UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING

SEMESTER II, SESSION 2023/2024

PROJECT PROPOSAL AND PLANNING - PHASE 1

SECD2613 - SYSTEM ANALYSIS AND DESIGN

SECTION 07

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1.0 Introduction

Universiti Teknologi Malaysia is the 5th best university in Malaysia based on QS World University Rankings that is specialised in engineering and technology. With more than 15000 undergraduates across three different campuses located in Johor Bahru, Kuala Lumpur and Pagoh, it is the top choice for anyone interested to pursue their studies in a wide selection of degree programmes including Computer Science and Engineering.

With such a huge amount of students on campus, there are surely a lot of resources that needs to be managed across multiple parties, including the students, departments and stakeholders. Without a proper system in place to maintain these resources, there would be severe consequences. For instance, miscommunication when reserving facilities for an event can cause higher costs and wasted time.

To prevent such problems from occurring, a centralised platform to manage campus resources should be developed. Therefore, we are proposing a system called Campus Resource Management System. By having a more centralised system, administrative and operational processes are more streamlined and efficiently improves the effectiveness of managing various resources within the campus.

2.0 Background Study

Currently, the myUTM Portal contains a Campus Life section where there is an activity list where students can register for activities around campus. However, this feature is currently underused and features limited information to users. Most of the time, events around campus are spread through social media such as Facebook and Telegram. Since there are numerous events happening on similar dates, certain events may slip through the cracks and receive poor attention by the community. Therefore, proper promotion of events and activities through social media is a priority to ensure success of said event.

Additionally, student management in UTM is separated between two websites. One website controls the academic profiles and registration of courses, while on the other hand, it contains the schedule and progress of courses that changes each semester. This system in place is unintuitive and would further enhance the user experience if only one system contains all features of the student profile in one place.

When anyone wants to book a certain facility in UTM, they would need to either email or call the person in charge. However, if the facility is already booked, there is no system to show it. This may cause miscommunication and scheduling problems. For instance, a seminar room could have two events happening at the same time due to miscommunication and resulting in conflict between the two parties. By having a centralised system for the booking process, the reservation process is smoother and more clearer to people.

3.0 Problem Statement

1. Disorganisation in Facility Booking

   The campus lacks a unified system for facility booking. Currently, students and staff must navigate through multiple platforms to reserve spaces, leading to confusion and inefficiency. For example, booking a classroom requires one system, while reserving a gym or stadium involves separate procedures. This fragmented approach creates barriers to seamless campus resource management, resulting in scheduling conflicts and reduced resource utilisation.

2. Ineffective Event Notification and Reminder System

   Students often learn about campus events through the university's central website, UTM.my. However, this platform offers limited customization and doesn't allow users to set reminders for events they are interested in. The absence of a "pin" or "favorite" feature makes it difficult for users to revisit event information, leading to lower event participation and a diminished sense of community engagement.

3. Non-User-Friendly Interface for Academic and Administrative Tasks

   Students find the campus management system's user interface challenging to navigate. Accessing academic profiles, registering for courses, or viewing schedules is cumbersome due to poor UI design. This leads to frustration and wasted time as students and administrators struggle to locate the right sections. Administrators also face challenges managing student enrolment, with disorganised data causing delays in processing and administrative tasks.

4. Inadequate Communication Between Students and Faculty

   Students often have difficulty reaching faculty members due to a lack of clear communication channels. The existing system does not provide an organised directory for staff contacts, leading to confusion and delays in communication. This problem impedes students from seeking academic guidance or discussing course-related issues, undermining the quality of education and academic support.

5. Insufficient Staff Management Tools.

   The campus HR administrators face significant challenges in managing faculty and staff information. Data is spread across multiple systems, resulting in disorganisation and inefficiency. There is no integrated solution for recruitment, scheduling, performance evaluation, and leave management. This lack of centralization leads to errors, time delays, and difficulties in maintaining accurate staff records.

4.0 Proposed Solution

The Campus Resource Management System (CRMS) is a robust platform that helps to streamline administrative and operational operations on a university or college campus. Its major goal is to increase efficiency, improve communication channels, and maximise resource allocation across departments and stakeholders by integrating a variety of operations under a single, centralised system.

