Persatuan Teknologi Komputer (PETAKOM) Portal Management System

(PPMS)

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Bachelor of Computer Science (Software Engineering) with Honours

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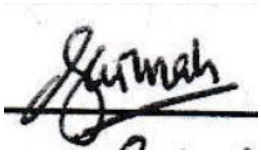

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Persatuan Teknologi Komputer (PETAKOM)
Portal Management System
(PPMS)

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ABSTRAK

Kemajuan teknologi pada masa kini telah menyebabkan banyak aplikasi berasaskan web dibangunkan. Begitu juga, projek berasakan web yang bertajuk Persatuan Teknologi Komputer (PETAKOM) Sistem Pengurusan Portal (PPMS) dimajukan. Matlamat projek ini adalah untuk menyediakan sistem pentadbiran portal berasaskan web untuk PETAKOM. Portal ialah sejenis aplikasi Web yang menawarkan antara muka pengguna tunggal untuk agregat bahan dan aplikasi bersambung. PPMS membolehkan PETAKOM mentadbir aktiviti kelab secara tersusun melalui portal, serta menyampaikan maklumat yang mungkin disampaikan bergantung kepada keutamaan pelajar fakulti pengkomputeran (FK). Portal, pada dasarnya, membolehkan pengguna pergi ke satu lokasi untuk mendapatkan bahan yang khusus yang berkait dengan minat dan keperluan mereka. Teknik penambahan dan pengulangan telah dipilih sebagai metodologi pembangunan untuk sistem ini. Teknik ini dipilih kerana ia memudahkan penambahbaikan. Reka bentuk sistem akan berdasarkan portal PPMS yang telahpun sedia ada daripada sistem semasa yang lain. Memandangkan sistem ini mesra pengguna, pengguna akan dapat memahami sistem dengan pantas dan melakukan aktiviti yang diperlukan daripada membuang masa mempelajari cara menggunakan sistem tersebut. Antaramuka pengguna sistem akan menjadi mudah dan responsif. Sistem yang dilaksanakan mampu melaksanakan pelbagai fungsi. Salah satunya ialah membenarkan pencipta kandungan FK menerbitkan bahan berkualiti yang berkaitan dengan teknologi dan permainan dalam portal. Susulan itu, PETAKOM boleh menyebarkan maklumat tentang program dan acara melalui laman web tersebut, memastikan pelajar FK tidak terlepas sebarang maklumat.

ABSTRACT

Persatuan Teknologi Komputer (PETAKOM) Portal Management System (PPMS) has been developed to provide a web-based portal administration system for PETAKOM. PPMS enables PETAKOM to administer the club's activities in an organized manner via the portal, as well as to deliver information that may be presented depending on the preferences of the Faculty of Computing (FK) students. The rapid application development technique was selected as the development methodology for this system. This technique was selected because iterations allow for easy improvement. The system's design will be based on existing information providing portals from other current real-life systems. Since this system is user-friendly, the user will be able to rapidly comprehend the system and do the required activity rather than wasting time learning on how to use the system. The system's user interface would be simple and responsive. The implemented system can perform a wide range of functions. The system also allows FK student to book PETAKOM room for any occasions. Aside from that, another module enables FK Students to lodge complaints regarding the organization or Faculty via the portal. Following that, PETAKOM can disseminate information about programs and events via the site, ensuring that FK students do not miss out on any information. Finally, PETAKOM can manage merchandise through the portal as well enabling FK students to purchase the merchants.

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LIST OF ABBREVIATIONS

FK	Faculty of Computing
PETAKOM	Persatuan Teknologi Komputer
PPMS	PETAKOM Portal Management System
UMP	University Malaysia Pahang
PHP	Hypertext Preprocessor
CSR	Corporate Social Responsibility
HTML	Hypertext Markup Language
GUI	Graphical User Interface
PMS	Portal Management System
NGO	Non-Government Organization
WCMS	Web Content Management System
AEM	Adobe Experience Manager
UM	Universiti Malaya
UMUC	Universiti Malaya UNESCO Club
API	Application Programming Interface
ICONCIDI'22	International Conference on Civilisational Dialogue 2022
UNESCO	United Nations Educational, Scientific and Cultural Organization
SDLC	System Development Life Cycle
RAD	Rapid Application Development
UAT	User Acceptance Test

CHAPTER 1

INTRODUCTION

1.1 Introduction

Persatuan Teknologi Komputer (PETAKOM) is a student organisation for students of Faculty of Computing (FK) at Universiti Malaysia Pahang (UMP). PETAKOM acts as a representation and a liaison between students and faculty for FK students, ensuring the students' well-being are being managed. PETAKOM's management team consist of several high committee members and advisors. PETAKOM high-committee members will alternate every two semesters based on polling. It is mandatory for the PETAKOM high committee to plan educational, career development, multimedia, and technologically connected activities and events for the fellow students throughout each semester. It will be easier for administrators to administer and monitor the system by sharing all programs and events if the site exists. This will also benefit students because they will not miss out on any information about programs, events, and news announcements. Next, it will be easy for PETAKOM to leverage their organization’s activities and merchandise through the portal. This will be helpful for PETAKOM in generating income to be used later for students’ well-being. PETAKOM may also provide knowledge about current technologies with students. The students also can suggest any programs that they wish to hold via the suggestion form that will be added in the PETAKOM portal. Students can also voice out their unsatisfaction over the facilities in Faculty of Computing (FK) via the complaint form provided in the portal. If all of this had to be done manually for example blasting material over social media, it would be time consuming and labour intensive.

1.2 Problem Statement

As an organization, PETAKOM does not has its own portal to manage their organization. At the very same time, majority FK students are ignorant of the establishment of the PETAKOM organisation as a student representative of the faculty. One of the major issues that PETAKOM faces is that most of FK students do not have access to proper information. This is due to PETAKOM's utilisation of a social media and E-community platform to disseminate event and programs information. At the same time, various information is provided through the E-community and social medias, causing students to overlook the information updated by PETAKOM. Even on social media, many people do not follow the official PETAKOM account. As a result, students lose out on the information provided by PETAKOM. Aside from that, publishing information or materials on social media takes a significant amount of time. PETAKOM administrators must log in to Instagram, Facebook, and Twitter in order to upload all of the components for a program and event and blast them over the social media platforms. Even though it looks like a simple job but then it really takes time to do it.

1.3 Objectives

The objective of this study are as follows:

i. To study the characteristics and functionality of existing portal management systems.

ii. To develop a portal management system for PETAKOM Portal Management System (PPMS).

iii. To validate the effectiveness of PPMS based on Schneiderman’s Eight Golden Principles.

1.4 Scope

There will be a few scopes set to ensure that the objectives are met:

i. This portal is only cover for UMP PETAKOM organization.

ii. This portal consists of five modules which are manage content, manage program suggestions, manage complain, manage merchandise, and manage PETAKOM Room reservation.

iii. This portal is built entirely with Laravel, a free and open-source PHP web framework.

iv. User of the system only covered for PPMS admin and for FK Students.

1.5 Significant of the project

i) FK Students

FK students may have prior knowledge of how a portal operates and thus acquire a better comprehension. Through the portal's contents, they may obtain information about PETAKOM's programmes and also able to suggest programs, lodge a complaint, buy PETAKOM’s merchandise and also reserve PETAKOM room.

ii) PETAKOM Admin

PETAKOM administrators can share information and posters about the association's programmes. At the same time, the admin can also manage the complains, program suggestions, merchandise and also PETAKOM Room reservation.

1.6 Report Organization

This report is divided into five chapters. Chapter 1 provides an overview of the project, including the Introduction, Problem Statements, Project Objective, Scope, Importance of the Project, and Report Organization.

Chapter 2 provides a brief overview of the project's literature study, which compares existing systems and discusses their benefits, drawbacks, and features.

The technique employed in this project is explained in Chapter 3, which includes the software methodology, software and hardware requirements, pseudocode, and diagrams. Rapid Application Development (RAD) model was chosen and will be implemented in developing this project. This project's stages include Requirement Phase, User Design Phase, Development Phase, and Cutover Phase.

Chapter 4 discusses the implementations, results, and discussion of this project. All the project's outcomes during development and implementation were discussed briefly in this chapter.

Chapter 5 concludes and summarises the project's outcome. In this chapter, the limitations and future works were clearly reviewed.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Examination of the literature on this topic reveals an in-depth comprehension of the Portal Management System (PMS). Prior to the invention, most website modifications had to be made via source code and a web programmer, but now, thanks to content management systems (CMS), all changes may be made via a specific form that appears on the website. It is made up of two key components that contribute to its effectiveness: a content management application and a content delivery application.

A content management system (CMS), is software that allows people to generate, manage, and edit website content without requiring specialist technical skills (Kinsta, 2021). Since portal pages comprised both apps (portlets and widgets) and web content, most portals began to offer integrations with an external Web Content Management System (WCMS), allowing material to be created or controlled in a WCMS and then displayed in a portal page. The key benefit of using WCMS is the online user-friendly interface and database access such as adding, editing, and publishing data. With its online template and plug in, the process of organising the database in design phases may also be simplified (Kolichenkov, 2014). Many portals were inspired to construct an embedded WCMS because of two-step content creation method (Hinz, 2011).

This chapter exhibits familiarity with a body of information and promotes the system's trustworthiness. It also summarises previous research and explains how current endeavour relates to it. This chapter combines and summarises the information available

regarding this portal system. Finally, it displays what has been learnt from other portals and how this study might be used to generate new ideas for the portal that is being developed.

In universities, various Portal Management Systems (PMS) are already in place that uses CMS framework. Only a few uses PHP framework. Three existing Portal Management Systems (PMS) were explained in detail. Studies are conducted on the portal of Taylor's Orientation Leaaders, portal of Zoologiko Club of Universiti Putra Malaysia (UPM), and portal of Universiti Malaya UNESCO Club (UMUC) in terms of appearance, features advantages and disadvantages of the portal system and the outcome of the comparisons on the features. The comparisons are done so that the PETAKOM portal that will be develop in this project will be a better version.

2.2 Review of Existing System

This section will look at three existing portal management systems. These three portal systems are the portal of Taylor's Orientation Leaders, portal of Zoologiko Club of Universiti Putra Malaysia (UPM), and portal of Universiti Malaya UNESCO Club (UMUC). Each of these portal systems are unique in terms of functionality and scope.

2.2.1 Taylor's Orientation Leader portal

Taylor's Orientation Leaders are a group of seniors who are prepared to guide juniors through their first E-orientation. It is a student body that collaborates with Taylor's Student Development (SD) to help new freshmen adapt to university life. The purpose is to improve new students' first-year experiences at Taylor's by instilling the Taylor's Culture of Excellence in them. The university's priority is to aid new students in assimilating to their new learning environment. (Orientation Leaders, n.d.)

This Taylor's portal features a header with its logo at the top and the navigation panel below the logo. The information in the navigation panel includes Study, Campus Life, Administration & Aid, About Taylor's, Teaching & Learning, and Research & Enterprise. It primarily represents information about Taylor's University, such as faculties, career services, accommodation, facilities, programmes, fees, administrations, scholarships, academics, research and

other relevant information. When the user clicks on a navigation tab, a drop-down menu appears, showing the available options for that respective navigation tab.

When scrolling down, the navigation panel remains on top of the screen until another navigation panel appears above it. The second sticky navigation panel contains information about the Orientation Leaders as navigation tabs such as About Us, Explore Our Activities, Sharing from Us, Be a Part of Us, and Contact Us. When the user clicks on the navigation tab, it links to content on the same page by scrolling rather than directing to another page. This reduces loading time because the information is supplied in less than a second since the information is in the same page.

Following that, this site employs a chatbot function called as Taylor's Live Chat. A chatbot is an API, a pre-programmed chat interface with which a website user may engage. They are developed to precisely resemble human behaviour and communicate in a conversational manner with website visitors (6 Reasons to Consider Using a Chatbot on Your Website, n.d.). Chatbots assist users in getting to the point as fast and easily as possible without leaving them feeling behind or bewildered. Chatbots are internet helpers that help visitors navigate through portal information.

Adobe Experience Manager (AEM) is the CMS utilised for this portal, and it is written in Java. Adobe Experience Manager (AEM) is an enterprise content management system (CMS) that optimises the creation, management, and distribution of content and digital media. AEM enables the creation of one-of-a-kind digital experiences as well as the management of completely context-specific messages that scale across products, services, organisations, and nations. Taylor's University utilises AEM because it wants to develop its network abroad and showcase its brand.

The portal also has social networking APIs. A social networking API is a sort of API that social media networks expose to allow third parties to access media data and features that may be integrated into portals. This portal includes social media APIs from Facebook, Instagram, YouTube, Twitter, and Spotify. When a person clicks on any of the social media APIs, they are brought to Taylor's University's social platform.

In terms of graphical user interface (GUI), the portal has an interactive homepage. The homepage is the first thing that a user will see when they access a portal. The homepage is sleek, with straightforward navigation and a high level of interactivity. Most

of the contents are important for Taylor's University newbies who are associated to the orientation resources. Instead of scrolling all the way to the portal's above-the-fold layout, the user may simply click on the return to top arrow in the footer to scroll the page back to the top. The user experience is straightforward since the portal requires fewer clicks. The portal also maintains uniformity in the type of typefaces used across the portal and the appropriate hierarchy is employed to identify the type of articles.

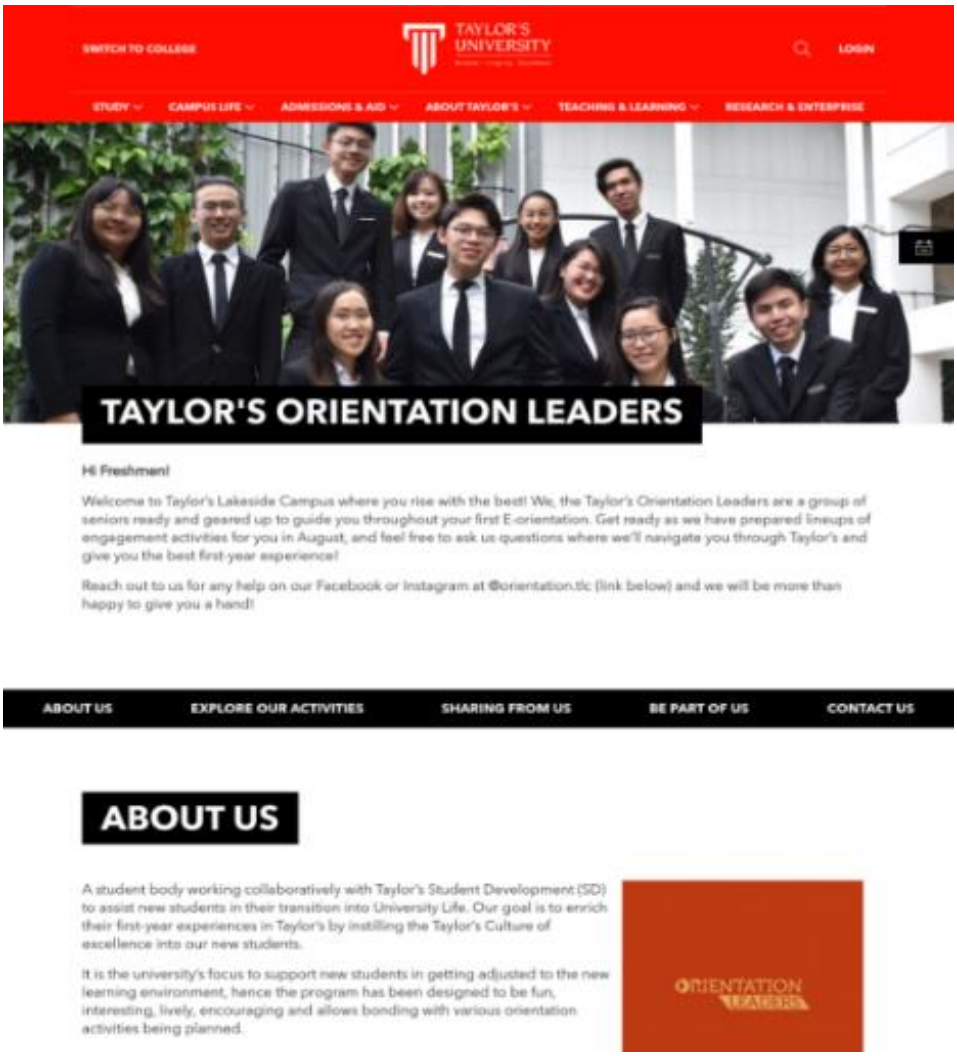

Figure 2.1 Taylor's Orientation Leader portal

2.2.2 Zoologico Club of Universiti Putra Malaysia (UPM) portal

The Zoologico Club is a student organisation linked with Universiti Putra Malaysia's Faculty of Veterinary Medicine (UPM). The club serves as a sub-club of the faculty's primary veterinary student organisation, Veternak. However, UPM veterinary students would be given first preference for club membership. The goal of the Zoologico club is to be an animal lovers club, which is the only one at UPM. Although the club does not have its own portal, it is linked to the faculty site.

The portal's primary header consists of the UPM logo, followed by the faculty's name beneath the iconic image. Below the faculty name, there is a navigation panel that is not attached to the top of the screen, which implies that the header will not be seen as the user slides down the portal. When the portal is scrolled down, the user cannot readily reach the navigation tab. To access the navigation tab, the user must either scroll up to the above-the-fold layout on the portal or simply click on the arrow button that displays on the right bottom of the screen once the navigation panel has been withdrawn from the user's view.

The navigation panel contains 'About us' option that shows information about the faculty, such as vision and mission. The 'Department' category contains information about the departments that are offered in the faculty. The 'Academic' page shows information about undergraduate, postgraduate, alumni, and specialised academics, while the 'Research' tab highlights information about research topics, centres of excellence, research outputs, and grants. The 'Veterinary Hospital' page displays information on the university veterinary hospital. The 'VLSU' tab, which stands for Veterinary Laboratory Services Unit, contains information about the services. The 'Services' page focuses on the services offered by the faculty. The 'New Student' tab displays briefing information for the new student, and the 'Animal Welfare Fund' tab indicates the type of funds as well as an e-payment link for donations.

The portal supports the use of two languages: English and Malay. This portal is categorised as a multilingual portal since it provides information in more than one language. The user can select the language options they desire based on their preferences. This overcomes the language barrier issue because the portal provides the opportunity to change the language. PHP is the programming language utilised to create this portal.

There is no CMS software used to handle the information that must be shown on the portal.

Following that, the portal offers an extra usability, accessibility, and user experience features in which the font size may be increased, decreased, or maintained at the default font size. This will help individuals who are having difficulty reading the portal's text. The portal also allows the user to change the background colour from purple to blue, grey, or black. Using a contrast colour, such as black, makes the text more readable. Aside from that, the portal includes another function called screen reader software, which represents accessibility. The programme is used to assist challenged people in converting text to voice and audio speech.

This portal's user interface is a catastrophe. The portal has a look and feel issue since the visual design is poor. A poor visual design will leave a negative impression since it immediately evokes a sense of untrustworthiness (Sharp, 2022). The typefaces are poorly matched and difficult to read. The portal's typography and font colour use are both poor. The portal has a lot of content and is a lot messier because there are so many links to different material on the portal. There are insufficient space and kerning for the sentences, making them difficult to read. In addition, a social media API is included into the portal. The portal includes APIs for social networking platforms such as Facebook, Twitter, LinkedIn, and email. Rather of looking for the club's social media on a social media site, users may just click on the API to be directed to the club's social media page. This portal's intended audience includes faculty students and staff only.

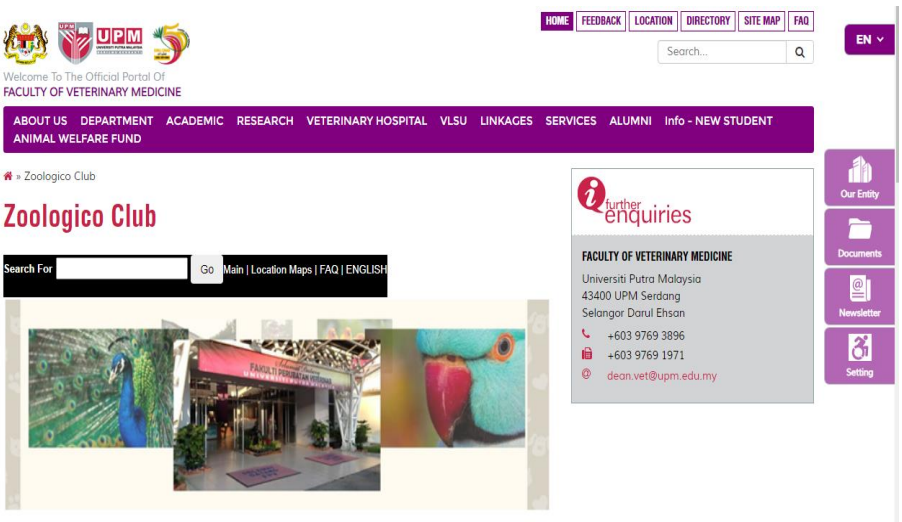

Figure 2.2 Zoologico Club of Universiti Putra Malaysia (UPM) portal

2.2.3 Portal of Universiti Malaya UNESCO Club (UMUC)

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) is a United Nations specialised organisation tasked with advancing global peace and security via international collaboration in education, arts, sciences, and culture. The Universiti Malaya UNESCO Club (UMUC) is one of the UNESCO units accessible at UM. The function of the club is to provide training to club members, to enlighten both members and the broader public by sharing knowledge about national and global concerns, and to take action and implement activities that are necessary for the club's continuous existence.

The complete name of the club, as well as contact information such as email and phone number, can be found at the top of the portal. The social media API is placed on the right side of the user's screen. Facebook, YouTube, Twitter, and Instagram are among the social media APIs that have been integrated into the portal. When a user clicks on the APIs, they are sent to the club's social media.

Below the social media API is the university logo on the left side of the user's view and the club's moto on the right side of the user's view on the portal. Below the university logo, there is also a navigation panel. The sticky navigation panel has tabs for Home, About UMUC, Activities, Membership and UNESCO.

When the mouse is hovered over a navigation tab, a drop down menu shows options. The Home tab displays the portal's main page. The About UMUC tab provides information about the club, such as its vision, purpose, duties, and functions. The Activites page includes all of the activities completed since 2009 until the present. The Membership page emphasises the benefits of being a member of the club as well as the application Google Form to become a member of the club. The UNESCO tab takes you to the home page of the UNESCO website. The portal is managed without the use of CMS software, however it is built with the Bootstrap framework. Bootstrap is an HTML, CSS, and JavaScript framework that is free and open source.

The homepage of the UMUC portal is very interactive. The visual design is excellent. The portal necessitates fewer clicks, resulting in a better user experience. The site also maintains consistency in the fonts used across the portal, and the proper

hierarchy is utilised to designate the type of content. The portal makes use of adequate spacing.

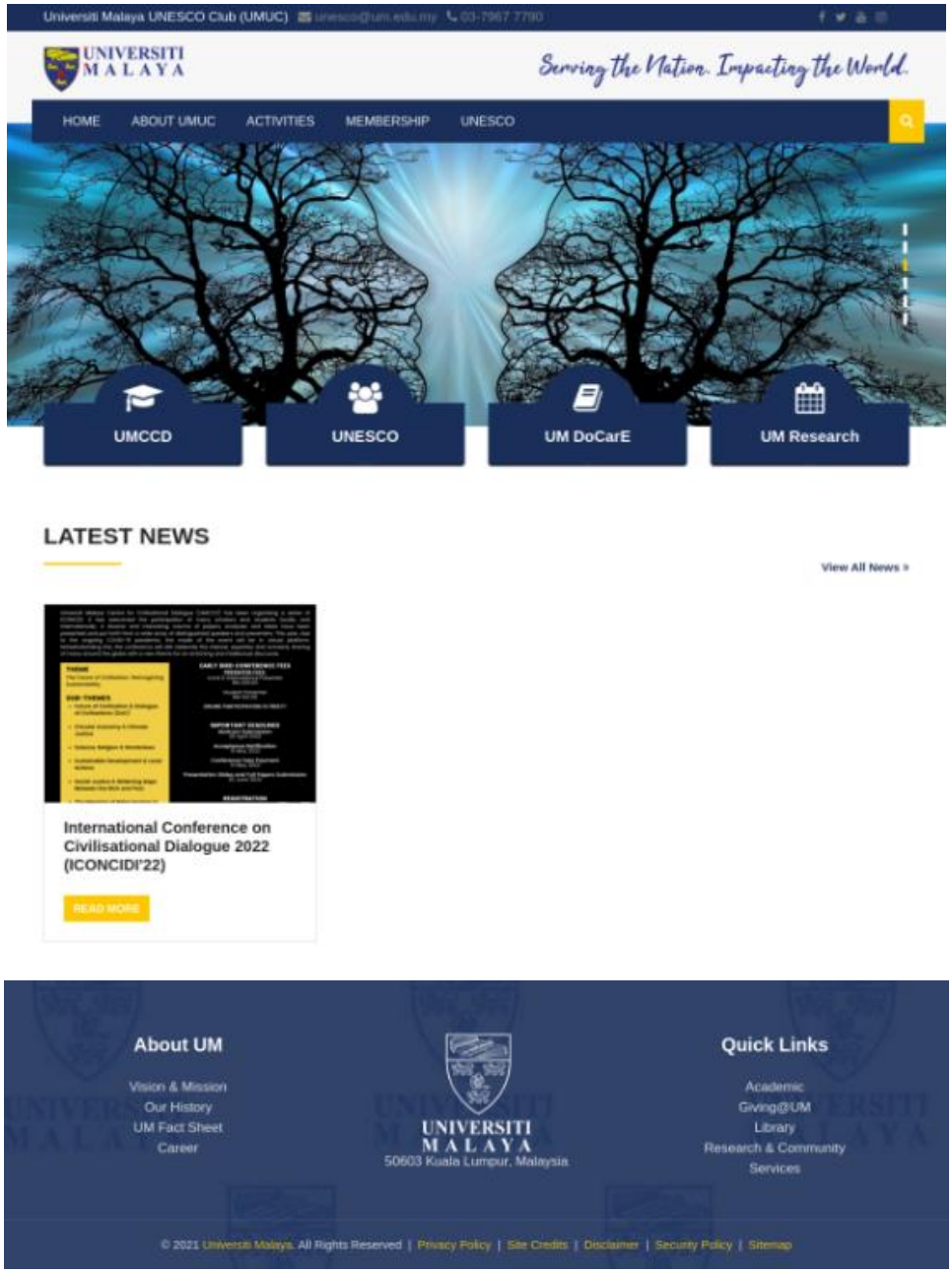

Figure 2.3 Portal of Universiti Malaya UNESCO Club (UMUC)

2.3 Summary Comparisons of Existing System

Table 2.3.1 summarises the existing portal management systems and the proposed system based on the prior review. The comparison with the proposed project can assist in identifying deficiencies in the present system. This comparison aids in the improvement of the new portal management system's productivity and quality.

Table 2.1 Comparison of Existing Systems

Features	**Taylor's Orientation Leader portal**	**UMUC portal**	**Zoologico Club portal**	**PPMS portal**
Graphical User Interface (GUI)	- Good Visual Design - Simple and minimalism	- Poor Visual Design - Messier interface - Compact Content	- Good Visual Design - Simple and minimalism	- Good Visual Design - Simple and minimalism - Trendy, intuitive design and user experience
Consistency in the system	- Layout is consistent throughout the system	- Layout is not consistent throughout the system	- Layout is consistent throughout the system.	- Provide consistent layout

Features	**Taylor's Orientation Leader portal**	**UMUC portal**	**Zoologico Club portal**	**PPMS portal**
Application Programming Interface	- Social Media API - Chatbot API	- Social Media API	- Social Media API - Google Translator API	- Social Media API - Analytics Reporting API - Google Sheets API
Target Audience	Newbie students who are going to enter Taylor's University.	UM students who are and wishing to be part of UNESCO club.	UPM students who are part of the club.	UMP Faculty of Computing (FK) students and staffs and PETAKOM Administrator.
Accessibility by Disabled People	None	None	- Can modify font size. - Can change background colour. - Screen Reader software	None
Navigation Panel	Sticky	Not Sticky	Sticky	Sticky
Secure Access	Secure HTTPS access	Secure HTTPS access	Secure HTTPS access	Secure HTTPS access
Framework	Adobe Experience Manager	None	Bootstrap	Laravel
Programming Language	Java	PHP	HTML, PHP, CSS	HTML, PHP, CSS

Table 2.2 Depict the advantages and disadvantages of the existing systems.

Features	**Taylor's Orientation Leader portal**	**UMUC portal**	**Zoologico Club portal**
Advantages	- Can view in both windows and mobile screen - Flexible Layout resolution	- Can view in both windows and mobile screen - Flexible Layout resolution	- Can view in both windows and mobile screen - Accessibility by disabled user
Disadvantages	Not Accessible by disabled user	Not Accessible by disabled user	Layout resolution is not flexible

2.4 Conclusion

As a conclusion to this chapter, the three current systems, FK portal, Zoologico Club UPM portal, and YUMP portal, which were previously examined based on their characteristics, benefits, and weaknesses, were compared to each other. Based on this, several functionalities and features that can be added to the proposed system.

The next chapter will cover the technique used to construct the PETAKOM Portal Management System (PPMS) and how that methodology was utilised in the system's development.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter will discuss and review the technique adopted as a framework for developing the proposed project. It will go into detail on how to analyse, design, and create the system utilising the System Development Life Cycle (SDLC). (SDLC) is a systematic procedure that allows for the creation of high-quality, low-cost software in the lowest amount of time. The SDLC's purpose is to create exceptional software that meets and surpasses all client expectations and needs. The SDLC develops and describes a thorough plan comprised of stages, or phases, each with its own procedures and deliverables. Adherence to the SDLC improves development speed while reducing project risks and expenses associated with alternative production techniques (Synopsys, n.d.).

There are several SDLC methodologies, such as Agile, Waterfall Development, and Rapid Application Development (RAD). The SDLC is a critical method for ensuring that there are no errors or problems when developing the system. RAD is a common agile project management method in the software development industry. The main advantage of a RAD method is quick project turnaround, which makes it an appealing alternative for engineers working in a fast-paced setting such as software development (Lucidchart Blog, 2018). Choosing the RAD model as a technique to create the proposed system may control the development process and increase the quality of the project flow.

3.2 Rapid Application Development (RAD)

Rapid application development is a software development process that emphasises rapid prototyping over extensive planning. A prototype is a functionally identical functioning model of a product component. The functional modules in the RAD model are produced in parallel as prototypes and then combined to create the whole product enabling faster product delivery. Because there is little formal planning, it is easier to accommodate modifications into the development process.

Figure 3.1 depicts the stages of the Rapid Application Development (RAD) methodology. The RAD technique will be used to execute this project. PETAKOM Portal Management System (PPMS) development is best suited to RAD since it can complete a project in a short period of time while maintaining a high level of quality. The tools such as CASE tools, code generators, and prototyping are the factors that allow the system to be completed in a short period of time. RAD is a changeable and flexible tool, which is ideal for this project because it is completed in a short period of time.

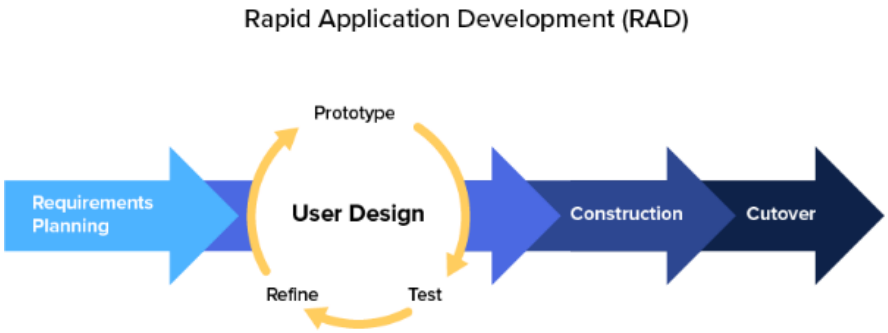

Figure 3.1 Phases in RAD

3.2.1 Requirement Phase

During this phase, the developer must conduct research on the present situation by collecting data and conducting surveys to learn about the problems that have arisen inside the PETAKOM organisation as well as the opinions of the high committee members. The proposed PPMS is compared to three existing portal management systems. The requirements are stated based on the portal area model and scope of the proposed portal provided by PETAKOM high committee members as well as the organization's

advisor. The requirements are then finalised, and approval is acquired to proceed with the implementation.

3.2.2 User Design Phase

It's time to get right into development at this point, fleshing out the user design with numerous prototypes. A framework, such as a use case and sequence diagram, will be designed for the PPMS and exhibited to clients. The user interface will also be developed based on the client's specifications and a comparison of the three existing systems.

3.2.3 Construction / Development Phase

During this phase, the developer must finish the detailed design of the PPMS portal as well as the designs that will be utilised to construct the site. The Figma is used by the developer to create the portal's prototype, while PHP programming language is used to create the system, Laravel is used to build the system interface, and PHPMyAdmin is used to administer the portal's database. The developer employs the XAMPP control panel in order to enter the portal's operating system. After development was completed, the system should be sent to ensure that it ran smoothly. In this example, the User Acceptance Testing (LAT) approach was adopted, which is a process of ensuring that a solution works for the end-user in a real-world setting before releasing it on the client site (Mathew 2018). FK students and PETAKOM administrators are the end users. If there is a fail function, the results of the testing must be reported in the User Acceptance Test (UAT).

3.2.4 Cutover Phase

This is the phase of implementation in which the final product is released (*Lucidchart Blog*, 2018). The system is already in production at this point. The developers prepare existing data for the new system and instruct users on how to utilise it. The User Manual is created to assist users in learning how to utilise the system, particularly administrators in learning how to administer the administration page. The developer also offers assistance in resolving any issues that may emerge shortly after the programme is operational.

3.3 Project Requirement

The features, functions, and activities that must be performed for a project to be considered successful are referred to as project requirements (Davey, 2021). They define the numerous goals for stakeholders to fulfil and provide everyone involved with a clear set of criteria to strive toward. The issue is that not all stakeholders have crystal clear expectations or thoughts about the finer points since they only care about the result.

3.3.1 Functional Requirement

Functional requirements describe ways a system must behave and what a software system should do (Tkachenko, 2019). It defines a function of a software system or its module. Functionality is measured as a set of inputs to the system under test to the output from the system.

Below are the lists of functional requirement :

- The content in the portal should be accessible to the FK students.
- The system should allow FK students to navigate from one page to another.
- The admin can add, edit, delete the content that has to be shown in the portal.
- FK students can suggest programs and lodge complains through the portal.
- The admin can login into the admin page of the portal as an admin
- The targeted user of the portal should know a little knowledge on how to access a portal.
- The portal should contain information related to PETAKOM programs, and technological updates.
- The admin can manage the merchandise in the portal and the students can purchase the merchandise.
- The students can reserve PETAKOM Room using the subsystem that will be added into the portal.

3.3.2 Non-Functional Requirement

Non-functional requirements are quality attributes that indicate how a system should behave. The non-functional requirement is concerned with "what a system should be" rather than "what a system should accomplish". They are typically developed from functional requirements based on customer and other stakeholders' feedback (Functional Requirements And Non Functional Requirements, 2022). Non-functional requirements describe the quality characteristics of the system to be built, such as performance, portability, and usability.

Below are the lists of non-functional requirement :

- The portal should be available 24 hours in a day.
- The portal should be accessible by people with disabilities as well.
- The portal layout should be flexible.
- The portal should be view in both windows and mobile screen.
- The portal should prompt the FK students to login into the system before they reserve the PETAKOM's room.
- The portal should be compatible and can be opened in any web browsers.
- The portal should allow admin only, to login into the admin page of the portal.

3.4 Hardware and Software Requirement

Hardware and software are required to create the system. To achieve the hardware requirements, a laptop or personal computer is required. The development environment includes an operating system, an internet browser, a web server, a database server, interface design tools, a programming language, a coding IDE, and a back-end environment for software requirements.

3.4.1 Hardware Specifications

The hardware specifications for developing the PPMS are shown in Table 3.1.

Table 3.1 Hardware Specifications

Description	Tools
Processor	Faster than 1.7Ghz
Memory	More than 1GB
Hard Disk	10GB available space
Resolution	1024 X 768 or more

3.4.2 Software Specifications

The software specifications for developing the PPMS are shown in Table 3.2.

Table 3.2 Software Specifications

Description	Tools
Operating System	Above Windows 8
Internet Browser	Chrome, Edge, Mozilla, Opera
Web Server	XAMPP Server
Database Server	MySQL
Programming Language	PHP, HTML
Coding IDE	Visual Studio Code
Back-end	phpMyAdmin, MySQL
Collaboration Platform	GitHub
Prototype	Figma

3.5 Proposed Design

The diagrams in this section are produced based on the system's design. This is intended to ensure that the client understands the system's flow.

3.5.1 Flowchart Diagram

The flowchart of the PETAKOM Portal Management System (PPMS) is depicted in the diagrams below. According to the modules, the flowchart will be separated into two users, one for the PETAKOM Administrator and another for the FK students. Flowcharts are used to clearly represent the flow of the system.

The Figure 3.2 shows how the PETAKOM administrator can manage the contents inside the portal. The administrator can add, edit, and delete the contents inside the portal to be shown in the public view of the portal.

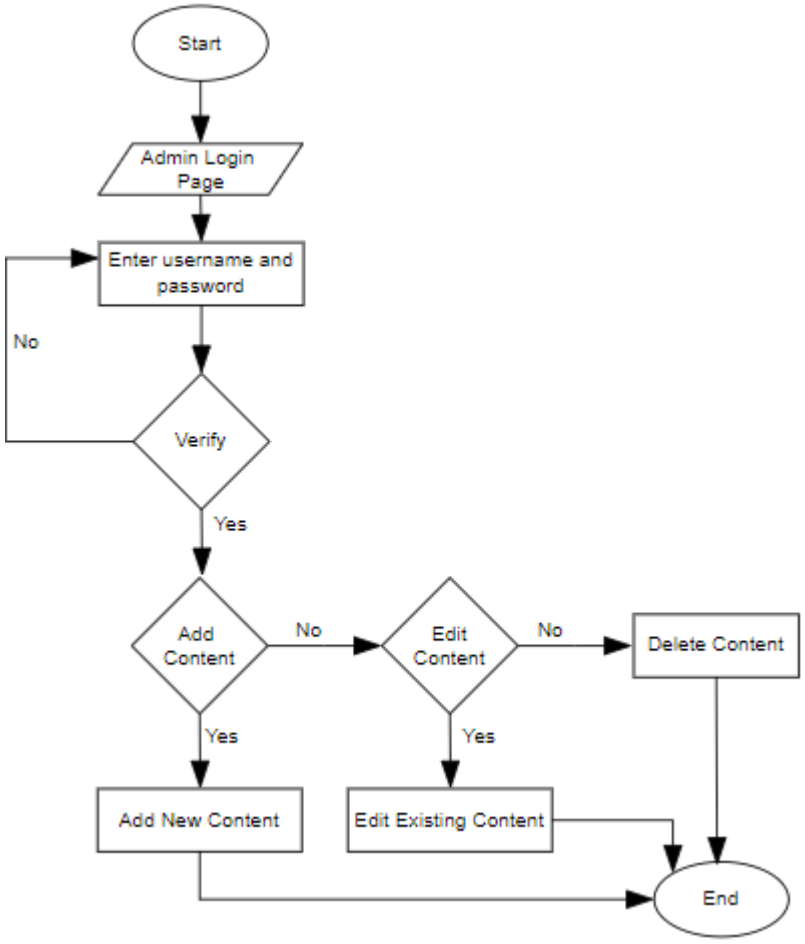

Figure 3.2 Flowchart of the PETAKOM Administrator Manage Content

Figure 3.3 depicts how students can suggest programs using the Form provided on the portal.

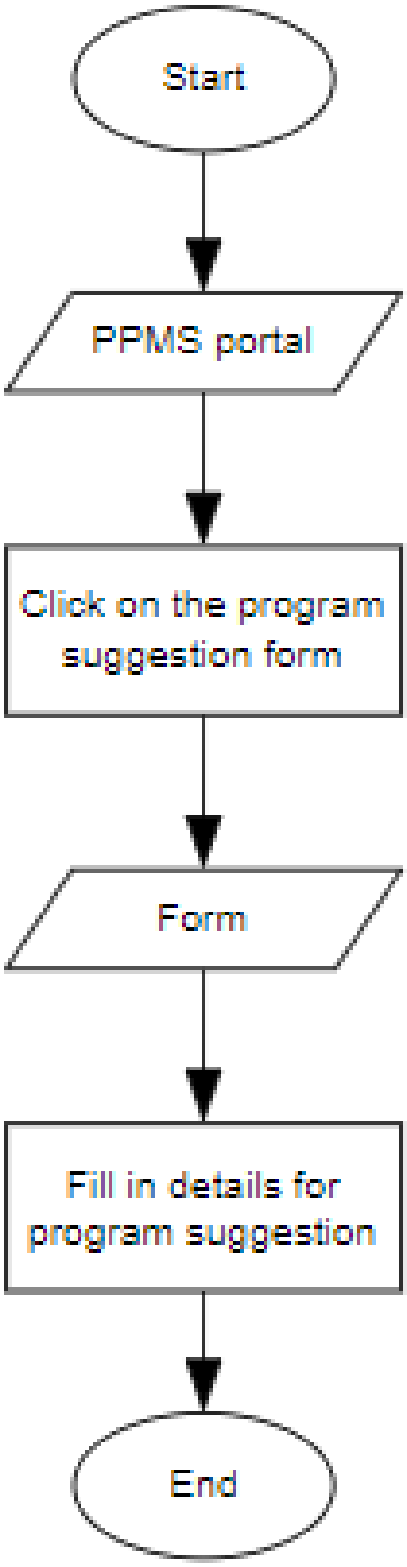

Figure 3.3 Flowchart of the FK Student Suggestion program

Figure 3.4 depicts how FK students may lodge a complaint about faculty or PETAKOM using the Google Form provided on the portal.

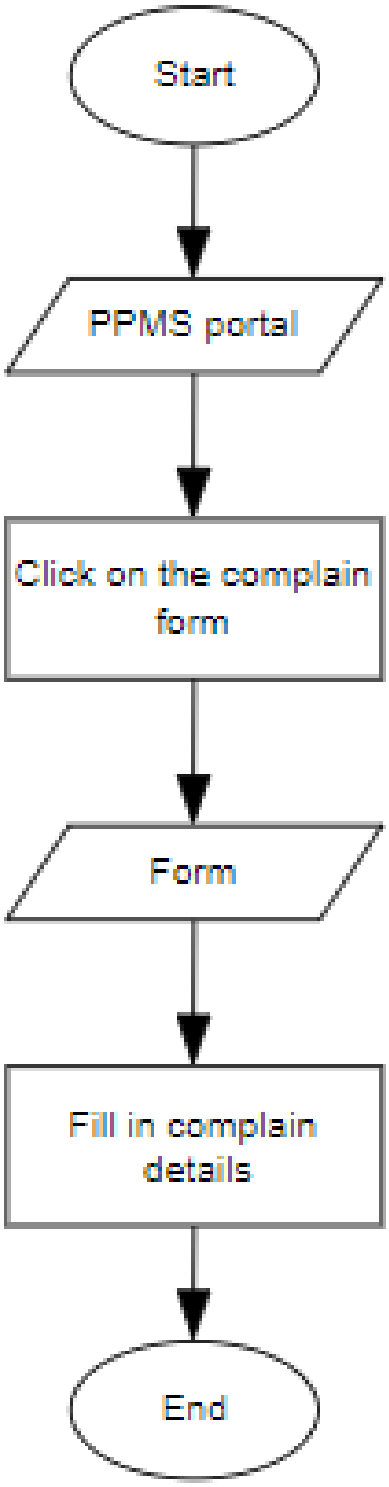

Figure 3.4 Flowchart of FK Student lodge a complaint

Figure 3.5 shows how PETAKOM administrator login into the portal and then review the complaints made by the students and then update in the portal.

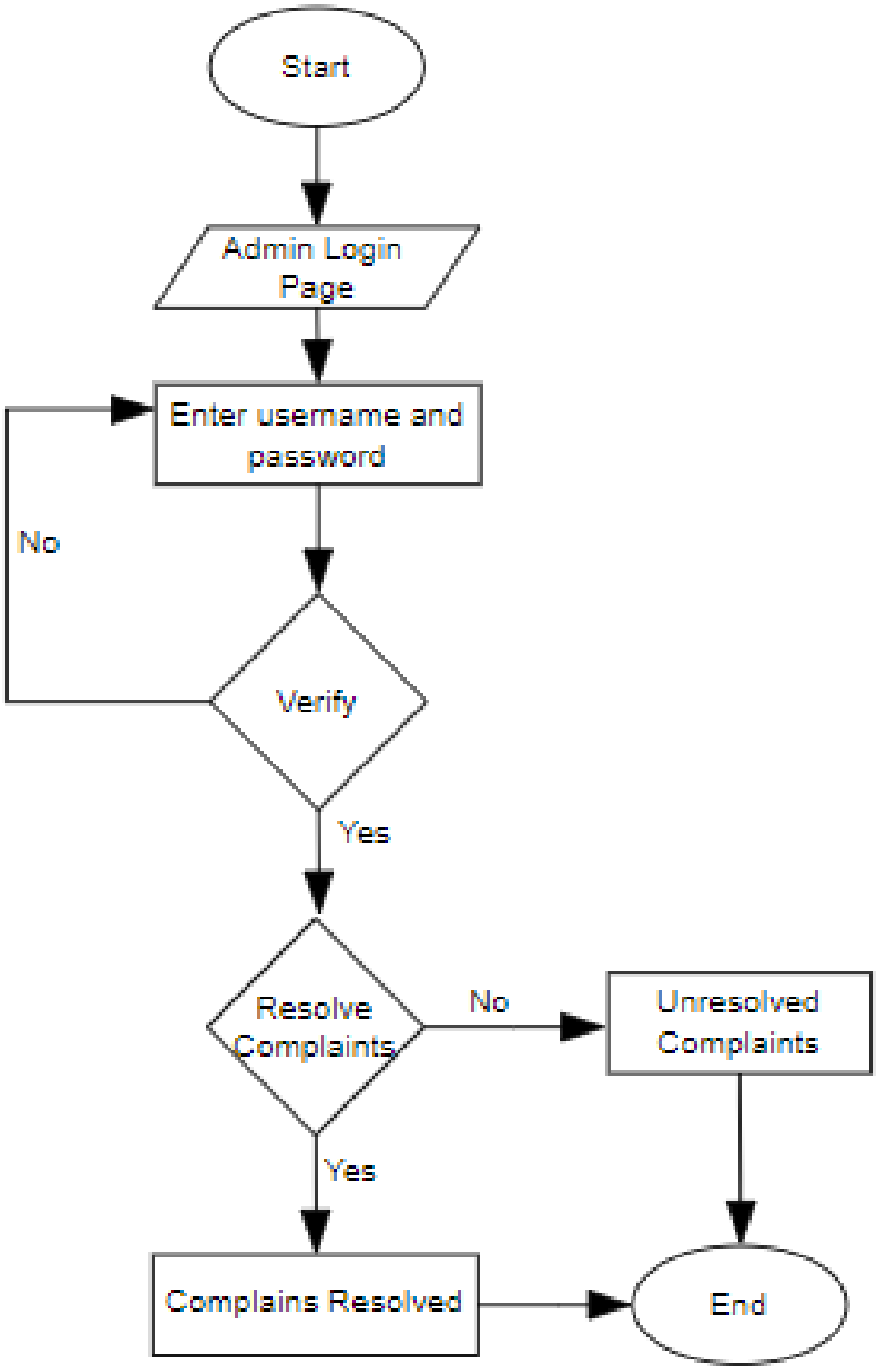

Figure 3.5 Flowchart of PETAKOM Administrator Reviewing Complains

Figure 3.6 depicts how the PETAKOM administrator login into portal to manage the merchandise details within the portal. The administrator can add, edit, and delete merchandise details.

