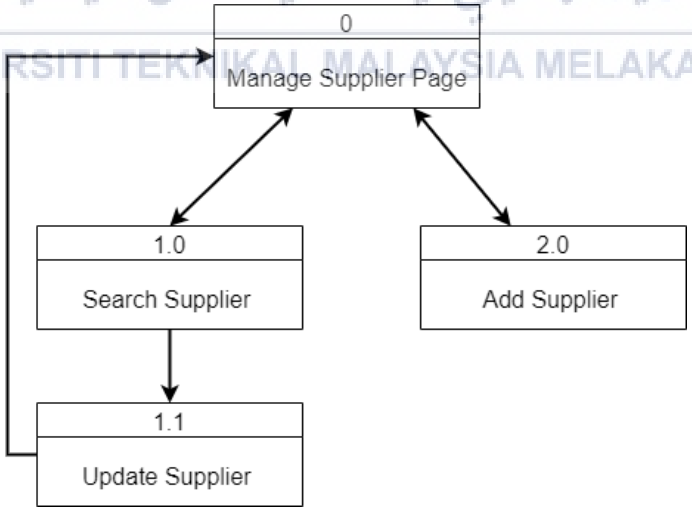


Figure 4.4: Manage Supplier UI Navigation

Figure 4.6: Manage Product UI Navigation below shows the UI navigation for manage staff process

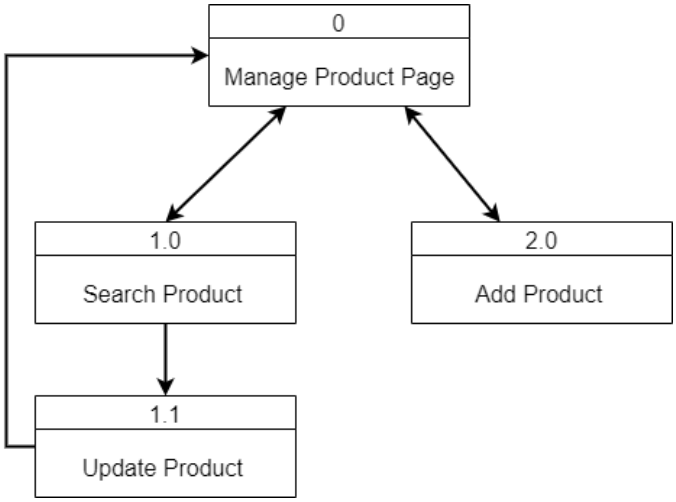


Figure 4.5: Manage Product UI Navigation

- ***Input Design***

This section will show the screen design that used to enter information, as well as any forms on which users write or type information.

Figure 4.7: Login Page UI below show the login page for Cashier and Inventory Management System with Barcode Scanner

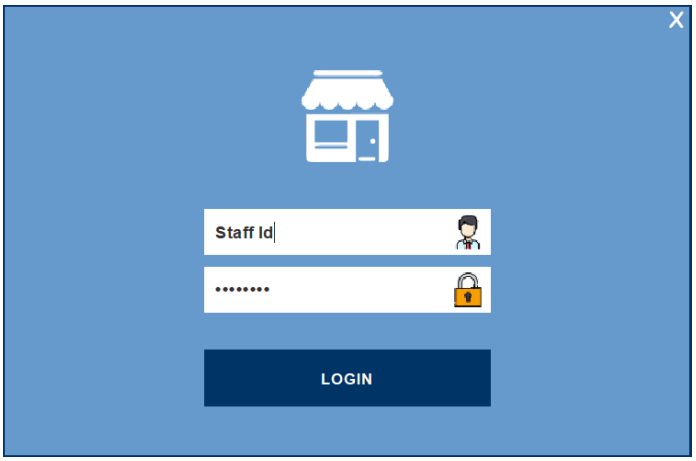


Figure 4.6: Login UI

Figure 4.8: Add Staff UI below show the add staff page for Cashier and Inventory Management System with Barcode Scanner

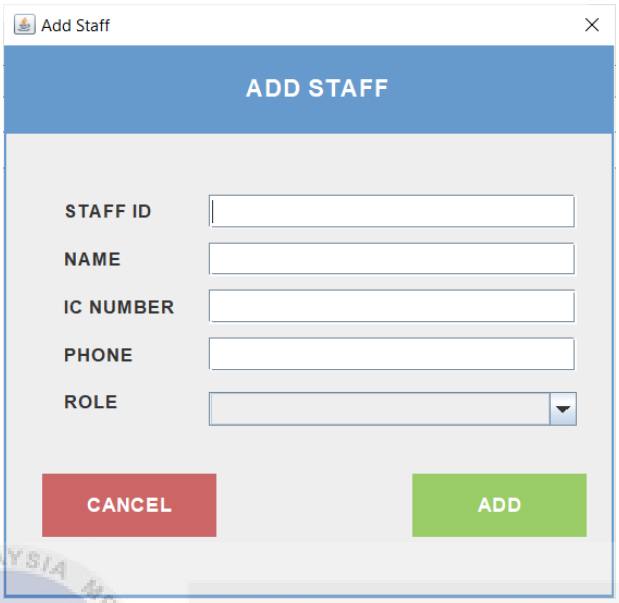


Figure 4.7: Add Staff UI

Figure 4.9: Update Staff UI below show the update staff page for Cashier and Inventory Management System with Barcode Scanner

Figure 4.8: Update Staff UI

Figure 4.10: Add Supplier UI below show the add supplier page for Cashier and Inventory Management System with Barcode Scanner

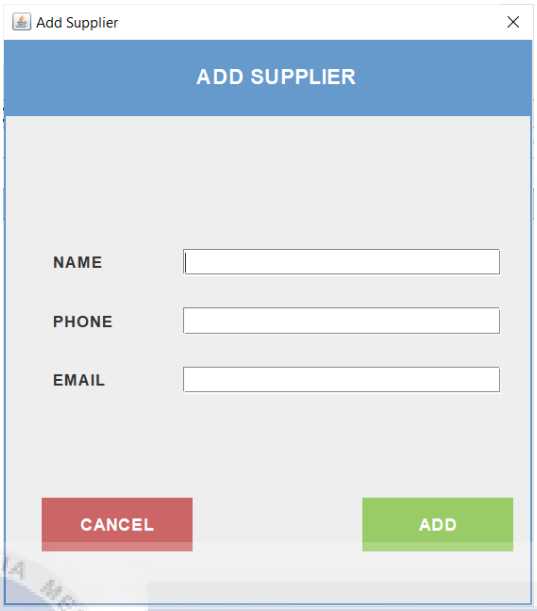


Figure 4.9: Add Supplier UI

Figure 4.11: Update Supplier UI below show the update supplier page for Cashier and Inventory Management System with Barcode Scanner

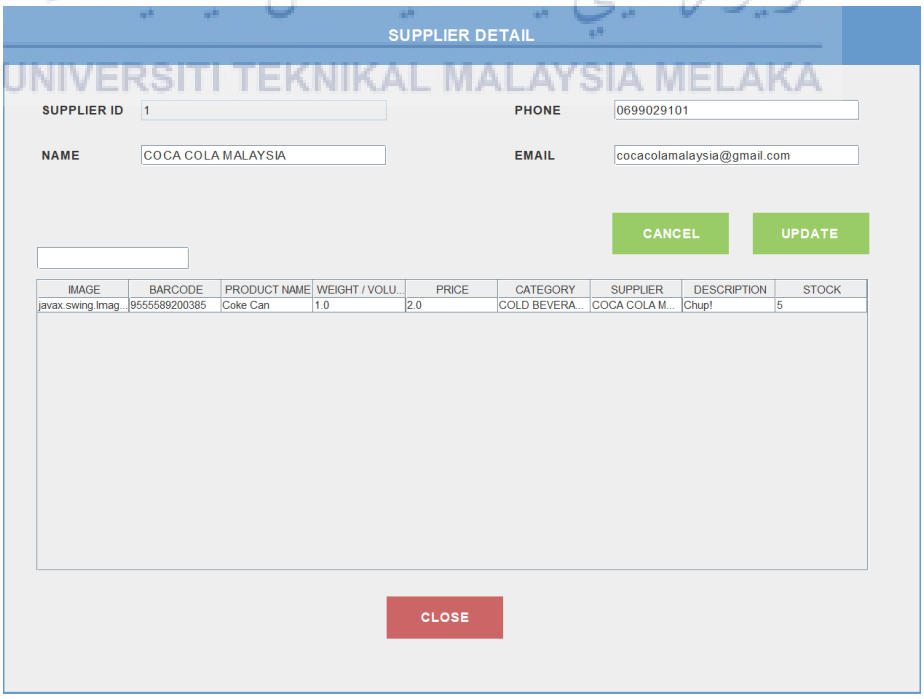


Figure 4.10: Update Supplier UI

Figure 4.12: Add Product UI below show the add product page for Cashier and Inventory Management System with Barcode Scanner

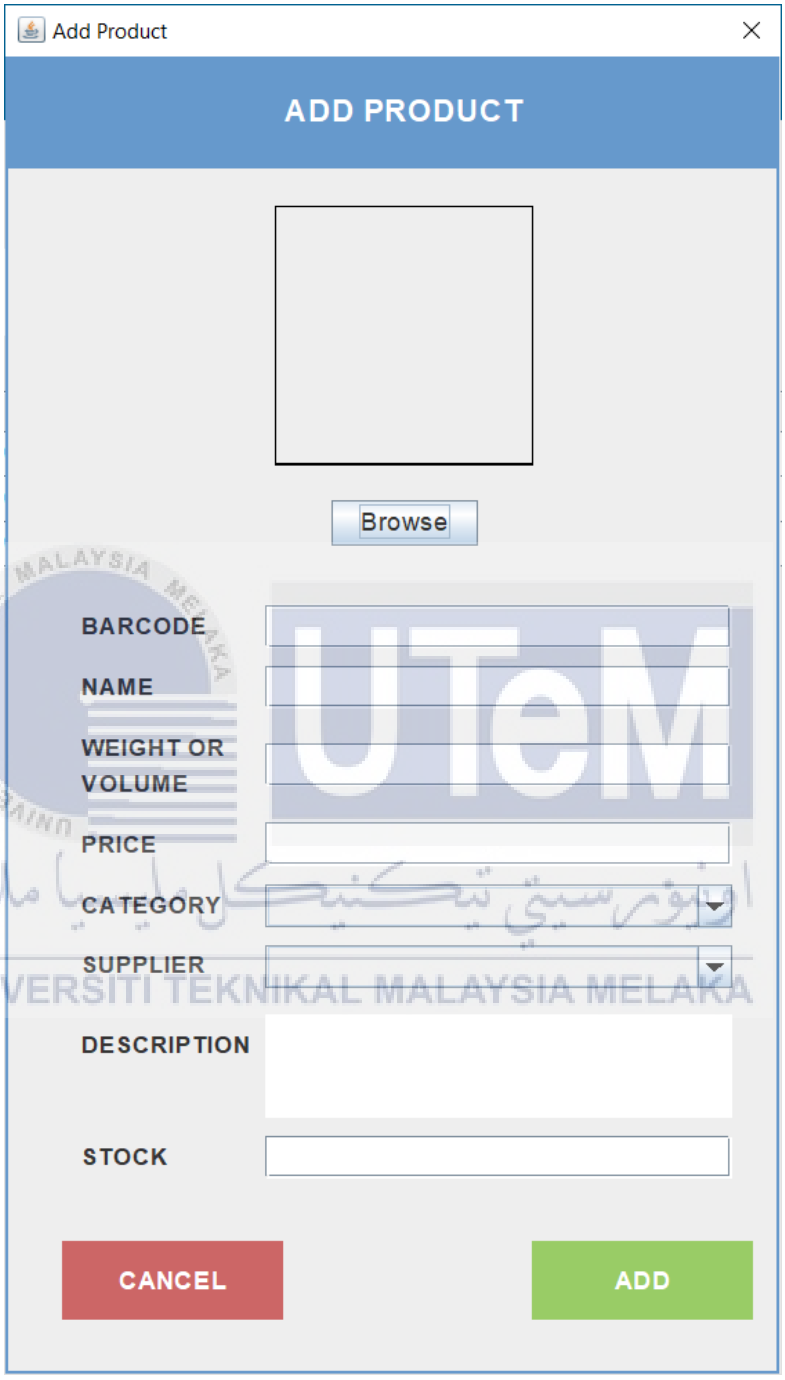


Figure 4.11: Add Product UI

Figure 4.13: Update Product UI below show the update product page for Cashier and Inventory Management System with Barcode Scanner