Among the CRMS's many capabilities is a comprehensive set of tools designed to make it easier to schedule and manage campus amenities efficiently. It provides users with unrivalled autonomy, allowing them to easily search availability, evaluate details, and secure bookings for a wide range of campus facilities, including classrooms, auditoriums, laboratories, and athletic fields. Facility managers can use powerful tools to define booking standards, regulate reservations, and constantly monitor resource consumption, ensuring that campus assets are used to their full potential.

The CRMS's core mission is to meticulously orchestrate campus events, workshops, lectures, and extracurricular activities. Event organisers have access to a wealth of effective tools for creating, scheduling, and managing a variety of campus events. Whether it's managing event registration, coordinating promotional efforts, controlling participant logistics, or gathering feedback, the system enables organisers to produce compelling events while increasing audience engagement and involvement.

The CRMS provides administrators with a comprehensive set of tools to efficiently manage student enrollment, course registration, academic records, and extracurricular activities. Students, in turn, receive access to their academic profiles, which allow them to easily manage course registration, examine schedules, and track academic progress inside the integrated CRMS environment.

In addition to its role in student and event management, the CRMS is an important tool for improving communication and notification among stakeholders. Users receive timely announcements, reminders, and alerts about forthcoming events, bookings, and deadlines via email, messaging, and notifications, allowing vital information to be disseminated efficiently throughout campus.

To summarise, the suggested CRMS, with its painstakingly integrated modules specialising in facility booking and management, event coordination, student administration, and communication and notification, provides a comprehensive answer to the multifaceted needs of university or college campuses. By centralising administrative activities and encouraging seamless communication and collaboration, the system has the ability to promote a paradigm change toward a more efficient, responsive, and dynamic campus management ecosystem.

Technical Feasibility

The Campus Resource Management System (CRMS) is a complete platform designed to improve administrative and operational operations on university and college campuses. CRMS improves efficiency, communication, and resource allocation across departments and stakeholders by combining several processes into a single system. It provides simple tools for scheduling and maintaining campus facilities, organising events, coordinating student activities, and improving communication through timely announcements and alerts. CRMS, with its integrated modules, encourages a paradigm change toward a more efficient and dynamic campus management ecosystem, streamlining administrative activities and encouraging collaboration among members.

Operational Feasibility

Operational feasibility for the proposed Campus Resource Management System (CRMS) necessitates robust Information System (IS) support to oversee and maintain its various features seamlessly. With a plethora of functionalities including a comprehensive database system, sophisticated sorting mechanisms, and integration with external APIs, diligent supervision is crucial to pre-emptively identify and address potential bugs or glitches. Continuous monitoring and proactive maintenance protocols are imperative to ensure the smooth and uninterrupted operation of CRMS, thereby maximising its effectiveness in streamlining campus resource management processes.

Economic Feasibility (CBA)

Assumptions	
Discount rate	10%
Sensitivity factor (Costs)	1.1
Sensitivity factor (Benefits)	0.9
Annual change in production costs	5%
Annual change in benefits	7%

Estimated Costs	
Hardware	RM 10 000
Software	RM 10 000
Maintenance	RM 8000 per year
Advertising	RM 2500 per year
Salary	RM 35 000 per year

Estimated Benefits	
Increase sales	RM 50 000 per year
Savings	RM 28 000 per year

Costs	Year 0	Year 1	Year 2	Year 3
Development Costs				
· Hardware	11 000			
· Software	11 000			
Total	22 000			
Production Costs				
· Maintenance		8800	9240	9702
· Advertising		2750	2888	3032
· Salary		38 500	40 425	42 446
Annual Production Costs		50 050	52 553	55 180
(Present Value)		45 500	43 432	41 458
Accumulated Costs		67 500	110 932	152390

Benefits	Year 0	Year 1	Year 2	Year 3
Increase sales		45 000	48 150	51 521
Savings		25 200	26 964	28 851
Annual Inventory Costs		70 200	75 114	80 372
(Present Value)		63 818	62 078	60 385
Accumulated benefits		63 818	125 896	186 281
Gain or loss		(3682)	14 964	33 891
Profitability Index	1.54			

5.0 Objectives

There are some objectives of this project.