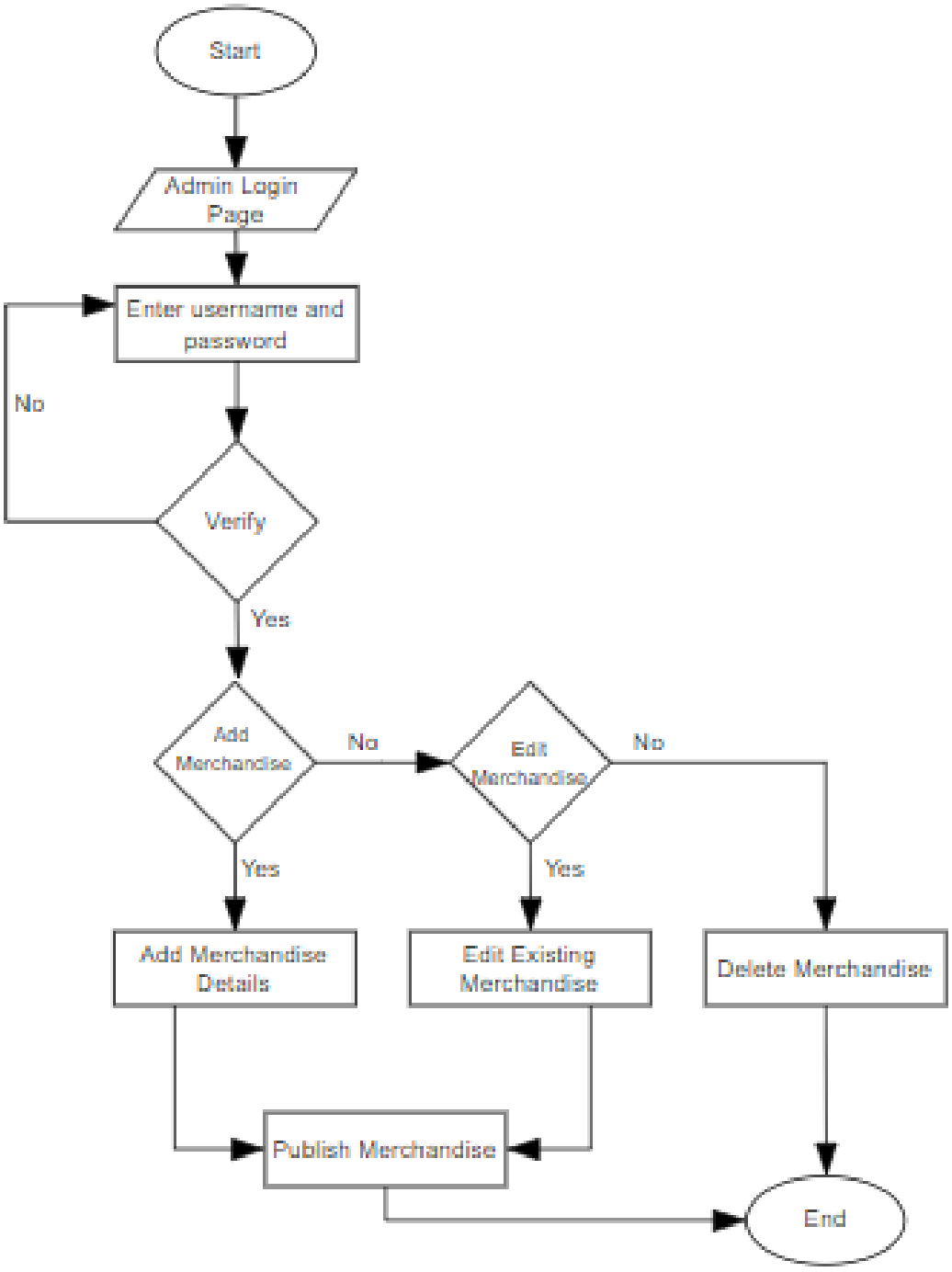

Figure 3.6 Flowchart of PETAKOM Administrator Managing Merchandise

Figure 3.7 depicts the FK student's purchase procedure for merchandise offered through the portal. When the students click on the merchandise, they will be sent to the accessible Form for the merchandise.

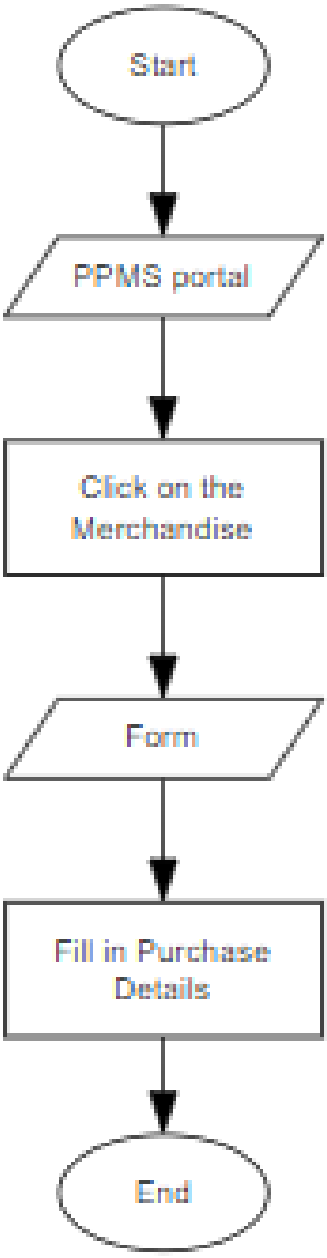

Figure 3.7 Flowchart of FK Student to purchase merchandise

Figure 3.8 depicts how FK students may reserve a PETAKOM room using the portal. When FK students select the PETAKOM Room Reservation option from the navigation tab, they will be led to another subsystem where they may make bookings.

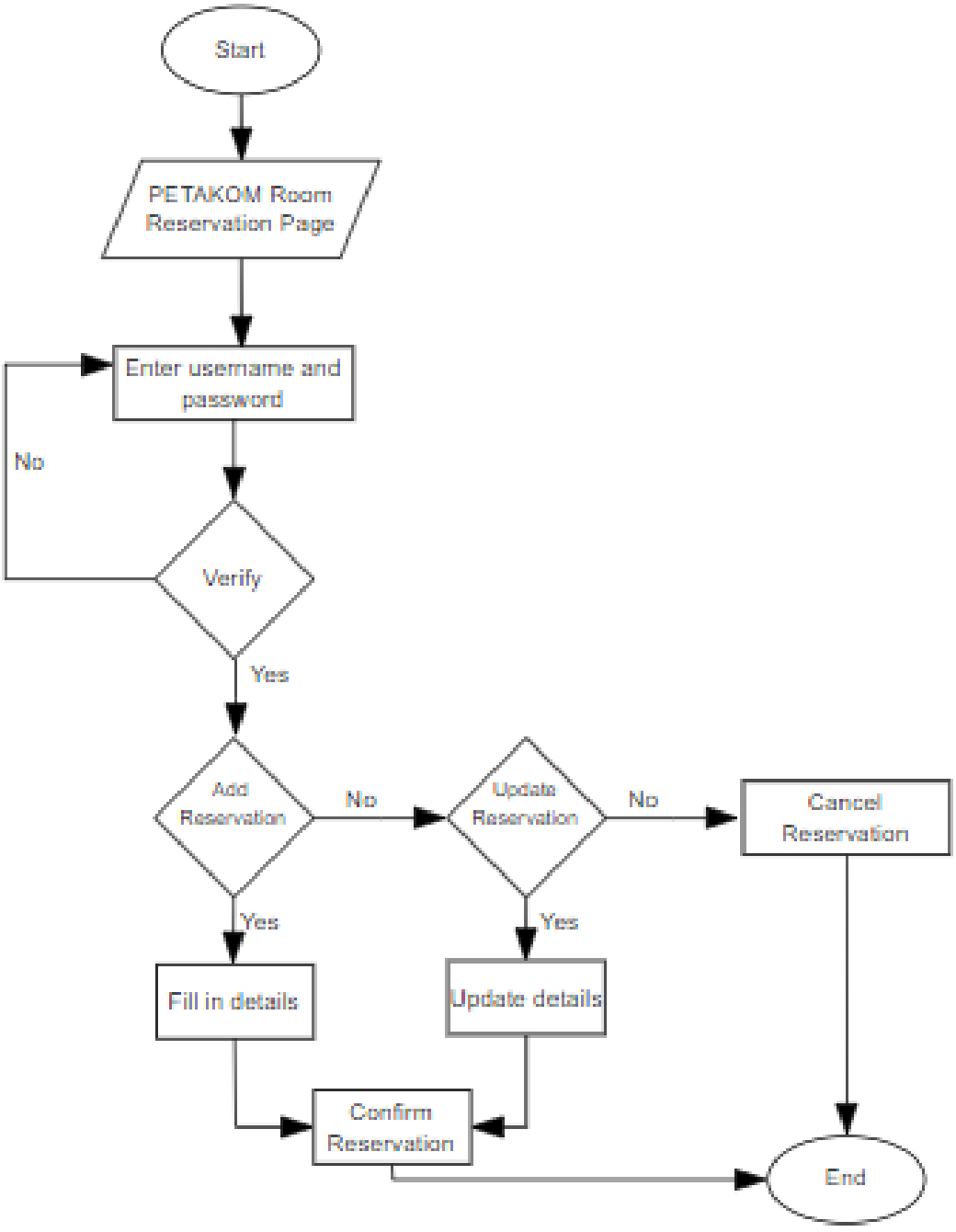

Figure 3.8 Flowchart of FK Students on PETAKOM Room Reservation

Figure 3.9 depicts the PETAKOM Administrator's deployment of the PETAKOM Room Reservation System. The FK Student bookings will be approved or rejected by the PETAKOM Administrator.

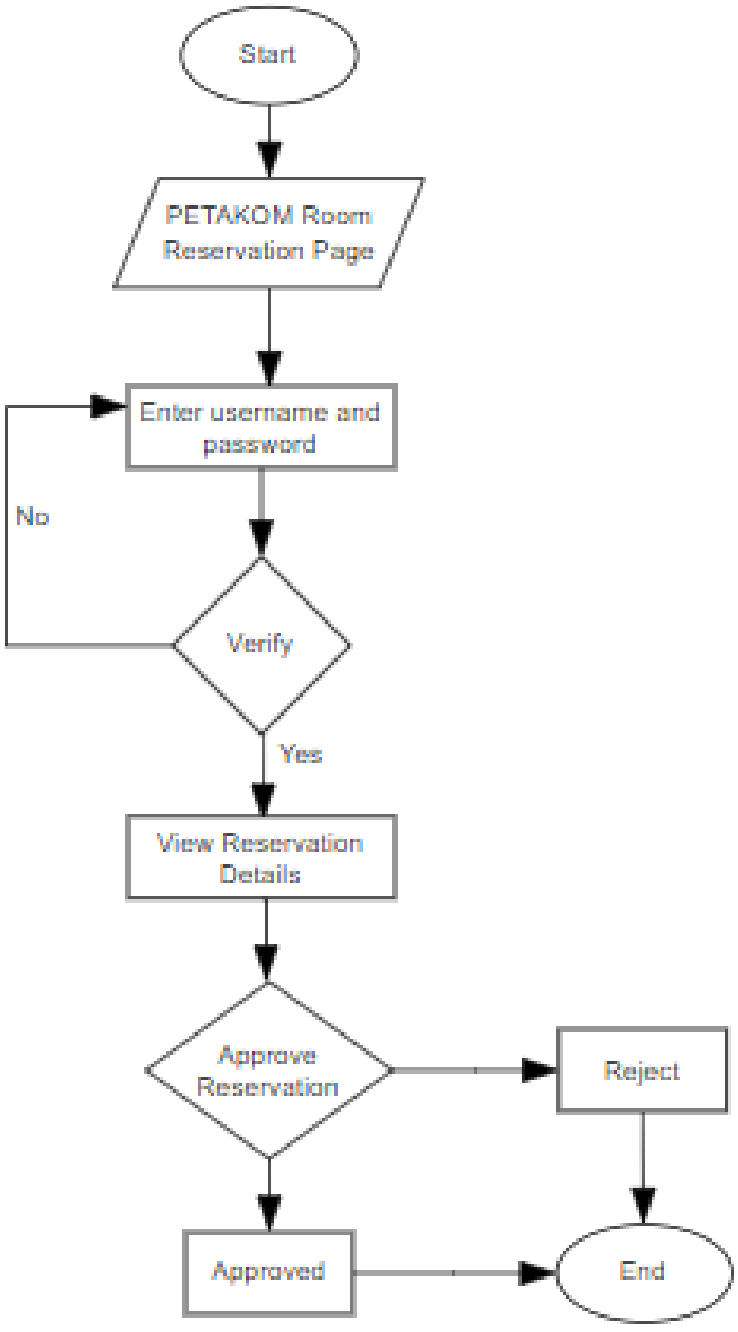

Figure 3.9 Flowchart of PETAKOM Administrator in managing PETAKOM Room Reservation

3.5.2 Context Diagram

The interaction between the system PETAKOM Administrator and the FK Students is depicted in figure above. Context Diagrams are used to define the context and limits of the system being represented. The context diagram depicts the designated data flow along the system interact between the system and the expected user. According to the context diagram in Figure 3.10, the PETAKOM Administrator may handle contents in the PPMS such as program contents, technological information, and committee member information, while students can access the contents maintained by the admin. The student can suggest programs using the system's form, and the administrator can manage the suggestions. Following that, students can file complaints about faculty and the PETAKOM organization using the complaint form given. The Administrator will review the complains and updates in the portal. Students can also reserve a PETAKOM room for a meeting, which must be approved by the PETAKOM Administrator. The administrator manages all PETAKOM's merchandise, and students who want to purchase it can do so through the portal.

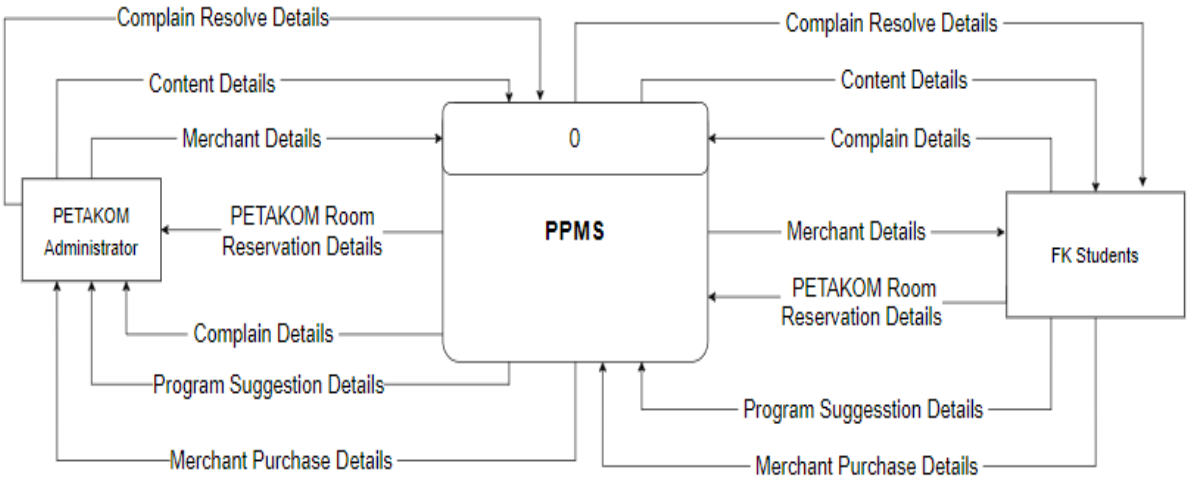

Figure 3.10 Context Diagram

3.5.3 Use Case Diagram and Description

The use case diagram for PETAKOM Portal Management System (PPMS) is shown in the figure above. A Use Case Diagram depicts the various ways in which a user may engage with a system. According to the Figure 3.11, the PETAKOM Administrator manages content, manages complain, manages program, manages merchandise, and manages PETAKOM Room reservation, whilst students participate in modules such as complain, program suggestion, purchasing merchandise, and making PETAKOM room reservation.

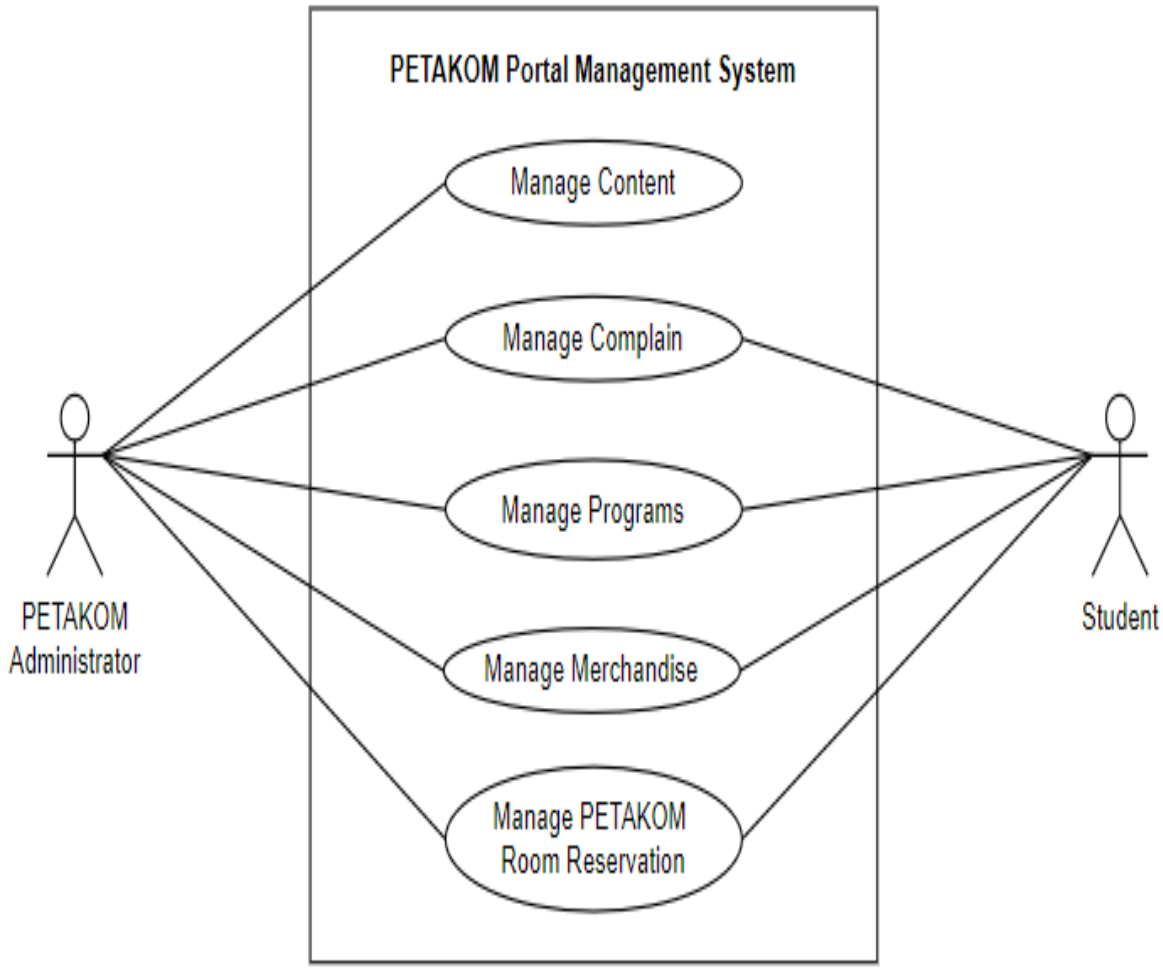

Figure 3.11 Use case diagram

i. Module 1: Manage Content

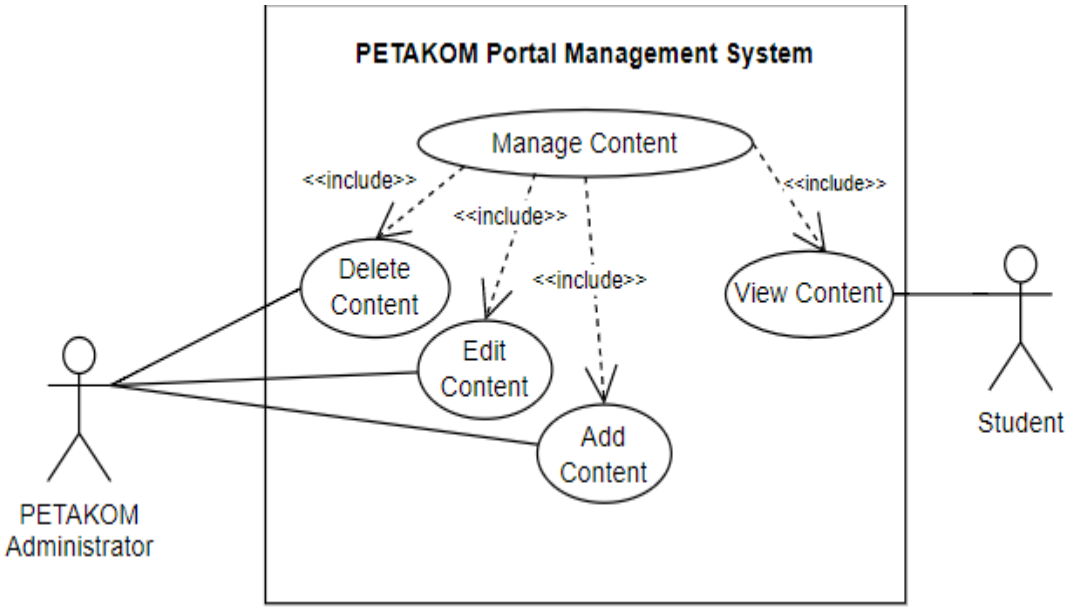

Figure 3.12 Use case Diagram for Manage Content

Table 3.3 Use Case Description for Manage Content

Use Case ID	UC1
Brief Description	To manage content in the portal.
Actor	Administrator, Student
Pre-Conditions	PETAKOM administrator already login into the admin page.
Basic Flow	1. Use case starts when the Admin is already login into admin side of the portal. 2. The admin can add, edit and delete content. **[A1: Add Content] [A2: Edit Content] [A3: Delete Content]** 3. On the normal portal view, students can view the content that is added into the portal. 4. Use Case Ends.
Alternative Flow	Alternative flow for Admin: **[A1: Add Content]** 1. The admin clicks on Add button. 2. The admin will add the details of the content and selects the type of content.

	3. The use case continues from basic flow step number 3. **[A2: Edit Content]** 1. The admin clicks on existing content. 2. The admin edits the content. 3. The portal contains the content that was updated recently. 4. The use case continues from basic flow step number 3. **[A3: Delete Content]** 1. The admin clicks on existing module. 2. The admin clicks on Delete button. 3. The portal contains the content that was updated recently. 4. The use case continues from basic flow step number 3.
Exceptional Flow	None
Post-Conditions	The content can be viewed in the portal.
Rules	None
Constraints	None

ii. Module 2: Manage Program Suggestions

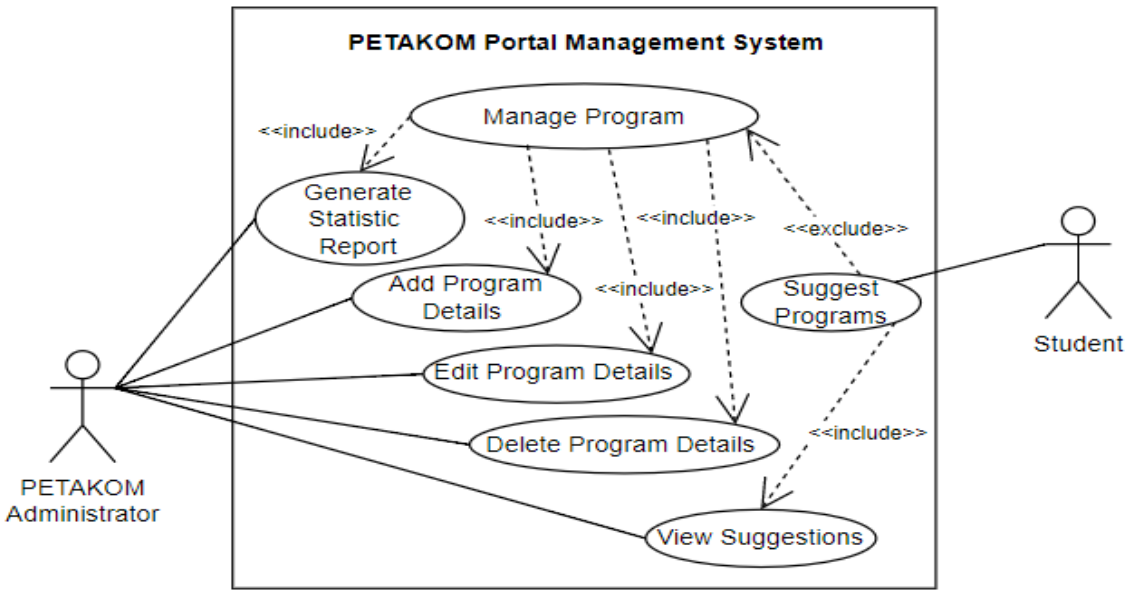

Figure 3.13 Use Case Diagram for Manage Program

Table 3.4 Use Case Description for Manage Program

Use Case ID	UC2
Brief Description	To Manage Program details on portal and view program suggestion by the students.
Actor	Administrator, Students
Pre-Conditions	PETAKOM administrator already login into the admin page.
Basic Flow	1. The admin can add, edit, and delete program suggestions. **[A1: Add Program Details] [A2: Edit Program Details] [A3: Delete Program Details]** 2. The admin can also review the statistics of the program held by PETAKOM by months. 3. On the normal portal view, students can view the program details. They can also suggest programs that can be done by PETAKOM Organization through the form that is added into the portal. 4. Use Case Ends.
Alternative Flow	Alternative flow for Admin:

	[A1: Add Program Details] 1. The admin clicks on Add button. 2. The admin will add the details of the program and add. 3. The use case continues from basic flow step number 2. **[A2: Edit Program Details]** 1. The admin clicks on existing program details. 2. The admin edits the program details. 3. The portal contains the content that was updated recently. 4. The use case continues from basic flow step number 2. **[A3: Delete Program Details]** 1. The admin clicks on existing program details. 2. The admin clicks on Delete button. 3. The portal contains the content that was updated recently. 4. The use case continues from basic flow step number 3.
Exceptional Flow	None
Post-Conditions	The program details can be viewed in the portal.
Rules	None
Constraints	None

iii. Module 3: Manage Complain

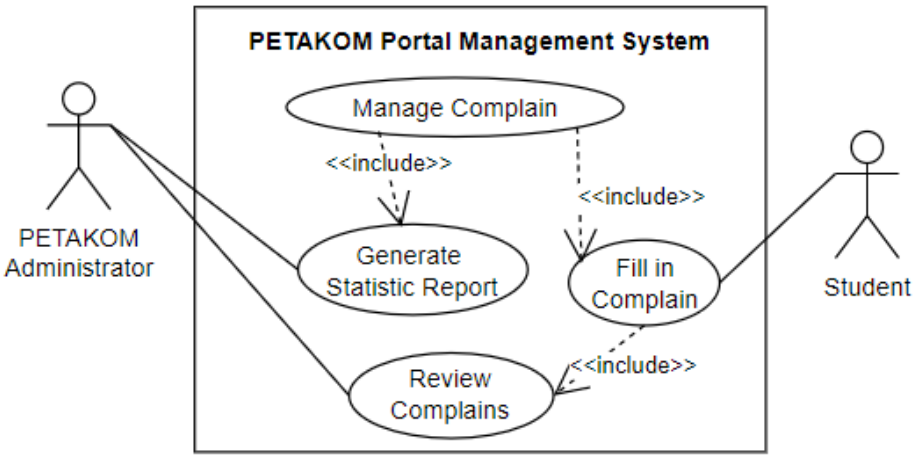

Figure 3.14 Use Case Diagram for Manage Complain

Table 3.5 Use Case Description for Manage Complain

Use Case ID	UC3
Brief Description	To complain via forms available in portal.
Actor	Students, Administrator
Pre-Conditions	The portal can be viewed by the students
Basic Flow	1. Use case starts the student clicks on Complain tab. 2. The student fills up the form available in portal. 3. The student clicks on Submit button. 4. The submitted complains later then will be reviewed by the Administrator and will set it as whether Resolved or Not Resolved. 5. The result then will be shown as statistic on the portal. 6. Use Case Ends.
Alternative Flow	None
Exceptional Flow	None
Post-Conditions	The form is submitted.
Rules	None
Constraints	None

iv. Module 4: Manage Merchandise

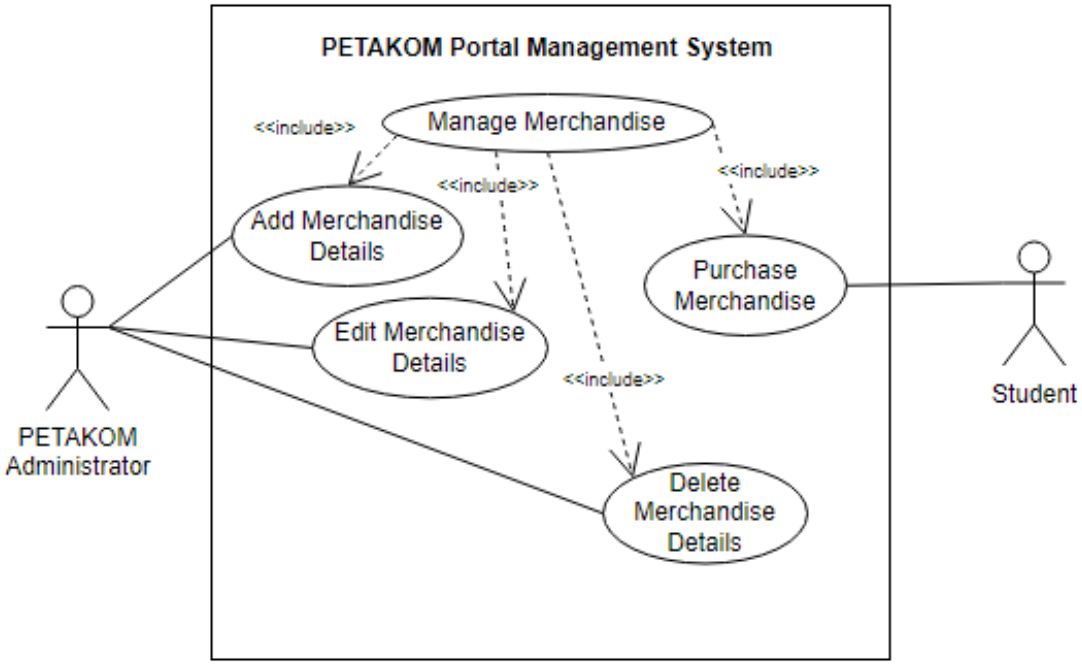

Figure 3.15 Use case Diagram for Manage Merchandise

Table 3.6 Use Case Description for Manage Merchandise

Use Case ID	UC4
Brief Description	To manage PETAKOM merchandise in the portal.
Actor	Administrator, Student
Pre-Conditions	PETAKOM administrator should log into admin page of the portal.
Basic Flow	1. Use case starts when the admin is in Merchandise tab on the admin page. 2. The admin can add, edit and delete merchandise. **[A1: Add Merchandise] [A2: Edit Merchandise] [A3: Delete Merchandise]** 3. On the normal portal view students can purchase the merchandise by clicking on the merchandise. **[A4: Purchase Merchandise]** 4. Use Case Ends.
Alternative Flow	Alternative flow for Admin: **[A1: Add Merchandise]**

	1. The admin adds all the merchandise details inside the portal. 2. The use case continues from basic flow step number 3. **[A2: Edit Merchandise]** 1. The admin clicks on the merchandise. 2. The admin edits the details of the merchandise. 3. The use case continues from basic flow step number 3. **[A3: Delete Merchandise]** 1. The admin clicks on the merchandise 2. The admin deletes the merchandise. 3. The use case continues from basic flow step number 3. Alternative flow for Students: **[A4: Purchase Merchandise]** 1. The student clicks on the available Merchandise. 2. The student will be directed to the Form to make and order and purchase. 3. The student clicks on submit button to confirm order. 4. The use case continues from basic flow step number 4.
Exceptional Flow	None
Post-Conditions	The portal can be view normally by the students.
Rules	None
Constraints	None

v. Module 5: PETAKOM Room Reservation

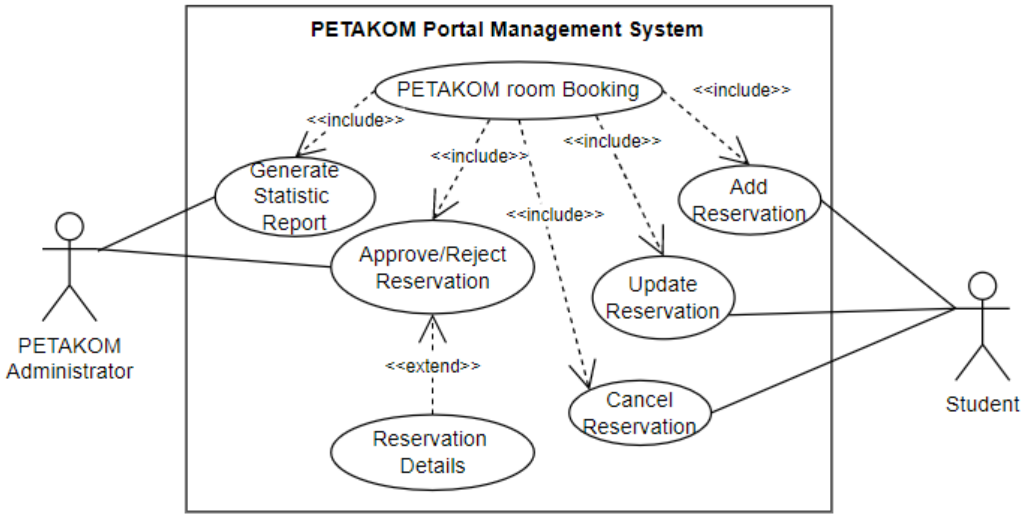

Figure 3.16 Use case Diagram for PETAKOM Room Reservation

Table 3.7 Use Case Description for PETAKOM Room Reservation

Use Case ID	UC5
Brief Description	To reserve PETAKOM room through the portal by opening another subsystem.
Actor	Administrator, Student
Pre-Conditions	Users must login into the reservation system.
Basic Flow	1. Use case starts when the users are login into the system. 2. The students can add, update and cancel reservation for PETAKOM room. **[A1: Add Reservation] [A2: Update Reservation] [A3: Cancel Reservation]** 3. The admin can approve or reject the reservation done by the students. **[A4: Approve/Reject Reservation] [A5: Generate Report]** 4. Use Case Ends.
Alternative Flow	Alternative flow for student: **[A1: Add Reservation]** 1. The student reserve the PETAKOM room for their purpose. 2. They can select the day and date of the reservation.

	3. The use case continues from basic flow step number 3. **[A2: Update Reservation]** 1. The student clicks on the edit reservation. 2. The student can edit the reservation details before approved or rejected by the administrator. 3. Once updated the details will be updated to the admin. 4. The use case continues from basic flow step number 3. **[A3: Cancel Reservation]** 1. The student clicks on the cancel button beside the accepted reservation details. 2. The data is removed from the database and is notified to the admin. 3. The use case continues from basic flow step number 3. Alternative flow for Administrator: **[A4: Approve /Reject Reservation]** 1. The admin will receive a list of reservations. 2. The admin will approve or reject the reservations. 3. The use case continues from basic flow step number 4. **[A4: Approve /Reject Reservation]** 1. The admin clicks on report statement to generate report and also view the statistic of the reservations. 2. The use case continues from basic flow step number 4.
Exceptional Flow	None
Post-Conditions	The student can reserve the PETAKOM room.
Rules	None
Constraints	One day the room can be only reserved once.

3.5.4 Activity Diagram

The figures below represent the PETAKOM Portal Management System (PPMS) activity diagram. An activity diagram is a behavioural diagram since it displays a system's behaviour. An activity diagram depicts the control flow from a starting point to a finishing point, highlighting the many decision routes that exist while the activity is being performed.

i. Module 1: Manage Content

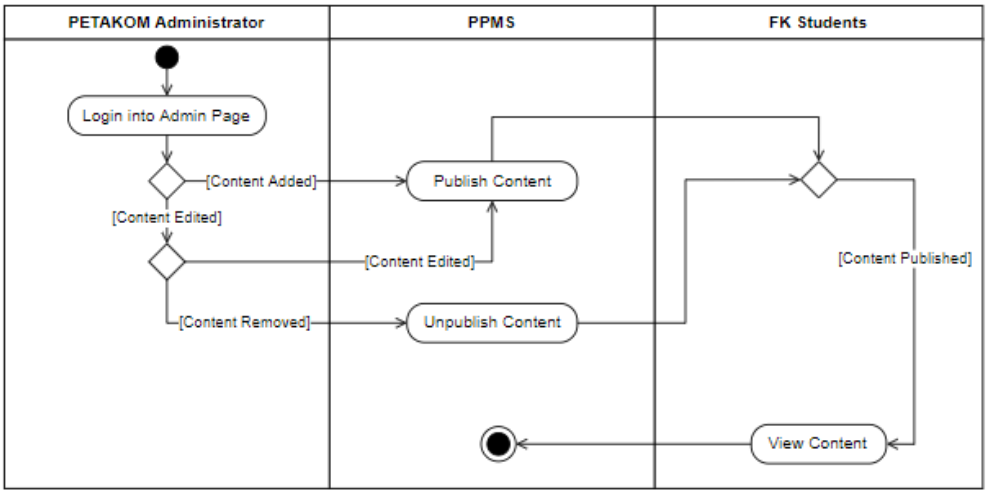

Figure 3.17 Activity Diagram for Manage Content

ii. Module 2: Manage Program

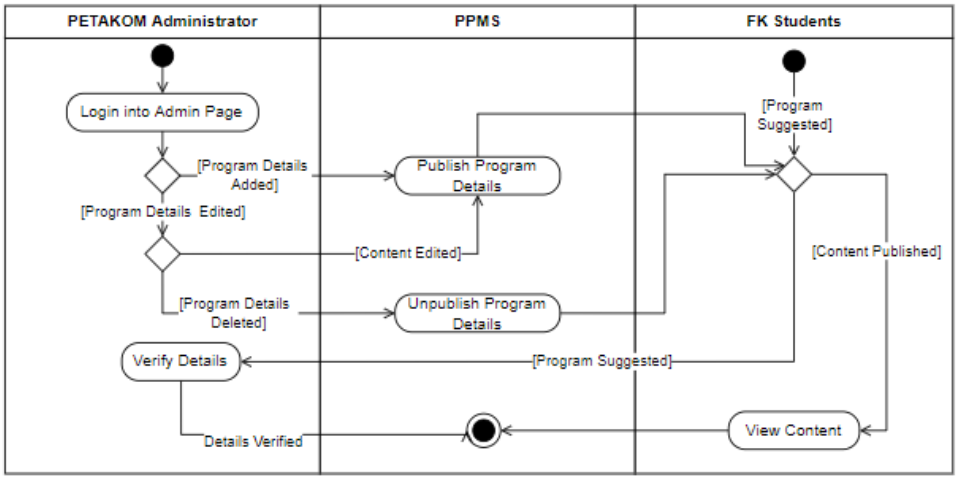

Figure 3.18 Activity Diagram for Manage Program

iii. Module 3: Manage Complain

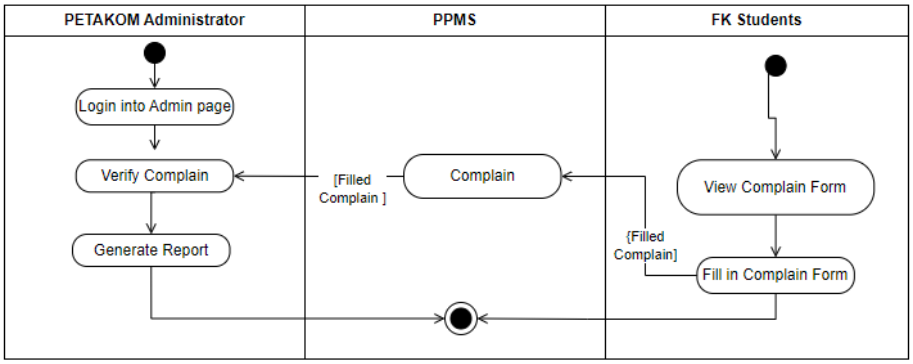

Figure 3.19 Activity Diagram for Manage Complain

iv. Module 4: Manage Merchandise

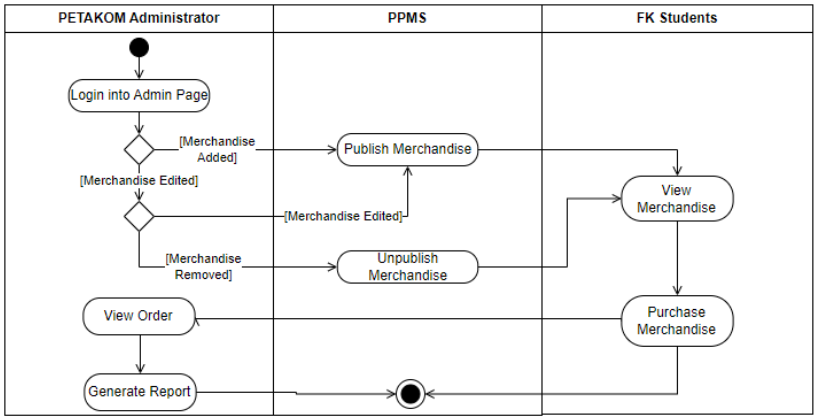

Figure 3.20 Activity Diagram for Manage Merchandise

v. Module 5: PETAKOM Room Reservation

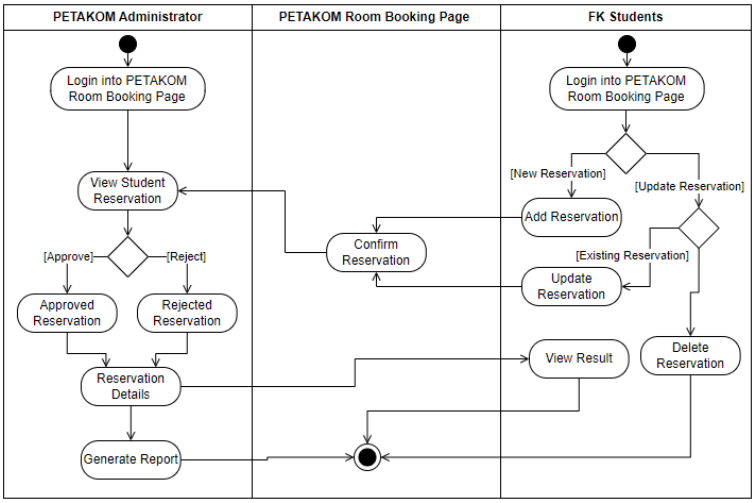

Figure 3.21 Activity Diagram for PETAKOM Room Reservation

3.5.5 Storyboard

Figure 3.22 depicts a storyboard for Manage Content Module by a PETAKOM administrator. In order to add Content into the portal, the admin first has to login into the system as 'Portal Admin'. Then Admin Dashboard will appear in home screen. From there admin can add new contents by clicking on News tab to add new News and Announcement or click on PETAKOM Management to add new details of PETAKOM Members. Once added, the admin will be directed to the overall lists of content according to the content. The figure shows the steps to add new contents inside the portal.

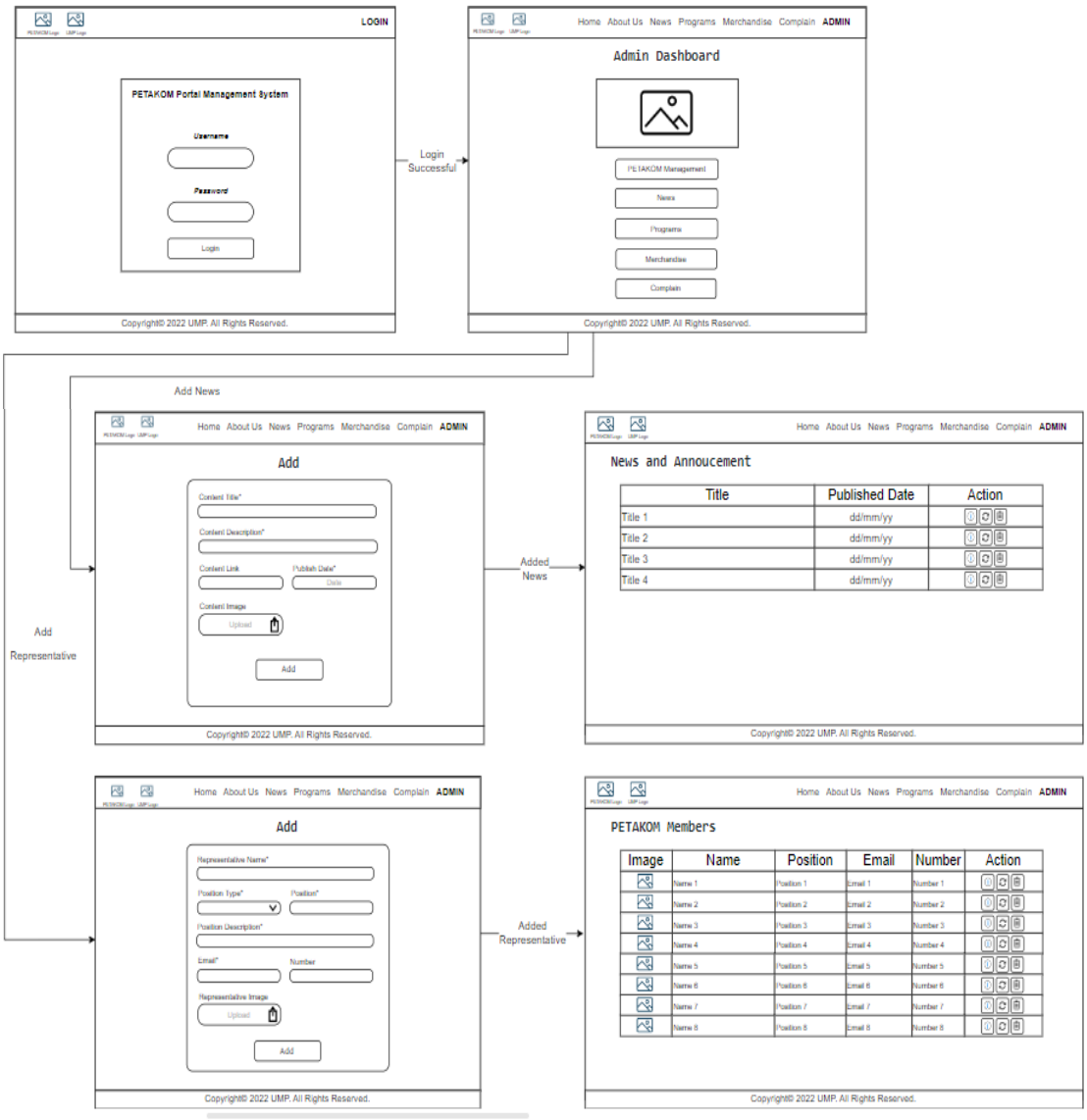

Figure 3.22 Storyboard for Adding Content by Admin

Figure 3.23 shows how Admin can update or delete the contents that has been released on the portal. To update the contents, the admin can click on the ‘Update’ Icon button to be directed to update page. To delete the content the admin can click on thrash icon to remove the content from the portal.

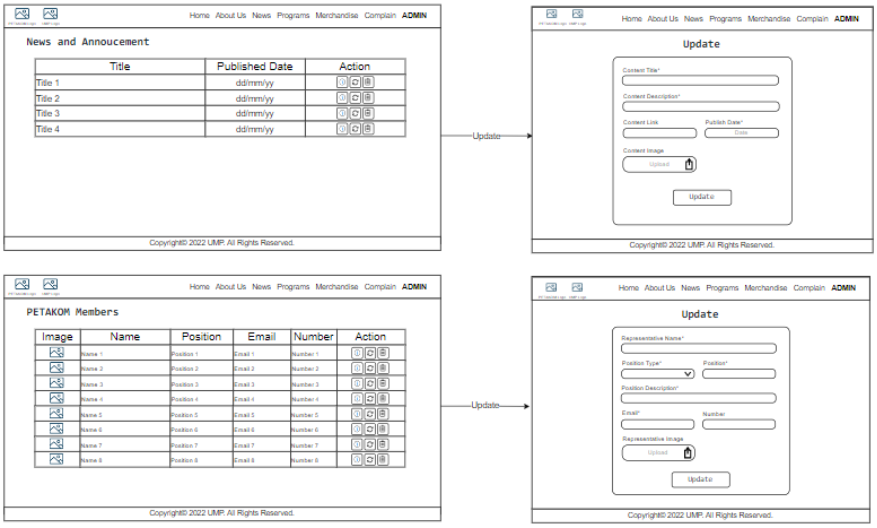

Figure 3.23 Storyboard for Updating or Deleting Content by Admin

Figure 3.24 depicts how admin can view the list of complains that has been added by the students. New complains will be added to ‘Unresolved’ lists. Once the complain has been resolved, the respective complain will be changed status to ‘Resolved’ Lists. The admin can also generate report based on the ‘Resolved’ and ‘Unresolved’ complains.

