ASZ FROZEN FOOD ORDERING SYSTEM

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ASZ FROZEN FOOD ORDERING SYSTEM

NOR FARAHZIBA BINTI HAMADUN

A thesis submitted in fulfilment of the
requirements for the award of the degree of
Bachelor of Computer Science (Network & Security)

School of Computing
Faculty of Engineering
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DECLARATION

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DEDICATION

This thesis is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.

ACKNOWLEDGEMENT

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My fellow student should also be recognised for their support. My sincere appreciation also extends to all my colleagues and others who have provided assistance at various occasions. Their views and tips are useful indeed. Unfortunately, it is not possible to list all of them in this limited space. I am grateful to all my family member.

ABSTRACT

Many people have started frozen food businesses, especially during the Covid-19 pandemic. One of them is ASZ Frozen Food. The workshop is located at No. 22 Blok 1 Jelai 3. The business started in October 2019, before the Covid-19 epidemic hit. Begun with a small operation that only sells one type of frozen food known as pau. The pau comes in seven different flavors: red bean, kaya, coconut, chocolate, pandan, chicken, and beef. The business then expands and offers a variety of other frozen foods such as pizza, curry puffs, and buns. As the business expands, more employees are hired. ASZ Frozen Food takes a more manual approach, relying on WhatsApp and Facebook as communication and commercial platforms. As a result, several issues arise from both the seller's and the customer's perspectives. It became inefficient, unproductive, and time-consuming. The project aims to introduce, design, and develop an effective and dependable frozen food ordering system that would make it simpler for sellers to collect orders and improve the quality of services offered to all customers. However, the project will focus on frozen food only. The food delivery is also done by the ASZ Frozen Food's worker. For authentication of the proposed system, hashing is performed after a user creates a new account and password. Besides, access control is also applied to validate a user's identity and provide authorized access to business data. The Waterfall model has been applied to carry out the project. PSM1 is responsible for requirements and system design, whereas PSM2 is responsible for implementation, integration and testing, and maintenance. Laravel framework, Microsoft Azure, and Visual Studio Code are the technologies involved in the proposed web application. The project will benefit ASZ Frozen Food (seller) in optimizing its ordering process. The proposed system reduces the risk of losing potential customers as a result of the current system problem. It makes it easier for the seller to gather all the orders. All order records are stored in a database to avoid being damaged or lost.

ABSTRAK

Kini ramai orang telah memulakan perniagaan makanan beku yang dikenali sebagai ‘Frozen Food’, terutamanya pada pandemik Covid-19. ASZ Frozen Food merupakan salah satu pengusaha yang membekalkan makanan ini. Bengkel ini terletak di No. 22 Blok 1 Jelai 3. Perniagaan ini bermula pada Oktober 2019, sebelum wabak Covid-19 melanda. Dimulakan dengan operasi kecil yang hanya menjual satu jenis makanan beku yang dikenali sebagai pau. Pau ini mempunyai tujuh perisa yang berbeza: kacang merah, kaya, kelapa, coklat, pandan, ayam dan daging lembu. Perniagaan ini kemudiannya berkembang dan menawarkan pelbagai makanan beku lain seperti piza, karipap dan roti. Apabila perniagaan berkembang, lebih ramai pekerja diambil bekerja. ASZ Frozen Food mengambil pendekatan secara manual iaitu bergantung pada WhatsApp dan Facebook sebagai platform komunikasi dan komersial. Akibatnya, beberapa isu timbul dari perspektif penjual dan pelanggan. Ia menjadi tidak berkesan, tidak produktif, dan memakan masa. Projek ini bertujuan untuk memperkenal, mereka bentuk dan membangunkan sistem pesanan makanan beku yang berkesan dan boleh dipercayai yang dapat memudahkan penjual mengumpul pesanan dan meningkatkan kualiti perkhidmatan yang ditawarkan kepada semua pelanggan. Bagaimanapun, projek ini memberi tumpuan kepada makanan beku sahaja. Penghantaran makanan juga dilakukan oleh pekerja ASZ Frozen Food. Untuk pengesahan identiti, penyulitan menggunakan kaedah ‘hashing’ dilakukan selepas pengguna mencipta akaun dan kata laluan baharu. Selain itu, kawalan akses juga digunakan untuk menghadkan akses yang dibenarkan kepada pengguna terhadap data perniagaan. Model Waterfall telah digunakan untuk menjalankan projek ini. PSM1 menjalani proses keperluan dan reka bentuk sistem, manakala PSM2 menjalani proses pelaksanaan, penyepaduan dan ujian, dan penyelenggaraan. Rangka kerja Laravel, Microsoft Azure dan Visual Studio Code ialah teknologi yang terlibat dalam aplikasi web yang dicadangkan. Projek ini akan memanfaatkan ASZ Frozen Food dalam mengoptimumkan proses pesanannya. Sistem yang dicadangkan mengurangkan risiko kehilangan pelanggan akibat masalah sistem sedia ada. Hal ini memudahkan penjual mengumpulkan semua pesanan kerana ia disimpan di dalam pangkalan data bagi mengelakkan daripada rosak atau hilang.

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LIST OF ABBREVIATIONS

UML	-	Unified Modeling Language
ERD	-	Entity Relationship Diagram
UI	-	User Interface
SQL	-	Structured Query Language
UTM	-	Universiti Teknologi Malaysia
CSS	-	Cascading Style Sheets
HTML	-	Hypertext Markup Language
ID	-	Identity Document
PK	-	Primary Key
FK	-	Foreign Key
HTTPS	-	Hypertext Transfer Protocol Secure
HTTP	-	Hypertext Transfer Protocol
PSM	-	Projek Sarjana Muda
DDos	-	Distributed Denial-of-Service
VS	-	Visual Studio
PHP	-	Hypertext Preprocessor
HDD	-	Hard Disk Drive
SSD	-	Solid State Drive
PC	-	Personal Computer

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Frozen foods refer to foods that are kept in the freezer until they are ready to be used. The major benefit of frozen food is its ability to be stored for longer periods. The vitamins, minerals, carbohydrates, protein, and fat contents in frozen food are unaffected. Fresh foods lose vitamins and minerals over time, but frozen food preserves them. As a result, most people prefer frozen food to fresh food. Frozen food also reduces food waste because people can freeze the leftovers for later use. Frozen food, especially for the seller, may save time and money by preventing wastage of materials and money. They can put the remaining food back in the freezer if they cannot sell all of it.

Due to the Covid-19 outbreak, people were concerned about future food and supply availability. Since frozen foods are simple and affordable, people prefer to buy them to stock up on food and supplies. Based on the Food Industry Association (FMI) report, the Food Industry Association discovered that frozen food was extremely popular in the supermarket during COVID-19 (*Product: The Power of Frozen 2021: FMI*, 2022). Even if the pandemic is over, they predict the need for frozen food would continue to rise. Because during the pandemic outbreak, the buyer spends more time with their families and eating together at home than they have in the past. Meal planning, cooking innovation, time-saving, and low-cost are all qualities frozen food offers. Since it benefits the buyer, frozen foods are keen to attract customers and increase sales. As a result, the seller takes advantage of the opportunity to start and expand their business. Because remaining frozen food product can be refreeze and sold again, frozen food can help sellers save money and time.

1.2 Problem Background

There are many people have started frozen food businesses especially during Covid-19 pandemic. One of them is ASZ Frozen Food. Fasrinah Binti Hamadun is the owner of ASZ Frozen Food. Her workshop is located at No. 22 Blok 1 Jelai 3 and she is 39 years old. She started the business in October 2019, before the Covid-19 epidemic hit. She earns money by starting a frozen food business with her cooking skills. Begun with a small operation that only sells one type of frozen food known as pau. The pau comes in seven different flavours: red bean, kaya, coconut, chocolate, pandan, chicken, and beef. The company then expands and offers a variety of other frozen foods such as pizza, curry puffs, and buns. As her company expands, she hires more employees and continues to sell her own product. She had no intention of purchasing other people's products in order to increase her stock. She uses WhatsApp and Facebook as communication and commercial platforms.

ASZ Frozen Food takes a more manual approach, relying on WhatsApp and Facebook as communication and commercial platforms. As a result, several issues arise from both the seller's and the customer's perspectives. The first view is from the seller. It is difficult for the seller to check the order limit because the order message keeps coming. Then, the seller has to collect customer data from different platforms through Facebook and WhatsApp. They should also check the message of both platforms and select the early order because it is limited. They must also use both platforms to notify each of their customers about an order decline due to insufficient stock or order limitations. Also, the seller tends to miscalculate the order quantity sometimes. Because they have to recalculate the orders due to the reject and add order. In addition, they should also inform the customer of the total price of the order including the additional price for each customer. This takes a long time. Besides, the order is written down in a book which can easily be lost or damaged. The analysis of business performance is also handled manually, which can lead to calculation errors and inaccuracies. Moreover, the seller did not have enough workers to produce the food. There would be a time when they don't pay attention to the expiration date of the food and the type of food that is almost out of stock. Finally, the blacklisted customer can still chat with the seller and try to place an order.

The next is from the customer's point of view. The customer is unsure of food availability as it changes frequently. In addition, he/she must manually notify the seller about the cancellation and addition of food ordered. Sometimes the amount of food delivered is not enough due to the seller calculation error. Thereafter, the customer will have to provide their address for each delivery even if they had previously provided it. They also need to request the total payment including an additional cost from the seller.

1.3 Project Aim

To introduce, design, and develop an effective and dependable frozen food ordering system that would make it simpler for sellers to collect orders and improve the quality of services offered to all customers.

1.4 Project Objectives

The objective of the project are:

a) To identify the requirement of an online food ordering system.
b) To design and develop an online food ordering system based on user requirement.
c) To test the functionality of the online food ordering system as per user requirement.

1.5 Project Scope

The scope of the project are:

a) The project will focus on frozen food only.

b) The food delivery was done by the ASZ Frozen Food's worker.

c) This system does not involve online transactions, such as an e-wallet and online payment gateway, instead it is replaced by submitting the proof of payment such as transaction screenshot and bank slip.

1.6 Project Importance

The project will benefit ASZ Frozen Food (seller) in optimizing its ordering process. The proposed system reduces the risk of losing potential customers as a result of the current system problem. It makes it easier for the seller to gather all the orders and improve customer satisfaction. All order records can now be stored in a database to avoid being damaged or lost. Furthermore, because the product is frozen food, the proposed ordering system differs from others. Food ordering services such as FoodPanda, GrabFood, and ShopeeFood deliver food to customers as soon as the order is received and prepared. These types of food order systems are not suitable for ASZ Frozen Food since the food must be frozen before being delivered to the consumer. It will be delivered two to three days after the customer placed the order. Moreover, food is not a priority for online shopping platforms like Shopee or Lazada. Anything that is not related to frozen food can be sold on such platforms. So, buyers rarely look for frozen food on those platform. Therefore, the proposed system in this project is customized specially for frozen food products in ASZ Frozen Food.

1.7 Report Organization

The first chapter of the project presents the problem background, objective, aim, scope, and importance. To summarize this chapter, ASZ Frozen Food is a newly opened business that uses a manual ordering system. ASZ Frozen Food, on the other hand, is experiencing several ordering issues as a result of its rapid growth. The existing method is time-consuming and inefficient. Therefore, the project aims to create a system that improves the efficiency of the ordering process while also being suitable for ASZ Frozen Food. The following part is a literature review that covers

the business's organizational structure and an analysis of the current system. The methodology will be described in Chapter 3. It defines the project's phases, development technologies, and system requirements. Next, the requirements and design, which include database and interface design, are highlighted in Chapter 4. Finally, Chapter 5 will wrap up the report by short describing the achievements, findings and providing a plan for PSM 2 project execution.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review is explained in this chapter. It assists developers in properly designing a system and developing an app. It offers insights, ideas, and guidelines for completing the project. It also helps the reader understand how a developer thinks and makes decisions. The existing procedure of the ASZ Frozen Food organization is described in this chapter to determine the characteristics of the current system. The proposed system would then be compared to other similar apps to ensure that it was unique. The proposed system's weaknesses and strengths can be determined through comparison. Through survey and interviews, the user requirement and preference for ASZ Frozen Food were also established.

2.2 Case Study

ASZ Frozen Food is a small startup business that produces a variety of ready-to-eat frozen food. As the business expands, the existing system is no longer able to manage the ordering process efficiently. Many problems are raised. Hence, an effective and time-efficient application must be developed through this project, based on the current system's problems and user requirements.

2.2.1 Company Organization Structure

ASZ Frozen Food is a business that produces frozen foods that are ready to eat. The business began before the COVID-19 epidemic struck in October 2019 and

continues to this day. Due to a shortage of money, the owner opens a frozen food business using her cooking talents. The workshop is located at No. 22 Blok 1 Jelai 3. Pau, pizza, curry puffs, and buns are among the frozen foods available. Each food product has its distinct flavor. For instance, red bean, kaya, coconut, chocolate, pandan, chicken, and beef are the flavors available for the pau. Then, as a communication and marketing platform, ASZ Frozen Food uses WhatsApp and Facebook. On those platforms, all promotions, sales, and orders took place.

Based on the Figure 2.1, the organizational structure for ASZ Frozen Food is small. Since the business is still new, only a few workers were hired: the chef and the runner. The owner would be on top of the structure. The owner is in charge of workers' development and training. Besides, the owner also acts as an accountant by planning budgets and forecasting sales. As for the chef, they must ensure that the ingredients and end products are fresh. They must measure, weight, and combine ingredients according to recipes. Then, either steam, bake or fry the food. Furthermore, they must keep a clean and safe working area, including managing equipment and food. Finally, they must securely store supplies and food. After that, the runner's responsibility is to deliver the meal to the correct address and consumer.

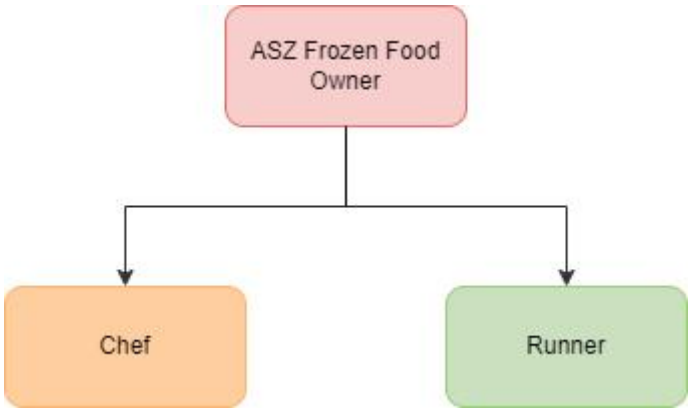

Figure 2.1 ASZ Frozen Food Organization Structure

2.2.2 Manual Operation

The existing or manual operation starts with a customer choosing their preferred food and making an order. The customer must inform the owner (ASZ Frozen Food owner) of the order by sending out a message via WhatsApp or Facebook. By alerting the owner, the customer can cancel or change the order. If cancellation occurs, the owner will take their name off the list and add the item to the stock list again. If there is no cancellation, the owner will proceed with the order pickup. Then, if the food purchased is not available, the owner will inform the customer. Besides, when the total order exceeds the stock quantity limit, the owner will close the order. Since the owner has no control over the order request, it forces her to accept orders that are slightly beyond the limit. The owner also needs to reject the remaining. After the order was closed, the chef would prepare the food ordered. The chef would then replace the expired food with a new one and confirm that enough food stock to fulfill the order. Each of the foods provided would then have an expiration date specified by the chef. If there is a shortage of stock, the owner must inform the remaining customers and then reject or postpone their orders.

