TUNKU ABDUL RAHMAN UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY

Programme: RSD (Group: 1)

Assignment

BACS2163 SOFTWARE ENGINEERING

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Plagiarism Statement and Guideline for Late Submission of Coursework Read, complete, and sign this statement to be submitted with the written report**. We confirm that the submitted works are all our own work and are in our own words.**

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1.0 Part 1

1.1 Organisation Background

Uniqlo is a Japanese company with a long history. In March 1949, a Yamaguchi-based corporation was established in Ube, Yamaguchi named Uniqlo. Then, Uniqlo clothing stores started to form and can be found on any given street corner in any given city. Fast Retailing, the parent firm, owns the company.

Uniqlo, an abbreviation for "Unique Clothing Warehouse," is a well-known Japanese retail company noted for its casual and minimalist aesthetic. Fast Retailing Co., Ltd., one of the world's largest retail holding firms, owns it. Uniqlo is well-known around the world for its high-quality apparel, low costs, and emphasis on utilitarian designs.

The founder, Tadashi Yanai, began Uniqlo in 1949 as a tiny men's clothes store in Hiroshima, Japan. Originally known as "Ogori Shoji," the company gradually expanded its activities and opened a number of locations across Japan during the 1980s. In 1984, the company was renamed "Unique Clothing Warehouse," which was then abbreviated to "Uniqlo."

The philosophy of Uniqlo rests around the concept of "LifeWear," which focuses on developing simple, well-designed, and versatile apparel that is appropriate for people's daily lives. The brand emphasises utility, high-quality fabrics, and reasonable costs, with the goal of providing timeless pieces that can be seamlessly integrated into any wardrobe.

Uniqlo's breakthrough came in the late 1990s when they launched their "Made for All" marketing campaign, emphasising the brand's commitment to inclusivity and apparel that people of all ages and backgrounds could appreciate. This strategy was well received by customers and aided Uniqlo in establishing a significant foothold in the Japanese market.

In the early 2000s, Uniqlo's global development began. The firm launched its first stores outside of Japan, first in London and later moving to other major cities worldwide. Now, Uniqlo has over a staggering 2,000 stores in over 25 countries, including the US, China, South Korea, France, and Australia.

Uniqlo's focus on partnerships with famous designers, artists, and businesses is one of the company's core strategies. Collaborations have included collaborations with well-known persons such as Jil Sander, Alexander Wang, and Christophe Lemaire, as well as prominent franchises such as Disney and Pokémon. Uniqlo has been able to provide unique and limited-edition designs that appeal to both fashion enthusiasts and a wider audience as a result of these collaborations.

Uniqlo's success can be linked to the company's commitment to producing high-quality apparel,

a focus on customer pleasure, and the ability to adapt to changing consumer demands. Uniqlo has become a worldwide recognized brand by fusing Japanese aesthetics with global fashion trends, and it continues to extend its presence and impact in the fashion sector.

1.2 Requirement gathering techniques

1.2.1 Requirements gathering techniques 1: Interviews

Justification:

Interviewer can communicate directly and one-on-one with stakeholders. Trust and rapport can be built through **personal interactions**. Stakeholders' opinions and concerns can be shared as well.

Interviewers can discover and seek **clarification on unclear requirements** by having an interview as there will be more context and elaboration provided by stakeholders according to their needs. Thus, misunderstandings can be avoided and reduced.

Implicit or **unspoken requirements can be revealed** and uncovered in interviews as it is not noticeable through other techniques.

Through interviews, interviewers can obtain a deeper and better understanding of users' needs. Real-time adjustments to users' line of questioning can be made as well when interviewers gain **real-time feedback** through an interview.

What to Gather:

Interviews can help to understand the **expectations of stakeholders**. After knowing the expectations, we can improve on system features and functionality. As the system reaches the expectations of users, it will increase the number of users.

Performance, security, usability and scalability of the system are known as **non-functional aspects** which are important in implementing a successful system. It will be tied indirectly to the specific functionalities.

There are many **limitations** in the system. Budget, timeline, technology preferences and regulatory requirements are the common constraints of the system. They should be identified and solved so that the system can run smoothly and won't affect the progress of the project.

Target Audience:

Primary stakeholders are also known as the individuals that are interested in the project's outcome such as end-users, clients or even business representatives who will purchase the software and use it.

Secondary stakeholders are also one of the target audiences as they will cause an indirect effect to the project. For example, managers, support teams and system administrators are the secondary stakeholders.

Domain experts are someone who is a genius in domain as they can comment on the specific requirements of users and give valuable perception.

How to Conduct Interviews:

First of all, to carry out any interview, we need to **plan and prepare**. Purpose of the interview should be defined. Then, we need to prepare a list of open-ended questions. An interview can only be held with stakeholders if we have the objectives and well-prepared questions list.

Next is **active listening** which means we should focus on stakeholders' responses. Follow-up questions must be prepared for them for a deeper understanding. A **summary** or detailed notes must be taken during the interviews to capture accurate requirements. Interviewers must respect stakeholders' opinions by showing a positive response.

Interview is an **iterative process** as multiple rounds of interviews are needed to clarify the users' requirements. Therefore, iterative interviews must be conducted to gain a comprehensive understanding.

Sample Questions:

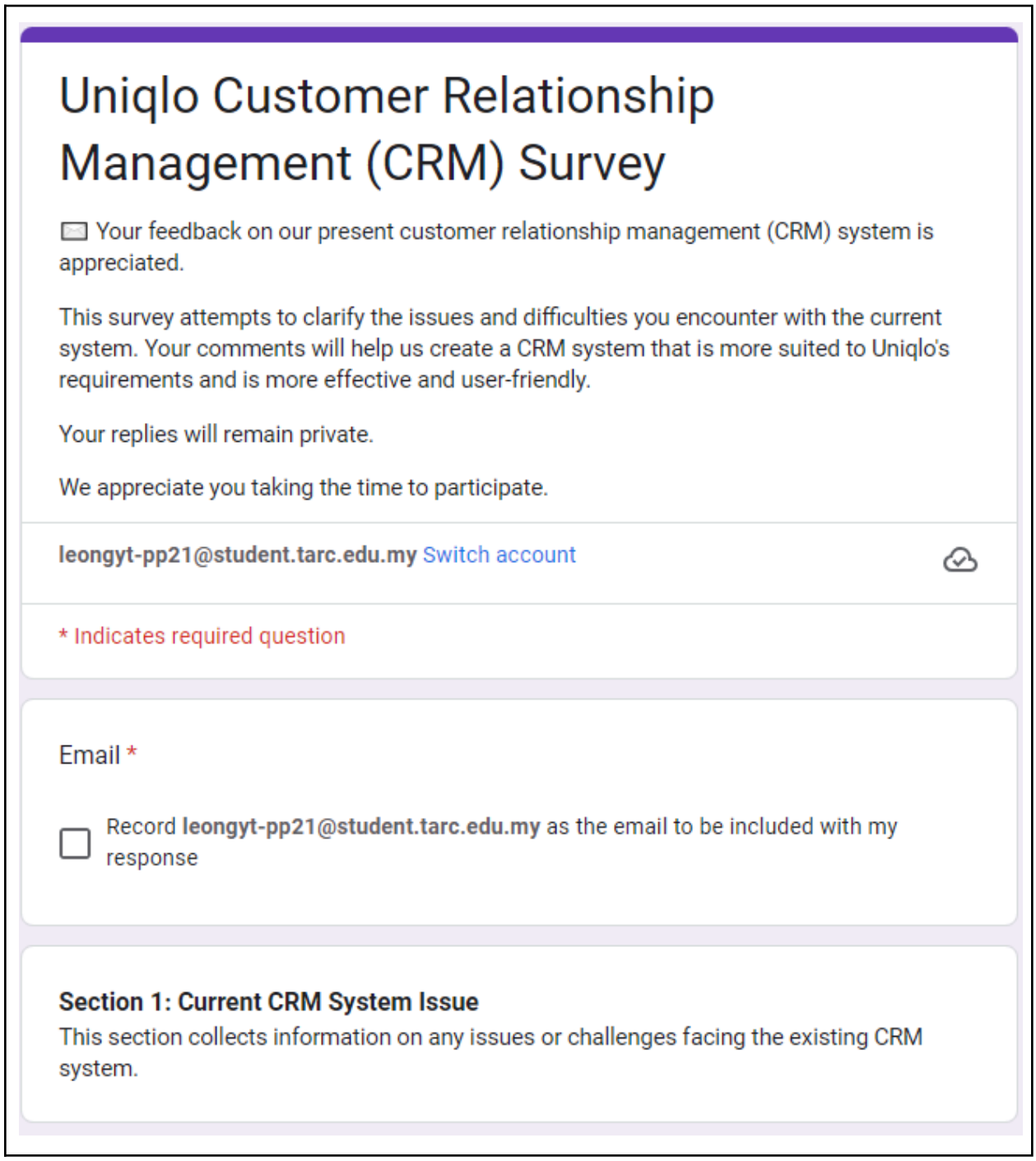
1. Can you mention the role of customer relations management (CRM)?
2. Can you describe your level of experience when you perform tasks in CRM software?
3. Are you proficient in using CRM tools?
4. Why does a CRM software program need to be considered?
5. What features do you think that should be included in the current CRM system?
6. How does the CRM system benefit you?
7. What challenges will be faced in the CRM system?
8. Does the current CRM system have all the essential modules?
9. Do you think integration of CRM with social networking sites is needed?
10. What are the important qualities of a CRM manager?

1.2.2 Requirements gathering techniques 2: Questionnaires

Justification:

What to Gather:

Google form link



Uniqlo Customer Relationship Management (CRM) Survey

Your feedback on our present customer relationship management (CRM) system is appreciated.

This survey attempts to clarify the issues and difficulties you encounter with the current system. Your comments will help us create a CRM system that is more suited to Uniqlo's requirements and is more effective and user-friendly.

Your replies will remain private.

We appreciate you taking the time to participate.

leongyt-pp21@student.tarc.edu.my Switch account

* Indicates required question

Email *

Record leongyt-pp21@student.tarc.edu.my as the email to be included with my response

Section 1: Current CRM System Issue

This section collects information on any issues or challenges facing the existing CRM system.

How would you rate your **overall satisfaction** with the current CRM system used by Uniqlo? *

	1	2	3	4	5	
Very satisfied	○	○	○	○	○	Very dissatisfied

What **specific challenges or issues** have you encountered while using the current CRM system at Uniqlo? Please provide details. *

- ☐ Lacking of support necessary function for business needs
- ☐ Hard to utilize
- ☐ Bad customer communication
- ☐ Improper workflow
- ☐ Poor efficiency for remote work
- ☐ Other: _____

How frequently have you **encountered issues or inefficiencies** in the Uniqlo system in the **past 6 months**? *

- ○ Multiple times a week
- ○ Once a week
- ○ A few times a month
- ○ Rarely
- ○ Never

How **effectively** does the **current CRM system handle** customer interactions and inquiries? *

	1	2	3	4	5	
Very satisfied	○	○	○	○	○	Very dissatisfied

Have you experienced any **difficulties with data entry or data accuracy** in the current CRM system? Please elaborate if applicable *

- [ ] Data quality issues (such as duplicate, inaccurate, and inconsistent data)
- [ ] Data format issues
- [ ] Data is not up-to-date
- [ ] Other: _____

Next Clear form

Section 2: Requirements of Proposed CRM System

This section gathers data regarding the functions or features that users prefer in the new system.

How important are the following **features** for the proposed CRM system?
Please rate each on a scale of 1 to 5, with 1 being "Not important" and 5 being "Very important."

User-friendly interface and **ease of use** *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Seamless integration with **other systems** (e.g., inventory management, point-of-sale) *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Robust **customer data management** and **tracking capabilities** *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Advanced **reporting and analytics** for **decision-making** *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Efficient lead and **opportunity management** *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Effective **customer service and support** features *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Comprehensive **customer profile and history management** *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Automation of **routine tasks** and **workflows** *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Integration with communication channels (e.g., email, phone) *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Mobile accessibility and support *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Security measures to protect customer data and privacy *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Scalability to accommodate future growth *

	1	2	3	4	5	
Very Importance	○	○	○	○	○	Not Importance

Are there any **additional requirements or specific functionalities** you would like to see in the proposed CRM system? Please provide details.

- ○ No
- ○ Other: _____

Back Next Clear form

Section 3: Demographic

Please provide the requested information about yourself.

What is your **employment status** within Uniqlo? *

- ◯ Employee full-time
- ◯ Employee part-time
- ◯ Freelance/contract employee

What is your **role or position** within Uniqlo? *

- ◯ Employee
- ◯ Manager/Supervisor
- ◯ Executive/Leadership
- ◯ Other: _____

How **long** have you been with Uniqlo? *

- ◯ Less that 1 year
- ◯ 1-3 years
- ◯ 3-5 years
- ◯ 5-10 years
- ◯ More than 10 years

What is your **age group**? *

- ◯ Under 25
- ◯ 25-34
- ◯ 34-44
- ◯ 45-54
- ◯ 55 or above

Thank you for taking the time to complete this questionnaire.
Your feedback will help us better understand the issues with the current CRM system at Uniqlo and gather requirements for the proposed system to meet the organization's needs.

Back Submit Clear form

1.3 Problems of the existing system.

1.3.1 Problems of the existing system 1: Data Silos and Inefficient Communication

Uniqlo is a huge organization which consists of different departments such as marketing, sales purchasing and customer support. These three departments are the departments that are in charge of handling customer data. However, they are handling it independently as different systems or databases have been used. Data silos occurred due to lack of integration which means the departments cannot share the customer information, this will probably lead to isolated information.

As a result, difficulty in accessing a holistic view of customers' interactions and preferences will occur. Lack of communication between departments will cause redundancy in customers' interactions. Users will undergo frustration as they have to give the same response to different representatives. Thus, lack of cohesion and customer-centricity will be shown. Customer loyalty and retention will be affected as seamless experiences are essential for a system.

An example for data silos is the support team has resolved the issue on late shipment of the purchase item but the sales team is unaware and does not take any action. Besides, promoting the same products to the same customer is one example. It is caused by lack of communication between the sales department and marketing departments.

1.3.2 Problems of the existing system 2: Lack of Personalization

In today's retail environment, personalization is critical for increasing client engagement and loyalty. When a CRM system fails to use client data for tailored marketing, it might result in generic and irrelevant communication, lowering customer satisfaction and retention.

Customers are more prone to disregard generic marketing tactics, resulting in lower engagement and conversion rates. Furthermore, buyers may regard Uniqlo as unconcerned about their demands and preferences, reducing brand loyalty. Personalized marketing initiatives, on the other hand, can result in increased consumer engagement, satisfaction, and retention.

For example, a frequent Uniqlo online shopper is interested in men's activewear but receives emails on women's apparel or irrelevant products on a regular basis. The absence of personalisation gives the client the impression that Uniqlo does not understand their preferences, which may lead to lower engagement and a lower possibility of making a purchase.

1.3.3 Problems of the existing system 3: Ineffective Customer Segmentation

Effective customer segmentation enables merchants to adapt marketing messages and offers to specific groups of customers. If Uniqlo's CRM system does not appropriately classify customers based on a variety of characteristics, the firm may miss out on opportunities to effectively communicate with specific customer categories.

Customers are more prone to disregard generic marketing tactics, resulting in lower engagement and conversion rates. Furthermore, buyers may regard Uniqlo as unconcerned about their demands and preferences, reducing brand loyalty. Personalized marketing initiatives, on the other hand, can result in increased consumer engagement, satisfaction, and retention.

For instance, Uniqlo sends advertising emails to clients who do not have children, offering discounts on children's apparel. This lack of adequate segmentation not only costs money, but also annoys and disinterests customers in future interactions.

1.3.4 Problems of the existing system 4: Limited Multichannel Integration

Customers connect with brands across several channels in today's omnichannel retail environment, including websites, mobile apps, physical stores, and social media. Customers may have uneven experiences if Uniqlo's CRM system does not integrate various channels seamlessly.

Inconsistent experiences might cause customer annoyance and misunderstanding. When a customer switches between the website and the mobile app, for example, he or she may see various prices for the same item. Such inconsistencies diminish confidence and trustworthiness, and customers may leave their purchases or opt not to buy with Uniqlo again. A well-integrated multichannel strategy fosters a consistent brand image and increases client trust.

To give you an idea, a consumer adds things to their online shopping cart on Uniqlo's website but is unable to access the same cart items when logging in to the mobile app later. The disconnected experience can generate customer aggravation and prompt them to leave their purchase.

1.3.5 Problems of the existing system 5: Insufficient Customer Support and Responsiveness

Customer satisfaction and retention depend on prompt and effective customer service. If Uniqlo's CRM system does not allow for efficient customer service and fast responses to enquiries or complaints, it may result in disgruntled customers and harm the brand's reputation.

Slow or insufficient customer service can degrade Uniqlo's reputation and harm the brand's image. Customers that receive poor customer service are more inclined to move to competitors who emphasise their requirements and deliver superior service. In contrast, responsive and excellent customer service may convert dissatisfied consumers into loyal advocates, increasing brand perception and creating long-term partnerships.

To illustrate, a consumer writes a support ticket via the Uniqlo website, requesting assistance with faulty merchandise. However, days go by without a response from the support service, leaving the consumer feeling ignored and dissatisfied. This lack of responsiveness may not only destroy the customer's trust, but may also hinder future purchases.

1.4 Software Quality Attributes of the Project

1.4.1 Software Quality Attributes 1: Usability

Usability refers to the simplicity and effectiveness with which users can navigate regarding, execute activities, and achieve their goals inside a CRM system. The following are some critical usability aspects for a CRM system:

Design of the User Interface (UI)

The new proposed system should be visually appealing, organised, and consistent while representing Uniqlo's brand identity and values. It should provide a simple and clear menu, unambiguous iconography, and reliable layout grids that carry users effortlessly across the Uniqlo CRM. Make sure that the CRM functions effectively on a variety of platforms and screen sizes, including computers, tablets, and smartphones. An alert information architecture ensures that product categories, filters, and search options are constantly available, which makes it easy for customers to browse and discover what they're looking for.

Navigation

The CRM system should have a navigation hierarchy that makes the online shop easy to navigate for users. Customers should have no problem discovering what they're searching for owing to well-organised major categories, subcategories, and filtering. The breadcrumbs and clickable links give orientation and make it easy for users to navigate back home.

Feedback Mechanisms

The new CRM system should include user feedback tools such as ratings, reviews, and surveys that allow customers to provide comments and suggestions on how the online store is improved. The CRM system should provide simple ways for users to communicate their opinions and experiences in order to establish a sense of involvement and community.

1.4.2 Software Quality Attributes 2: Reliability

Reliability is a vital component of software quality that ensures the CRM system's dependable and ongoing operation. Reliability is an essential for Uniqlo's online store to give customers a seamless and secure purchasing experience.

Uniqlo's CRM system must operate with minimal downtime and disturbance. Customers should be able to access the online shop, make purchases, and connect with customer service professionals without encountering system faults or malfunctions on a consistent basis.

Fault Tolerance

It is important to keep fault tolerance in mind when creating the CRM system. For example, the system should allow for redundancy and failover solutions. To reduce downtime in the event of a server or component failure, the software should spread out the deployment of several servers and databases over multiple physical locations. Besides, Use load balancers to equally distribute traffic and avoid overtaxing any one server.

Automated Recovery and Tracking

A reliable CRM software should establish continuous monitoring tools that keep monitoring the CRM’s system functionality and condition in real time. It needs to create automated alerts that will send notifications to the administration when issues are detected, which can enable a quicker intervention in regular operations. Additionally, these scripts may automatically resolve frequent problems without the need for human participation. Therefore, it can reduce the need for humans to constantly keep track of system errors and facilitate recovery.

Data Replication and Backups

The reliability and data integrity of Uniqlo's CRM system are guaranteed through data replication and backups. In order to provide smooth failover and reduce data loss in the event of primary database failures, the system should provide real-time data replication that keeps synchronised copies of the primary database at the backup site. Redundant backups include making several copies of data kept in different physical or geographic locations to help guard against hardware failures, data corruption, and cyberattacks. The recent data may be restored because of planned backup frequency and retention settings, and periodic testing and validation of backups confirms their usefulness. Furthermore, the software can include offsite or cloud-based backup storage, which can enhance backup dependability, while point-in-time recovery features enable data restoration to certain historical moments.

1.4.3 Software Quality Attributes 3: Flexibility

Modular System Enhancement

By employing a modular system enhancement technique, Uniqlo is able to concentrate on resolving particular issues without having to disturb the entire system, allowing for focused enhancements to crucial functionalities. For instance, if the system checkout process is failing, a modular approach would let the team concentrate on improving and testing that single module while leaving other aspects alone. This might save the system time and effort, which allows the Uniqlo company to put that extra effort into expanding into other areas.

Cross-Platform Flexibility

The new Uniqlo CRM system should allow for cross platform compatibility. There are many categories of users that surf the Uniqlo website with different types of devices ranging from mobile to desktop PCs. With different platforms available, customers do not need to worry about using which specific device to access the system.

1.4.4 Software Quality Attributes 4: Functionality

Correctness

The new proposed system should produce accurate and valid results. It should be able to handle user input correctly and produce the expected result. The system also must be accurate and precise in performing its function such as handling user input correctly, behaving as expected under different scenarios.

Completeness

The new proposed system should provide all the necessary functions and features required to enable the system to accomplish their intended tasks respectively. The system should not lack any critical functions or features so that the system can handle a variety of unexpected scenarios and fulfil user requirements.

Performance

The new proposal system should be able to respond quickly toward user requests and fulfil its intended functions effectively. It should have minimal delays, optimal resource utilisation etc. The system should also have the ability to handle extra user loads or workloads without causing delay.

1.4.5 Software Quality Attributes 5: Security

Security refers to a system that protects the data and information of the company from unauthorised access users to prevent any important data or information lost. The system should only allow authorised users to access the company's database. The following are some critical security aspects for a CRM system:

Confidentiality

Uniqlo's security system ensures that any sensitive information of its company is protected and is kept secret and can only be accessed by authorized users or individuals who have a legitimate need to know. It also involves the protection of private data or information to prevent unauthorised access.