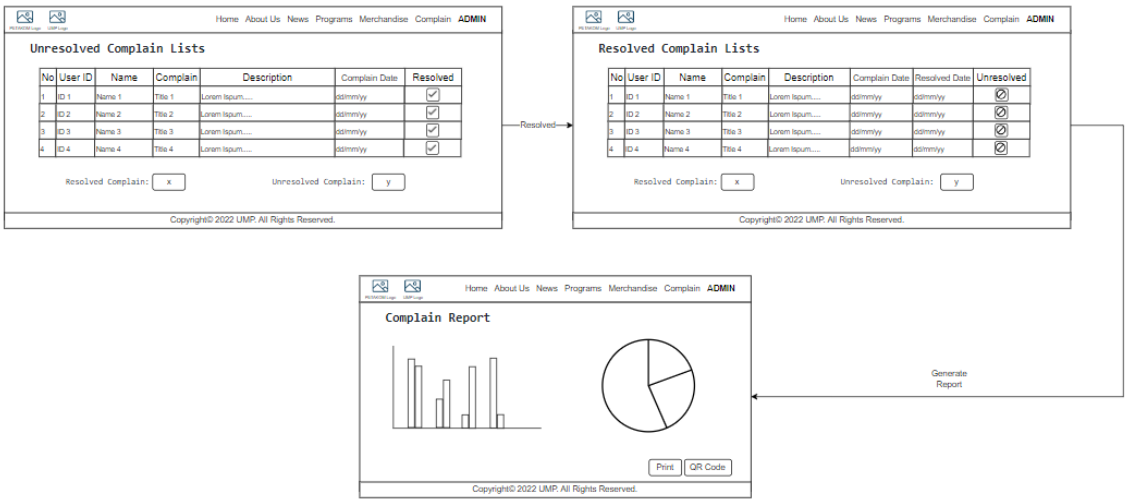

Figure 3.24 Storyboard for Manage Complain by Admin

Figure 3.25 depicts how students can lodge a complaint about the faculty or the PETAKOM organisation using the portal. Students hover the cursor over 'Others' on the navigation bar on the home page. The students are then sent to the page by clicking on the 'Complain' option. The students can then complete the Google form.

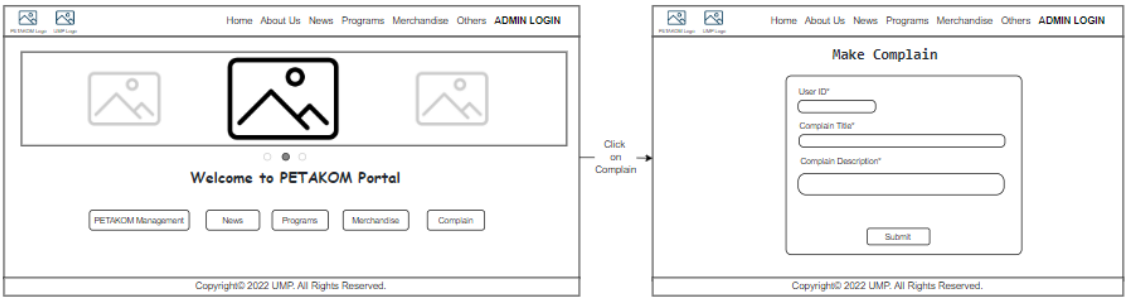

Figure 3.25 Storyboard of Student Making a Complain

Figure 3.26 shows how admin can add merchandise into the portal. The admin should login as the portal admin in order to add the merchandise under merchandise section. Once added the merchandise will be available for view. From the view the admin can update or delete the merchandise from the list by clicking ‘Update’ or ‘Trash’ button. Figure 3.27 shows how the merchandise are being updated and deleted from the list.

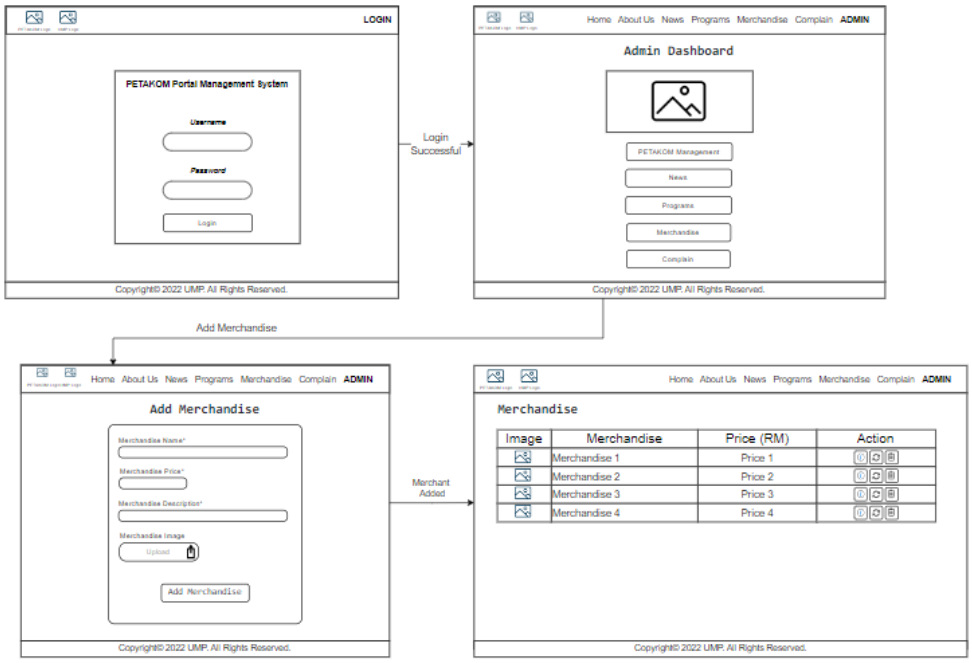

Figure 3.26 Storyboard of Admin Adding Merchandise

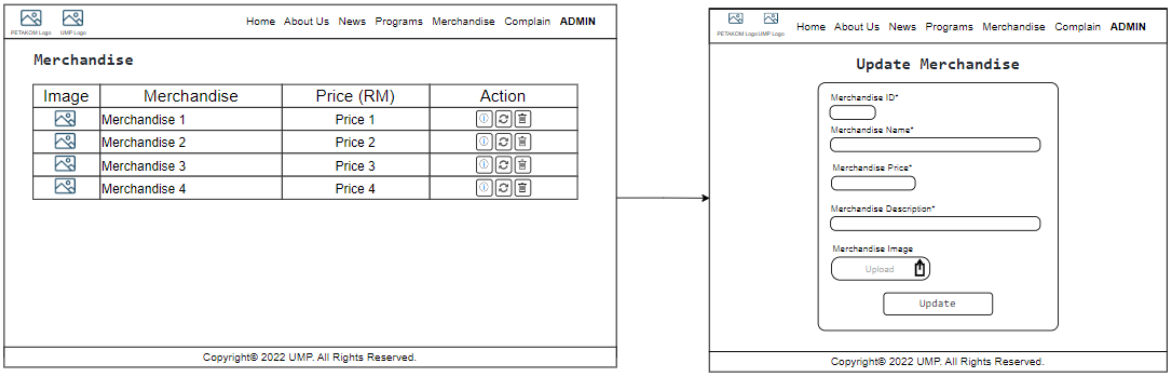

Figure 3.27 Storyboard of Admin Updating or Deleting Merchandise

Figure 3.28 depicts how students order PETAKOM-listed merchandise. The students click on the 'Merchandise' option on the navigation tab. The students will then be directed to the merchandise lists. From there the students can purchase the merchandise by clicking on the merchandise ‘More Info’ button and filling out the order form.

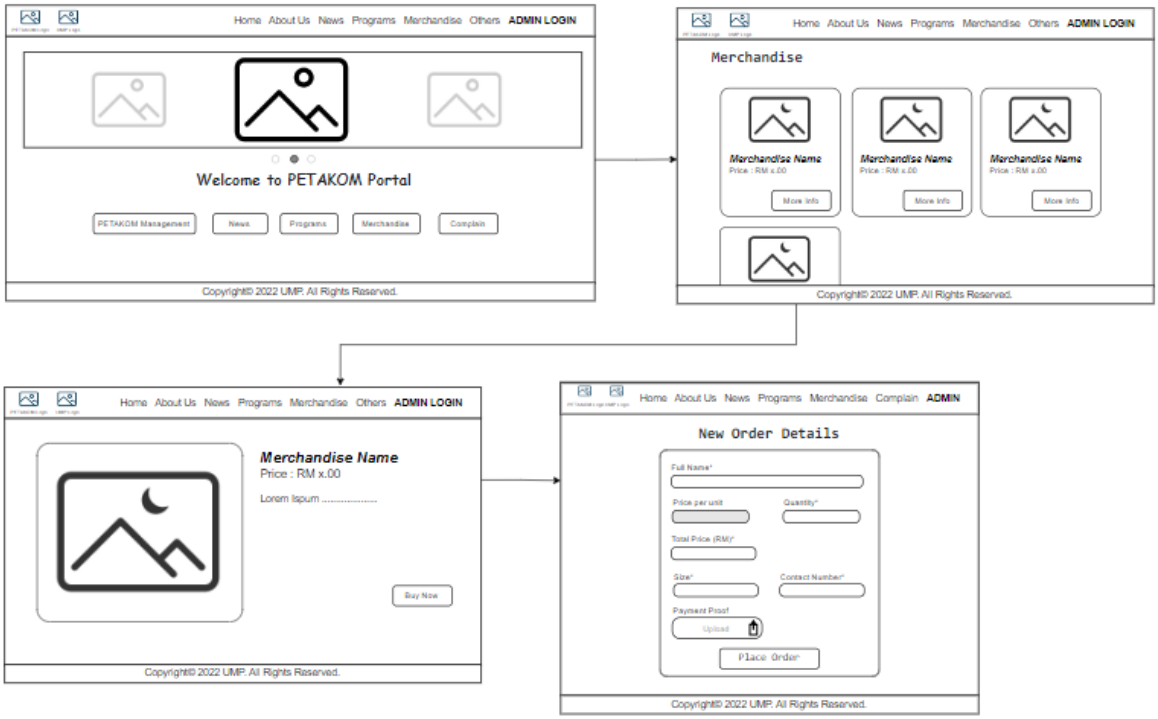

Figure 3.28 Storyboard for Purchasing Merchandise

Figure 3.29 depicts how PETAKOM admin can generate order report according to merchandise and sizes. The admin can also generate a PDF report from the portal for the usage of the admin and the supplier.

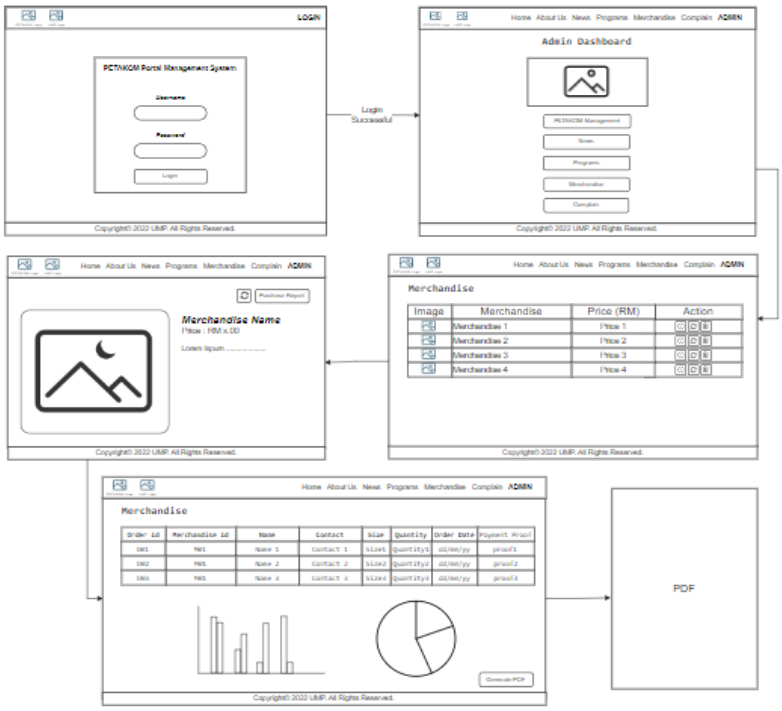

Figure 3.29 Storyboard for Generating Purchase Report

Figure 3.30 shows how admin can add PETAKOM Program details into the portal. The admin should login as the portal admin in order to add the program details. Once added the program information, it will be available for public view. From the view the admin can update or delete the merchandise from the list by clicking ‘Update’ or ‘Trash’ button. Figure 3.31 shows how the merchandise are being updated and deleted from the list.

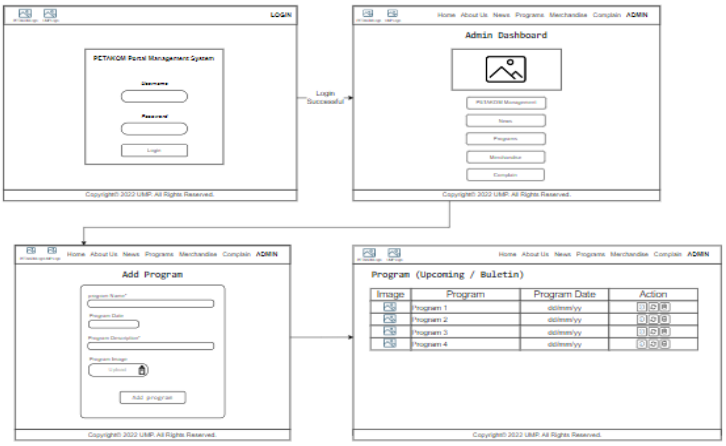

Figure 3.30 Storyboard for Adding Program into portal

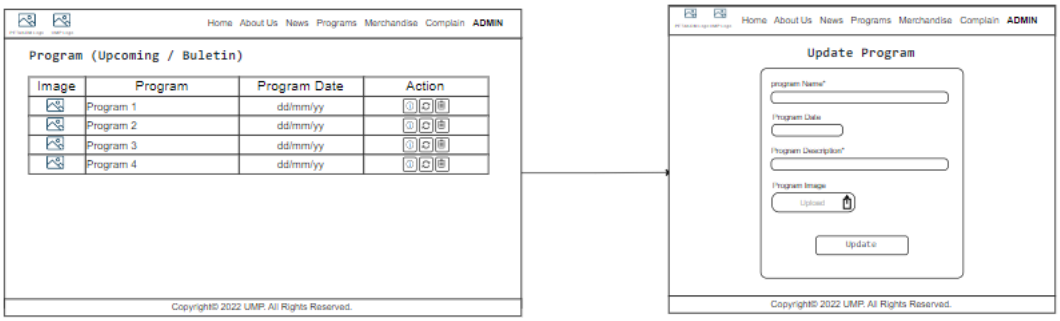

Figure 3.31 Storyboard for Deleting or Updating Program into portal

Figure 3.32 depicts how Admin can generate graphical report for Programs held by PETAKOM according to years. The admin needs to hover over Program option at navigation tab and choose Program Report and the admin will be redirected to Program Report page. The admin can view both bar graph and pie chart according to Upcoming Programs and Bulletin Programs.

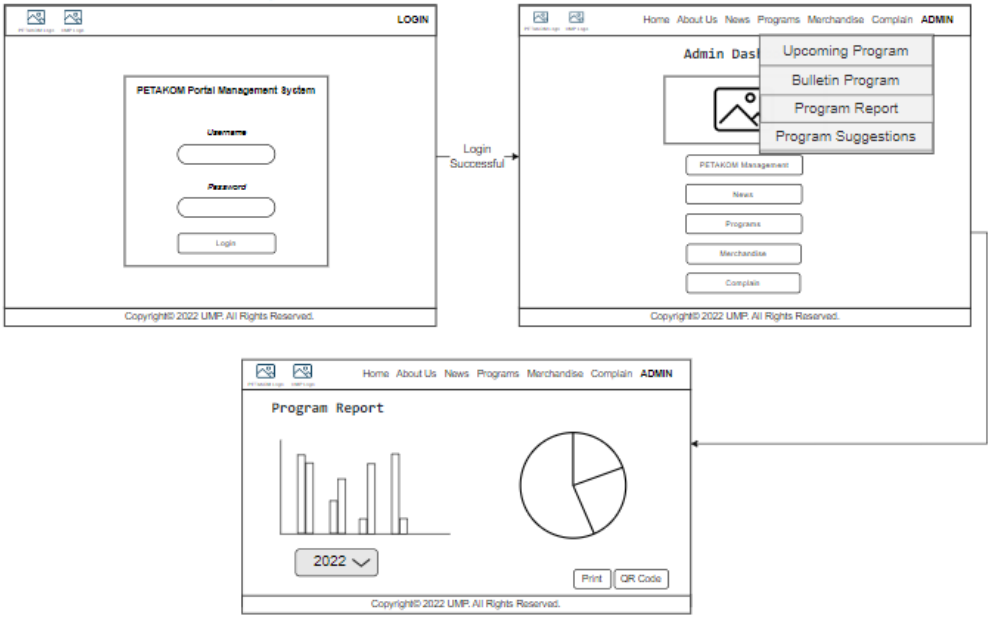

Figure 3.32 Storyboard for generation Program Report for Admin

Figure 3.33 depicts how Admin can review the programs that has been suggested by students. The admin needs to hover over Program option at navigation tab and choose Program Suggestion and the admin will be redirected to Program Suggestion page. The admin can view the lists of programs that has been suggested by the FK students.

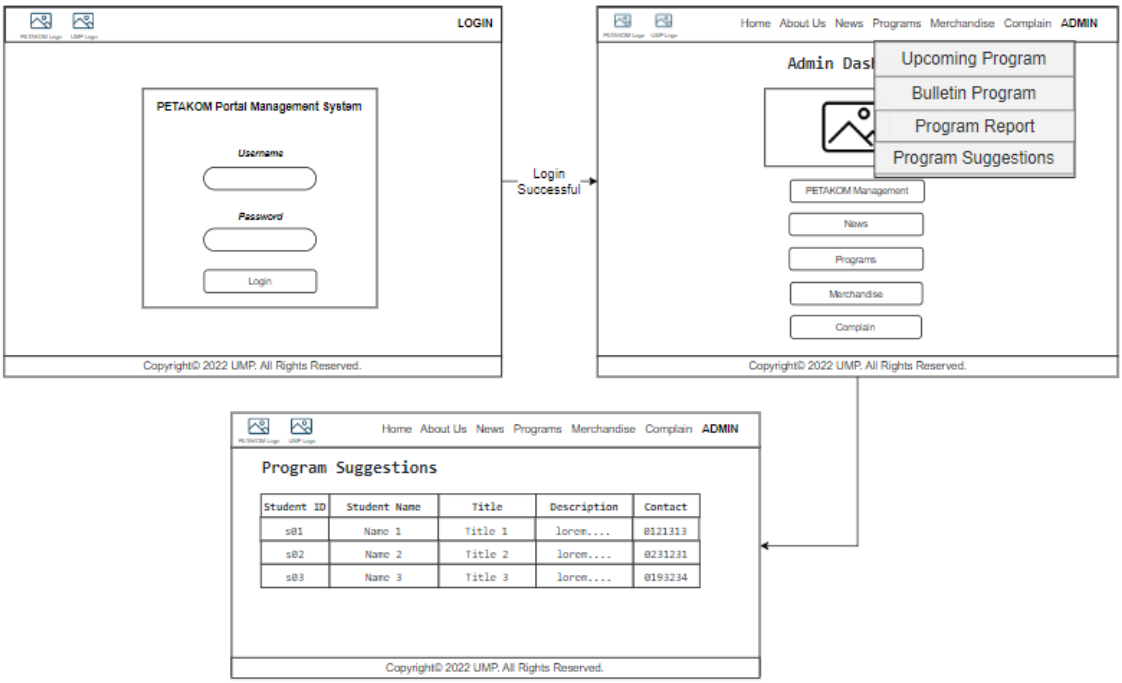

Figure 3.33 Storyboard for viewing Program Suggestions by Students

Figure 3.34 depicts how Students can view program's details that has been uploaded by the admin. For each program the students can click on More Info button to know further details about the program and also register themselves into the program. The student also can suggest programs that can be conducted by PETAKOM for the students. The process is shown in Figure 3.35.

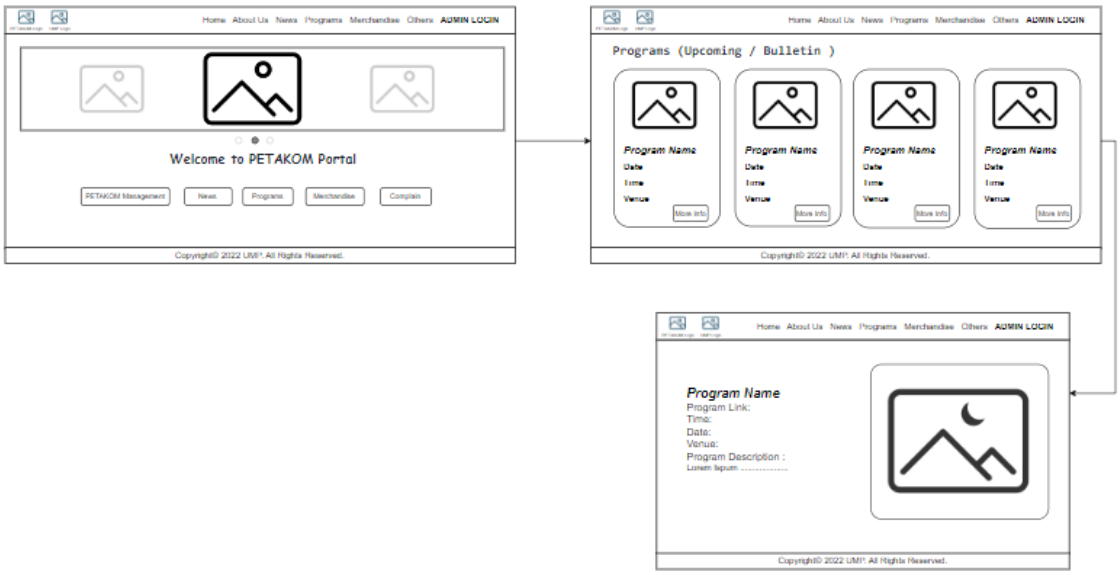

Figure 3.34 Storyboard for viewing Programs held by PETAKOM

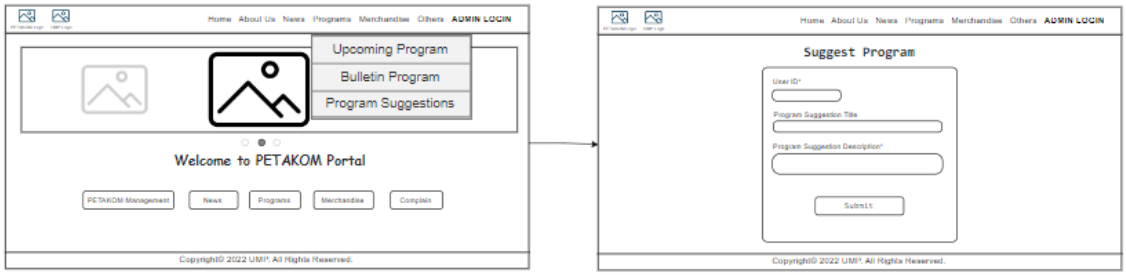

Figure 3.35 Storyboard for Program Suggestion Form

Figure 3.36 depicts how FK students can book the PETAKOM Room. They will first need to log into the system. They will then be brought to the main page, where they may reserve the PETAKOM room by clicking on Add Reservation.

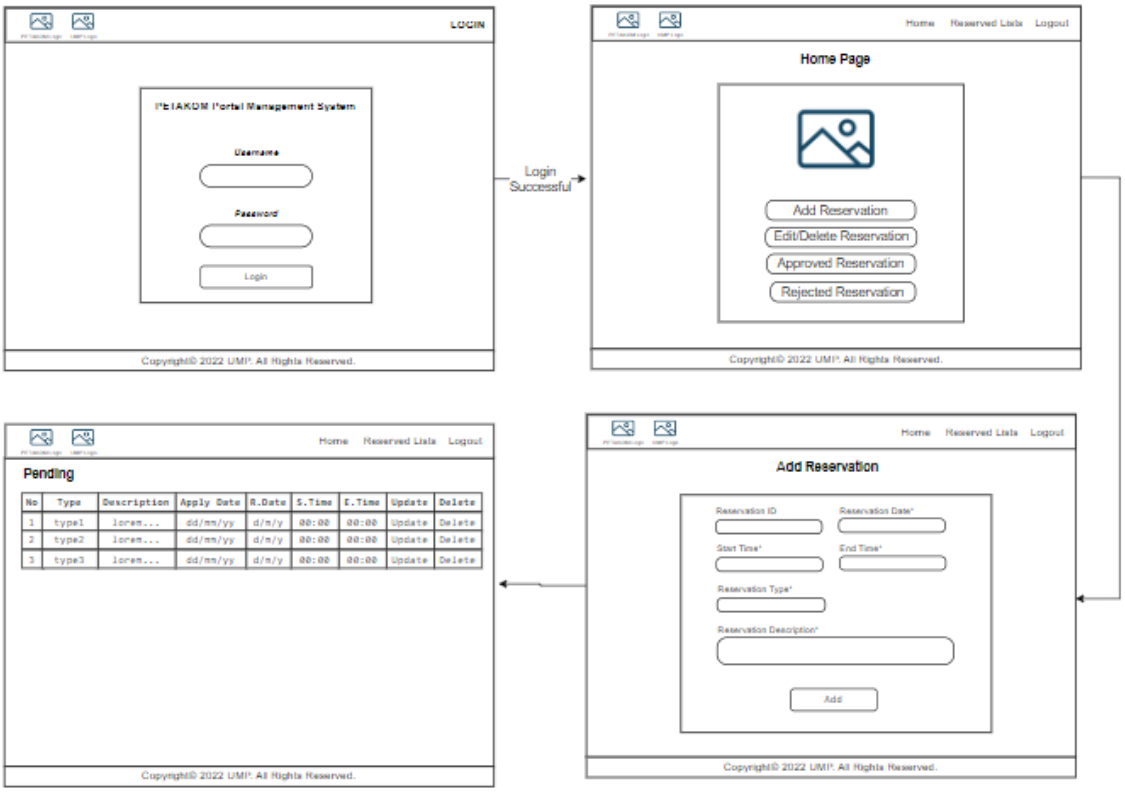

Figure 3.36 Storyboard for Add Reservation

Figure 3.37 depicts how FK students can update the reservation information. Students will click on update reservation after logging in to update their reservation details or delete button to cancel their reservation.

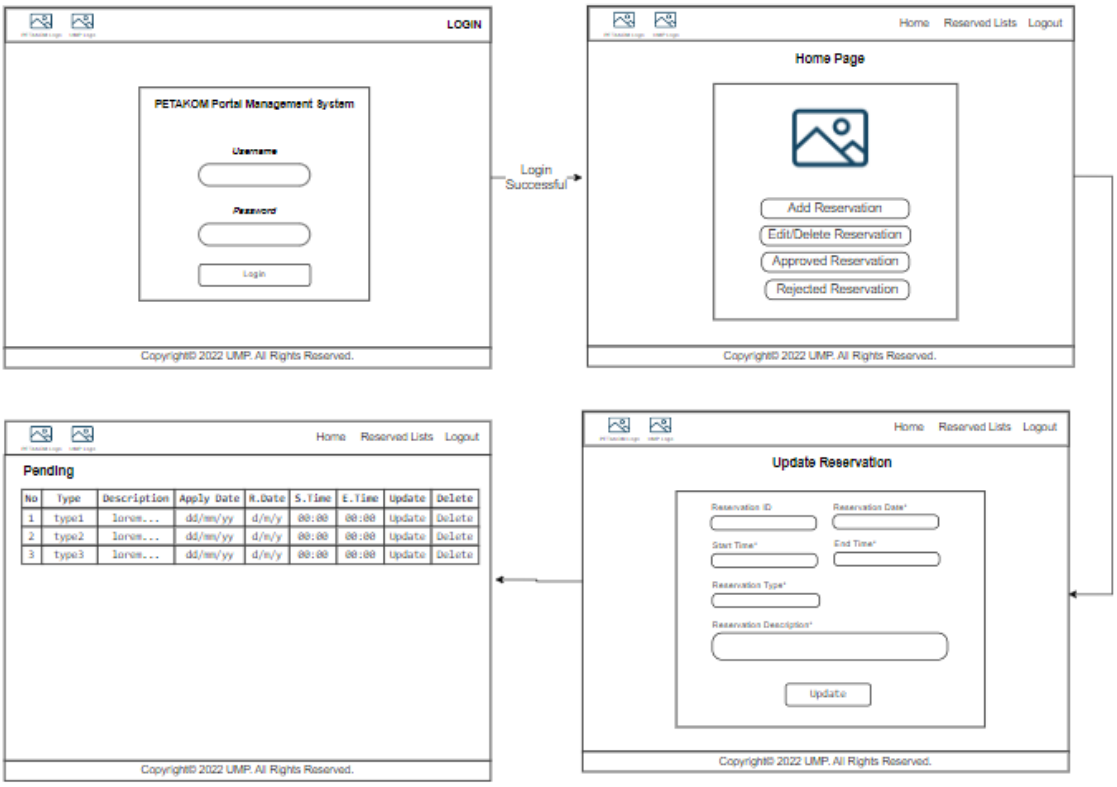

Figure 3.37 Storyboard for Update/Delete Reservation

Figure 3.38 depicts how the PETAKOM Administrator can accept or reject the FK Students' reservation lists. The administrator will view all the request list and then will approve or reject the reservations.

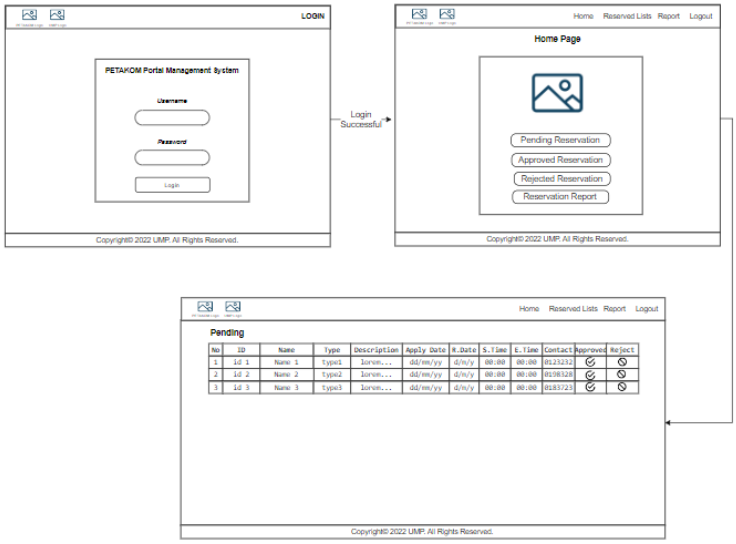

Figure 3.38 Storyboard of approving and rejecting PETAKOM room reservation

Figure 3.39 depicts how the PETAKOM Administrator can generate report based on the number of reservations according to months and also in terms of Total Approved and Rejected Reservations.

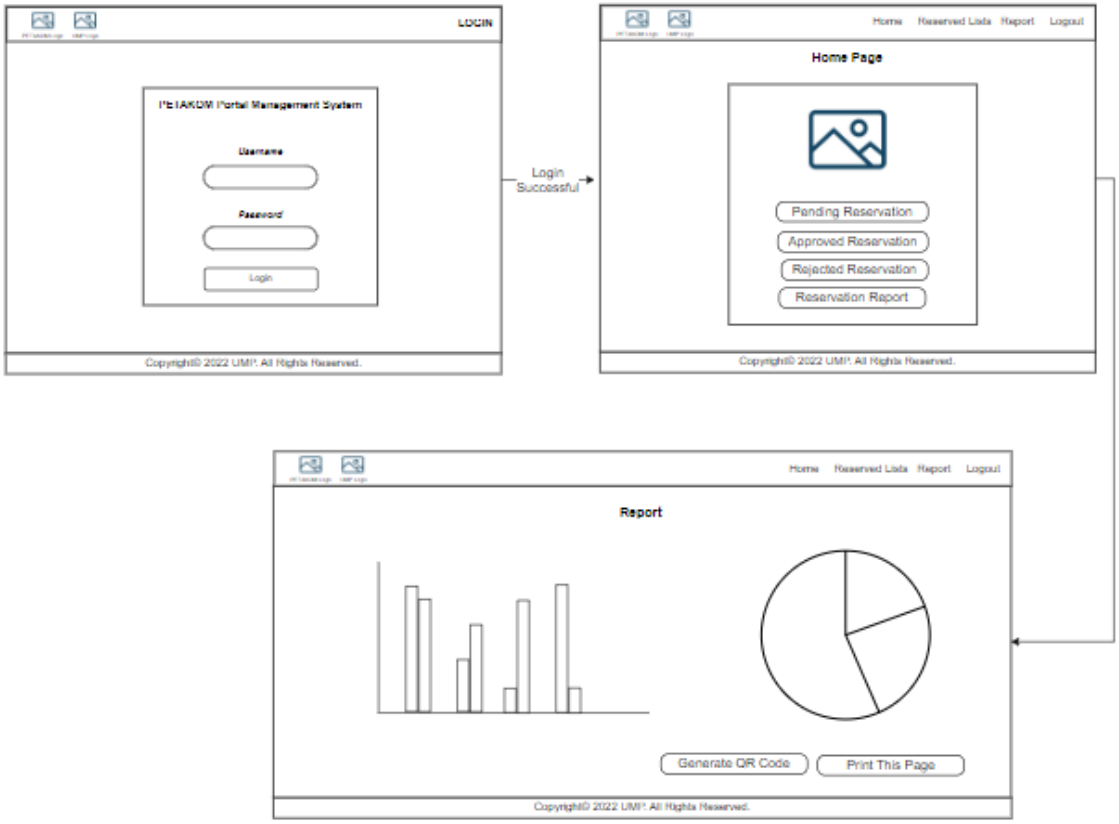

Figure 3.39 Storyboard of PETAKOM room reservation Report

3.6 Data Design

Figure 3.40 depicts the entity relationship diagram (ERD) Table for PPMS. ERD is a graphical representation that depicts the relationship among people, objects, places, concepts or events within a system.

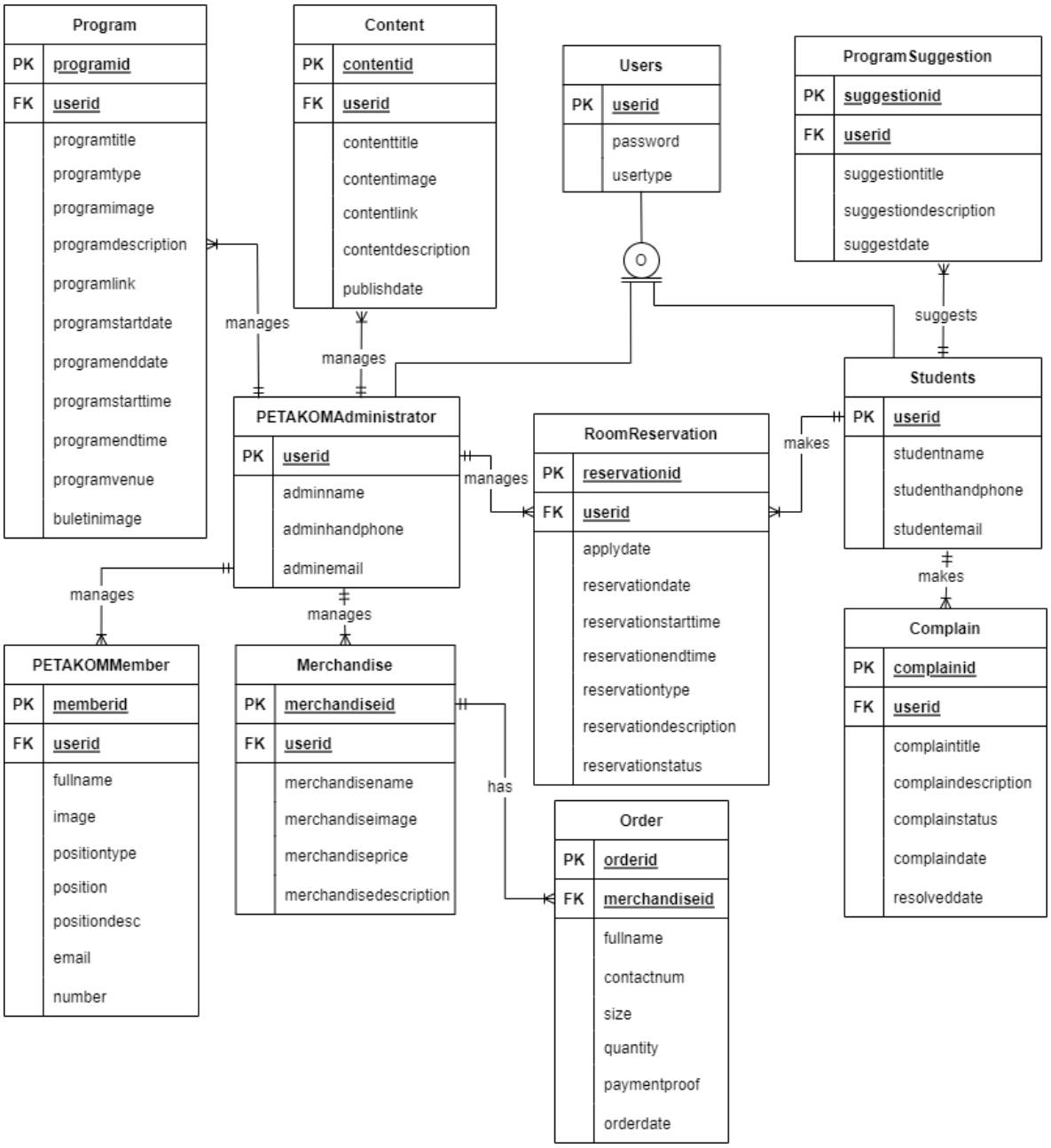

Figure 3.40 ERD Table

Table 3.8 depicts the Data Dictionary Table for PPMS. A data dictionary is a documentation tool that provides metadata, metrics or details about a database and data within it.

Table 3.8 Data Dictionary Table

PETAKOMAdministrator

Attributes	Description	Data Type	Key
userid	User ID	Varchar(7)	PK
adminname	Admin Name	Varchar(255)	
adminhandphone	Admin Handphone	Varchar(11)	
adminemail	Admin Email	Varchar(255)	

Students

Attributes	Description	Data Type	Key
userid	User ID	Varchar(7)	PK
studentname	Student Name	Varchar(255)	
studenthandphone	Student Handphone	Varchar(11)	
studentemail	Student Email	Varchar(255)	

Content

Attributes	Description	Data Type	Key
contentid	Content ID	Varchar(7)	PK
userid	User ID	Varchar(7)	FK
contenttitle	Content Title	Varchar(255)	
contentimage	Content Image	Varchar(255)	
contentdescription	Content Description	Text	
contentlink	Content Link	Varchar(255)	
publishdate	Publish Date	Date	

Program

Attributes	Description	Data Type	Key
programid	Program Suggestion ID	Varchar(7)	PK
userid	User ID	Varchar(7)	FK
programtitle	Program Title	Varchar(255)	
programtype	Program Type	Varchar(10)	

programimage	Program Image	Varchar(255)	
programdescription	Program Description	Text	
programlink	Program Link	Varchar(255)	
programstartdate	Program Starting Date	Date	
programenddate	Program End Date	Date	
programstarttime	Program Starting Time	Time	
programendtime	Program End Time	Time	
programvenue	Program Venue	Varchar(255)	
buletinimage	Bulletin Image	Varchar(255)	

Merchandise

Attributes	Description	Data Type	Key
merchandiseid	Merchandise ID	Varchar(7)	PK
userid	User ID	Varchar(7)	FK
merchandisename	Merchandise Name	Varchar(255)	
merchandiseimage	Merchandise Image	Varchar(255)	
merchandiseprice	Merchandise Price	Double	
merchandisedescription	Merchandise Description	Text	

Order

Attributes	Description	Data Type	Key
ordereid	Order ID	Varchar(7)	PK
merchandiseid	Merchandise ID	Varchar(7)	FK
fullname	Order Name	Varchar(255)	
contactnum	Order Contact Number	Varchar(255)	
size	Order Size	Varchar(255)	
quantity	Quantity	Integer	
paymentproof	Proof of Payment	Varchar(255)	
orderdate	Order Date	Date	

Complain

Attributes	Description	Data Type	Key
complainid	Complain ID	Varchar(7)	PK
userid	User ID	Varchar(7)	FK
complaintitle	Complain Title	Varchar(255)	

complaindescription	Complain Description	Varchar(255)	
complainstatus	Complain Status	Varchar(255)	
complaindate	Complain Date	Date	
resolvedate	Complain Resolved Date	Date	

Room Reservation

Attributes	Description	Data Type	Key
reservationid	Room Reservation ID	Varchar(7)	PK
userid	User ID	Varchar(7)	FK
reservationdate	Reservation Date	Date	
reservationstarttime	Reservation Start Time	Time	
reservationendtime	Reservation End Time	Time	
reservationtype	Reservation Type	Varchar(255)	
reservationdescription	Reservation Description	Varchar(255)	
reservationstatus	Reservation Status	Varchar(255)	

Users

Attributes	Description	Data Type	Key
userid	User ID	Varchar(7)	PK
password	Password	Varchar(7)	
usertype	User Type	Varchar(255)	

PETAKOMMember

Attributes	Description	Data Type	Key
memberid	PETAKOM Member ID	Varchar(7)	PK
userid	User ID	Varchar(7)	FK
fullname	PETAKOM Member Name	Varchar(255)	
image	PETAKOM Member Image	Varchar(255)	
positiontype	Position Type	Varchar(255)	
position	Position Held	Varchar(255)	
positiondesc	Position Description	Varchar(255)	
email	PETAKOM Member Email	Varchar(255)	
number	PETAKOM Member Number	Varchar(255)	

3.7 Proof of Initial Concept/Prototype

This part comprises evidence of early work. Because this is a project-based prototype, the functionality is added to bring it up to standard. The following prototypes are designed using Figma software tools.

Figure 3.41 depicts the main page of the portal from the public view. Normal users are able to click on the button and redirected to their desired pages according to the clicked button. This main page also contains the vision and mission of the PETAKOM organization.

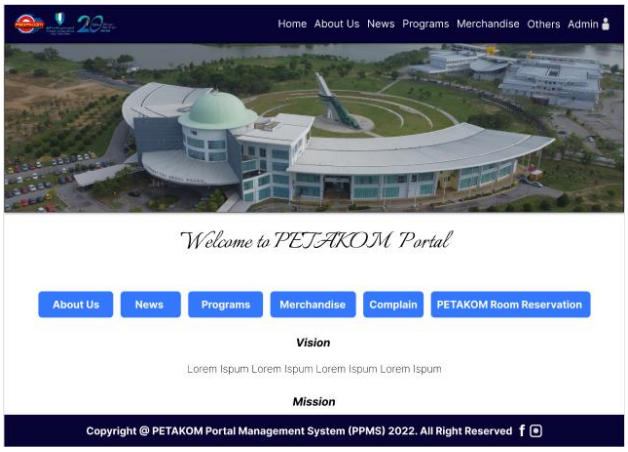

Figure 3.41 Home page of the portal

Figure 3.42 shows the Login page for the Administrator to login into their desired home page.

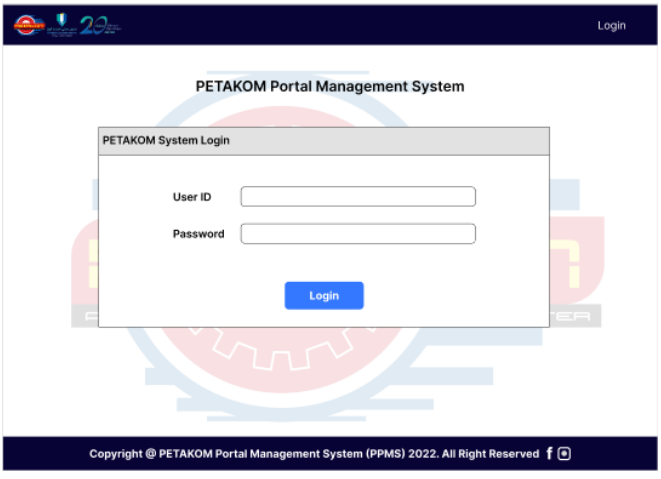

Figure 3.42 Login page of the portal for Admin

Figure 3.43 shows the Admin Dashboard once they have login into the PETAKOM portal. From the main page the admin can redirected to the desired web page.

Figure 3.43 Admin Dashboard

Figure 3.44 shows the About us page of the portal from public view. Basically, this page will show the PETAKOM Members lists.

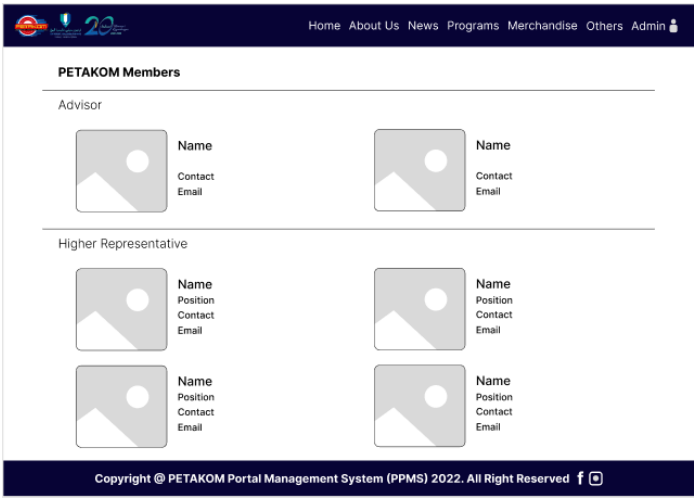

Figure 3.44 About Us page of the portal

Figure 3.45 shows the PETAKOM Members details management page of the portal from Admin view. The admin can add (blue button), update (yellow button) or delete (red button) the details in the page causing the details to be altered in the public view of the

portal. Figure 3.46 shows the add interface while figure 3.47 shows the update page for the PETAKOM members details.