1. To provide a unified facility booking system.
2. To implement a customizable event notification system with reminder capabilities.
3. To create a user-friendly interface for accessing academic and administrative information.
4. To create a centralised platform for managing extracurricular activities and student clubs.
5. To integrate HR management systems for staff administration, covering recruitment, scheduling, and performance evaluation.
6. To establish clear communication channels between students and faculty through a comprehensive directory.

6.0 Scope of the Project

We are creating a system that helps the university to manage the various administrative and operational processes, which are unified facility booking, event management, administrative information, academic information and communication between stakeholders. The system eases the staff and students to access the functions and information needed. The system also acts as a clear communication channel between the staff and students to ensure that all students receive the correct information and are notified of events. The stakeholders involved are staff, students, faculty, and administrators. Each of the different types of users will have different functions and views.

On staff's view, the system allows staff to communicate efficiently with students, faculty, and administrators. Staff can utilise the system to coordinate events and activities. For example, staff can customise event notifications with reminder capabilities. The system assists in student enrollment and academic administration. It also manages campus facilities and resources.

From a student's perspective, the system with a user-friendly interface facilitates access to academic information and resources such as course registration, grades, and academic schedules. Students can use it to get the latest information about events or any updates from the faculty. The system will provide a unified facility booking system for students, allowing them to check the availability of facilities while planning activities. Students can easily book facilities through the system, saving time and enhancing the efficiency of the management system.

In the faculty's view, the system assists in academic management. Faculty can use it to schedule classes and view student enrollment. The system helps manage course materials and assignments, serving as a valuable tool for course planning, curriculum development, and lesson preparation.

From the administrators' perspective, the system provides oversight of system configurations. Administrators can easily access data analytics to monitor progress. The system assists in the coordination of institutional events, meetings, and committees. HR management systems integrated within the system provide a platform for recruitment, scheduling, and performance evaluation. This includes a platform for job seekers to submit applications online and track their application status. It allows HR managers to create and manage staff schedules, including shift assignments and time-off requests. The system also supports resolving user inquiries, technical issues, and system maintenance tasks.

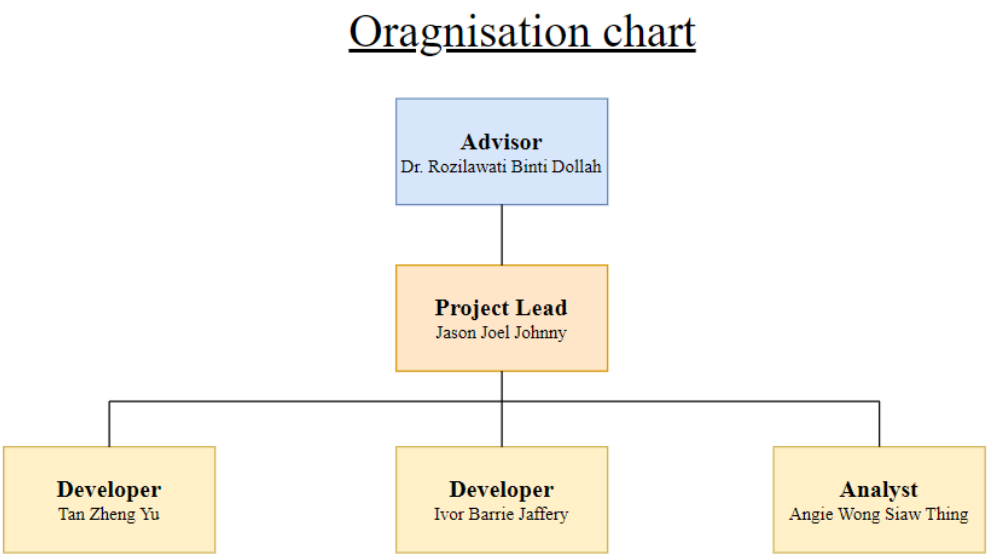
We will ensure the user interface is user-friendly for all types of users, considering accessibility and ease of navigation.The system is implemented by robust security measures to protect sensitive data and ensure smooth maintainence. The system also implemented a feedback

mechanism to gather user feedback and suggestions for system improvements. It is to ensure continuous enhancement.