Figure 4.12: Update Product UI

Figure 4.14: Cashier Profile UI below show the update profile page for Cashier and Inventory Management System with Barcode Scanner

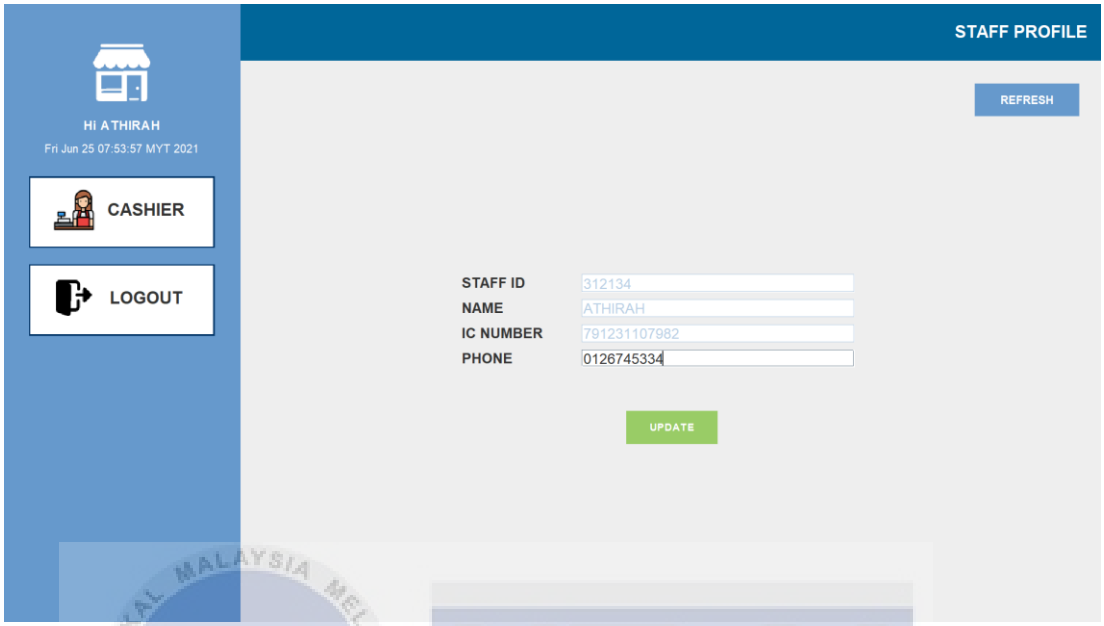


Figure 4.13: Cashier Profile UI

- ***Output Design***

The output design for this system is payment receipt and report. Both designs will be applied on PSM2.

4.2.2 Database Design

Database design is a collection of step or processes that help with designing, creating, implementing, and maintaining data management system. The main objectives of database design in DBMS are to produce logical and physical designs models of the proposed database system. This section will define the ER Diagram in detail along with the data dictionary and normalization.

4.2.2.1 Conceptual and Logical Database Design

The conceptual model is to establish the entities, their attributes, and their relationships. The logical data model defines the structure of the data elements and set the relationships between them. It can be illustrated with Entity Relationship (ER) diagram. ER is a diagram that shows the relationships of entity sets stored in a database.

For this system, there are six possible (7) entities. Figure 4.15: ER Diagram below shows the ER diagram for Cashier and Inventory Management System with Barcode Scanner

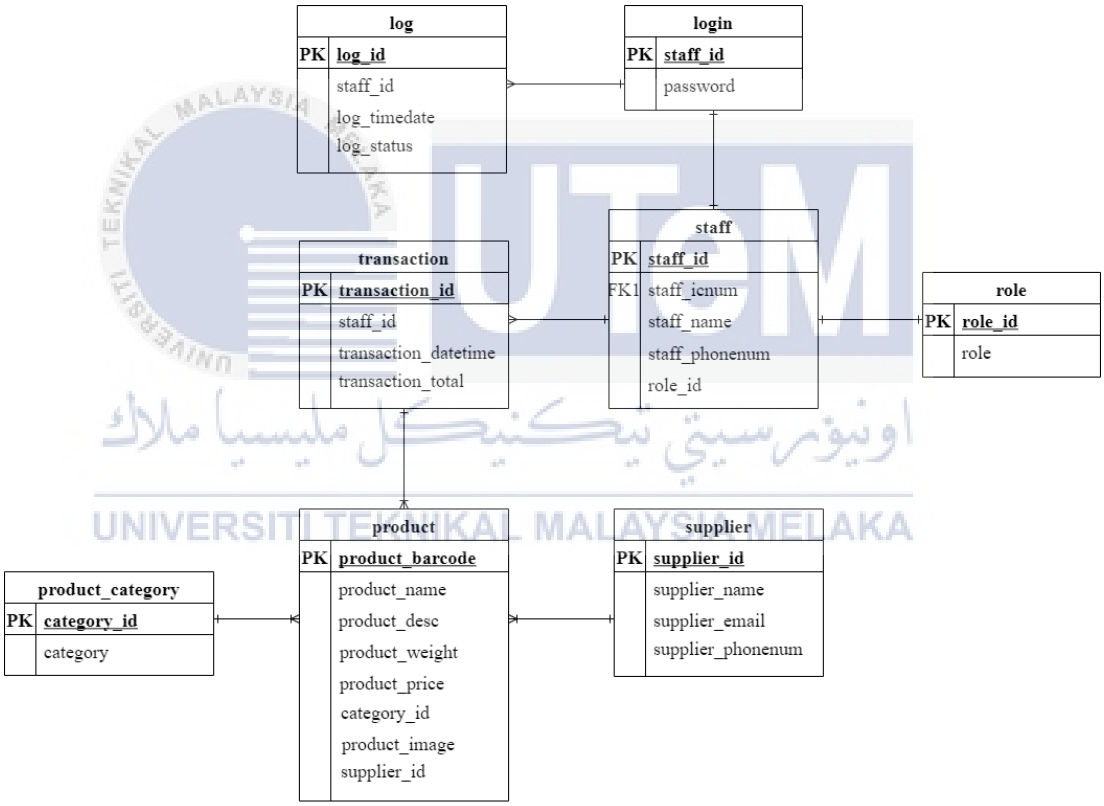


Figure 4.14: ER Diagram

Table 4.1: Login Table Data Dictionary below show the data dictionary for login table

Table 4.1: Login Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	staff_id	Varchar	6	Yes	Staff unique id	Yes
2.	password	Varchar	16	No	Staff login account password	Yes

Table 4.2: Role Table Data Dictionary below show the data dictionary for role table

Table 4.2: Role Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	role_id	Int	2	Yes	Role unique id	Yes
2.	role_title	Varchar	10	No	Role title	Yes

Table 3.3: Staff Table Data Dictionary below show the data dictionary for staff table

Table 4.3: Staff Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	staff_id	Varchar	6	Yes	Staff unique id	Yes
2.	staff_name	Varchar	250	No	Staff name	Yes
3.	staff_icnum	Varchar	12	No	Staff identification number	Yes

4.	staff_phonenum	Varchar	11	No	Staff phone number	Yes
5.	role_id	Int	2	No	Staff role	Yes

Table 4.4: Supplier Table Data Dictionary below show the data dictionary for staff table

Table 4.4: Supplier Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	supplier_id	Varchar	4	Yes	Supplier unique id	Yes
2.	supplier_name	Varchar	80	No	Supplier name	Yes
3.	supplier_email	Varchar	12	No	Supplier email	Yes
4.	supplier_phonenum	Varchar	11	No	Supplier phone number	Yes

Table 4.5: Product Table Data Dictionary below show the data dictionary for staff table.

Table 4.5: Product Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	product_barcode	Varchar	13	Yes	Product barcode	Yes
2.	product_name	Varchar	150	No	Product name	Yes

3.	product_descp	Varchar	200	No	Product description	Yes
4.	product_weightvol	Decimal		No	Product weight	Yes
5.	product_price	Decimal		No	Product price	Yes
6.	category_id	Varchar	5	No	Product category	Yes
7.	product_image	BLOB		No	Product image path	No
8.	supplier_id	Varchar	4	No	Supplier unique id	Yes

Table 4.6: Product Category Table Data Dictionary below show the data dictionary for product_category table.

Table 4.6: Product Category Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	category_id	int	2	Yes	Category id	Yes
2.	category	Varchar	50	No	Category name	Yes

Table 4.7: Transaction Table Data Dictionary below show the data dictionary for transaction table.

Table 4.7: Transaction Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	transaction_id	Int	3	Yes	Transaction id	Yes
2.	staff_id	Varchar	4	Yes	Staff unique id	Yes
3.	transaction_ datetime	Datetime		No	Transaction time and date	Yes
4.	transaction_ total	Decimal	4	No	Total payment	Yes

Table 4.8: Log Table Data Dictionary below show the data dictionary for transaction table.

Table 4.8: Log Table Data Dictionary

No	Name	Datatype	Length	Primary Key	Description	Mandatory (Yes / No)
1.	log_id	Int	3	Yes	Log id	Yes
2.	log_timedate	Datetime		Yes	Log time and date	Yes
3.	staff_id	Varchar	6	No	Staff unique id	Yes
4.	log_status	Varchar	20	No	Log status (LOOGED IN /	Yes

					LOGGED OUT)	

4.3 Detailed Design

This section will elaborate further specification on the logic of the design and the approach to satisfying the requirements.