If there are no concerns with the expiration date or stock, the owner will contact the customer after the chef have prepared the food ordered. The owner would negotiate with the consumer concerning delivery mode, day, and time for the customer to get the purchase. If the customer wishes for pick up or walks in, they will go straight to the store. But if the customer wishes for delivery, the owner will request the customer's complete address. However, the customer must wait for the runner to deliver the food throughout the agreement's period. Meanwhile, the owner will compute the total price of the food, including the extra charge and pass it to the runner. The customer can pay in cash or through an online transaction. If the payment is in cash, the consumer must pass it directly to the runner. If the customer pays using an online transaction, the customer must provide the owner with evidence of the transaction. Finally, the owner would send the customer a payment receipt as evidence of purchase. Figure 2.2 and Figure 2.3 show the swim lane diagram of the current system.

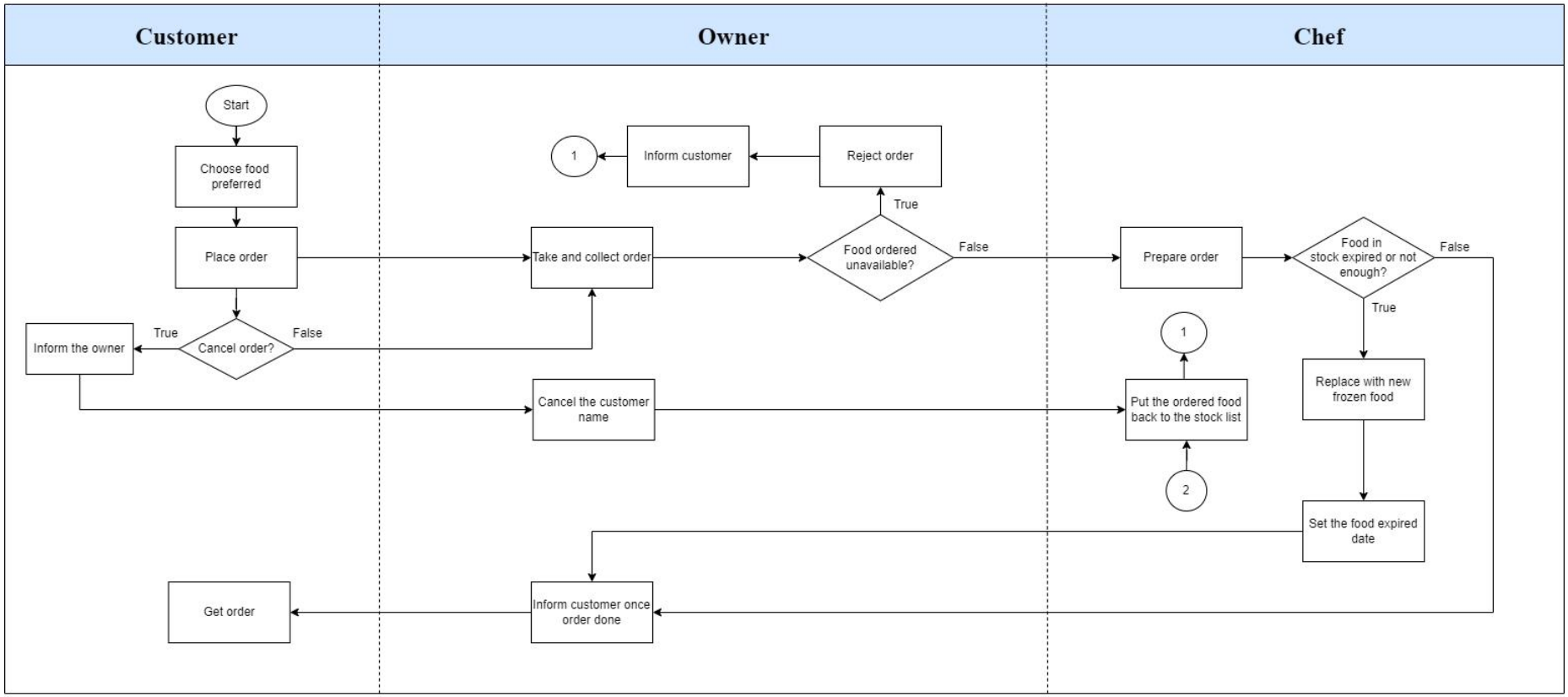

Figure 2.2 Swim lane diagram of the current system (Part I)

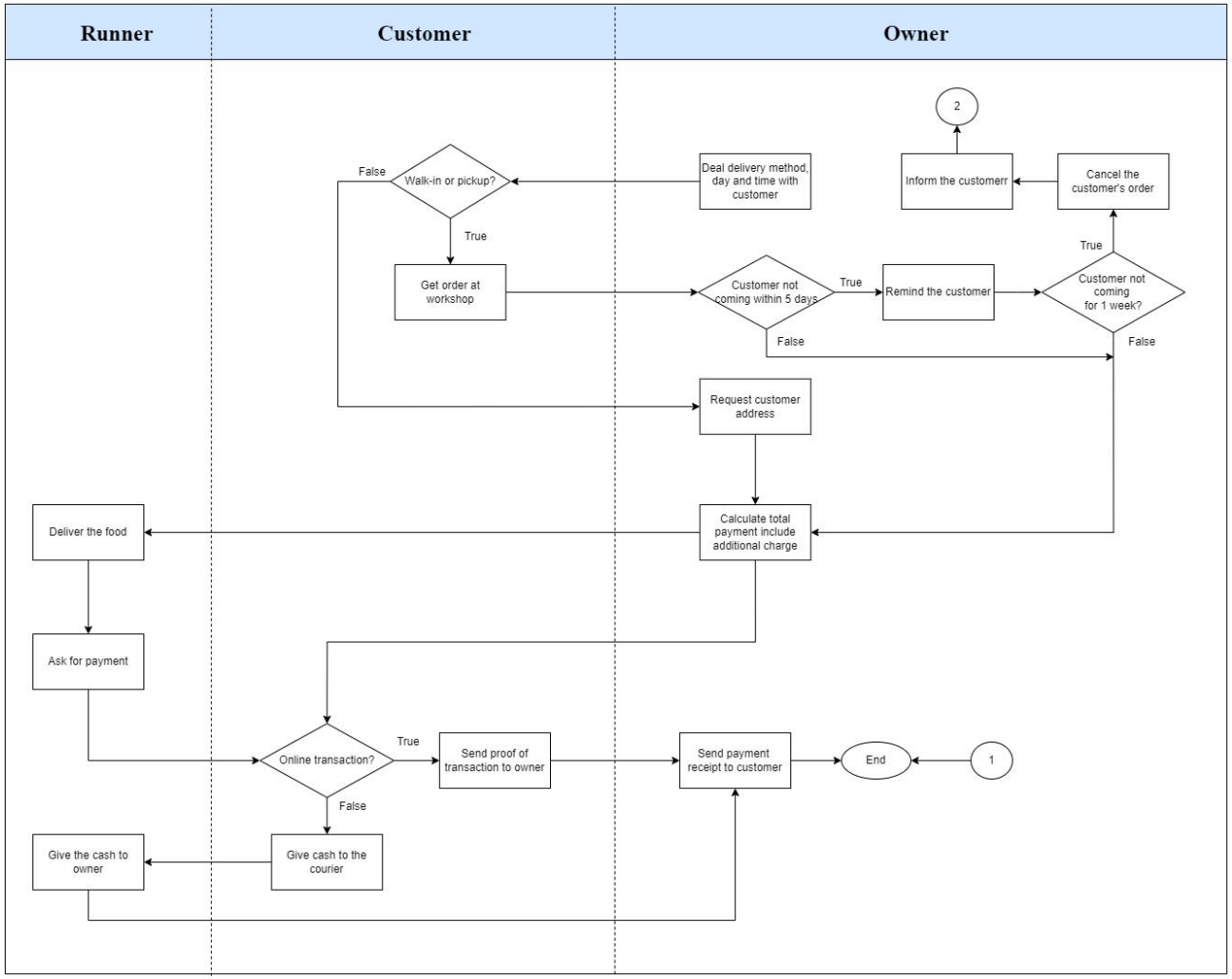

Figure 2.3 Swim lane diagram of the current system (Part II)

2.3 Current System Analysis

Since the existing method uses a manual approach, more challenges arise as the business expands. It became inefficient, unproductive, and time-consuming. From the owner's perspective. It is hard to prohibit a customer from ordering once the order has closed. The owner must then collect customer order details from various platforms such as Facebook and WhatsApp. Then, the chef should also double-check the information on those platforms and select an early order since the stock is limited. In addition, the owner must use both platforms to announce to each of the customers about an order decline caused by insufficient stock. Furthermore, the owner sometimes miscalculates the order quantity. The owner must recalculate the orders because of the rejection and modify the order request by the customer. Moreover, they should remind the customer of the total cost of the order, including the extra cost. It consumes a lot of time. Additionally, the owner lacked chef to prepare the food. There will be times when the chef will overlook the expiry date of the food and the type of food that is nearly out of stock. Lastly, the banned customer might continue to communicate with the owner and attempt to place an order.

Next, from the consumer's viewpoint. The customer is confused about food availability since it changes regularly. Furthermore, the customer must directly inform the owner of any cancellations or changes to the food ordered. Besides, due to the owner calculation error, the amount of food received is sometimes insufficient. Following that, the customer will be required to provide their address for each delivery, even if they have already given it. The customer must also ask the owner for the whole amount, including any additional costs.

2.4 Proposed Solution

There would be a checker in the system to ensure that the order cannot be executed once it is out of stock. This can make it easier for the seller to choose the early customer for each order from a different platform. Subsequently, the proposed system would display the food and the remaining stock. Then the customer would

know the remaining amount for each food in ASZ Frozen Food. In addition, the system can automatically calculate the quantity of food ordered. This reduces the work of the seller to calculate the overall quantity of food ordered by customers, which leads to calculation errors. The customer can also get the food in the right quantity. Moreover, the proposed system can calculate the total payment including an additional cost for each order. Therefore, there is no need for the seller to do the calculation manually for each customer because it leads to a calculation error. The customer can also view the total food payment at any time. Additionally, the system can also automatically generate payment receipts. The seller can simply print the receipt or view it from the system. Sellers don't need to manually list all the information about the food ordered and calculate the total price. After that, there are two cancel buttons, one for the seller and one for the customer. The seller cancel button can automatically generate a message informing the customer about the cancellation. The seller no longer needs to create a message.

For the customer, the system provides a cancel button with reason options to notify the seller of the customer's cancellation. It helps the customer notify the seller without texting. After cancellation, the system will automatically update the available stock. In this way, calculation errors due to the recalculation of stocks are avoided. Additionally, two notifications were also created in the system. The first is a notification to remind the seller of the expiry date of the food (1 to 3 days before the expiry date of the food). This way, the seller would pay attention to the expiration date of the food and would not forget to replace the food with the new one. The second notification is a reminder that the food is almost out of stock (20% food left). Now the seller will know which food item is almost out of stock and make sure to restock it as soon as possible. For delivery, the system would display the address and phone number entered by the customer during the food ordering process. Thus, the seller and the customer do not have to exchange numbers and addresses for each delivery via texting. Besides, the proposed system also advertises a request to hire a worker on the homepage since the seller needs more workers. Finally, about the blacklisted customer. The system has a banning feature to prevent the blacklisted customer from placing an order until it is unblocked. In the proposed system, the system administrator can access the record of food sold stored in the system database to evaluate the business progress per week or month. The system also can track

business performance and present an analysis for a better decision-making process through the reports generated by the system.

2.5 Comparison Between Existing Systems

A comparison with similar existing applications is crucial to analyze the capabilities and originality of the proposed application. By referring to the existing application, innovative ideas can be presented. But, each application has its own set of traits and requirements. To minimize unnecessary functionality, the developer must identify the appropriate feature to include in the proposed application. Table 2.1 compares the existing applications, GrabFood, Foodpanda, Shopee, and Lazada, to the proposed application. The analysis is made based on the ordering procedure and features that make the seller's work easier. The majority of them share similar characteristics, especially in terms of ordering qualities.

The GrabFood (*GrabFood Food Delivery Service - Order Food Online*, 2022) and Foodpanda (*Order Online ~ Express Food Delivery in Malaysia | Foodpanda*, 2019) apps serve the same purpose. They enable customers to easily explore restaurants in their neighborhood and order their preferred dishes via website or mobile. However, it is not suited for ASZ Frozen Food because these applications send the food immediately after the order has been completed and processed. Unlike ASZ Frozen Food, which requires more time (at least two days) to prepare before being delivered to customers. Almost all of the GrabFood and Foodpanda apps provide restaurant-style meals. The majority of customers choose to use these two apps to enjoy their meals right once they have been delivered. Unlike frozen food, which purposely is kept in the freezer for later consumption. However, some of the features of the GrabFood and Foodpanda apps are identical to the proposed application. Orders placed through GrabFood and Foodpanda cannot be fulfilled if the food is out of stock or the restaurant is closed. They can also determine the amount of food purchased, calculate the total payment including any additional charges, and generate the payment receipt automatically. In addition, users may examine and print the complete payment.