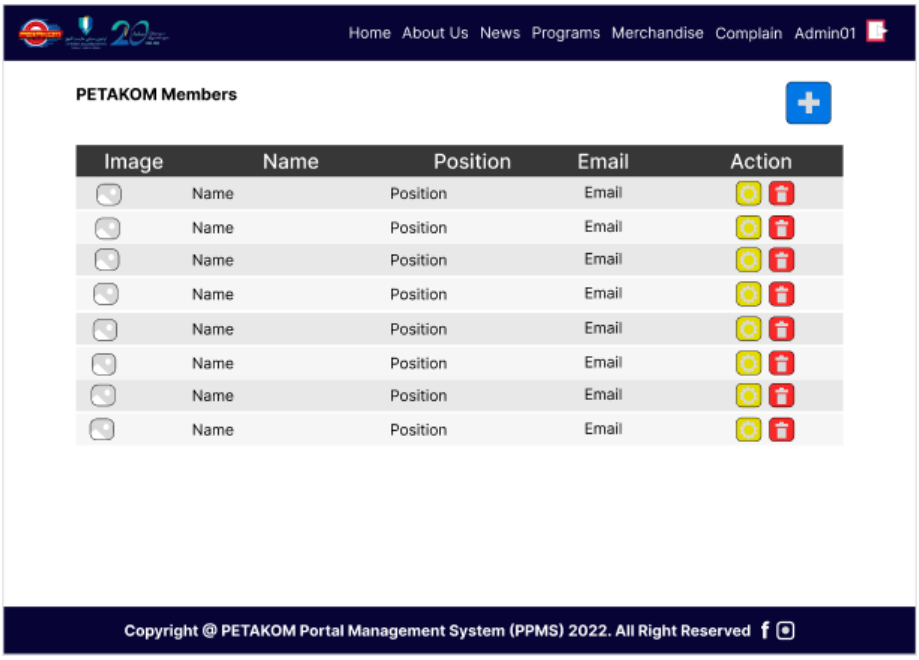

Figure 3.45 PETAKOM Members management page

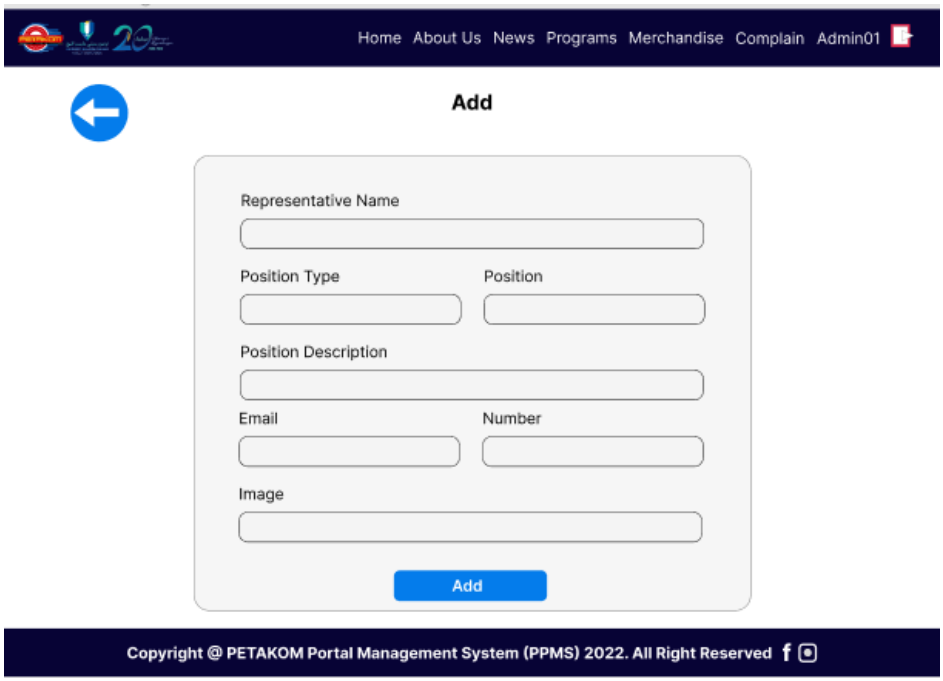

Figure 3.46 PETAKOM Members Add page

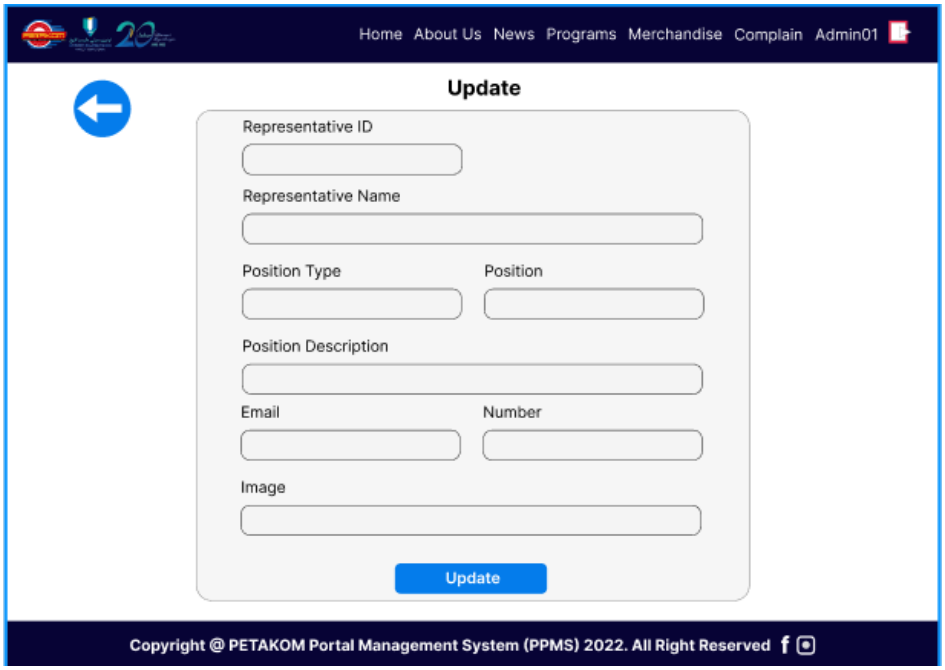

Figure 3.47 PETAKOM Members Update page

Figure 3.48 shows the News and Announcement page for the public view. When the public user clicks on the Info button, they are redirected the News page which is shown in Figure 3.49. The user can be redirected to the back page by clicking on the back button.

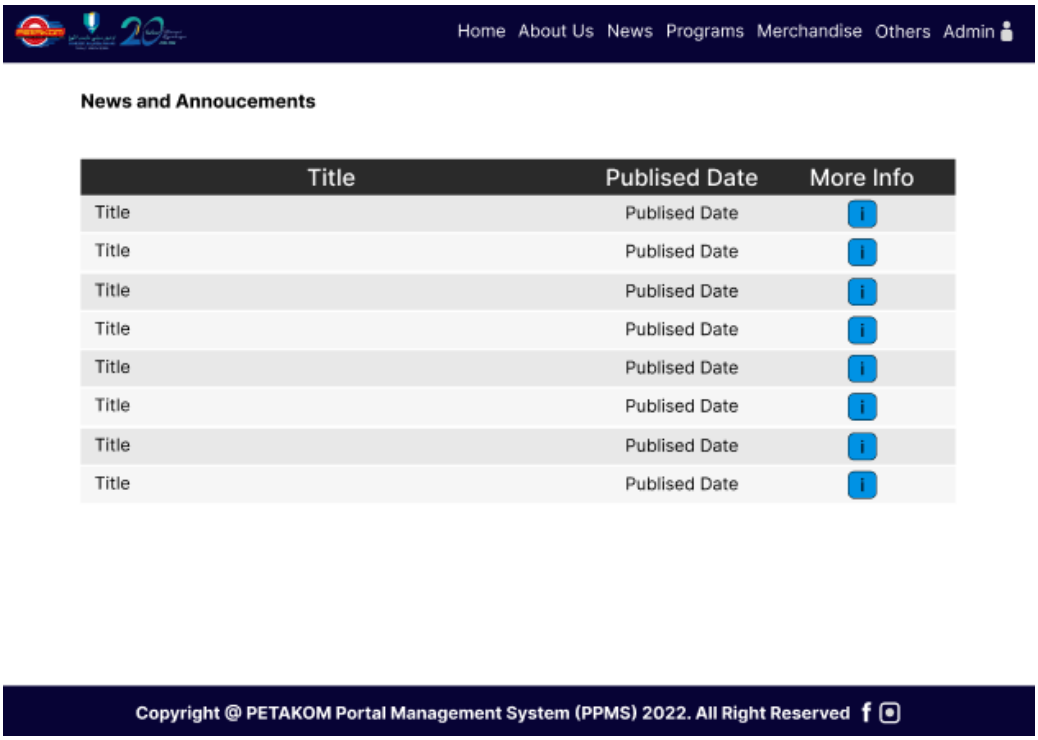

Figure 3.48 News and Announcement page

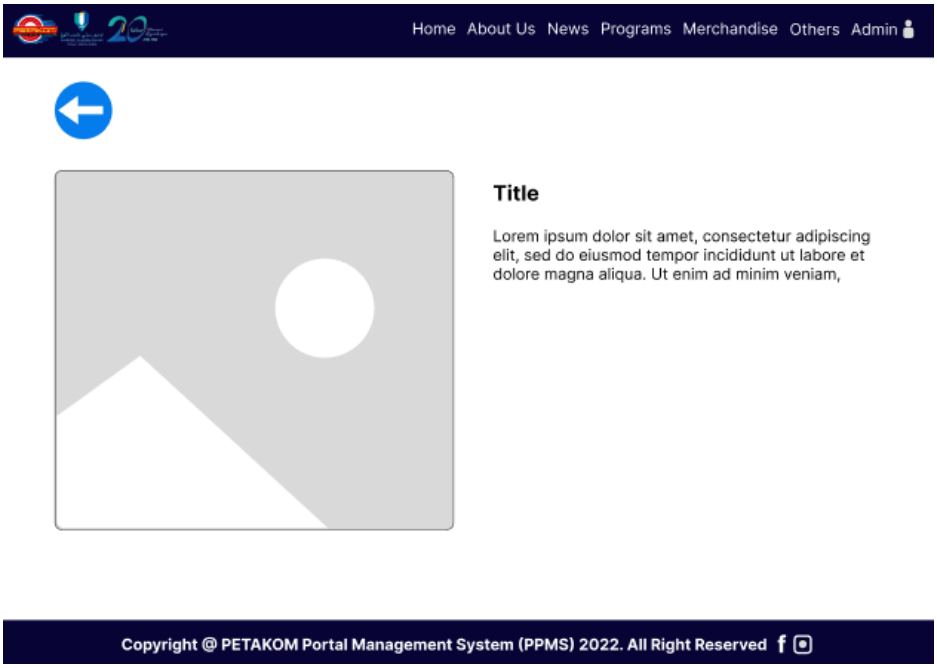

Figure 3.49 Specific News and Announcements page

Figure 3.50 shows the News and Announcement page of the portal from Admin view. The admin can add, update, or delete the details in the page causing the details to be changed in the public view of the portal. The specific news of the page is shown in Figure 3.51. Figure 3.52 shows the add interface while figure 3.53 shows the update page for the PETAKOM members details.

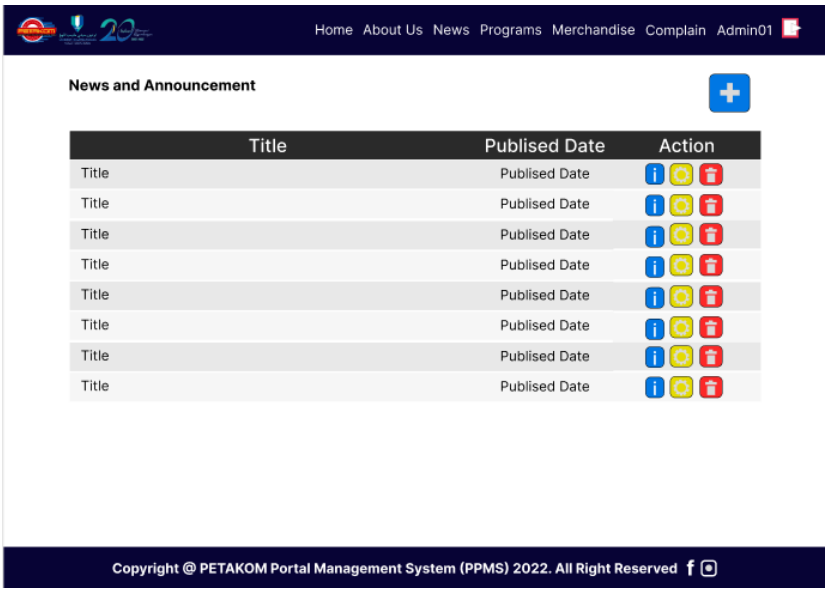

Figure 3.50 News and Announcement Management page

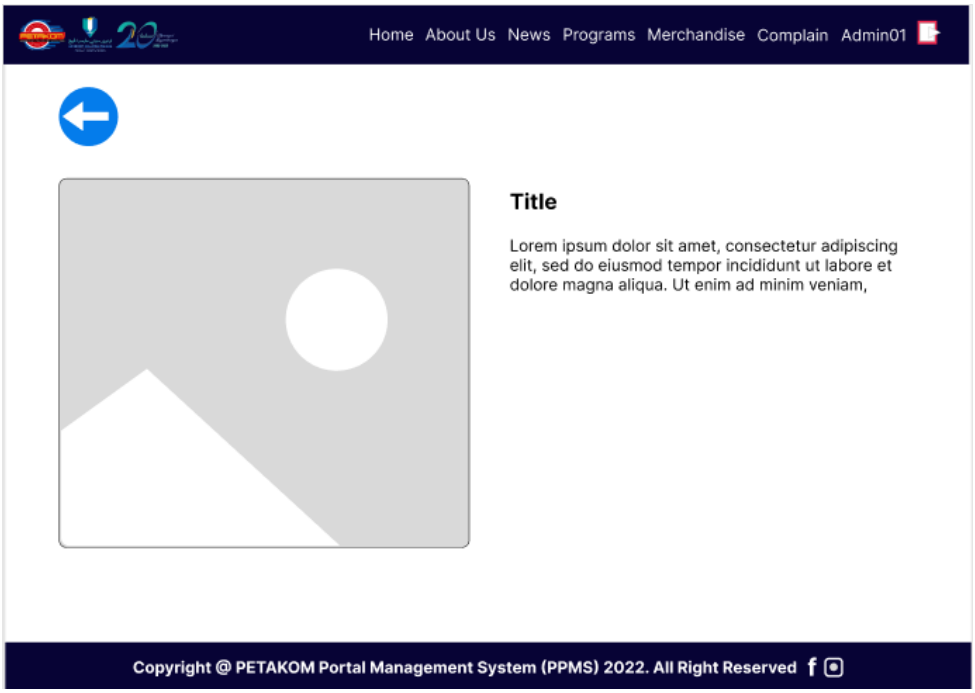

Figure 3.51 Specific News and Announcement Management page

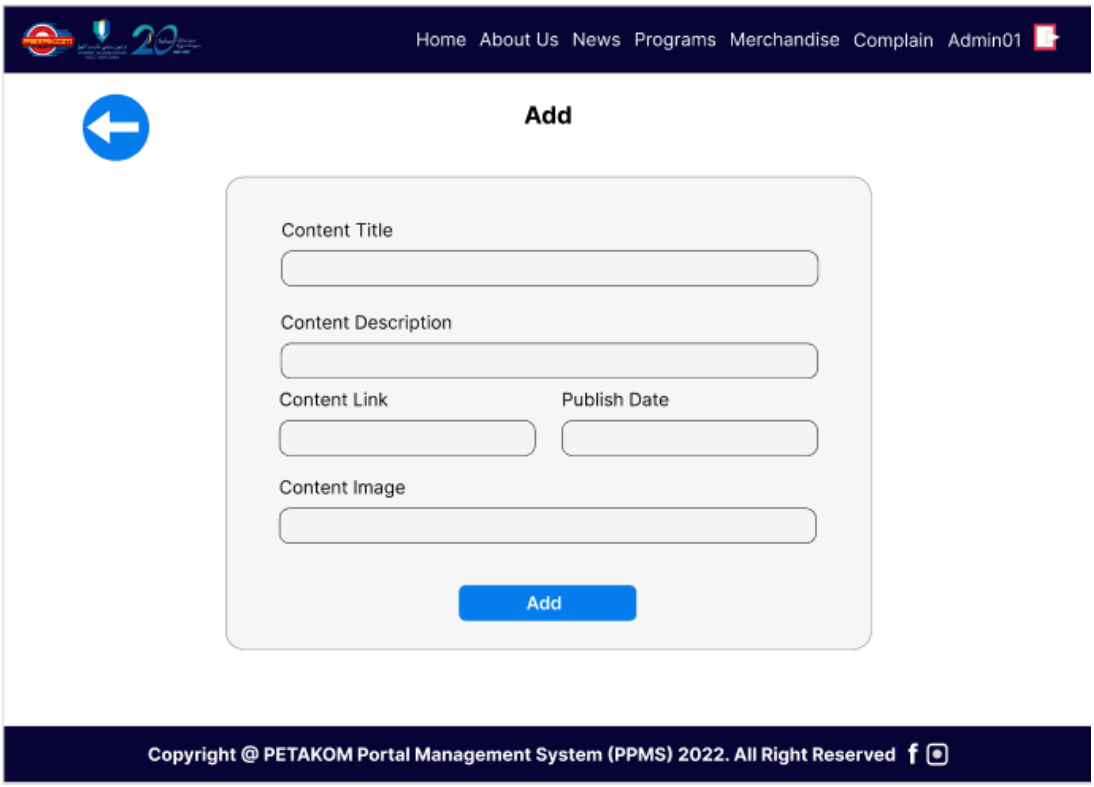

Figure 3.52 Add News and Announcement page

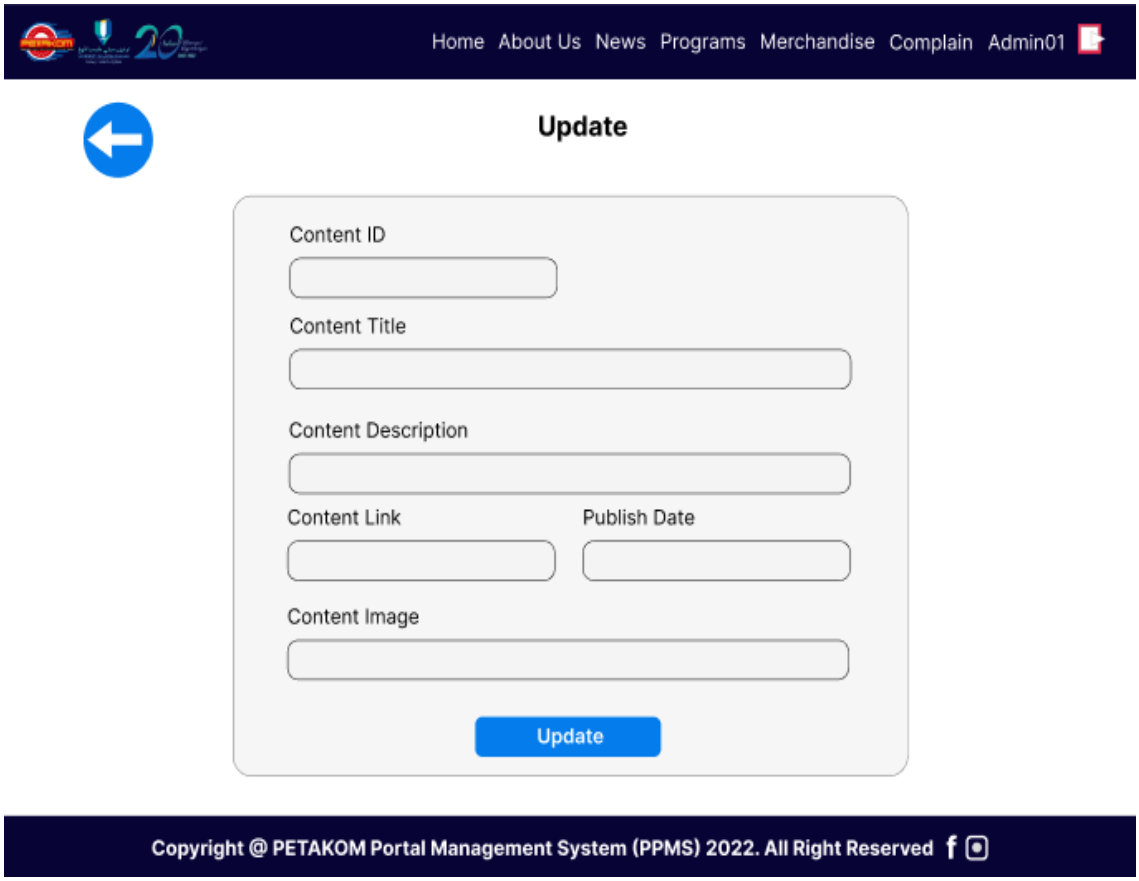

Figure 3.53 Update News and Announcement page

Figure 3.54 shows the upcoming program interface from the public view. The main details of the program are depicted in the main interface. To see further into the user will click on the 'More Info' button to see detailed information of the program which is shown in Figure 3.55. The user can hover over the on the Programs option on the navigation tab. Over the option the user can select on the Bulletin Program option in order to be redirected to interface that is shown in Figure 3.56. Same as for upcoming program the user clicks on the 'More Info' button to see the detailed information as presented in Figure 3.57. From the navigation tab the user can also select suggest program option to be directed to interface on figure 3.58. In this page the normal users can suggest the programs that can be arranged by the PETAKOM organization.

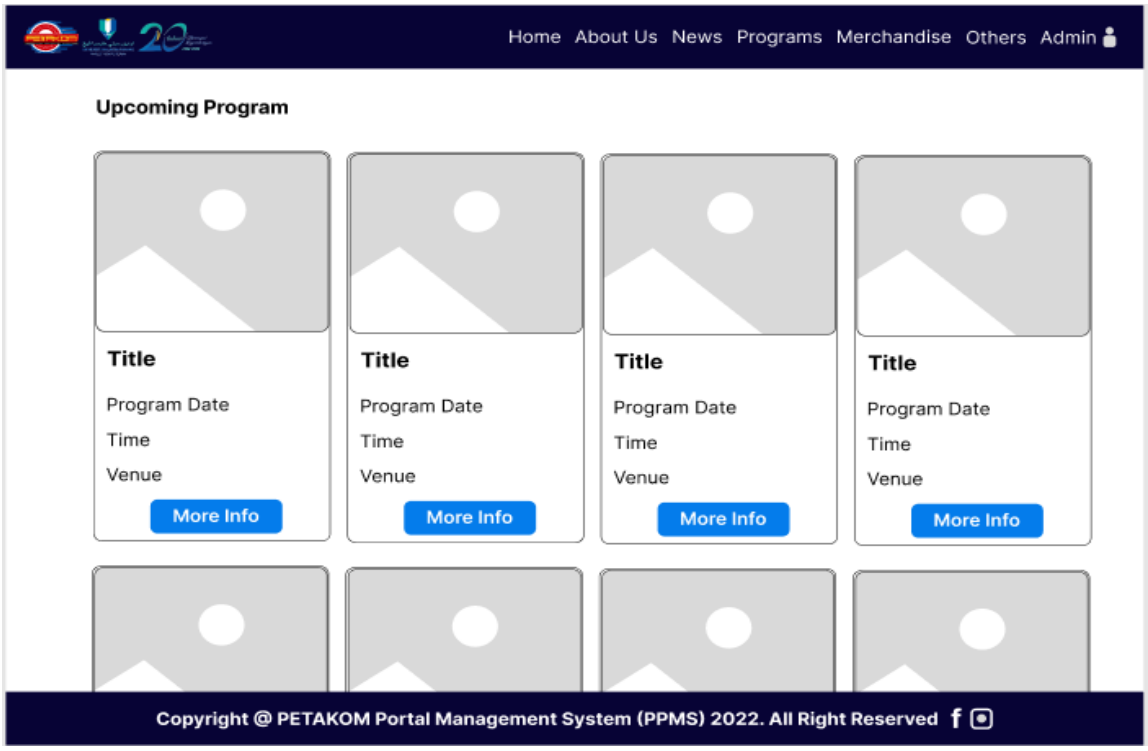

Figure 3.54 Upcoming Program page

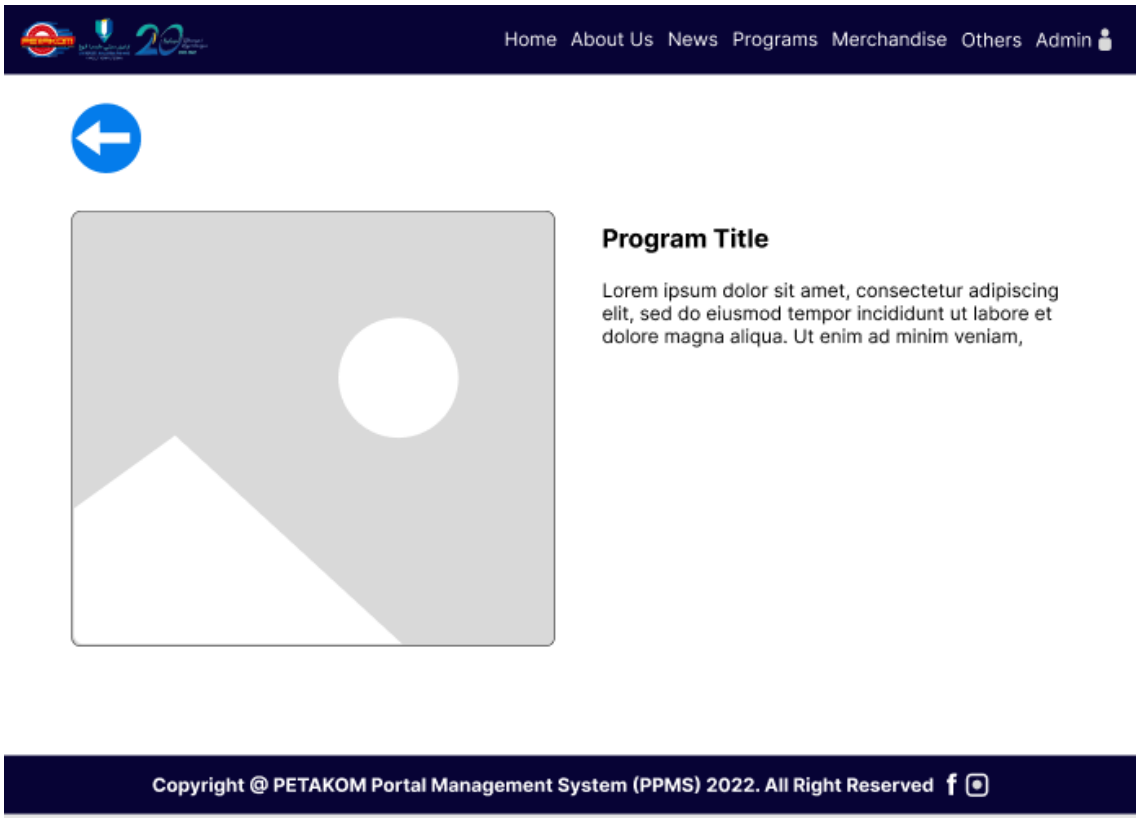

Figure 3.55 Specific Upcoming Program page

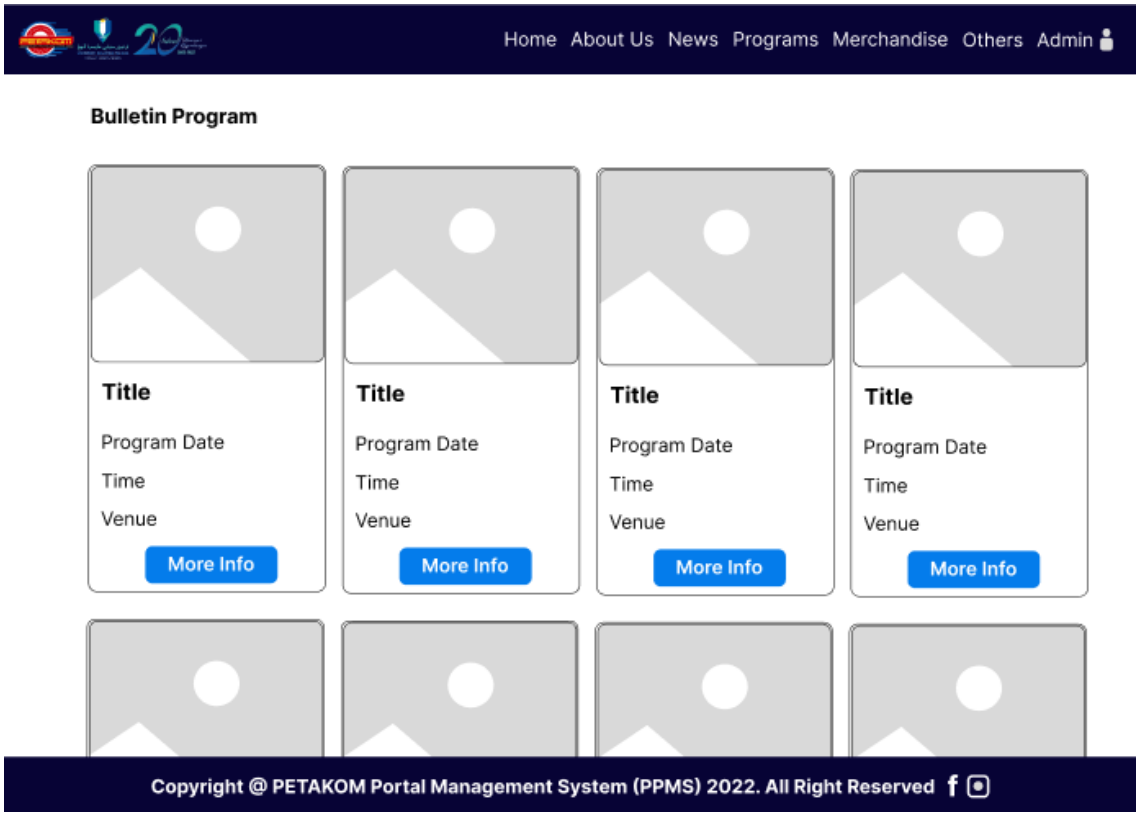

Figure 3.56 Bulletin Program page

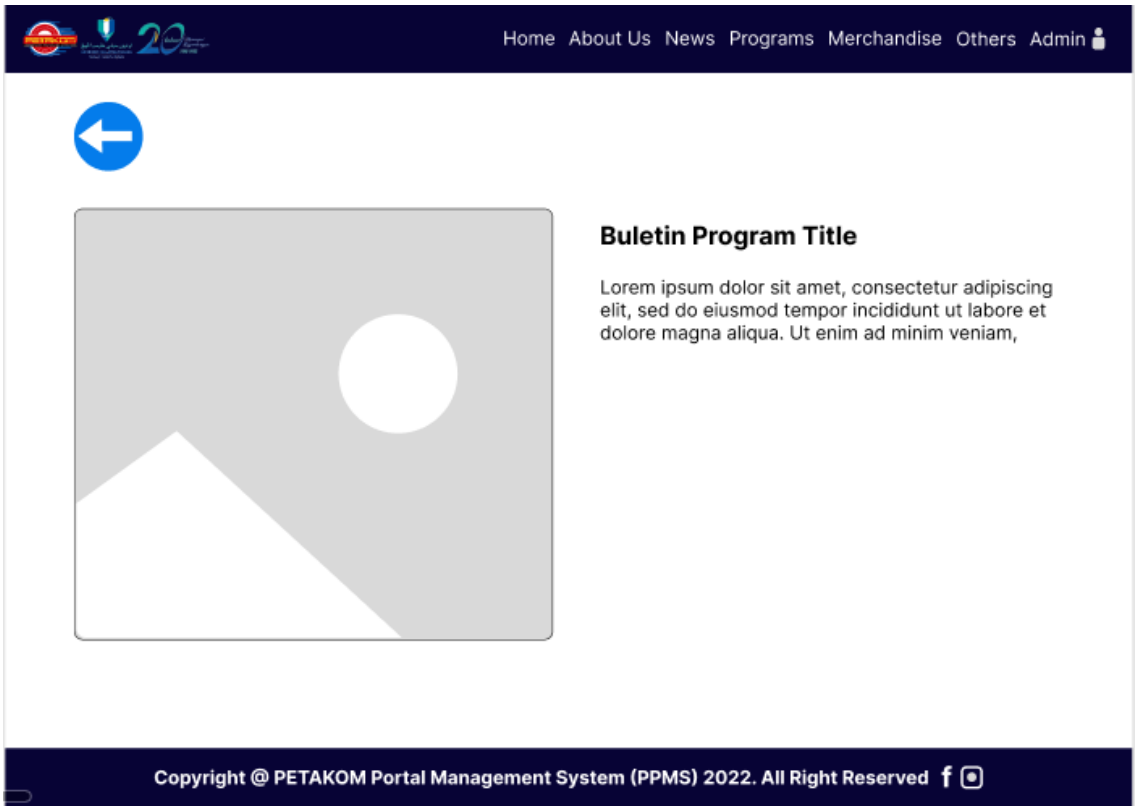

Figure 3.57 Specific Bulletin Program page

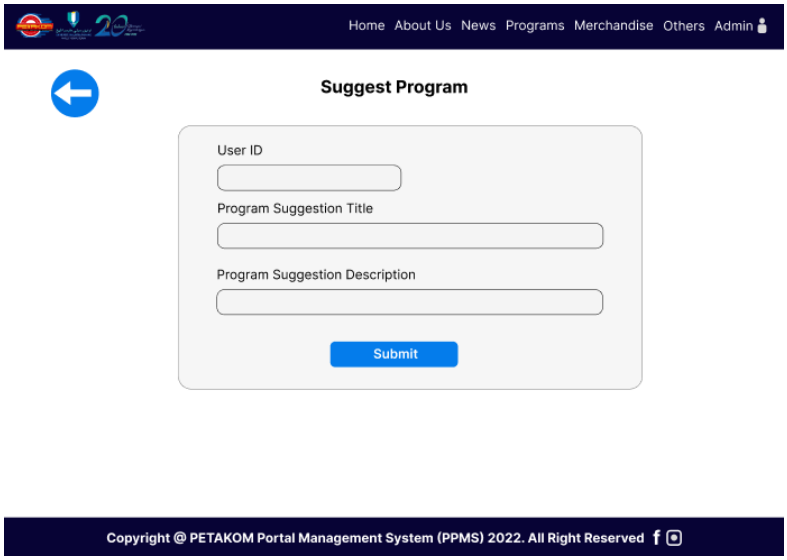

Figure 3.58 Suggest Program page

From the admin page, the admin can manage the program details as shown in figure 3.59 for upcoming programs and figure 3.60 for program bulletin. The specific program information interface, figure 3.61 shows the detailed information of the program and from there the admin can click on the update button to update the information. The update page of the program as shown in figure 3.62. From figure 3.59 or figure 3.60, the admin is brought to the Add page, figure 3.63 by clicking on the Add button on top of the table. The admin can hover over the program option on the navigation tab to see the program report as shown in figure 3.64. The admin can also view the list of program suggestion as shown in figure 3.65.

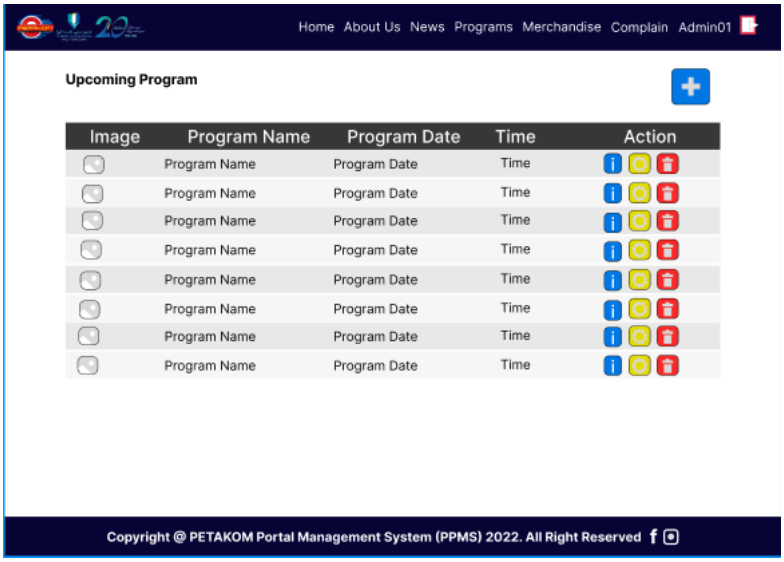

Figure 3.59 Upcoming Program Management page

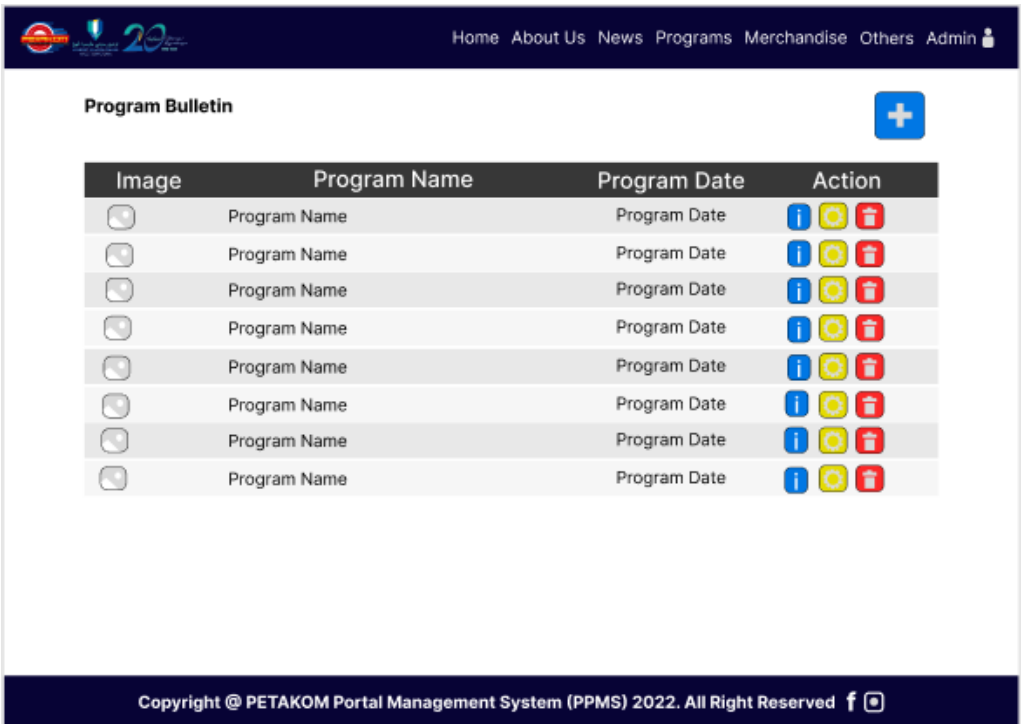

Figure 3.60 Program Bulletin Management page

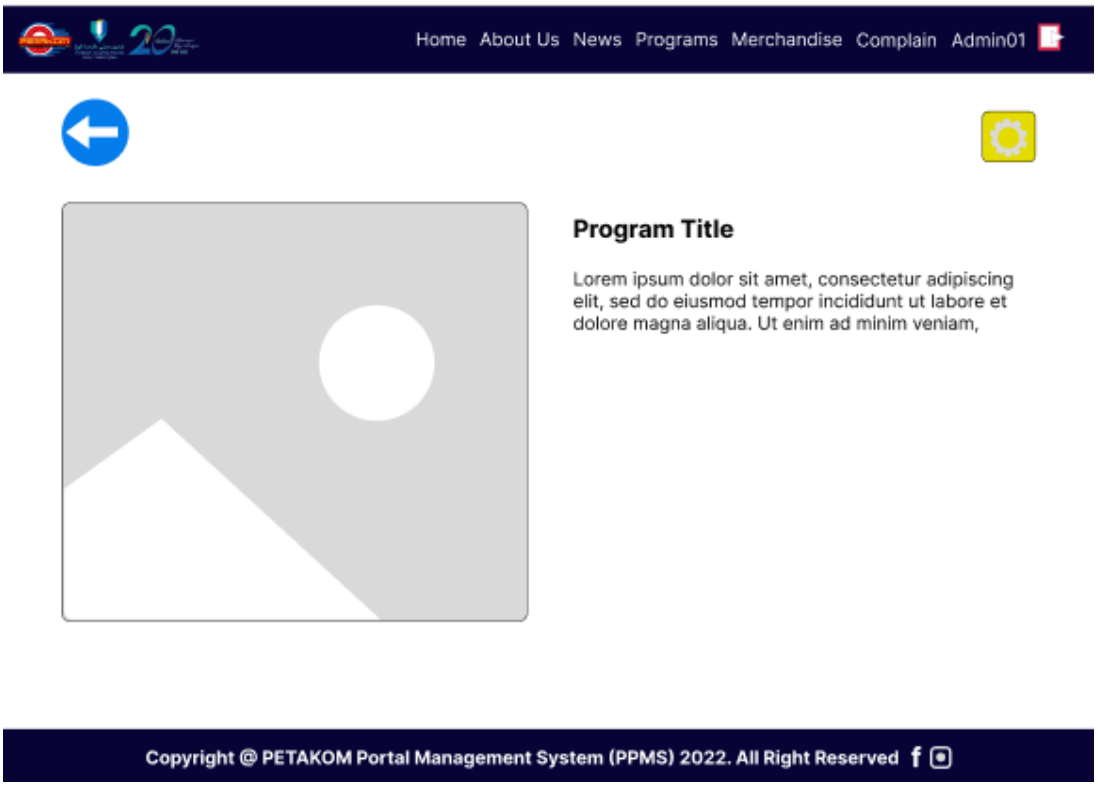

Figure 3.61 Specific Program Information page

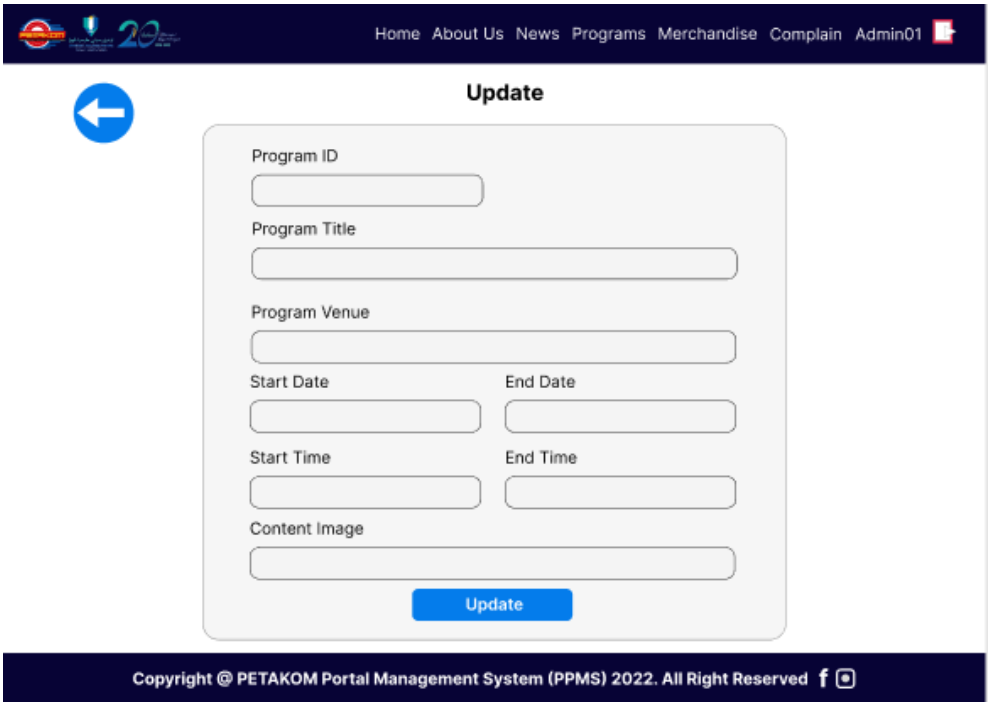

Figure 3.62 Update Program Information page

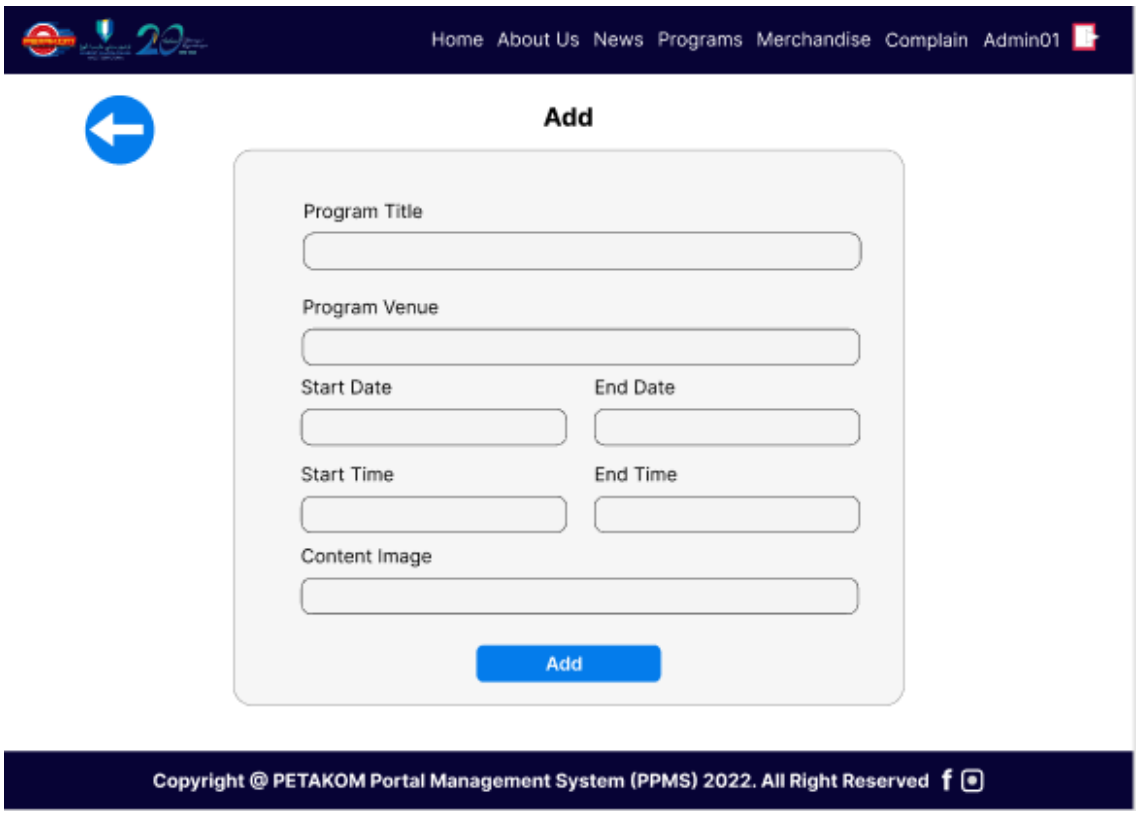

Figure 3.63 Add Program Information page

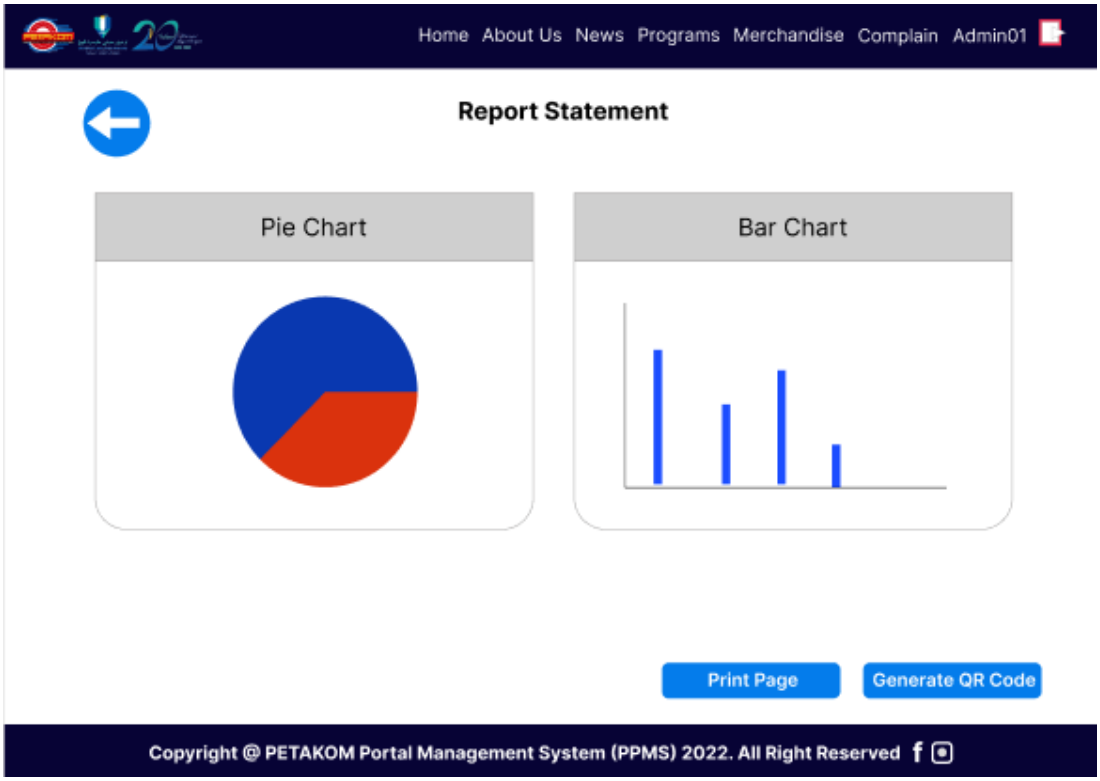

Figure 3.64 Program Report page

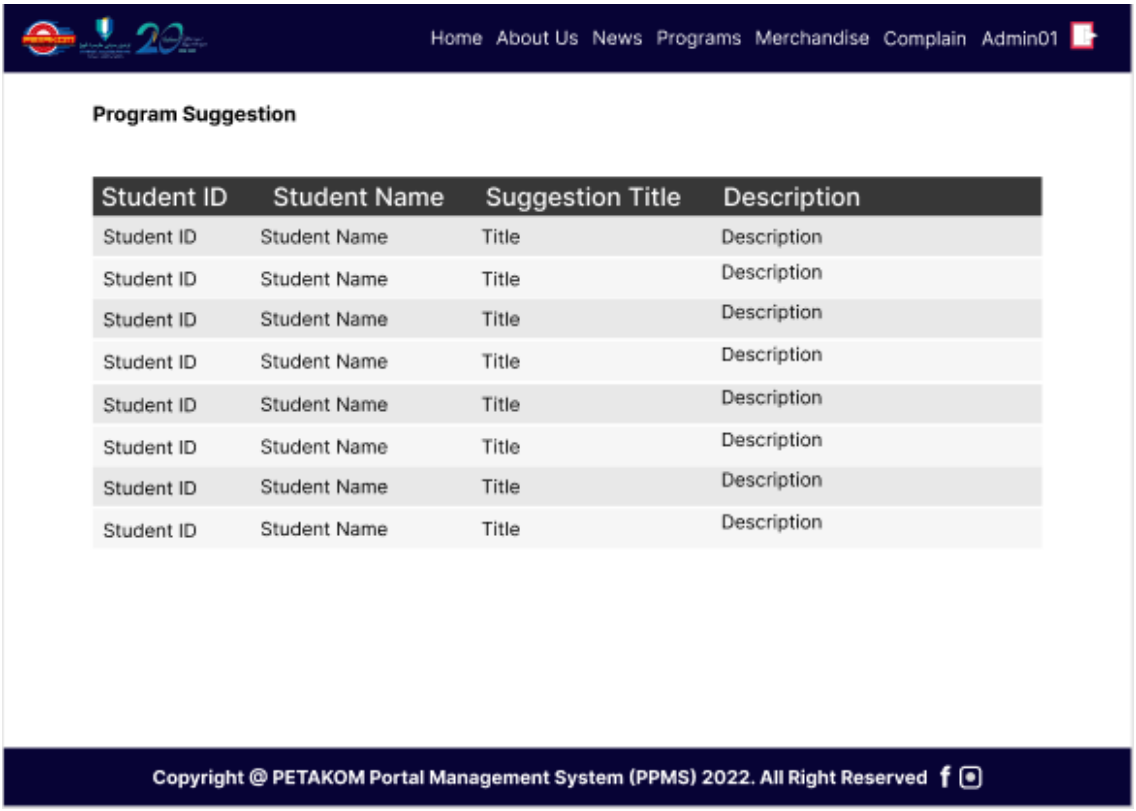

Figure 3.65 Program Suggestion Lists page

The PETAKOM Merchandise list in public view of the portal is shown in figure 3.66. When the user clicks on ‘More Info’ button they are redirected to figure 3.67 where the users can view the merchandise in detail. The ‘Buy Now’ button will direct the user to interface that is shown in figure 3.68 where the user can buy the merchandise.