4.3.1 Software Design

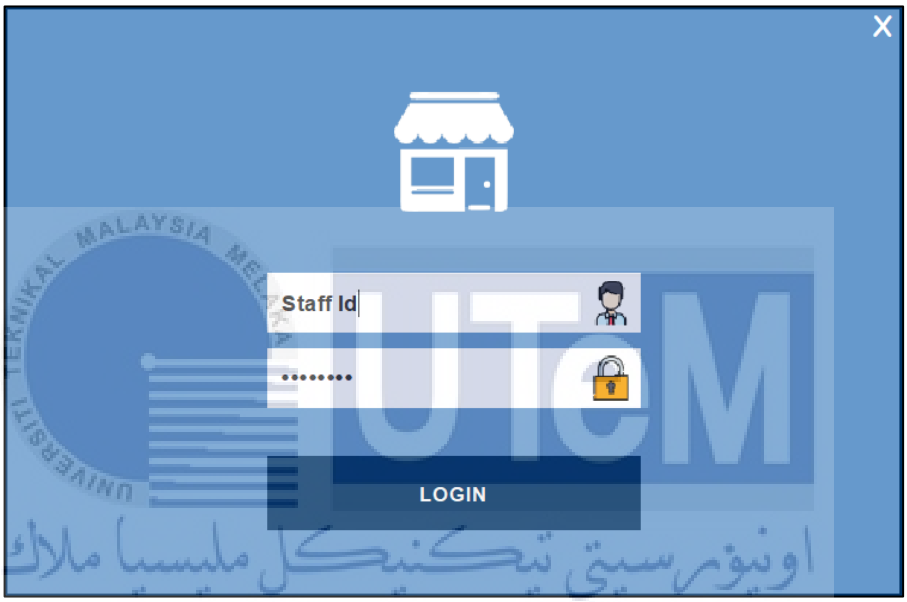
This section will describe every detail function of the program specification. The program specification will include information of the program description, file input, output, pseudo code and sample screens.

- ***Login Design Specification***

Table 4.8: Login Design Specification below shows the specification for login page design.

Table 4.9: Login Design Specification

Description	This program handles the login process of the system.
Input	Staff id and password
Output	If the staff id and password match the program will redirect to dashboard. If not, it will display alert message “Invalid id or password”
Pseudo Code	START Staff enter staffid and password, Staff click “LOGIN” button, The system check if its valid, If valid Check roleid If roleid = 1

	Redirect to admin dashboard Else Redirect to cashier dashboard Else Alert “Invalid id or password” END
Screen  **Figure 4.15: Login Design**	

- ***Admin Dashboard***

Table 4.9: Admin Dashboard Design Specification below shows the specification for admin dashboard page design

Table 4.10: Admin Dashboard Design Specification

Description	This program handles the navigation process of the system.
Input	Staff id
Output	Admin will be directed to the page that they choose on the menu
Pseudo Code	START

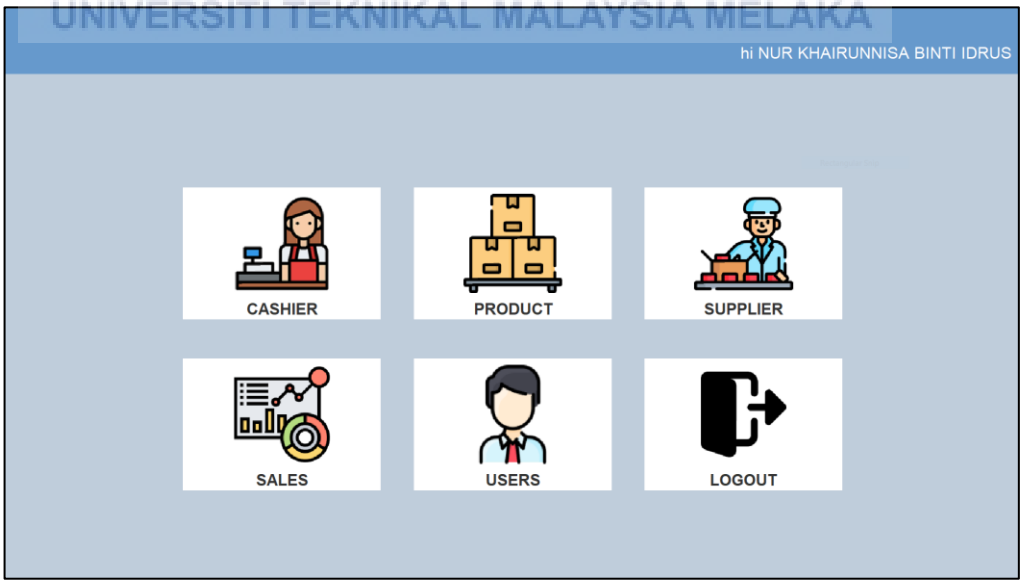
	If admin choose cashier menu Directed to sales transaction page Else if admin choose product menu Directed to product page Else if admin choose supplier menu Directed to supplier page Else if admin choose product menu Directed to product page Else if admin choose staff menu Directed to staff page Else if admin choose sales menu Directed to sale page Else Admin logout END
Screen	

Figure 4.16: Admin Dashboard Design

- ***Add Staff Design Specification***

Table 4.10: Add Staff Design Specification below shows the specification for add staff page design

Table 4.11: Add Staff Design Specification

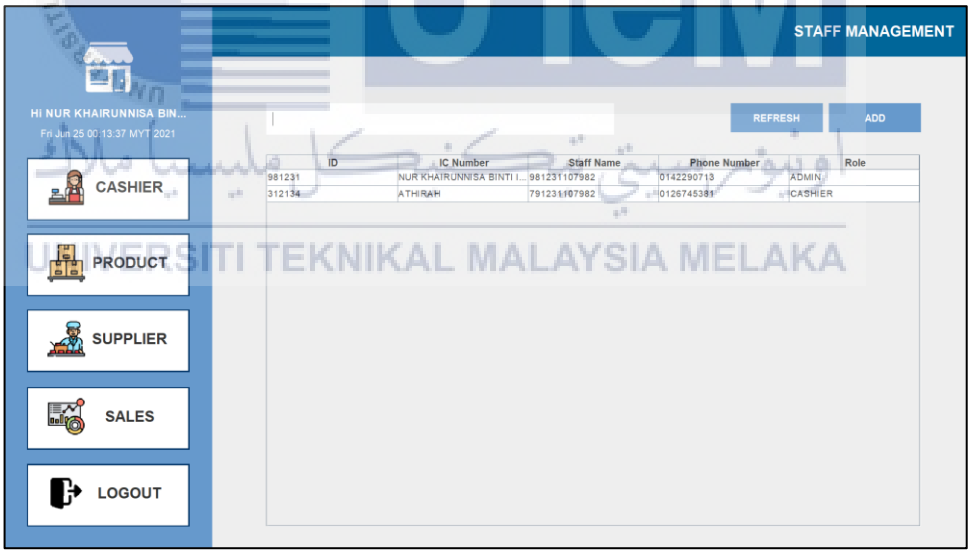
Description	This program handles the add staff process of the system.
Input	Staff id, name, NRIC, phone number,role
Output	Add staff data inside database
Pseudo Code	START Admin click “ADD” button, Admin key in input, Admin click Add button, Admin click “YES” button in confirmation dialog END
Screen	

Figure 4.17: Add Staff Design part 1

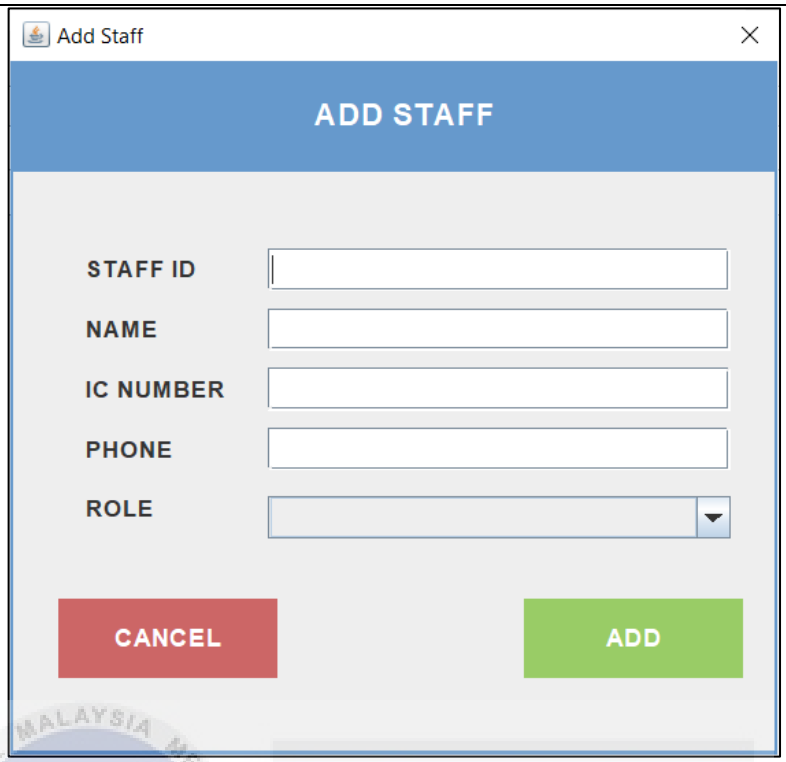


Figure 4.18: Add Staff Design part 2

- ***Update Staff Design Specification***

Table 4.11: Update Staff Design Specification below shows the specification for update staff page design

Table 4.12: Update Staff Design Specification

Description	This program handles the update staff process of the system.
Input	Staff id, name, NRIC, phone number, role
Output	Update staff data inside database
Pseudo Code	START Admin click staff list, Admin key in input, Admin click “UPDATE” button, Admin click “YES” button in confirmation dialog END