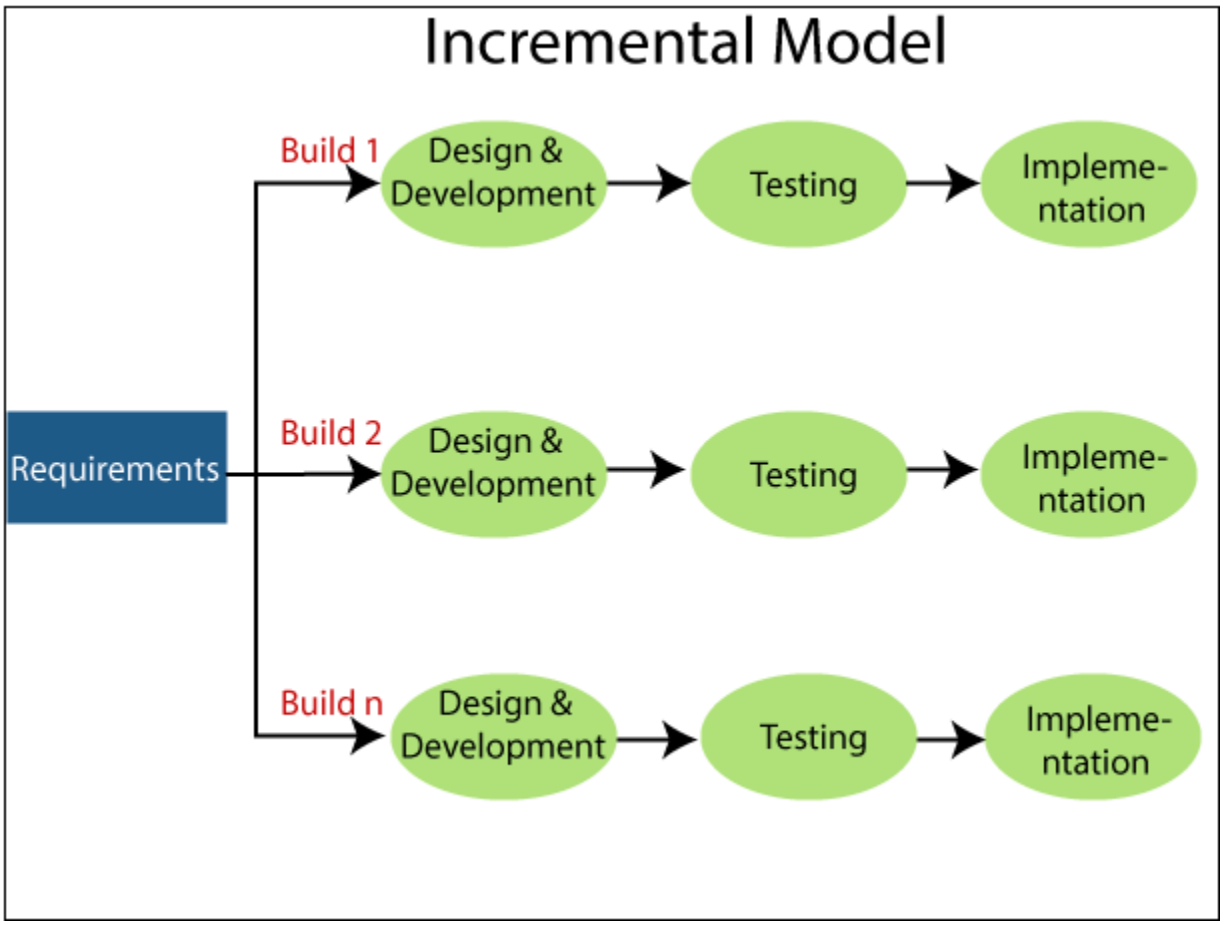
Authorization

Uniqlo's security system only allows permissions to individuals or users to access certain resources or perform specific tasks. It involves the identification of users or individuals followed by the roles assignment. For instance, the details of daily sales reports can only be seen by the manager because the system has authorised it to be seen by the manager only.

Authentication

The new proposed system should be able to verify the identity or information of users to ensure that only authorised users or individuals can access the system. It involves confirming that the registered user's identity is the same as the company database and matching the information such as username, password, email, etc. This function helps to protect against unauthorised user access.

1.5 Software process model



Incremental Process Model is a software process model where the requirements are divided into independent modules of the software development cycle. It is based on the features of adding new increments to a current system without the need to build a new system from the start.The new subsequent modules are built upon the previous module with new functions, and this process will keep repeating until a final version of the software is produced. Normally, this software process model is suitable to build for large and complex systems.

There are 4 stages in the Incremental Process Model which are requirements, design, implementation and testing. Each module will go through the 4 phases until it is completed.

1.5.1 4 Stages in Incremental Model

1.5.1.1 Requirements

The product analysis expertise identifies the needs in the first step of the incremental model. The requirement analysis team also understands the system functional requirements. This phase is critical in the incremental paradigm of software development.

1.5.1.2 Design

The design of the system functionality and the development approach are completed successfully at this phase of the SDLC Incremental model. The incremental model employs a style and development phase when new functionality is added to software.

1.5.1.3 Implementation

The implementation step permits the development system's coding phase. It includes the final coding that is designed during the designing and developing phase and tested during the testing phase. Following the completion of this phase, the number of working products is increased and updated all the way to the final system product.

1.5.1.4 Testing

The testing phase in the incremental model evaluates the performance of each current function as well as added capabilities. Various approaches are utilised to test the behaviour of each task throughout the testing phase.

1.5.1 Advantages

The incremental method allows for the incorporation of evolving requirements in consecutive increments. It is easier to control risk since dangerous components are detected and dealt with throughout the iteration process. During a reduced literature, this modal is also easier to test and debug.

This software paradigm provides a lot of flexibility in that the system may be customised to the client and permits modules to be independent and change the requirement during iterations.his system has changing requirements throughout the development process.

Some of the hardware required to build this system should be sent or acquired from an overseas source, and some of the group members' organisations have not been vacant during the early stages of development.

1.5.2 Justification

For our software organisation, it is still in the analysis stage and has many unconfirmed aspects that have not been finalised by our customer. Therefore, We must adopt this incremental model, which allows the project to be divided into smaller modules or increments that may be created and delivered separately. The project team can fulfil the client's marketing timetable and give early value by focusing on providing functional increments.

Overall, an incremental development paradigm is a more adaptable, collaborative, and flexible approach to system development. It enables organisations to offer value sooner and continuously develop the system in response to feedback and changing requirements, resulting in a successful and customer-centric end product. However, the development model must be chosen depending on the needs, complexity, and requirements of the given project.

2.0 Part 2

2.1 Project Planning Schedule

The project planning schedule will be divided into **7 stages**. The **first stage** is conducting **background research** on the company and obtaining **requirement information**. It involves active collection. Documenting and analysing requirements from the client while also understanding the organisation's needs. The project team conducts interviews, design questionnaire surveys, and carry out questionnaire distribution.

The **second stage** is **requirement analysis.** Requirement analysis refering the gathering phase aims to improve and arrange the asic need into detailed and executable specification. It analysed the present system's problem, defined the proposed system's objectives, and suggested a solution for the new system.

The **third stage** is the **first incremental** model for the **customer support model**. The first phase in the project planning schedule for this increment is design, which includes conceptual design and user flow diagrams. Following that is software development, which includes coding features like live chat, feedback forms, Q&A capabilities, and email functionality. Following that, we cure problems in the bug-fixing phase and conduct testing, including unit testing, integration testing, and module testing, to ensure that the Customer Support Module in the initial increment is well-structured and tested.

For the **fourth stage** of the incremental model which is the **second incremental product and order module**, the first step in the project planning process is design, which includes conceptual design, user flow diagrams, and prototype. Throughout the software development phase, we will focus on building services such as displaying products, adding things to the basket, tracking orders, and writing evaluations. We'll take care of any issues in the bug-fixing phase, and the testing phase, which comprises unit testing, integration testing, and module testing, will ensure functionality. The purpose of this initial increment is to build a powerful Product & Order Module for easy product browsing, ordering, and tracking.

For the **fifth stage** is the **third incremental payment module**. In this third phase, it will conceptually define, user-flow map, and prototype the Payment Module. Then, key functionality such as payment processing, payment history viewing, and payment method switching will be made available. We'll address any issues and thoroughly test the module using unit, integration, and module testing during the Bug Fixing stage. The goal is to provide a reliable payment module for efficient payment administration and processing.

For the **sixth stage** is the **fourth increment** which is the **sales module**. During the first part of this project, the Sales Module is being created and developed. Throughout the design process, this encompasses user flow diagrams, conceptual design, and prototypes. Throughout the software development process, we will create functionality for sales forecasting and creating

sales reports. Following development, there will be a bug fixing stage to address any issues. Finally, during the Testing phase, we will do unit testing, integration testing, and module testing to guarantee the operation and stability of the Sales Module. The goal is to create a well-organised reporting and sales forecasting module.

In the **last stage** of the project, which is the **deployment stage**, we will do System Testing to ensure that everything works properly, followed by Performance Stress and Reliability Tests. After that, we'll switch to Maintenance and Support to continue taking care of the system while we finish the documentation. A Final Review will analyse the project's progress and identify any areas for improvement as the project draws to an end with a fully tested, supported system and thorough documentation.

2.1.1 Gantt Chart

Overview Gantt Chart

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	JULY				AUGUST				SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER			
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Organization Background & Requirement Gathering	**14 days**	**1/7/2023**	**14/7/2023**																								
	- Organisation Background Research	5 days	1/7/2023	5/7/2023																								
	- Interview	3 days	6/7/2023	8/7/2023																								
	- Design Questionnaire	2 days	9/7/2023	10/7/2023																								
1	- Questionnaire Distribution	4 days	11/7/2023	14/7/2023																								
	Requirement Analysis	**13 days**	**15/7/2023**	**25/7/2023**																								
	- Problem Statement Analysis	3 days	15/7/2023	17/7/2023																								
	- Define Proposed System Objectives	3 days	17/7/2023	19/7/2023																								
2	- Proposed Solution	7 days	19/7/2023	25/7/2023																								
	First Increment	**25 days**	**22/7/2023**	**18/8/2023**																								
	- Design	8 days	22/7/2023	1/8/2023																								
	- Software Development (User Management Module)	11 days	2/8/2023	12/8/2023																								
3	- Testing (User Management Module)	6 days	13/8/2023	18/8/2023																								
	Second Increment	**25 days**	**15/8/2023**	**11/9/2023**																								
	- Design	8 days	15/8/2023	22/8/2023																								
	- Software Development (Product & Order Module)	11 days	23/8/2023	5/9/2023																								
4	- Testing (Product & Order Module)	6 days	6/9/2023	11/9/2023																								
	Third Increment	**25 days**	**8/9/2023**	**4/10/2023**																								
	- Design	8 days	8/9/2023	15/9/2023																								
	- Software Development (Payment Module)	11 days	16/9/2023	26/9/203																								
5	- Testing (Payment Module)	6 days	27/9/2023	4/10/2023																								
	Fourth Increment	**25 days**	**5/10/2023**	**29/10/2023**																								
	- Design	8 days	5/10/2023	12/10/2023																								
	- Software Development (Sales Module)	11 days	13/10/2023	23/10/2023																								
6	- Testing (Sales Module)	6 days	24/10/2023	29/10/2023																								
	Fifth Increment	**25 days**	**25/10/2023**	**18/11/2023**																								
	- Design	8 days	25/10/2023	1/11/2023																								
	- Software Development (Customer Module)	11 days	2/11/2023	12/11/2023																								
7	- Testing (Customer Support Module)	6 days	13/11/2023	18/11/2023																								
	Deployment	**15 days**	**22/11/2023**	**9/12/2023**																								
	- System Testing	3 days	22/11/2023	24/11/2023																								
	- Performance Stress Test	3 days	25/11/2023	27/11/2023																								
	- Relibility Test	3 days	25/11/2023	27/11/2023																								
	- Maintenance and Support	4 days	1/12/2023	4/12/2023																								
	- Documentation	2 days	5/12/2023	6/12/2023																								
8	- Final Review	3 days	7/12/2023	9/12/2023																								

Organisation Background & Requirement Gathering

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	JULY WEEK 1							JULY WEEK 2						
	DATE				1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Organisation Background Research	5 days	1/7/2023	5/7/2023														
2	Interview	3 days	6/7/2023	8/7/2023														
3	Design Questionnaire	2 days	9/7/2023	10/7/2023														
4	Questionnaire Distribution	4 days	11/7/2023	14/7/2023														

Requirement Analysis

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	JULY WEEK 3							JULY WEEK 4						
					15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	Problem Statement Analysis	3 days	15/7/2023	17/7/2023														
2	Define Proposed System Objectives	3 days	17/7/2023	19/7/2023														
3	Proposed Solution	7 days	19/7/2023	25/7/2023														

First Increment (User Management Module)

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	JULY WEEK 4							AUGUST WEEK 1							AUGUST WEEK 2							AUGUST WEEK 3						
					22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Design	**8 days**	**22/7/2023**	**1/8/2023**																											
	- Conceptual Design	2 days	22/7/2023	23/7/2023																											
	- User Flow Diagrams	3 days	24/7/2023	26/7/2023																											
1	- Prototyping	3 days	27/7/2023	1/8/2023																											
	Software Development (User Mangement Module)	**11 days**	**2/8/2023**	**12/8/2023**																											
	- Coding	**8 days**	**2/8/2023**	**9/8/2023**																											
	- Create account function	8 days	2/8/2023	9/8/2023																											
	- Login function	8 days	2/8/2023	9/8/2023																											
2	- Bug fixing	3 days	10/8/2023	12/8/2023																											
	Testing (User Management Module)	**6 days**	**13/8/2023**	**18/8/2023**																											
	- Unit Testing	2 days	13/8/2023	14/8/2023																											
	- Integration Testing	2 days	15/8/2023	16/8/2023																											
3	- Module Testing	2 days	17/8/2023	18/8/2023																											

Second Increment (Product & Order Module)

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	AUGUST - WEEK 3							AUGUST - WEEK 4							SEPTEMBER - WEEK 1							SEPTEMBER - WEEK 2						
					15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Design	**8 days**	**15/8/2023**	**22/8/2023**																											
	- Conceptual Design	2 days	15/8/2023	16/8/2023																											
	- User Flow Diagrams	3 days	17/8/2023	19/8/2023																											
1	- Prototyping	3 days	20/8/2023	22/8/2023																											
	Software Development (Product & Order Module)	**11 days**	**23/8/2023**	**5/9/2023**																											
	- Coding	**8 days**	**23/8/2023**	**2/9/2023**																											
	- View product function	8 days	23/8/2023	2/9/2023																											
	- Add to cart function	8 days	23/8/2023	2/9/2023																											
	- Track order function	8 days	23/8/2023	2/9/2023																											
	- Review function	8 days	23/8/2023	2/9/2023																											
2	- Bug fixing	3 days	3/9/2023	5/9/2023																											
	Testing (Product & Order Module)	**6 days**	**6/9/2023**	**11/9/2023**																											
	- Unit Testing	2 days	6/9/2023	7/9/2023																											
	- Integration testing	2 days	8/9/2023	9/9/2023																											
3	- Module testing	2 days	10/9/2023	11/9/2023																											

Third Increment (Payment Module)

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	SEPTEMBER - WEEK 2							SEPTEMBER - WEEK 3							SEPTEMBER - WEEK 4							OCTOBER - WEEK 1						
					8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7
	Design	**8 days**	**8/9/2023**	**15/9/2023**																											
	- Conceptual Design	2 days	8/9/2023	9/9/2023																											
	- User Flow Diagrams	3 days	10/9/2023	12/9/2023																											
1	- Prototyping	3 days	13/9/2023	15/9/2023																											
	Software Development (Payment Module)	**11 days**	**16/9/2023**	**26/9/203**																											
	- Coding	**8 days**	**16/9/2023**	**23/9/2023**																											
	- Make payment function	8 days	16/9/2023	23/9/2023																											
	- View payment history function	8 days	16/9/2023	23/9/2023																											
	- Change payment method function	8 days	16/9/2023	23/9/2023																											
2	- Bug fixing	3 days	24/9/2023	26/9/2023																											
	Testing (Payment Module)	**6 days**	**27/9/2023**	**4/10/2023**																											
	- Unit Testing	2 days	27/9/2023	28/9/2023																											
	- Integration testing	2 days	1/9/2023	2/9/2023																											
3	- Module testing	2 days	3/9/2023	4/9/2023																											

Fourth Increment (Sales Module)

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	OCTOBER - WEEK 1							OCTOBER - WEEK 2							OCTOBER - WEEK 3							OCTOBER - WEEK 4							OCTOBER - WEEK 4						
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
	Design	**8 days**	**5/10/2023**	**12/10/2023**																																			
	- Conceptual Design	2 days	5/10/2023	6/10/2023																																			
	- User Flow Diagrams	3 days	7/10/2023	9/10/2023																																			
1	- Prototyping	3 days	10/10/2023	12/10/2023																																			
	Software Development (Sales Module)	**11 days**	**13/10/2023**	**23/10/2023**																																			
	- Coding	**8 days**	**13/10/2023**	**20/10/2023**																																			
	- Sales forecasting function	8 days	13/10/2023	13/10/2023																																			
	- Generate sales report function	8 days	13/10/2023	13/10/2023																																			
2	- Bug fixing	3 days	21/10/2023	23/10/2023																																			
	Testing (Sales Module)	**6 days**	**24/10/2023**	**29/10/2023**																																			
	- Unit Testing	2 days	24/10/2023	25/10/2023																																			
	- Integration testing	2 days	26/10/2023	27/10/2023																																			
3	- Module testing	2 days	28/10/2023	29/10/2023																																			

Fifth Increment (Customer Support Module)

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	OCTOBER - WEEK 4							NOVEMBER - WEEK 1							NOVEMBER - WEEK 2							NOVEMBER - WEEK 3						
					25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Design	**8 days**	**25/10/2023**	**1/11/2023**																											
	- Conceptual Design	2 days	25/10/2023	26/10/2023																											
	- User Flow Diagrams	3 days	27/10/2023	29/10/2023																											
1	- Prototyping	3 days	30/10/2023	1/11/2023																											
	Software Development (Customer Support Module)	**11 days**	**2/11/2023**	**12/11/2023**																											
	- Coding	**8 days**	**2/11/2023**	**9/11/2023**																											
	- Live chat function	8 days	2/11/2023	9/11/2023																											
	- Feedback form function	8 days	2/11/2023	9/11/2023																											
	- Q&A function	8 days	2/11/2023	9/11/2023																											
	- Email function	8 days	2/11/2023	9/11/2023																											
2	- Bug fixing	3 days	10/11/2023	12/11/2023																											
	Testing (Customer Support Module)	**6 days**	**13/11/2023**	**18/11/2023**																											
	- Unit Testing	2 days	13/11/2023	14/11/2023																											
	- Integration testing	2 days	15/11/2023	16/11/2023																											
3	- Module testing	2 days	17/11/2023	18/11/2023																											

Deployment

TASK	TASK DESCRIPTION	Duration	Start Date	End Date	NOVEMBER - WEEK 4							DECEMBER - WEEK 1							DECMBER - WEEK 2						
					22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	System Testing	3 days	22/11/2023	24/11/2023																					
2	Performance Stress Test	3 days	25/11/2023	27/11/2023																					
3	Relibility Test	3 days	25/11/2023	27/11/2023																					
4	Maintenance and Support	4 days	1/12/2023	4/12/2023																					
5	Documentation	2 days	5/12/2023	6/12/2023																					
6	Final Review	3 days	7/12/2023	9/12/2023																					

2.1.2 Task Allocation List

Organisation Background Research & Requirements Gathering

Task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
Organisation Background Research	2	Tang Tzu Li, Leong Yuen Theng	1/7/2023	5/7/2023	5
Interview	3	Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	6/7/2023	8/7/2023	3
Design Questionnaire	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	9/7/2023	10/7/2023	2
Questionnaire Distribution	2	Joshua Chew Chun Thoe, Heah Khang Wei	11/7/2023	14/7/2023	4

Requirement Analysis

Task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
Problem Statement Analysis	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	15/7/2023	17/7/2023	3
Define Proposed System Objectives	2	Tang Tzu Li, Leong Yuen Theng	17/7/2023	19/7/2023	3
Proposed Solution	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	19/7/2023	25/7/2023	7

First Increment (User Management Module)

Task Name	Sub-task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
Design	Conceptual Design	2	Tang Tzu Li, Joshua Chew Chun Thoe	22/7/2023	23/7/2023	2
	User Flow Diagram	3	Leong Yuen Theng, Eugene Yong Wei Jie, Heah Khang Wei	24/7/2023	26/7/2023	3
	Prototyping	2	Tang Tzu Li, Leong Yuen Theng	27/7/2023	1/8/2023	3
Software Development (Customer Support Module)	Create account function	1	Tang Tzu Li	2/8/2023	9/8/2023	8
	Login function	1	Leong Yuen Theng	2/8/2023	9/8/2023	8
	Bug Fixing	1	Heah Khang Wei	10/8/2023	12/8/2023	3
Testing (Customer Support Module)	Unit Testing	2	Tang Tzu Li, Leong Yuen Theng	13/8/2023	14/8/2023	2
	Integration Testing	2	Joshua Chew Chun Thoe, Eugene Yong Wei Jie	15/8/2023	16/8/2023	2
	Module Testing	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	17/8/2023	18/8/2023	2

Second Increment (Product & Order Module)

Task Name	Sub-task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
Design	Conceptual Design	2	Tang Tzu Li, leong Yuen Theng	15/8/2023	16/8/2023	2
	User Flow Diagram	2	Joshua Chew Chun Thoe, Heah Khang Wei	17/8/2023	19/8/2023	3
	Prototyping	2	Eugene Yong Wei Jie, Tang Tzu Li	20/8/2023	22/8/2023	3
Software Development (Product & Order Module)	View product function	1	Tang Tzu Li	23/8/2023	2/9/2023	8
	Add to cart function	1	Leong Yuen Theng	23/8/2023	2/9/2023	8
	Track order function	1	Heah Khang Wei	23/8/2023	2/9/2023	8
	Review function	1	Eugene Yong Wei Jie	23/8/2023	2/9/2023	8
	Bug Fixing	1	Joshua Chew Chun Thoe	3/9/2023	5/9/2023	3
Testing (Product & Order Module)	Unit Testing	2	Heah Khang Wei, Joshua Chew Chun Thoe	6/9/2023	7/9/2023	2
	Integration Testing	2	Tang Tzu Li, Leong Yuen Theng	8/9/2023	9/9/2023	2
	Module Testing	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	10/9/2023	11/9/2023	2

Third Increment (Payment Module)

Task Name	Sub-task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
Design	Conceptual Design	2	Heah Khang Wei, Eugene Yong Wei Jie	8/9/2023	9/9/2023	2
	User Flow Diagram	2	Joshua Chew Chun Thoe, Leong Yuen Theng	10/9/2023	12/9/2023	3
	Prototyping	2	Tang Tzu Li, Leong Yuen Theng	13/9/2023	15/9/2023	3
Software Development (Payment Module)	Make payment function	1	Joshua Chew Chun Thoe	16/9/2023	23/9/2023	8
	View payment history function	1	Eugene Yong Wei Jie	16/9/2023	23/9/2023	8
	Change payment method function	1	Heah Khang Wei	16/9/2023	23/9/2023	8
	Bug Fixing	2	Tang Tzu Li, Leong Yuen Theng	24/9/2023	26/9/2023	3
Testing (Payment Module)	Unit Testing	2	Joshua Chew Chun Thoe, Eugene Yong Wei Jie	27/9/2023	28/9/2023	2
	Integration Testing	2	Tang Tzu Li, Leong Yuen Theng	1/10/2023	2/10/2023	2
	Module Testing	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	3/10/2023	4/10/2023	2

Fourth Increment (Sales Module)