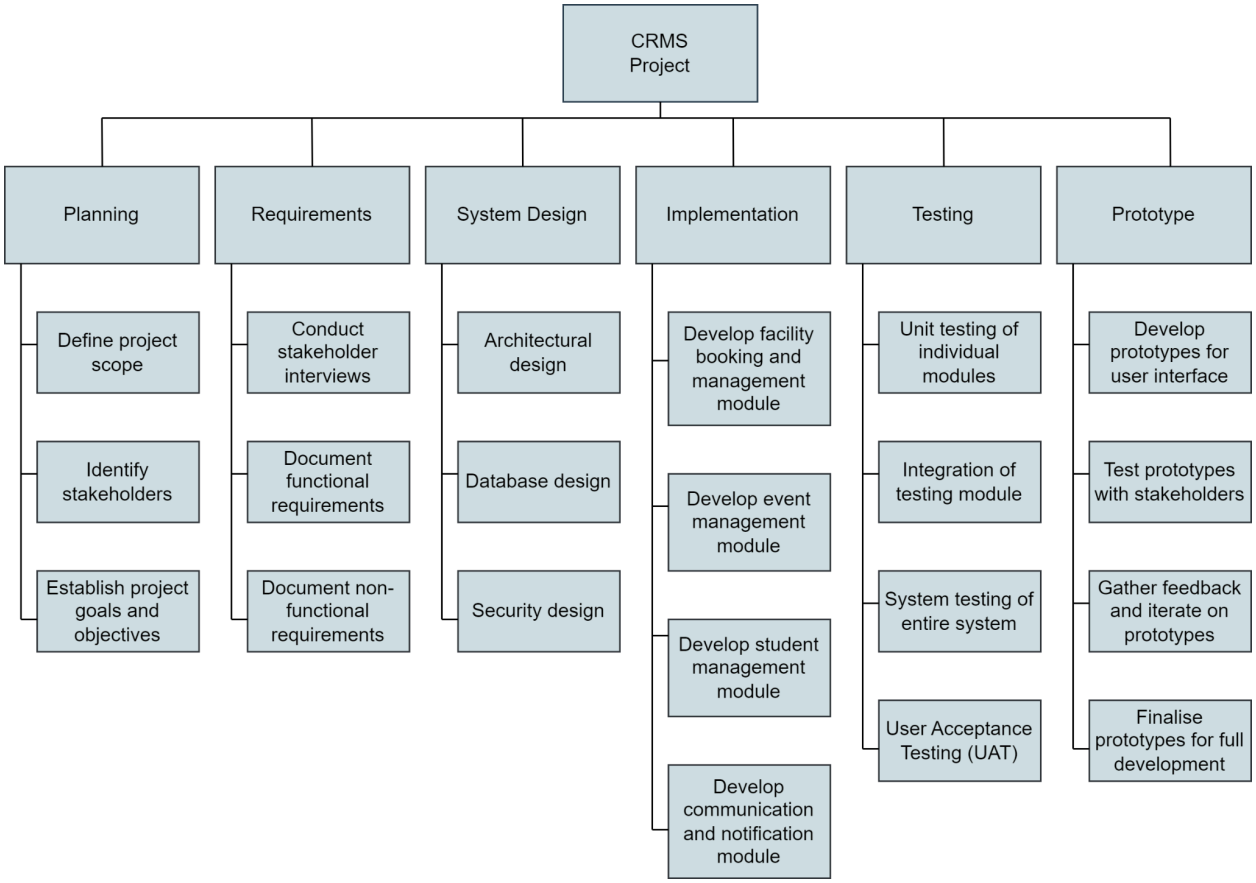
There are six phases in the program development, which are planning, requirements, system design, implementation, testing and prototype. Firstly, in the duration of 1 week, we need to define project scope, identify stakeholders, and establish projects. To ensure requirements are met, we will conduct stakeholder interviews and prepare functional and non-functional documents in the duration of 1 week. During system design, architectural design, database design, and security design will be done in the duration of 2 weeks. During implementation, we will develop a faculty booking and management module, event management module, student management module, and communication module to meet our objectives in the duration of 3 weeks. The next phase is testing. It will test the individual modules, the entire system, and integrate the testing module in the duration of 2 weeks. The last phase is the prototype. We will develop the prototypes for user interface, text prototype with stakeholders. gather feedback and iterate on prototypes and finalise prototypes for full development in the duration of 2 weeks.