Screen

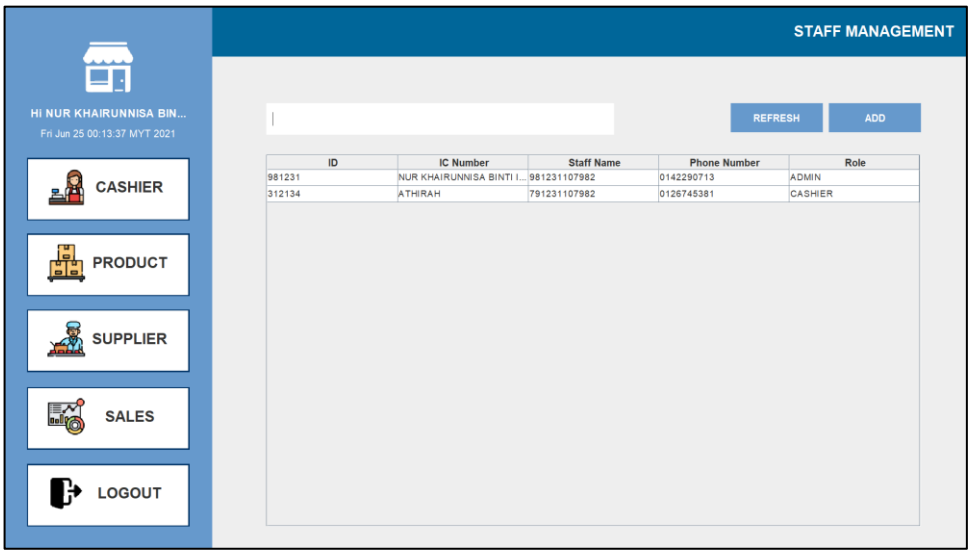


Figure 4.19: Update Staff Design part 1

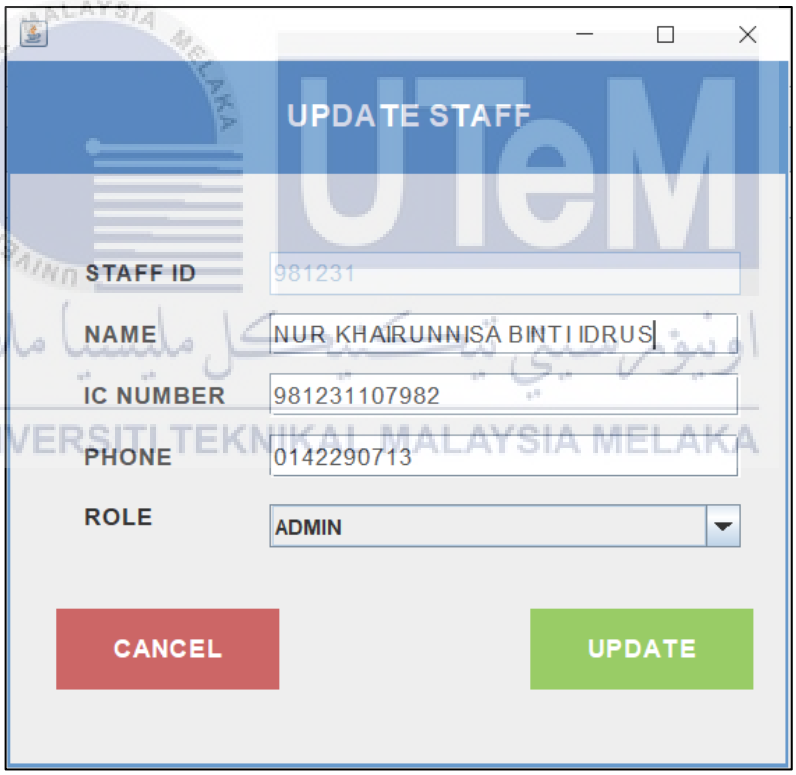


Figure 4.20: Update Staff Design

- ***Add Supplier Design Specification***

Table 4.12: Add Supplier Design Specification below shows the specification for add supplier page design

Table 4.13: Add Supplier Design Specification

Description	This program handles the add supplier process of the system.
Input	Supplier name, phone number, email
Output	Add supplier data inside database
Pseudo Code	START Admin click "ADD" button, Admin key in input, Admin click Add button, Admin click "YES" button in confirmation dialog END
Screen	

Figure 4.21: Add Supplier Design part 1

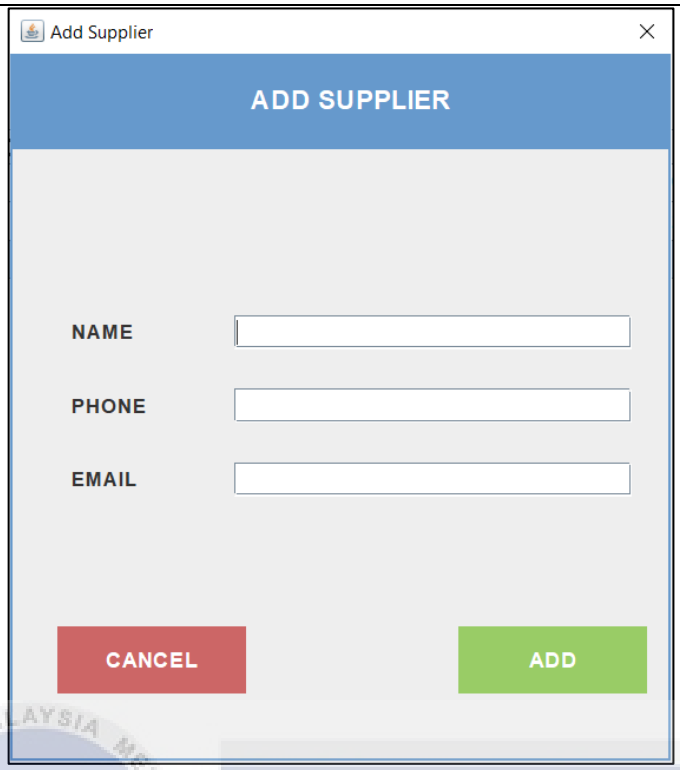


Figure 4.22: Add Supplier Design part 2

- ***Update Supplier Design Specification***

Table 4.13: Update Supplier Design Specification below shows the specification for update supplier page design

Table 4.14: Update Supplier Design Specification

Description	This program handles the update supplier process of the system.
Input	Supplier name, phone number, email
Output	Update supplier data inside database
Pseudo Code	START Admin click supplier list, Admin key in input, Admin click “UPDATE” button, Admin click “YES” button in confirmation dialog END

Screen

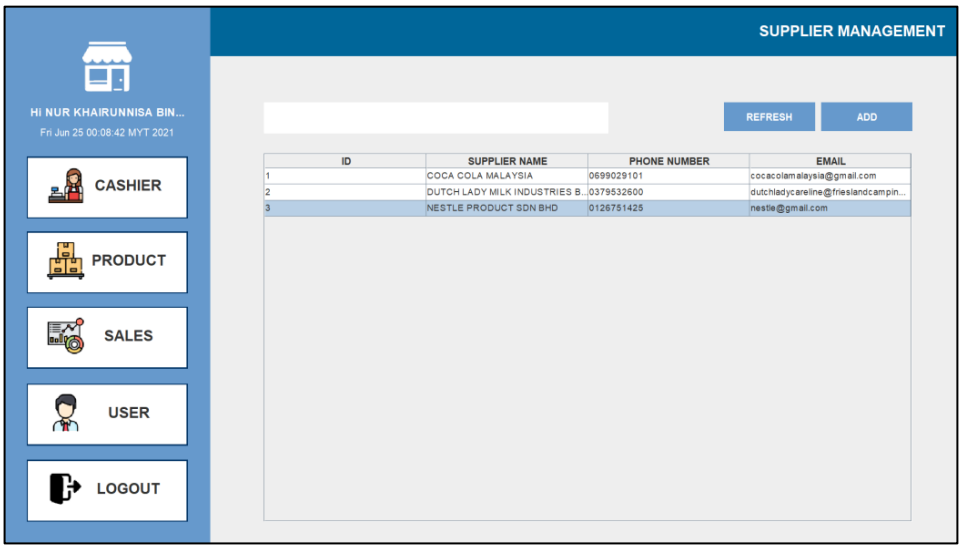


Figure 4.23: Update Staff Design part 1

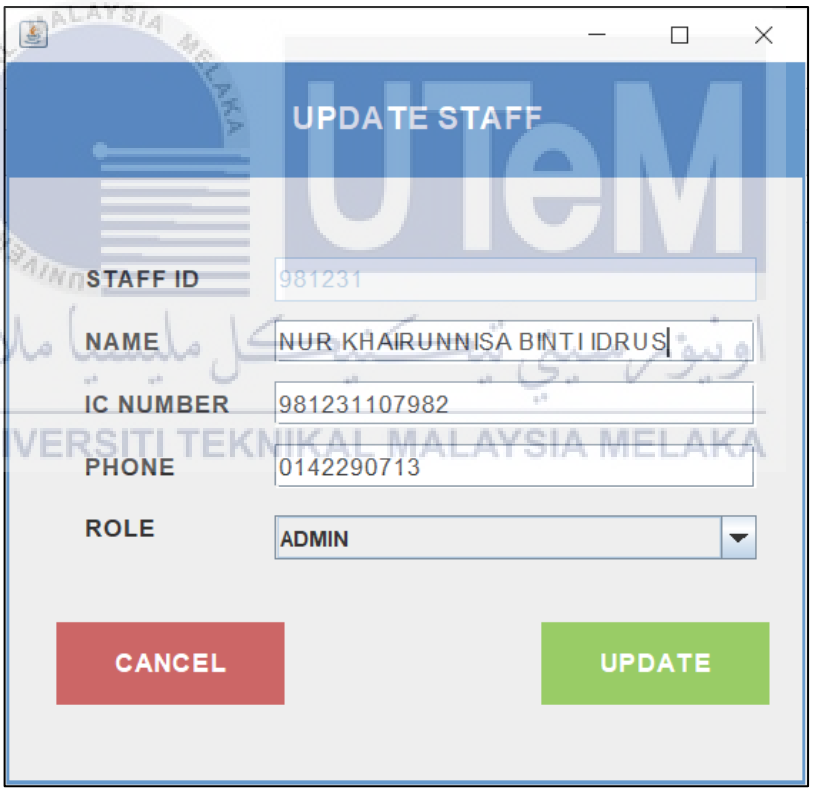


Figure 4.24: Update Staff Design part 2

- ***Add Product Design Specification***

Table 4.14: Add Product Design Specification below shows the specification for add product page design

Table 4.15: Add Product Design Specification

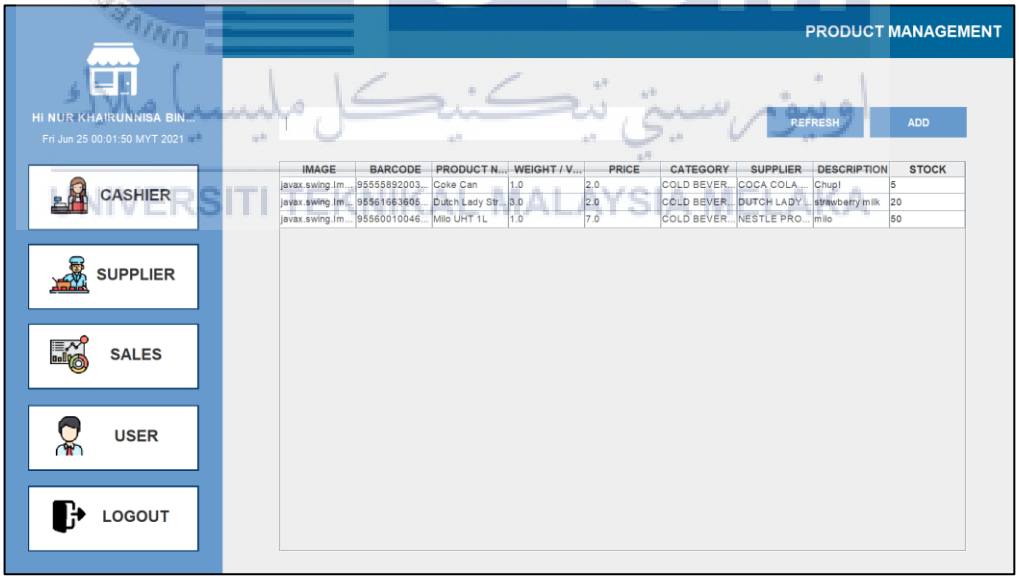
Description	This program handles the add product process of the system.
Input	Product image, barcode, name, weight, price, category, supplier, description, and stock
Output	Add product data inside database
Pseudo Code	START Admin click “ADD” button, Admin key in input, Admin click Add button, Admin click “YES” button in confirmation dialog END
Screen	