Task Name	Sub-task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
Design	Conceptual Design	2	Heah Khang Wei, Eugene Yong Wei Jie	5/10/2023	6/10/2023	2
	User Flow Diagram	2	Joshua Chew Chun Thoe, Tang Tzu Li	7/10/2023	9/10/2023	3
	Prototyping	2	Leong Yuen Theng, Heah Khang Wei	10/10/2023	12/10/2023	3
Software Development (Sales Module)	Sales forecasting function	2	Tang Tzu Li, Eugene Yong Wei Jie	13/10/2023	20/10/203	8
	Generate sales report function	2	Joshua Chew Chun Thoe, Heah Khang Wei	13/10/2023	20/10/203	8
	Bug Fixing	1	Leong Yuen Theng	21/10/2023	23/10/2023	3
Testing (Sales Module)	Unit Testing	2	Tang Tzu Li, Leong Yuen Theng	24/10/2023	25/10/2023	2
	Integration Testing	3	Joshua Chew Chun Thoe, Heah Khang Wei, Eugene Yong Wei Jie	26/10/2023	27/10/2023	2
	Module Testing	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	28/10/2023	29/10/2023	2

Fifth Increment (Customer Support Module)

Task Name	Sub-task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
Design	Conceptual Design	2	Tang Tzu Li, Joshua Chew Chun Thoe	25/10/2023	26/10/2023	2
	User Flow Diagram	3	Leong Yuen Theng, Eugene Yong Wei Jie, Heah Khang Wei	27/10/2023	29/10/2023	3
	Prototyping	2	Tang Tzu Li, Leong Yuen Theng	30/10/2023	1/11/2023	3
Software Development (Customer Support Module)	Live chat function	1	Tang Tzu Li	2/11/2023	9/11/2023	8
	Feedback function	1	Leong Yuen Theng	2/11/2023	9/11/2023	8
	Q&A function	1	Joshua Chew Chun Thoe	2/11/2023	9/11/2023	8
	Email function	1	Eugene Yong Wei Jie	2/11/2023	9/11/2023	8
	Bug Fixing	2	Heah Khang Wei, Joshua Chew Chun Thoe	10/11/2023	12/11/2023	3
Testing (Customer Support Module)	Unit Testing	2	Tang Tzu Li, Leong Yuen Theng	13/11/2023	14/11/2023	2
	Integration Testing	2	Joshua Chew Chun Thoe, Eugene Yong Wei Jie	15/11/2023	16/11/2023	2
	Module Testing	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	17/11/2023	18/11/2023	2

Deployment

Task Name	Predecessor	Person-In-Charge	Start Date	End Date	Duration (Days)
System Testing	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	22/11/2023	24/11/2023	3
Performance Stress Test	2	Tang Tzu Li, Leong Yuen Theng	25/11/2023	27/11/2023	3
Reliability Test	3	Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	25/11/2023	27/11/2023	3
Maintenance and Support	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	1/12/2023	4/12/2023	4
Documentation	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	5/12/2023	6/12/2023	2
Final Review	5	Tang Tzu Li, Leong Yuen Theng, Joshua Chew Chun Thoe, Eugene Yong Wei Jie, Heah Khang Wei	7/12/2023	9/12/2023	3

2.2 System Requirements

2.2.1 Functional Requirements

2.2.1.1 Functional Requirement 1: User Management Module

1.1	The system shall allow users to register as a new user of the system or sign in to an existing account.	
1.1.1	The system shall allow users to create a new account.	For example, users need to fill in their personal information such as email address, username and password to create a new account. The system will prompt a status message “Registered” if all the fields are filled in correctly.
1.1.2	The system shall allow users to login to their existing account.	For example, users enter their email address that had registered before and password to login. The system will prompt a status message ”Login Successfully” if the email address and password is valid.
1.1.3	The system shall allow users to create a new account via google account or Facebook account.	Users click on “Sign In with Google” or “Sign In with Facebook”, a new Uniqlo account that links to Google or Facebook accounts will be created.

2.2.1.2 Functional Requirement 2: Products & Order Module

1.2	The system shall allow users to browse and purchase the products.	
1.2.1	The system shall allow the users to view the product details and product availability.	For example, the system will prompt the product availability and check the product made in which country. The system also linked the information with the inventory to show the stock whether it was out of stock or not.
1.2.2	The system shall allow the users to add to the cart.	Make it short, the system shall allow the users to add their favourite products into the cart. This way allows the user to make payments faster.
1.2.3	The system shall allow the users to have real-time order tracking for their order.	For instance, the system shall allow the users to view the exact location of the parcel via the GPS.
1.2.4	The system shall allow the user to check and track the delivery status.	For example, the system must show the status to the user with updated status time by time such as “packed” which means the parcel is packed and ready to deliver. The status “courier pick up” means the courier picked up the parcel from the seller. Next, the status “Out for delivery” which means the courier is trying to distribute your parcel now. The status “Delivered” means the courier has distributed your parcel successfully.
1.2.5	The system shall allow the user to select the product that needs to be refunded and provide a reason.	For instance, the system shall prompt the selection to the user of the product that is desired to be refunded and provide a proper reason or comment that needs to be refunded for a particular product.
1.2.6	The system shall allow the user to agree to the refund and return policies within the app	The system shall check the user whether has to meet the policies or not before applying for a refund and returning a product.
1.2.7	The system shall send an email to users to update the refund status.	For example, the system shall update the status throughout the process. to the user.
1.2.8	The system shall finalise the result for a user.	For example, the system shall resolve the request by finalising the refund or replacement or rejecting it with clear reasons.

2.2.1.3 Functional Requirement 3: Payment Module

1.3	The system shall allow the user to make payment.	
1.3.1	The system shall allow the users to make payments by different methods.	To prove that, the system shall allow the users to make payments with many methods such as TNG E-Wallet, Online Banking, and Credit Card payment to make it more flexible.
1.3.2	The system shall allow the users to confirm payment.	After they have chosen their payment methods, the system shall prompt out a confirmation message to the users which allows the users to double check the payment details.
1.3.3	The system shall allow the users to cancel the payment.	When users make an unwanted payment, they can cancel payment within 5 minutes after they make the payment.
1.3.4	The system shall allow the users to download and print the receipt.	For example, the system shall allow the download of the receipt as a pdf file. Next, if the user wants to print the receipt they are also allowed to print it without downloading the receipt.
1.3.5	The system shall allow the users to view payment history.	Users can view back the payment they had made a few days ago or even a few months ago to track their expenses.

2.2.1.4 Functional Requirements 4: Sales Module

1.4	The system shall allow the users to forecast and analyse the sales.	
1.4.1	The system shall allow the users to view sales forecasting charts.	For example, users can forecast the sales by viewing the bar chart, pie chart or line chart shown by the system. Therefore, they can make changes on their marketing plan.
1.4.2	The system shall allow the users to analyse the sales.	For example, users can monitor and analyse the weekly and monthly sales through the summary report displayed by the system and come out with an efficient marketing plan.
1.4.3	The system shall allow users to generate the sales reports.	Users can generate and print out the sales reports that they want for viewing or referencing purposes through the system.

2.2.1.5 Functional Requirements 5: Customer Support Module

1.5	The system shall allow the users to interact with the seller through customer support.	
1.5.1	The system shall allow the users to fill in the feedback form.	Users can choose the issues they have faced via feedback form. A brief message can be written in the feedback form to illustrate the issues that are faced.
1.5.2	The system shall allow the users to send email to the customer service.	Instead of using feedback form, some users will prefer writing an email to the customer service or customer support to make a complaint about the problems they had faced when using the system.
1.5.3	The system shall allow the users to use live chat to communicate with customer support.	Users can have a real-time chat with the customer support regarding the issues they had faced or the questions that related to the system.
1.5.4	The system shall provide a hotline contact number to allow users to make phone calls.	For example, some users do not want to wait for the customer support to respond to their request. Phone call can help them to communicate with customer support in a faster way.

2.2.2 Non-Functional Requirements

2.2.2.1 Product Requirements

Usability

Usability refers to the simplicity and effectiveness with which users can navigate regarding, execute activities, and achieve their goals inside a CRM system. In terms of **design of user interface (UI)**, the system consists of a simple and clear menu that does not consume a lengthy learning curve of the users. Besides, **navigation** plays an important role in categorising the contents in the system, so that users can discover and look for the functions they want easily. **Feedback mechanisms** such as reviews, rating and surveys need to be provided as well. Through the feedback that is given by customers, the company can improve the system according to the users' requirements.

Reliability

Reliability is a vital component of software quality that ensures the CRM system's dependable and ongoing operation. A reliable system can give users a seamless and secure online shopping experience. In terms of **fault tolerance**, the system should allow for redundancy due to the internet connection and failure of the system. By spreading out the servers and databases, component failure can be reduced. Presence of load balancers can distribute traffic and avoid overtaxing any one server. **Continuous monitoring tools** that keep track of the CRM's system functionality and condition in real time should be implemented in the system to constantly keep track of the system errors and facilitate recovery. **Data replication and backups** are essential for the system. Real-time data replication provides smooth failover and reduces data loss in the event of primary database failure. While data backups help to restore the date if there is any occurrence of system breach or database corrupted.

Efficiency

The characteristics and functionality of a system or software program are referred to as its efficiency. In terms of **response time**, the system should have a lower response time to prevent system delays that will make the users frustrated when using the system. **Throughput** refers to a system's ability to process a specified number of operations or activities in a certain amount of time. A system that is effective should be able to handle a large number of operations without degrading performance. Efficiency also takes into account how effectively a system **utilises its resources**, such as CPU, memory, and network bandwidth. A well-designed system maximises resource consumption to reduce waste and assure smooth functioning.

Performance

Performance refers to a software system's or application's features and characteristics that correlate to the system's speed, responsiveness, and overall efficiency when carrying out its tasks. In terms of **load handling**, performance determines how effectively a system can manage varying degrees of load, ranging from routine usage to peak loads. Load testing is a typical technique for evaluating a system's performance under varied scenarios. **Latency** will affect system performance as well. Latency is a measurement of the lag or delay in the transfer of data or processing. Low latency is vital in online shopping systems to improve users' online shopping experience.

Space

Space usually refers to the properties and characteristics of a software system or program that are connected to the consumption and administration of storage space, both on the server or storage devices and on the client-side. In terms of **storage capacity**, the system should contain large storage capacity, so that more users' information can be stored without facing the problem of reaching the maximum storage capacity. **Data purging** is essential for the system too. Data purchasing refers to the clearing or deletion of data. This allows the system to free up space and have more space for new data by removing the unwanted data or data that have reached the end of its useful life.

2.2.2.2 Process / Organisation Requirements

Implementation requirement

Implementation requirement is one of the process / organisation requirements. The platform of the application should be a web-based application so that customers can purchase clothes on any device and customer support staff can use the system for sales forecasting and analysis anywhere and anytime with the presence of internet connection. Oracle database is used as the database server of this platform to store all the information of the system, especially the information of user accounts that register for the application. The system will develop the UI design with HTML and CSS to design the layout. The JavaScript will be executed to perform specific tasks or actions on a web page such as Event Handling, Data validation, animation, and effect which HTML and CSS.

Organisation's Standards

Besides, the organisation's standards need to be followed. The design of the software must fulfil the UI design standard. The buttons and labels must be scalable to allow them to fit into various types of devices based on the screen resolution. The background colour and font colour must be contrast so that users can view the content clearly and without any difficulty. The font size can be adjusted by the user whether smaller or bigger based on the user's preferences as this can make the application more user-friendly. The text and the navigation hyperlink instructions should be precise and clear to avoid users misunderstanding the procedure.

Application Layout

In terms of application layout, the system needs to be similar to the legacy system currently used in the Uniqlo app to reduce the learning curve of the end user when using the new system. Furthermore, tips and simple users' guidance can be provided to shorten the learning time of novice users.

Standard requirement

For standard requirements, the system needs to be developed according to ISO and IEEE standards as specified. For example, ISO 9001 is quality management where the system needs to be developed to meet company standards in quality products and services. The standard also places an emphasis on improvement of top management processes that extends throughout the whole company or organisation. Other than that, continuous evaluation and review is done to ensure that a strong management system is finally developed which helps organisation improvement.

Delivery Requirement

In terms of delivery requirements, the system that is developed must be delivered to the users along with a set of complete documentation. The documentation refers to a set of specific conditions and instructions that presents how a system is handed over to the intended users for usage purposes. It also helps to ensure that the quality standards are met, especially targeted users in suitable environments specifically made for them.

2.2.2.3 External Requirements

Safety

In terms of safety requirements, the system must install anti-malware apps and firewalls to block the hacker and unauthorised person to hack the data information. To enhance the security, users are required to create a strong password such as the password with the combination of uppercase, lowercase, special character and number, so that the outsiders or unauthorised users cannot access the account easily.

Backup of Data

The system must apply a secondary database storage for backup purposes for storing the user account information to prevent the data loss if the primary database has been corrupted or formatted. Backup of data should be carried out regularly. When there is an occurrence of security breach in the system, data can be restored from the secondary storage without any data loss.

Data Encryption

To prevent data leakage, data encryption plays an important role. When a customer enters an online shopping website and decides to make a purchase or submit personal information, the web server uses Secure Socket Layer (SSL) or Transport Layer Security (TLS) to establish a secure connection. Within the SSL/TLS framework, data encryption algorithms are used to encode sensitive information such as users' personal information.

Privacy and Confidential

User information must be kept private and secret, and it must not be disclosed to any third party. In such instances, business owners are legally required to keep user information confidential and not release it without the necessary permits or legal grounds. Failure to comply with these regulations can have serious legal and financial ramifications for the company.

Interoperability

Interoperability involves the exchange and sharing of information, data or services between different systems or components. It often relies on adhering to common interfaces and protocols that enable data exchange between systems. For example, using standardised web protocols like HTTP allows different applications to interact effectively.

Ethical

Ethics play a crucial role in ensuring that the organisation's actions and behaviours align with societal expectations and promote responsible and fair practices. Ethics of the online shopping

system (Uniqlo) is critical for establishing trust, retaining client loyalty, and ensuring that the firm runs in a socially responsible and sustainable manner. Adherence to ethical values helps to the online shopping platform's long-term profitability and reputation. For instance, the system should make pricing, taxes, shipping expenses, and return procedures clear. Avoid hidden fees and deceptive advertising. By providing accurate product descriptions and photographs, deception can be avoided. Products' price reasonably and competitively. During instances of great demand, price gouging or unethical pricing tactics should be prevented.

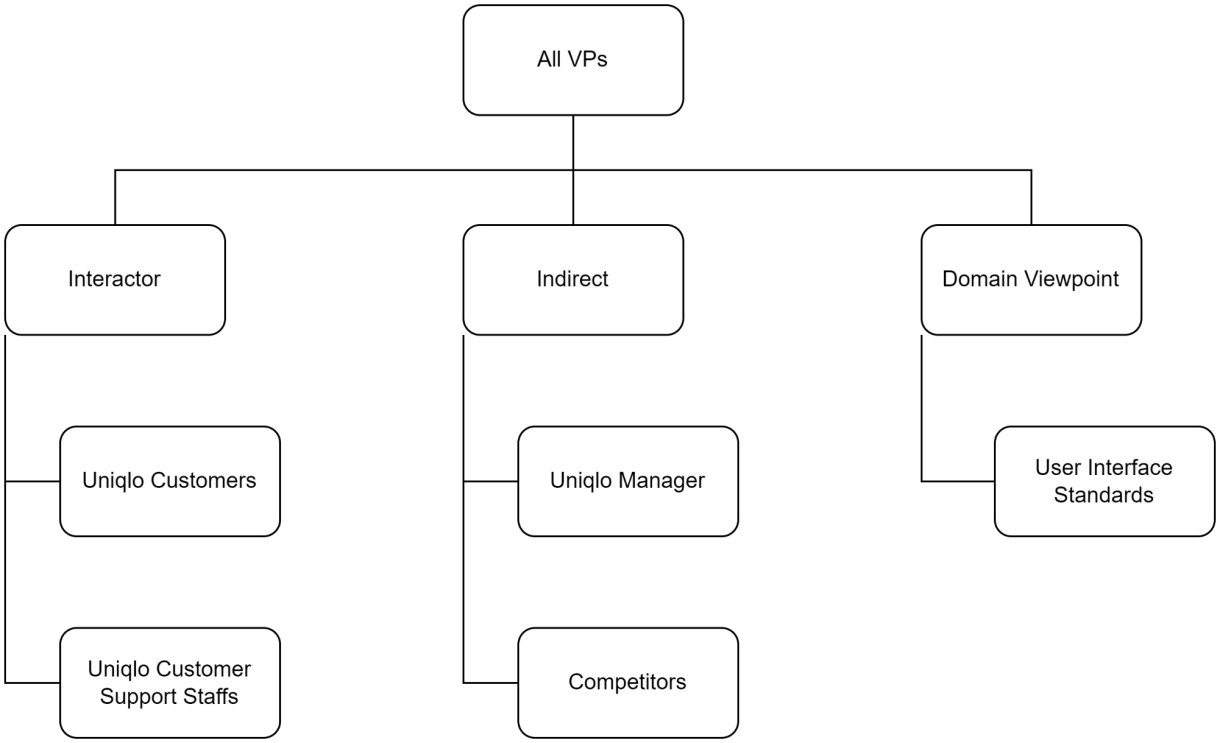
Legislative

Legislative refers to the legal rules and duties that the system must follow while engaging with third parties like consumers, suppliers, and regulatory bodies. In terms of consumer protection laws, it is essential to stick to consumer protection laws. These laws differ by country, but they frequently concern matters like return policies, warranties, product safety, and dispute resolution. Since there are credit card transactions in this online shopping system, Payment Card Industry (PCI) compliance is needed to ensure a secure environment for credit card payment.

Privacy

To consider privacy in the online shopping system, the system should state clearly that personal information or data will be collected when users access or use the system at the beginning as informed consent should be obtained before collecting the data. Data minimization is essential in the online shopping system too. The system should only collect the minimum amount of personal information which is needed such as email address and contact number instead of collecting unnecessary information. Furthermore, users must have full control on their personal information in terms of the purpose of the data collection.

2.3 Viewpoint-oriented Analysis



Viewpoint-oriented analysis, also known as viewpoint analysis, is a method used in many domains, including literature, cinema studies, sociology, and even business, to evaluate and understand a subject or work from numerous views or viewpoints. This method involves evaluating a topic, document, or occurrence from several perspectives and angles from which it may be observed, comprehended, or evaluated.

Viewpoint-oriented analysis is separated into three main viewpoints which are the interactor viewpoint, indirect viewpoint and domain viewpoint. Interactor viewpoint relates to the point of view or perspective of an entity or individual who is actively involved in some sort of contact. Indirect viewpoint refers to a viewpoint or vantage point that is given indirectly through different means such as narration, character actions, or other aspects in a story or text. Domain viewpoint refers to a distinct perspective or viewpoint within a given domain or branch of knowledge, which is frequently used in debates or analyses of that specific topic. A domain can refer to a specific subject topic, discipline, industry, or area of competence in many settings.

The purpose of viewpoint-oriented analysis is to achieve a thorough and multidimensional knowledge of the subject matter by investigating how diverse points of view might lead to alternative interpretations, insights, or conclusions. It acknowledges that persons from various backgrounds, experiences, and views may interpret and assess the same issue differently.

2.3.1 Interactor Viewpoint

2.3.1.1 Uniqlo Customers

Uniqlo customers are one of the interactor viewpoints as they can interact directly with the system to perform their roles and tasks. For instance, customers can make orders by adding the items they wish to purchase into the shopping cart. They can even browse and search the products by categories and view all product details and reviews before purchasing. After they have chosen the products, they can make payment through the system. There are a few payment methods for customers to choose for their payment such as online banking, credit card and TnG e-wallet. In short, it is essential to know about customers' requirements to provide better service and satisfaction.

2.3.1.2 Uniqlo Customer Support Staffs

One of the interactor viewpoints is Uniqlo Customer Support Staffs. They can directly interact with the system via customer support to perform their tasks. For example, they can live chat with the customers to assist customers in solving the problems and issues they have faced when using the system. They can even respond to the feedback form that is filled in by the customers, so that customer service staff can look into the problems that are faced by the customers and provide a useful solution. As a result, the perspective of the customer support staff on the online shopping system is required in order to boost job efficiency while reducing time and effort spent.

2.3.2 Indirect Viewpoint

2.3.2.1 Uniqlo Manager

The Uniqlo Manager is one of the indirect perspectives. The manager is in charge of creating the business plan and long-term strategies, as well as making top-level managerial choices and expanding the organisation. To generate reports, the manager does not directly engage with the web system. Instead, the management will examine the employee's graphical reports to understand the company's performance. The manager will also use the generated reports to make business choices and establish future company strategies. As a result, it is critical to include the Uniqlo manager's perspective in the online buying system.

2.3.2.2 Competitors

In addition, Uniqlo's competitors are one of the indirect perceptions. Competitors do not engage directly with the online shopping system; instead, the system provides current market trends and competitive data to help them understand the strategies of their competitors. For example, while the COVID-19 epidemic has expanded the use of digital and contactless payments, rivals' systems have been enhanced to allow clients to pay using a number of payment methods such as internet banking, credit card, and TnG e-wallet. This not only expedites payment operations, but also boosts consumer satisfaction because this approach is more secure during the COVID-19 epidemic. By considering the rivals' points of view in the online shopping system, the company will be able to enhance the quality of its products and services, allowing it to attract more clients.

2.3.3 Domain Viewpoint

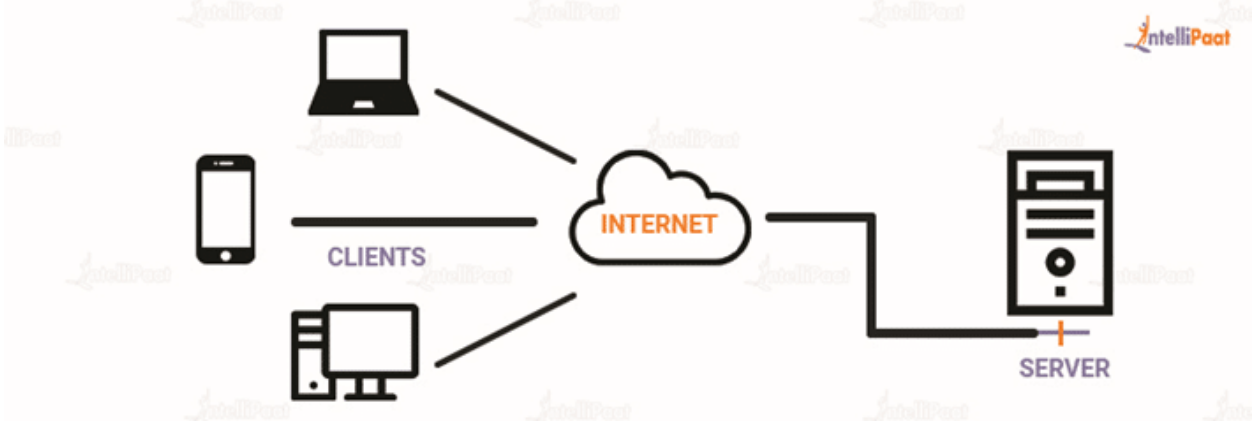
2.3.3.1 User Interface Standards

One of the domain viewpoints for the Uniqlo CRM is user interface standards. User interface is the part where interaction and communication between human and computer happens. A well-designed interface such as having user friendly features ensures a great user experience which means users are able to understand the functionalities. It will be easy for the users when using the interface provided. Such features help to increase the number of users browsing through the website which benefits the company a lot. There will also be an increase in the company's profit. By providing this kind of standard viewpoint can help improve user experience.