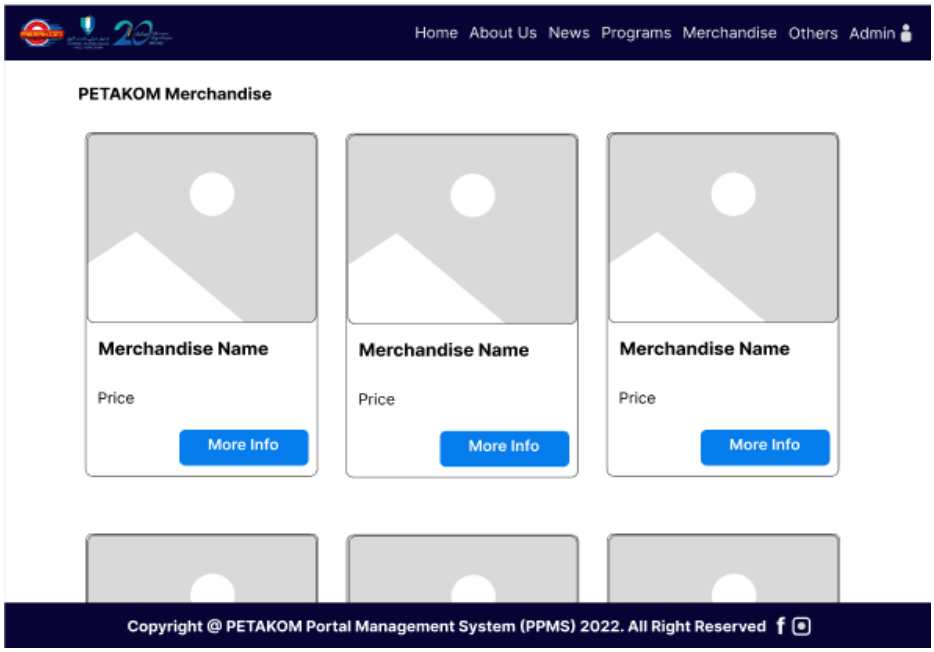

Figure 3.66 Merchandise Lists page

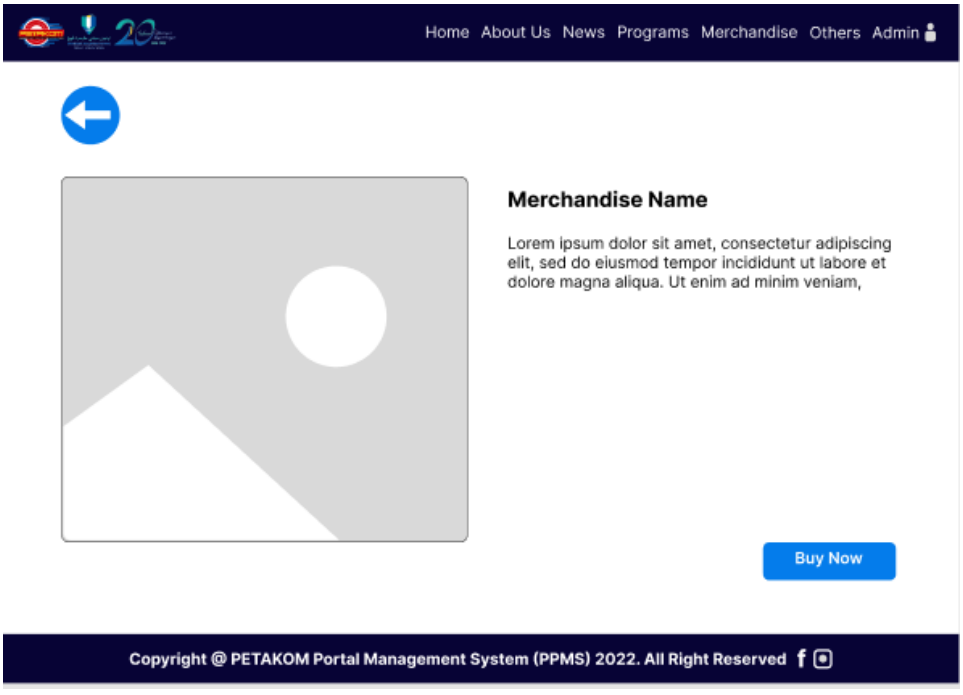

Figure 3.67 Merchandise Information page

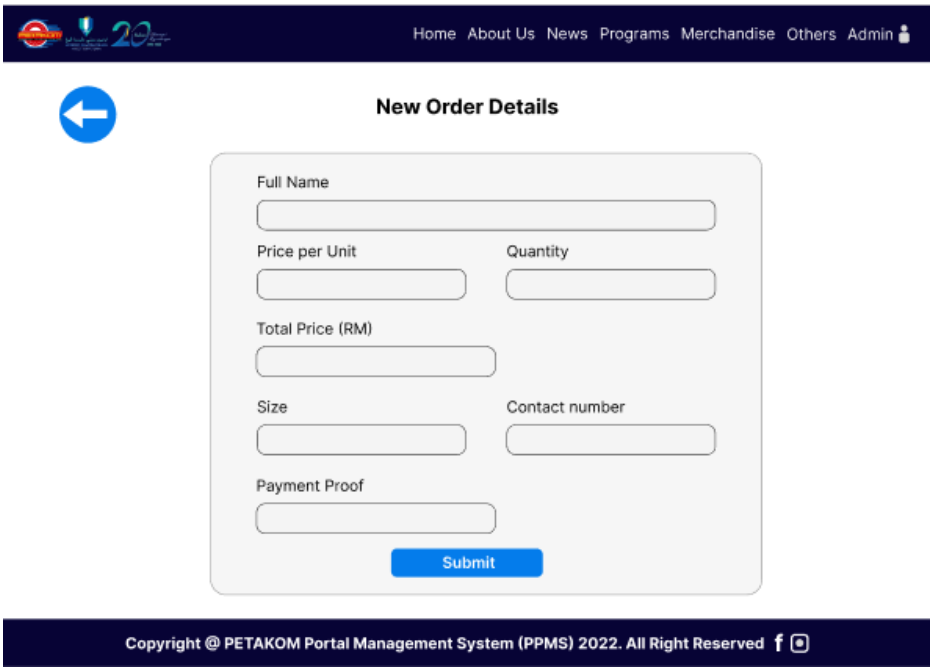

Figure 3.68 Merchandise Purchase page

Figure 3.69 shows the Merchandise management page of the Administrator view. The admin can view, add, update, and delete the merchandise details. Figure 3.70 shows the merchandise details page, while figure 3.71 shows the add page of the merchandise. The update page of the merchandise is shown in figure 3.72 where the admin can update the merchandise details. The purchase report of the merchandise is shown in figure 3.73, where the admin can generate PDF of the purchase order.

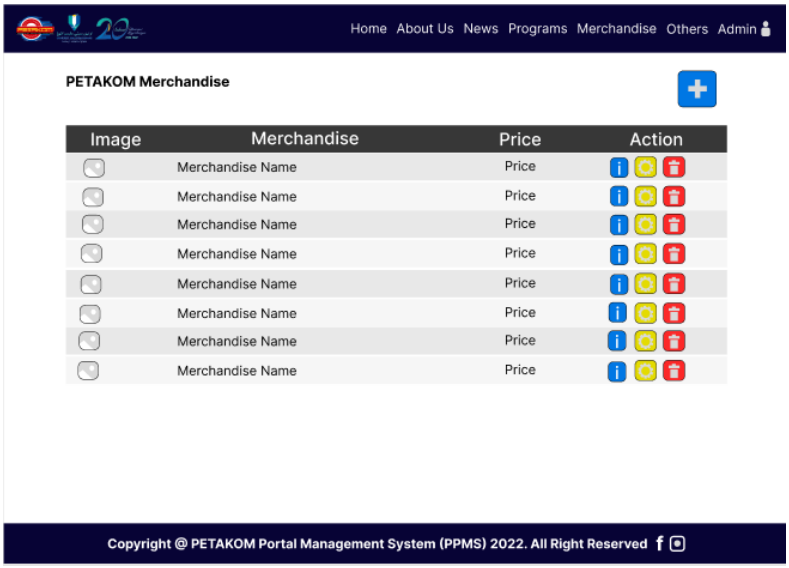

Figure 3.69 Merchandise Management page

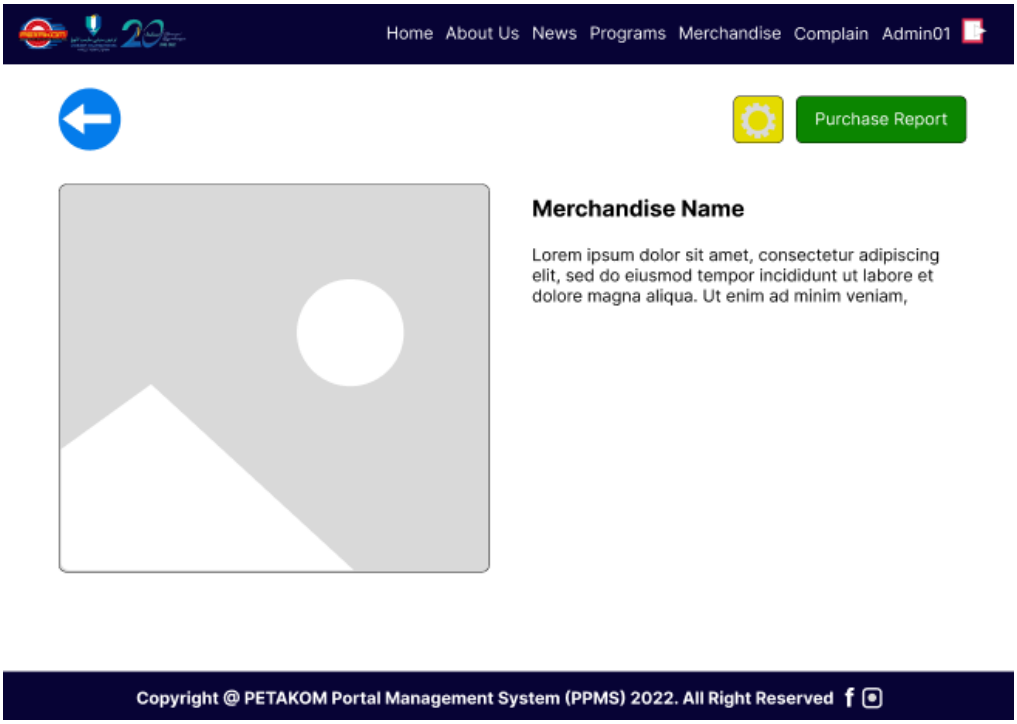

Figure 3.70 Specific Merchandise Information page

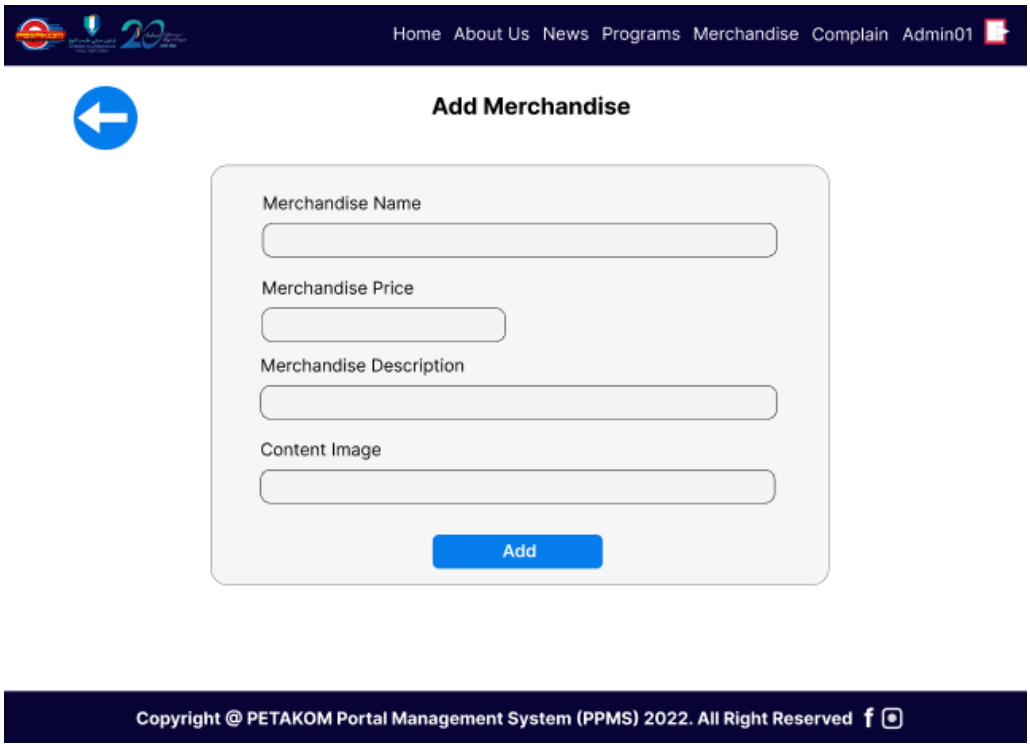

Figure 3.71 Add Merchandise page

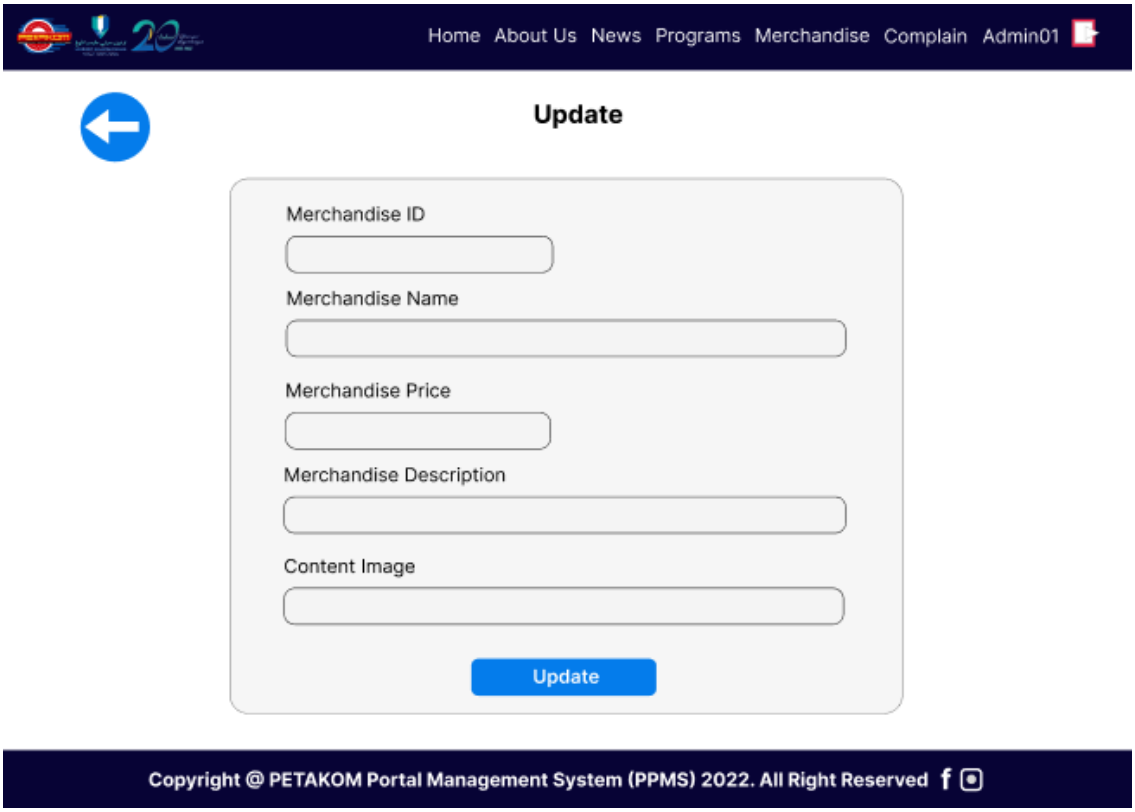

Figure 3.72 Update Merchandise page

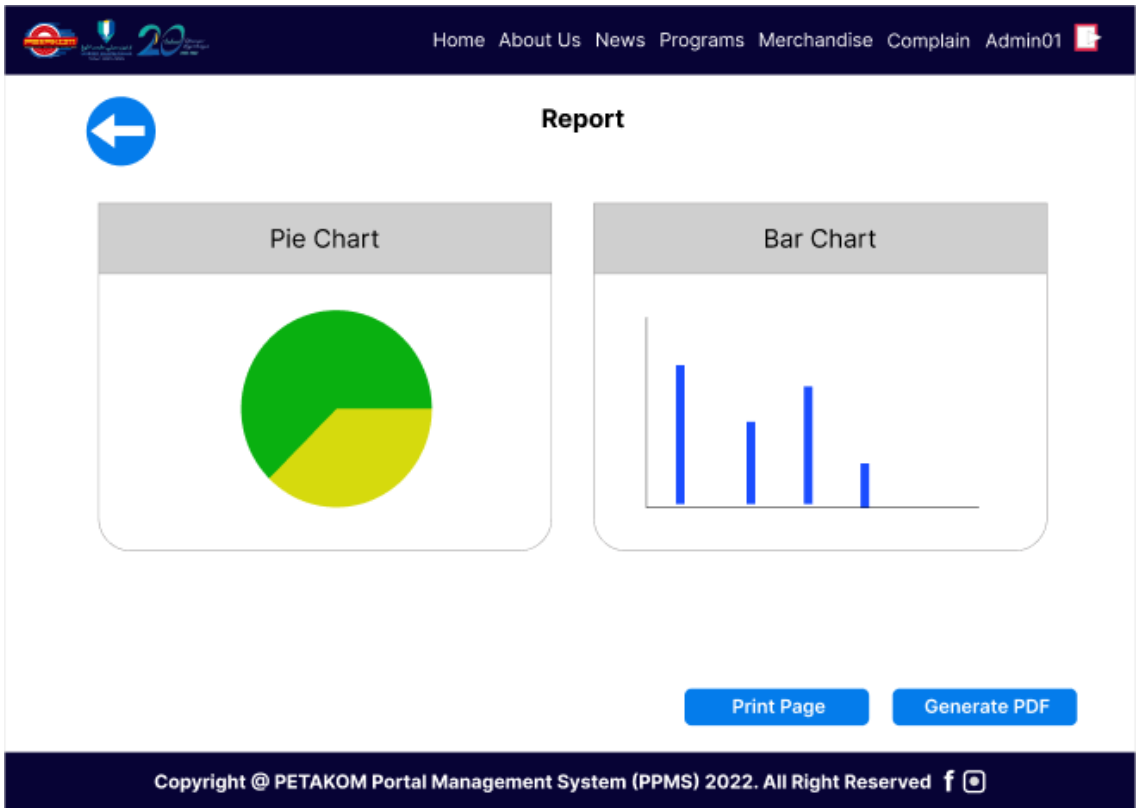

Figure 3.73 Merchandise Report page

From the public view of the portal the FK students can complain regarding the faculty or PETAKOM organization through the online form that is depicted in figure 3.74. The public users can also view the list of resolved and unresolved list as shown in figure 3.75 and figure 3.76 respectively.

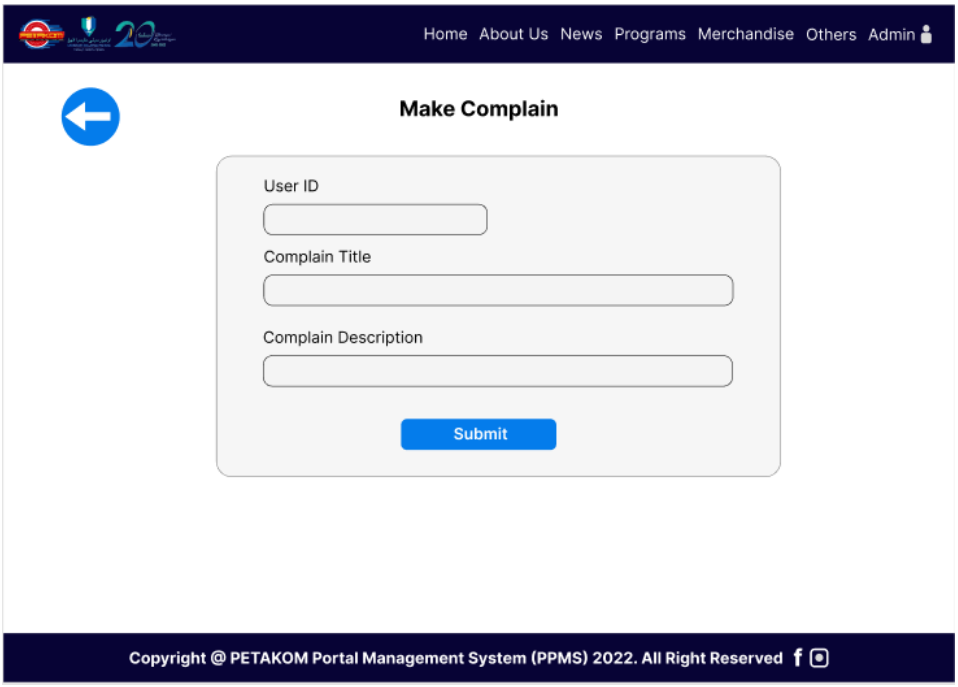

Figure 3.74 Make Complain page

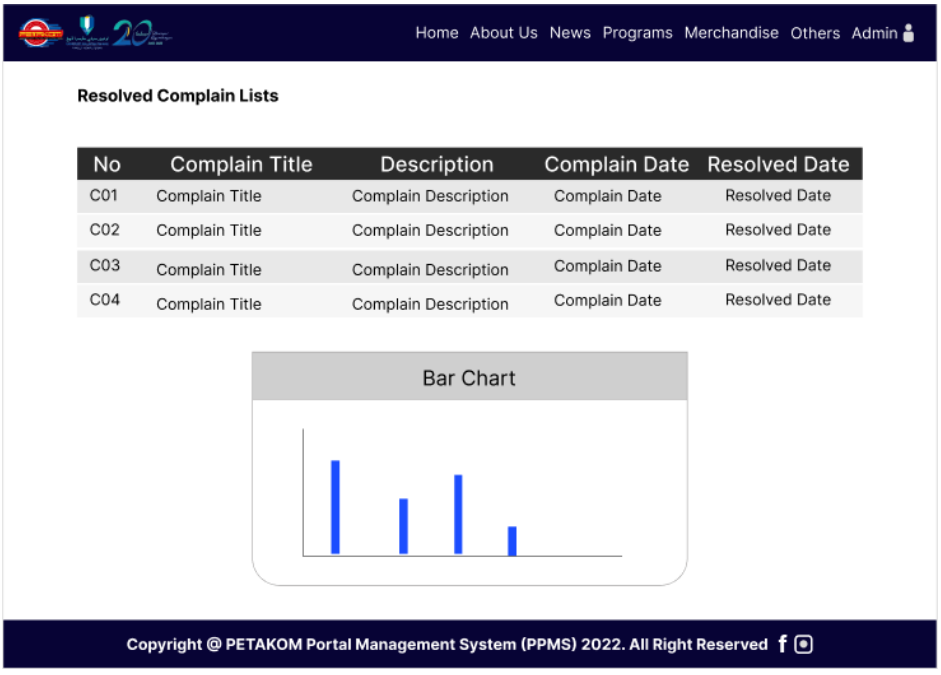

Figure 3.75 Resolved Complain Lists

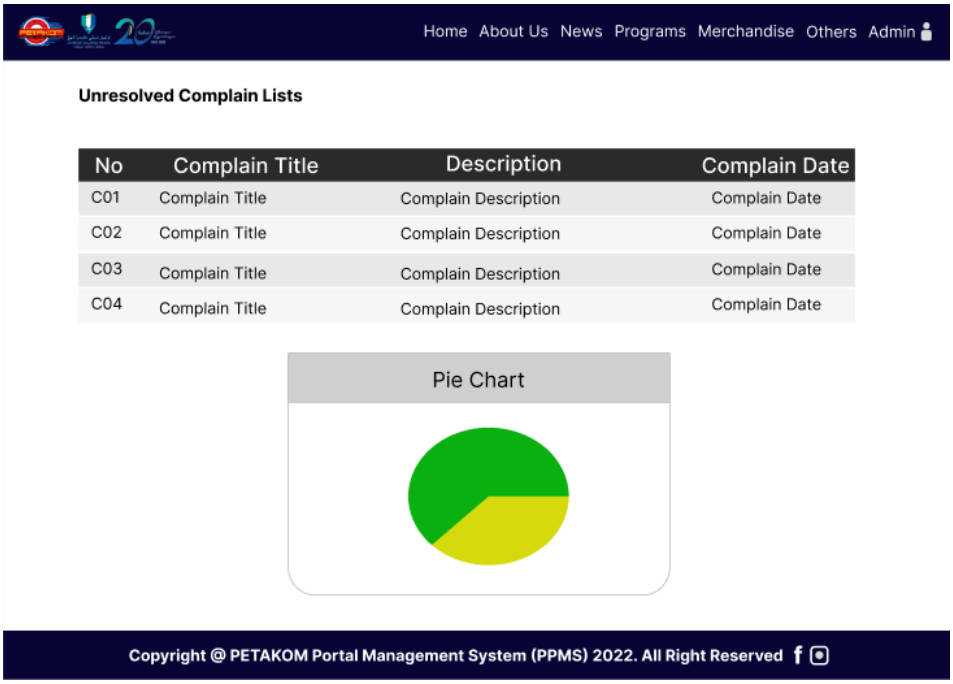

Figure 3.76 Unresolved Complain Lists

Figure 3.77 and 3.78 shows the resolved and unresolved complain list in admin view. The ban red button will change the status of the resolved complain to unresolved, while the green tick button will change unresolved complain status to resolved. The complaint report for admin view is shown in figure 3.79.

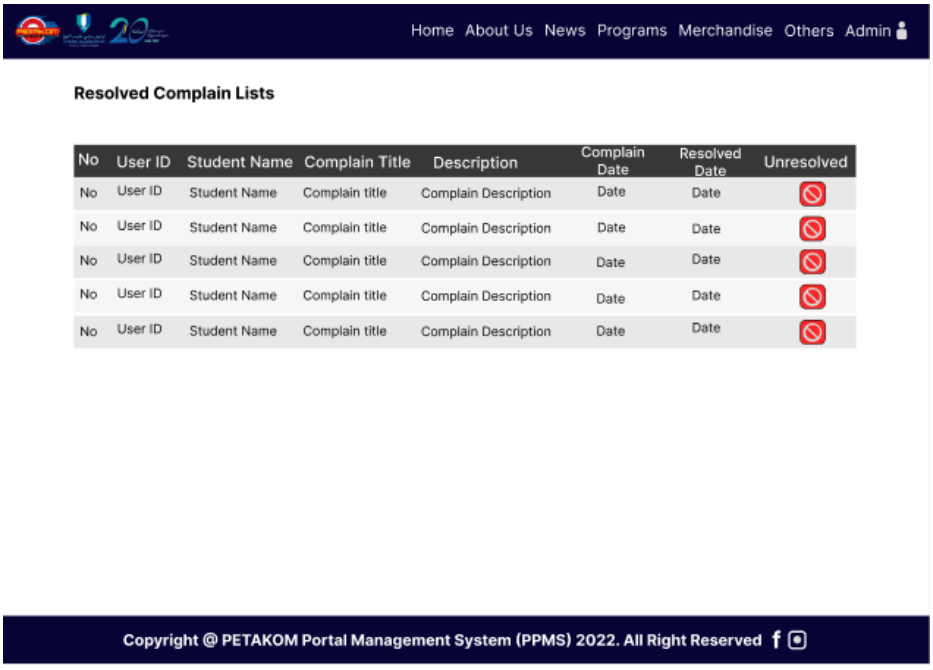

Figure 3.77 Resolved Complain Lists from Admin view

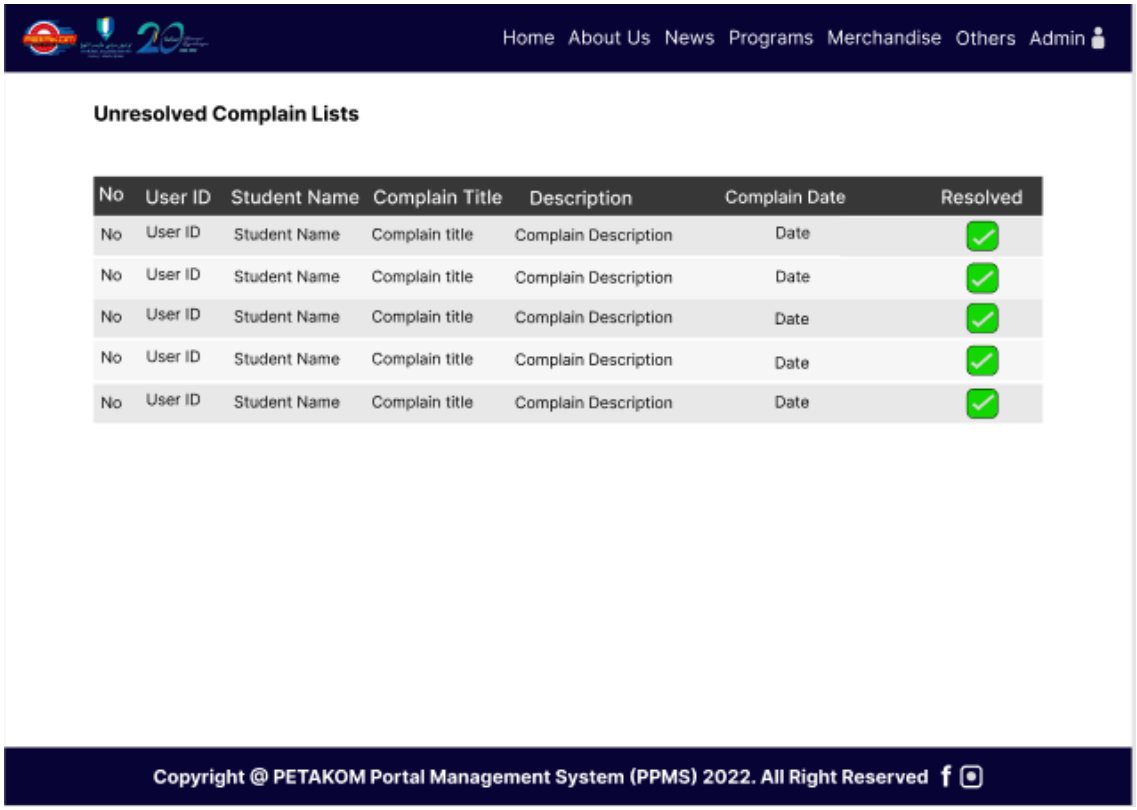

Figure 3.78 Unresolved Complain Lists from Admin view

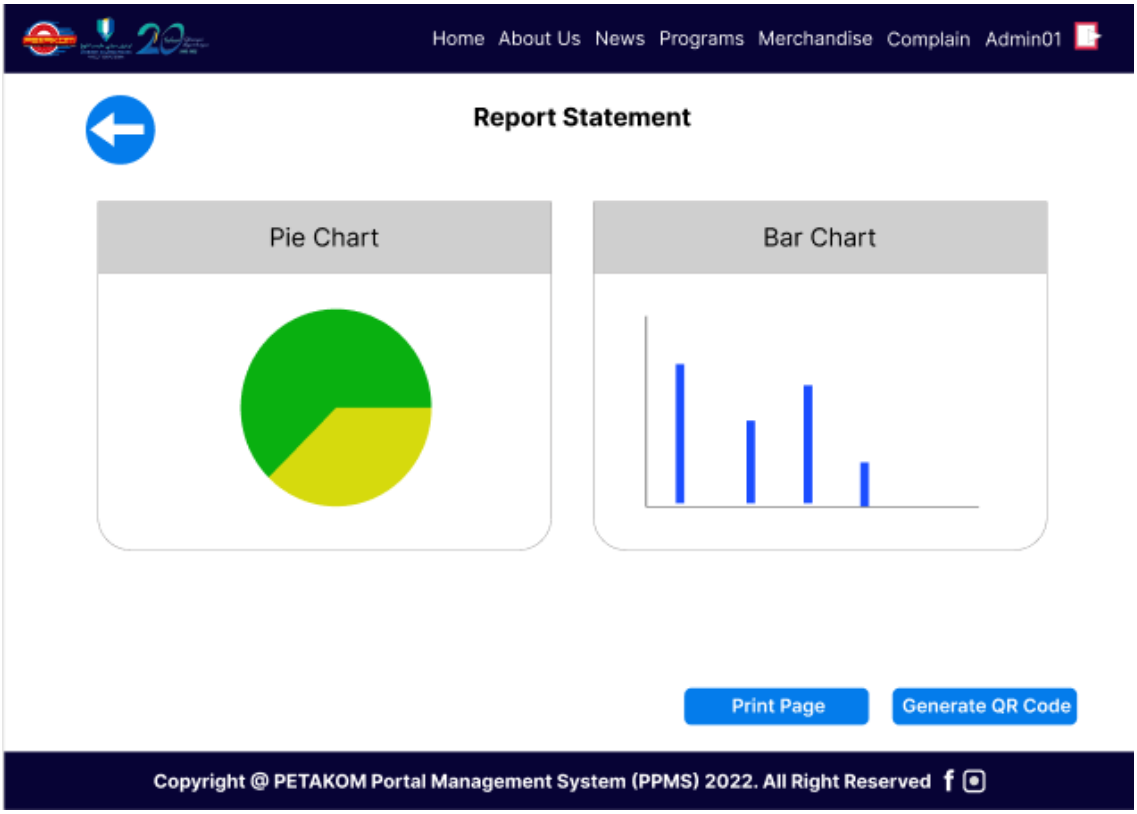

Figure 3.79 Complain Report from Admin view

Figure 3.80 shows the login page of the PETAKOM room booking system for both admin and student. The authentication will direct the user to their specific home page.

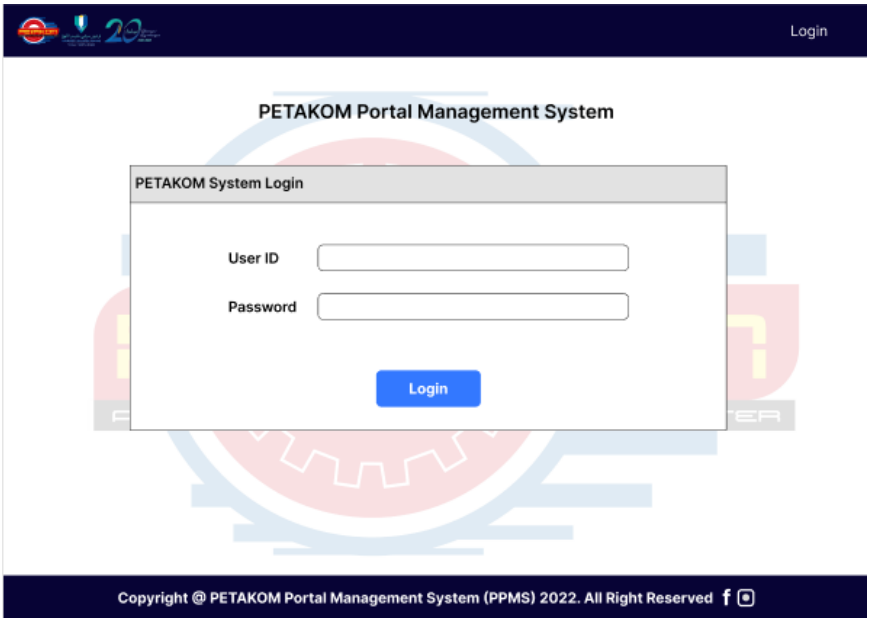

Figure 3.80 PETAKOM Room Booking Login page

Figure 3.81 shows the home page of the FK student once they have login. The FK student can choose to add, update, or cancel their reservation. They can also view the approved and rejected reservation list.

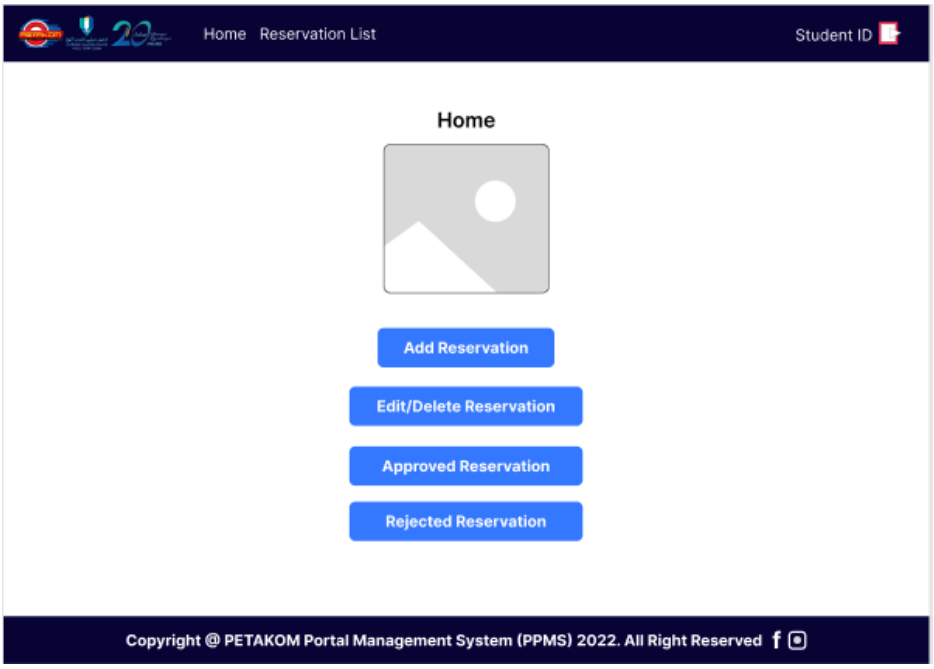

Figure 3.81 Student Home page of PETAKOM Room Booking

Figure 3.82 shows the Add Reservation page for the PETAKOM Room Reservation system. Here FK Students can add reservation for the PETAKOM Room. Once they have filled up the details the students will click on the Add Reservation button.

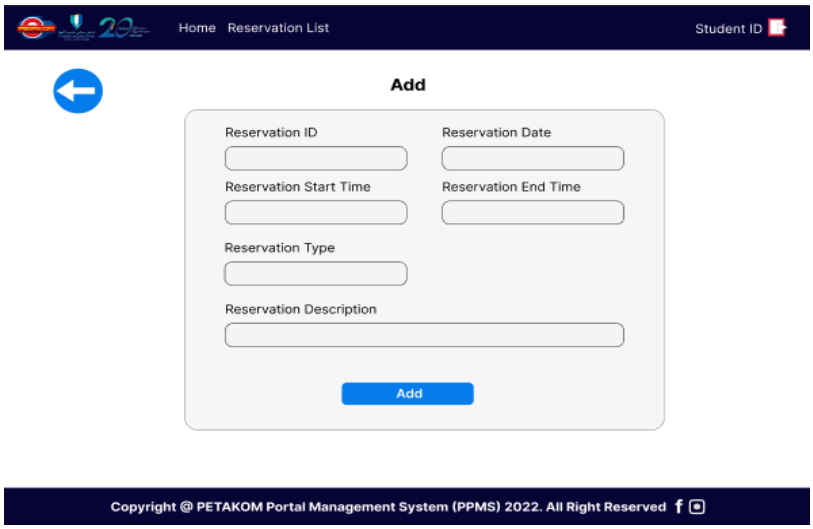

Figure 3.82 Add Reservation page

Figure 3.83 shows the Pending reservation list of the PETAKOM Room Booking. Here student can update or delete the reservation by clicking on the respective buttons. If they click on the Update button, they will direct to Update page on figure 3.84, else if they click on delete button the data will be removed from the Database. Figure 3.85 and figure 3.86 shows the approved and rejected reservation lists of the respective student.

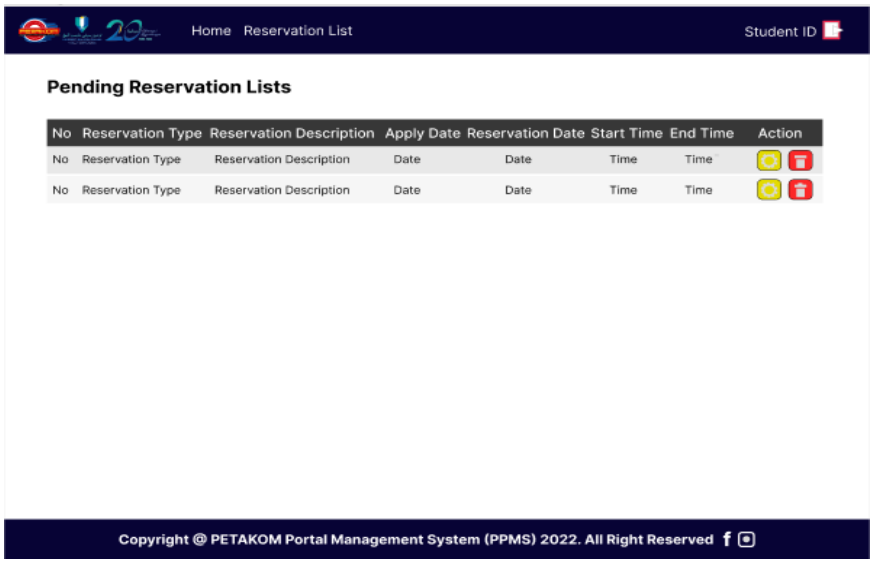

Figure 3.83 Pending Reservation Lists Student Page

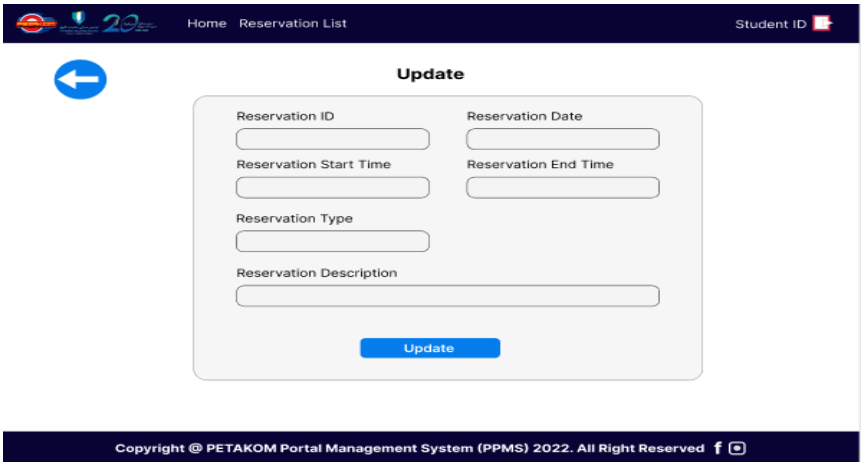

Figure 3.84 Update Student Reservation

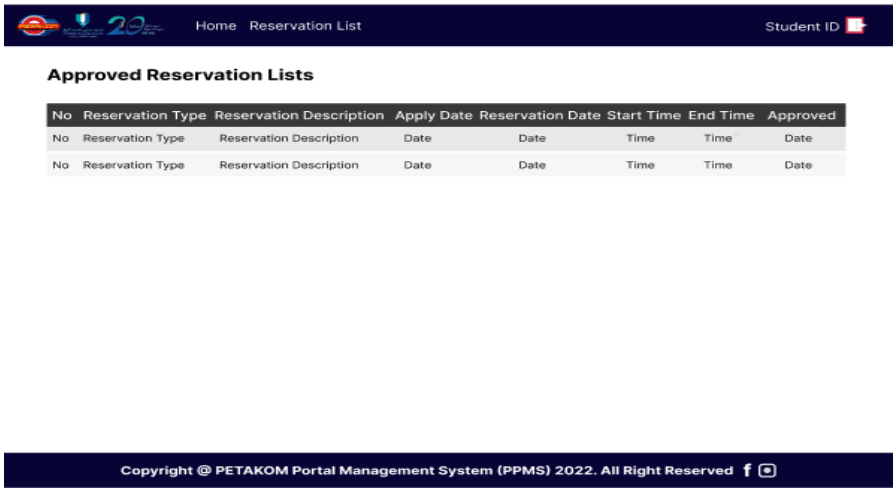

Figure 3.85 Approved Student Reservation Lists

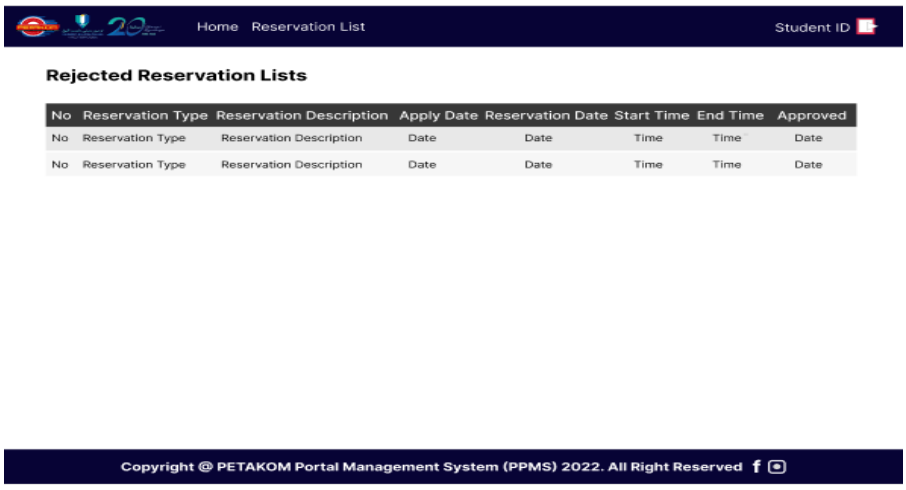

Figure 3.86 Rejected Student Reservation Lists

Figure 3.87 shows the admin homepage once they have login into the system. The admin can view the list of pending reservations, approved reservations, rejected reservations and reservation report. In the pending reservation lists in figure 3.88, the admin can accept or reject the student's reservation request. Figure 3.89 and figure 3.90 shows the students approved and rejected reservation list and from there the admin can change the approval status by clicking on the update button and redirected to interface shown in figure 3.91. The reservation report of the admin view is shown in figure 3.92.