Figure 4.25: Add Product Design part 1

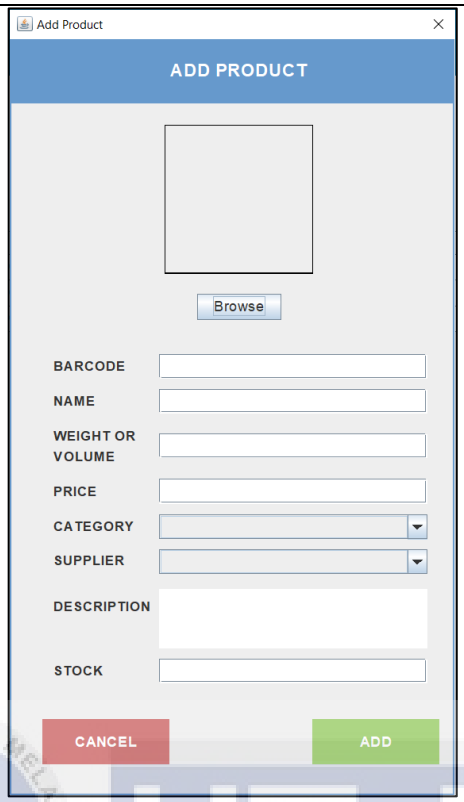


Figure 4.26: Add Product Design part 2

- ***Update Product Design Specification***

Table 4.15: Update Product Design Specification below shows the specification for update staff page design

Table 4.16: Update Product Design Specification

Description	This program handles the update product process of the system.
Input	Product image, barcode, name, weight, price, category, supplier, description, and stock
Output	Update product data inside database
Pseudo Code	START Admin click product list, Admin key in input, Admin click “UPDATE” button,

	Admin click “YES” button in confirmation dialog END

Screen

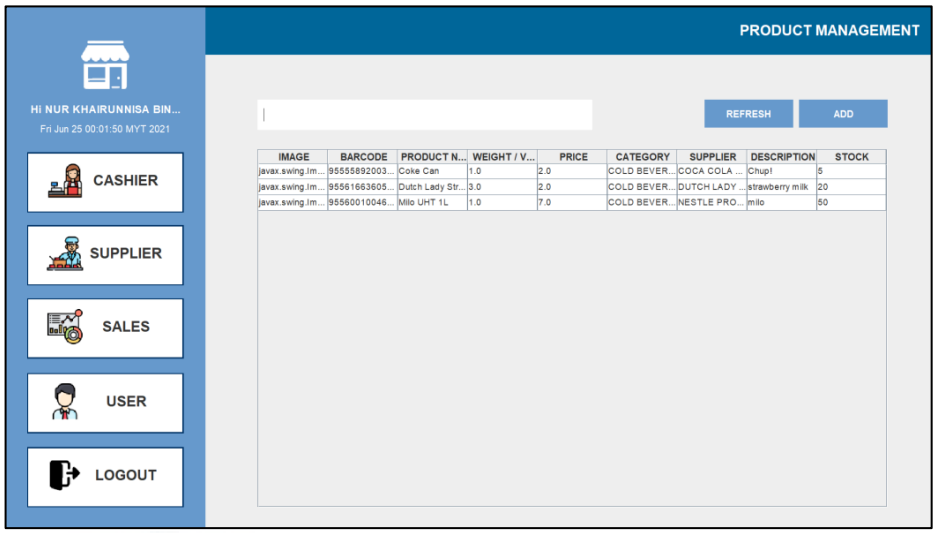


Figure 4.27: Update Product Design part 1

Figure 4.28: Update Product Design part 2

- ***Cashier Dashboard Design Specification***

Table 4.16: Cashier Dashboard Design Specification below shows the specification for cashier dashboard page design

Table 4.17: Cashier Dashboard Design Specification

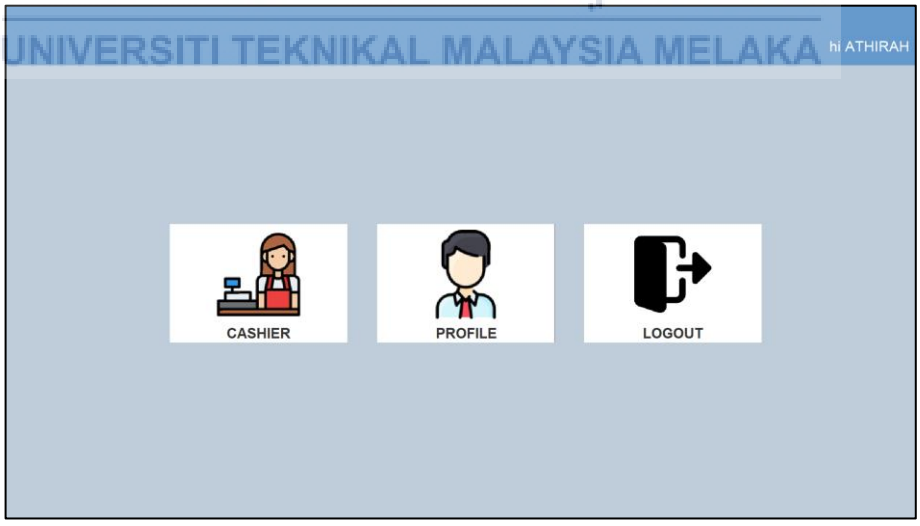
Description	This program handles the navigation process of the system.
Input	Staff id
Output	Cashier will be directed to the page that they choose on the menu
Pseudo Code	START If cashier choose cashier menu Directed to sales transaction page Else if cashier choose profile menu Directed to profile page Else Cashier logout END
Screen	

Figure 4.29: Cashier Dashboard Design

- ***Update Cashier Profile Design Specification***

Table 4.18: Update Cashier Design Design Specification below shows the specification for update staff page design

Table 4.18: Update Cashier Profile Design Specification

Description	This program handles the update product process of the system.
Input	Phone Number
Output	Update staff data inside database
Pseudo Code	START Cashier key in input, Cashiers click “UPDATE” button, Cashiers click “YES” button in confirmation dialog END
Screen	

Figure 4.30: Cashier Profile Design

- ***Sales Transaction***

Table 4.19: Sales Transaction Design Specification below shows the specification for sales transaction page design

Table 4.19: Sales Transaction Design Specification

Description	This program handles the sales transaction process of the system.
Input	Barcodes, Payment
Output	Transaction record
Pseudo Code	START Cashier scan barcode, Cashiers click “PAY” button, Cashier input payment Cashiers click “PAY” button, Cashiers click “YES” button in confirmation dialog END
Screen	

Figure 4.31: Sales Transaction Design part 1

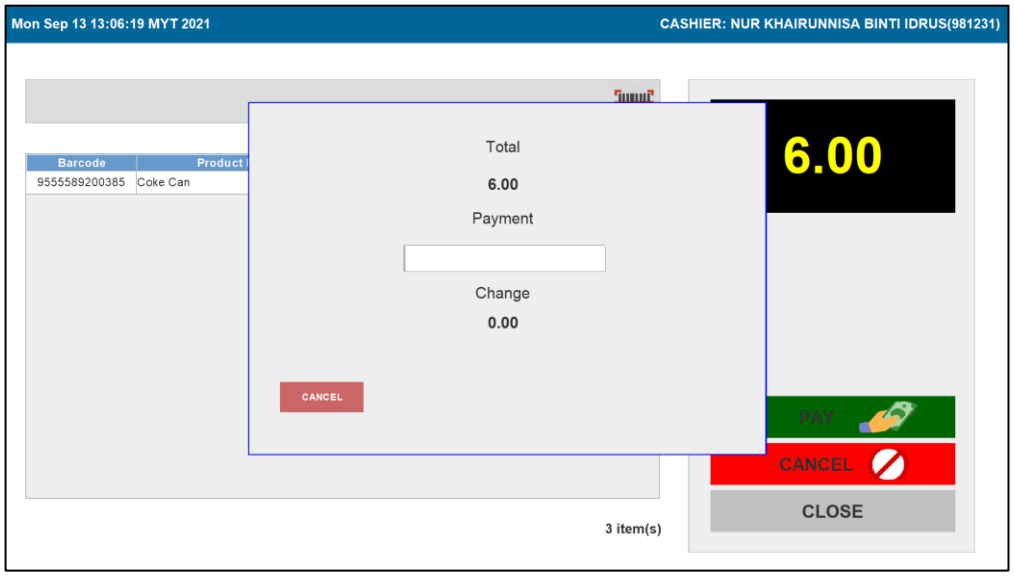


Figure 4.32: Sales Transaction Design part 2

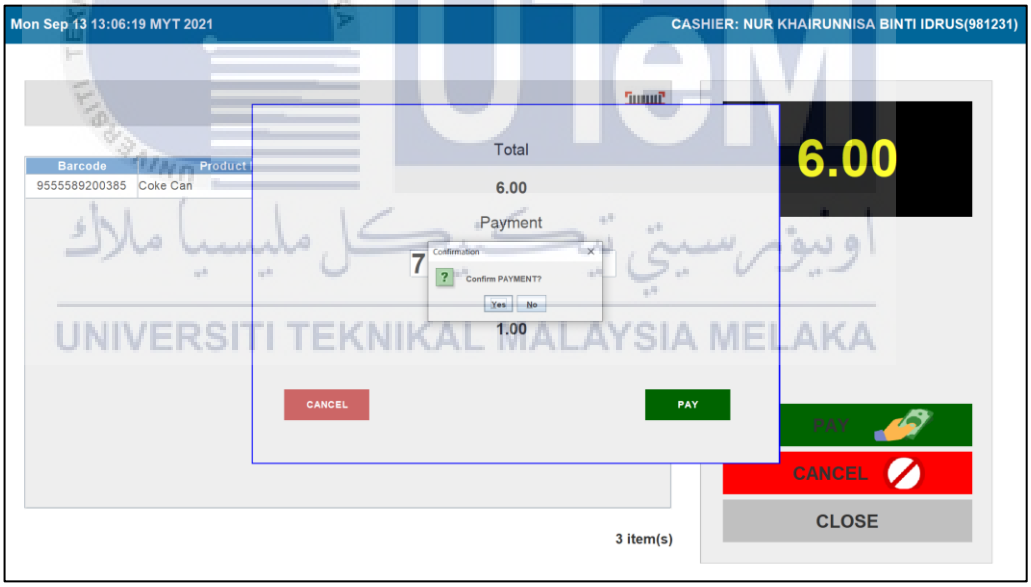


Figure 4.33: Sales Transaction Design part 3

4.3.2 Physical Database Design

This system uses data definition language (DDL) to create the database object in the database. Table 4.20 below shows the create table command using DDL.