3.0 Part 3

3.1 System Architectural Design

Client Server Model



The customer service agents and personnel will use the proposed system which includes the following function: customer support module, product and order module, payment module and sales module.

The Client Server Model is the best fit for the Uniqlo proposed system since it requires the **least amount of hardware** and is **simple to update** in the future. Uniqlo can accommodate a large number of users and customers (businesses) due to the inherent scalability of the client-server technology. The system is easily extensible to meet increased demand as Uniqlo's client base and product choices develop.

Using a client-server approach, Uniqlo may **maintain central control** over the system's basic features and data. Because of this centralised control, the administration of user accounts, inventory, payments, and orders is uniform, secure, and effective.

The server-side components perform resource-intensive processes such as data storage, business logic, and database management. This division of work **enhances resource allocation** to guarantee that client devices (web browsers, mobile applications) can function successfully without being slowed down by complex computations.

Despite this, the repository model has a **superior security mechanism** that protects the customer's data information. The client-server strategy increases security by centralising key data and services on the server side. This centralization allows robust security measures like encryption, authentication, and access control to protect user data and transactions.

The use of centralised server-side data storage ensures **data consistency**. Because all clients have access to the same authoritative source of data, data conflicts and inconsistencies that may develop in decentralised systems are avoided.

Besides, **reliability and redundancy** are key components of the client-server method in the proposed Uniqlo system. Reliability ensures the system's consistency in providing services and data to consumers without unanticipated interruptions. In order to achieve this, high server uptime, fault tolerance, load balancing, and disaster recovery strategies are employed. Redundancy requires duplicating critical parts, servers, and data to decrease downtime and increase system resilience. Several server instances, data backups, multiple load balancers, network paths, and power sources are all part of the redundancy strategy. These collaborative efforts ensure that Uniqlo's online store infrastructure is trustworthy and continues to provide services to customers even in the event of hardware faults, network outages, or other unplanned situations. Reliability and redundancy are critical for delivering a consistent and continuous user experience.

However, client and server communication is necessary across a **network**, most often the internet. This dependency on network connectivity may pose issues if there are network delays or outages, which can slow down the system's response time. Instead, the repository approach does not offer offline access, which allows customers to show a member's QR code to redeem points without needing to connect to the internet, and a central server can become a bottleneck if numerous clients make simultaneous requests.

3.2 Test Planning

3.2.1 Testing Process

There are 4 levels of testing in the testing process which are unit testing, module testing, system testing and user acceptance testing.

Unit Testing

Unit testing is to ensure all units can function properly and correctly. Valid and invalid data should be entered into the system to verify whether it can provide an expected result. If the data inputs are valid, the system should continue the next process or state. If the data inputs are invalid, the system should prompt error messages and stop the process from going to the next state.

Module Testing

Module testing is also known as integration testing which is used to test the integration between all the modules. The tester will verify whether the important and necessary data can be passed to the next module to perform the jobs or tasks.

System Testing

System testing comes after unit testing and module testing. It is to test the whole system whether it can meet all the functional and non-functional requirements.

User Acceptance Testing

The testers of user acceptance testing (UAT) are usually the end-users as they can test the system from users' perspective to determine whether the system meets the requirements. This testing is the final validation step before the system or software is deployed to customers.

3.2.2 Testing Items

The items that will be tested are the user management function, product and order function, payment function, sales function and customer support function. In terms of **user management function**, it will verify the data inputs by the users whether are valid or invalid. For creating a new user account, valid data inputs can proceed to the next process which is creating the account successfully. For the login in user management function, valid data inputs will lead the users to the next stage which is the homepage of Uniqlo. In terms of **product and order function**, if the product is valid and available, the selected product will be added to the cart successfully. After making an order through the cart, the order will be placed successfully. In terms of **payment function**, it will verify whether the system can make the payment successfully with the available payment methods such as credit card/debit card, TnG e-wallet and online banking. Payment receipt will be generated as well after the payment is successful. For the **sales function**, it will verify whether the forecasting and analysis report will be generated successfully according to the user's needs. For the **customer support function**, it will verify whether users can get responses or useful information and solutions from the customer support service or staff via feedback form, email and live chat.

3.2.3 Testing Procedure

For the online shopping function, users need to sign up by creating a new account. If the users have an account before, they just need to login to their existing account. After login to the system, the users need to choose the page they wish to access and browse. If they want to purchase items, they should click on the products page that will lead them to all categories of products. If users have any questions according to the system, they should click on "Help" to view the Frequently Asked Questions (FAQ). There will be a list of common problems faced and proposed solutions. To change the language, the users need to click on language options that have been provided on the navigation bar. After users have chosen their preferred items, they need to add to cart. Users need to make an order to proceed to the payment page. In the payment page, users need to select their preferred payment method to continue the transaction. After payment is done, users need to confirm the payment to generate the receipt for their references. Users need to click on "Contact Us" to interact with the customer support of Uniqlo via live chat, email or feedback form. Users need to fill in the feedback form for any issues or complaints. From staff perspective, to view sales forecasting or analysis reports, users need to choose "Sales" to view the reports according to their requirements. Besides, from a staff perspective, users need to click on "Message" to open the live chat and interact with customers.

3.2.4 Testing Requirements

3.2.4.1 Hardware Requirement

For this application, the end-users should use a tablet, smartphone, and laptop which are electronic devices that are compatible with the application. For example, the laptop specification must be 4GB RAM required to be executed, the CPU specifications like 2 gigahertz (GHz) or a faster compatible processor or System on a Chip (SoC), and the hard disk size should be 32GB or larger hard disk. Essentially, the SSD is better than HDD which has a higher download and upload speed. The crucial component is the WLAN or LAN card, which must be embedded into the computer to connect the network.

3.2.4.2 Software Requirement

The computer requires the operating system to boot the computer. So, the preferred operating system version is Windows 10 and above. The reason that I need to use Windows 10 and above is because the Operating System is newer and can support more applications and firmware. Windows 7 and Windows 8 have some features that are not supported and the firmware version is too old. On the other hand, the computer must have built-in browsers such as Google Chrome and Internet Explorer.

3.2.5 Testing Constraints

3.2.5.1 Test Item Availability

Constraint:	Test Item Availability
Problem:	The module is incomplete, and testing is still at level 1. Many items and features are still incompatible, and the inventory may be out of current. Integration and module testing, on the other hand, are ineffective.
Solution:	Because it was not scheduled sooner, the testing period should be extended.

3.2.5.2 Test Resources Availability

Constraints:	Test Resource Availability
Problem:	The cost may be more than planned, indicating that the hardware component is not strong enough to carry out the testing and the hardware fails or is destroyed accidently while the tester is evaluating the module. In other cases, the hardware component is too old to support the high-performance task. The software, such as the operating system, is particularly vital since it allows the computer to work even if the licence has expired, is no longer functional, or the OS version is too old and does not support specific functions.
Solution:	The budget should be increased to a reasonable level. To ensure that testing runs properly, the hardware should be upgraded to an appropriate specification. Besides, the software should be updated automatically to the most recent version.

3.2.5.3 Time Constraint

Constraints:	Time Constraint
Problem:	There might not be enough time to complete all of the testing, such as unit testing, module testing, and so on. Which necessitates testing each function by hand as it only provided 6 days for the testing.
Solution:	The time allotted for testing should be increased to allow the tester to test more accurately and flawlessly. Besides, this problem may be fixed by using automated testing software. Manual testing may be eliminated with the use of automated testing software, saving the tester a significant amount of time by eliminating the need for them to complete the testing in front of a computer. As a result, both overall efficiency and the accuracy of the discoveries generated rise since the results obtained via the use of automated testing are reliable.

3.3 Test Case

3.3.1 Unit Testing

Unit testing that which is need to test the function one by one make sure that the function can perform properly this test is developers can easily detect and fix the error which allow to help save the maintenance cost for the future. In unit testing we should test the input parameter one by one for all of the outcomes. The unit testing for the online uniqlo function, User Management function, Products & Order function, Online Payment function, Online Sales function, and Customer Support function.

User Management Module

User-Management - Registration

Test Description: To test the functions of the registration function of the User Management Module for Uniqlo.

Program Name: Uniqlo System - User Management Module - Register Page					
Test Date: 13 Aug 2023 - 14 Aug 2023			**Tester: Tang Tzu Li**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their personal information correctly.				
Valid Registration Information					
	To verify if a user will be able to register with an email address,username and password				
1.	Enter email address	Email = “jake@gmail.com”	-	-	-
2.	Enter username	Username = “Jake”	-	-	-
3.	Enter password	Password = “jake1@2245”	-	-	-
	User clicks on the	-	User Registration	Same as expected results.	Pass

	“Create Account” button.		is successful. Successful message displayed “Congratulations! Registered "Successful" to the user and displayed a “Continue to Proceed” button which redirects to the Login page.		
Invalid Registration Information (i)					
	To verify if a user will be able to register with an **invalid** email address,username and password				
1.	Enter email address	**Invalid** Email = “jakegmail.com”	-	-	-
2.	Enter username	Username = “Jake”	-	-	-
3.	Enter password	Password = “jake*1@2245”	-	-	-
	User clicks on the “Register” button.	-	User Registration is unsuccessful. An error message will be prompted displaying “Invalid username”.	Same as expected result.	Fail

Invalid Registration Information (ii)					
	To verify if a user will be able to register with an email address, **invalid** username and password				
1.	Enter email address	Email = “jake@gmail.com”	-	-	-
2.	Enter username	**Invalid** Username = “Jake…”	-	-	-
3.	Enter password	Password = “jake1@2245”	-	-	-
	User clicks on the “Register” button.	-	User Registration is unsuccessful. An error message will be prompted displaying “Invalid username”.	Same as expected result.	Fail
Invalid Registration Information (iii)					
	To verify if a user will be able to register with an email address, username, and **invalid** password				
1.	Enter email address	Email = “jakegmail.com”	-	-	-
2.	Enter username	Username = “Jake”	-	-	-

3.	Enter password	**Invalid** Password = “jake*1@2245”	-	-	-
	User clicks on the “Register” button.	-	User Registration is unsuccessful. An error message will be prompted displaying “Invalid password”.	Same as expected result.	Fail

User-Management - Login

Test Description: To test the functions of the login function of the User Management Module for Uniqlo.

Program Name: Uniqlo System - User Management Module - Login Page					
Test Date: 13 Aug 2023 - 14 Aug 2023			**Tester: Leong Yuen Theng**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their personal information correctly.				
Valid Login Information					
	To verify if a user will be able to login with username and password				
1.	Enter username	Username = “Jake”	-	-	-
2.	Enter password	Password = “jake1@2245”	-	-	-
3.	Click on “Login” Button	-	User Login is successful. Successful message displayed “Congratulations! Login Successful”to	Same as expected results.	Pass

			the user and displayed a “Continue to Proceed” button which redirects to the Product page.		
Invalid Login Information (i)					
	To verify if a user will be able to login with **invalid** username or email and password.				
1.	Enter username	**Invalid** Username = “!Jake”	-	-	-
2.	Enter password	Password = “jake1@2245”	-	-	-
3.	Click on “Login” Button	-	User Login is unsuccessful. Error messages will be prompted displaying “Invalid username”.	Same as expected results.	Fail
Invalid Login Information (ii)					
	To verify if a user will be able to login with username and **invalid** password.				

1.	Enter username	Username = “Jake”	-	-	-
2.	Enter password	**Invalid** Password = “jake*1@2245”	-	-	-
3.	Click on “Login” Button	-	User Login is unsuccessful. Error messages will be prompted displaying “Invalid password”.	Same as expected results.	Fail

Payment Module

Make Payment - Credit Card

Test Description: To test the functions of the Credit Card function of the payment module for Uniqlo.

Program Name: Uniqlo System - Payment Module - Credit Card Page					
Test Date: 27 Sep 2023 - 28 Sep 2023			**Tester: Joshua Chew Chun Thoe**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their payment details correctly.				
Valid Payment Information					
	Verify if a user will be able to make payment with name on card, card number, card expiry date, CVV and OTP number				
1.	Enter name as on card	Name as on card = “Jake”	-	-	-
2.	Enter card number	Card number = “1111 2222 3333 4444”	-	-	-
3.	Enter card expiry date	Card expiry date = “08/28”	-	-	-
4.	Enter CVV	CVV = “001”	-	-	-

5.	Enter OTP number	OTP number = “112233”	System will send the OTP number to the user’s email.	Same as expected result.	Pass
6.	Click on “Confirm payment” Button	-	Payment success message displayed.	Same as expected result.	Pass
Invalid Payment Information(i)					
	To verify if a user will be able to make payment with **invalid** name on card, card number, card expiry date, CVV and OTP number				
1.	Enter name as on card	**Invalid** Name as on card = “Joke”	-	-	-
2.	Enter card number	Card number = “1111 2222 3333 4444”	-	-	-
3.	Enter card expiry date	Card expiry date = “08/28”	-	-	-
4.	Enter CVV	CVV = “001”	-	-	-

5.	Enter OTP number	OTP number = “112233”	System will prompt an error message “Invalid name as on card”. System will not be able to send the OTP number to the user’s email as the button is not clickable.	Same as expected result.	Failed
Invalid Payment Information(ii)					
	To verify if a user will be able to make payment with name on card, **invalid** card number, card expiry date, CVV and OTP number				
1.	Enter name as on card	Name as on card = “Jake”	-	-	-
2.	Enter card number	**Invalid** card number = “1111 2222 3333”	-	-	-
3.	Enter card expiry date	Card expiry date = “08/28”	-	-	-

4.	Enter CVV	CVV = “001”	-	-	-
5.	Enter OTP number	OTP number = “112233”	System will prompt an error message “Invalid card number”. System will not be able to send the OTP number to the user’s email as the button is not clickable.	Same as expected result.	Failed
Invalid Payment Information(iii)					
	Verify if a user will be able to make payment with name on card, card number, **invalid** card expiry date, CVV and OTP number				
1.	Enter name as on card	Name as on card = “Jake”	-	-	-
2.	Enter card number	Card number = “1111 2222 3333”	-	-	-

3.	Enter card expiry date	**Invalid** card expiry date = “08/284”	-	-	-
4.	Enter CVV	CVV = “001”	-	-	-
5.	Enter OTP number	OTP number = “112233”	System will prompt an error message “Invalid card expiry date”. System will not be able to send the OTP number to the user’s email as the button is not clickable.	Same as expected result.	Failed
Invalid Payment Information(iv)					
	Verify if a user will be able to make payment with name on card, card number, card expiry date, **invalid** CVV and OTP number				
1.	Enter name as on card	Name as on card = “Jake”	-	-	-

2.	Enter card number	Card number = “1111 2222 3333”	-	-	-
3.	Enter card expiry date	Card expiry date = “08/28”	-	-	-
4.	Enter CVV	**Invalid** CVV = “00”	-	-	-
5.	Enter OTP number	OTP number = “112233”	System will prompt an error message “Invalid CVV”. System will not be able to send the OTP number to the user’s email as the button is not clickable.	Same as expected result.	Failed
Invalid Payment Information(v)					
	Verify if a user will be able to make payment with name on card, card number, card expiry date, CVV and **invalid** OTP number				

1.	Enter name as on card	Name as on card = “Jake”	-	-	-
2.	Enter card number	Card number = “1111 2222 3333”	-	-	-
3.	Enter card expiry date	Card expiry date = “08/28”	-	-	-
4.	Enter CVV	CVV = “001”	-	-	-
5.	Enter OTP number	**Invalid** OTP number = “1122”	-	-	-
6.	Click on “Confirm payment” Button	-	Error message displayed “Invalid OTP number”	Same as expected result	Failed

Make Payment - Touch&Go E-Wallet

Test Description: To test the functions of the Touch & Go E-Wallet payment module for Uniqlo.

Program Name: Uniqlo System - Payment Module - Touch & Go E-Wallet Page					
Test Date: 27 Sep 2023 - 28 Sep 2023			**Tester: Joshua Chew Chun Thoe**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their payment details correctly.				
Valid Payment Information					
	Verify if a user will be able to make payment with TnG e-wallet.				
1.	Enter contact number	Contact number = “01160734398”	-	-	-
2.	Enter 6-digit pin number	Pin number = “123456”	-	-	-
3.	Click on “Pay” Button	-	Payment success message displayed.	Same as expected result.	Pass
Invalid Payment Information(i)					

	Verify if a user will be able to make payment with **invalid** contact number				
1.	Enter contact number	**Invalid** contact number = “01-2334667”	-	-	-
2.	Enter 6-digit pin number	Pin number = “123456”	-	-	-
3.	Click on “Pay” button		Error message displayed “Invalid contact number”.	Same as expected result.	Failed
Invalid Payment Information(ii)					
	Verify if a user will be able to make payment with **invalid** pin number.				
1.	Enter contact number	Contact number = “01160734398”	-	-	-
2.	Enter 6-digit pin number	**Invalid** pin number = “111111”	-	-	-
3.	Click on “Pay” Button	-	Error message displayed “Invalid 6-digit pin number”.	Same as expected result.	Failed

Invalid Payment Information(v)					
	Verify if a user will be able to make payment with **invalid** contact number and **invalid** pin number				
1.	Enter contact number	**Invalid** contact number = “01-2334667”	-	-	-
2.	Enter 6-digit pin number	**Invalid** pin number = “111111”	-	-	-
3.	Click on “Pay” Button	-	Error message displayed “Invalid contact number” and “Invalid 6-digit pin number”.	Same as expected result.	Failed

3.3.2 Module Testing

Module Testing is a software testing technique that focuses on verifying the individual components or modules of a software system. During module testing, each module is tested in isolation to ensure that it behaves as intended and produces the expected result or outputs for a given set of inputs.

Module testing is also known as integration testing which is used to test the integration between all the modules. The tester will verify whether the important and necessary data can be passed to the next module to perform the jobs or tasks.

User Management Module

Program Name: Uniqlo System - User Management Module - Register Page					
Test Date: 17 Aug 2023 - 18 Aug 2023			**Tester: Tang Tzu LI**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their personal information correctly.				
Valid Register Information					
	To verify if a user will be able to register with email, username and password.				
1.	Enter email address	Email = “Mike@gmail.com”	-	-	-
2.	Enter username	Username = “Mike”	-	-	-

3.	Enter password	Password = “Mike@0657”	-	-	-
4..	Click on “Register” Button	-	User Registration is successful. Successful message displayed “Congratulations! Registered Successful” to the user and display a “Continue to Proceed” button to redirect to the Login page.	Same as expected results.	Pass
Program Name: Uniqlo System - User Management Module - Login Page					
Test Date: 17 Aug 2023 - 18 Aug 2023			**Tester: Leong Yuen Theng**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their personal information correctly.				
Valid Login Information					
	To verify if a user will be able to login with username or email and password				
1.	Enter username	Username = “Jake”		-	-

2.	Enter password	Password = “jake1@2245”		-	-
3.	Click on “Login” Button	-	User Login is successful. Successful message displayed “Congratulations! Login Successful”to the user and displayed a “Continue to Proceed” button which redirects to the Product page.	Same as expected results.	Pass
Program Name: Uniqlo System - User Management Module - Login Page					
Test Date: 17 Aug 2023 - 18 Aug 2023			**Tester: Joshua Chew Chun Thoe**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their personal information correctly.				
Valid social media Information					
	To verify if a user will be able to log in with Facebook or Google				
1.	Select Facebook	Link “Facebook”		-	-

2.	Click on “Facebook” Icon Button	-	Login is successful. Successful message is displayed to the user and a ”Continue to Proceed” button is displayed which redirects to the Product page.	Same as expected result	Pass

Payment Module

Program Name: Uniqlo System - Payment Module - Credit Card Page					
Test Date: 27 Aug 2023 - 28 Aug 2023			**Tester: Joshua Chew Chun Thoe**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their payment details correctly.				
Valid Payment Information					
	Verify if a user will be able to make payment with name on card, card number, card expiry date, CVV and OTP number				
1.	Enter name as on card	Name as on card = “Jake”	-	-	-
2.	Enter card number	Card number = “1111 2222 3333 4444”	-	-	-
3.	Enter card expiry date	Card expiry date = “08/28”	-	-	-
4.	Enter CVV	CVV = “001”	-	-	-
5.	Enter OTP number	OTP number = “112233”	System will send the OTP number to	Same as expected result.	Pass

			the user's email.		
6.	Click on "Confirm payment" Button	-	Payment success message displayed.	Same as expected result.	Pass
Program Name: Uniqlo System - Payment Module - Touch & Go E-Wallet Page					
Test Date: 27 Sep 2023 - 28 Sep 2023			**Tester: Joshua Chew Chun Thoe**		
No.	**Objective/ Test Case Procedure(s)**	**Test Data**	**Expected Results**	**Actual Results**	**Remarks**
	The system shall require the customers to fill in their payment details correctly.				
Valid Payment Information					
	Verify if a user will be able to make payment with TnG e-wallet.				
1.	Enter contact number	Contact number = "01160734398"	-	-	-
2.	Enter 6-digit pin number	Pin number = "123456"	-	-	-
3.	Click on "Pay" Button	-	Payment success message displayed.	Same as expected result.	Pass