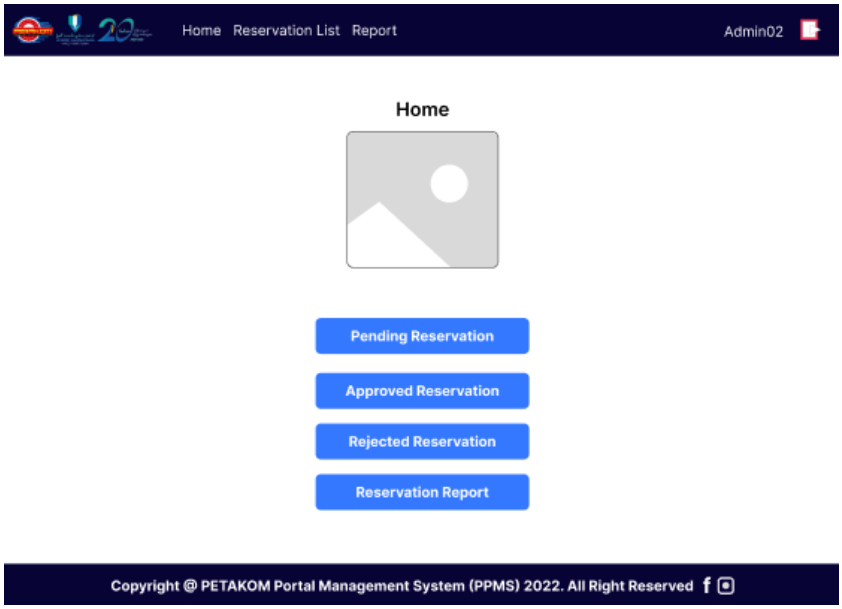

Figure 3.87 Admin Homepage of PETAKOM Room Reservation

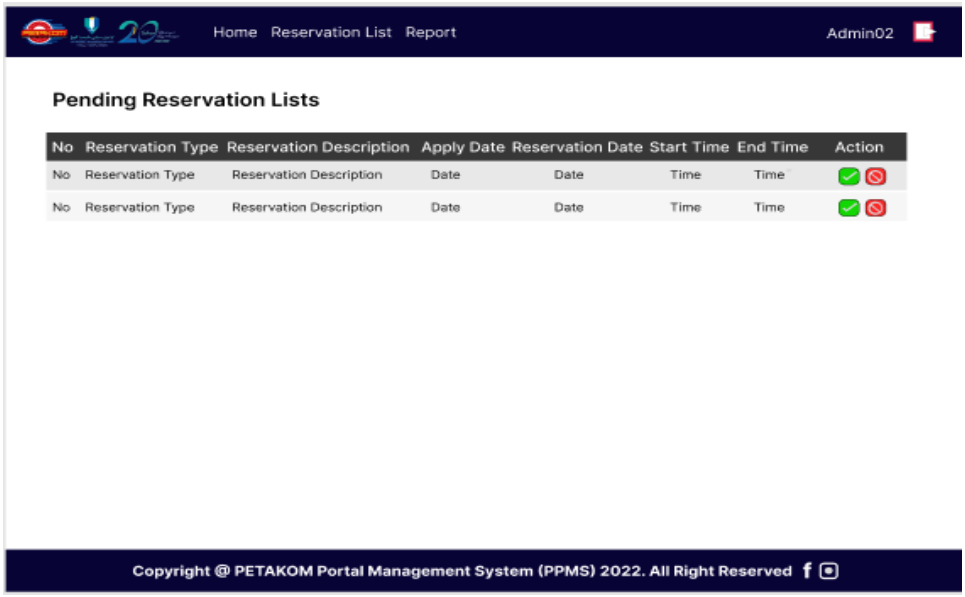

Figure 3.88 Pending Reservation List of Administrator

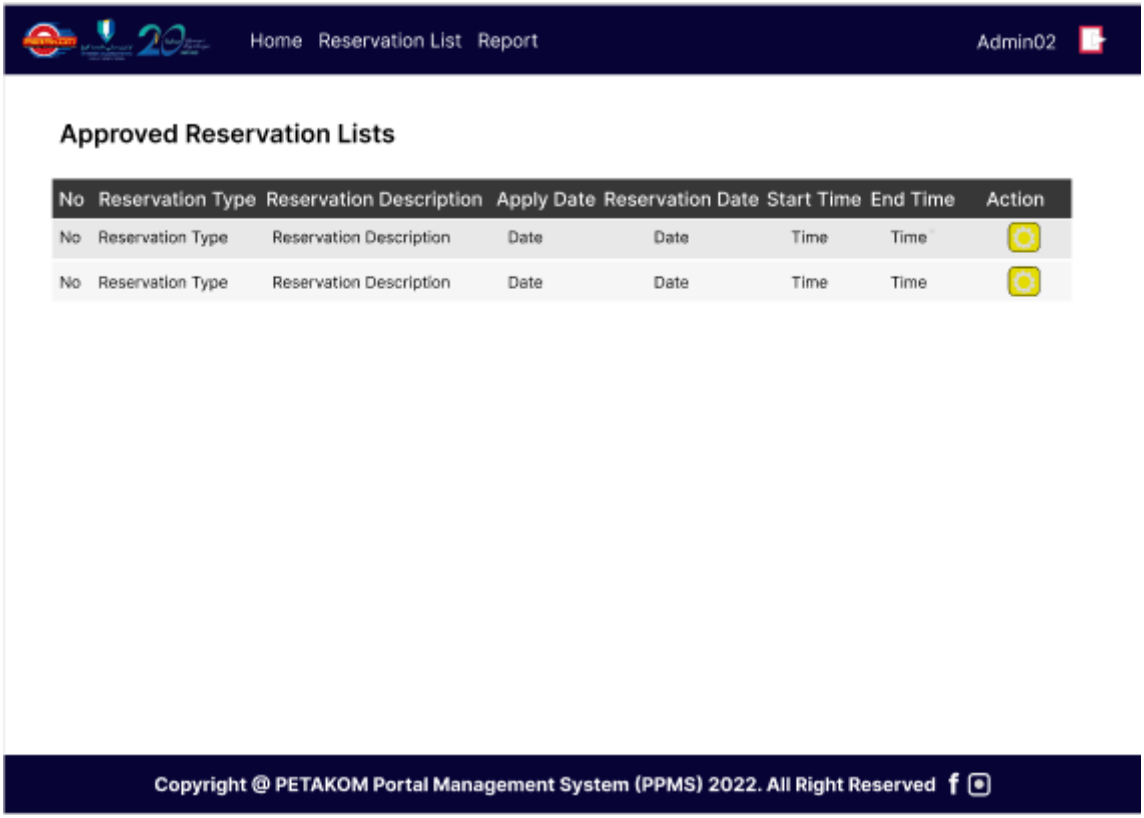

Figure 3.89 Approved Reservation List of Administrator

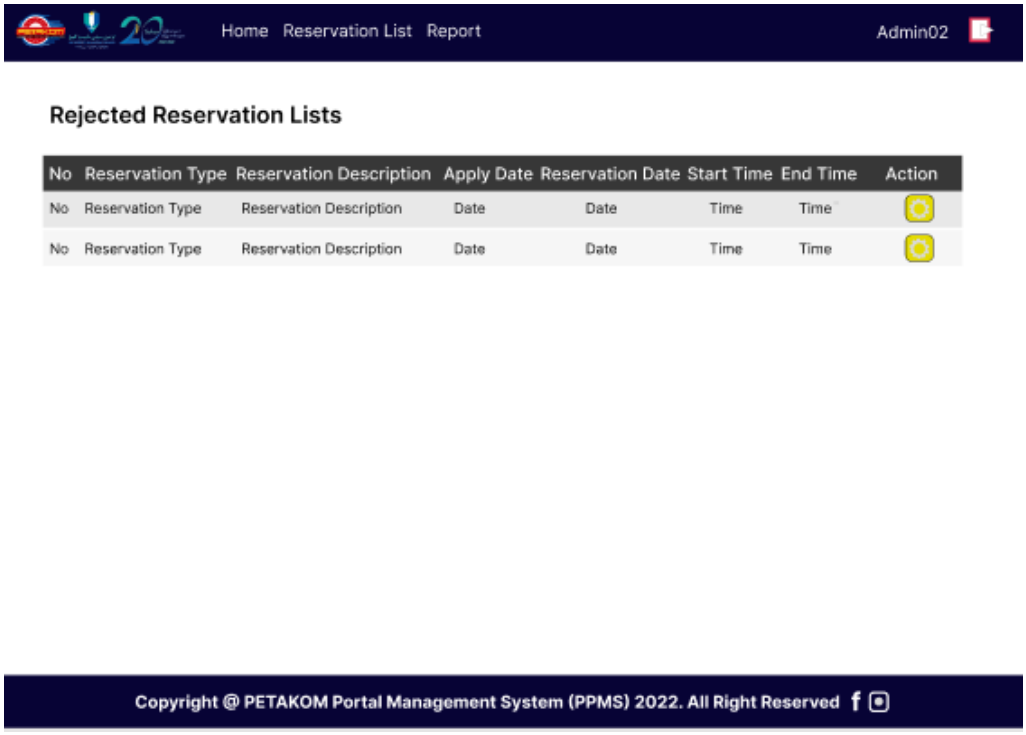

Figure 3.90 Rejected Reservation List of Administrator

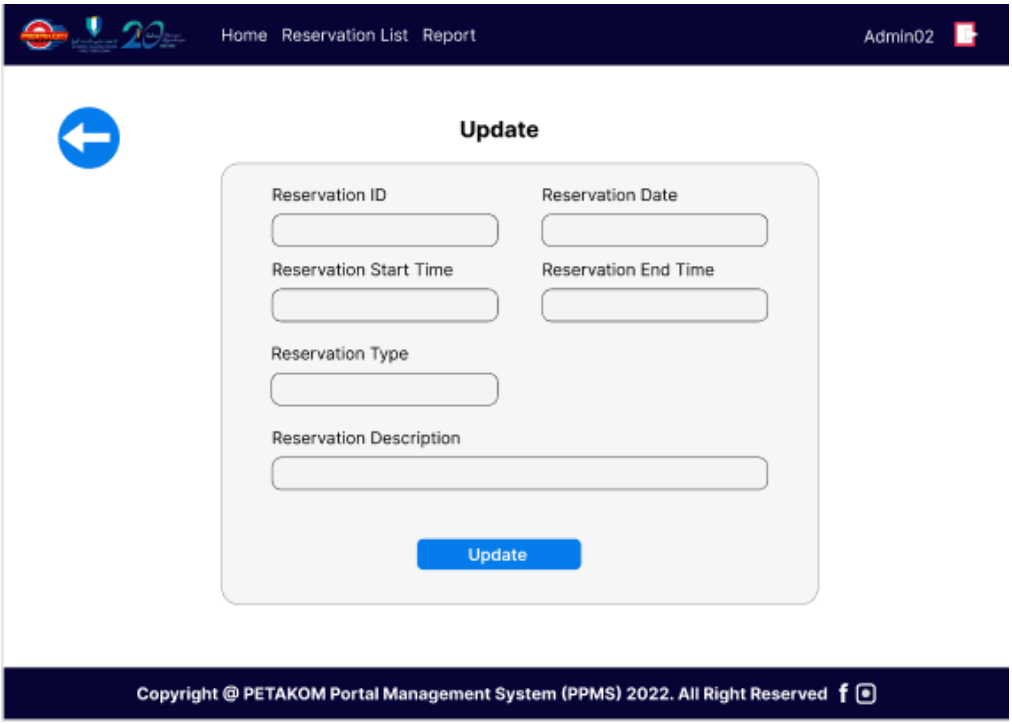

Figure 3.91 Update Reservation details

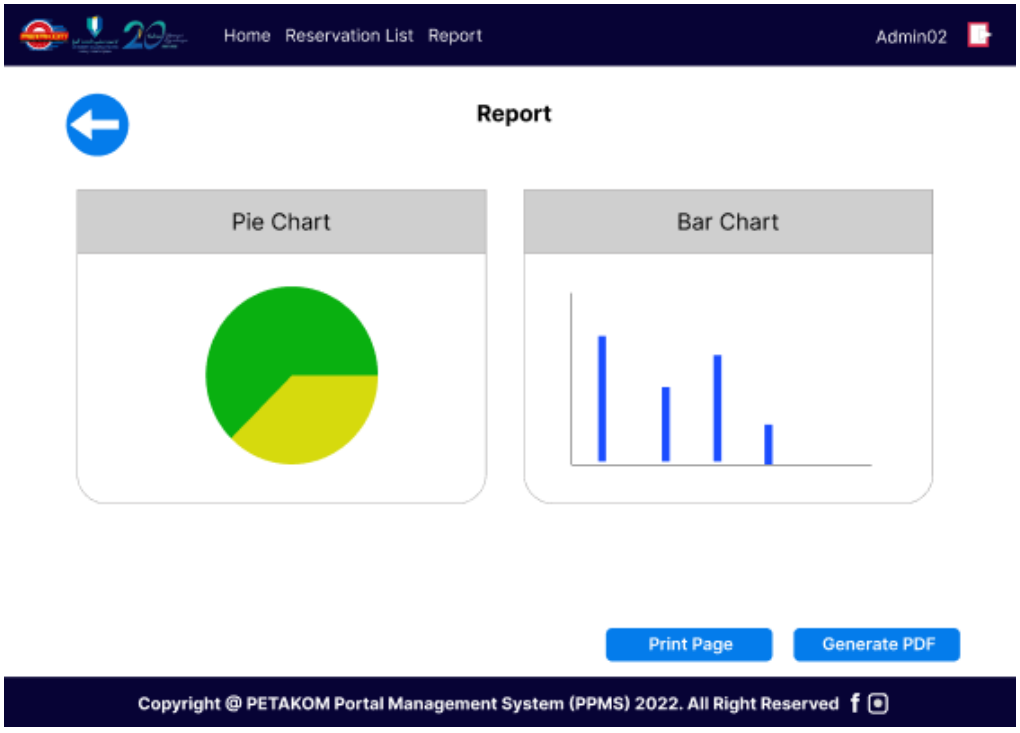

Figure 3.92 Reservation Report of Administrator

3.8 Testing/Validation Plan

Testing is a process that happens once the development process is done. It will assess the performance of the system in terms of functional and non-functional requirements. This section will document the PPMS User Acceptance Test (UAT) technique. User Acceptance Testing (UAT), also known as beta or end-user evaluating, is described as the user or client testing the programme to decide whether it can be accepted. After functional, system, and regression testing have been completed, this is the final stage of testing. The major goal of this testing is to ensure that the software meets the business requirements. End-users who are familiar with the business needs perform this validation. Because the user acceptance test is the final testing performed before the programme goes live, it is evident that this is the customer's final opportunity to test the product and determine its suitability. Table 3.9 to Table 3.13 depicts the UAT form required to evaluate the PPMS's functionality.

i. Module 1: Manage Content

Table 3.9 UAT form for Manage Content

Test Case	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login			
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login			
Add new content	Admin can add and publish content	Content can be published to the portal			
Edit Existing Content	Admin can edit details of existing content	Content published can be edited			
Delete Content	Admin can delete and unpublished	Content published is removed			

	existing content	from the portal			

ii. Module 2: Manage Program

Table 3.10 UAT form for Manage Program

Test Case	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login			
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login			
Add new Program Details	Admin can add and publish details	Details can be published to the portal			
Edit Existing Program Details	Admin can edit details of existing details	Details published can be edited			
Delete Program Details	Admin can delete and unpublished existing details	Details published is removed from the portal			
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to number of programs.	Correct Bar and Pie chart is presented			
Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.			

Fill up Program Suggestion Form	FK Students can fill up the program suggestion form without any error.	Form can be filled up.			
Uploading Program Picture	Admin can upload the pictures of the program without any error.	Picture can be uploaded.			

iii. Module 3: Manage Complaint

Table 3.11 UAT form for Manage Complaint

Test Case	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login			
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login			
Complain Issue can be reviewed.	Admin can review the complains done by the students by clicking on the resolved or unresolved button.	Complains can be reviewed			
Able to click ‘Resolved’ button	Admin can click the ‘Resolved’ button.	Changes the complaint type from Unresolved to Resolved			

Able to click ‘Unresolved’ button	Admin can click the ‘Unresolved’ button.	Changes the complaint type from Resolved to Unresolved			
Fill up the Google Form	Students able to fill up the Google form	Google form can be filled up			
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to number of complains resolved and unresolved.	Correct Bar and Pie chart is presented			
Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.			

iv. Module 4: Manage Merchandise

Table 3.12 UAT form for Manage Merchandise

Test Case	**Test Data**	**Expected Result**	**Actual Result**	**Pass/Fail**	**Comment**
Login with correct username and password	Admin entered correct username and password	Successfully login			
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login			
Add new Merchandise	Admin can add new merchandise	Merchandise can be published to the portal			

Edit Merchandise	Admin can edit details of merchandise	Merchandise details can be edited			
Delete Merchandise	Admin can delete the merchandise	Merchandise is removed from the portal			
Purchase Merchandise	FK Students can purchase merchandise through the form that is available on the portal	Merchandise can be purchased by the FK Student			
Generate Report	Admin can generate the correct order report according to merchandise and sizes.	Report can be generated.			
Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.			
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to merchandise and also sizes.	Correct Bar and Pie chart is presented			
Generate PDF	Admin can generate the report in PDF format.	PDF is created.			
Uploading Merchandise Picture	Admin can upload the pictures of the merchandise without any error.	Picture can be uploaded.			

v. Module 5: PETAKOM Room Booking

Table 3.13 UAT form for PETAKOM Room Booking

Test Case	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login			
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login			
Add Reservation	FK Students can reserve the PETAKOM room by filling up the details	PETAKOM room can be reserved			
Update Reservation	FK Students can update the reservation details by clicking on 'Update' button	Reservation details can be updated			
Cancel Reservation	FK Students can cancel reservation by clicking on 'Cancel' button	Reservation can be cancelled			
Approve/ Reject Reservation	The PETAKOM Administrator can approve or reject the reservations done by the	Reservations can be approved and rejected			

	students by clicking either on ‘Approve’ or ‘Reject’ buttons.				
Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.			
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to reservation’s approval.	Correct Bar and Pie chart is presented			

User Acceptance Approval

Table 3.14 User Acceptance Approval for PPMS

	Name	Date
Verified by: _____ Developer	NARRESH NAIDU SUBRAMANIAM	
Approved by: _____ Client		

Table 3.15 depicts the evaluation form that will be distributed to users who will evaluate the system's usability. Evaluation forms are used to collect and analyse user feedback. Any enhancements or changes to the system are based on feedback and effectiveness metrics. Google Form is used for the evaluation. The assessment form's questions will be based on Schneiderman’s eight golden guidelines of interface design. User Interface (UI) Design is concerned with predicting what users may need to accomplish and ensuring that the interface has features that are simple to access, understand, and utilise to assist those activities.

Table 3.15 Usability Test form for PPMS

The principles	**Questions**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Strive for consistency	The layout, style and design of the system are maintained throughout the system.	1	2	3	4	5
	Terms, and language used are consistent.	1	2	3	4	5
Enable frequent users to use shortcuts	The keyboard shortcuts being able to be used in the system.	1	2	3	4	5
	Users to access all parts of the website with a minimum of clicks.	1	2	3	4	5
Offer informative feedback	Prompt and appropriate feedback is given	1	2	3	4	5
	The current location is clearly indicated.	1	2	3	4	5

Design dialogue to yield closure	The system provides a clear message to users of what their actions has led them to.	1	2	3	4	5
Offer simple error handling	The system flag text fields when user forgot to provide input in online form.	1	2	3	4	5
Permit easy reversal of actions	The user able to undo or cancel their actions.	1	2	3	4	5
	Users can easily get back to the relevant start point.	1	2	3	4	5
Support internal locus of control	The home page is effective in orienting and directing users to their desired task.	1	2	3	4	5
Reduce short-term memory load	Call to actions (Add, Update, Submit button) are clear, well labelled and appear clickable.	1	2	3	4	5
	Appropriate input fields (date, drop down for selection) are used and required formats are indicated.	1	2	3	4	5

3.9 Potential use of Proposed Solution

PETAKOM Portal Management System (PPMS) is the proposed system, and the portal will be entirely maintained by the PETAKOM Administrator. This suggested PPMS assists PETAKOM Organization in properly organising their organisations. The FK students will have access to adequate information through this portal. Plus, the portal navigates to another subsystem which enables the student to reserve PETAKOM Room. The students will not be left out of the information provided by PETAKOM and will be kept up to date. PETAKOM can appoint one representative as an administrator to administer the portal during each session.

3.10 Gantt Chart

The Gantt Chart depicts the project's development over time. The project will adhere to the recommended methodology, which covers the requirements planning phase, and the user design phase.

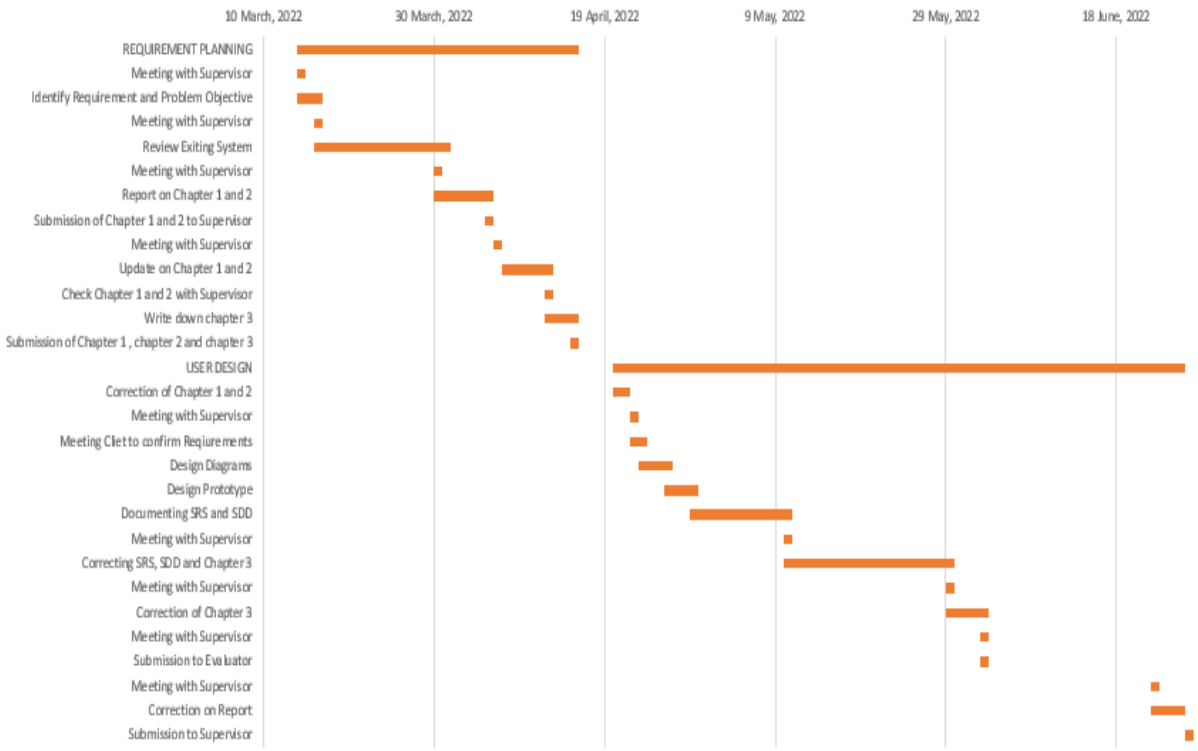

Figure 3.93 Gantt Chart of First Evaluation

CHAPTER 4

IMPLEMENTATION, RESULTS AND DISCUSSION

4.1 Introduction

This chapter discusses project implementation as well as testing. Following the RAD approach, the implementation and testing phases will be completed module by module. The system interface was also studied. The testing and discussion results will be justified towards the end of the chapter.

4.2 Implementation

The implementation process will commence following a meeting with all stakeholders to reach a consensus. All necessary information has been successfully gathered from stakeholders.

4.2.1 Development

During the implementation phase, the developer must configure the localhost server with the XAMPP control panel. XAMPP is critical in implementation since, to open phpMyAdmin, we must ensure that the XAMPP control panel is working properly and without errors. The developer then creates a database with phpMyAdmin to hold the data. The developer may then script the codes into action. The web application framework employed to develop the website is Laravel. Laravel is developed on PHP, an open-source programming language that has long been a frontrunner among backend languages. Laravel aims to make development easier by simplifying typical tasks seen in most online

applications, such as authentication, routing, sessions, and caching. Figure 4.1 shows the XAMPP Control Panel and Figure 4.2 shows the interface of phpMyAdmin.

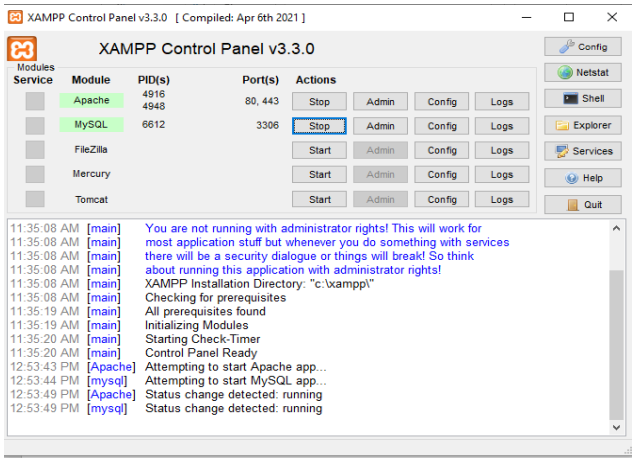

Figure 4.1 XAMPP Control Panel

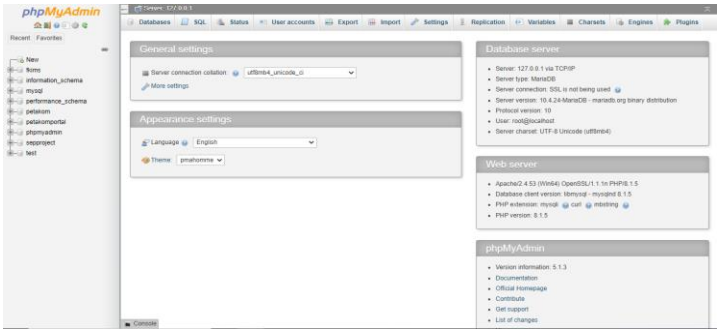

Figure 4.2 phpMyAdmin

4.2.2 Database Design

A database is used by this portal, which is managed via phpMyAdmin. The database 'petakomportal' is located on the localhost server. Tables needed to be formed after the database was built to store data.

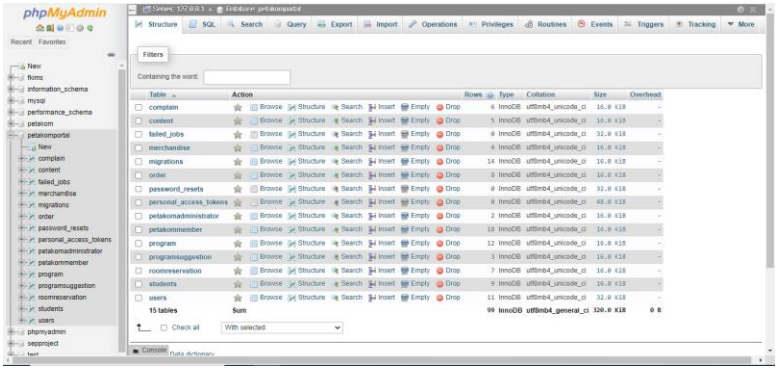

Figure 4.3 Database of petakomportal

4.3 Portal Interfaces

After the portal has been effectively created, the system can be put into operation. This portal has two views, which are public and admin. The public view of the portal's homepage is depicted in Figure 4.4. On the navigation tab, the administrator can login as Administrator by clicking the 'Admin' option, and the system will redirect to the login screen shown in figure 4.5. Figure 4.6 shows the interface of the Admin Dashboard once the admin has successfully login into the system as administrator.

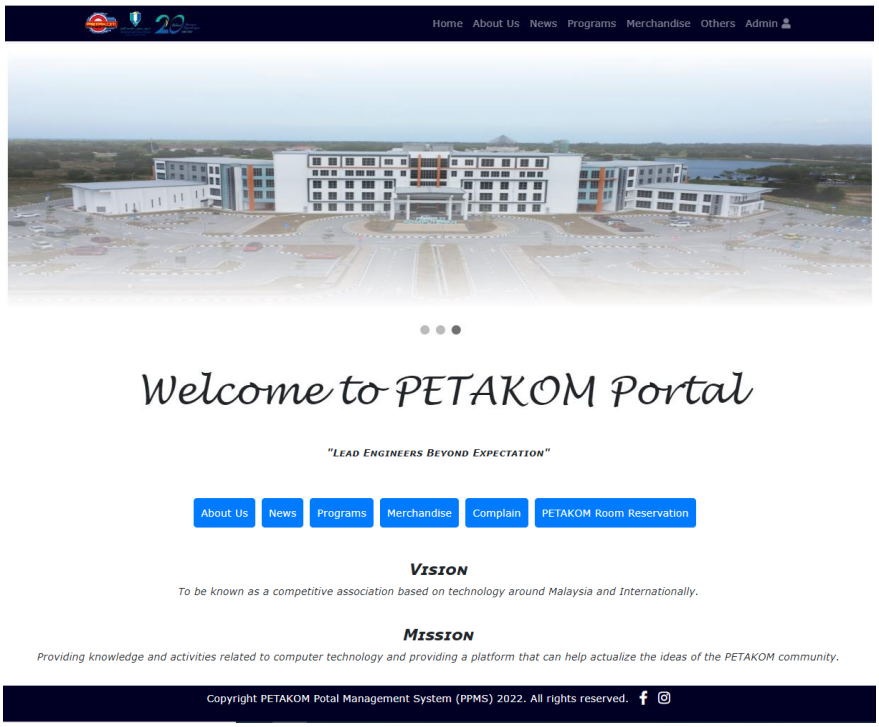

Figure 4.4 Portal's Homepage of public view

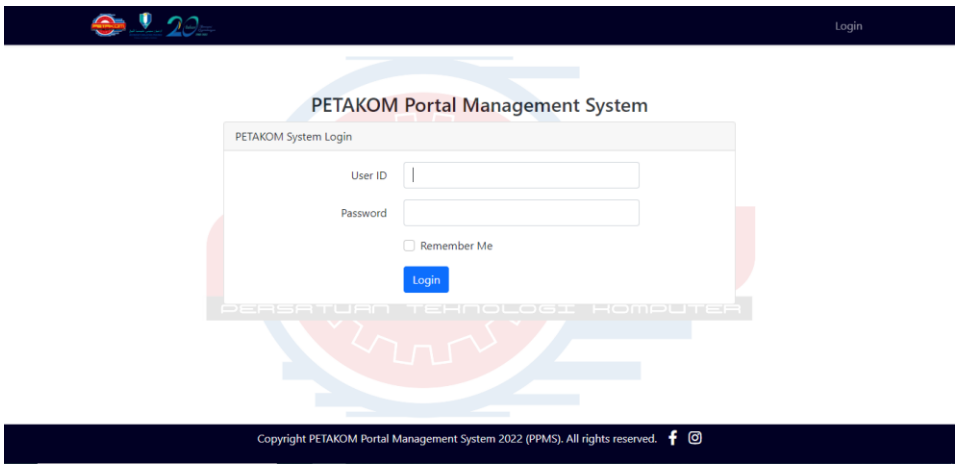

Figure 4.5 Login Interface for Admin

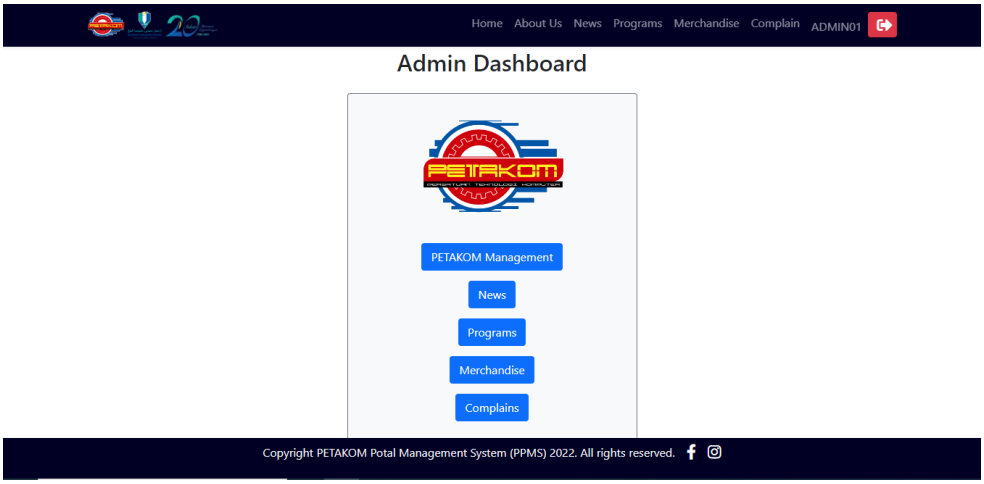

Figure 4.6 Admin Dashboard Interface

4.3.1 Manage Content

Figure 4.7 illustrates the PETAKOM Organization list in public view of the portal based on position order, whereas figure 4.8 depicts the PETAKOM Organization News and Announcements in public view of the portal. The lists can be sorted by News alphabetical order or by publication date. The 'Info' button which is available in figure 4.8 will redirect to specific news and announcement page which is shown in figure 4.9. The back button on figure 4.9 will redirects back to the previous page.

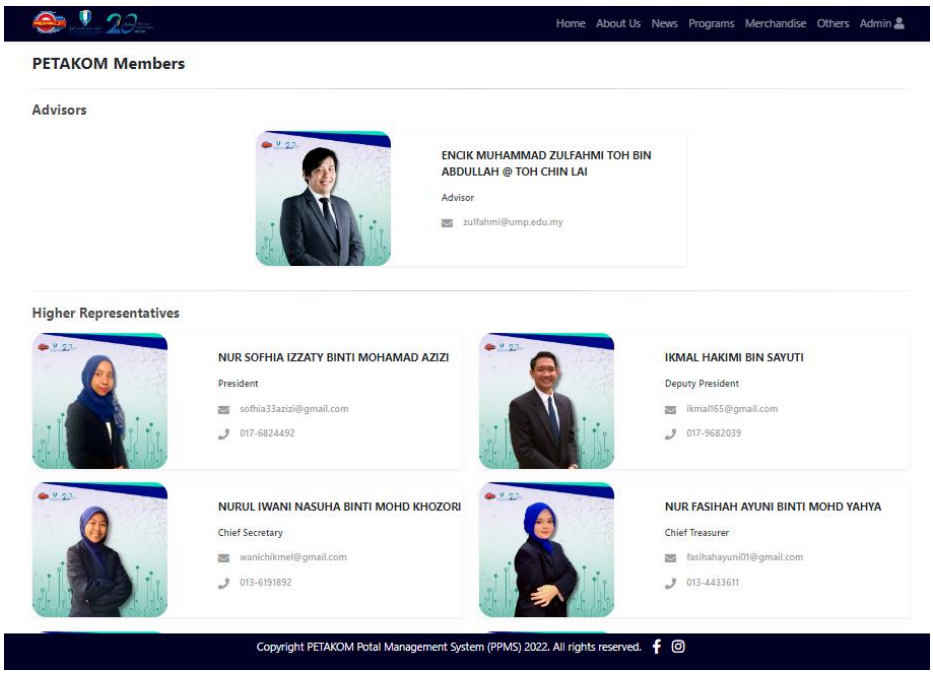

Figure 4.7 PETAKOM Organization List in Public View

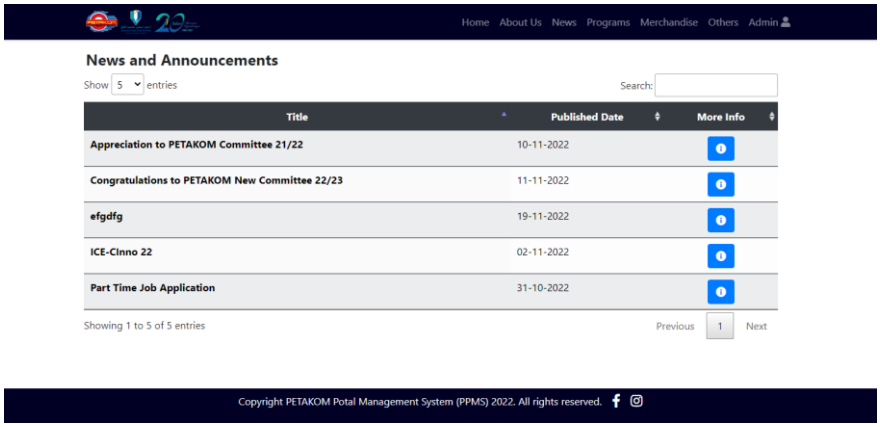

Figure 4.8 PETAKOM News and Announcement List in Public View

Figure 4.9 Specific News and Announcement in Public View

Figure 4.10 depicts the PETAKOM Organization Lists, whereas Figure 4.13 depicts the News and Announcement List from the Admin's perspective. The addition symbol on top of the table in figures 4.10 and 4.13 denotes Add page interface, which is seen in figures 4.11 and 4.16, respectively. The administrator will provide the necessary information and then click the 'Add' button. The yellow button in figures 4.10 and 4.13 denotes the Update button, and it will return you to the interface seen in figures 4.12 and 4.15, respectively. After amending the details, the 'Update' button is pressed to apply the changes. The red button with the symbol thrash in figures 4.10 and 4.13 represents the 'Delete' Button. When clicked, the back button seen in figures 4.11, 4.12, 4.14, 4.15, and 4.16 will take the users back to the previous page.

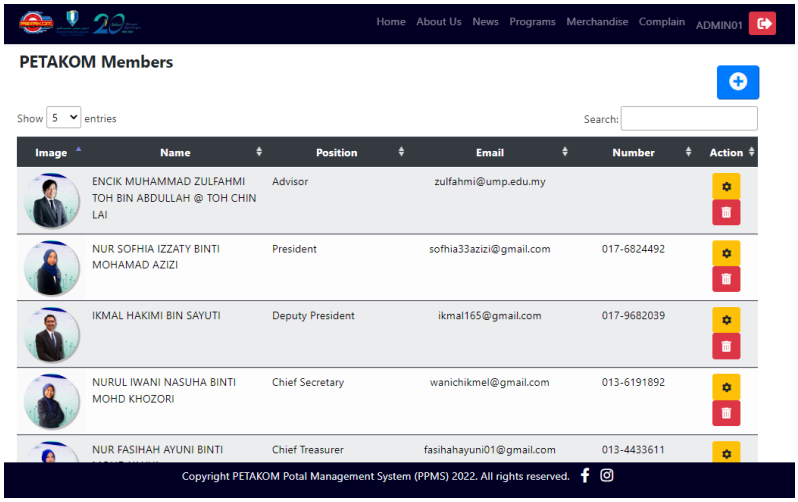

Figure 4.10 PETAKOM Organization List in Admin View

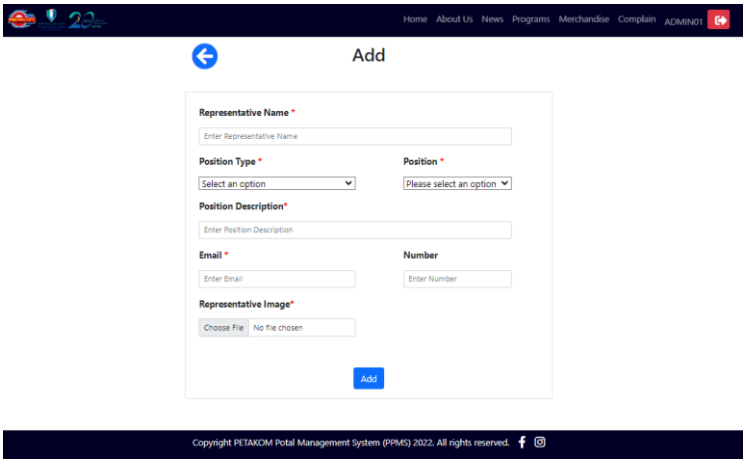

Figure 4.11 PETAKOM Organization Add Interface

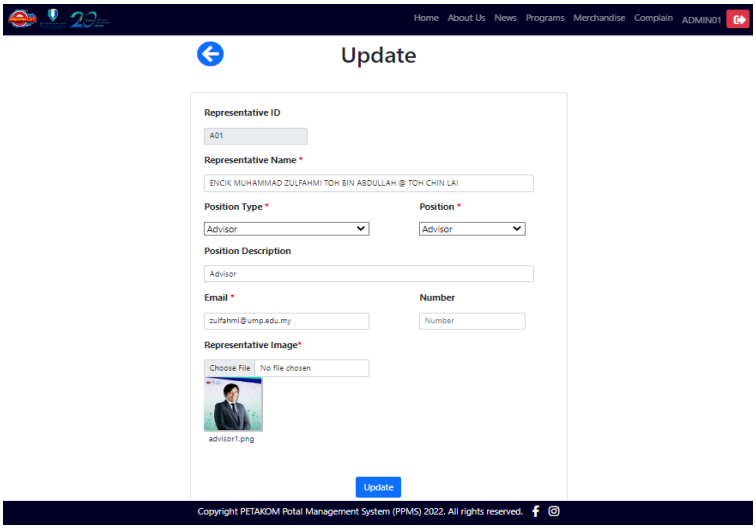

Figure 4.12 PETAKOM Organization Update Interface

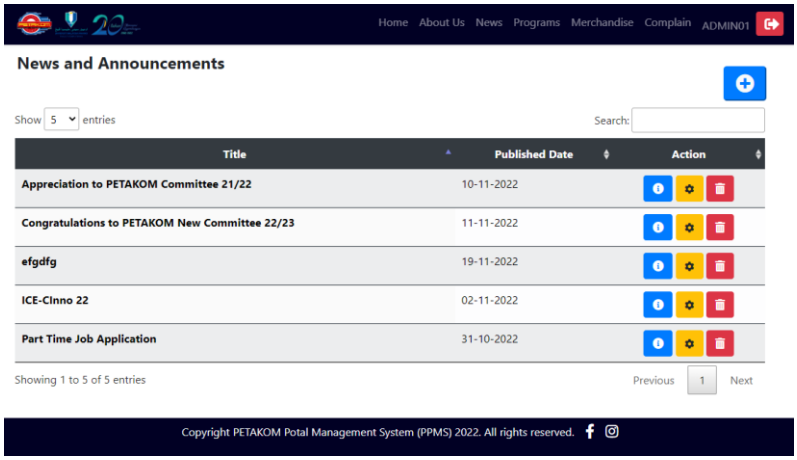

Figure 4.13 News and Announcement Lists in Admin View

Figure 4.14 Specific News and Announcement in Admin View

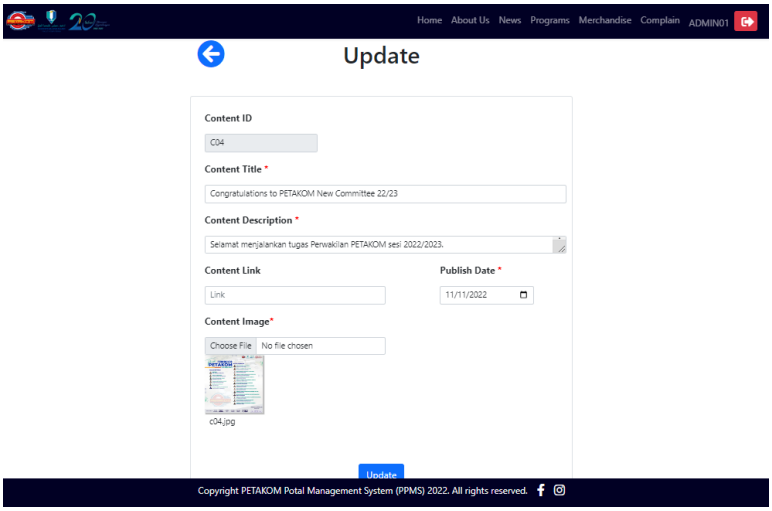

Figure 4.15 Update News and Announcement Interface

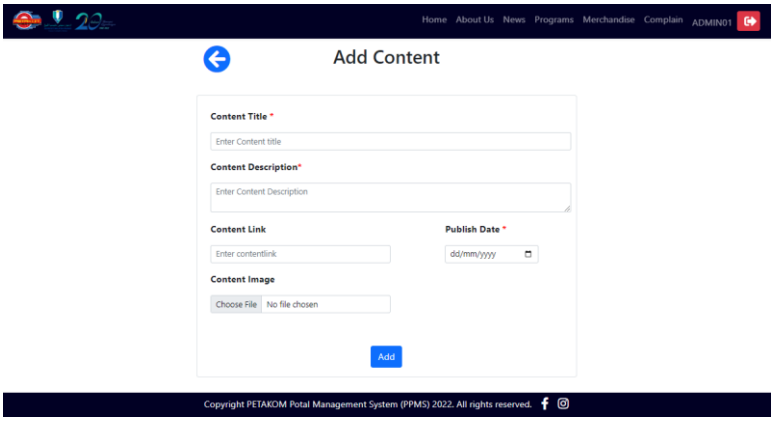

Figure 4.16 Add News and Announcement Interface

4.3.2 Manage Program

Figure 4.17 depicts the upcoming program listings in public view, and when the 'More Info' button is clicked, the user is sent to the specific program interface displayed in figure 4.18, and the back button in the upper left corner returns the user to the previous page. Students can register themselves in the programs by clicking on the registration link available in figure 4.18. Figure 4.19 depicts the program bulletin interface for public viewing, and when the user hits the 'More Info' button, the user is brought to the particular bulletin interface seen in figure 4.20. The picture in figure 4.20 is the program bulletin report image, which is not the same as the image in figure 4.19, which is the program image. The public can recommend programmes in the online form provided, as seen in figure 4.21.