Table 4.20: Physical Database Design

Table Name	DDL Syntax Command
login	CREATE TABLE `login` (`staff_id` varchar(6) NOT NULL, `password` varchar(16) NOT NULL, PRIMARY KEY (`staff_id`))
role	CREATE TABLE `role` (`role_id` int(2) NOT NULL, `role` varchar(10) NOT NULL, PRIMARY KEY (`role_id`))
staff	CREATE TABLE `staff` (`staff_id` varchar(6) NOT NULL, `staff_icnum` varchar(12) NOT NULL, `staff_name` varchar(250) NOT NULL, `staff_phonenum` varchar(11) NOT NULL, `role_id` int(11) NOT NULL, PRIMARY KEY (`staff_id`))
supplier	CREATE TABLE `supplier` (

	`supplier_id` int(5) NOT NULL AUTO_INCREMENT, `supplier_name` varchar(80) NOT NULL, `supplier_email` varchar(150) NOT NULL, `supplier_phonenum` varchar(11) NOT NULL, PRIMARY KEY (`supplier_id`))
product category	CREATE TABLE `product_category` (`category_id` int(2) NOT NULL AUTO_INCREMENT, `category` varchar(50) NOT NULL, PRIMARY KEY (`category_id`))
product	CREATE TABLE `product` (`product_barcode` varchar(13) NOT NULL, `product_name` varchar(150) NOT NULL, `product_weightvol` decimal(10,0) NOT NULL, `product_price` decimal(10,0) NOT NULL, `category_id` int(5) NOT NULL, `supplier_id` int(5) NOT NULL, `product_descp` varchar(200) NOT NULL, `product_img` mediumblob, `product_stock` bigint(250) NOT NULL, PRIMARY KEY (`product_barcode`))
transaction	CREATE TABLE `transaction` (`transaction_id` int(9) unsigned zerofill NOT NULL AUTO_INCREMENT, `staff_id` varchar(6) NOT NULL,

	`transaction_timedate` datetime NOT NULL DEFAULT CURRENT_TIMESTAMP, `transaction_total` double NOT NULL, PRIMARY KEY (`transaction_id`))
log	CREATE TABLE `log` (`log_id` int(4) NOT NULL AUTO_INCREMENT, `log_timedate` datetime NOT NULL DEFAULT CURRENT_TIMESTAMP, `staff_id` varchar(6) NOT NULL, `log_status` varchar(20) NOT NULL, PRIMARY KEY (`log_id`))

4.4 Conclusion

In conclusion, designing the database is important because this can provide a solution for the problems specified in the requirement document in analysis phase. The output of this phase is the design document. The design document act as a plan for the solution and will be used later for implementation, testing and maintenance.

CHAPTER 5: IMPLEMENTATION

5.1 Introduction

This chapter will discuss the implementation phase of Cashier and Inventory Management System with Barcode Scanner. This chapter includes the environment setup and configuration environment setup before executing the implementation. This chapter also will include the system version and implementation status of the project.

5.2 Software Development Environment Setup

This section will explain how to setup the software development environment for development process. For this project, there are few software that need to be installed such as Eclipse IDE which have been used as text editor tools to write the programming codes. This section will explain every specific software that must be installed before proceeding to implementation phase.

5.2.1 Eclipse IDE for Java Developers

Eclipse IDE for Java Developers is an open source and free IDE with modular architecture specifically for Java. It also considered to be most popular Java IDE since it has powerful features that can be used to carry out the projects. The other reason this IDE is chosen is because it has a drag and drop functionality that can help the front end programmer to design the interface of the system.

5.2.2 Wamp64 Version 3.2.3

WAMP is an acronym that stands for Windows, Apache, MySQL, and PHP. This software is the combination of the 4 software in one software. The main reason why this project need Wamp64 is because it required have the Apache and MySQL. Both Apache and MySQL are needed in this project to allow Cashier and Inventory Management System with Barcode Scanner to access the database.

5.3 Software Configuration Management

This section will provide the explanation of the software configuration on system and software.

5.3.1 Configuration Environment Setup

Cashier and Inventory Management System with Barcode Scanner would require Wamp64 program running on the desktop before it can execute the system. With Wamp64 running on the desktop, Apache and MySQL services will also runs on the desktop. Thus, allowing Cashier and Inventory Management System with Barcode Scanner to access the database. Both Apache and MySQL can also be configured individually on computer system. However, to ease the configuration setup, the project is recommended to install Wamp64 since it contain both software in one software.

5.3.2 Version Control Procedure

Version control is a process during programming where it manages the change of the development process. This procedure of tracking and managing of the can helps the future audit trail for the revision and update of these finalized versions. Table 5.1 below shows the version control of the system.

Table 5.1: Version Control of Cashier and Inventory Management System with Barcode Scanner

Version	Author	Description
1.0	Nur Khairunnisa Binti Idrus	The first version of the system developed during PSM.

5.4 Implementation Status

Implementation status is documentation of the project implementation history. Table 5.2 below show the implementation status of this project.

Table 5.2: Implementation Status Cashier and Inventory Management System with Barcode Scanner

Module	**Duration To Complete**	**Month to Complete**	**File**	**Total File**
Database Connection	1 days	March 2021	sqliteConnection.java	1
Authentication	4 days	March 2021	loginUI.java	1
Admin Dashboard	2 days	March 2021	admin_dashboardUI.java	1
Supplier Management	14 days	April 2021	Supplier.java suppliersMain.java addSupplier.java editSupplier.java	4
Product Management	14 days	May 2021	Product.java productMain.java addProduct.java editProduct.java	4
Staff Management	5 days	June 2021	Staff.java staffMain.java	5

			addStaff.java editStaff.java staffProfile.java	
Sales Transaction	21 days	August 2021	cashierMain.java payment.java	2
Report Management	3 days	August 2021	reportMain.java Product Staff.java Log.java productReport.java saleReport.java logReport.java	7

5.5 Conclusion

This chapter explain the software environment that need to be set up before executing the implementation phase. It's also cover the version procedure and implementation status that can be used for future version references.

CHAPTER 6: TESTING

6.1 Introduction

This chapter will discuss the testing phase of the project. The main objective of testing phase is to evaluates and and test the system. The requirements and features of the system will be tested one by one and will be documented inside the test plan. The test plan will include the test number, test description and the test results for each test case. For this system, a white and black-box testing approach will be used to test the system.

6.2 Test Plan

This section will describe how the test case is being conducted. A test plan is important as it act as a test guideline for the test organization to conduct the test. It usually contains everything that will be required in the project. A test plan usually includes all of the activities to be executed, the scope, roles, input and actual results.

6.2.1 Test Organization

Test organization is people who is assigned to perform the test process of the given activity. For this project, since there are two user type that will use this system, which is a cashier and admin, the number of people for the test organization also will be consist of two people. The test organization will conduct the test based on the test plan and will record the test result for future references. Table below show the information of the test organization for this project

Table 6.1: Test Organization

Tester	Name	Role
T01	Nur Khairunnisa Binti Idrus	Admin
T02	Nur Syammina Binti Idrus	Cashier

6.2.2 Test Environment

This section will discuss the environment during the testing process. For this project, the testing process is being done using the developer laptop. The hardware required for the system test environment is similar with the hardware requirement listed previously on chapter 2 while the software is similar with the listed previously on chapter 5. Table 6.2 below shows the hardware and software need for the test environment.

Table 6.2: Test Environment Specification

Hardware Requirement	
Development Tools	Honor Magicbook "14" Laptop
RAM	8 GB
Processor	AMD Ryzen 5 3500U with Radeon Vega Mobile Gfx 2.10 GHz
Input Device	L&K Laser 1D Barcode Scanner Product Code: NT2012 Basic Model Input Type: EAN-13
Software Requirement	
Development Platform	Eclipse IDE for Java Developers Version: 2021-03
Operating System	Window 10
Web Server	Wamp64 Version: 3.2.2 64 bits

6.2.3 Test Schedule

This section will provide the duration of the testing process taken by the test organization to complete the test. Table 6.3 below shows the test schedule of the testing phase for this project

Table 6.3: Test Schedule

Role	Total Module	Total Test Case	Duration
Admin	6	41	2 days
Cashier	4	15	1 days

6.3 Test Strategy

This section will describe the test strategy used for the testing process. A test strategy is important as it provide a proper guideline to achieve the test objective such as a detailed execution and result of the test type mentioned in the test plan. There are two type of testing technique used in the test process which is white-box and black-box.

6.3.1 Black-box technique

Black-box testing is a technique to test the system against the external factors that might lead to software failures. It will focus on the inputs received from the user and the output that will be produced by the system. The test organization participated in this testing will not cover the internal details such as the code and development method.

6.3.2 White-box technique

White box-testing is is a technique to test the system against the internal factors to verify the flow of the input and output. The testing will cover the internal details such as the structure, statement, loop, object, and functions of the codes.

6.4 Test Design

This section will list out the test case for each module in the test description. The actual result be provided to assist the tester organization during the testing process. However, any output of the test result would still need to be recorded.

6.4.1 Test Description

This section will list out the test description for each module. It consists of the module name, the test case identification, the description, and the actual result of the test. For this project, there are 41 total test cases for the user role Admin. Table 6.4 below describe the test case for Admin.

Table 6.4: Admin Test Case

Module	Test Case Identification	Test Description	Actual Result
Authentication	ADMIN_A1	To authenticate the user with correct id and password	User directed to admin dashboard page
	ADMIN_A2	To authenticate the user with correct id and password	Popup "Invalid userid or password"
	ADMIN_A3	To log out user from the system	User logged out from the system
Admin Dashboard	ADMIN_B1	To test the cashier button if it go to the right page	User will be directed to Cashier page
	ADMIN_B2	To test the product button if it go to the right page	User will be directed to Product Management page
	ADMIN_B3	To test the supplier button if	User will be directed to

		it go to the right page	Supplier Management page
	ADMIN_B4	To test the user button if it go to the right page	User will be directed to User Management page
	ADMIN_B5	To test the report button if it go to the right page	User will be directed to Report Management page
Supplier Management	ADMIN_C1	To test if the textfield will search for existed supplier	The table will automatically display the details of the supplier
	ADMIN_C2	To test if the textfield will search for non-existed supplier	The system will popup “supplier does not exist”
	ADMIN_C3	To test if the refresh button refresh the table	The table will be updated with new added inouts
	ADMIN_C4	To test if the add supplier data successfully added into the database after user click add button	The add supplier data successfully added into the database
	ADMIN_C5	To test if the update supplier data successfully updated inside the database after user click update button	The update supplier data successfully updated into the database

	ADMIN_C6	To test if the system display the supplier details after click on table row	The system display the selected supplier details
Product	ADMIN_D1	To test if the textfield will search for existed product	The table will automatically display the details of the product
	ADMIN_D2	To test if the textfield will search for non-existed product	The system will popup “product does not exist”
	ADMIN_D3	To test if the refresh button refresh the table	The table will be updated with new added inputs
	ADMIN_D4	To test if the add product data successfully added into the database after user click add button	The add product data successfully added into the database
	ADMIN_D5	To test if the textfield value reset back to current value after the user click :yes on reset confirmation button	The value of the textfield in update column turn back to preview value
	ADMIN_D6	To test if the text field value remain unchanged after	The value of the text field in update

		the user click :no on reset confirmation button	column turn remain unchanged
	ADMIN_D8	To test if the update product data successfully updated inside the database after user click “yes” update confirmation button	The update product data successfully updated into the database
	ADMIN_D9	To test if the update product data fail updated inside the database after user click “no” update confirmation button	The update product data failed to update into the database
	ADMIN_D10	To test if the system displays the supplier details after click on table row	The system displays the selected supplier details
Cashier	ADMIN_E1	To test if the table updated when the user scans the existed barcode	The table update the product list into the table
	ADMIN_E2	To test if the table updated when the user scans the existed barcode	The system will popup “Product Not Found” message.