3.4 User Interface Design Principles

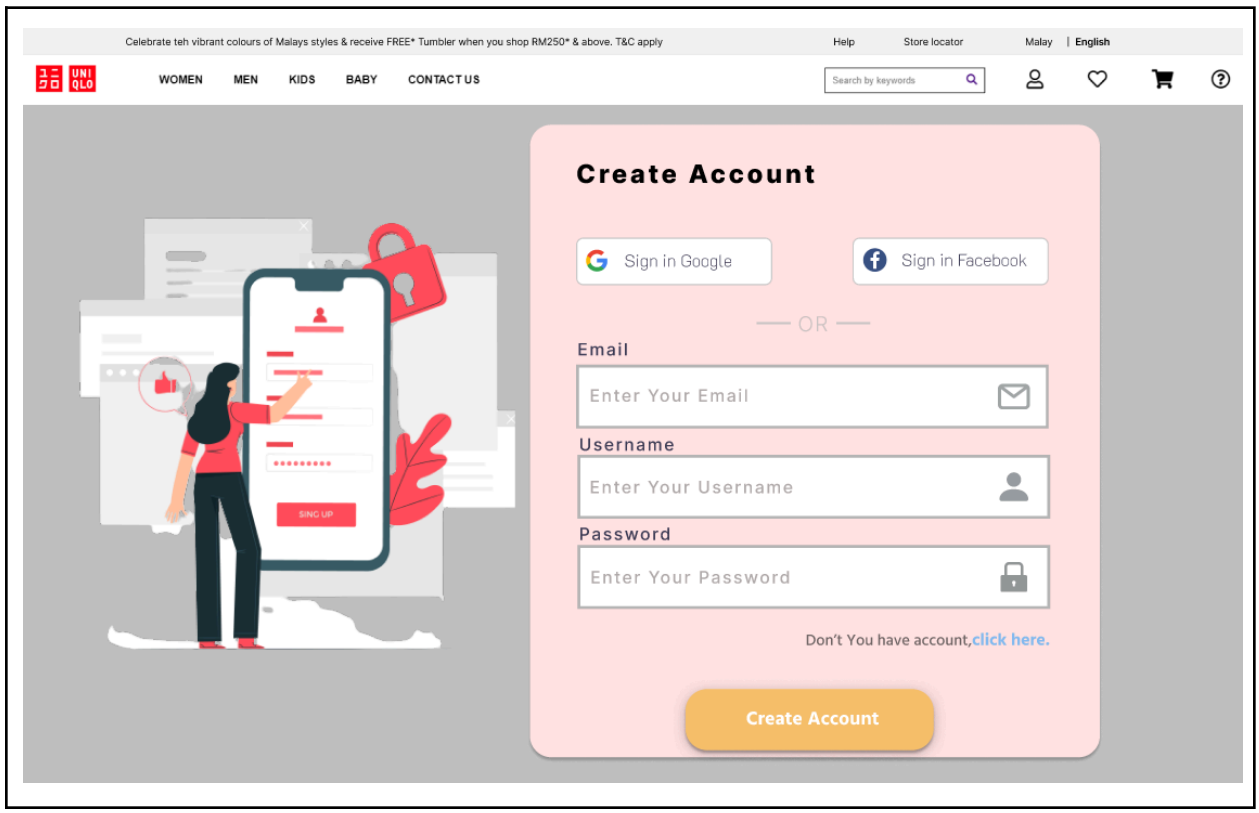


Figure 3.4.1 Sign Up Page

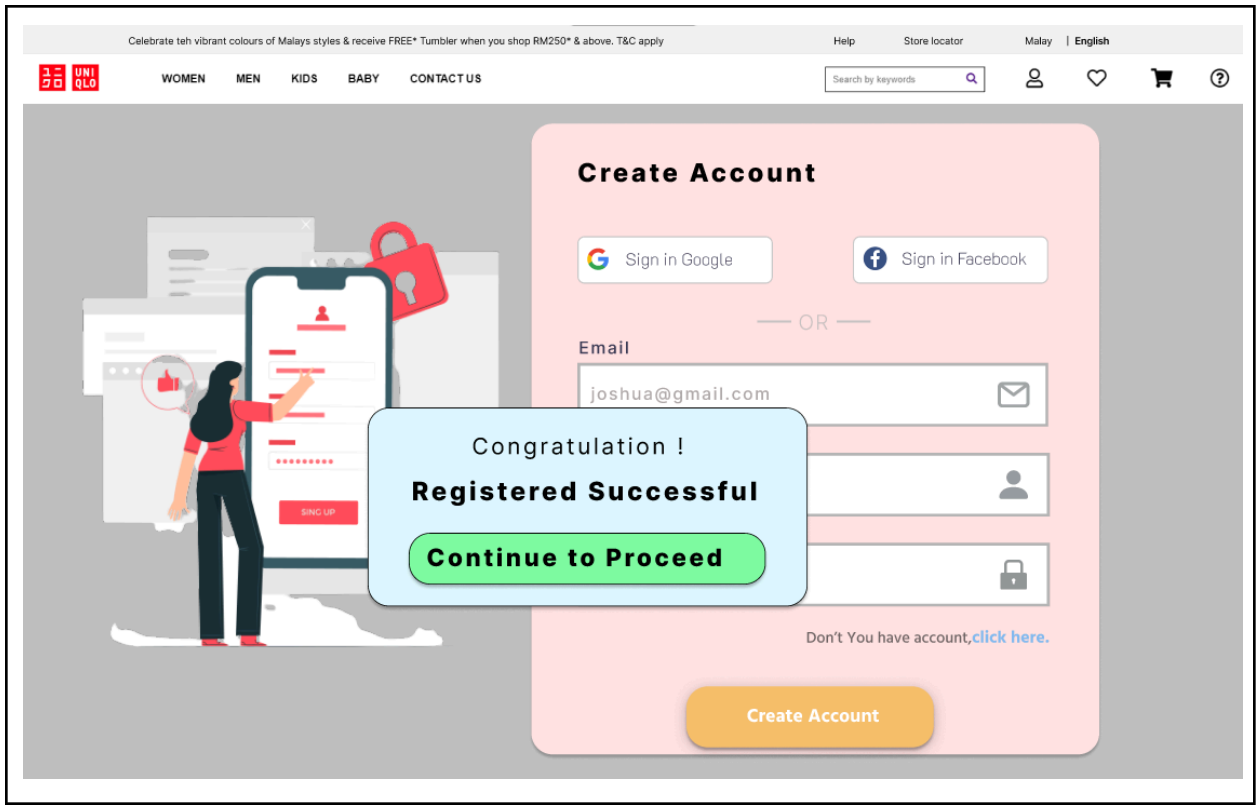


Figure 3.4.2 Sign Up Page (Registered Successful)

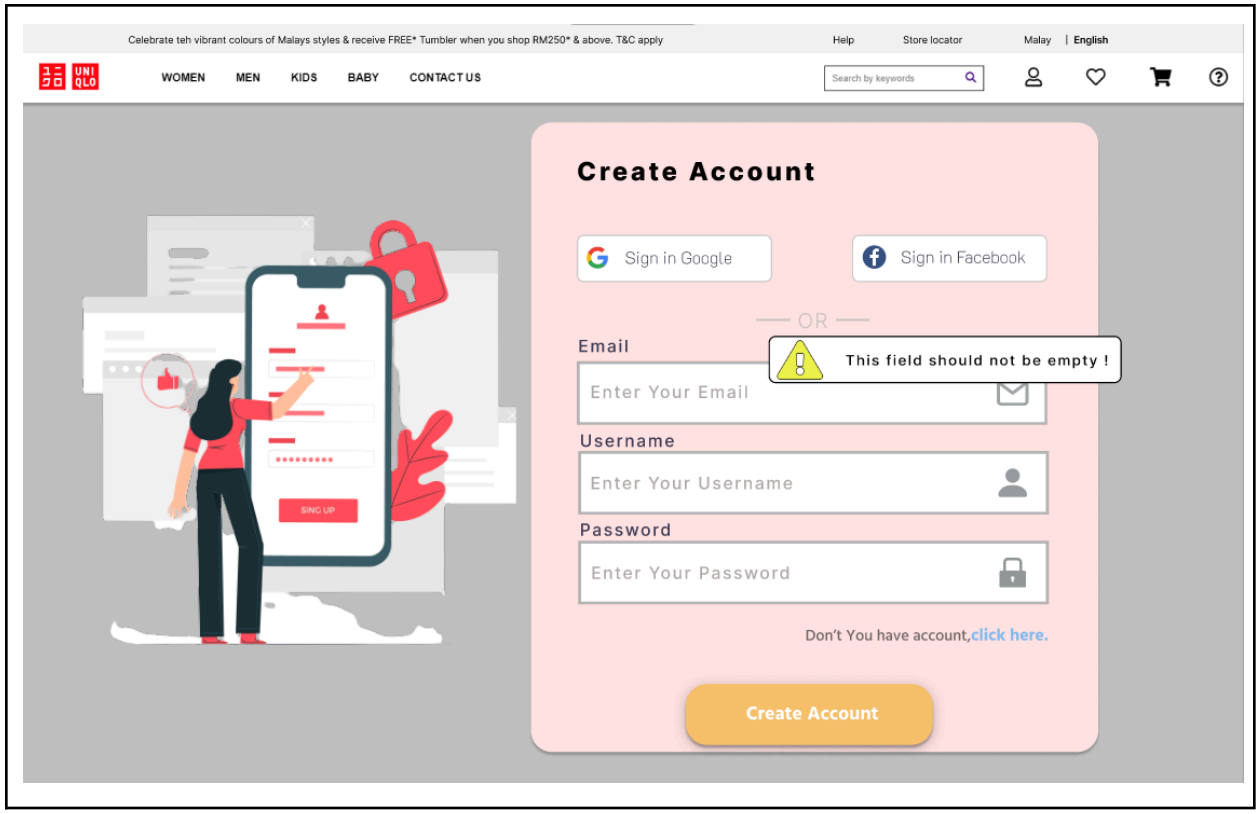


Figure 3.4.3 Sign Up Page (Prompt Error if invalid)

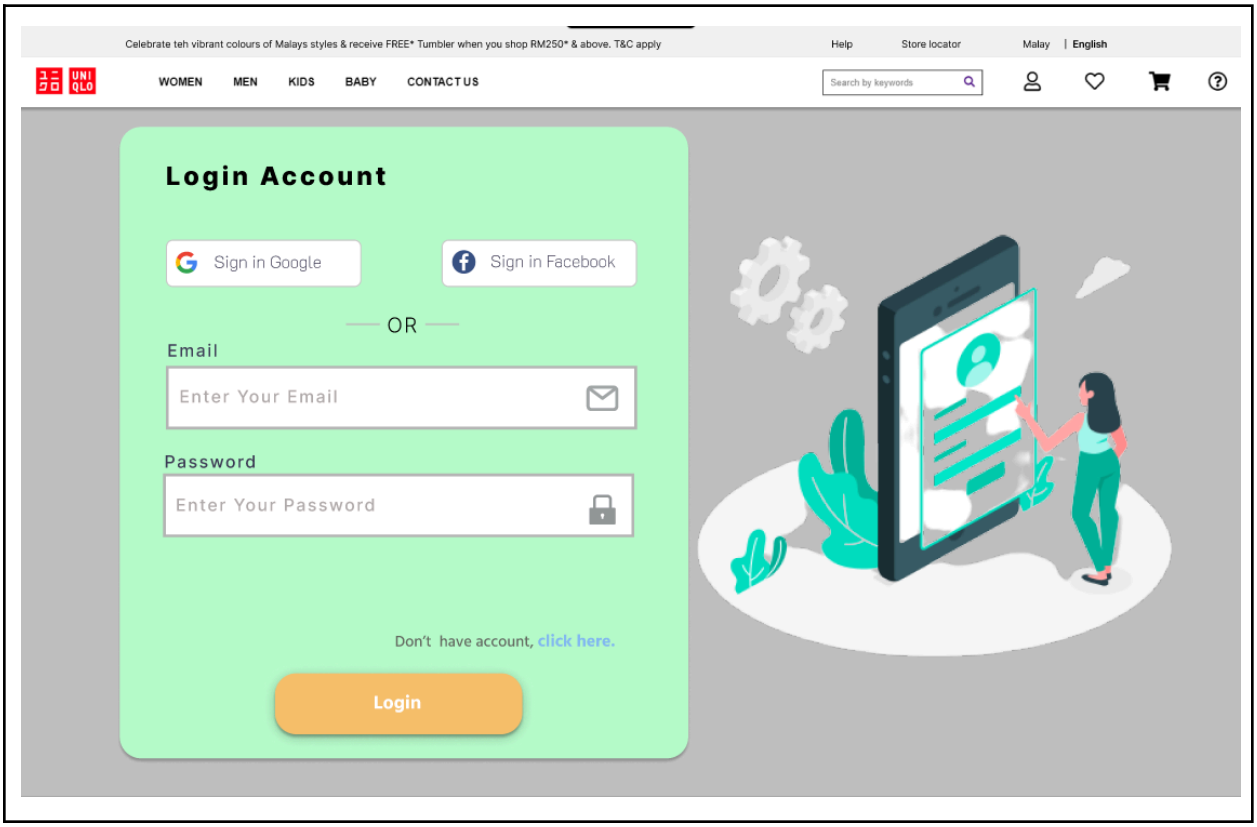


Figure 3.4.4 Sign In Page

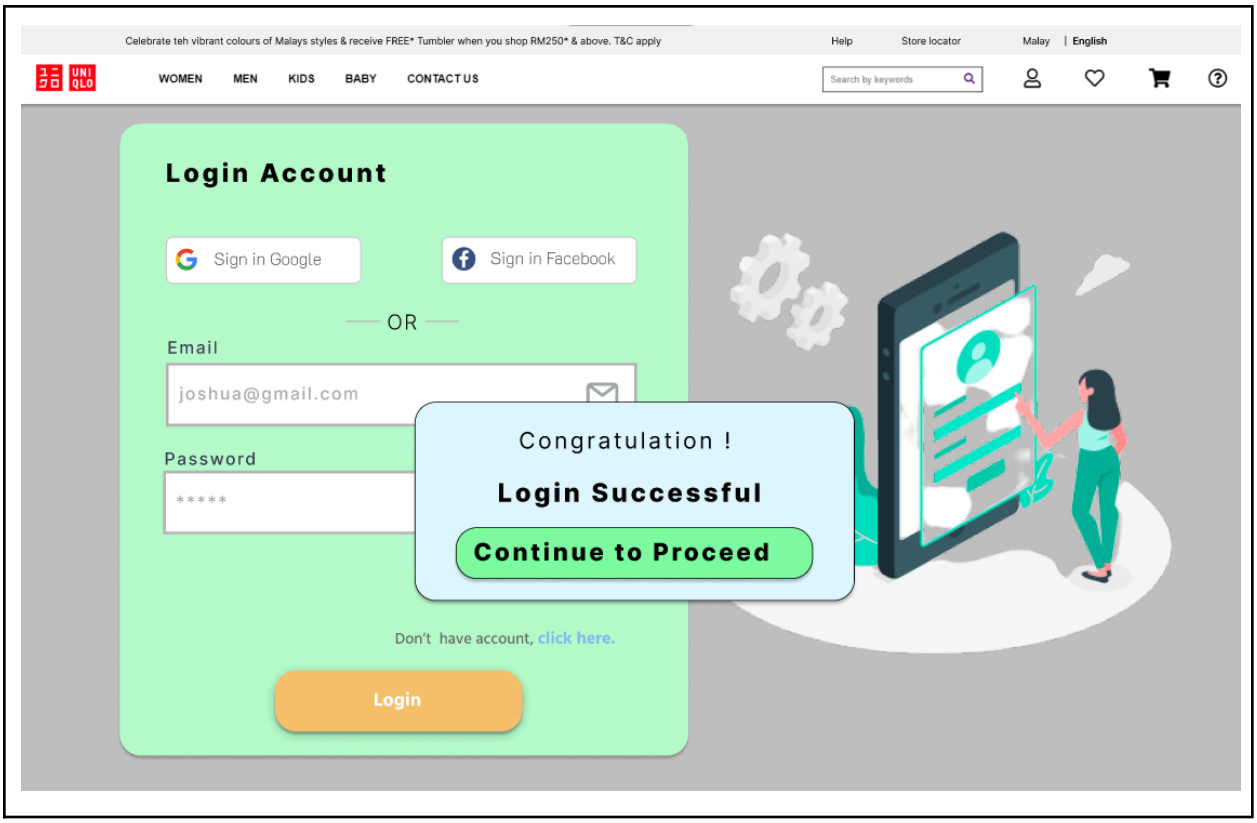


Figure 3.4.5 Sign In Page (Login Successful)