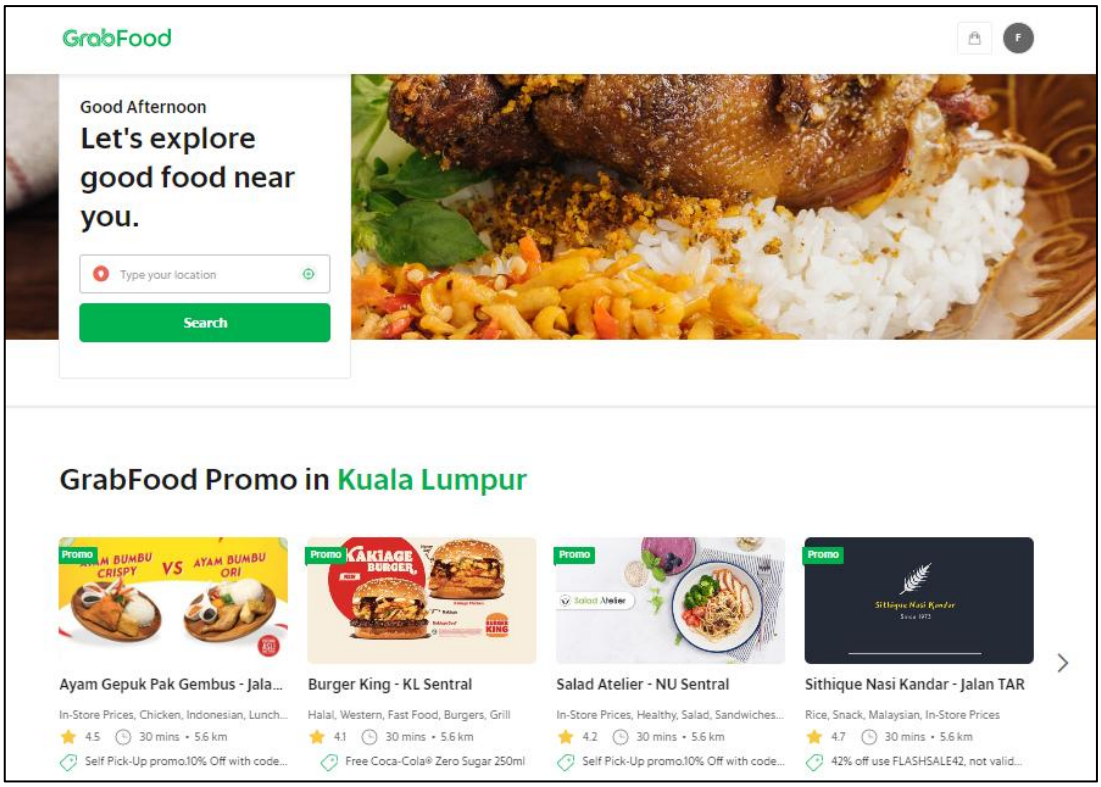

Figure 2.4 Main page of GrabFood website

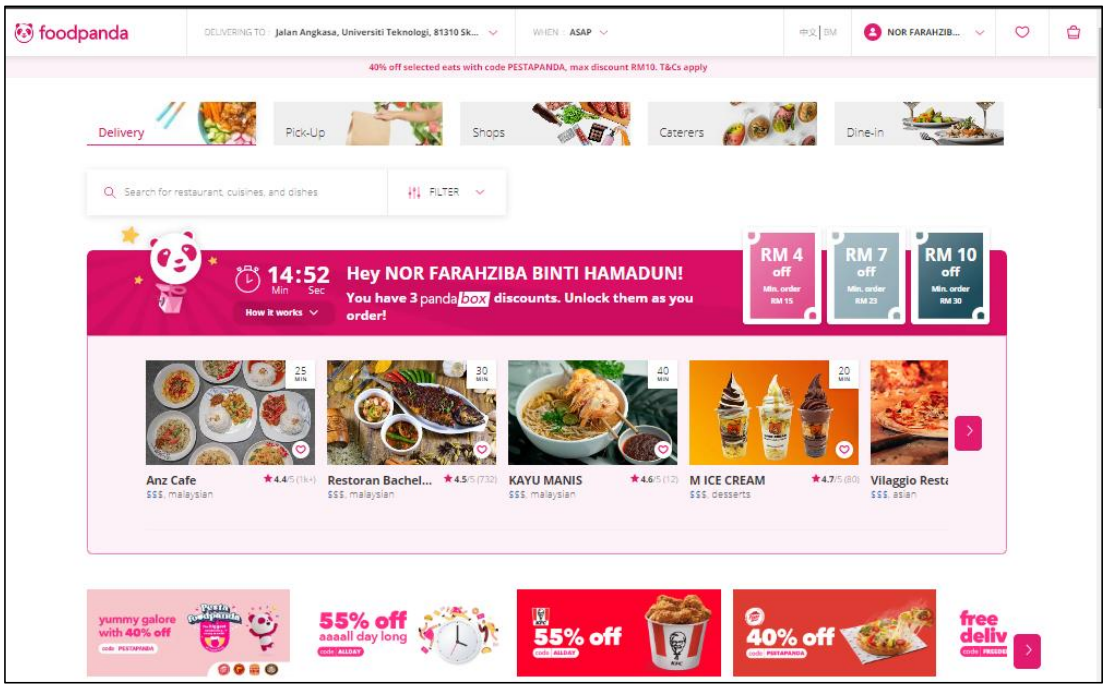

Figure 2.5 Main page of Foodpanda website

The two most popular e-commerce shopping apps in Southeast Asia in 2019 were Lazada (*Lazada.com.my: Best Online Shopping in Malaysia*, 2019) and Shopee (*Shopee*, 2019). They provide customers with a convenient and secure buying

experience through mobile and web access. GrabFood and Foodpanda applications are more identical to the suggested application than Lazada and Shopee. Lazada and Shopee, in comparison to GrabFood and Foodpanda, have three additional features that the proposed application takes. They can show the availability of products and alert the seller when a product is going to run out of stock. Besides, they can also provide reports for tracking and analyzing business performance. Even so, those platforms can sell a wide variety of products, not just-food. As a result, Lazada and Shopee are unable to remind users of the food's expiration date. It is not appropriate to be implemented in the applications.

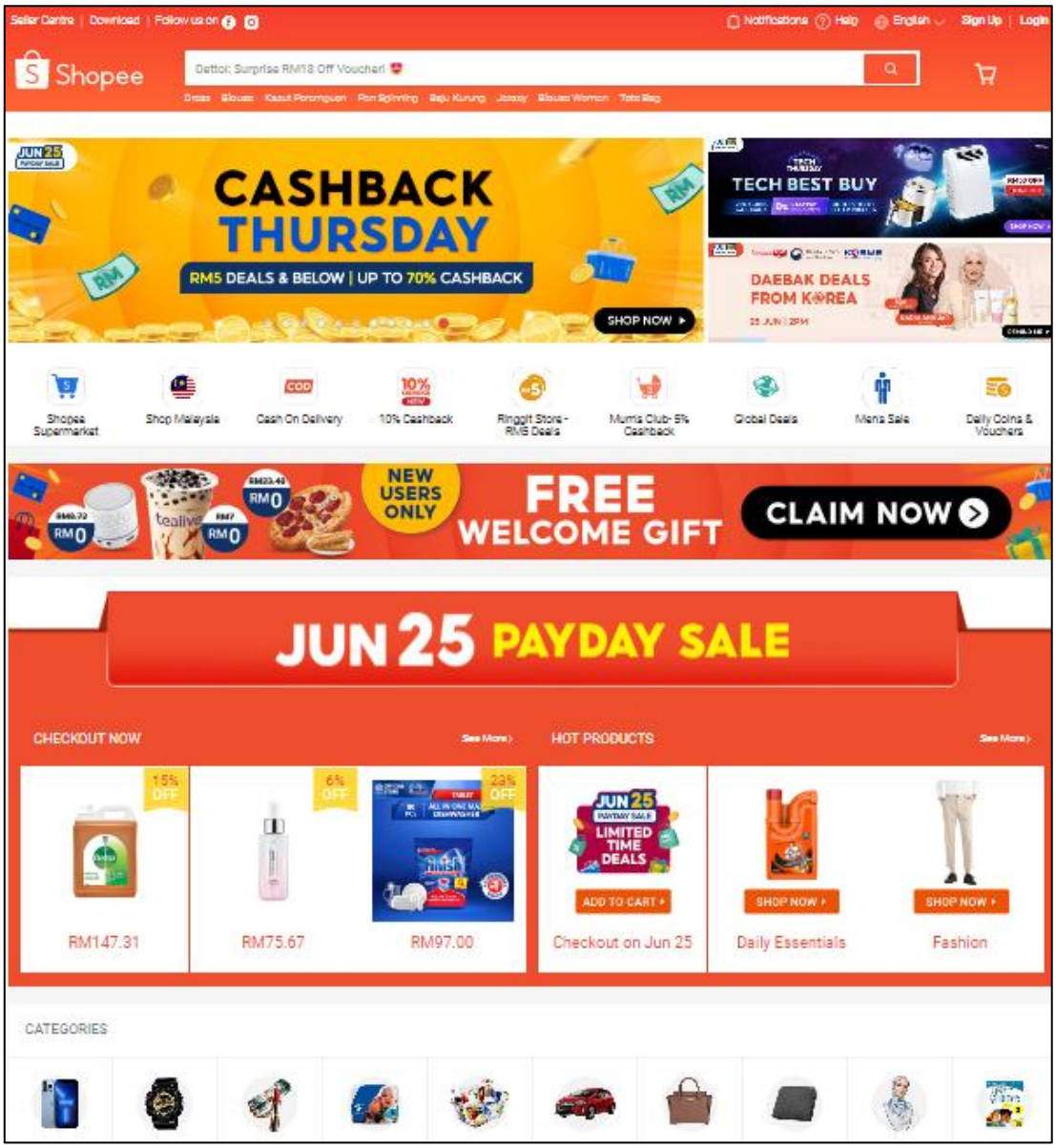

Figure 2.6 Main page of Shopee website

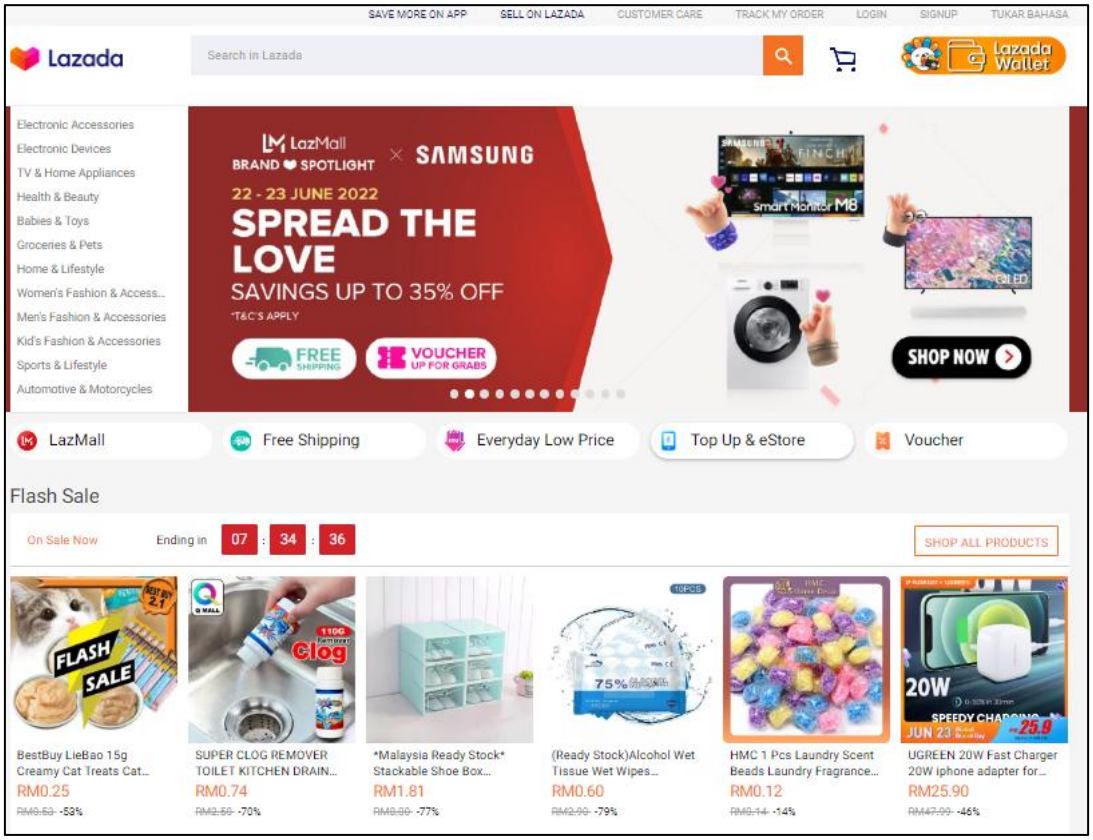

Figure 2.7 Main page of Lazada website

However, none of the four existing applications can broadcast a seller's request to recruit a worker. Such functionalities are not required for their applications since they are utilized to buy goods and services.

Table 2.1 Comparison summary of the existing system

Characteristics	**GrabFood**	**Foodpanda**	**Shopee**	**Lazada**	**Proposed System**
Order cannot be executed once food out of stock	√	√	√	√	√
Display the product availability and remaining stock	X	X	√	√	√
Auto calculate the quantity of purchase	√	√	√	√	√

Auto calculate the total payment including an additional cost	√	√	√	√	√
Can view the total payment	√	√	√	√	√
Auto generate payment receipts.	√	√	√	√	√
Can print the payment receipt	√	√	√	√	√
Auto generate a cancellation message	√	√	√	√	√
Remind seller about the product that almost expired	X	X	X	X	√
Remind seller about the product is almost out of stock	X	X	√	√	√
Can advertises a request to hire a worker	X	X	X	X	√
Can generate reports to track business performance and analysis.	X	X	√	√	√

2.6 Literature Review of Technology Used

The project's technology includes web hosting, database, framework, password validation, a hashing function, access control, and email notification.

2.6.1 Web Hosting

Web hosting is required since the proposed system is a web-based application. Web hosting is a service that allows ASZ Frozen Food Ordering System to be accessed via the internet. It is one of the most important aspects to consider while developing a website. Having a website with excellent reliability may benefit online business owners boost profits and enhancing customer experience.

2.6.2 Database

A web database is a type of database that can be accessed through the internet rather than having its information saved on a computer or associated storage. It is compatible with the proposed system because it is a web-based application that also uses internet access. Moreover, ASZ Frozen Food must store a lot of information about customers, owners, employees, sales, and more. As a solution, the database is used to gather information since it can organize it into a form that can be easily read, modified, added, or removed. MySQL (*What Is MySQL? A Beginner-Friendly Explanation*, 2022) is the database utilized for this project.

2.6.3 Framework

Frameworks are useful tools that developers use to build websites as well as other apps. Frameworks help developers detect problems in their programming. It also reduces the workload for developers by giving basic guidelines and control over the code. Therefore, a framework can speed up the development process. Laravel (Otwell, 2019) is the framework that was chosen for this project.

2.6.4 Password Validation

Before allowing users to proceed with the registration, the proposed system must validate the password created by users. One or more uppercase, lowercase, numeric, and special characters must be included in the password . To create a strong password, all of the conditions must be met (Mombrea, 2013).

2.6.5 Hashing Function

Hash functions are frequently used in association with digital signatures to maintain data integrity. For authentication of the proposed, hashing is performed after a user creates a new account and password. Then, the system code hashes it and saves the output into the database. The password is converted into a compressed numerical value during the hashing process. So, people cannot grasp it since it is not plaintext (Arias, 2018).

2.6.6 Access Control

Access control is a crucial aspect of data security since it determines who has access to and uses the business information of ASZ Frozen Food. Access control can validate a user's identity and provide authorized access to business data through authentication and authorization (Piscitello, 2015). For example, after placing an order, a consumer can only view his or her own purchased food. They are unable to view other customers' purchases. Only the owner of ASZ Frozen Food has access to that information.

2.6.7 Email Notification

If the user forgot their password, an email with a code would be sent to them. For verification, the user must input the correct code. Only after successful verification may the user reset their password. Its purpose is to guarantee that only authorized users use the account and access the website.

2.7 Chapter Summary

This chapter detailed the current system, its comparison to existing systems, and the technologies utilized. The issues are determined by analyzing the current system flow. The originality and qualities of the proposed system were then measured by comparing it to other similar existing applications. The proposed system will certainly differ from similar existing applications. Finally, research on technology or tools was conducted to choose the best tool for building the proposed system. It is crucial to keep user information secure. So, it is vital to avoid any unauthorized user from gaining access to a user account and collecting sensitive information. Thus, a dependable and appropriate technique must be applied to ensure a strong the system's security.

CHAPTER 3

SYSTEM DEVELOPMENT METHODOLOGY

3.1 Introduction

Chapter 3 outlines the methodology used for this project. The system development methodology is a framework that specifies the processes involved in the definition, construction, and implementation of a system. There are several frameworks, each with its own set of advantages and drawbacks. In addition, this chapter will detail the project's progress through each phase of the methodology. This chapter would also cover the system requirements, including hardware and software requirements. Following that, this chapter would give a more in-depth description of the tools or technology used.