7.0 Project Planning

7.1 Human Resource



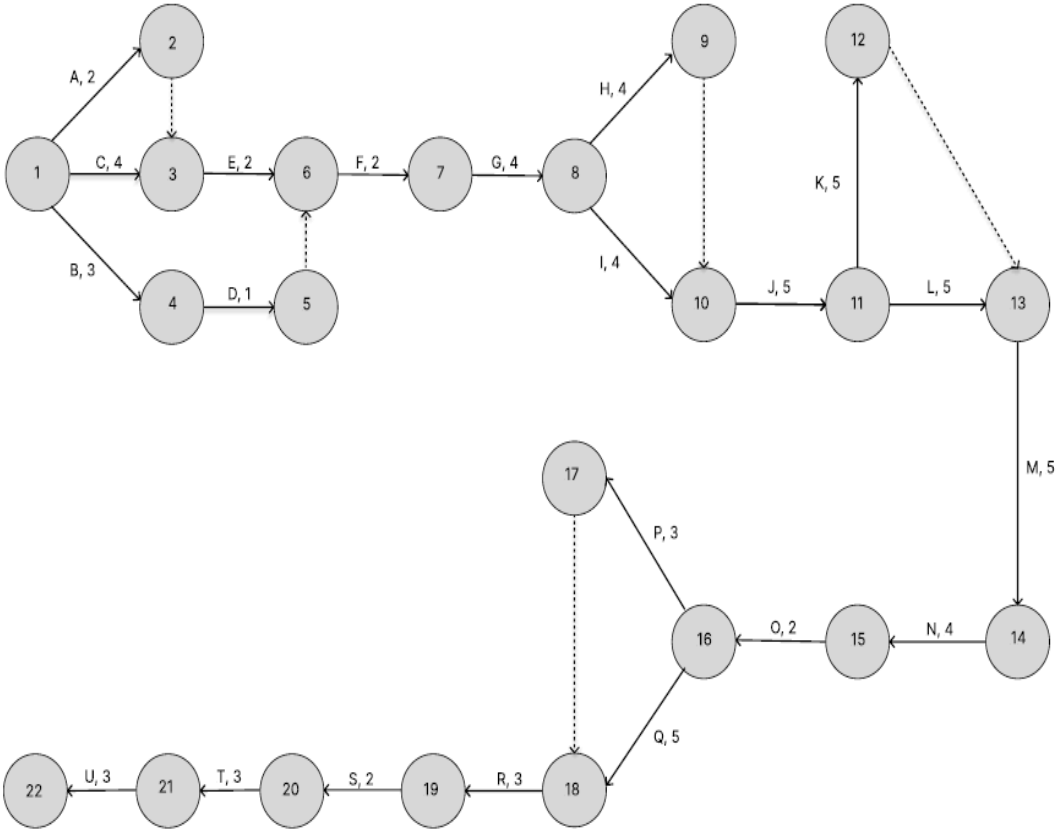
7.2 Work Breakdown Structure (WBS)



7.3 PERT Chart

Activity	Description	Predecessor	Duration (Days)
Planning			
A	Define Project Scope	-	2
B	Identify Stakeholders	-	3
C	Establish Project Goals and Objectives	-	4
Requirements			
D	Conduct Stakeholder Interviews	B	1
E	Document Functional Requirements	A, C	2
F	Document Non-functional Requirements	D, E	2
System Design			
G	Architectural Design	F	4
H	Database Design	G	4
I	Security Design	G	4
Implementation			
J	Develop Facility Booking and Management Module	H, I	5
K	Develop Event Management Module	J	5
L	Develop Student Management Module	J	5
M	Develop Communication and Notification Module	K, L	5
Testing			
N	Unit Testing of Individual Modules	M	3
O	Integration of Testing Module	N	2
P	System Testing of Entire System	O	3