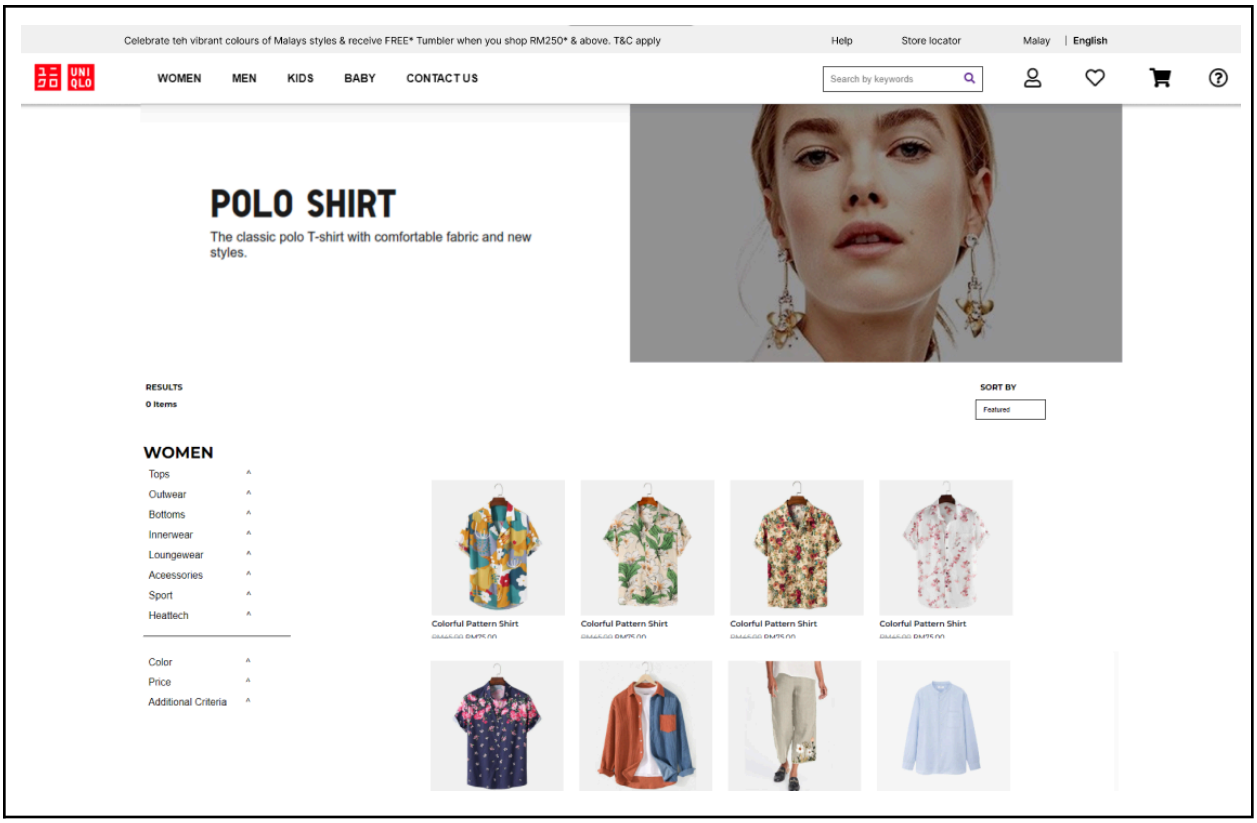


Figure 3.4.6 Product Page

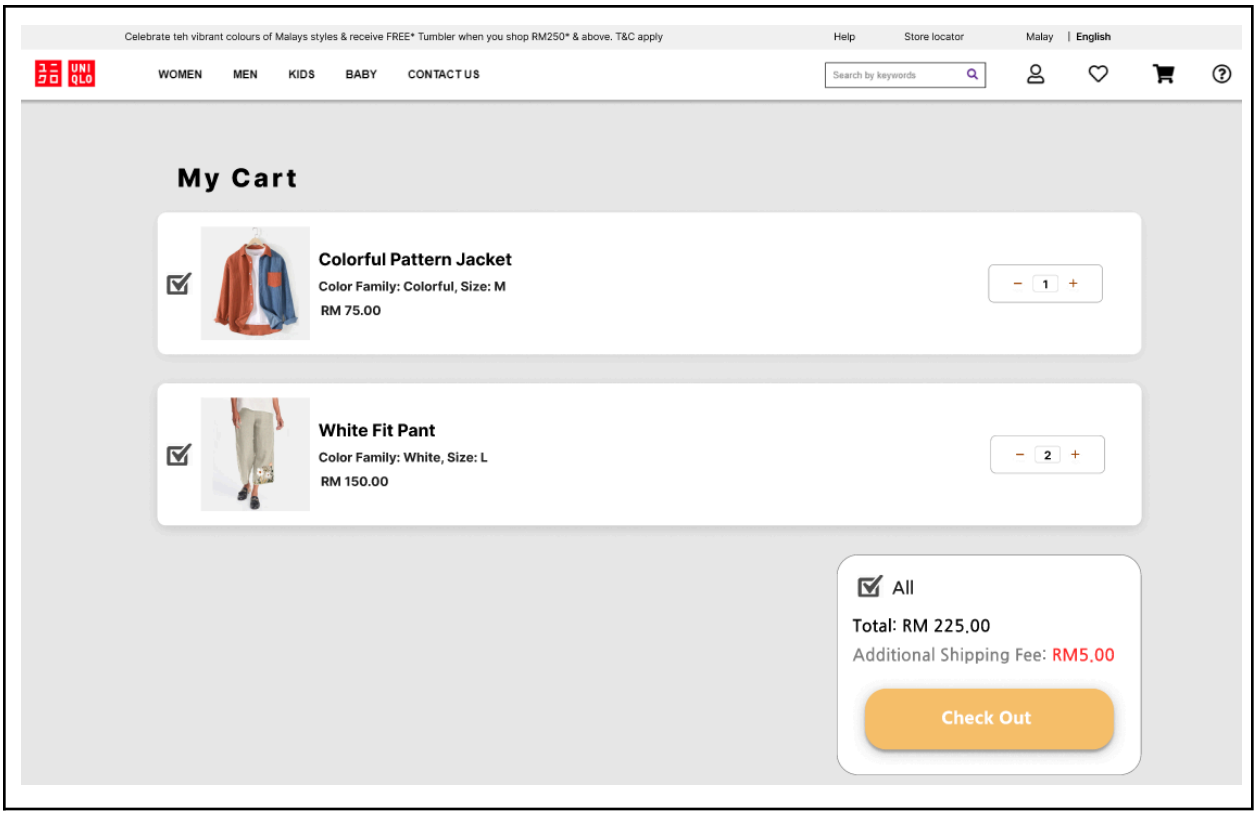


Figure 3.4.7 Cart Page

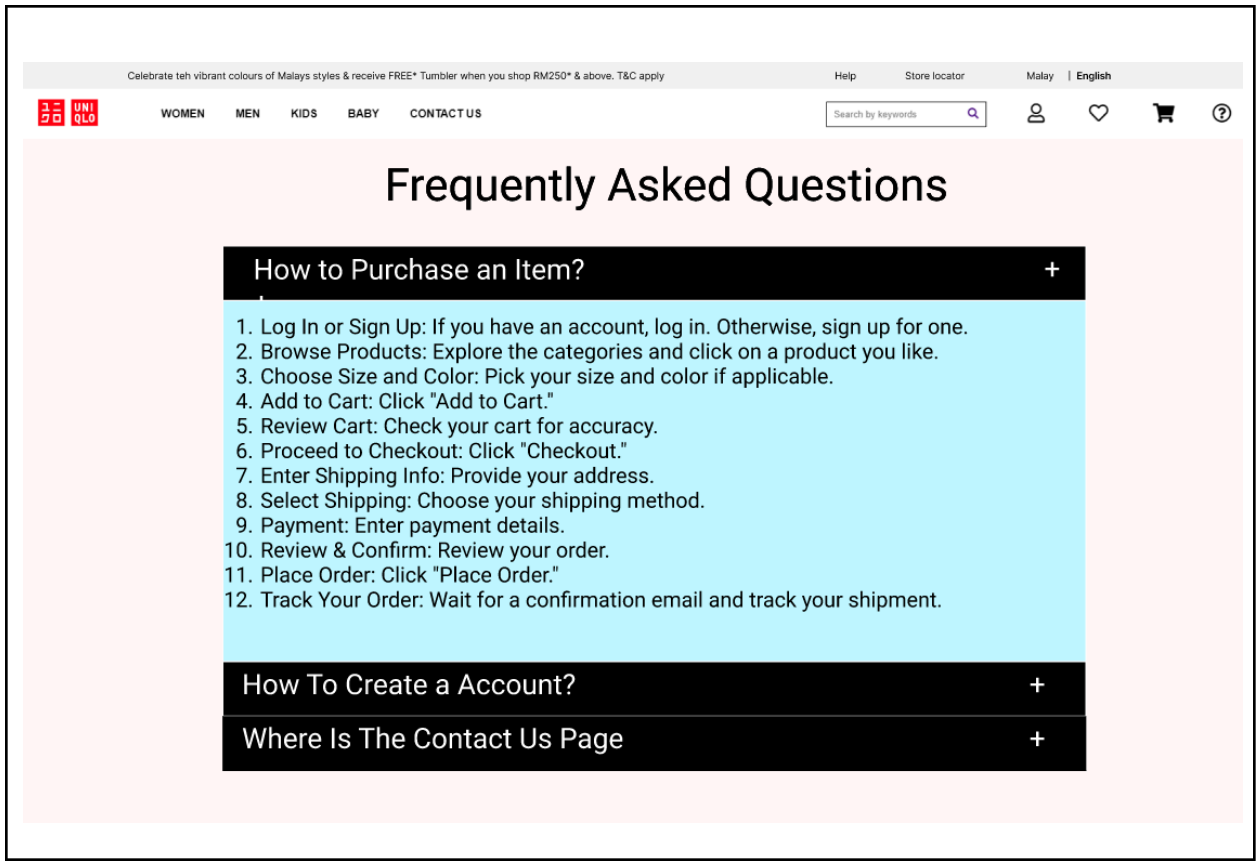


Figure 3.4.8 Frequently Asked Questions Page

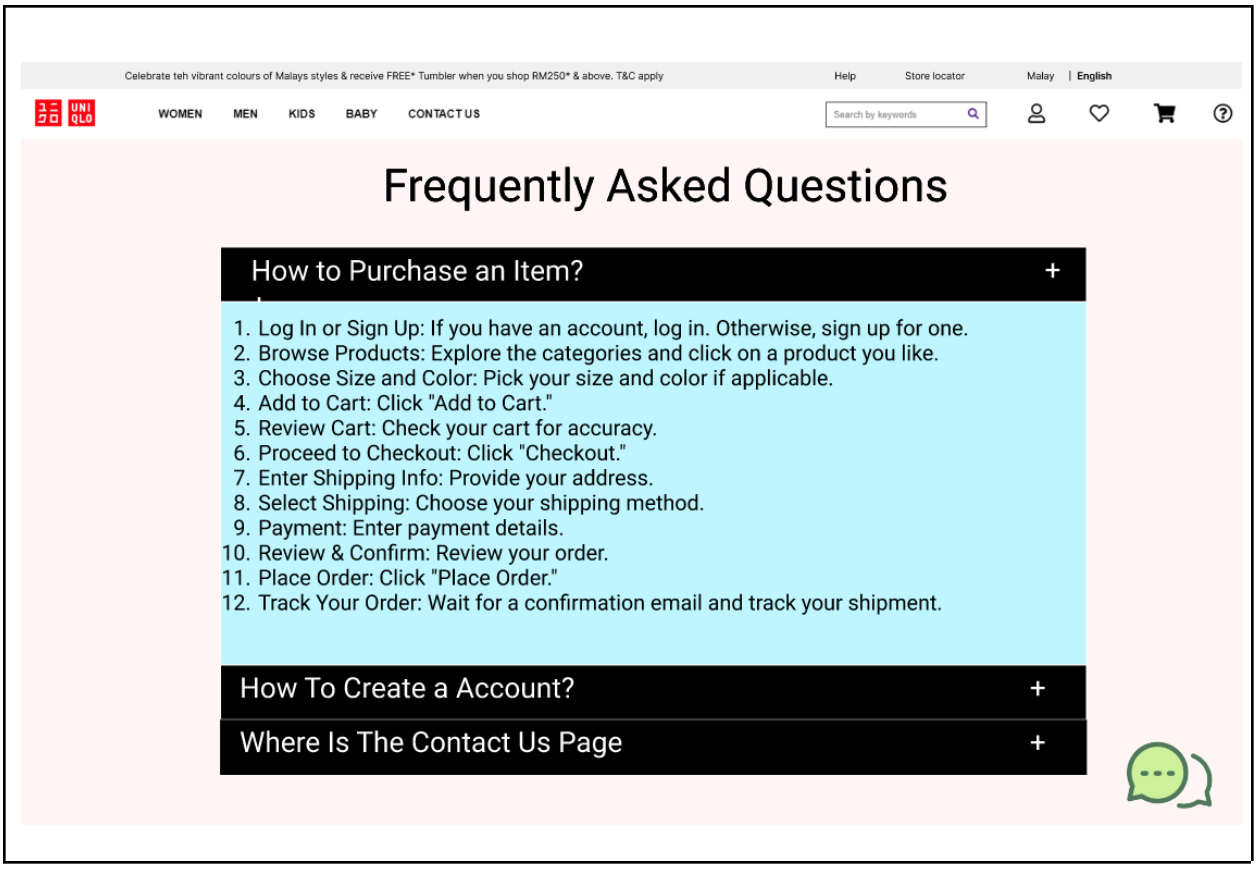


Figure 3.4.9 Frequently Asked Questions Page (English language)

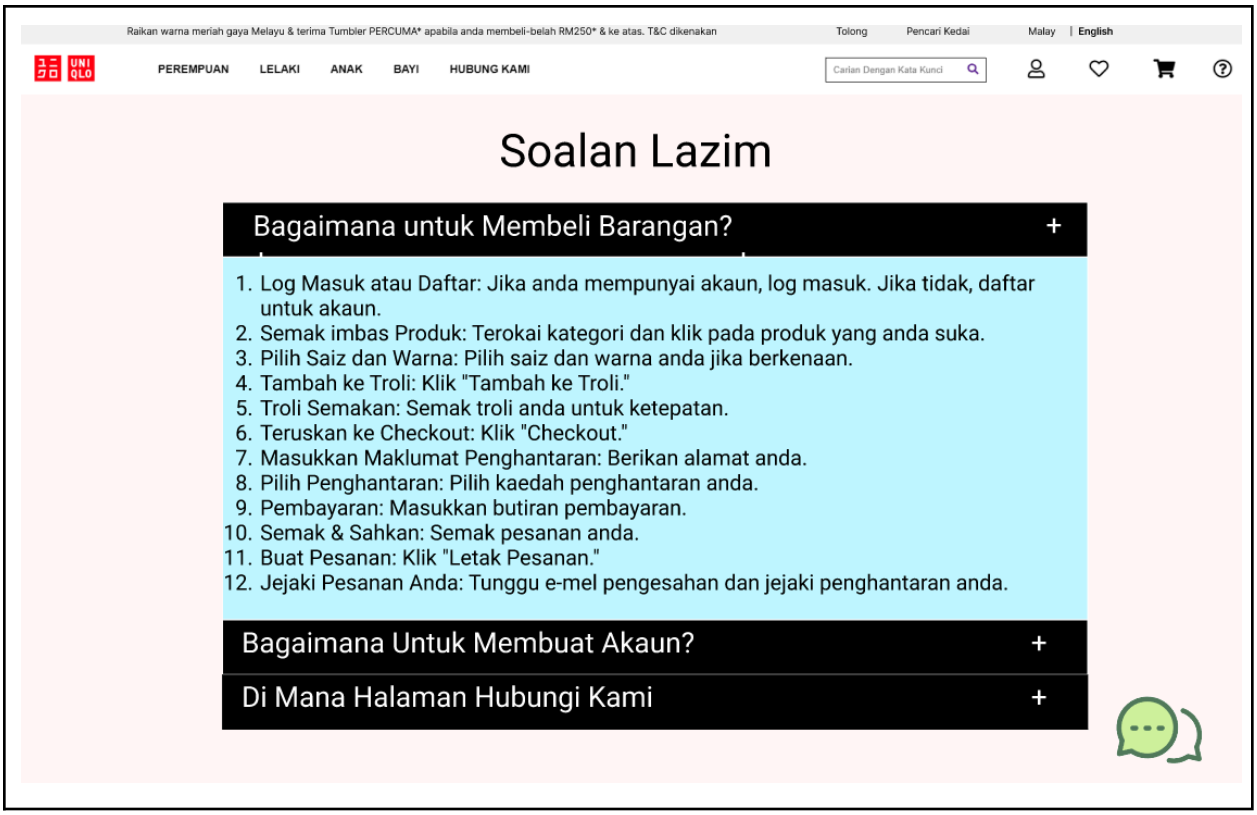


Figure 3.4.10 Frequently Asked Questions Page (Malay language)

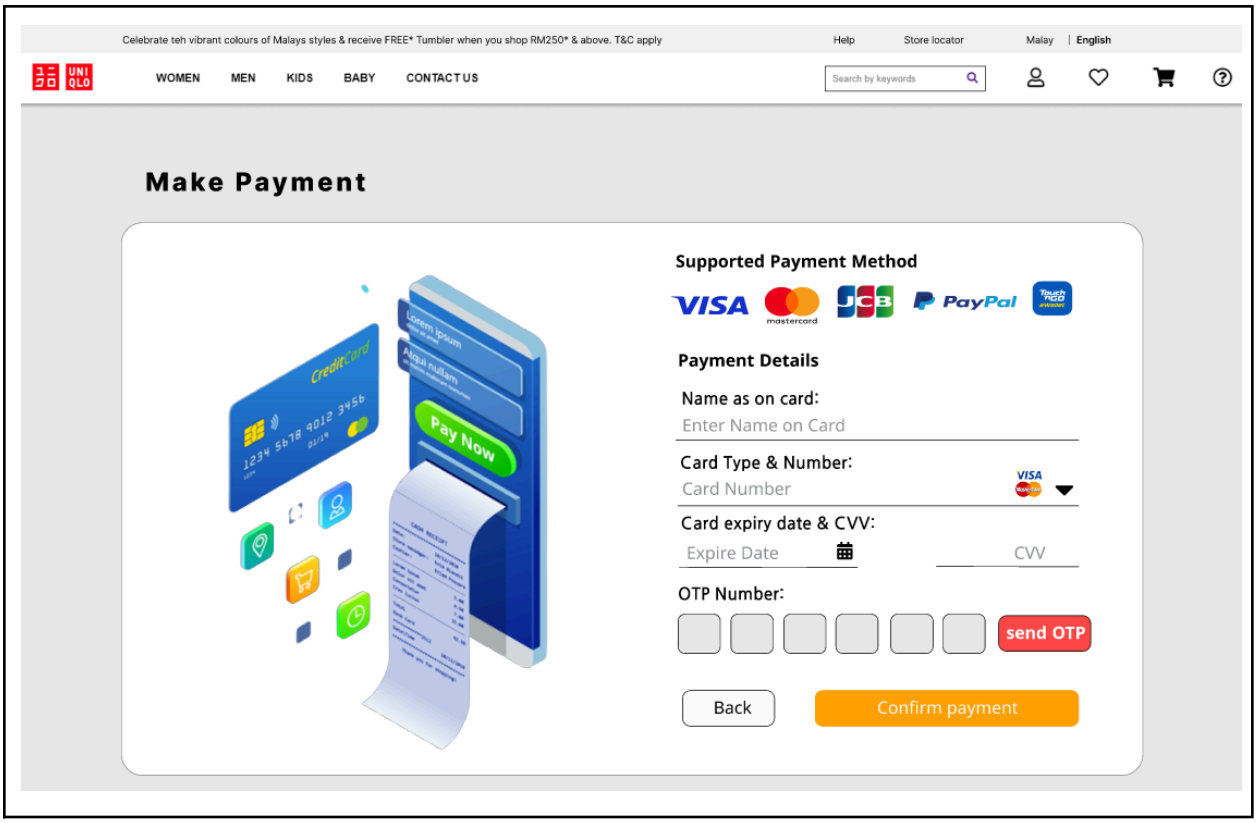


Figure 3.4.11 Make Payment (Credit Card)

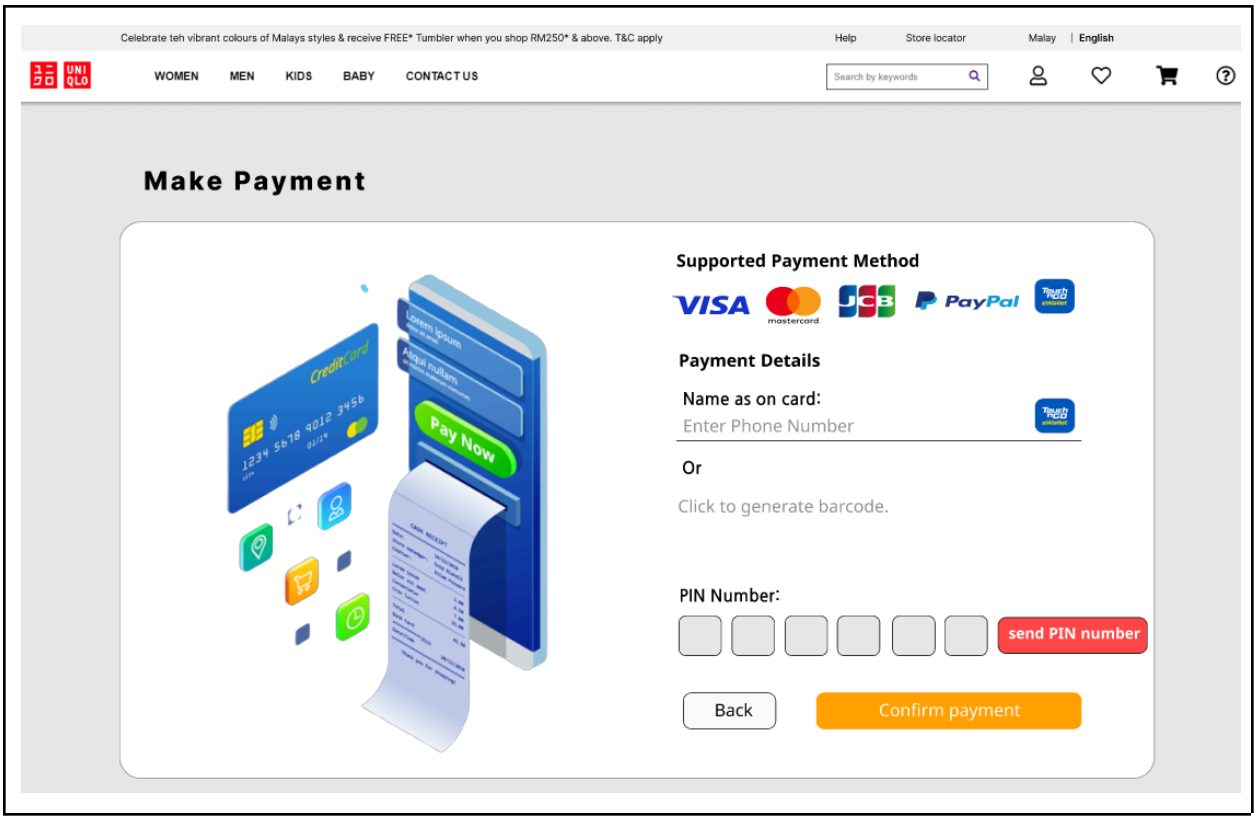


Figure 3.4.12 Make Payment (Touch and Go)

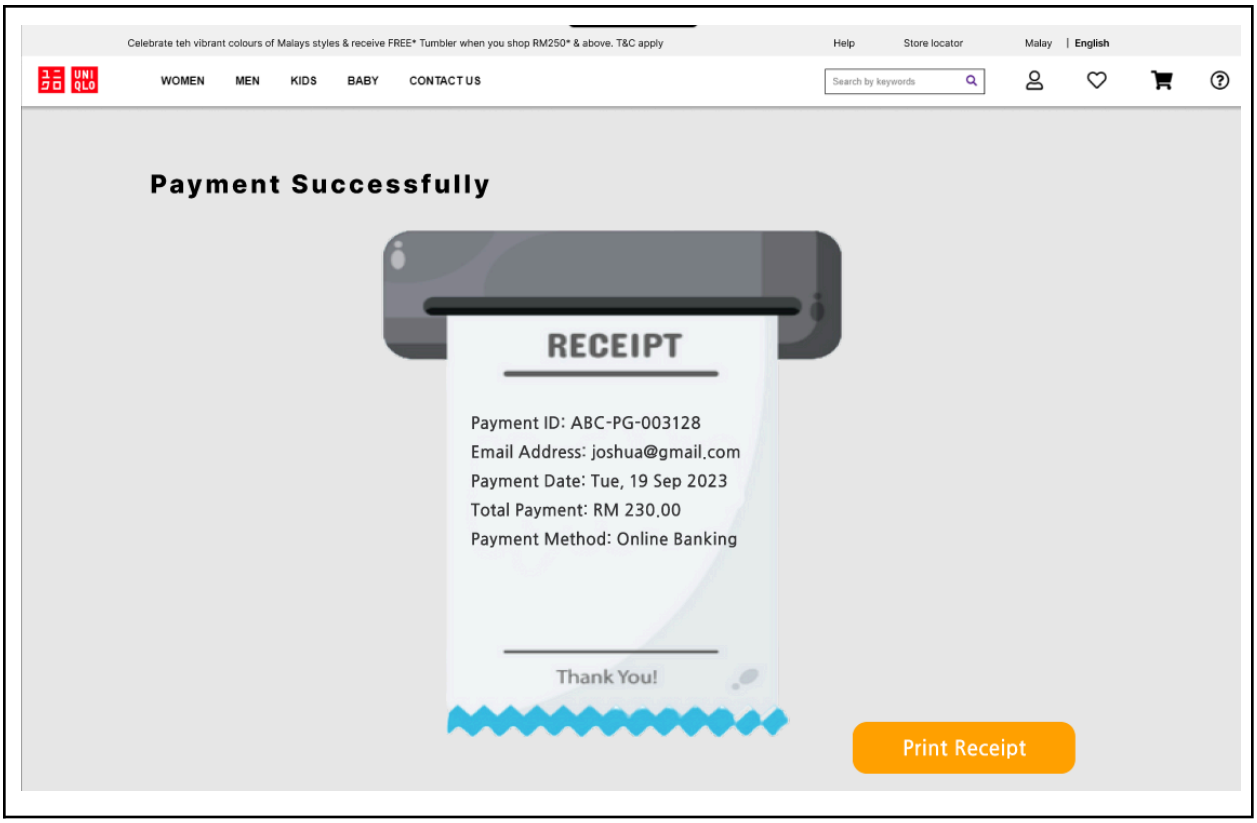


Figure 3.4.13 Print Receipt (Payment Successfully)