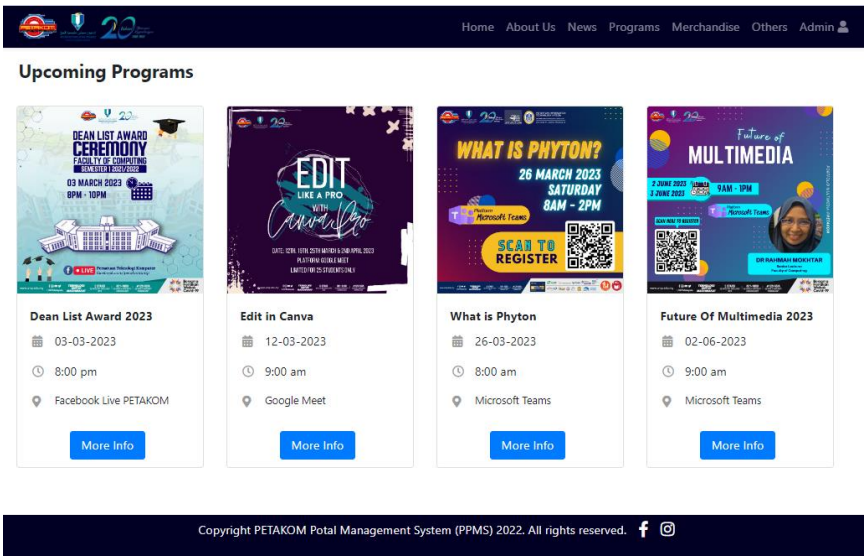

Figure 4.17 Upcoming Program interface in public view

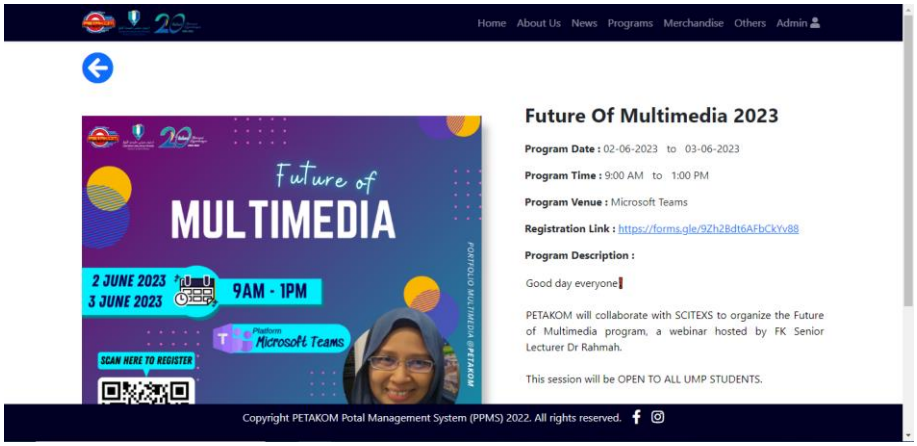

Figure 4.18 Specific Upcoming Program interface in public view

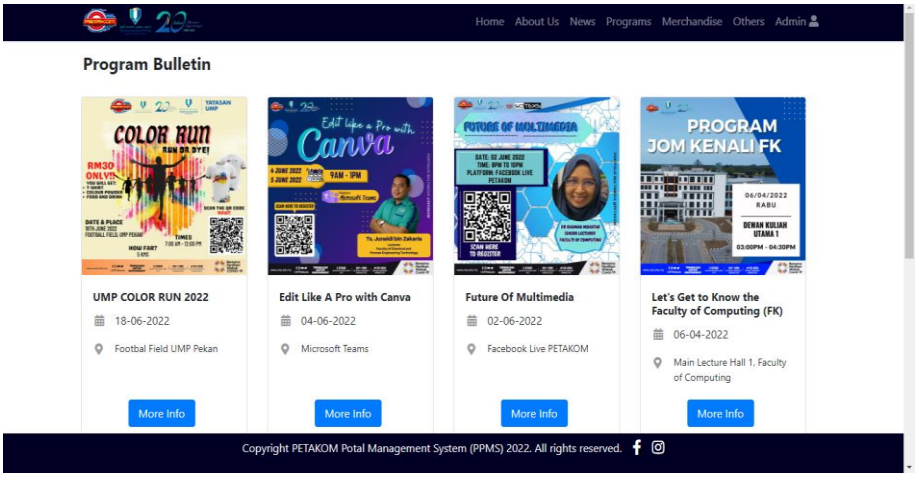

Figure 4.19 Bulletin interface in public view

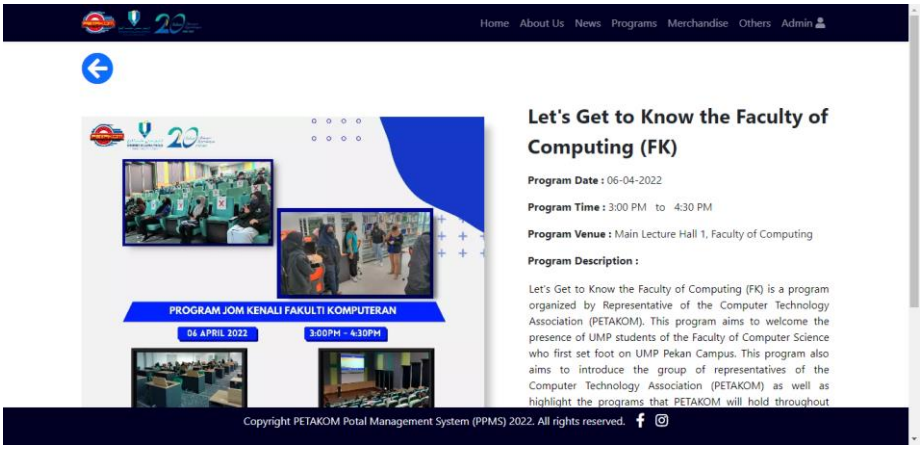

Figure 4.20 Specific Bulletin interface in public view

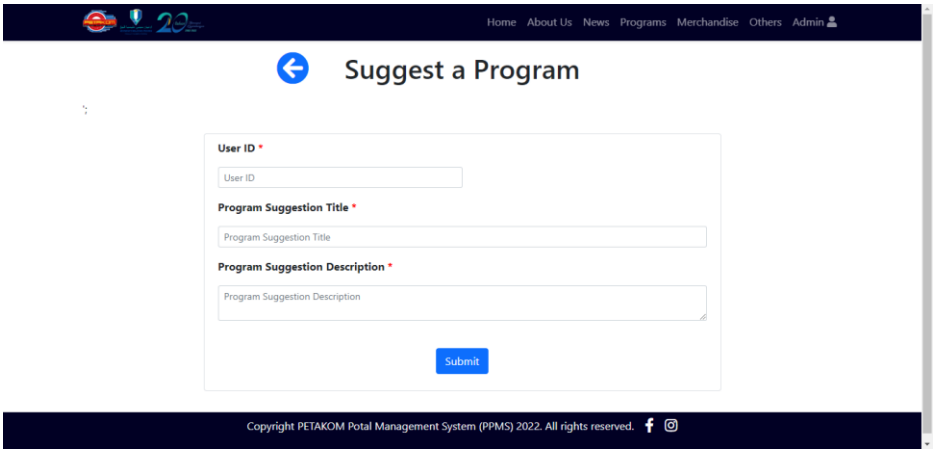

Figure 4.21 Program suggestion online form in public view

Figures 4.22 and 4.24 show the upcoming and bulletin programme lists in admin view, respectively, and when the user clicks on the 'More Info' button, they are routed to the interfaces illustrated in figures 4.23 and 4.25. The administrator can update the program information in the page displayed in figure 4.26 by clicking on the yellow 'Update' button in figures 4.22 and 4.24. Figures 4.22 and 4.24 show the 'Plus' symbol, which denotes the add program interface depicted in figure 4.27. The administrator can also browse the program lists provided by public users by hovering the mouse over the 'Program' option in the navigation tab and selecting 'Program Suggestion,' which will display the interface shown in figure 4.28. The program report is depicted in Figure 4.29, where both pie chart and bar chart available to be presented and QR code can be generated based on the report and is shown in figure 4.30.

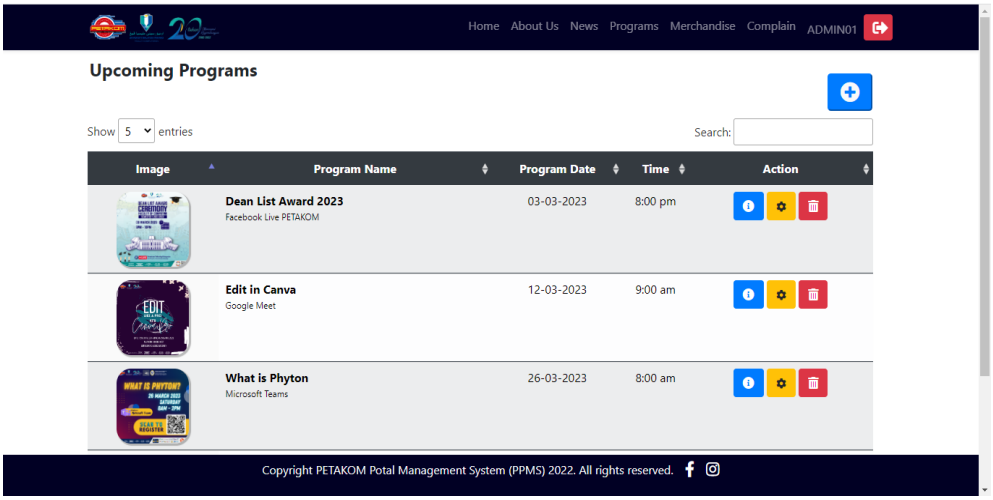

Figure 4.22 Upcoming Program lists in admin view

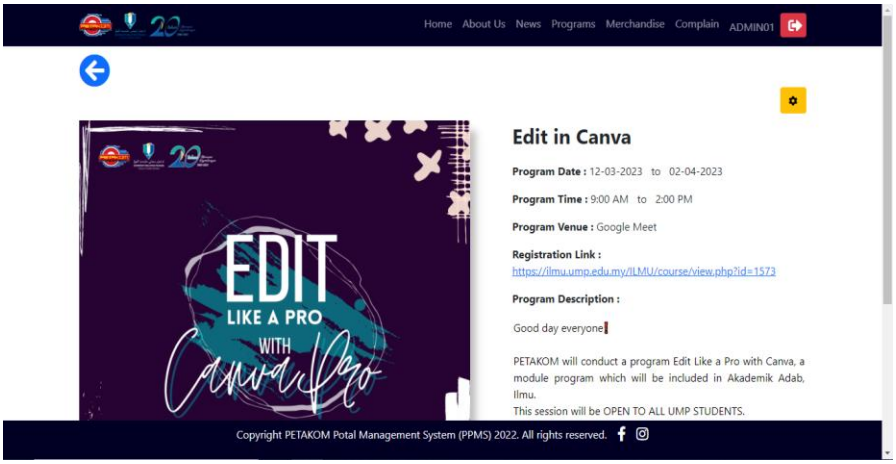

Figure 4.23 Specific Upcoming Program interface in admin view

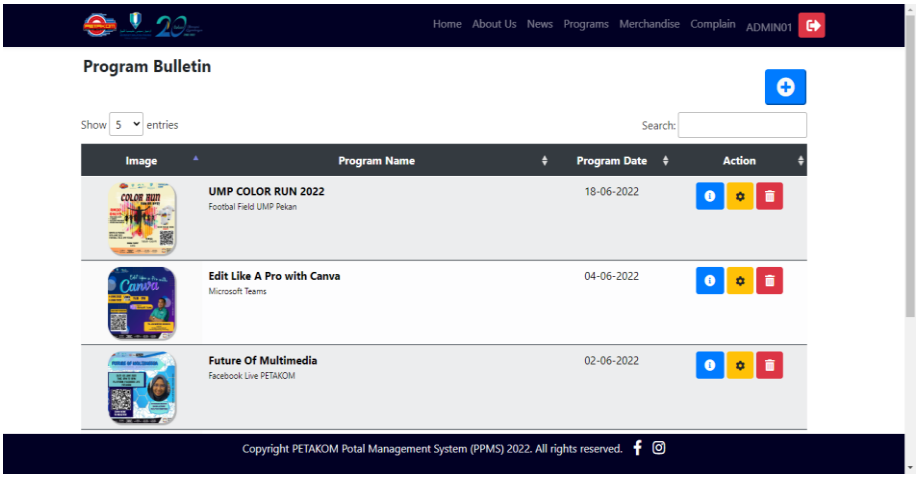

Figure 4.24 Bulletin lists in admin view

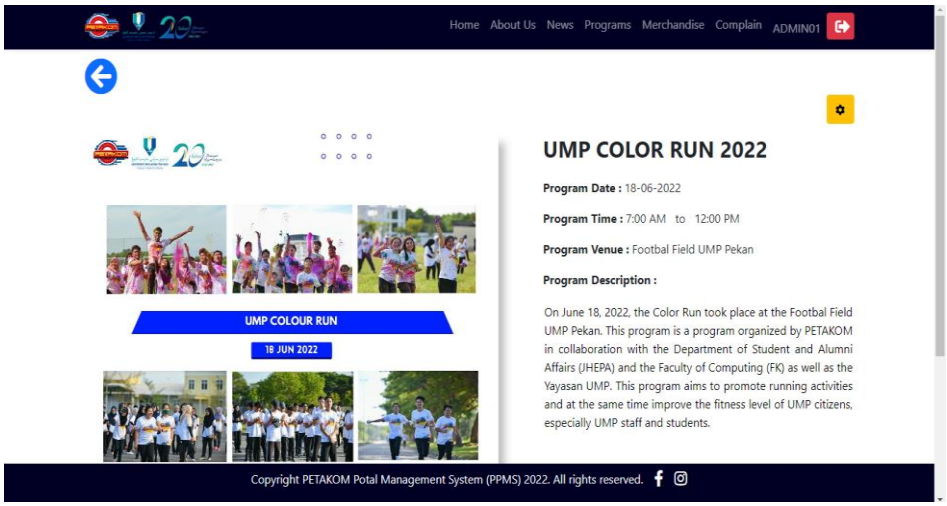

Figure 4.25 Specific Bulletin interface in admin view

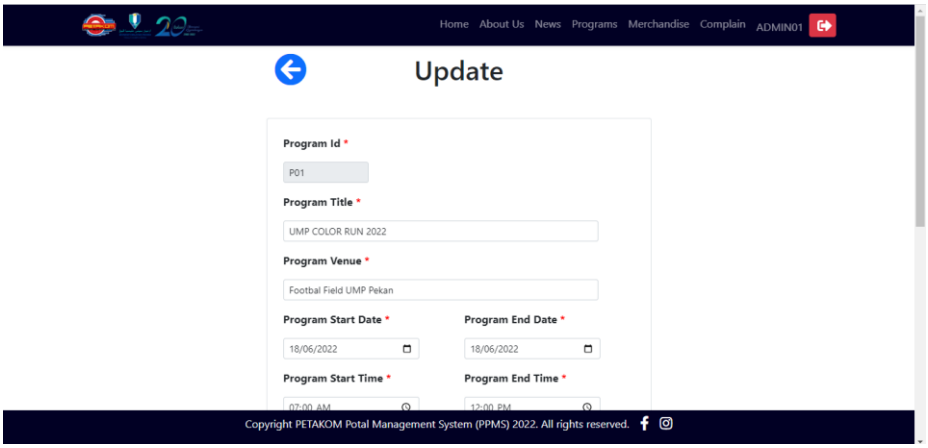

Figure 4.26 Update Programs interface in admin view

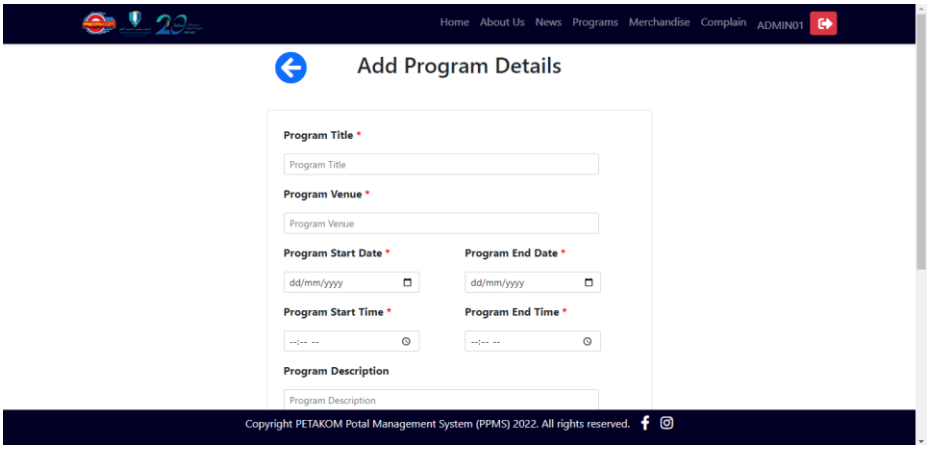

Figure 4.27 Add Program interface in admin view

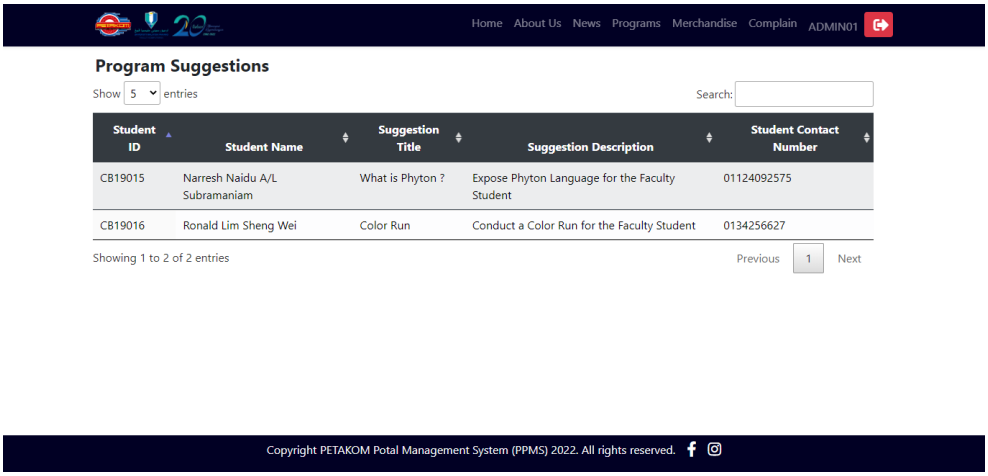

Figure 4.28 Program Suggestion interface in admin view

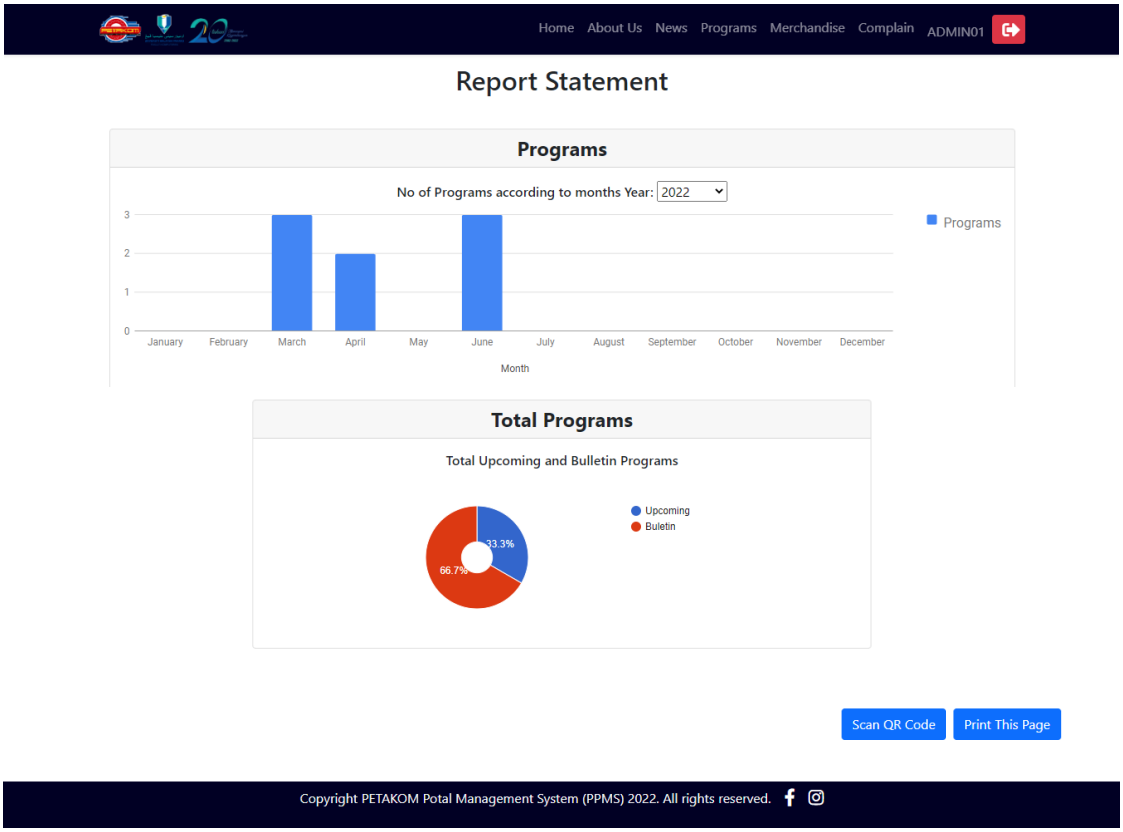

Figure 4.29 Programs Report interface in admin view

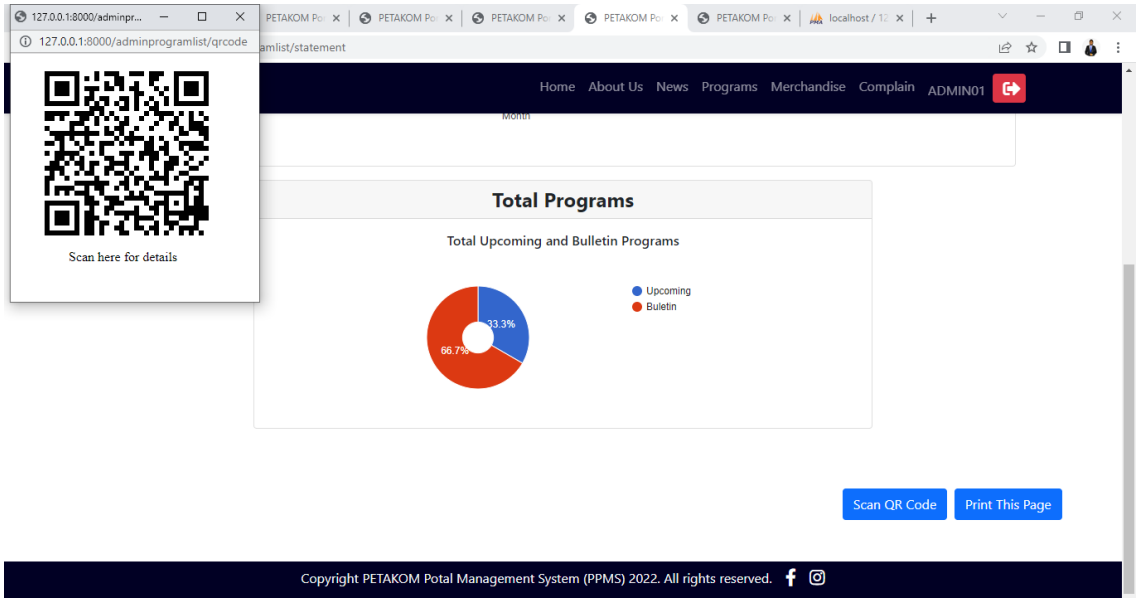

Figure 4.30 Program QR Code implementation in admin view

4.3.3 Manage Merchandise

Figure 4.31 shows the merchandise lists in the public view interface and clicking the 'More Info' button takes the user to the screen displayed in figure 4.32. The user can be led to the online order form displayed in figure 4.33 by clicking on the 'Buy Now' button located on the right bottom of the portal in figure 4.32. To confirm their order, the user enters the required information and hits the submit button that is shown in figure 4.33.

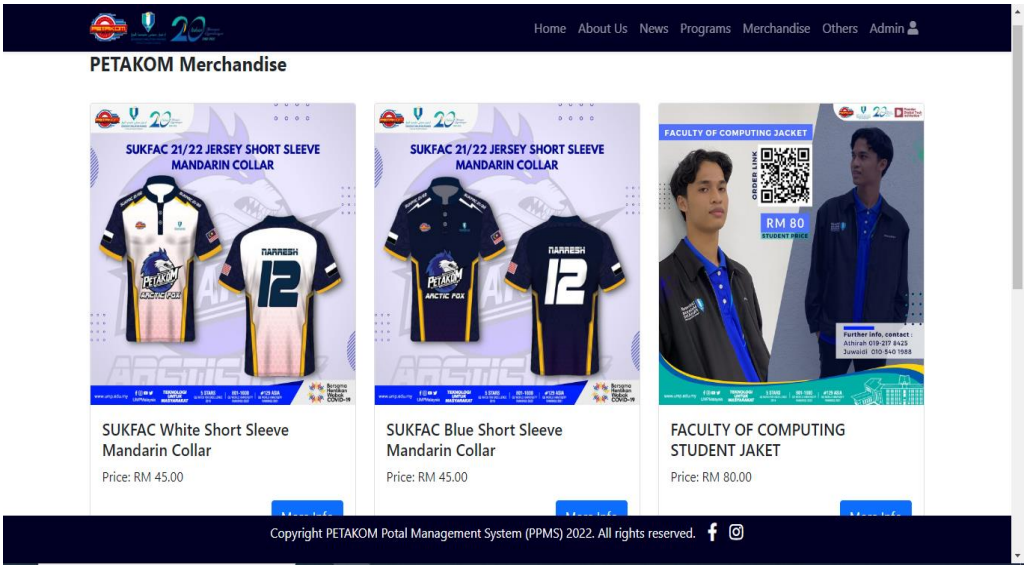

Figure 4.31 Merchandise Lists in public view

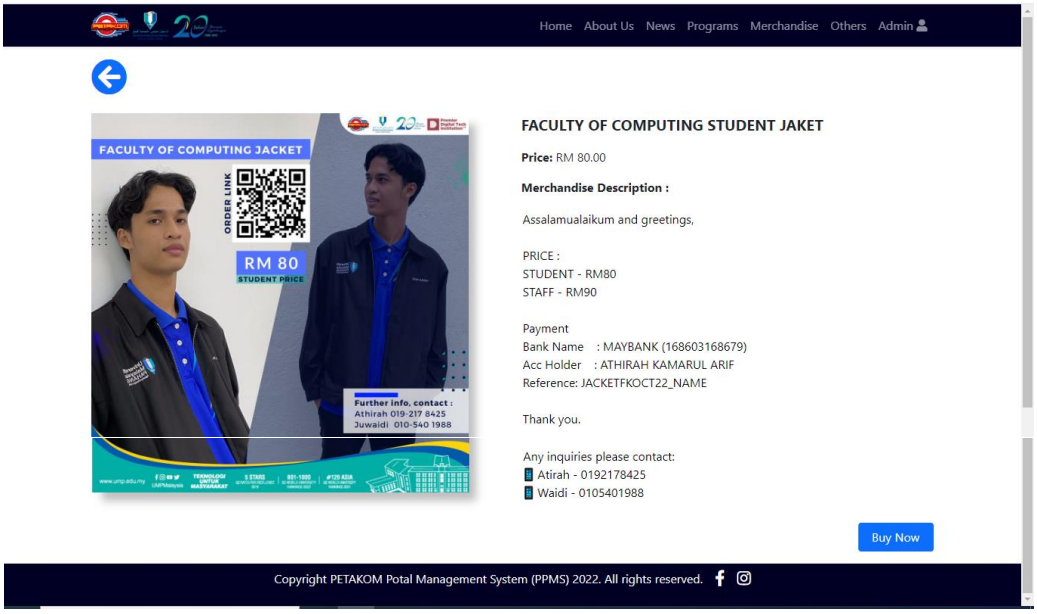

Figure 4.32 Specific Merchandise in public view

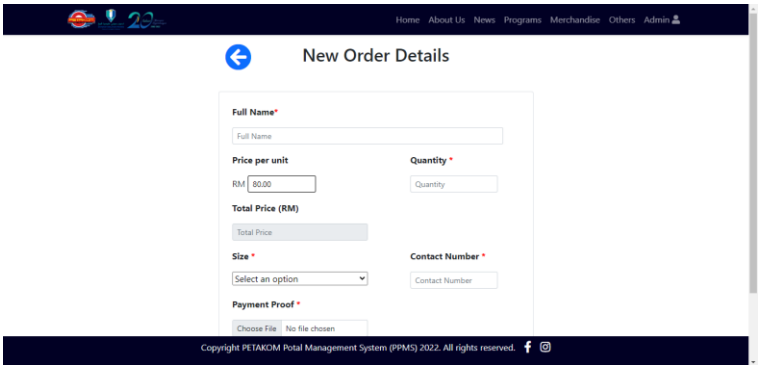

Figure 4.33 Merchandise Order Form

Figure 4.34 depicts the Merchandise Lists in the admin view interface. The 'Plus' sign in the top right corner of the site displays an add merchandise option. When the administrator clicks the button, he is sent to the add merchandise screen, as seen in figure 4.37. The administrator can enter relevant information and then click the submit button. The red 'Trash' symbol in figure 4.34 represents the 'Delete' button, and when the admin clicks on it, the item information is erased from the database. The 'Info' button directs the visitor to the merchandise page seen in figure 4.35. The yellow 'Update' button displayed in figures 4.34 and 4.35 will take the administrator to the update page shown in figure 4.36. The administrator can change the merchandise information by clicking the update button. The 'Purchase Report' green button, seen in figure 4.35 on the upper right of the portal, will take the user to the Merchandise order report page, shown in figure 4.38. There are order table listings available, as well as suitable pie charts and bar charts based on the sizes. The user may also produce a PDF of the order by clicking the 'Generate PDF' button in the bottom right corner of the portal.

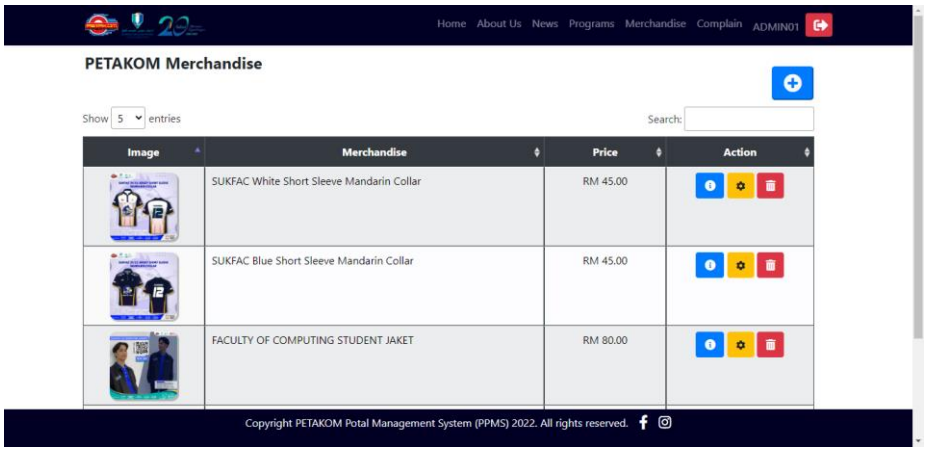

Figure 4.34 Merchandise Lists in Admin View

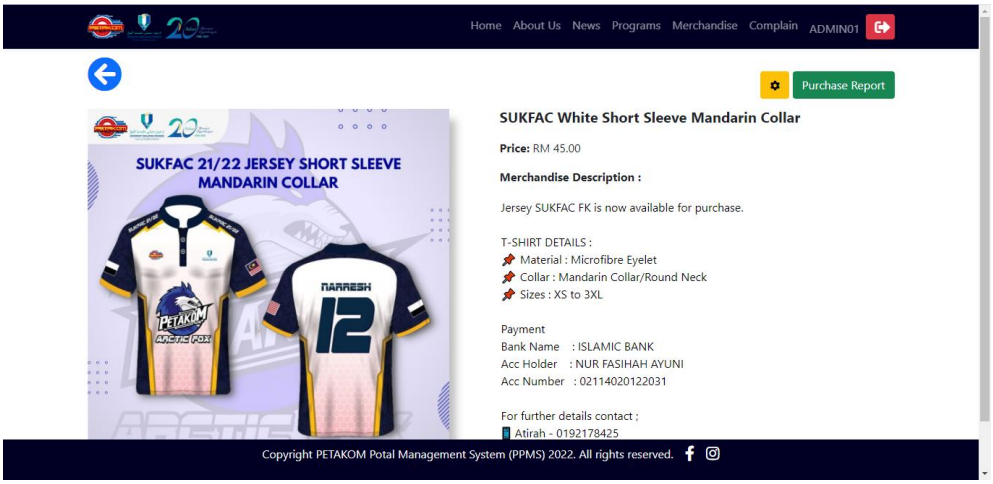

Figure 4.35 Specific Merchandise in Admin View

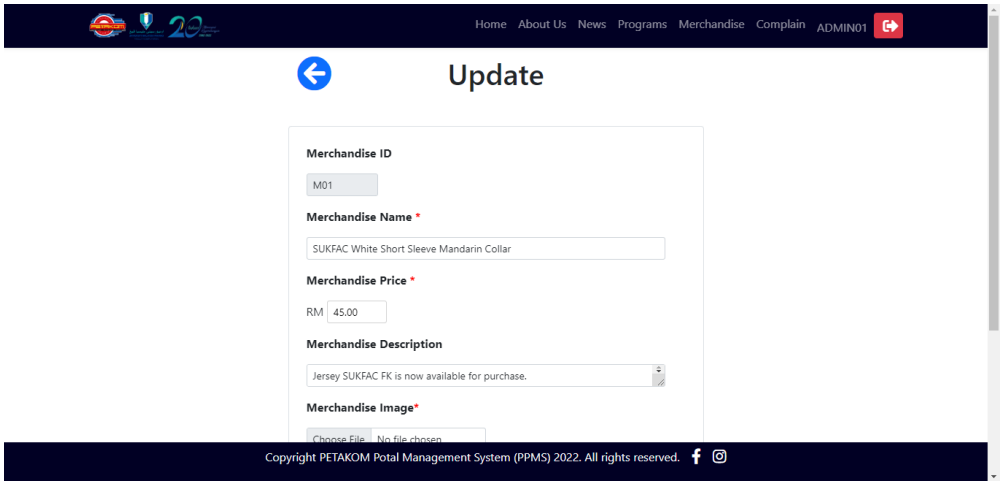

Figure 4.36 Update Merchandise Details

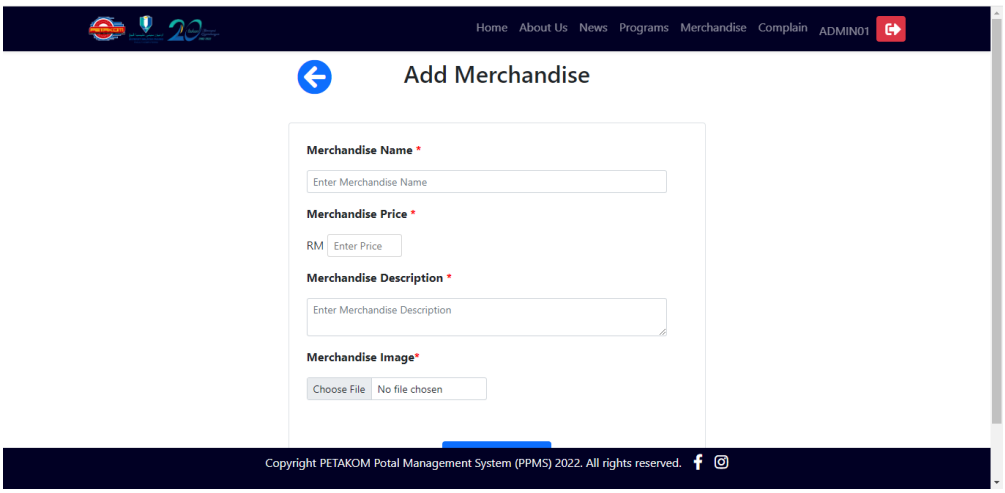

Figure 4.37 Add Merchandise Details

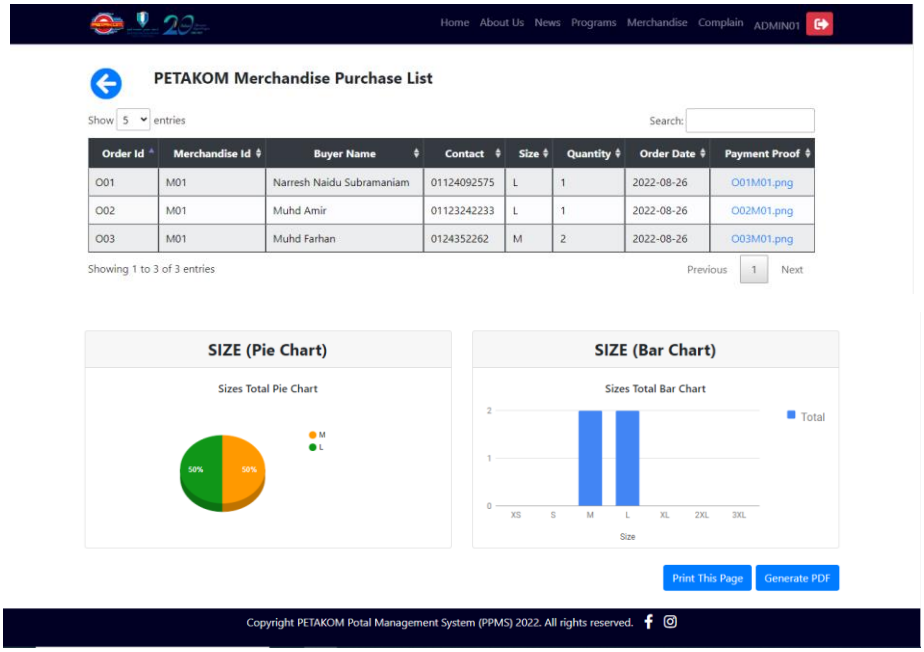

Figure 4.38 Merchandise Order Report

4.3.4 Manage Complains

Figure 4.39 depicts the complain form, where students can use the online form to lodge a complain about the faculty or the PETAKOM Organization. Following the submission of the complaint, the complain will be sent to the Unresolved Complain lists, as illustrated in Figure 4.41. At the bottom of the table, a pie chart showing the complain status will be displayed. Figure 4.40 depicts the resolved complain list for the portal's public viewing, as well as a bar chart for the complain status.

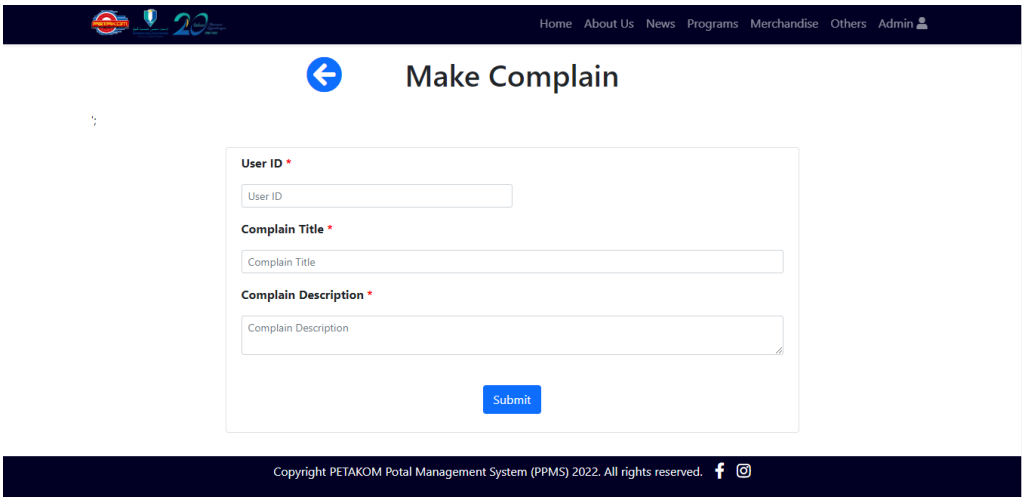

Figure 4.39 Complain Form Interface

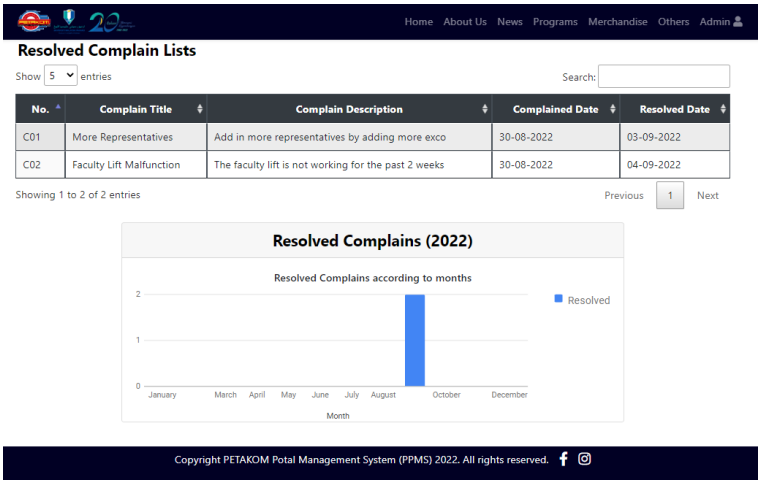

Figure 4.40 Resolved Complain Lists in public view

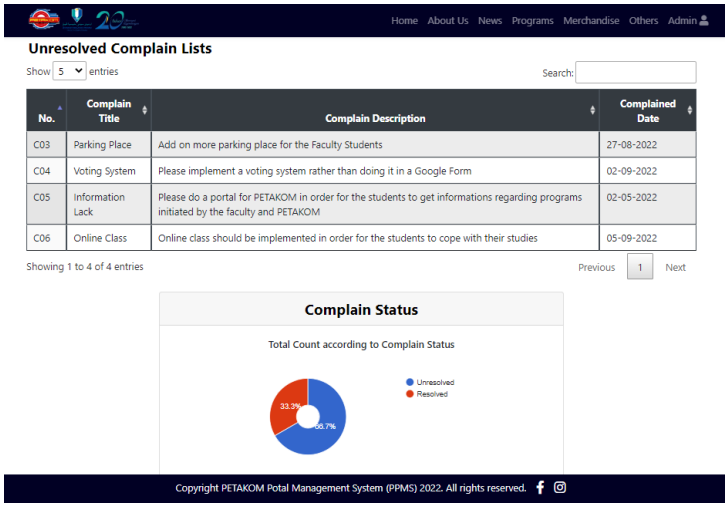

Figure 4.41 Unresolved Complain Lists in public view

In admin view, Figure 4.42 depicts the lists of resolved complain lists. As illustrated in figure 4.43, the red 'Ban' button indicates that the complain status will be moved back to unresolved lists. Figure 4.43 indicates that the 'Tick' green button on the unresolved complain listings will convert the complain status from unresolved to resolved. Once a complaint has been reviewed and resolved, the administrator can change the status of the complaint from unresolved to resolved by clicking the 'Tick' button. Figure 4.44 depicts the complain report according to the amount of complain statuses. The bar chart shows the number of complaints that have been resolved and those that have not been resolved over the course of a year. The complain report's QR code is generated, as illustrated in figure 4.45.

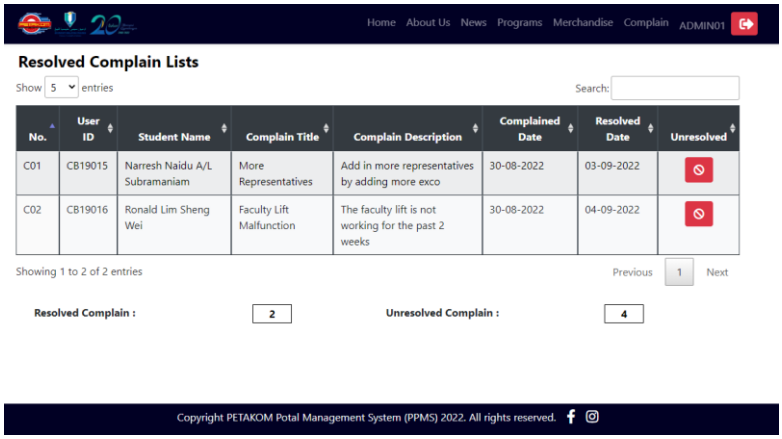

Figure 4.42 Resolved Complain Lists in admin view

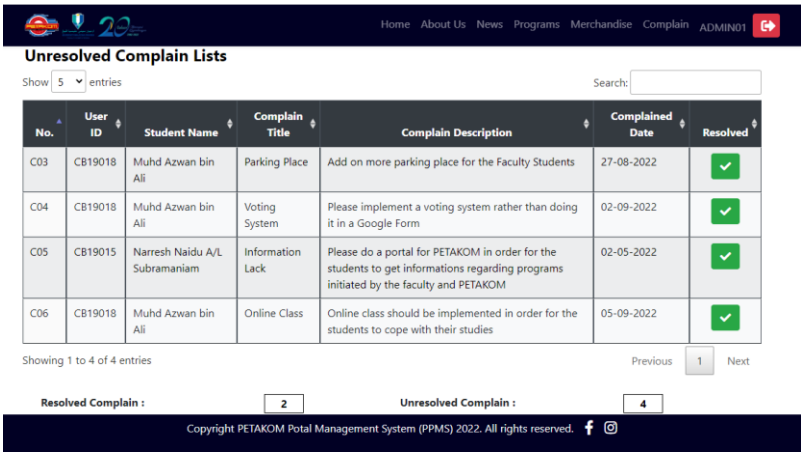

Figure 4.43 Unresolved Complain Lists in admin view

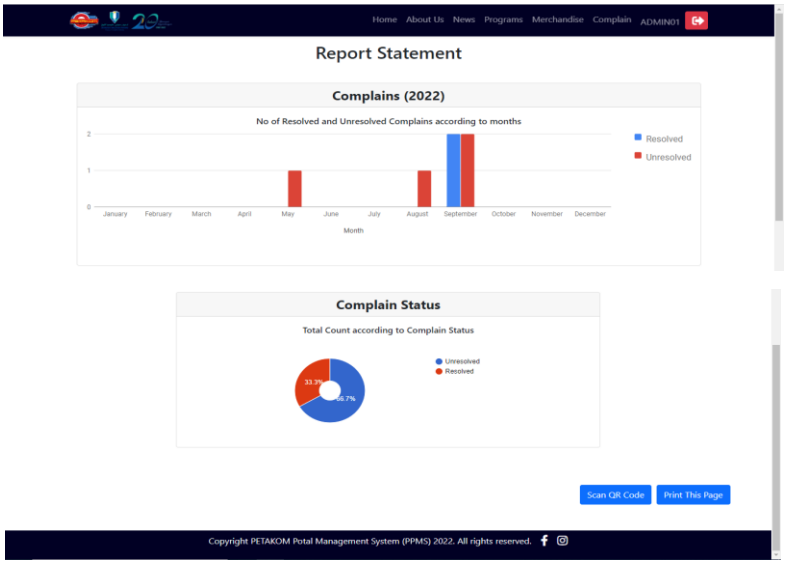

Figure 4.44 Complain Report

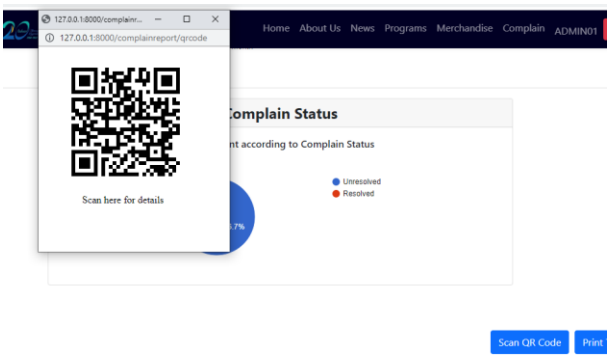

Figure 4.45 QR Code for Complain Report

4.3.5 Manage PETAKOM Room Reservation

Figure 4.46 depicts the login screen for the PETAKOM room reservation. Once the student has successfully logged into the system, the screen shown in figure 4.47 will be the student home dashboard. The 'Add Reservation' button takes the student to the reservation window illustrated in figure 4.48. Figure 4.49 depicts the student's pending reservation, which indicates that the application has not been approved or rejected. The red button represents 'Delete,' whereas the yellow button represents 'Update.' Once the student clicks the yellow button, the update reservation interface will appear, as illustrated in figure 4.50. The 'Approved Reservation' button in figure 4.47 will take the student to figure 4.51, while the 'Rejected' button will take them to interface shown in figure 4.52. The red 'Door' button on the top right of the navigation tab indicates logout button.