3.2 Methodology Choice and Justification

The waterfall model has been applied to carry out the project. It was the first (Software Development Life Cycle) SDLC methodology used in software development (*What Is SDLC (Software Development Life Cycle) Phases & Process*, 2022). This implies that the previous step must be completed before moving on to the next one. Since it was performed in a linear sequential flow, the phases of this waterfall model do not overlap. The waterfall model's uniformity makes it simple to understand and maintain. Following that, every phase has its own set of targets and is evidence-based. The phases were also handled and finalized one by one.

The phase begins with requirements analysis. The project requirements are examined and discussed in a specification document. A feasibility analysis is performed to see whether these requirements are acceptable. It is vital to examine any limits and restrictions like time and money that may impact the project

development. Next, system design specifies hardware and system needs, including datasets, scripting languages, network equipment, and User Interface (UI). After that, the source code is developed according to requirements during implementation. The system is built in different programs known as units, which are then combined. However, before combining it, the performance of each unit is checked. Following that, the code is tested. All potential system flaws will be investigated manually or automatically performing test cases. The customer is present throughout the testing process to check that the proposed solution satisfies all requirements. To provide quality assurance, any weaknesses and problems discovered during the testing phase are corrected. To evaluate its functionality, the proposed system is deployed into a real environment (client's server). End-users can access the system once it has been implemented. After it has been deployed, the following phase is to offer maintenance services to ensure the proposed system operates properly. The major goal of this phase is to repair any failures that the users encounter while using the proposed system.

Each phase in this project has a defined objective and must be completed one after the other. Furthermore, the project's sequence is quite similar to the waterfall model phase. PSM1 is responsible for requirements and system design, whereas PSM2 is responsible for implementation, integration and testing, and maintenance. The previous phase must be completed before moving on to the next. After PSM1 is finished, continue to PSM2. Before proceeding on to the next phase, the previous one must be completed. As a result, the waterfall model is suitable for the project.

3.3 Phases of the Chosen Methodology

The waterfall model consists of six phases. So it begins with a requirements analysis. Following that, there will be system design, implementation, testing, deployment, and finally maintenance (Sharma, 2016). Figure 3.1 illustrates the waterfall model's sequence and flow.

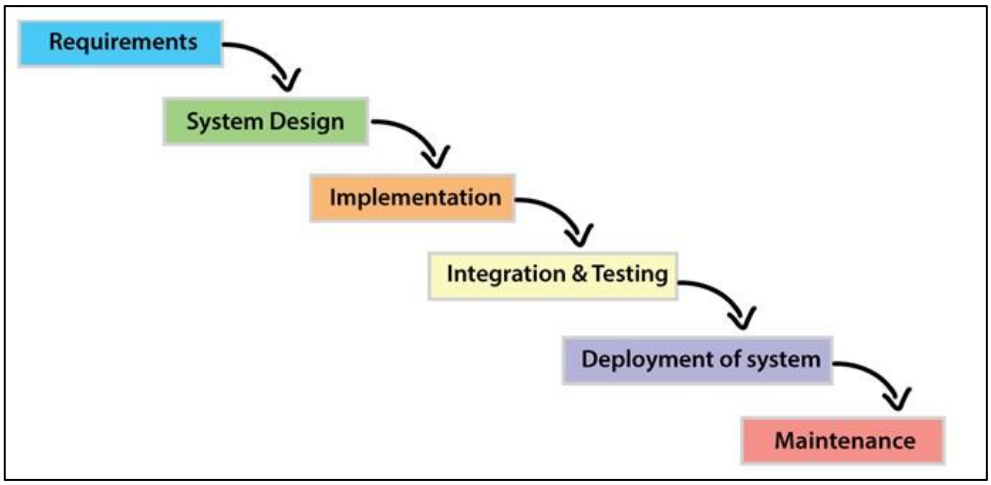

Figure 3.1 Six phases of the Waterfall Model (*What Is Waterfall Model? Pros and Cons*, 2019)

3.3.1 Requirement analysis

In the first phase, data from stakeholders are gathered via interview. To obtain the information, an interview was held with the owner of ASZ Frozen Food. A few questions had been raised in order to have a better picture of her business and current system. These data are used to establish user requirements and to gain an understanding of the proposed system. The goal of Chapters 1 and 2 in this project is to collect data from stakeholders. The first chapter of the requirement analysis is where a background problem must be discovered. The background problem may then define the problem, project goal, scope, objective, and importance. Next, the source of the problem can be discovered in Chapter 2 using the organizational structure and manual operation. The swim lane diagram was produced to illustrate the flow of the present system to make it simpler or clearer. Then, an analysis was performed to identify all the problems that exist in the current system. In addition, the suggested system was compared to other similar applications. The comparison is meant to highlight the advantages and uniqueness of the proposed system. The explanation for these differences is then discussed, demonstrating that the suggested system is superior to other similar systems. However, the suggested system must satisfy the user requirement and minimize needless features.

3.3.2 System design

Since the system requirements have now been defined based on the requirements and analysis. The next phase is to understand how to construct the system. The hardware and software requirements must be identified during this phase. A lot of diagrams were utilized to show the entire architecture of the proposed system. The use case diagram, sequence diagram, and activity diagram, for example, were used to describe the proposed system's behavior, functionality, and scope. They are also used to demonstrate the interactions between the actor and the system. There are additional diagrams, such as Unified Modeling Language (UML) diagrams, Entity Relationship Diagram (ERD) diagrams, and data dictionary diagrams that offer a better understanding of the relationships between various database tables.

3.3.3 Implementation

This phase would take place once the system design had been thoroughly validated. It makes use of data from the previous phase. This phase takes system design inputs and develops them into little programs called units, which are then tested and implemented in the following phase. During the implementation phase, each unit is developed and its entire functionality is tested, commonly known as unit testing. Thus, the system design is turned into source code with perfectly working program modules in this phase. This phase would be completed in PSM2.

3.3.4 Integration and Testing

Testing is performed to ensure the system is balanced and useful. This could prevent from client experiencing any disruptions or faults during production. It can manual or automated execution of test cases. After all of the code is completed, the product is tested. All of the units built during the previous phase are tested and merged into a system. A continuous examination is done to see whether there are issues or errors regarding the code and design. The customer is also engaged in the

testing process to make sure that all needs are satisfied. To provide quality assurance, any vulnerabilities and faults discovered throughout this phase are corrected.

3.3.5 Deployment of system

In the deployment phase, the product is finished. Following the completion of functional and non-functional testing, the system is deploy in a client's server to be tested for performance. End-users can access the system once it has been deployed. This phase may also involve educating real-time users to describe the system's advantages. Then, the system is deployed in the client's environment or made available to the market. This phase consists of installing, migrating, and supporting the entire system in the user environment.

3.3.6 Maintenance

In the waterfall model, this is the final but most crucial phase. The client has received and is using the product. Some problems may arise in the customer's environment. The primary aim of this phase is to fix the issue. In return, improved versions of the system are produced in order to optimize it. It is important to ensure that everything works well. The adjustments that raised during this phase are mostly connected to issues started by the users after the deployment and testing phases, such as faults or flaws discovered during live system usage or client requests. However, this phase would not be a part of the project. The project would only be performed until phase 5.

3.4 Gantt Chart PSM

A Gantt chart is used to oversee the project timeline and progress. Furthermore, it aids in ensuring that the task is performed on time or before the

deadline. So, it is helpful for time management. The PSM 1 Gantt chart is shown in Figures 3.2 and 3.3, whereas the PSM 2 Gantt chart is depicted in Figures 3.4.

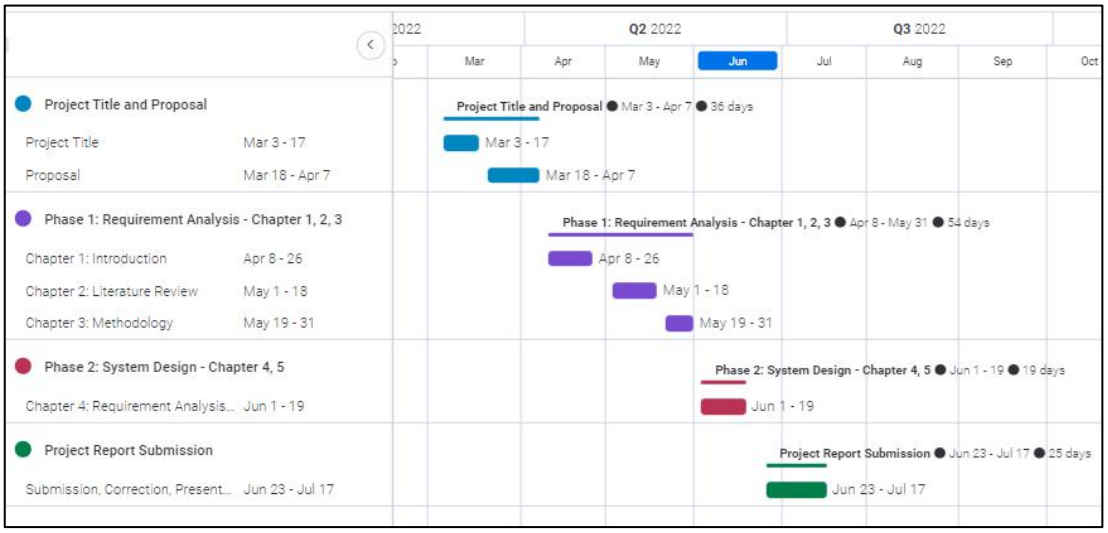

Figure 3.2 The Gantt chart for PSM 1

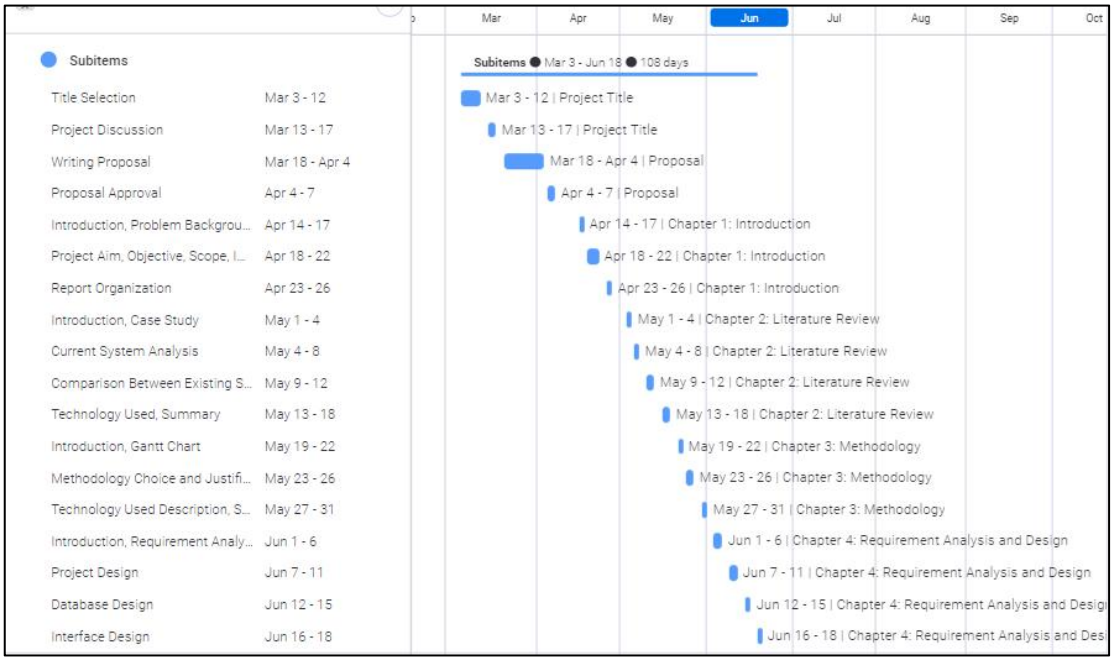

Figure 3.3 The detailed Gantt chart for PSM 1

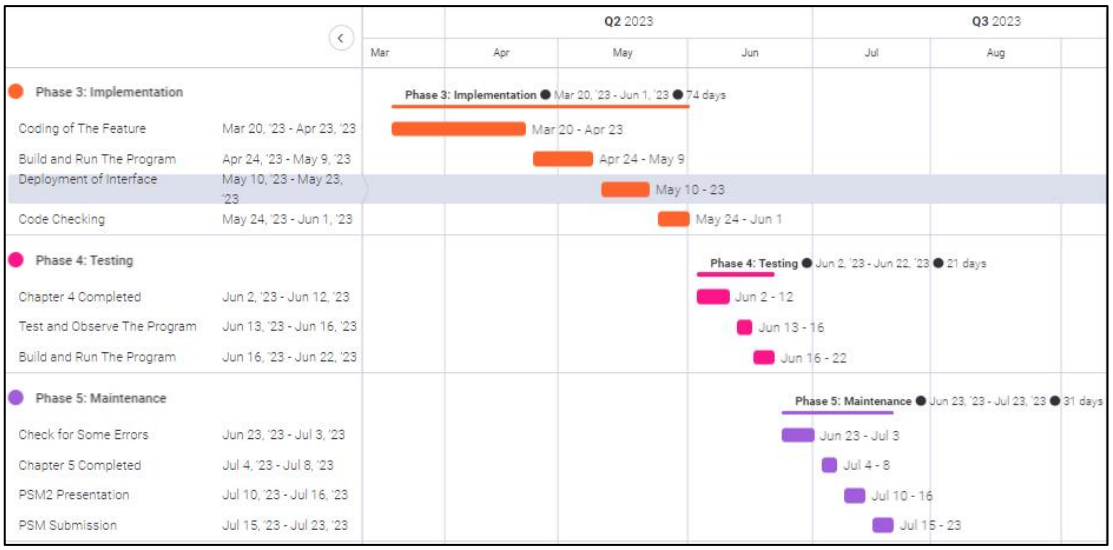

Figure 3.4 The Gantt chart for PSM 2

3.5 Technology Used Description

Laravel framework, Microsoft Azure, and Visual Studio Code are the technologies involved in the proposed web application.

3.5.1 Laravel

Laravel is a web application framework or also known as an open-source PHP framework that is both sturdy and simple to use (*Laravel - Overview - Tutorialspoint*, 2019). It reuses existing framework components, which aids in the development of web applications. As a result, the web application becomes more organized and sensible. Laravel focuses on making development easier by simplifying typical tasks seen in most web applications, including authentication, routing, sessions, and caching. This can meet the system security and network requirements. Besides, the proposed system is a web-based application that utilizes PHP and should be safe and protected. Laravel is seen to be a great option.

3.5.2 Microsoft Azure

In Microsoft Azure, PHP is often utilized. It maintains groups of Windows Web Servers that are used to host web applications. PHP is enabled by default for the Microsoft Azure website. It offers a variety of cloud services, such as computing, analytics, storage, and networking. Furthermore, in comparison to Amazon Web Services (AWS) and Google Cloud, Microsoft Azure places a great emphasis on security. It offers storage encryption, an application gateway, and a DDoS protection service (Emmitt & 2021, 2021).