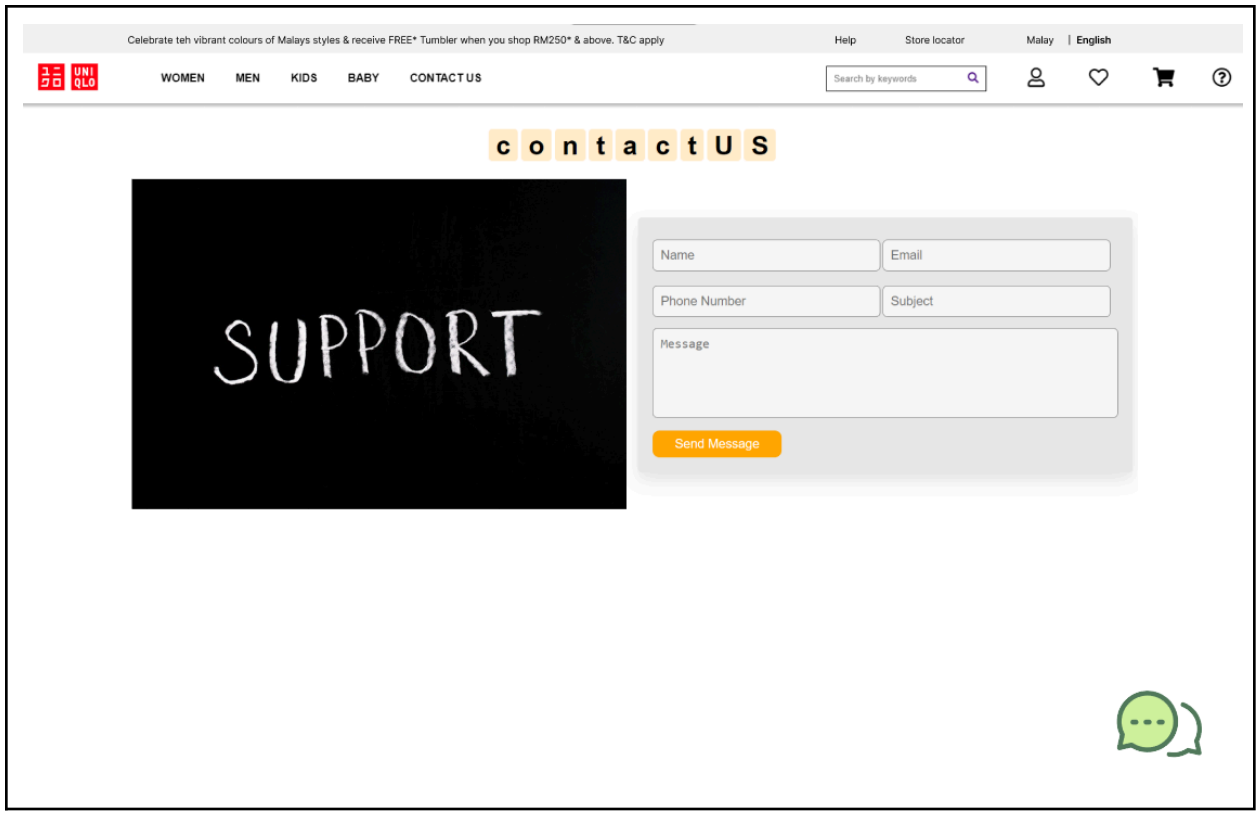


Figure 3.4.14 Contact Us Page

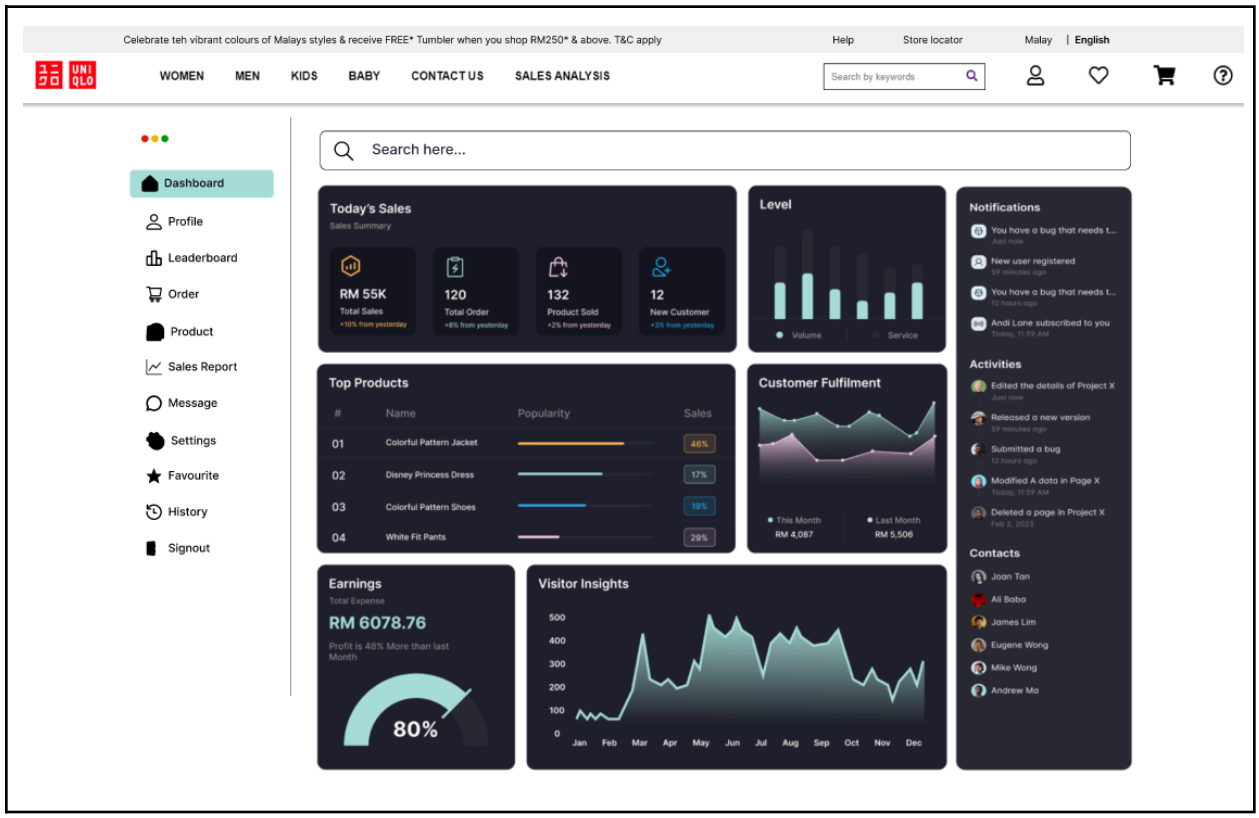


Figure 3.4.15 Sales Analysis Page

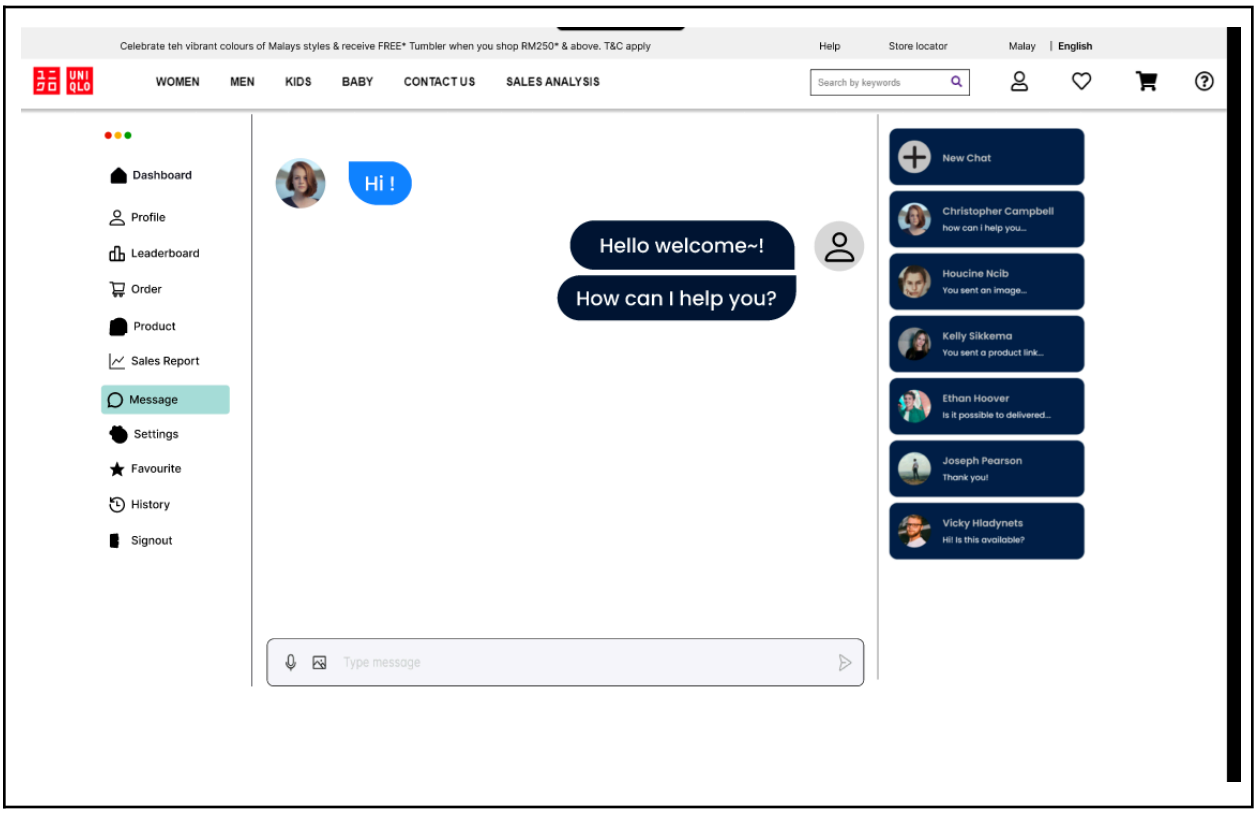


Figure 3.4.16 Customer Support Service Page

3.4.1 Consistency

Consistency is the principle where elements are arranged in a uniform manner, operations activated in the same way. Having such features means consistency is applied throughout the whole system. Having a consistent design means that users do not need to relearn the features available in the system as they are familiar with it. This means when they are browsing through the system, they are able to apply the knowledge on each feature available.

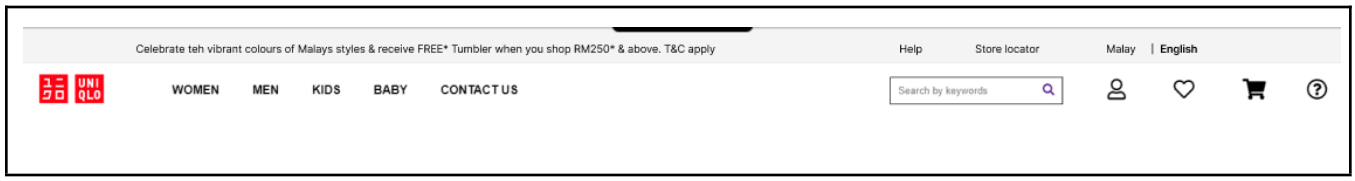


Figure 1 .1 Client side navigation bar is consistent

According to Figure 1, the UI layout for the Uniqlo homepage stays the same as the user is browsing the Women, Men, Kids and Baby page categories. This includes the colour, page style and fonts being similar. By having a same or similar layout design means that users, particularly the Uniqlo staff, are able to learn the system quickly.

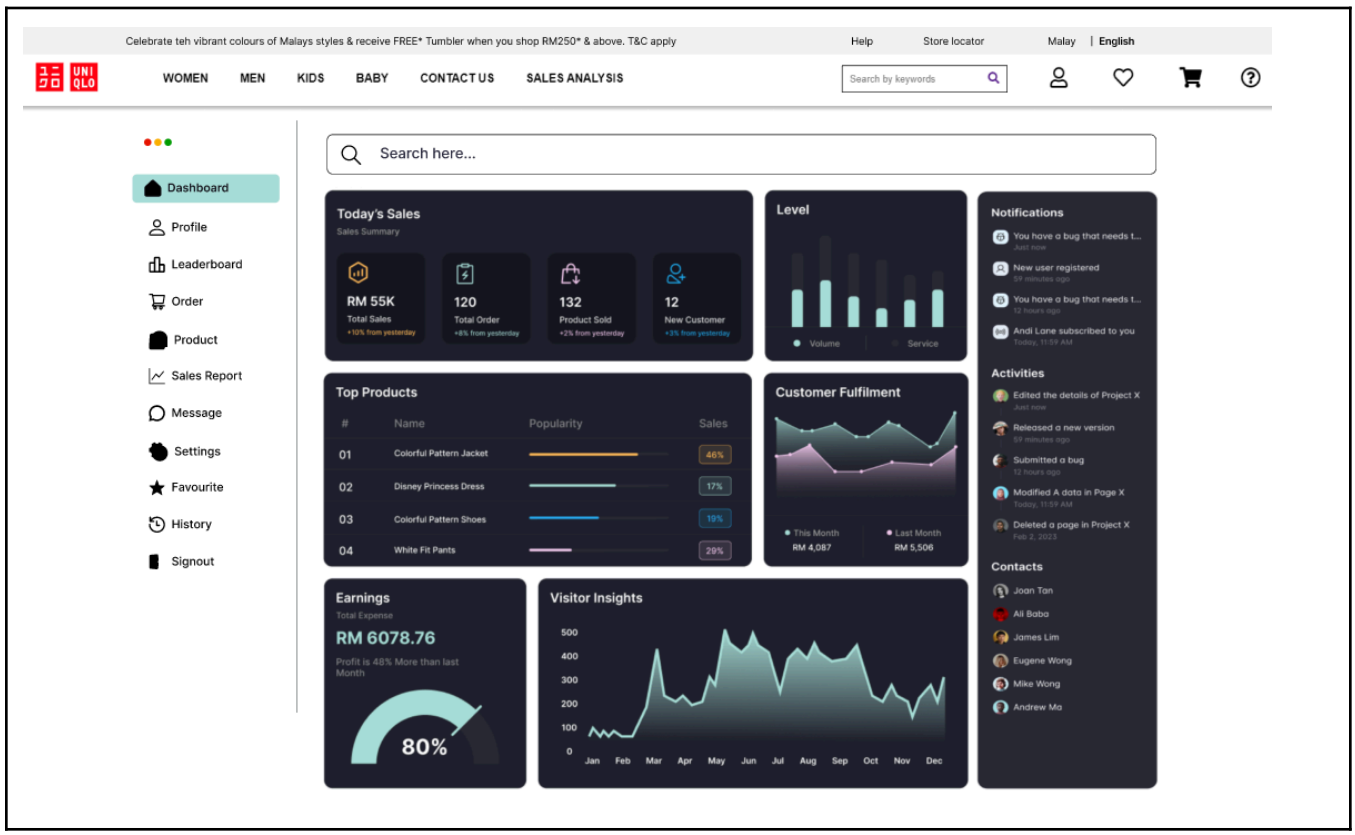


Figure 1 .2 Staff Sales Analysis page with a consistent layout design

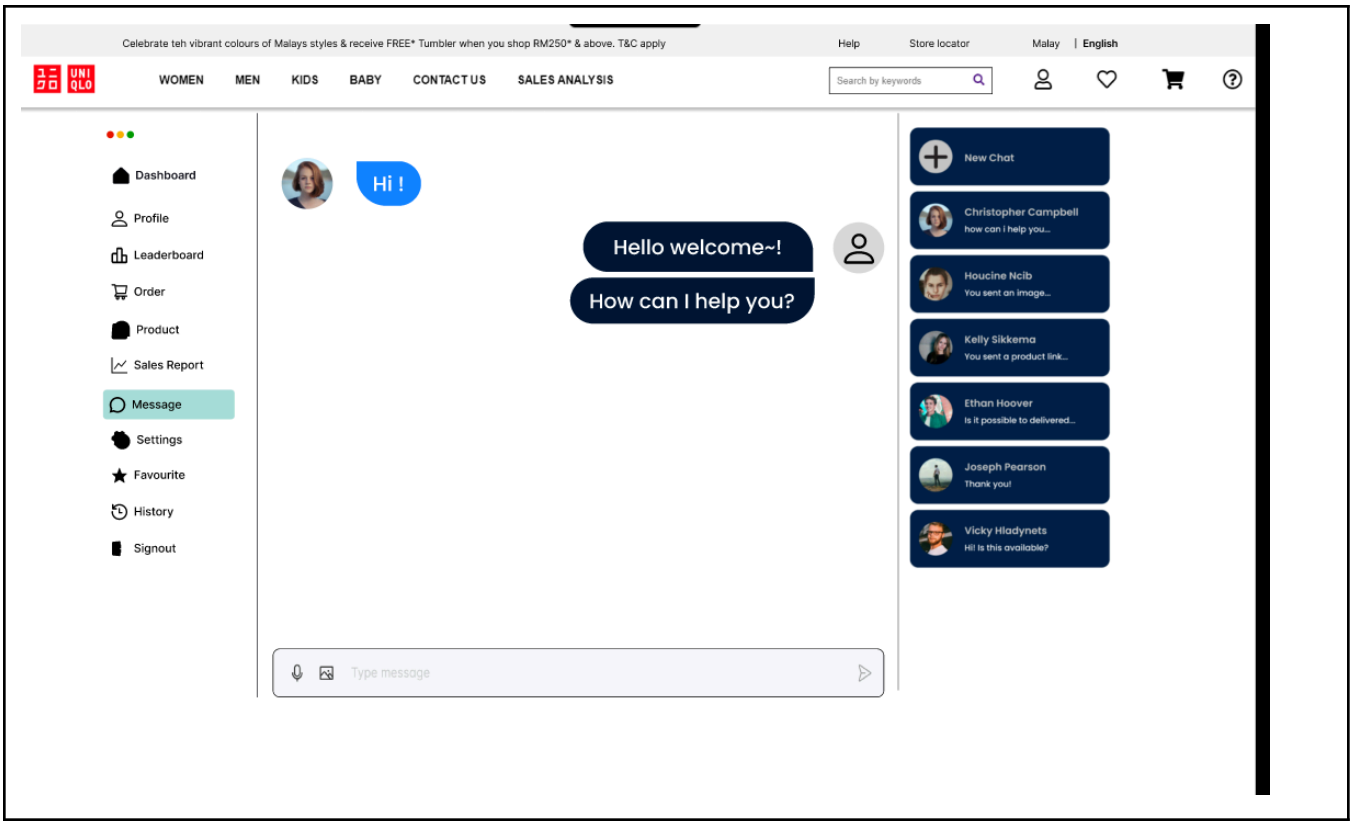


Figure 1 .3 Customer Service Support module with consistent layout design

Based on Figures 1.2 and 1.3, it shows the UI layout of the sales analysis management layout. The sales module has a similar layout to the customer support module. It allows the staff to work easily as all the elements, like colour, buttons, and styles, are similar. The commercial staff will be able to learn the system quickly and easily.

3.4.2 User Familiarity

User Familiarity is the principle where the UI design uses terms and concepts that are drawn from users' past experiences. Normally different system UIs use the same terms and concepts for business purposes. When users interact with the UI, they won't feel any different but rather natural and familiar as they have interacted with other similar systems.

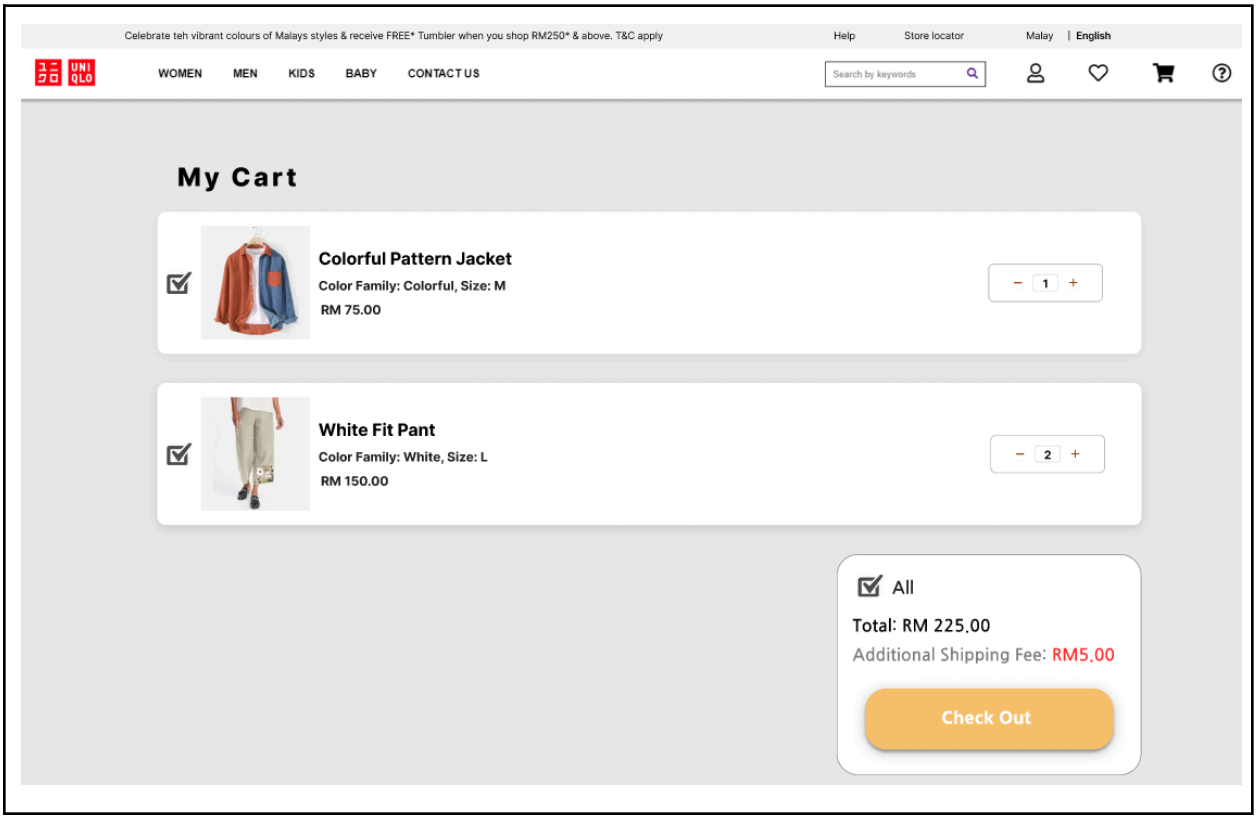


Figure 2 Shopping cart page using with general term

According to Figure 2, the word "Check Out" is familiar to users as people commonly say check out an item. Figure 2 can be found in the Add To Cart page, it allows users to check out their items. Therefore, when using the system, users will feel natural and familiar as the word using is not bombastic and fancy.

3.4.3 Minimal Surprises

Minimal surprises, also known as “lack of surprises”, refers to the principle of creating interfaces that behave in a predictable manner. It aims to minimise user confusion and frustration by aligning the interface’s behaviour with users’ mental models and expectations. Having a UI design with less surprises helps users in a way that does not contradict. With such a principle, users will expect the functions to work according to and not in an unexpected way.

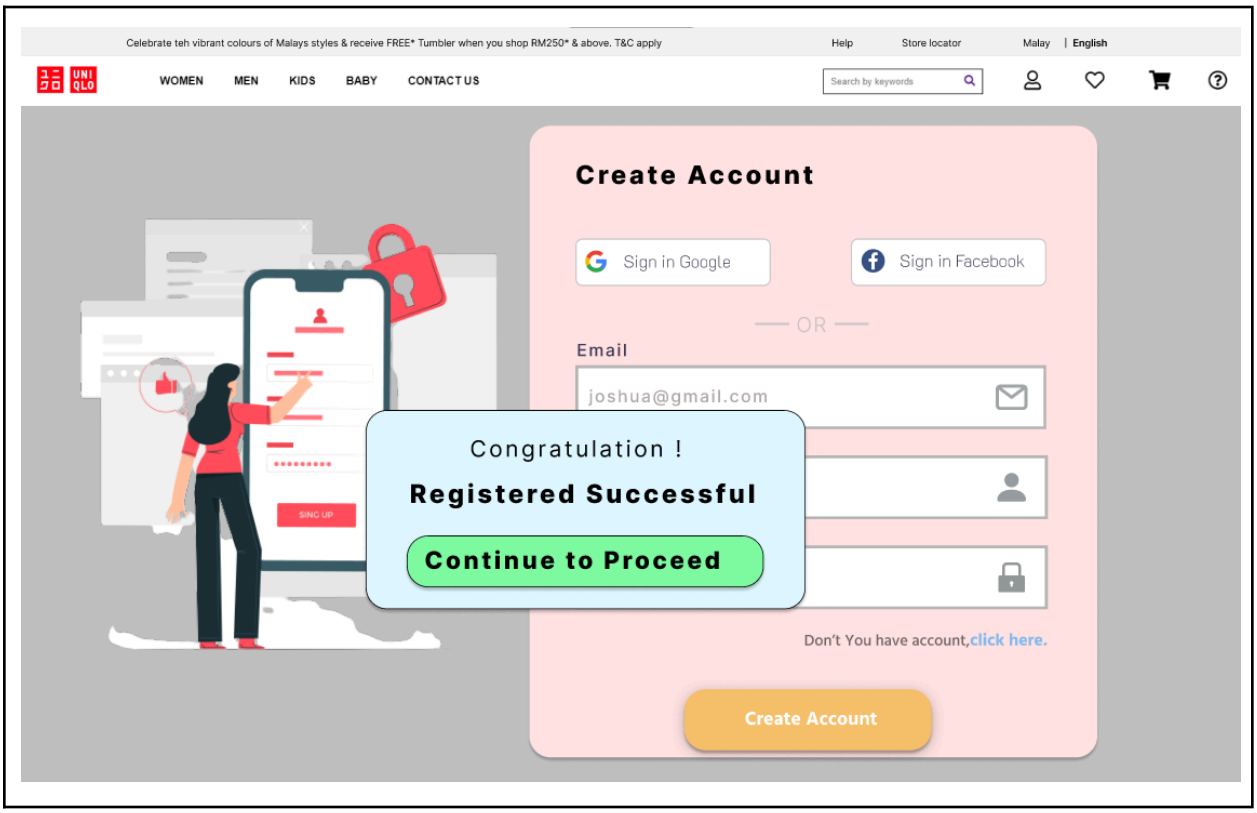


Figure 3.1

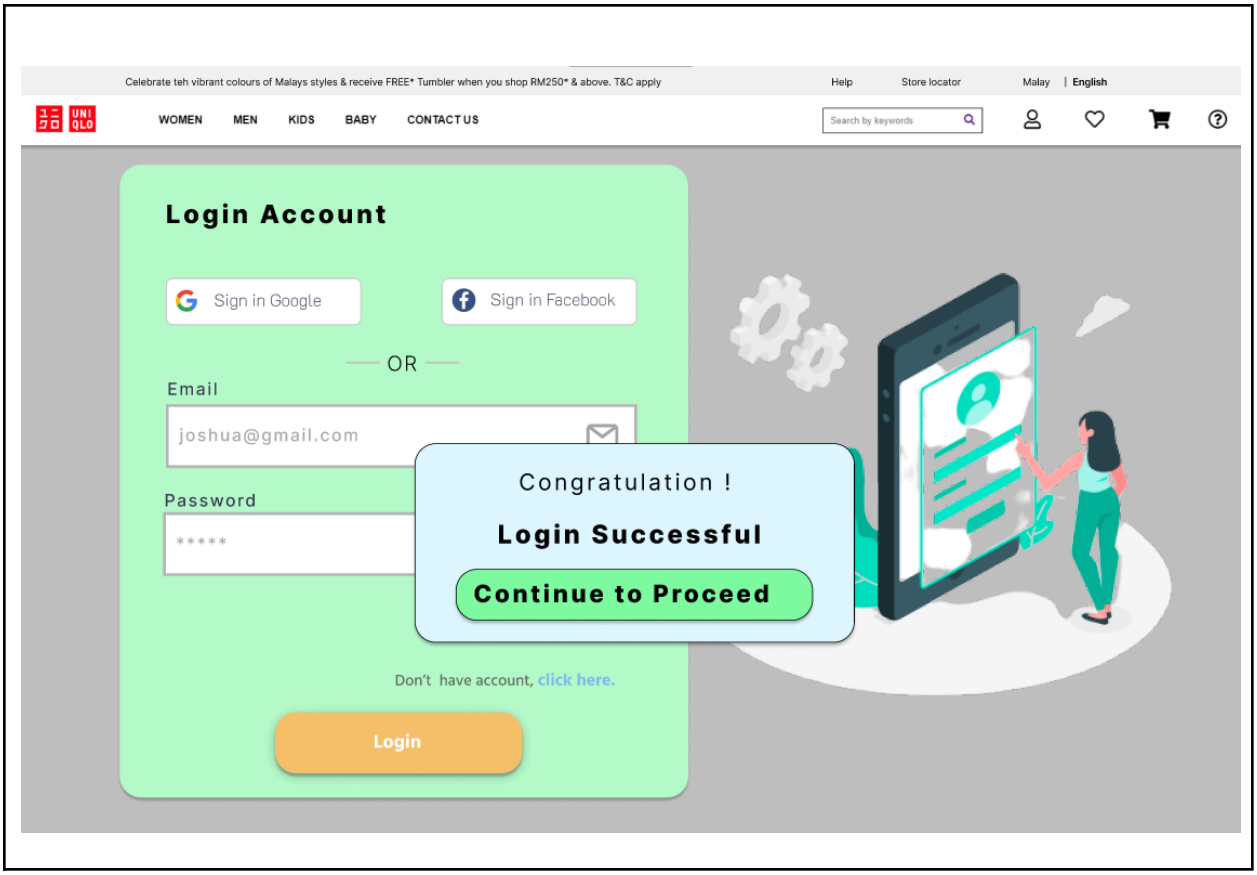


Figure 3.2

In Figure 3.1 and 3.2 the proposed system had prompted the successful notification after the sign up and sign in process. It is necessary to prompt a notification for every procedure in the system to minimal surprises of the user. Therefore the user will know he had completed the task and can continue to proceed to the next page.