Q	User Acceptance Testing (UAT)	O	5
Prototype			
R	Develop Prototypes for User Interface	P, Q	3
S	Test Prototypes with Stakeholders	R	2
T	Gather Feedback and Iterate on Prototypes	S	3
U	Finalise Prototypes for Full Development	T	3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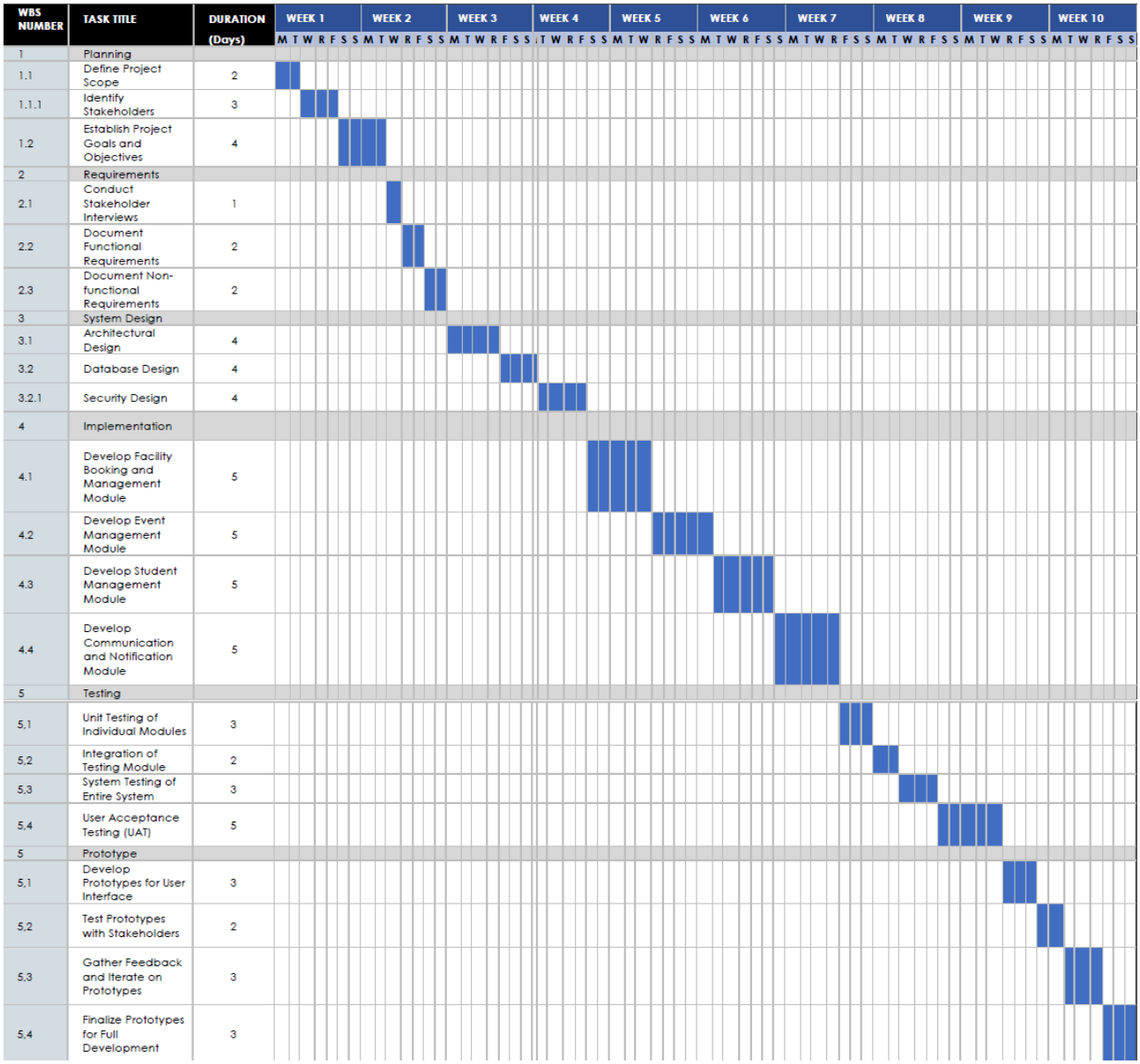
7.4 Gantt Chart