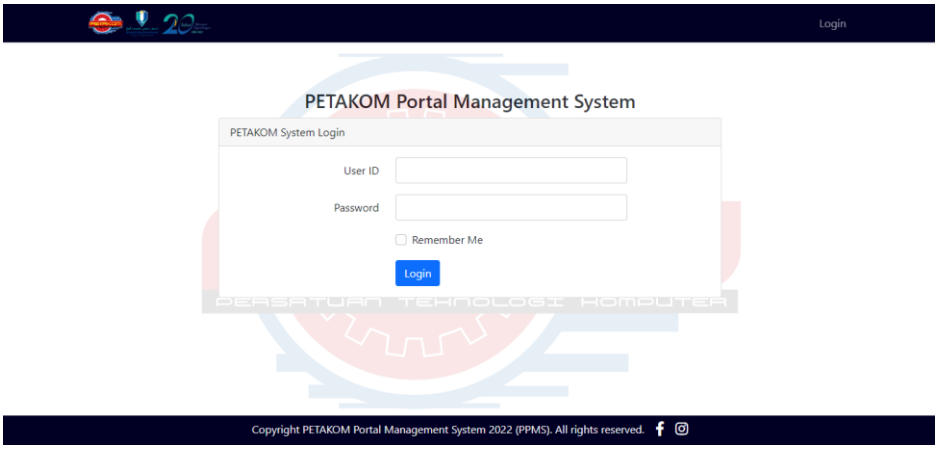

Figure 4.46 Login Interface for PETAKOM Room Reservation

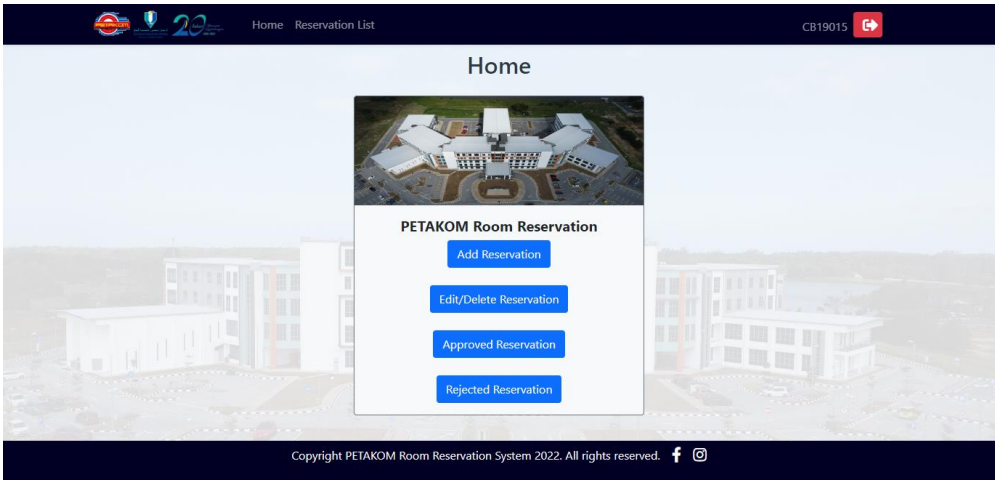

Figure 4.47 Student Dashboard

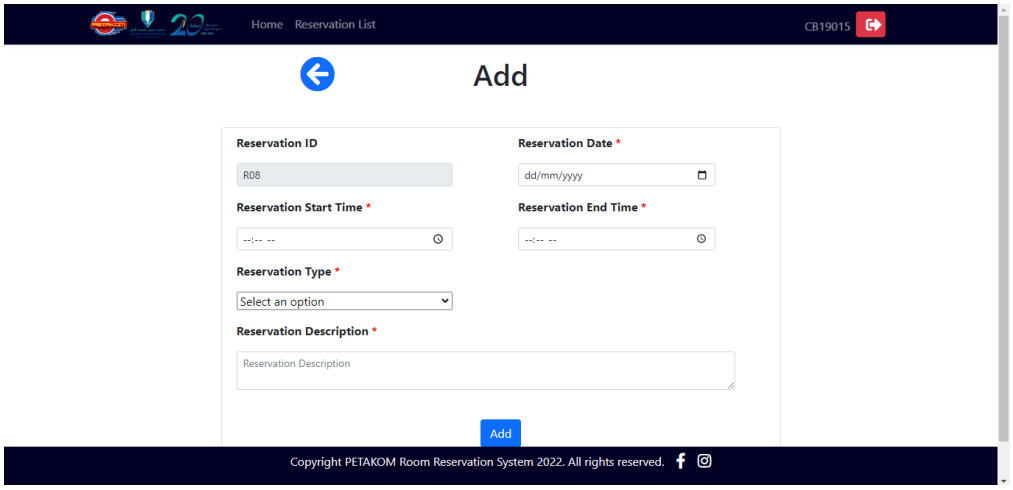

Figure 4.48 Add Reservation Interface

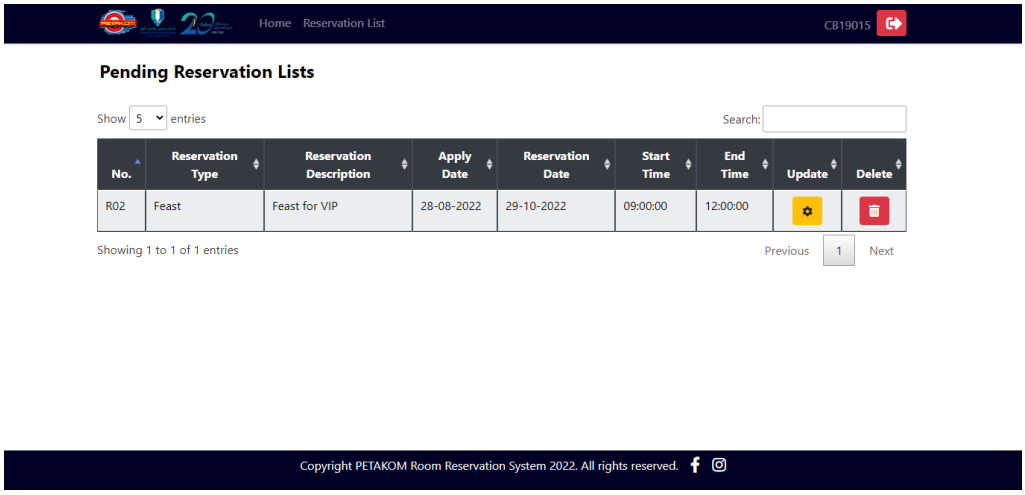

Figure 4.49 Pending Reservation of Student

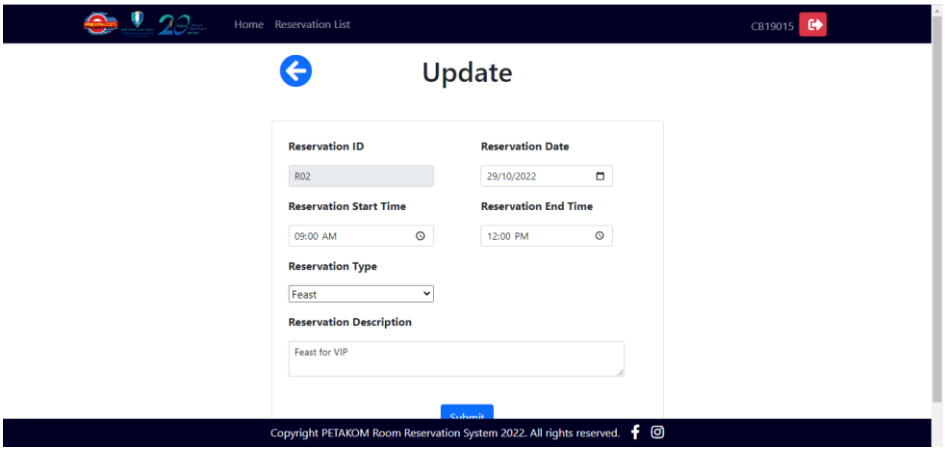

Figure 4.50 Update Reservation Interface

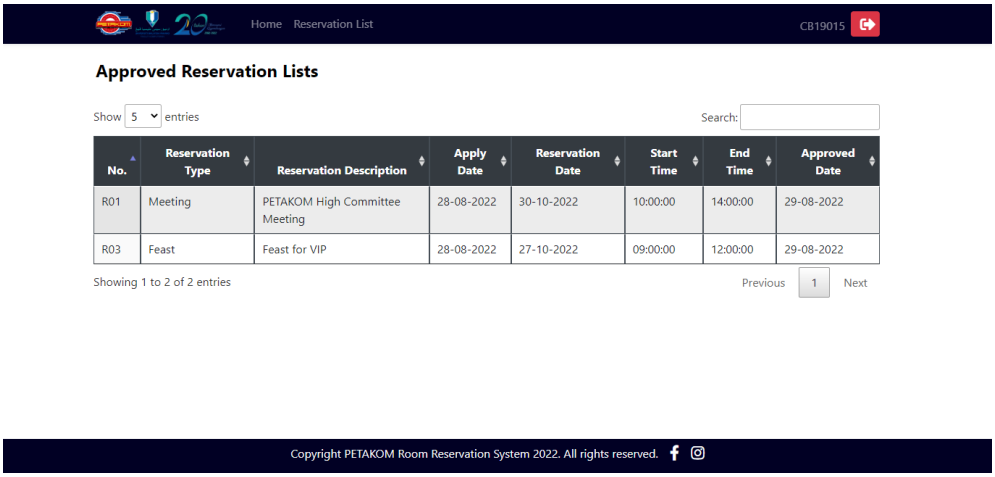

Figure 4.51 Approved Reservation of Student

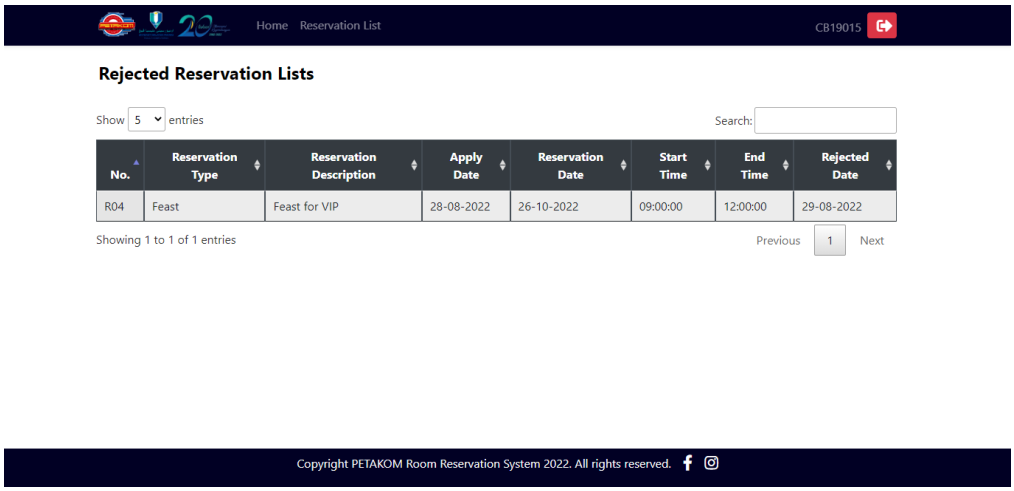

Figure 4.52 Rejected Reservation of Student

Once the admin access to the system, the screen shown in figure 4.53 will be the admin home dashboard. Figures 4.54, 4.55, and 4.56 show the listings of pending reservations, approved reservations, and rejected reservations for admin viewing. The green 'Tick' button in figure 4.54 shows that the reservation has been approved, whereas the red 'Banned' button indicates that the reservation has been rejected. The blue 'Update' button in figures 4.55 and 4.56 sends the admin to figure 4.57, which is the admin view's update reservation page. The administrator can change the reservation status to approved or rejected. Figure 4.58 represents the room reservation report statement, whereas Figure 4.59 depicts the QR code implementation.

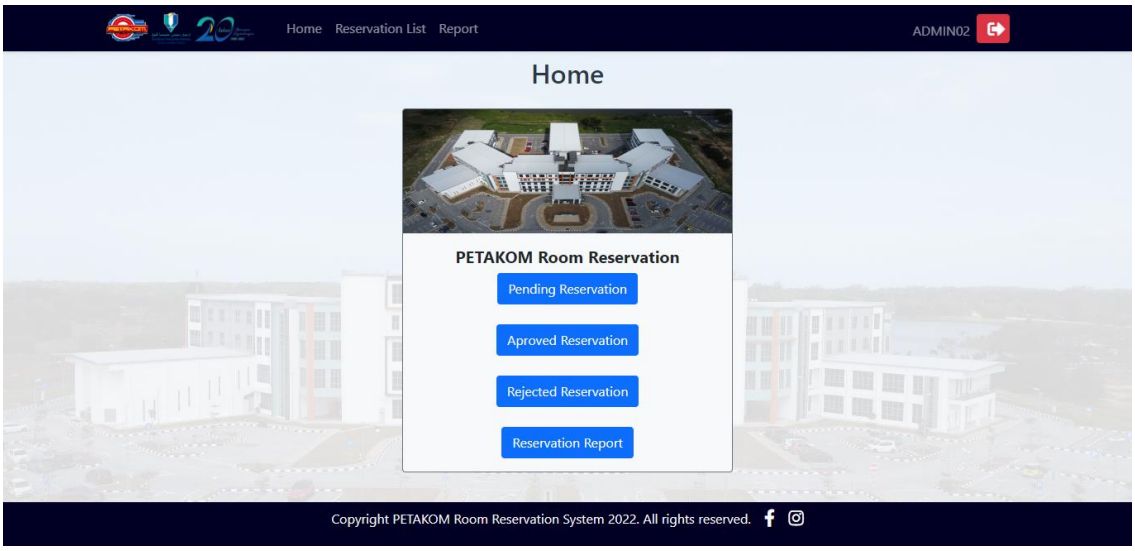

Figure 4.53 Admin Dashboard

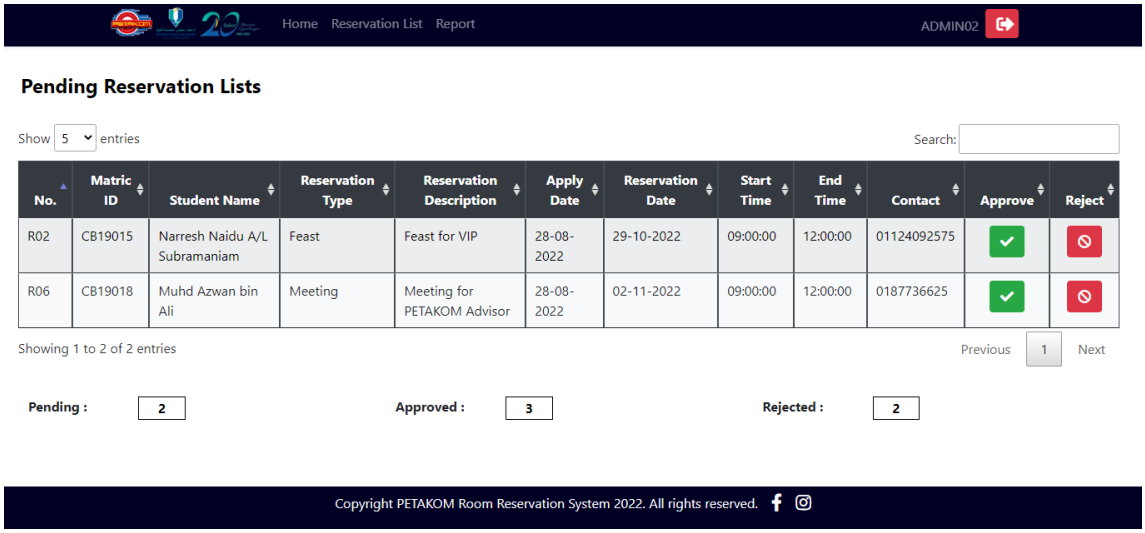

Figure 4.54 Pending Reservation for Admin View

Figure 4.55 Approved Reservation for Admin View

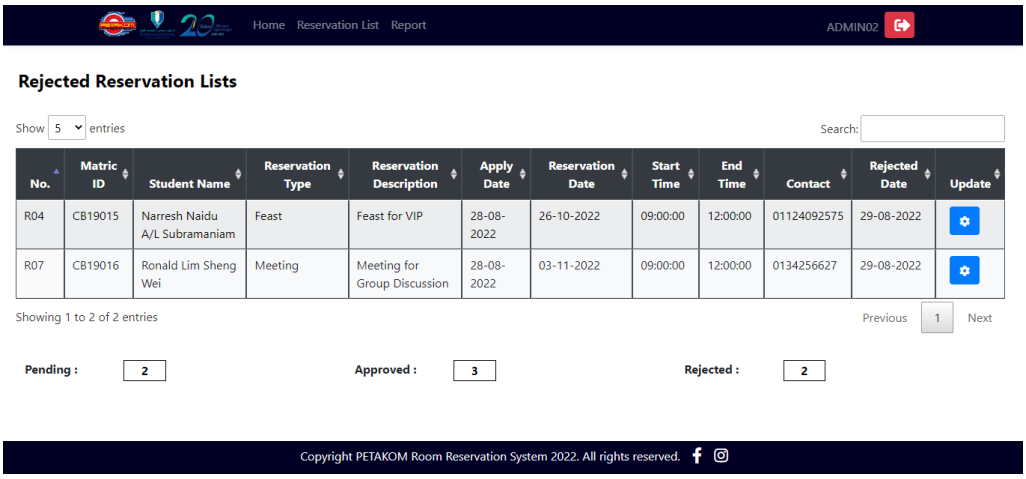

Figure 4.56 Rejected Reservation for Admin View

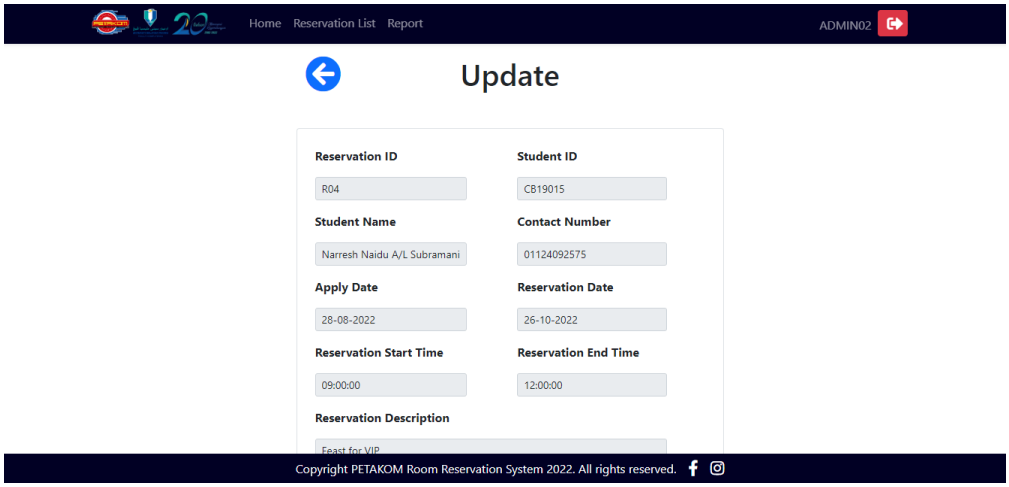

Figure 4.57 Update Reservation for Admin View

Figure 4.58 Report Statement for Reservation

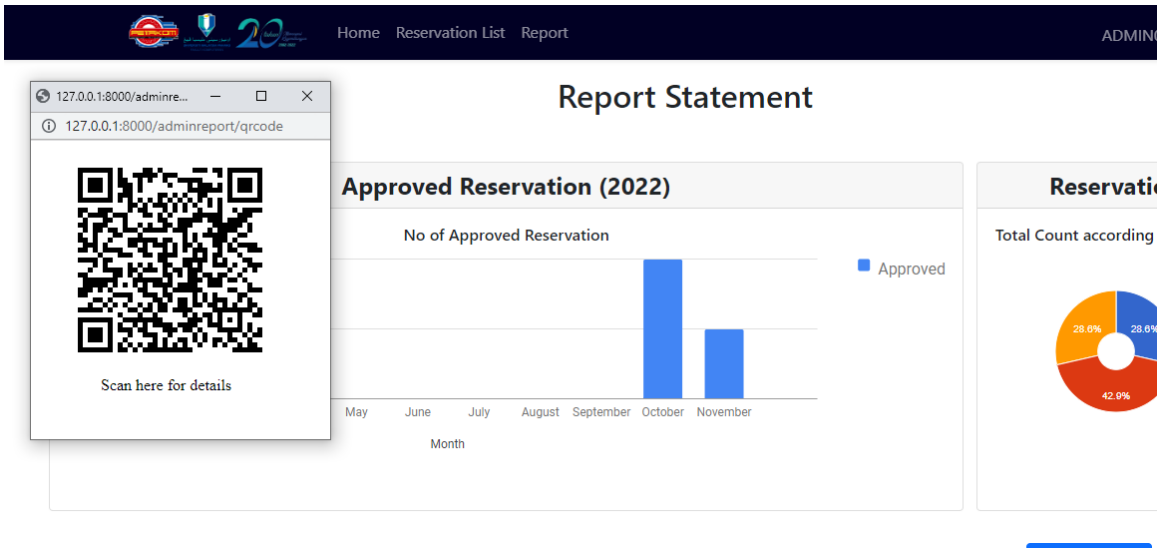

Figure 4.59 QR Code for Reservation Report Statement

4.4 Result and Discussion

After the development process is over, the system is ready for testing to determine its functionality and usability. User Acceptance Test (UAT) is used for functionality testing, in which the user tests all the system's accessible functions to see if they operate. The results of the UAT demonstrate that all the portal's functionalities are operational. The UAT findings may be found in APPENDIX A.

While testing and reviewing the usability and effectiveness of the portal, users are provided a survey using a Google form (refer to APPENDIX B) once they have gone through the system. The survey answered by 10 novice users in which the survey consists of 13 questions divided into eight principles based on Schneiderman's Eight Golden Rules, to which users must respond by rating on a scale of strongly disagree, disagree, neutral, agree, and strongly agree.

Figure 4.60 depicts the results of user feedback for the first principle, strive for consistency. In other words, all system elements should be consistent. Consistency restricts the amount of ways actions and processes may be represented, preventing users from having to learn different representations for each activity. According to the figure 4.60 below, 50% of users strongly agree and agree that the system's layout, style, and design are consistent throughout the system. Six out of ten respondents, on the other hand, strongly agree that the phrases and languages utilised are consistent. The remaining four respondents just agree with the statement. Thus, it can be concluded that the first principle is achieved.

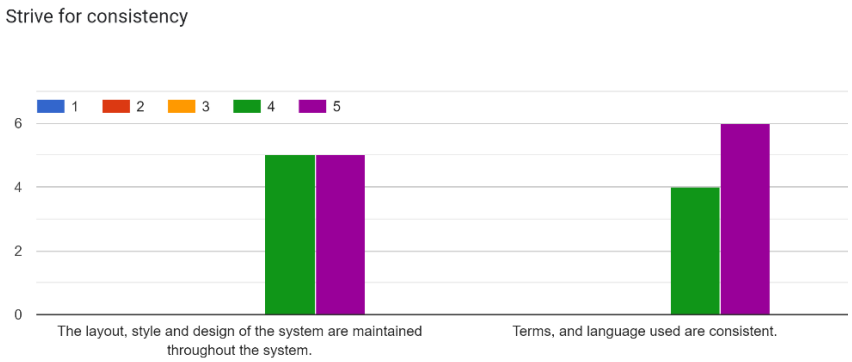

Figure 4.60 Results of user feedback for first principle

Figure 4.61 presents the user feedback findings for the second principle, which is to allow regular users to employ shortcuts. This idea allows users to access all areas of the portal with a few clicks. According to the figure below, 80% of users strongly agree and 20% agree that keyboard shortcuts can be employed in the system. On the other hand, 60% of users agree and the remaining 40% strongly agree that users should be able to access all aspects of the portal with a minimum of clicks. As a result, the portal obtains favourable feedback on the second principle.

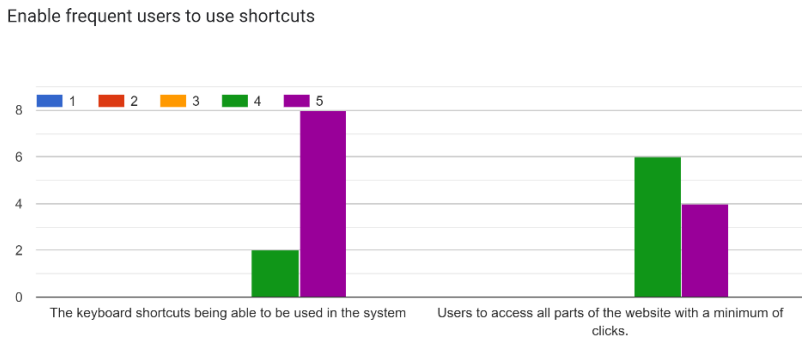

Figure 4.61 Results of user feedback for second principle

Figure 4.62 shows the results of user feedback for the third principle, which is to provide informative feedback. Within a fair length of time, meaningful, human-readable feedback should be provided for each activity. Among 10 responders, 60% strongly agreed that the site provides quick and relevant feedback, while 30% agreed and 10% were neutral. It was also discovered that half of the users agree that the present location is clearly indicated, while the remaining users rated strongly agree (40%) and neutral (10%). As a result of this, the portal may be receiving positive feedback on the third principle.

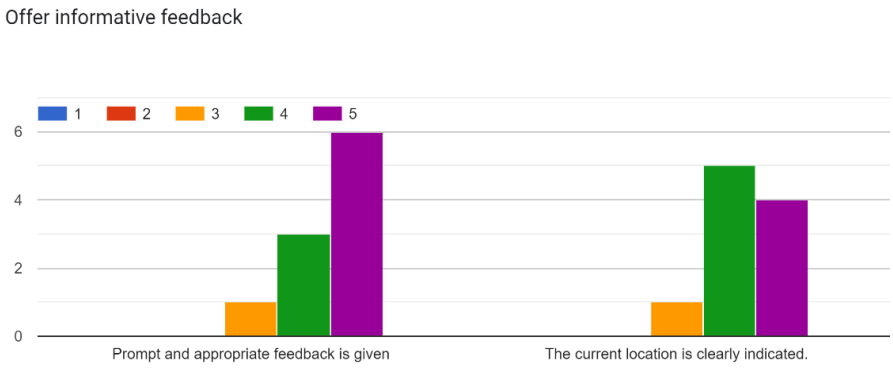

Figure 4.62 Results of user feedback for third principle

The outcomes of user feedback for the fourth principle, design dialogue to yield closure, are depicted in Figure 4.63. Informative feedback following a set of actions provides operators with a sense of achievement, a sense of relaxation, a signal to abandon contingency preparations, and a signal to prepare for the next set of operations. According to the graph, 60% strongly agree and 40% agree that the system gives a clear message to users about the consequences of their actions. This concludes that the portal fulfilled its fourth principle.

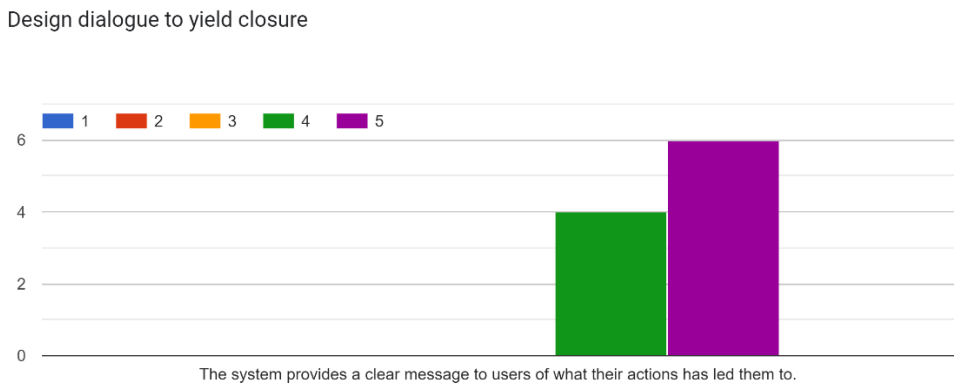

Figure 4.63 Results of user feedback for forth principle

The result of the user feedback on fifth principle is portrayed in Figure 4.64 which is offer simple error handling method. This concept focuses on straightforward ways to deal with mistakes, such as showing clear error notices and informative advice to remedy the problem. According to the graph in figure 4.64, 80% strongly agree and 20% agree that the system flags text fields when a user forgets to supply data in an online form. This means that the portal accomplished its fifth principle.

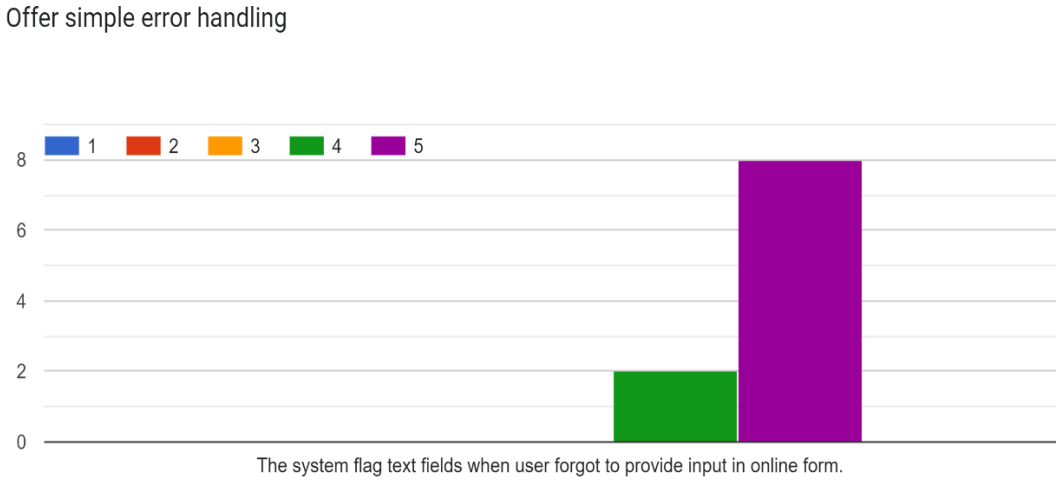

Figure 4.64 Results of user feedback for fifth principle

The Figure 4.65 depicts the results of user input for the sixth principle, which allows for easy action reversal. To allow for simple reversal, the actions provided to users should be as reversible as feasible. This relieves the users' burdens when an error or behaviour may be undone. According to the figure 4.65, 60% strongly agree that users may reverse or cancel their activities and simply return to the relevant starting point. The remaining 40% agree with both statements. This assures that the portal's sixth principle was met.

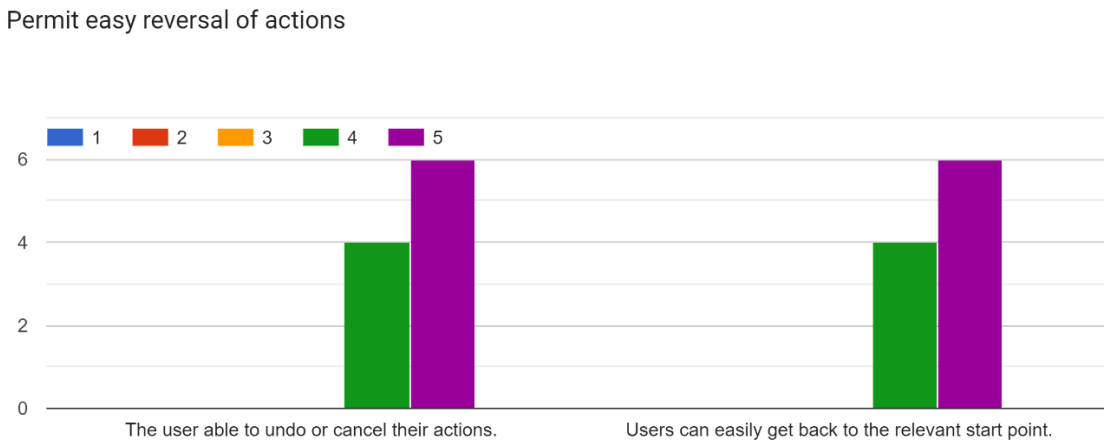

Figure 4.65 Results of user feedback for sixth principle

The outcomes of user input for the seventh principle, which support internal locus of control, are depicted in Figure 4.66. We need to provide people control and freedom so that they feel in charge of the system. Allowing them some type of free will helps to comfort the user. According to the findings, 60% of respondents strongly agree that the home page is good in orienting and directing people to their desired task. The remaining 40% agree with it. This ensures that the seventh principle of the portal was satisfied.

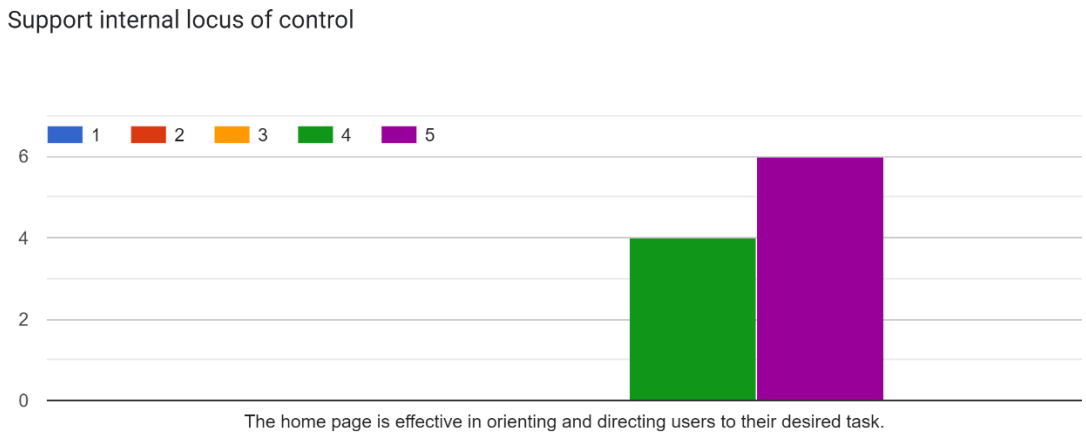

Figure 4.66 Results of user feedback for seventh principle

The figure 4.67 depicts the results of user input for the eighth principle, which is lower short-term memory load. You may minimise short-term memory load by creating interfaces with clearly visible alternatives, or by employing pull-down menus and icons. According to the data, 60% of respondents strongly agree, while 40% agree that the call-to-action buttons are obvious, well-labelled, and seem clickable. It was also discovered that 70% of users strongly agreed that suitable input fields are utilised and needed formats are stated, while the remaining 30% agreed. This guarantees that the portal's eight principles were met.

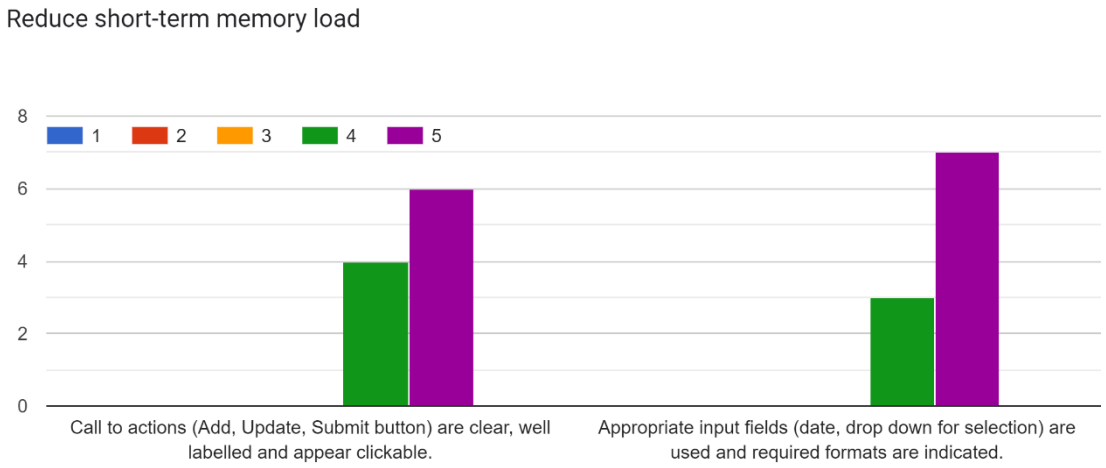

Figure 4.67 Results of user feedback for eighth principle

PETAKOM Portal Management System (PPMS) is assessed as having good overall performance since it has gotten great user feedback for providing a low-cost and dynamic website for PETAKOM organisations to manage their information. The system objectives were all met as a result of this system's development. The characteristics and functionality of the portal management system could be studied through this implementation, which met the first purpose. This system development achieved the second goal of creating a portal for PETAKOM. The final objectives have been met, and the developed portal has been validated in terms of functionality and usability based on the modules of the built PPMS aimed at user acceptance.

CHAPTER 5

CONCLUSION

5.1 Introduction

Chapter 5 will summarise the outcomes of establishing the PETAKOM Portal Management System (PPMS) for FK students in order to fulfil the objectives and solve the issues outlined in the problem description previously in Chapter 1. It is extremely difficult to manage an organisation without a proper comprehensive system. This approach has the potential to be an excellent management tool for the PETAKOM organisation. The Laravel Framework, which employs PHP and HTML as programming languages, was utilised to create this portal. The system is coded in Visual Studio, and the repository is hosted on GitHub. FK students assess this portal to test the usability and functionality of this portal. The review method demonstrates that students provide favourable comments, and that this application meets the application's objectives.

5.2 Discussion on User Acceptance

Following the completion of the development phase, the implementation and evaluation processes are carried out to test the functionality, usability, and effectiveness of the portal.

. This section analyses whether or not the project's objectives were met. The first objective, which is to study the features and functionality of current portal management systems, has been met, since all of the functionality and characteristics of three existing

portals were studied before constructing the project, as indicated in Chapter 2. The next goal was to create a portal management system for the PETAKOM Organization utilising the Laravel Framework. The generated PPMS is subsequently evaluated to confirm its effectiveness based on Schneiderman's Eight Golden Principles and also employing UAT test which obeys the third objective.

5.3 Limitation and Constraint

Project constraints, according to recent study, are the elements that restrict your growth process. They cover all time and resource constraints, as well as professionals and technical components of upcoming project (Cherednichenko, 2022).

During the project's development, the following restrictions were encountered:

i. Time

Time is an extremely important factor in the portal's development. This portal has just five modules due to time constraints. Aside from that, the site only covered a portion of the PETAKOM Organization's management.

ii. Programming/Scripting Error

Programming is required for the development of the portal system. There are situations when mistakes in coding arise. The portal would be unable to test or execute if there were issues. The errors must be resolved before the project may be executed.

5.4 Future Work

There are various enhancements that may be used to improve the PETAKOM Portal Management System in the future (PPMS).

i. The developer can add new modules and contents to the portal system (example, Voting Module, Coop Mart Management Module).

ii. The developer can provide multi-language support in the portal. (example, Malay Language)

iii. The developer can include new features that are accessible to persons with disabilities. (example, screen reader software, dyslexia-friendly fonts)

iv. Add additional Application Programming Interfaces (API) by the developer. (example, Chatbot API, Website Traffic API)

v. The developer enabled public users the ability to adjust the text size and colour scheme.

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APPENDIX A

USER ACCEPTANCE TEST (UAT)

TABLE OF CONTENTS

1.0 TESTING REPORT

The purpose of this section is to outline the User Acceptance Testing (UAT) procedure for the application. Approval of this testing that reviewers are sure that following the execution of the test plan, the resulting system will regarded thoroughly tested and appropriate for implementation.

Nurul Arni Aziera Bt Mojd Zulkifli, President of PETAKOM Organization, was chosen to go through the system. This form records any faults or difficulties discovered

1.1 Module 1: Manage Content

Table 1.1 shows the test case for Manage Content Module. All the result is pass.

Table 1.1 Manage Content Test Case

Test Case	Test Data	Expected Result	Actual Result	Pass /Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login	User login successfully	Pass	-
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login	User unable to login successfully	Pass	-
Add new content	Admin can add and publish content	Content can be published to the portal	New contents added into database	Pass	-
Edit Existing Content	Admin can edit details of existing content	Content published can be edited	Updated details are discovered in database	Pass	-
Delete Content	Admin can delete and unpublished existing content	Content published is removed from the portal	Data is removed from database	Pass	-

1.2 Module 2: Manage Program

Table 1.2 shows the test case for Manage Program Module. All the result is pass.

Table 1.2 Manage Program Test Case

Test Case	Test Data	Expected Result	Actual Result	Pass /Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login	User login successfully	Pass	-
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login	User unable to login successfully	Pass	-
Add new Program Details	Admin can add and publish details	Details can be published to the portal	New programs added into database	Pass	-
Edit Existing Program Details	Admin can edit details of existing details	Details published can be edited	Updated programs discovered in database	Pass	-
Delete Program Details	Admin can delete and unpublished existing details	Details published is removed from the portal	Data is removed from database	Pass	-
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to number of programs.	Correct Bar and Pie chart is presented	The system presents correct chart.	Pass	-
Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.	The system generates the correct QR Code	Pass	-

Fill up Program Suggestion Form	FK Students can fill up the program suggestion form without any error.	Form can be filled up.	Filled up details are found in database.	Pass	-
Uploading Program Picture	Admin can upload the pictures of the program without any error.	Picture can be uploaded.	Uploaded pictures can be found in the directory and database	Pass	-

1.3 Module 3: Manage Complain

Table 1.3 shows the test case for Manage Complain Module. All the result is pass.

Table 1.3 Manage Complain Test Case

Test Case	**Test Data**	**Expected Result**	**Actual Result**	**Pass /Fail**	**Comment**
Login with correct username and password	Admin entered correct username and password	Successfully login	User login successfully	Pass	-
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login	User unable to login successfully	Pass	-
Complain Issue can be reviewed.	Admin can review the complains done by the students by clicking on the resolved or unresolved button.	Complains can be reviewed	Complains can be seen in unresolved category.	Pass	-

Able to click ‘Resolved’ button	Admin can click the ‘Resolved’ button.	Changes the complaint type from Unresolved to Resolved	Complain changes category from Unresolve to Resolved	Pass	-
Able to click ‘Unresolved’ button	Admin can click the ‘Unresolved’ button.	Changes the complaint type from Resolved to Unresolved	Complain changes category from Resolved to Unresolve	Pass	-
Fill up the Google Form	Students able to fill up the Google form	Google form can be filled up	Complain Details are added into Database	Pass	-
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to number of complains resolved and unresolved.	Correct Bar and Pie chart is presented	The system presents correct chart.	Pass	-
Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.	The system generates the correct QR Code	Pass	-

1.4 Module 4: Manage Merchandise

Table 1.4 shows the test case for Manage Merchandise Module. All the result is pass.

Table 1.4 Manage Merchandise Test Case

Test Case	Test Data	Expected Result	Actual Result	Pass /Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login	User login successfully	Pass	-
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login	User unable to login successfully	Pass	-
Add new Merchandise	Admin can add new merchandise	Merchandise can be published to the portal	New Merchandise added into database	Pass	-
Edit Merchandise	Admin can edit details of merchandise	Merchandise details can be edited	Updated Merchandise discovered in database	Pass	-
Delete Merchandise	Admin can delete the merchandise	Merchandise is removed from the portal	Merchandise is removed from database	Pass	-
Purchase Merchandise	FK Students can purchase merchandise through the form that is available on the portal	Merchandise can be purchased by the FK Student	Order details are added into database	Pass	-
Generate Report	Admin can generate the correct order report according to merchandise and sizes.	Report can be generated.	Report can be generated	Pass	-

Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.	The system presents correct QR Code.	Pass	-
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to merchandise and sizes.	Correct Bar and Pie chart is presented	The system presents correct chart.	Pass	-
Generate PDF	Admin can generate the report in PDF format.	PDF is created.	PDF is created	Pass	-
Uploading Merchandise Picture	Admin can upload the pictures of the merchandise without any error.	Picture can be uploaded.	Uploaded picture can be found in directory and database	Pass	-

1.5 Module 5: PETAKOM Room Booking

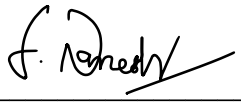
Table 1.5 shows the test case for PETAKOM Room Booking Module. All the result is pass.

Table 1.5 PETAKOM Room Booking Test Case

Test Case	Test Data	Expected Result	Actual Result	Pass /Fail	Comment
Login with correct username and password	Admin entered correct username and password	Successfully login	User login successfully	Pass	-
Login with incorrect username and password	Admin entered incorrect username and password	Unsuccessful login	User unable to login successfully	Pass	-
Add Reservation	FK Students can reserve the PETAKOM room by filling up the details	PETAKOM room can be reserved	New Reservation added into database	Pass	-
Update Reservation	FK Students can update the reservation details by clicking on 'Update' button	Reservation details can be updated	Updated reservation details are found in database	Pass	-
Cancel Reservation	FK Students can cancel reservation by clicking on 'Cancel' button	Reservation can be cancelled	Cancel reservation are removed from database	Pass	-

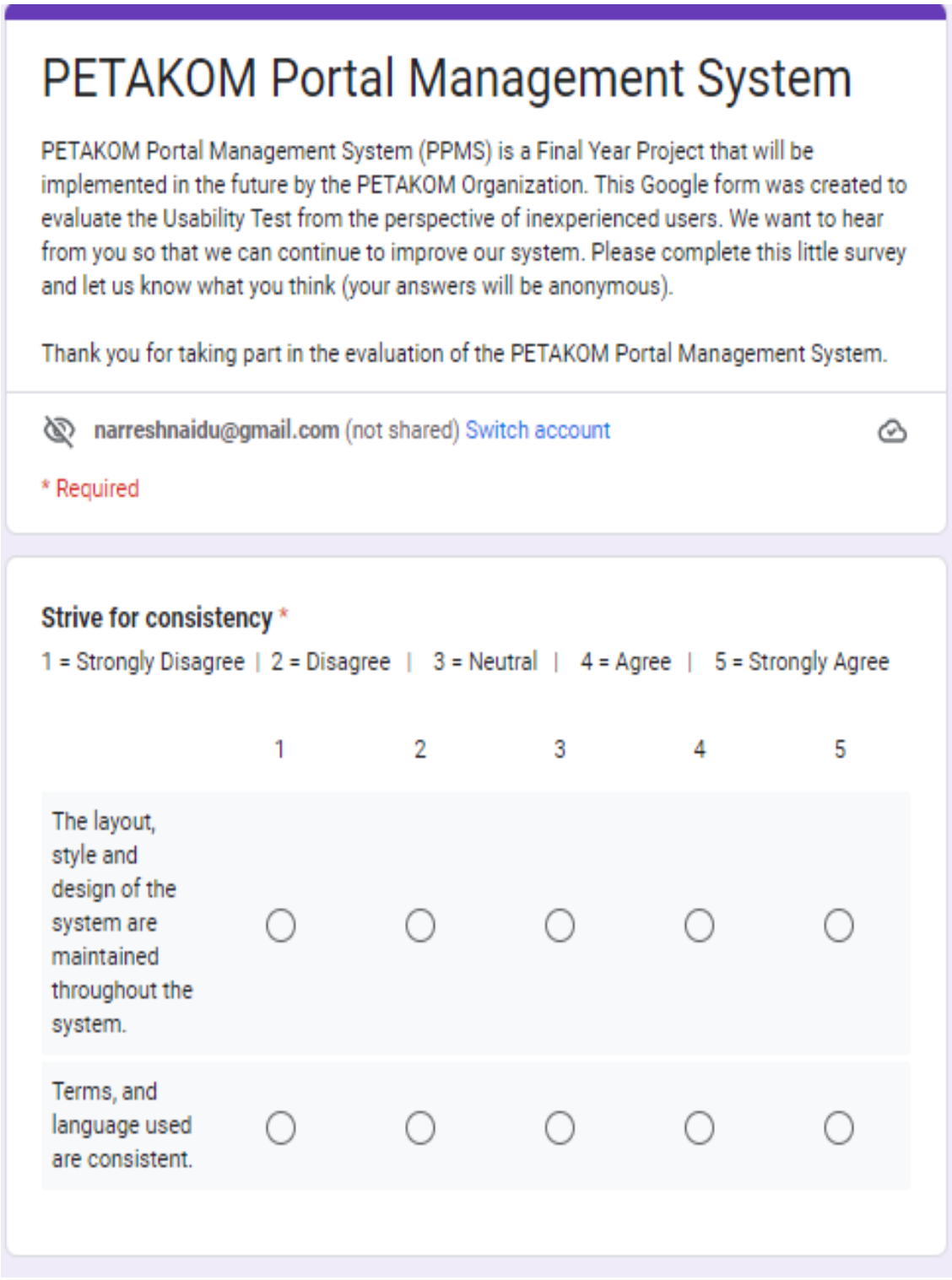
Approve/ Reject Reservation	The PETAKOM Administrator can approve or reject the reservations done by the students by clicking either on ‘Approve’ or ‘Reject’ buttons.	Reservations can be approved and rejected	Reservation approval status can be updated	Pass	-
Generate QR Code	Admin can generate the summary of the report in QR code	A proper QR code is generated.	The system presents correct QR Code.	Pass	-
Generate correct Bar and Pie Chart	Admin can generate the correct Bar and Pie Chart according to reservation’s approval.	Correct Bar and Pie chart is presented	The system presents correct chart.	Pass	-

2.0 SYSTEM TESTING APPROVAL

General Information		
Project Name	PETAKOM Portal Management System (PPMS)	
Time Taken	9 Months	
Client	Nurul Arni Aziera Bt Mojd Zulkifli	
Application Name	PETAKOM Portal Management System (PPMS)	
	Name	Date
Verified by:  Developer	NARRESH NAIDU SUBRAMANIAM	03/11/2022
Approved by:  Client	NURUL ARNI AZIERA BT MOJD ZULKIFLI	03/11/2022

APPENDIX B

USABILITY TEST (GOOGLE FORM QUESTIONS FOR USERS)



PETAKOM Portal Management System

PETAKOM Portal Management System (PPMS) is a Final Year Project that will be implemented in the future by the PETAKOM Organization. This Google form was created to evaluate the Usability Test from the perspective of inexperienced users. We want to hear from you so that we can continue to improve our system. Please complete this little survey and let us know what you think (your answers will be anonymous).

Thank you for taking part in the evaluation of the PETAKOM Portal Management System.

narreshnaidu@gmail.com (not shared) Switch account

* Required

Strive for consistency *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
The layout, style and design of the system are maintained throughout the system.	○	○	○	○	○
Terms, and language used are consistent.	○	○	○	○	○

Enable frequent users to use shortcuts *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
The keyboard shortcuts being able to be used in the system	○	○	○	○	○
Users to access all parts of the website with a minimum of clicks.	○	○	○	○	○

Offer informative feedback *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
Prompt and appropriate feedback is given	○	○	○	○	○
The current location is clearly indicated.	○	○	○	○	○

Design dialogue to yield closure *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
The system provides a clear message to users of what their actions has led them to.	○	○	○	○	○

Offer simple error handling *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
The system flag text fields when user forgot to provide input in online form.	○	○	○	○	○

Permit easy reversal of actions *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
The user able to undo or cancel their actions.	○	○	○	○	○
Users can easily get back to the relevant start point.	○	○	○	○	○

Support internal locus of control *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
The home page is effective in orienting and directing users to their desired task.	○	○	○	○	○

Reduce short-term memory load *

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

	1	2	3	4	5
Call to actions (Add, Update, Submit button) are clear, well labelled and appear clickable.	○	○	○	○	○
Appropriate input fields (date, drop down for selection) are used and required formats are indicated.	○	○	○	○	○

Submit

Clear form

APPENDIX C

SOFTWARE REQUIREMENT SPECIFICATION (SRS)

SOFTWARE DESIGN DOCUMENT (SDD)