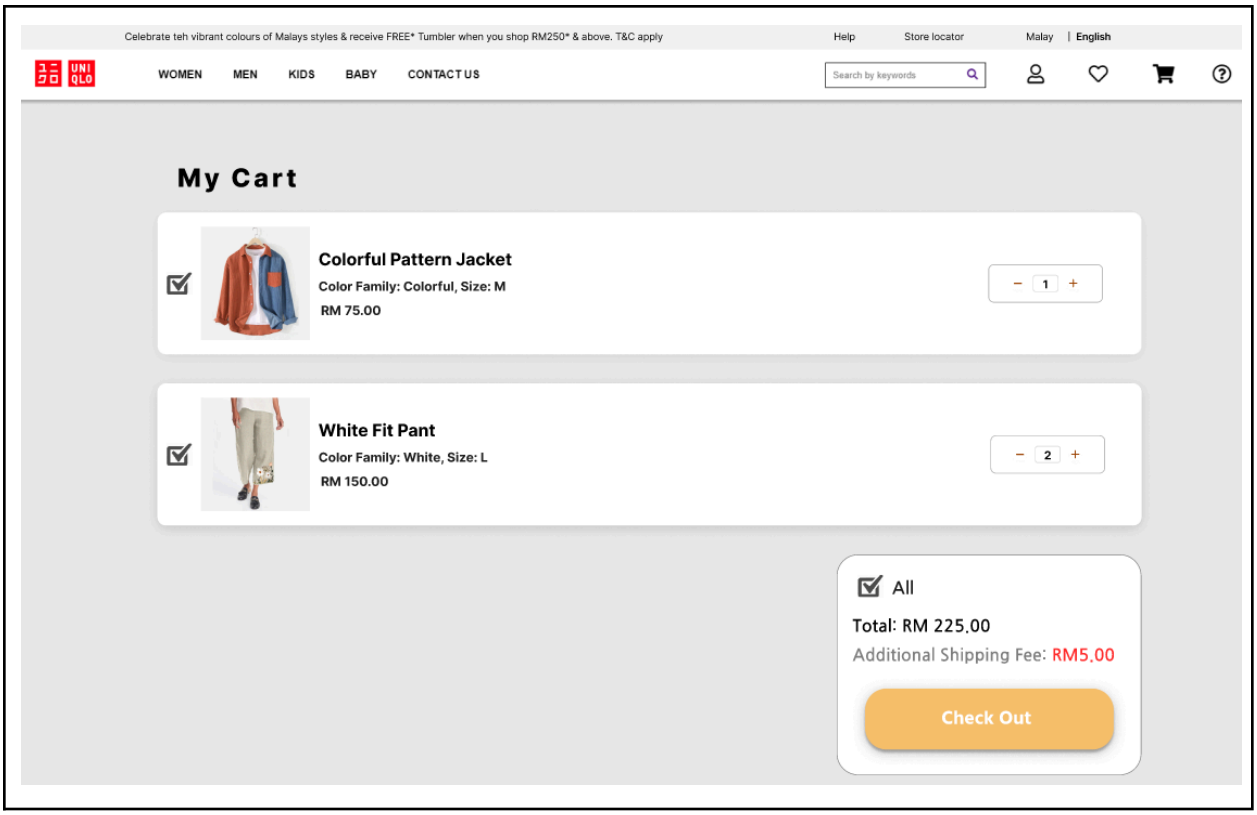


Figure 3.3 Shopping cart with clear layout

When the user clicks on the cart icon on the menu, they are taken to a dedicated “My Cart” which is similar to Figure 3.3 page which provides a summary of the items in their cart, along with the quantities and price. Thus, users can quickly review their selections.

3.4.4 Recoverability

Recoverability refers to the ability of the users to easily recover from errors or undesirable actions within a system or application. It involves designing interfaces in a way that minimises the impact of errors and provides users with clear solutions to resolve issues and proceed to their intended tasks.

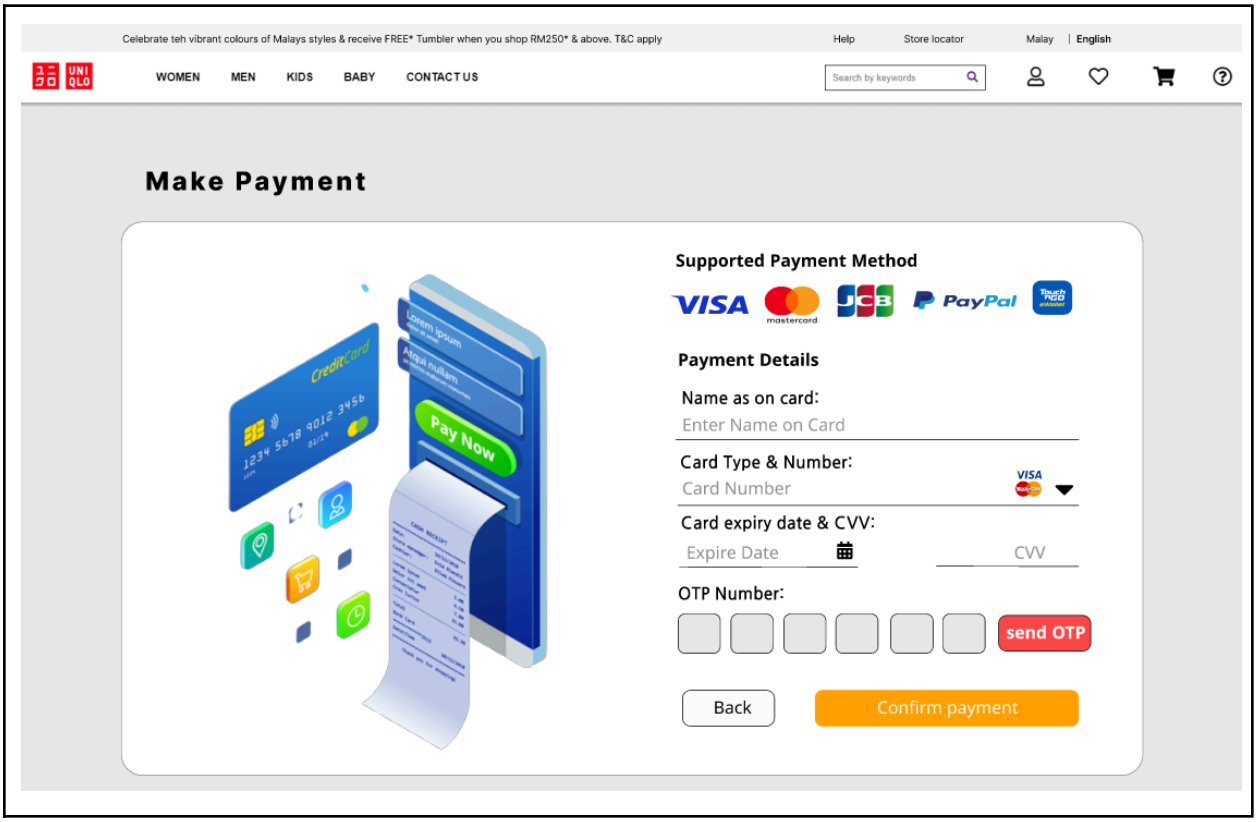


Figure 4 Payment Page allow to back previous page

In Figure 4, there is a “Back” button besides “Confirm Payment” button to allow users to click on it if they accidentally press “Check Out” and they do not want to make payment yet. With the “Back” button, the payment action is reversible if the users haven’t entered their payment details and proceed to the third party such as the Bank Authorization System.

3.4.5 User Guidance

User guidance refers to the provision of assistance, support and direction to users as they interact with an interface or system. It aims to improve the user experience by helping users understand how to effectively use the interface or system to perform tasks and achieve their goals. This means lesser frustration for users to experience with guidance available for them. For example, novice users require a guideline to easily utilise the system, and the instructions must be as easy as feasible. The difficult instruction should be kept away from the user interface.

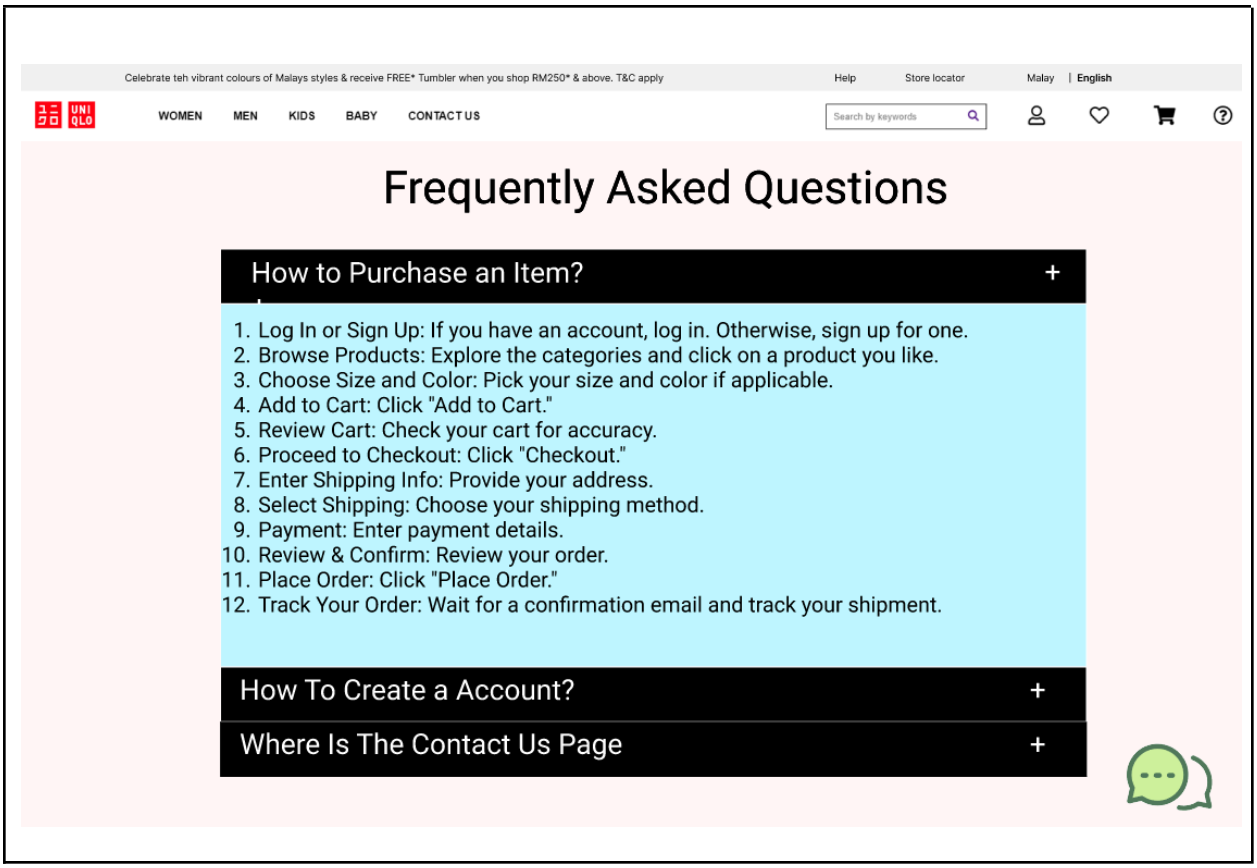


Figure 5 FAQ help to solve the user queue

In Figure 5, there is a guide on how to purchase an item in the Uniqlo online shopping system. By having the guidance, users can shorten the learning curve on this system as they do not need to spend much time on discovering and knowing the functionality and how the system works.

3.4.6 User Diversity

User Diversity refers to the recognition and consideration of the wide range of characteristics, user needs and ability that users possess. It emphasises the understanding that users vary in terms of their age, gender, cognitive ability etc. For example, language. The system will need to be able to handle the various characteristics of users such as the main speaking language of the user.

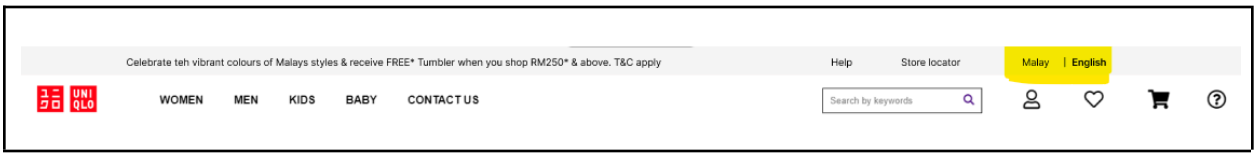


Figure 6: Dual language option for the customer

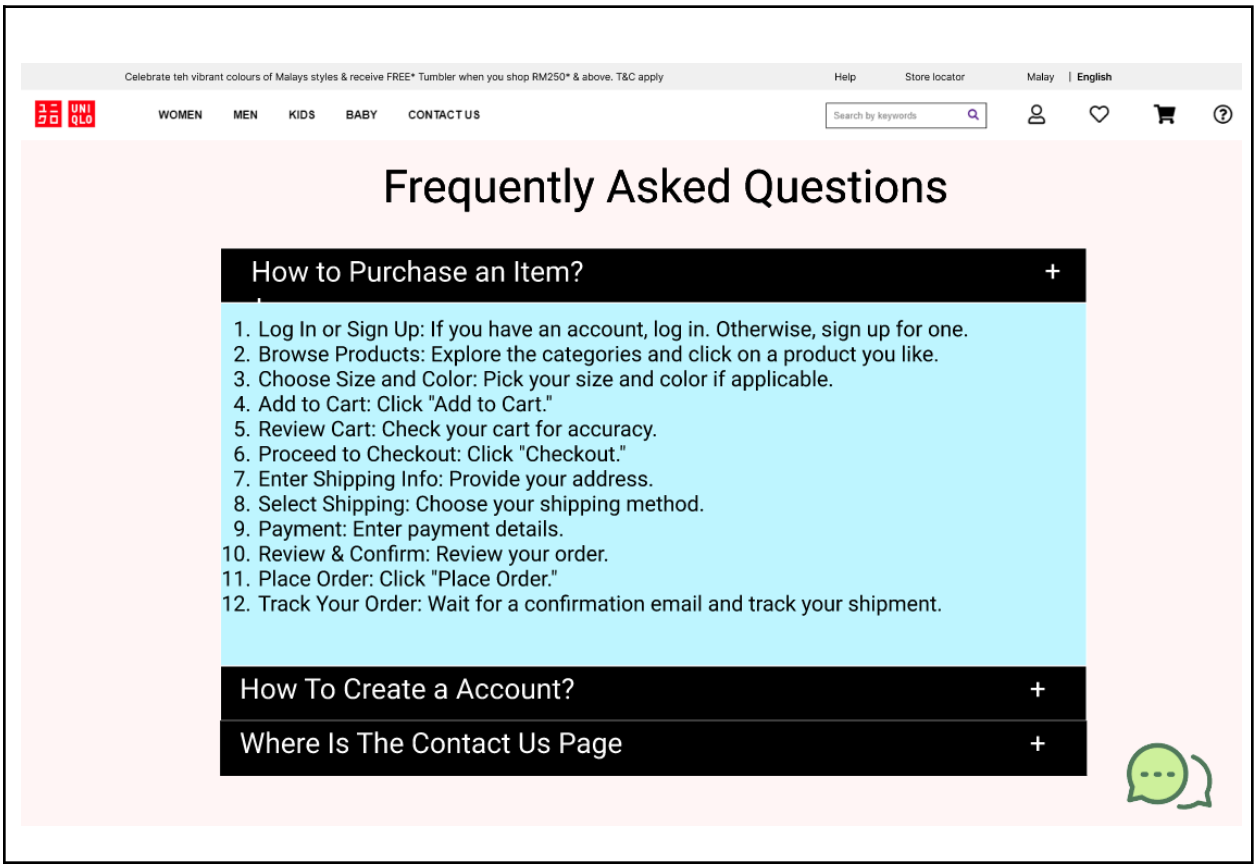


Figure 6.1 System using English Language

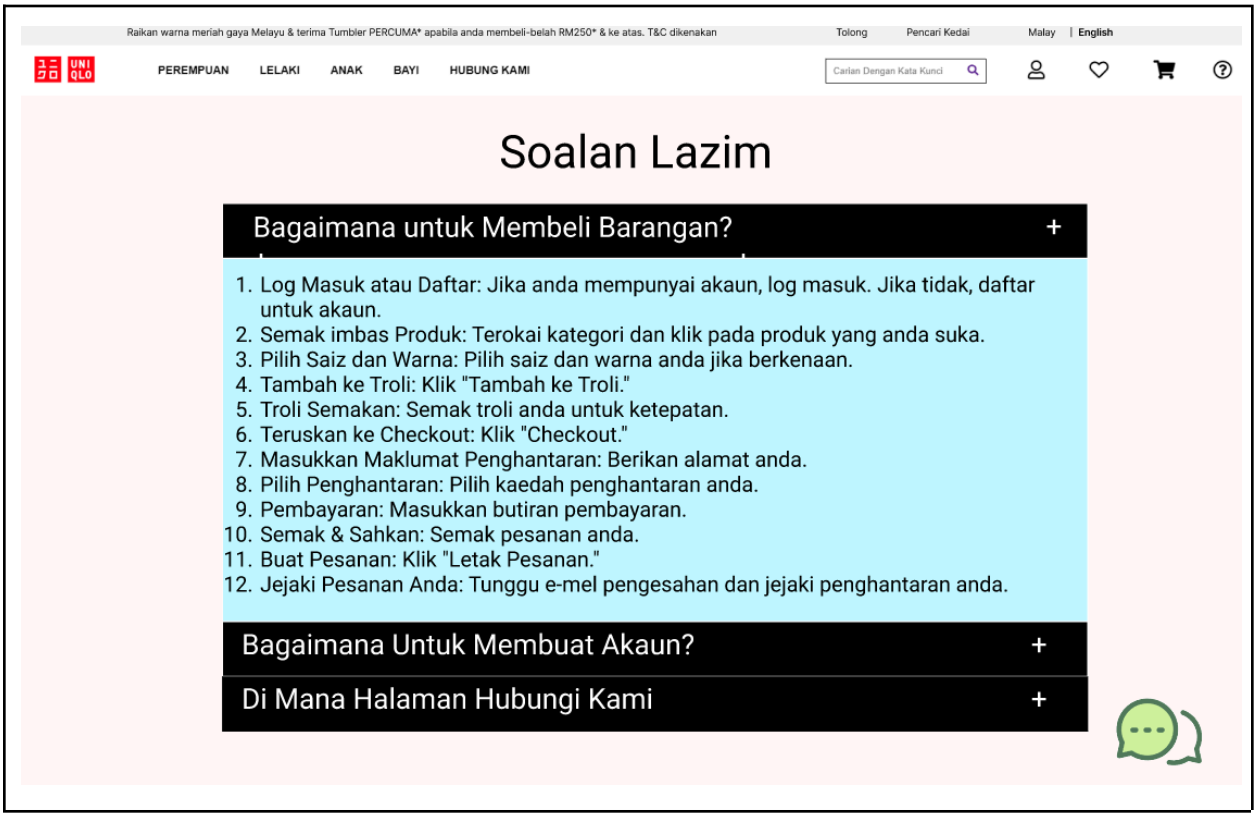


Figure 6.2 System using Malay language

Based on Figure 6, it can be seen that the navigation bar of the proposed system provides user dual language. The dual-language navigation bar is an excellent example of how to handle user variety. Because the system recognizes that users may speak multiple languages, it allows them to choose the language that best suits them. This enhances the user experience while also encouraging diversity and making the system more accessible to a larger audience.

It is a significant user interface design component since Malaysia has a large number of individuals who do not speak English well. Because certain Malay are seldom exposed to English, it should give them a distinct variety of the language so that they can utilise the system more effectively. Figure 6.1 and Figure 6,2 show two different languages that are available in the Uniqlo online shopping system.

4.0 Reference

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