	ADMIN_E3	To test if the pay button directed to payment popup with total price	The system will popup the payment interface with total price.
	ADMIN_E4	To test the cancel button with “yes” confirmation	The system will reset the table
	ADMIN_E5	To test the cancel button with “no” confirmation	The system will remain unchanged
	ADMIN_E6	To test the close button with “yes” confirmation	The system will close the interface
	ADMIN_E7	To test the close button with “no” confirmation	The system will remain unchanged
Staff / User Management	ADMIN_F1	To test if the textfield will search for existed user/staff	The table will automatically display the details of the user/staff
	ADMIN_F2	To test if the text field will search for non-existed user/staff	The system will popup “user/staff does not exist”
	ADMIN_F3	To test if the refresh button refreshes the table	The table will be updated with new added inputs
	ADMIN_F4	To test if the add user/staff data successfully added into the database after user click add button	The add user/staff data successfully added into the database

	ADMIN_F5	To test if the textfield value reset back to current value after the user click :yes on reset confirmation button	The value of the textfield in update column turn back to preview value
	ADMIN_F6	To test if the text field value remain unchanged after the user click :no on reset confirmation button	The value of the text field in update column turn remains unchanged
	ADMIN_F7	To test if the update user/staff data successfully updated inside the database after user click “yes” update confirmation button	The update user/staff data successfully updated into the database
Report Management	ADMIN_G1	To test the Sales Report button if it go to the right page	The system will display sales report
	ADMIN_G2	To test the Product Report button if it go to the right page	The system will display product report
	ADMIN_G3	To test the Log Report button if it	The system will display log report

		go to the right page	

Next, there are 15 total test cases for the user role Cashier. Table 6.5 below describe the test case for Cashier.

Table 6.5: Cashier Test Case

Module	**Test Case Identification**	**Test Description**	**Actual Result**
Authentication	CAS_A1	To authenticate the user with correct id and password	User directed to cashier dashboard page
	CAS_A2	To authenticate the user with correct id and password	Popup "Invalid userid or password"
	CAS_A3	To log out user from the system	User logged out from the system
Cashier Dashboard	CAS _B1	To test the cashier button if it go to the right page	User will be directed to Cashier page
	CAS _B2	To test the Profile button if it goes to the right page	User will be directed to Staff Profile page
Cashier	CAS _C1	To test if the table updated when the user scans the existed barcode	The table update the product list into the table
	CAS _C2	To test if the table updated when the	The system will popup "Product

		user scans the existed barcode	Not Found" message.
	CAS _C3	To test if the pay button directed to payment popup with total price	The system will pop up the payment interface with total price.
	CAS _C4	To test the cancel button with "yes" confirmation	The system will reset the table
	CAS _C5	To test the cancel button with "no" confirmation	The system will remain unchanged
	CAS _C6	To test the close button with "yes" confirmation	The system will close the interface
	CAS _C7	To test the close button with "no" confirmation	The system will remain unchanged
Staff Profile	CAS_D1	To test if the staff profile match with the staff who currently logged in	The system displays the profile of the staff that currently logged in
	CAS_D2	To test if the refresh button refreshes the table	The table will be updated with new added inputs
	CAS_D3	To test if the update user/staff data successfully updated inside the database after user click "yes" update	The update user/staff data successfully updated into the database

		confirmation button	

6.4.2 Test Data

This section will show the test data that the test organization use to explain when the correct or incorrect data is inserted into the system. Table 6.6 below show the test data for user Admin.

Table 6.6: Admin Test Plan

Test Case Identification	Description	Steps
ADMIN_A1	Staff ID: 981231 Password = 123	1. Fill in the text field with given data 2. Click "Login" button
ADMIN_A2	Staff ID: 312134 Password = my*staf	
ADMIN_A3	Button: Logout	Click button
ADMIN_B1	Menu: Cashier	
ADMIN_B2	Menu: Product	
ADMIN_B3	Menu: Supplier	
ADMIN_B4	Menu: User	
ADMIN_B5	Menu Report	
ADMIN_C1	Input = Coca Cola Malaysia	Fill in the text field with given data
ADMIN_C2	Input = H&M	
ADMIN_C3	Button: Refresh	Click "Refresh" button
ADMIN_C4	Supplier Name = SOCMA TRADING Phone = 06826654132 Email= socma@business.com	1. Fill in the text field with given data 2. Click "Add" button
ADMIN_C5	Supplier Name = SOCMA TRADING Phone = 06452678905	1. Fill in the text field with given data

	Email= socma@business.com	2. Click “Update” button
ADMIN_C6	Table row[0]	Click table row
ADMIN_D1	Input = Mentos	Fill in the text field with given data
ADMIN_D2	Input = Breeze	Fill in the text field with given data
ADMIN_D3	Button: Refresh	Click “Refresh Button”
ADMIN_D4	Barcode = 9556001129130 Name = Milo 3in1 Weight = 0.33 Price = 1.20 Category = Hot Beverage Supplier = Milo Description = 3in1 Stock = 40	1. Fill in the text field with given data 2. Click add button
ADMIN_D5	Button: Reset	1. Click button “Reset” 2. Choose “Yes” option
ADMIN_D6	Button: Reset	1. Click button “Reset” 2. Choose “No” option
ADMIN_D8	Stock = 40	1. Click button “Update” 2. Choose “Yes” option
ADMIN_D9	Stock = 90	1. Click button “Update”

		2. Choose “No” option
ADMIN_D10	Table: row[0]	Click table row
ADMIN_E1	Scanner	Scan items
ADMIN_E2		
ADMIN_E3	Button: pay	Click button
ADMIN_E4	Button = Cancel	1. Click button “Update” 2. Choose “Yes” option
ADMIN_E5		1. Click button “Update” 2. Choose “No” option
ADMIN_E6	Button = Close	1. Click button “Update” 2. Choose “Yes” option
ADMIN_E7		1. Click button “Update” 2. Choose “No” option
ADMIN_F1	Input = Khairunnisa	Fill in the text field with given data
ADMIN_F2	Input = Siti	
ADMIN_F3	Button: Refresh	Click button
ADMIN_F4	StaffID = 762134 Name = Nur Syammina IC Number = 981223108764 Phone = 0197254632 Role = Cashier	1. Click button “Add” 2. Choose “Yes” option
ADMIN_F5	Button: Reset	1. Click button “Reset”

		2. Choose “Yes” option
ADMIN_F6		1. Click button “Reset” 2. Choose “No” option
ADMIN_F7	Phone = 0142290713	1. Click button “Update” 2. Choose “Yes” option
ADMIN_G1	Button: Sales Report	Click Button
ADMIN_G2	Button: Product Report	
ADMIN_G3	Button: Log Report	

Table 6.7 below shows the test data for user role Cashier

Table 6.7: Cashier Test Data

Test Case Identification	Test Description	Actual Result
CAS_A1	Staff ID: 981231 Password = 123	1. Fill in the text field with given data 2. Click “Login” button
CAS_A2	Staff ID: 312134 Password = my*staf	
CAS_A3	Button: Logout	Click Button
CAS _B1	Button: Cashier	
CAS _B2	Button: Profile	
CAS _C1	Scanner	Scan Items
CAS _C2		
CAS _C3	Button: Pay	Click button
CAS _C4	Button: Cancel	1. Click button “Cancel”

		2. Choose “Yes” option
CAS _C5		1. Click button “Cancel” 2. Choose “No” option
CAS _C6	Button: Close	1. Click button “Cancel” 2. Choose “Yes” option
CAS _C7		1. Click button “Cancel” 2. Choose “No” option
CAS_D1	Staff Id	Check if the staff ID match
CAS_D2	Button: Refresh	Click Button
CAS_D3	Phone Number: 0187625143	1. Fill the phone number field with the input given 2. Click “Update” button 3. Choose “Yes” Option

6.5 Test Result and Analysis

This section will show the result of the test that have been conducted. The result will come out as “Pass” if the test is success and “Fail” if the result test is failed. Table 6.8 below show the all the result of Admin Test Case

Table 6.8: Admin Test Result

Test Case Identification	Actual Result	Result (Pass/Fail)
ADMIN_A1	User directed to admin dashboard page	Pass
ADMIN_A2	Popup “Invalid userid or password”	Pass
ADMIN_A3	User logged out from the system	Pass
ADMIN_B1	User will be directed to Cashier page	Pass
ADMIN_B2	User will be directed to Product Management page	Pass
ADMIN_B3	User will be directed to Supplier Management page	Pass
ADMIN_B4	User will be directed to User Management page	Pass
ADMIN_B5	User will be directed to Report Management page	Pass
ADMIN_C1	The table will automatically display the details of the supplier	Pass
ADMIN_C2	The system will popup “supplier does not exist”	Pass
ADMIN_C3	The table will be updated with new added inputs	Pass
ADMIN_C4	The add supplier data successfully added into the database	Pass

ADMIN_C5	The update supplier data successfully updated into the database	Pass
ADMIN_C6	The system displays the selected supplier details	Fail (The product image by the supplier does not appear)
ADMIN_D1	The table will automatically display the details of the product	Pass
ADMIN_D2	The system will popup “product does not exist”	Pass
ADMIN_D3	The table will be updated with new added inputs	Pass
ADMIN_D4	The add product data successfully added into the database	Pass
ADMIN_D5	The value of the textfield in update column turn back to preview value	Pass
ADMIN_D6	The value of the text field in update column turn remain unchanged	Pass
ADMIN_D8	The update product data successfully updated into the database	Pass
ADMIN_D9	The update product data failed to update into the database	Pass
ADMIN_D10	The system displays the selected supplier details	Pass
ADMIN_E1	The table update the product list into the table	Pass

ADMIN_E2	The system will popup "Product Not Found" message.	Pass
ADMIN_E3	The system will popup the payment interface with total price.	Pass
ADMIN_E4	The system will reset the table	Pass
ADMIN_E5	The system will remain unchanged	Pass
ADMIN_E6	The system will close the interface	Pass
ADMIN_E7	The system will remain unchanged	Pass
ADMIN_F1	The table will automatically display the details of the user/staff	Pass
ADMIN_F2	The system will popup "user/staff does not exist"	Pass
ADMIN_F3	The table will be updated with new added inputs	Pass
ADMIN_F4	The add user/staff data successfully added into the database	Pass
ADMIN_F5	The value of the textfield in update column turn back to preview value	Pass
ADMIN_F6	The value of the text field in update column turn remains unchanged	Pass
ADMIN_F7	The update user/staff data successfully updated into the database	Pass

ADMIN_G1	The system will display sales report	Pass
ADMIN_G2	The system will display product report	Pass
ADMIN_G3	The system will display log report	Pass

A total of 41 test case have been conducted for the Admin. The bar chart in Figure 6.1 below is the summarized testing result for the admin