WBS NUMBER	TASK TITLE	DURATION (Days)
1	Planning	
1.1	Define Project Scope	2
1.1.1	Identify Stakeholders	3
1.2	Establish Project Goals and Objectives	4
2	Requirements	
2.1	Conduct Stakeholder Interviews	1
2.2	Document Functional Requirements	2
2.3	Document Non-functional Requirements	2
3	System Design	
3.1	Architectural Design	4
3.2	Database Design	4
3.2.1	Security Design	4
4	Implementation	
4.1	Develop Facility Booking and Management Module	5
4.2	Develop Event Management Module	5
4.3	Develop Student Management Module	5
4.4	Develop Communication and Notification Module	5
5	Testing	
5,1	Unit Testing of Individual Modules	3
5,2	Integration of Testing Module	2
5,3	System Testing of Entire System	3
5,4	User Acceptance Testing (UAT)	5
5	Prototype	
5,1	Develop Prototypes for User Interface	3
5,2	Test Prototypes with Stakeholders	2
5,3	Gather Feedback and Iterate on Prototypes	3
5,4	Finalize Prototypes for Full Development	3

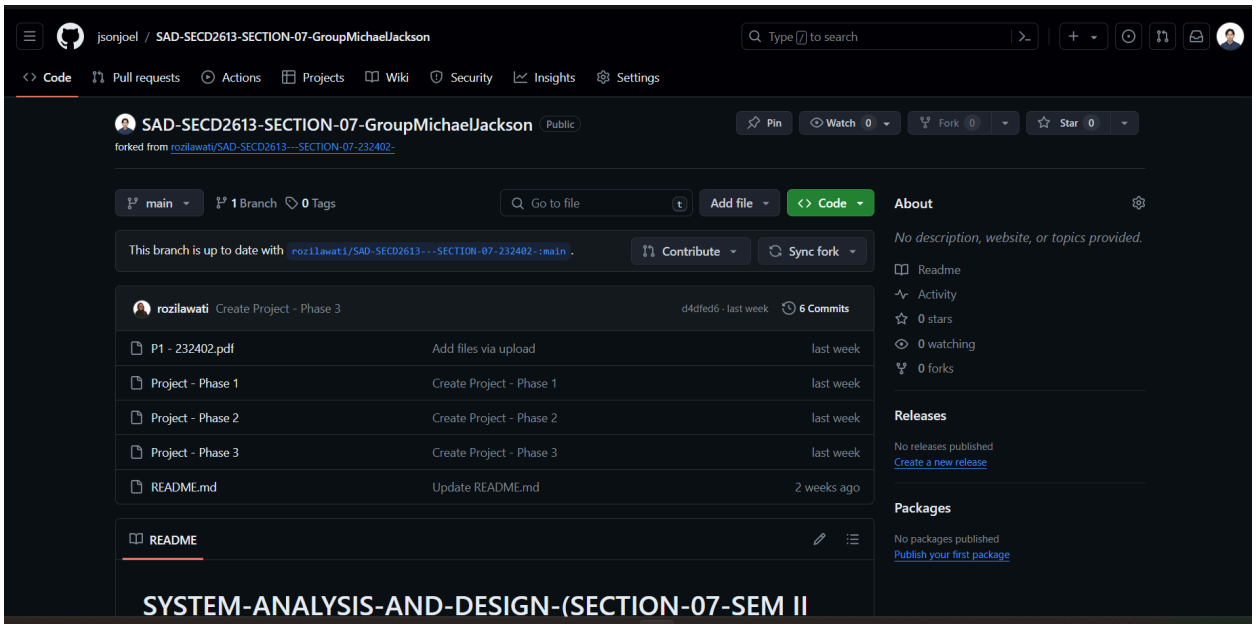
8.0 Benefit and Overall Summary of Proposed System

CRMS is a proposed system to increase the efficiency of the campus resource management system. It reduces manual efforts and paperwork, allowing staff and administrators to focus on more strategic tasks. The system acts as a central communication channel for stakeholders to transfer information between each other and access the information needed. Notifications and announcements made can be easily sent to stakeholders as well. CRMS maximises the utilisation of campus resources. It allows for better planning and allocation of facilities by integrating facilities booking, event management, and academic administration. Additionally, students can easily access academic resources and information. It also satisfies students as it saves time and becomes a helpful tool for event planning by checking the availability of the facility they need. CRMS is also a powerful tool for managing student enrollment, course registration, and academic records. It helps reduce manual errors. CRMS is designed as a web-based platform accessible via various devices, ensuring widespread accessibility across the campus community. Therefore, CRMS is an efficient communication channel on campus. The CRMS system is supported by robust Information System (IS) infrastructure to ensure smooth functioning and maintenance.