3.5.3 Visual Studio Code

Visual Studio (VS) Code is a simplified code editor that supports development tasks such as building, debugging, and executing a website and cloud apps (*Visual Studio Code*, 2016). Visual Studio Code is an amazing editor for students and other learners who are just starting to learn HyperText Markup Language (HTML) and (Cascading Style Sheets) CSS. This course is intended mostly for students and learners who are at the starting then, to the advanced process of education to code in HTML, CSS, and JavaScript. Since this project is considered a practice for students to improve their programming skills, VS code is the best alternative.

3.6 System Requirement Analysis

It is essential to understand the basic requirements for the web application being created for it to be developed and function properly. Tables 3.1 and 3.2 outline the minimum hardware and software requirements for developing the proposed web application.

Table 3.1 The minimum hardware requirements

Hardware	Specification
Processor	Intel Core i5, 2.30GHz or above
Memory RAM	At least 8GB
Hard drive	At least 1TB storage HDD or 256GB SSD
I/O Devices	Mouse and keyboard
Internet connection	WiFi or mobile data

Table 3.2 The minimum software requirement

Software	Specification
Operating System	Windows 9 and above
Web Browser	Google Chrome, Firefox
IDE	Visual Studio Code
Front-end Tools	Laravel
Back-end Tools	MySQL

3.7 Chapter Summary

This chapter examines the best methodology for the project. The methodology used acts as a guideline to ensure that the project is manageable, efficient, and useful. The project becomes structured, and the application built can work properly if all phases of the methodology are followed. After that, a detailed analysis of the technology for developing the proposed web application is necessary to ensure it is suitable for the proposed web application. It is also imperative to study the minimum hardware and software requirements to guarantee that the proposed web application can be developed and run effectively.

CHAPTER 4

REQUIREMENT ANALYSIS AND DESIGN

4.1 Introduction

The fourth chapter will go over requirement analysis, design, database design, and interface design. The persons involved and their authority was then described using a use case diagram. A sequence diagram is also provided to demonstrate how the user, process, and machine interact in a given scenario. The activity diagram depicts a system's workflow from start to finish. Finally, the class diagram shows the system structure's class, attribute, operational, and relationship. Finally, the system architecture represents the overall system from an overhead shot.

4.2 Requirement Analysis

The requirement analysis contains a use case diagram, sequence diagram, activity diagram, and class diagram.

4.2.1 Use Case Diagram

A use case diagram is a method of summarizing information about a system and its users. This implies that it describes how a user who utilizes the system will achieve a goal. It is often illustrated as a graphical representation of interactions between various parts of a system. The system event will be specified using use case diagrams. In this diagram, an actor is an entity that plays a part in the system. It is drawn in the shape of a skeleton, as seen in Figure 4.1. ASZ Frozen Food Ordering Systems actors are Admin, Chef, Runner, and Customer. A use case is a

representation of a system's action or operation. It's designed as an oval and labeled with the operation. A use case represents each actor's activity. The system, which is drawn as a rectangle, is used to specify the extent of the use case. Figure 4.1 presents the use case diagram for the entire ASZ Frozen Food Ordering System. Each actor's function in the ASZ Frozen Food Ordering System is described in Table 4.1.

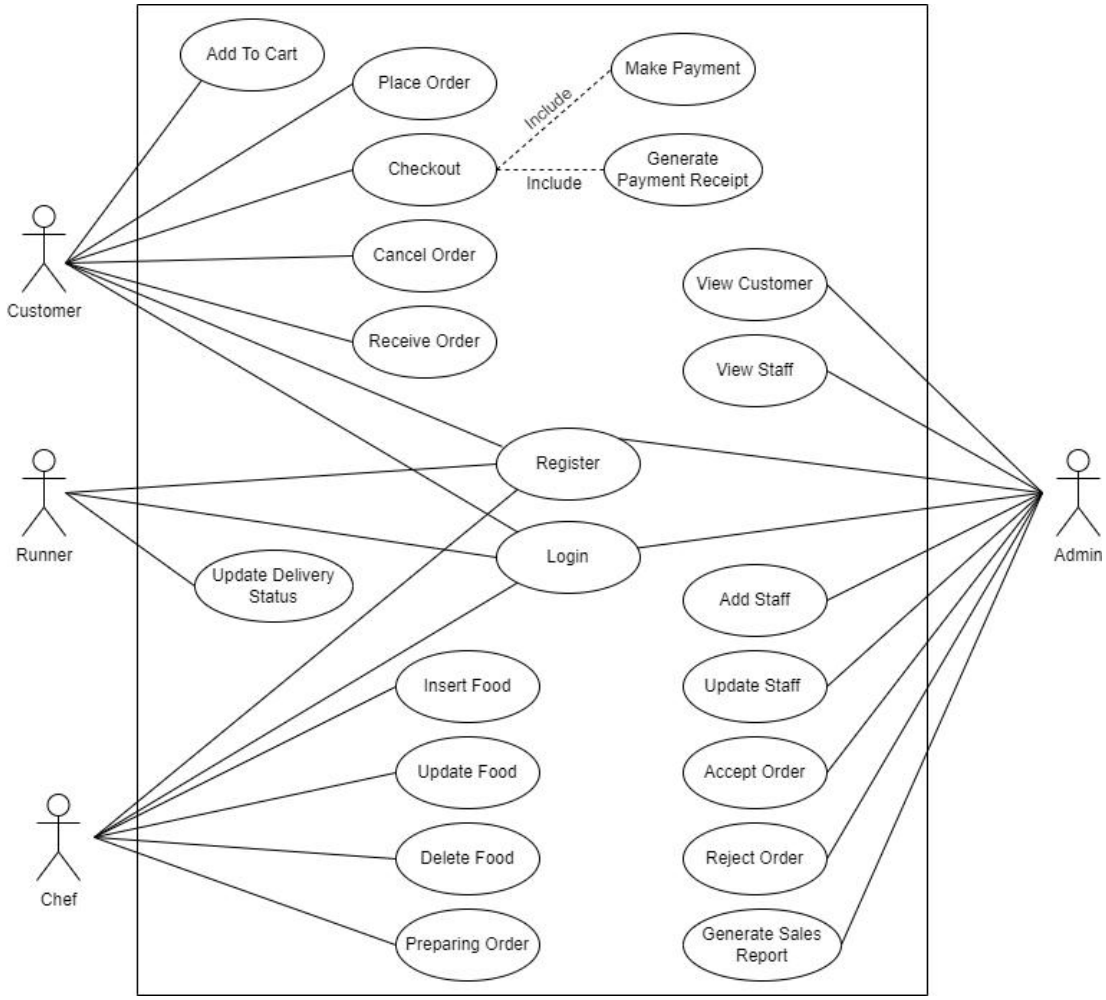

Figure 4.1 The use case diagram for the entire ASZ Frozen Food Ordering System.

Table 4.1 The description of each actor

Actor	Description
Admin	Admin has the privilege to view customer and staff information. Admin is also in charge of adding new staff and updating staff information. Any order placed by the customer would be forwarded to the administrator for approval. The order would be

	accepted or rejected by Admin. The admin would then be provided a sales report to review.
Customer	The customer is the one who buys food from the system. The cart would initially be filled with every food chosen. Customers can make an order by selecting food from the cart. To successfully purchase the food, the consumer must complete the checkout process by submitting a payment receipt. Following the checkout procedure, a payment receipt would be generated. Customers must then confirm whether or not they received the food successfully.
Runner	The food would be delivered to the customer by the runner. The runner must update the delivery status to inform whether the food is ready for delivery or has been delivered.
Chef	The chef is in charge of the food preparation. As a result, the chef would be in charge of adding new food, updating food data, and deleting food from the system. The chef must also prepare the food and hand it over to the runner for delivery. Preparing means taking the food from the fridge, packing it, and giving it to the runner.

Table 4.2 The description of each actor

Use Cases	Description
Login	Login to access the system .
Register	Create an account with the system.
View Customer	View customer information.
View Staff	View staff information. Chef and runner are among the staff.
Add Staff	Add new staff information into the system.Chef and runner are among the staff.
Update Staff	Update the staff information. Chef and runner are among the staff.
Accept Order	Accept the order made by the customer.
Reject Order	Reject the order made by the customer.
Generate Sales	The system generate the sales report for analysis.

Report	
Add To Cart	All of the foods chosen, along with their variations and quantities, would be put to the cart.
Place Order	Select the food in the cart to process the order request.
Checkout	Make a payment for the order and receipt will be generated
Make Payment	Pay for the order according to its total price and upload proof of payment to the system.
Generate Payment Receipt	A payment receipt is generated after the payment is successful.
Cancel Order	Cancel the order that had been made.
Receive Order	To confirm that the food was delivered successfully.
Update Delivery Status	Update the delivery status to inform whether it is ready for delivery or has already been delivered.
Insert Food	Add new food into the system.
Update Food	Update the food information.
Delete Food	Delete the food from the system permanently.
Preparing Order	Get the order ready and give it to the runner for delivery. Preparing means taking the food from the fridge, packing it, and giving it to the runner.

4.2.2 Sequence Diagram

A sequence diagram is a form of interaction diagram. This sequence diagram would show how the ASZ Frozen Food Ordering System works and in what sequence a group of objects interacts. For example, how the user interacts with the login interface, the information acquired from the user, and the order in which the food order is accomplished.

4.2.2.1 User Login

It starts with the user logging into the ASZ Food Ordering system. The user must input their phone number or id and password on the login screen. The login controller would send the phone number and password to the database to be confirmed. If the phone number and password are both valid, the login is successful and the user is directed to the home page; otherwise, the user is returned to the login page.

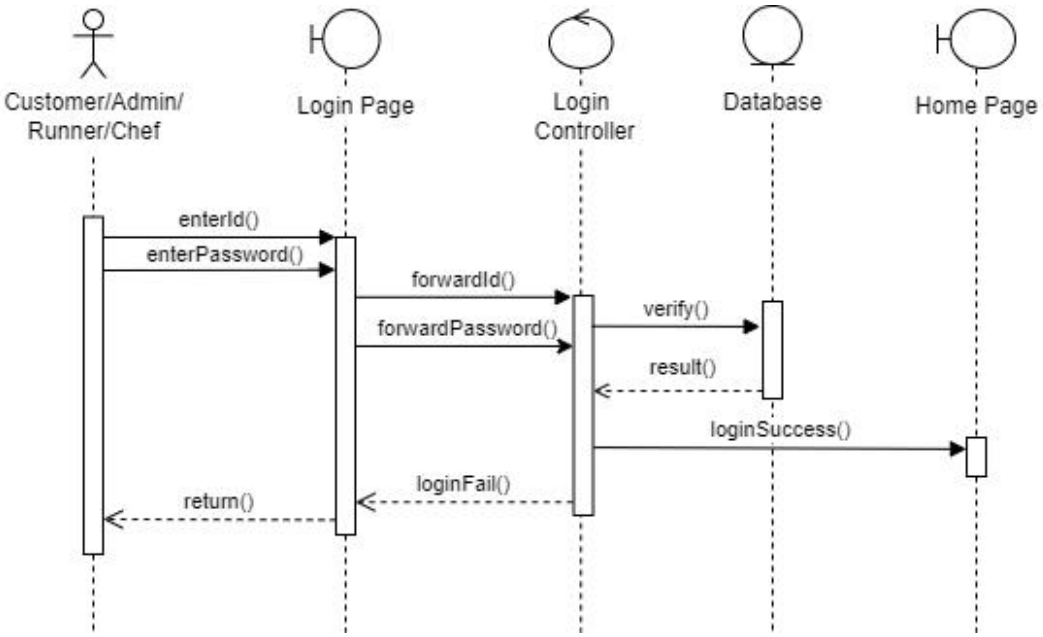

Figure 4.2 The sequence diagram for user login

4.2.2.2 Register

Users who have not yet registered cannot access the system. They must first register before they can login. To begin, users must input their personal information, including their phone number and password, on the register page. The system would then send a confirmation code to the user's phone number. If the code entered is correct, the registration is completed and the information is saved in the database. However, if the code entered is invalid, the user will be returned to the registration page.

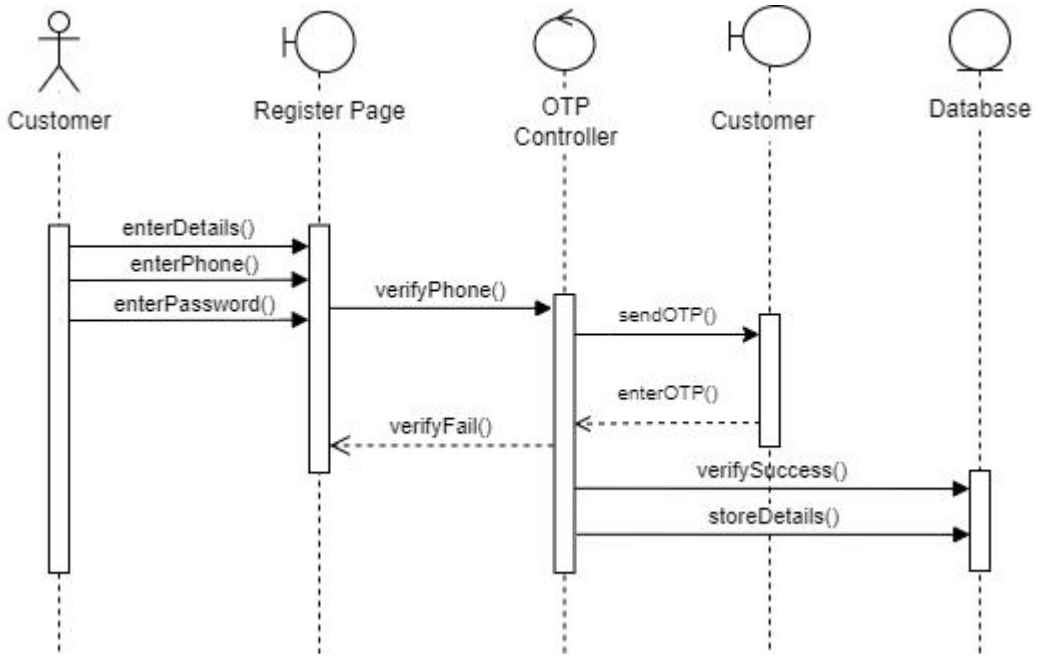

Figure 4.3 The sequence diagram for register

4.2.2.3 Food Ordering

Figure 4.4 is a food ordering sequence diagram. It starts with the consumer logging in and then redirects them to the home page. Customers may order food from the home page by viewing the available options, selecting their desired food, flavor, and quantity, and then adding it to their cart. Customers may check and confirm their orders from the cart. Once the order has been confirmed, it is saved in the database and removed from the cart. The order was then sent to the admin for approval. If the admin approves the order, the chef will begin preparing the food. The runner would accept the order for delivery after everything is prepared. However, if the admin rejects the order, the system will update the order in the database as a canceled order and notify the customer. The admin would then have to give the buyer a refund.