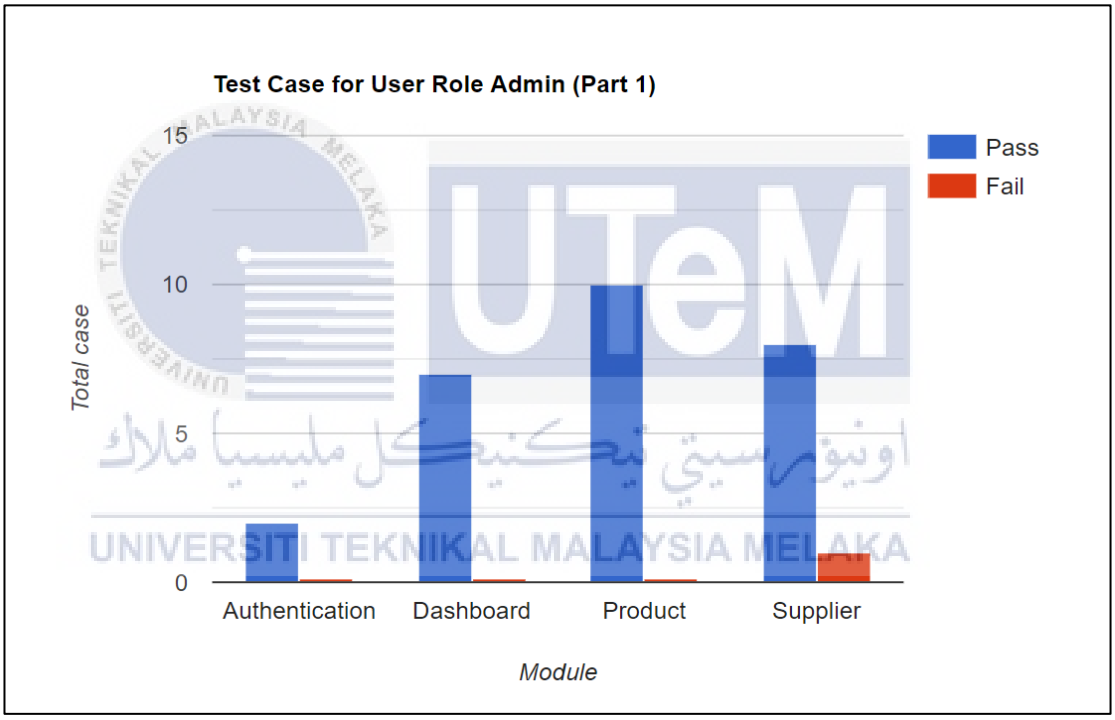


Figure 6.1: Admin Test Result Part 1

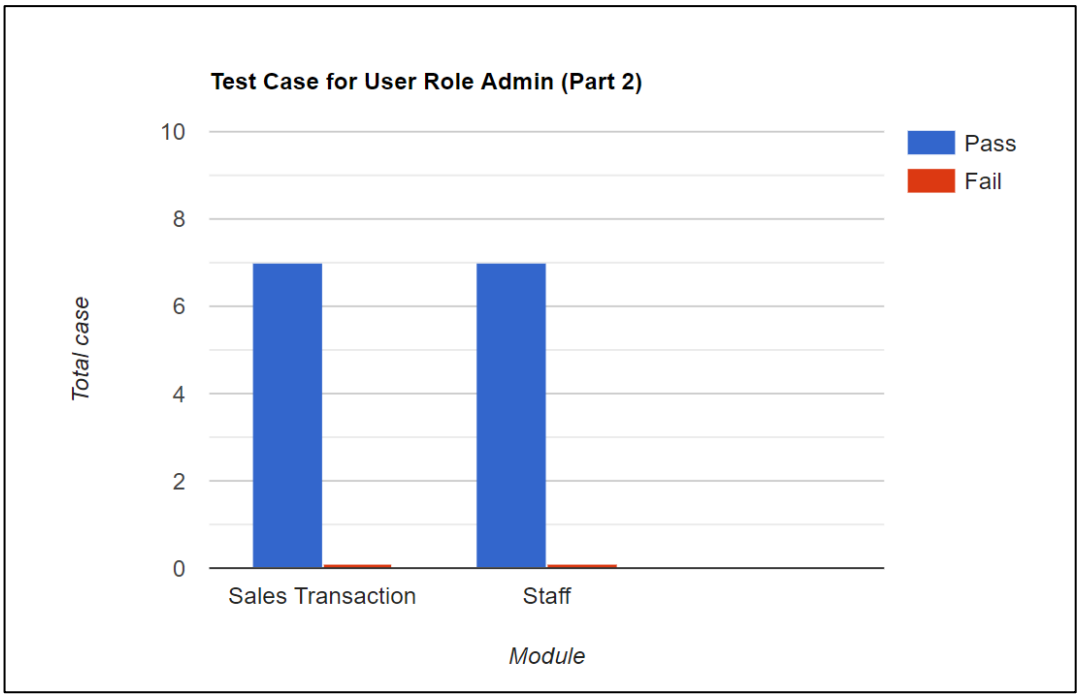


Figure 6.2: Admin Test Result Part 2

Next is the test result from the user role cashier. Table 6.9 below shows all the test result performed for the cashier.

Table 6.9: Cashier Test Result

Test Case Identification	Actual Result	Result (Pass/Fail)
CAS_A1	User directed to cashier dashboard page	Pass
CAS_A2	Popup “Invalid userid or password”	Pass
CAS_A3	User logged out from the system	Pass
CAS _B1	User will be directed to Cashier page	Pass
CAS _B2	User will be directed to Staff Profile page	Pass

CAS _C1	The table update the product list into the table	Pass
CAS _C2	The system will popup “Product Not Found” message.	Pass
CAS _C3	The system will pop up the payment interface with total price.	Pass
CAS _C4	The system will reset the table	Pass
CAS _C5	The system will remain unchanged	Pass
CAS _C6	The system will close the interface	Pass
CAS _C7	The system will remain unchanged	Pass
CAS_D1	The system displays the profile of the staff that currently logged in	Pass
CAS_D2	The table will be updated with new added inputs	Pass
CAS_D3	The update user/staff data successfully updated into the database	Pass

A total of 15 test case have been conducted for the Cashier. The bar chart in Figure 6.3 below is the summarized testing result for the Cashier

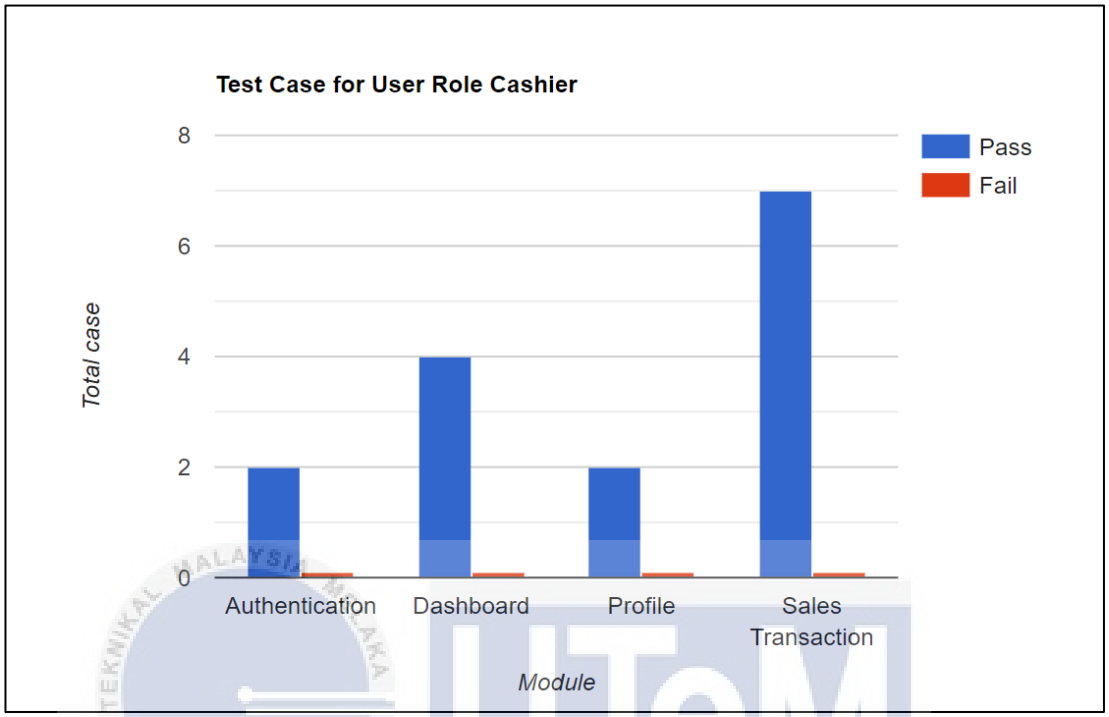


Figure 6.3: Cashier Test Result

6.6 Conclusion

In conclusion, Cashier and Inventory Management System with Barcode Scanner manage to pass the testing phase and manage to deliver the objective of the system. The next chapter will discuss the strength and the limitations of this system.

CHAPTER 7: PROJECT CONCLUSION

7.1 Observation on Weakness and Strength

After conducting the testing, for Cashier and Inventory Management System with Barcode Scanner, the weakness and strength of the system can be observed and listed out.

7.1.1 The Strength of Cashier and Inventory Management System with Barcode Scanner

- The system uses barcode scanner that can speed up the sales transaction process
- The system will deduct the stock items for every successful sales transaction to ensure the correct stock numbers
- The system provides sales report for the admin to keep track with the sales
- The system provides product report for the admin to keep track will the product stock
- The system provides log report for the admin to track the login activity of the staff

7.1.2 The Limitation of Cashier and Inventory Management System with Barcode Scanner

- The cashier interface does not have any functionally to add the quantity which make the cashier need to scan or input the quantity multiple times until they reach the desired quantity
- The system does not provide any transaction receipt for the customer

- The system does not provide visual representative for the sales report.

7.2 Propositions of Improvement

Cashier and Inventory Management System with Barcode Scanner can make future improvement on the cashier interface. Some of my suggestion is to add a quantity option where the cashier can key in the amount of the product quantity without having to scan it multiple times. The second suggestion is to provide a receipt for every transaction for the customer reference. I also recommend to add a statistical chart such as bar graph on the sales report section to ease the admin understanding on the sales reporting.

7.3 Project Contribution

Cashier and Inventory Management System with Barcode Scanner belong to Universiti Teknikal Malaysia Melaka (UTeM) and Fakulti Teknologi Maklumat dan Komunikasi (FTMK). The purpose of this project is as fulfillment of the requirements for the Bachelor of Computer Science (Software Development) with Honours.

7.4 Conclusion

In conclusion, the Cashier and Inventory Management System with Barcode Scanner have achieved it objective. The system also manages to solve the problems on the problem statement. Both admin and cashier now can use the system to ease and speed up the sale transaction process. The admin also can manage the supplier and products in one place. The development of the system successfully provide the benefits for the convenience store.

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APPENDIX A: Gantt Chart

Activity	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
FYP Briefing														
Assigned to Supervisor														
Proposal Preparation														
Submit Proposal to Supervisor														
System Development and Report Chapter 1														
System Development and Report Chapter 2														
System Development and Report Chapter 3														
System Development and Report Chapter 4														
Project Demo														
Final Presentation and Submission of Final Report														