URL of GitHub repository:

https://github.com/jsonjoel/SAD-SECD2613-SECTION-07-GroupMichaelJackson

Repository Snapshot:



Feature Branching

- Allows developers to work on features independently, reducing interference and risk.
- Speeds up development by enabling multiple features to be worked on simultaneously.

Pull Requests

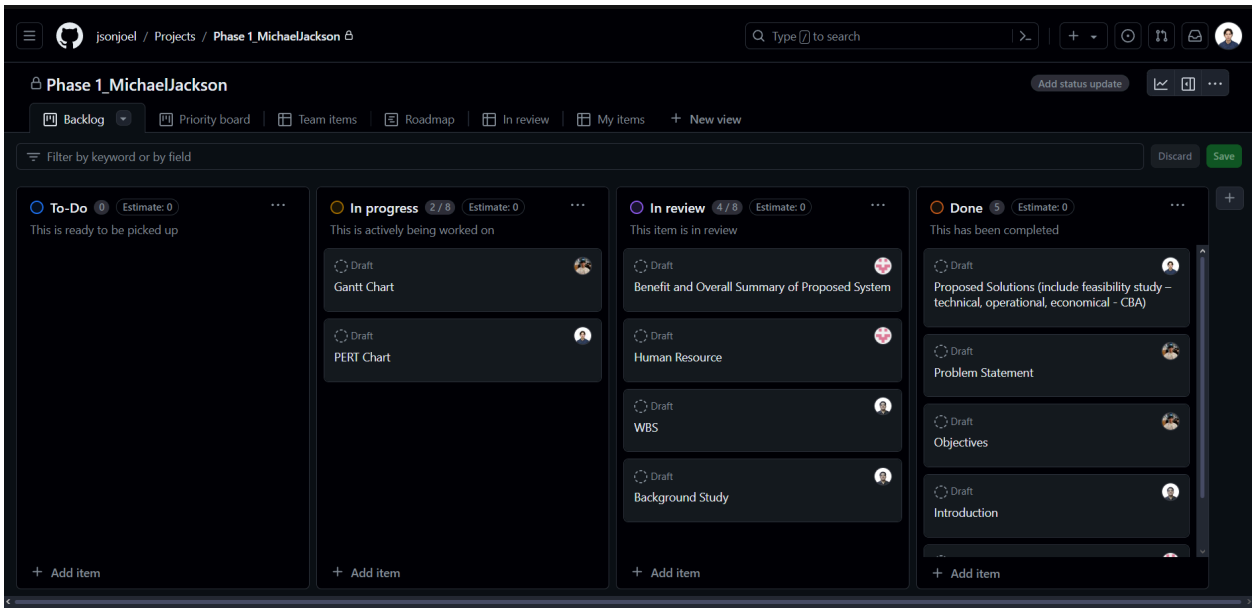
- Facilitates peer review to maintain code quality, catch bugs early, and share knowledge.
- Encourages collaboration and feedback among team members.

Code Reviews

- Promotes learning and collaboration by sharing insights and best practices.
- Enhances code quality through standards enforcement and optimization suggestions.

URL of the Github project:
https://github.com/users/jsonjoel/projects/4

Project snapshot:



Visualizing Workflow

Kanban boards are visual representations of our project's workflow. We can watch how tasks, issues, and pull requests proceed from one step to the next, providing us a clear view of what's happening, what's finished, and what's coming up.

Work Prioritisation

Kanban boards help our team prioritise our work by organising tasks into columns like "To Do," "In Progress," and "Done." This clarity ensures that team members prioritise the most important work first.

Collaboration

Kanban boards help our team members collaborate more effectively. Everyone can see what others are doing, which avoids duplication of effort and promotes communication and collaboration.