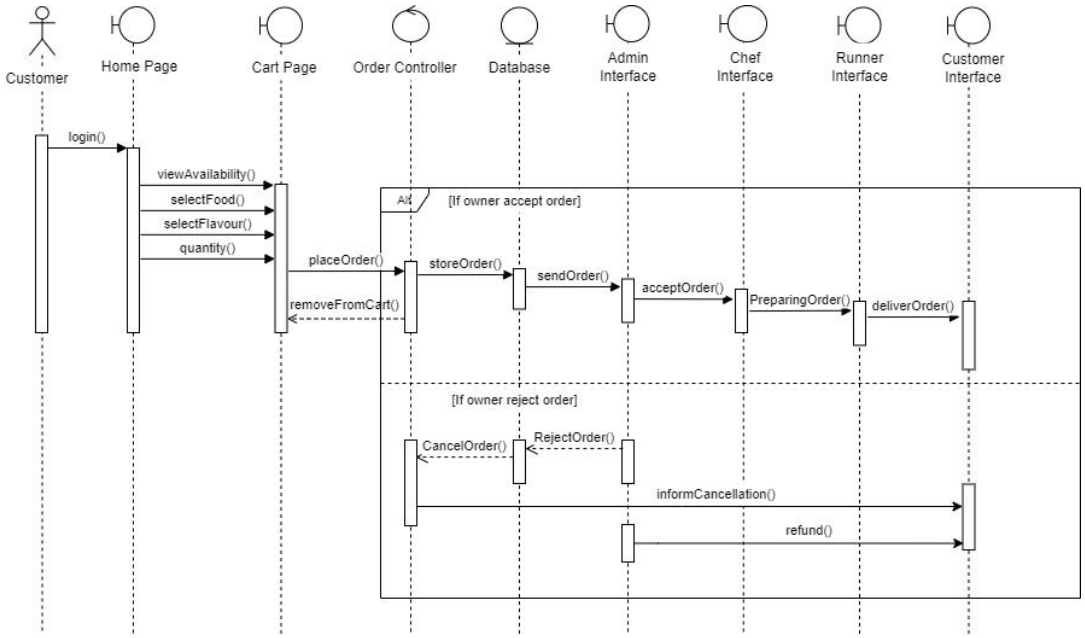

Figure 4.4 The sequence diagram for food ordering

4.2.3 Activity Diagram

The activity diagram is used in the ASZ Frozen Food Ordering System to illustrate its flow of control. It's quite similar to the flowchart. Activity diagrams may also explain the steps in the previously indicated use case. The graphic was separated into three sections: customer, system, and staff. The chef, and runner are among the staff. It begins with the customer opening the website and then logging in. Before accessing, the system will validate the login id and password in the database. If they are a first-time user, they must first register by filling out the registration form, and their information will be stored in the customer database. The customer can then choose to see their cart, select food, or view their order. The selected food would be added to the cart. The user can check out the order after viewing the cart. Before placing an order, customers must input their address information and make a payment. The system will save the order in the order database. However, the customer can still cancel their order if necessary. The admin must then accept the customer's order before the chef may begin preparing and give it to the runner. Once the order has been prepared, the runner will accept delivery and guarantee that it is

safely delivered to the customer. Figure 4.5 displays the complete view of the activity diagram.

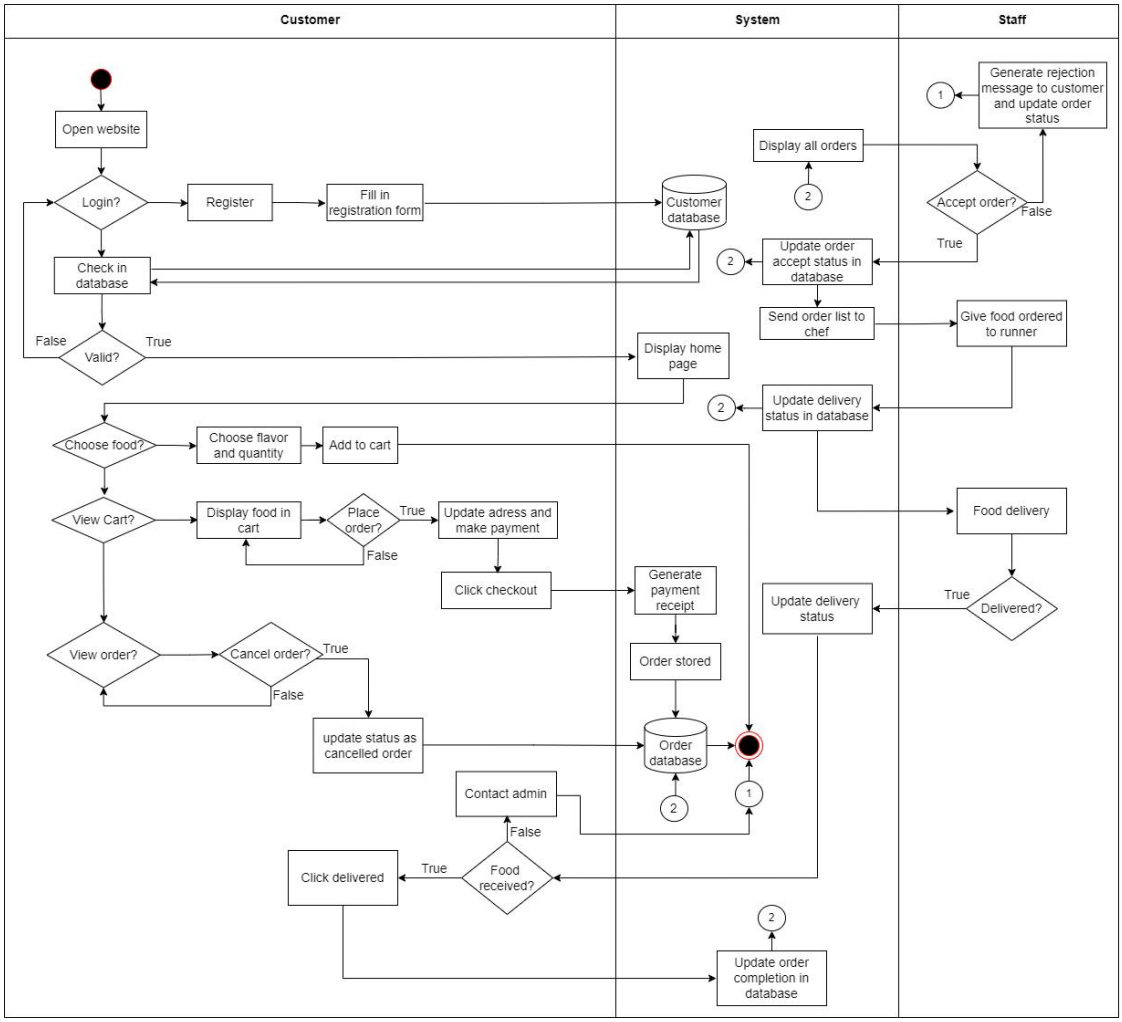

Figure 4.5 The activity diagram for proposed system

4.2.4 Class Diagram

The static view of the ASZ Frozen Food Ordering System can be represented by the class diagram. It describes a class's characteristics and actions. It also displays a set of classes, interfaces, associations, collaborations between elements, and limitations. Not only is it used to analyze and design the static view of the proposed system, but it also defines the proposed system's responsibility. The UML Class design for ASZ Frozen Food Ordering System is shown in Figure 4.6.

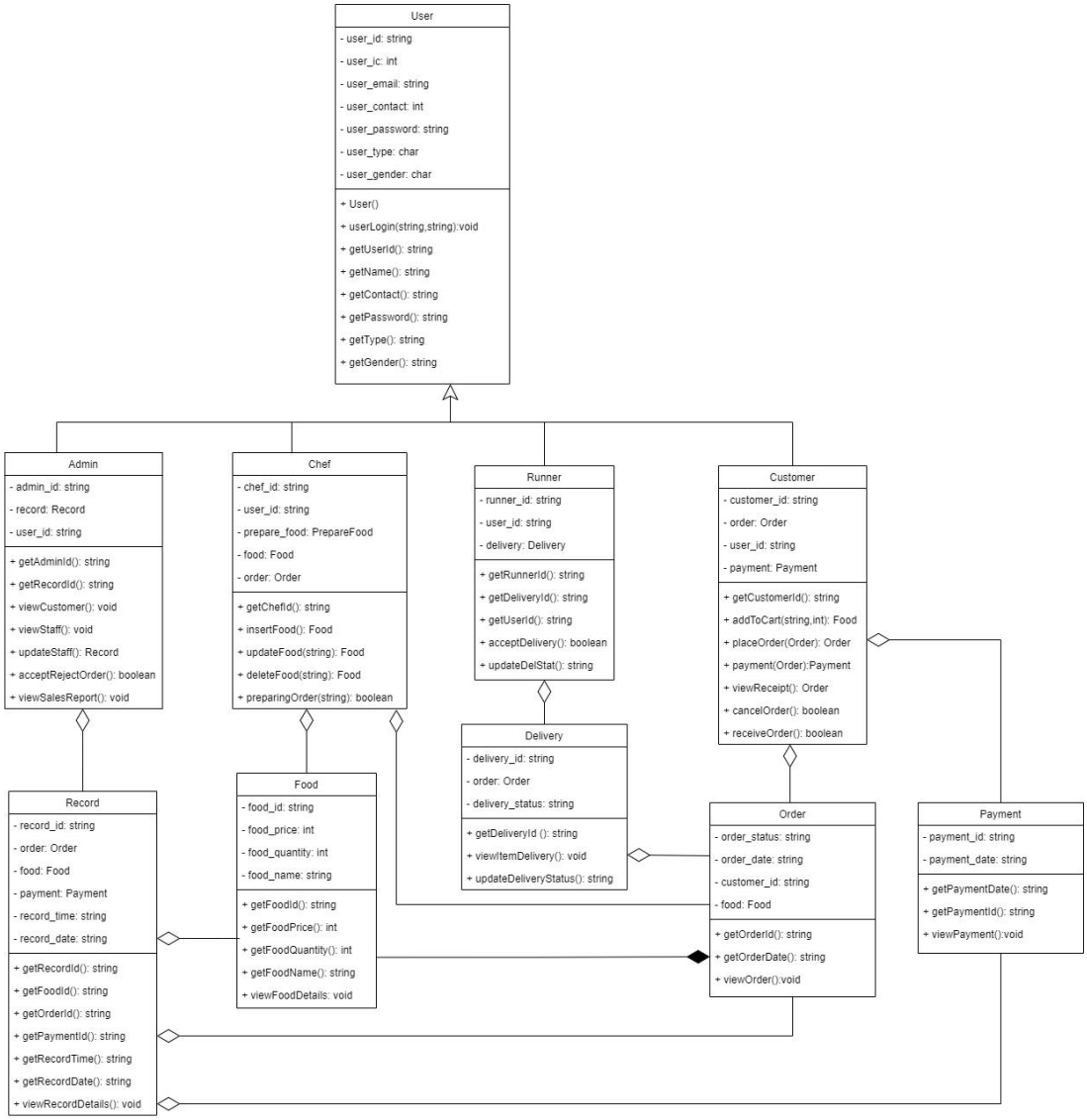

Figure 4.6 The UML diagram for proposed system

4.3 Project Design

The proposed system design is visualized in Figure 4.7. Before accessing the website, each user login must be verified. When the registration process was completed, the password was encrypted using the hash function and stored in the database. When a user attempts to log into the system, their password is compared to the database's decrypted hash password. Only if the user ID and password match can they get access to the website. This encryption is essential to ensure that only

authorized users can access the website. The admin, chef, runner, and customer have access to their own functions. Its function is to restrict user access. To begin, the customer logs in to the website through their mobile phone. The customer would next be subjected to a password verification and hashing procedure before being allowed to access the website. If the user forgot their password, the system would send an email with a code to them for verification. Only after entering the correct code can they reset their password and change to the new password.

The web page would be shown when the data request through the internet, web service, and the web server was delivered to the customer. All of the customer information and orders would be saved in the database. However, data would be extracted from the database in order to show the appropriate information, such as it is for the ordering page, confirmation page, and fulfillment page. Next, the runner, admin, owner, and chef can access the system via their phone number or PC to fulfill the order. Hence, the customer's and order's information from the database would be sent to them. For example, the chefs must access the order information to prepare the food and hand it to the runner then the runner must view the customer's address to deliver it.

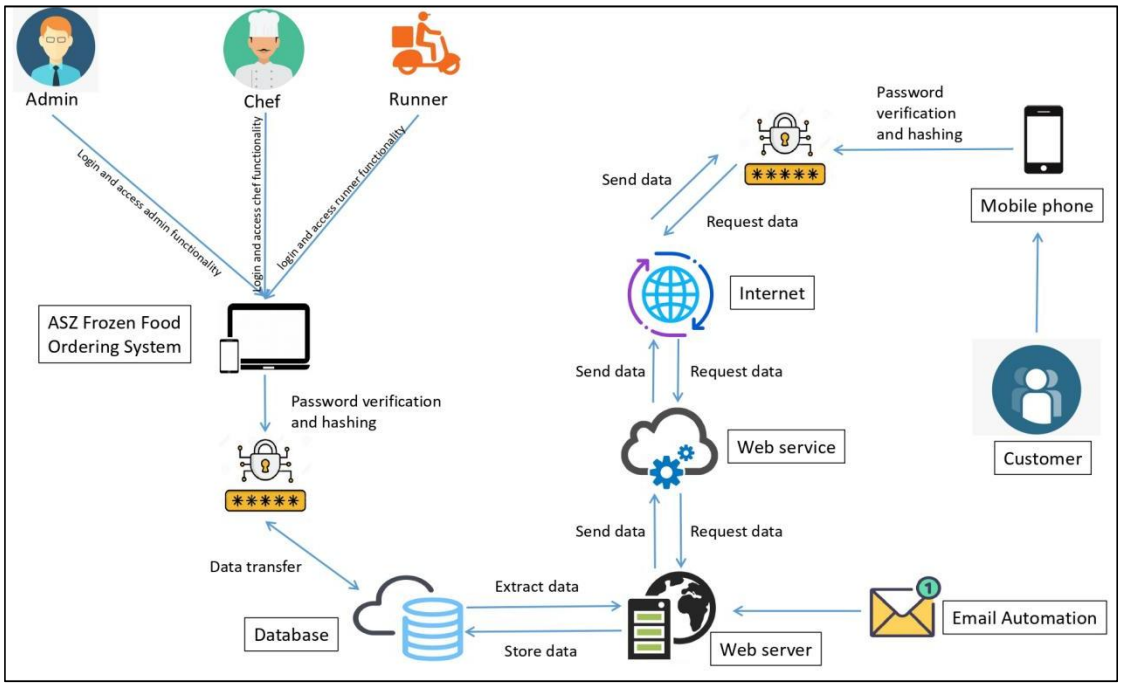

Figure 4.7 The proposed system architecture

4.4 Database Design

Databases are essential since they are used to store, manage, and retrieve any type of data for the proposed system. All information about the user, order, food, and so on is stored in a database. That data is collected in one location so that it could be examined and evaluated. Thus, the database design is used to determine what data must be stored and how the data parts interact. An Entity-Relationship Diagram (ERD) is used to illustrate the different entities in the proposed system and their relationships with one another. It starts with visual aspects of the entities like Order, Admin, Customer, Chef, Runner, and so on. Lines are used to indicating the relationship between entities. One-to-one and one-to-many relationships are included in the proposed system's ERD. Figure 4.8 displays the whole ERD of the proposed system.

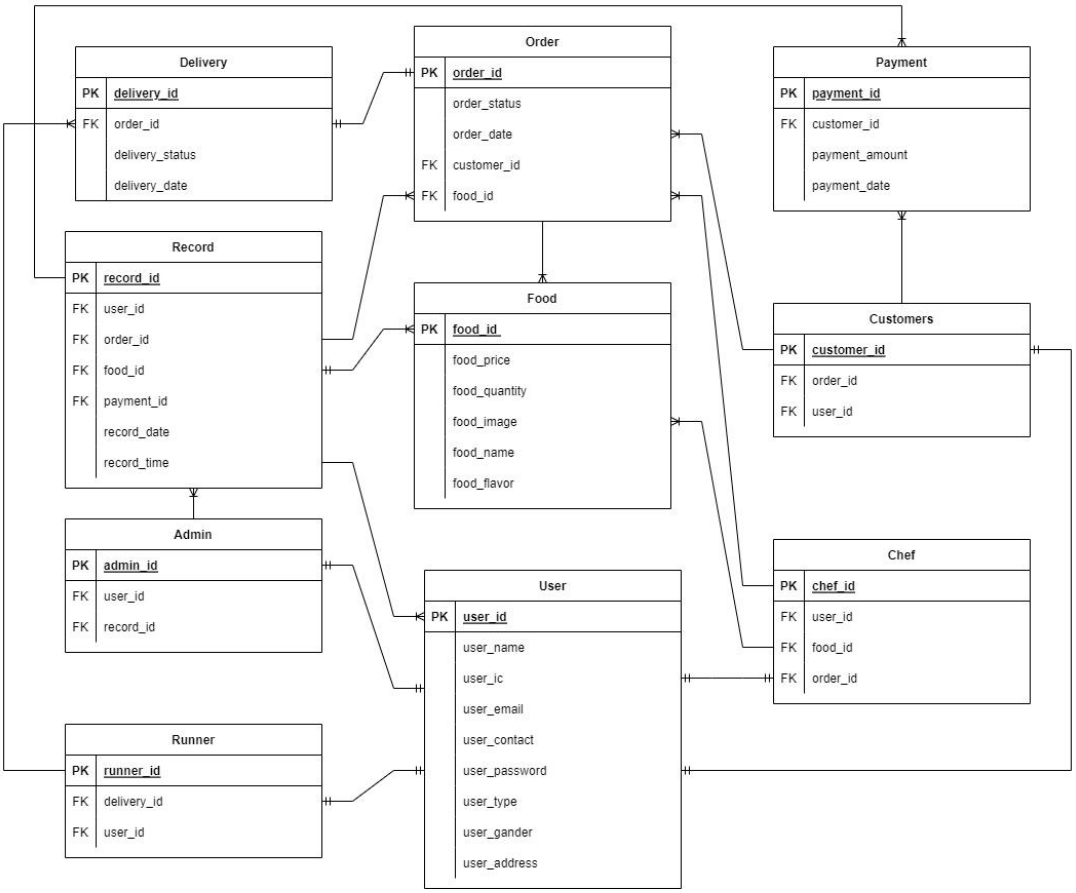

Figure 4.8 The ERD for proposed system

Table 4.3 Data dictionary for proposed system

File name	Datatype	File Length	Constrain	Description
User Table				
user_id	varchar	5	Primary Key	The ID of the user
user_name	varchar	50		The name of the user
user_ic	bigint			The identity card number of the user
user_email	varchar	50		The email of the user
user_contact	bigint			The contact number of the user
user_password	varchar			The login password of the user
user_type	varchar	20		The type of user
user_gender	varchar	6		The gender of the user
user_address	varchar	200		The address of the user
Admin Table				
admin_id	varchar	5	Primary Key	The ID of the admin
user_id	varchar	5	Foreign Key	The ID of the user
record_id	varchar	5	Foreign Key	The ID of the record
Chef Table				
chef_id	varchar	5	Primary Key	The ID of the chef
user_id	varchar	5	Foreign Key	The ID of the user
order_id	varchar	5	Foreign Key	The ID of the order
Runner Table				
runner_id	varchar	5	Primary Key	The ID of the runner
delivery_id	varchar	5	Foreign Key	The ID of the delivery
user_id	varchar	5	Foreign Key	The ID of the user

Customer Table				
customer_id	varchar	50	Primary Key	The ID of the customer
order_id	varchar	5	Foreign Key	The ID of the order
user_id	varchar	5	Foreign Key	The ID of the user
Food Table				
food_id	varchar	50	Primary Key	The ID of the food
food_price	decimal			The price of the food
food_quantity	int			The quantity of food
food_image	binary			The image of the food
food_name	varchar	50		The name of the food
food_flavor	varchar	20		The flavor of the food
Order Table				
order_id	varchar	5	Primary Key	The ID of the order
order_status	bit			The status of the order
order_date	date			The date of the order
customer_id	varchar	5	Foreign Key	The ID of the customer
food_id	varchar	5	Foreign Key	The ID of the food
Delivery Table				
delivery_id	varchar	5	Primary Key	The ID of the delivery
delivery_status	bit			The status of the delivery
delivery_date	date			The date of the delivery

order_id	varchar	5	Foreign Key	The ID of the order
Payment Table				
payment_id	varchar	5	Primary Key	The ID of the payment
payment_amount	decimal			The amount of the payment
payment_date	date			The date of the payment
customer_id	varchar	5	Foreign Key	The ID of the customer
Record Table				
record_id	varchar	5	Primary Key	The ID of the record
record_date	date			The date of the record created
record_time	time			The time of the record created
user_id	varchar	5	Foreign Key	The ID of the user
order_id	varchar	5	Foreign Key	The ID of the order
food_id	varchar	5	Foreign Key	The ID of the food
payment_id	varchar	5	Foreign Key	The ID of the payment

4.5 Interface Design

UI design is another name for user interface design. The website layout of the proposed system was imagined using UI design. It also illustrates how the user interacts with the system. The most important feature of good user interface design is its simplicity. A user interface that is easy to comprehend and implement. Icons and labels must be clear and simple. Refer to Appendix B for the full interface of each user.

4.5.1 Customer Interface

The majority of user interface designs begin with a login or registration interface. Customers must first register and create a new account by entering the required details. Then, using the correct user ID and password, log into the system. If the customer forgot their password, the system would send an email with a code to them for verification. Only after entering the correct code can they reset their password and change to the new password. A home page interface would be displayed once the customer successfully logged into the system. It promotes things, including staff recruitment or making important announcements. Furthermore, it displays a variety of frozen food options that can be ordered. The customer will be directed to the food ordering interface if they click to view any of the food options. Users can also search for food by clicking the magnifying glass button. The customer can select their preferred flavor, and the amount required to place an order. However, the chosen food would be placed in the cart first. Customers can access their cart by clicking the shopping bag icon on the home page. The total price of all selected foods would be displayed. They can also remove food from the cart or pick only the required food before checking out. Before placing an order, customers must input their delivery address, select a shipping method, and submit a proof of payment on the checkout interface. Following that, a payment receipt for the customer purchases would be generated. After the placement of an order, the order would be submitted to the admin for approval. The user can change their profile by clicking the person symbol on the home page.

4.5.2 Chef Interface

Chef have authority over the food product. They can add a product by uploading a photo of it along with its name, price, stock, and variants. Click the "x" button to cancel the procedure, or the "save" button to store the product information. Chef may check or update the product information under "Manage Product" after adding the product. They can also choose to delete the product. Following that, each order approved by the admin would be shown on the "Order" page. The chefs then

prepare the food based on the order displayed. The chef must collect the food from the freezer, pack it, then hand it to the runner. If the preparation is complete, the chef must click the "Done" button on the "Order" page. The "Order History" page displays the completed prepared order that was handed to the runner.

4.5.3 Runner Interface

The "Delivery Order" option on the main page would display all of the orders that have been given to the runner. When the runner is ready to deliver the product, he must click the "Accept" button. The runner must then click the "Done" button on the "On The Way" page once the product has been successfully delivered. Before that, the runner must complete the proof of delivery form by uploading the delivery photo as well as the receiver's name and IC number. Then click "Submit" to save the record. Its purpose is to guarantee that the product is delivered to the correct customer. The customer cannot also mislead the seller by claiming that the product has not yet been delivered and requesting a refund. After that, the delivered product is recorded and saved on the "Delivery History" page.

4.5.4 Admin Interface

The admin has additional authority to view customers, view staff, and manage staff. Before proceeding with the product preparation, the admin must first approve the customer order on the "Approval" page. Before that, the admin would examine the evidence of payment made by the customer to check that the payment was sent to the right account and follow the overall price of the food. After acceptance, the record will be shown on the "Approval History" page. Admin can accept the order by clicking the "Approve" button or reject it by clicking the "x" button. The admin is in control of adding and removing staff. Furthermore, a sale report is also generated by the system so the owner can monitor the business's performance each week and month.

4.6 Chapter Summary

Throughout the research in this chapter, requirements, and design are critical since they are the basis of remarkable system development. The requirements are provided to assist in identifying the user's needs, and the project's limitations, and to generate a satisfactory outcome. Meanwhile, the design aids in visualizing the ultimate result, developing a suitable product, and testing the appropriate parameter. A good design can aid in the achievement of a successful project goal. The design can also describe project failure, flow, and module in the proposed project.

CHAPTER 5

CONCLUSION

5.1 Introduction

PSM1 concludes with Chapter 5. It describes a summary of the project's aims and objectives, achievements, and implementation plan. This project aims at establishing, creating, and building a reliable frozen food ordering system that will make it easier for sellers to collect orders and improve the quality of services provided to all customers. The objective is to identify the specifications for an online food ordering system, design and create an online food ordering system based on user requirements, and test the online food ordering system's functioning based on user requirements.

5.2 Achievement

After completing the research, each chapter finished is an achievement. Each chapter is necessary to provide a correct and appropriate system based on the proposal. The background problem of the ASZ Frozen Food ordering system is identified in Chapter 1. The project purpose, objective, scope, and importance are decided based on the background problem. The second chapter is a review of the literature. The proposed system's user is determined by defining the organizational structure. Their control over the proposed system is also determined by the structure of the organization. The proposed system's strengths and limitations are then identified by comparing it to other similar existing systems. Furthermore, this chapter assists in selecting the right technology for the proposed system development. The research highlighted a security component. It is critical to guarantee that the proposed system is protected.In Chapter 3, the achievement is determined after the methodology is chosen. The waterfall model was applied in the project's process.

This chapter also involves an investigation of the technology used. The proposed system is built using the Laravel framework, Microsoft Azure, and Visual Studio Code. The proposed system's development process may now be visualized. Finally, Chapter 4 is an important element of the research since it describes the system's functionality and interaction with its users. The UI design helps in picturing the proposed system's interface. AS the outcome, the implementation becomes easier since it is based on the design interface.

5.3 Plan For Project Implementation

The proposed system's implementation would take place during PSM 2. It begins with the implementation phase of the waterfall methodology. Following that are testing, deployment, and maintenance. The system coding in PSM1 would refer to the UML class diagram during implementation. The database files are then arranged according to ERD. The web page would be designed similarly to the UI interface in PSM1. The proposed system can be developed correctly by following the steps in the waterfall model. However, time management is also necessary to guarantee that each task is performed on time as per the Gantt chart. The Gantt chart is used to guide the development of the proposed system. The outcome may not be as planned. There would be a lot of bugs and issues that would require time to repair. As a result, the Gantt chart is essential for managing the time for the PSM2 project. Next, since PSM2 would not be on the next semester, this PSM1 report would need to be studied again and well understood before beginning the PSM2 implementation phase.

5.4 Chapter Summary

Chapter 5 summarizes all chapters in this project in terms of achievement. The project's implementation would take place during PSM2. Thus, the PSM1 plan to develop the ASZ Frozen Food Ordering System is complete. It might be viewed as the end of PSM1, but it is also the start of PSM2.

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Appendix A Interview Session

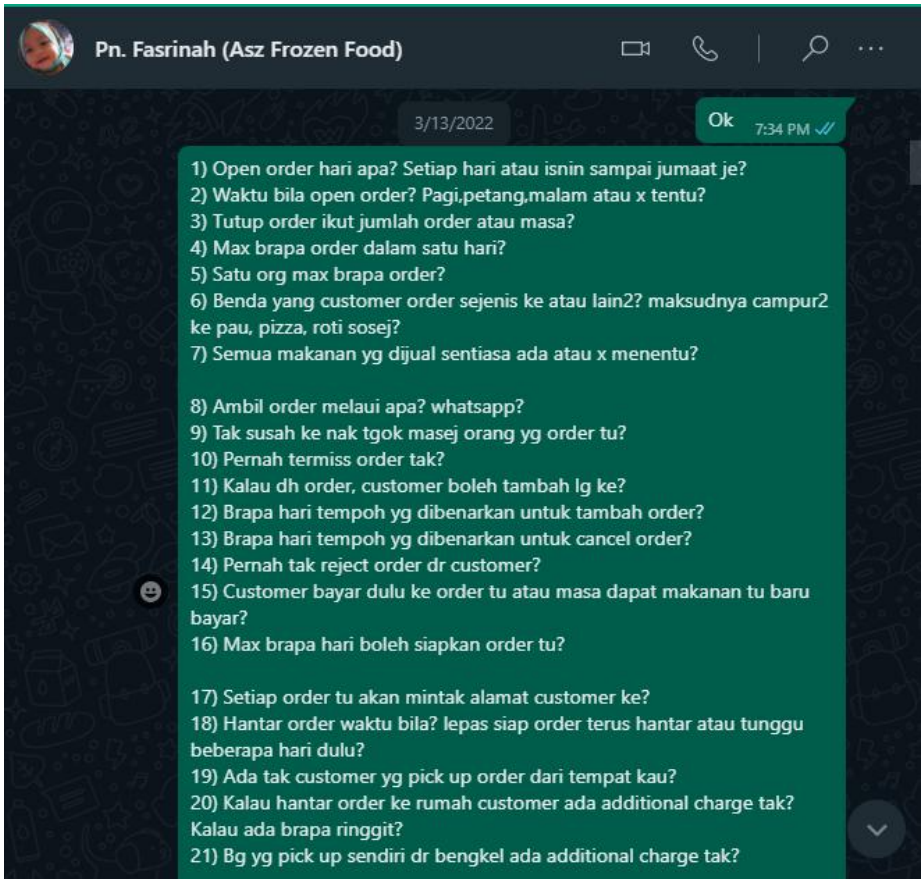

Figure A.1 The questions provided for the interview session (Part I)

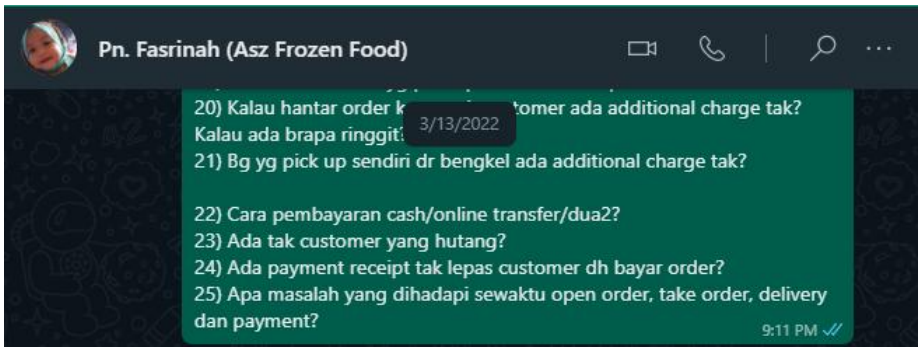

Figure A.2 The questions provided for the interview session (Part II)

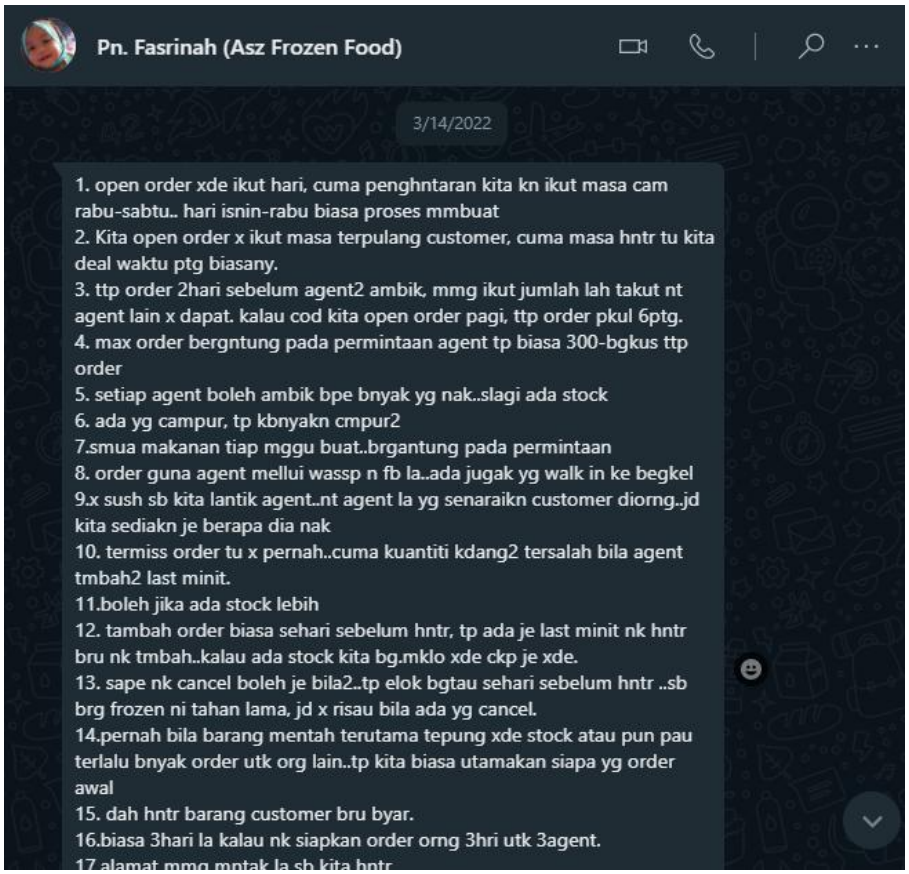

Figure A.3 The answers provided for the interview session (Part I)

Figure A.4 The answers provided for the interview session (Part II)

Appendix B User Interface

Customer Interface

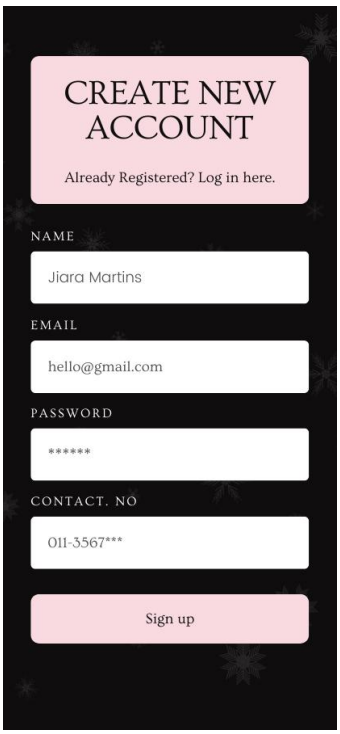

Figure B.1 The interface to create new account

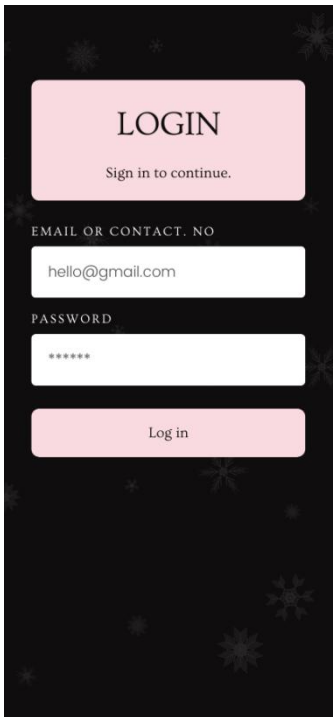

Figure B.2 The login interface

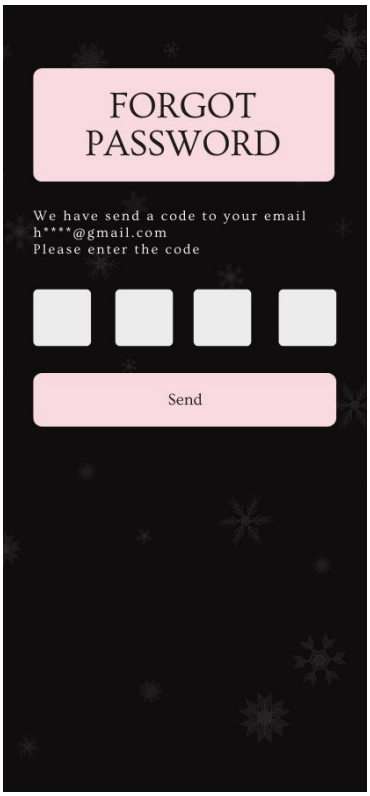

Figure B.3 The forgot password interface

Figure B.4 The customer's home page interface

Figure B.5 The food menu interface

Figure B.6 The user's cart interface

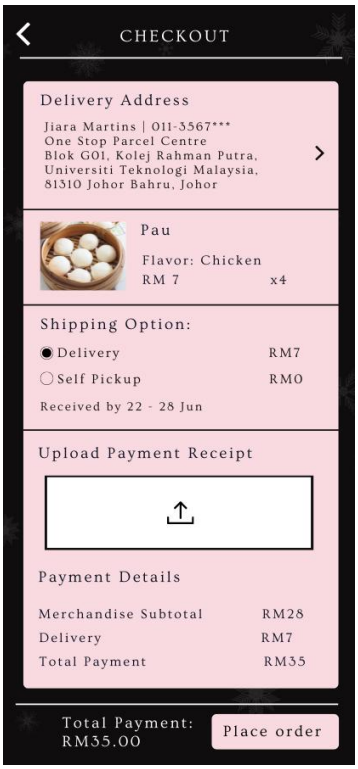

Figure B.7 The checkout and payment interface

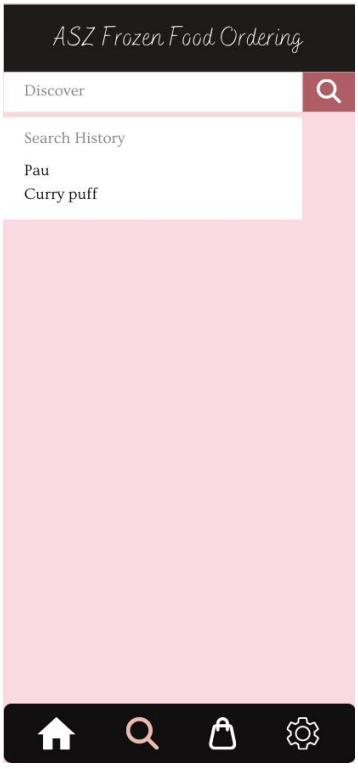

Figure B.8 The search bar interface

Figure B.9 The user profile interface

Chef Interface

Figure B.10 The chef's home page interface

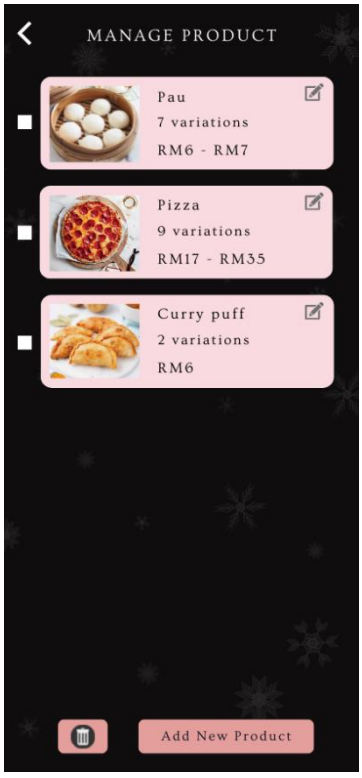

Figure B.11 The interface to manage product

Figure B.12 The interface to add new product

Figure B.13 The interface that display order to be prepared

Figure B.14 The interface that display order history

Runner Interface

Figure B.15 The runner's home page interface

Figure B.16 The interface that display address to deliver the order

Figure B.17 The interface to update delivery progress

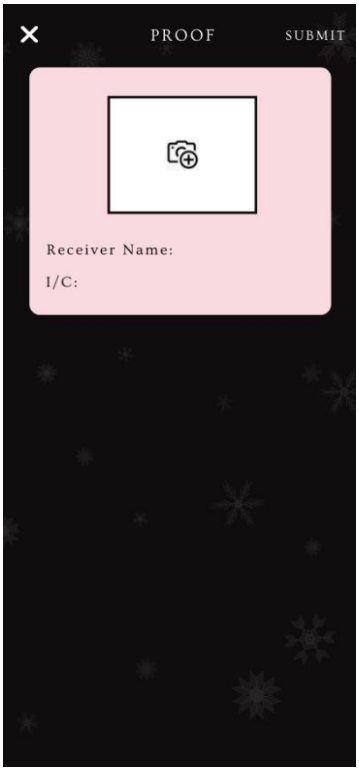

Figure B.18 The interface to provide the proof of successful delivery

Figure B.19 The interface that display delivery history

Admin Interface

Figure B.20 The admin's home page interface

Figure B.21 The interface that display order to be approved

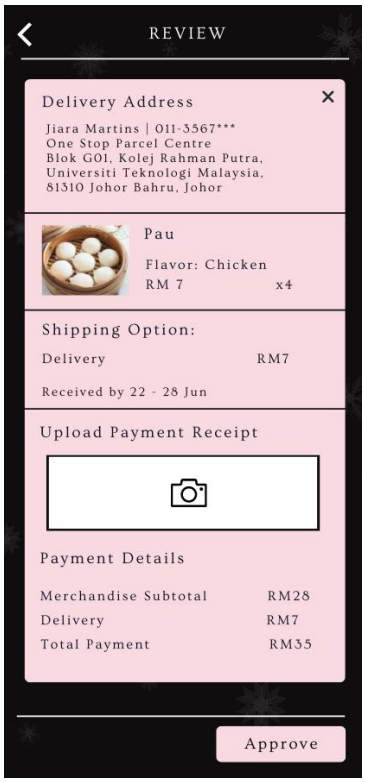

Figure B.22 The interface that display the order information for review

Figure B.23 The interface that display order approval history

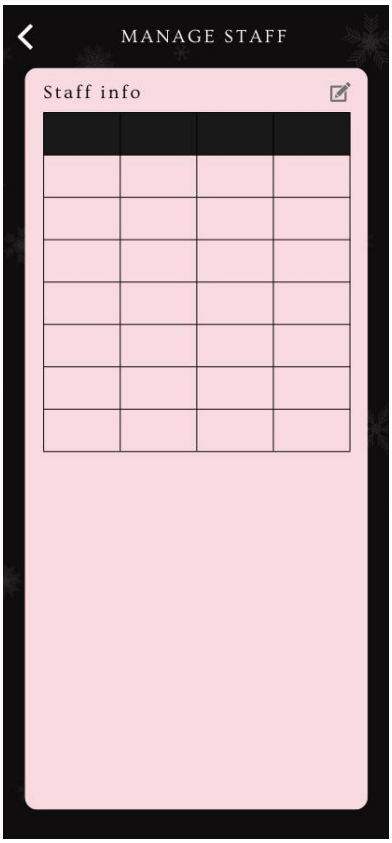

Figure B.24 The interface that display staff information

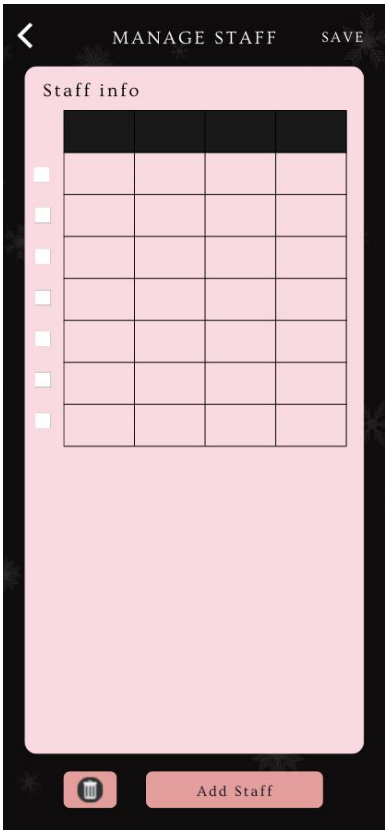

Figure B.25 The interface to manage staff information

Figure B.26 The interface to add new staff information

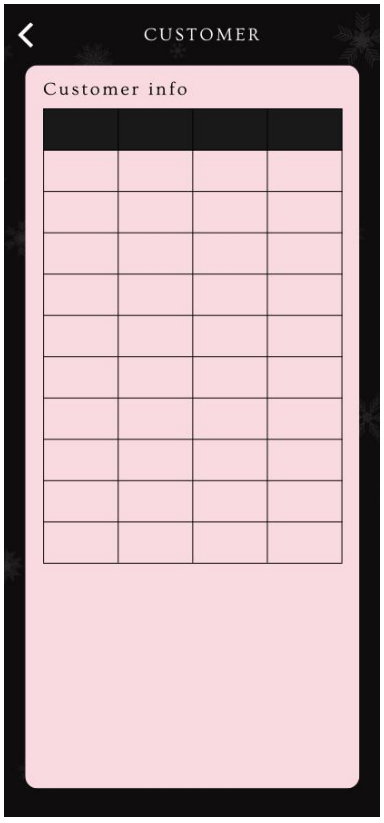

Figure B.27 The interface that display customer information

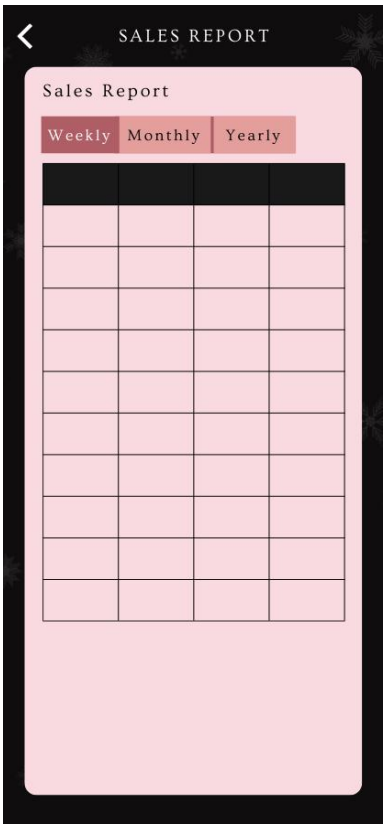

Figure B.28 The interface that generate sales report