FACULTY OF COMPUTING
UTM Johor Bahru

SECD2613 – SYSTEM ANALYSIS AND DESIGN

Semester 2 – 2023/2024

Campus Resource Management System

Project proposal

Lecturer: Dr. Rozilawati
Section: 03

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1. Introduction **3**
2. Background Study **3**
3. Problem Statement **4**
4. Proposed Solution **5**
5. Objective **6**
6. Project Scope **7**
7. Project Planning **8**
7.1 Human resources ***8***
7.2 Work Breakdown Structure (WBS) ***9***
7.3 Pert Chart ***10***
7.4 Gantt Chart ***13***
8. Benefits and Summary of Proposed System **14**
9. Project Documentation **15**
https://github.com/Dimitrix94/Project-SAD-Group-5 ..... **15**

1. Introduction

The Campus Resource Management System (CRMS) is a broad digital solution designed to enhance the efficiency and experience of educational institutions by streamlining the administration and utilization of campus facilities, resources, and services. CRMS will integrate various campus operations into a single platform, CRMS addresses challenges such as scheduling conflicts and inefficient resource use with real-time tracking, automated scheduling, and detailed reporting. Leveraging modern technologies like cloud computing, mobile accessibility, and data analytics, CRMS is scalable and adaptable to any institution's needs, from small colleges to large universities. Ultimately, CRMS supports the strategic goals of educational institutions by fostering an organized, efficient, and responsive campus environment, ensuring optimal resource utilization and contributing to the success and satisfaction of the academic community.

2. Background Study

Managing campus resources efficiently and properly is crucial for smooth operations and a good experience for students, faculty, and staff. UTM has used semi manual processes and separate systems to manage resources such as classrooms, laboratories, campus facilities and equipment. The process often leads to scheduling conflicts, underused resources, and communication problems. For example, booking a room may require many emails and phone calls, making it slow and prone to errors.

Without a centralized platform, these problems get worse. Information about resource availability and scheduling is scattered, causing confusion and poor use of resources. This lack of a unified platform makes it hard for users to find and book the facilities they need. Additionally, not having real-time information can frustrate users, as they waste time trying to locate available spaces or equipment.

Modern technology offers a solution with a Campus Resource Management System (CRMS). A CRMS combines all aspects of resource management into one easy-to-use system, secure, using cloud computing, mobile access, and data analytics. This system makes booking and scheduling simpler, provides real-time updates, and generates detailed reports. By adopting a CRMS, institutions can improve efficiency, transparency, and user satisfaction, ensuring that campus resources are used effectively and campus operations run smoothly.

3. Problem Statement

The absence of a Campus Resource Management System (CRMS) at educational institution presents several significant challenges:

1. Inefficient Resource Allocation: Without a centralized system, allocating resources such as classrooms, laboratories, and equipment becomes a manual and time-consuming process. This often leads to double bookings, underutilization, and conflicts, disrupting academic schedules and campus operations.

2. Poor Communication: The lack of a unified platform for managing resources hampers effective communication between students, faculty, and administrative staff. Coordinating the use of facilities requires multiple emails, phone calls, and in-person meetings, which can result in miscommunication and delays.

3. Limited Transparency: In the absence of a CRMS, tracking the availability and status of campus resources is difficult. Users often have no visibility into what resources are available, booked, or out of service, leading to frustration and wasted time.

4. Manual Scheduling Challenges: Scheduling rooms, events, and other resources manually is prone to errors and inefficiencies. This process can be likened to arranging multiple overlapping appointments without a calendar, making it hard to ensure that all needs are met without conflicts.

5. Inadequate Reporting and Analytics: Without a CRMS, generating reports on resource usage and identifying trends is cumbersome and inaccurate. This lack of data hampers the institution's ability to make informed decisions about resource planning and optimization.

6. Overburdened Resources: Some resources may become overused while others remain idle. For instance, certain popular facilities might be constantly booked, leading to wear and tear, while other equally suitable resources are underutilized due to lack of visibility.

7. User Frustration and Decreased Satisfaction: The inefficiencies and frustrations stemming from manual resource management processes can lead to decreased satisfaction among students, faculty, and staff. This negatively impacts the overall campus experience and can affect the institution's reputation.

Implementing a Campus Resource Management System (CRMS) would address these issues by providing a centralized, automated, and transparent platform for managing campus resources effectively, ensuring optimal utilization, and enhancing the overall efficiency and satisfaction of the academic community.

4. Proposed Solution

The system will be using a single database to hold all reservations and correspondence relating to the College's resources. This will ensure a in-depth control and monitoring of resource usage. which will have Key features include:

- **Streamlined resource management:** Our system conducts a thorough analysis of resource usage, tracking metrics like frequency of use, booking duration, and peak times. This data-driven approach empowers administrators to optimize resource allocation efficiently.

- **Automated scheduling and conflict resolution:** Through advanced algorithms, our system automates the scheduling process, ensuring reservations don't overlap and offering alternative times when conflicts arise. This automation enhances productivity and minimizes administrative burden.

- **Real-time communication and updates:** Users receive instant notifications regarding their reservations, including confirmations, rescheduling options, and any changes or cancellations. This feature keeps all stakeholders informed and enables effective appointment management.

- **Intuitive user interface:** Our system boasts a user-friendly mobile app and website, simplifying resource searches, reservation-making, and calendar management. Designed for ease of use, it enhances overall user satisfaction.

- **Seamless integration with existing IT infrastructure:** Integration with current campus IT systems such as calendaring applications, email services, and student information systems ensures smooth data synchronization and a cohesive user experience.

- **Robust reporting and feedback mechanisms:** Administrators have access to powerful reporting tools for generating comprehensive reports on resource utilization. Additionally, user input mechanisms facilitate ongoing system improvement and strategic planning.

- **Enhanced security and privacy measures:** Our system prioritizes data security and privacy, incorporating state-of-the-art features like data encryption, secure login procedures, and regular security audits.

  The Campus Resource Management System will provide a complete solution for managing campus resources, ensuring effective utilization and improving the overall user experience by putting these features into practice.

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5. Objective

- **Efficiency in scheduling:**Automate the scheduling process to reduce wasted time, avoid conflicts and ensure optimal resource allocation.

- **Transparency in resource allocation:**Provide clear explanations for decline booking requests to increase user understanding and satisfaction.

- **Workload Management:**Monitor and balance the workload of resource managers to ensure high quality management without overburdening staff.

- **Scalability and flexibility**:Design the system to grow with campus needs and adapt to changes in academic requirements and technology.

- **Improved user experience**:Provide an intuitive user interface and real-time updates to enhance the user experience for students, faculty and staff.

- **Data-driven decision making**:Leverage robust analytics and reporting tools to enable informed decision making and optimize the use of resources.

  These goals ensure that the system effectively improves the management and utilization of campus resources, resulting in greater efficiency and user satisfaction.

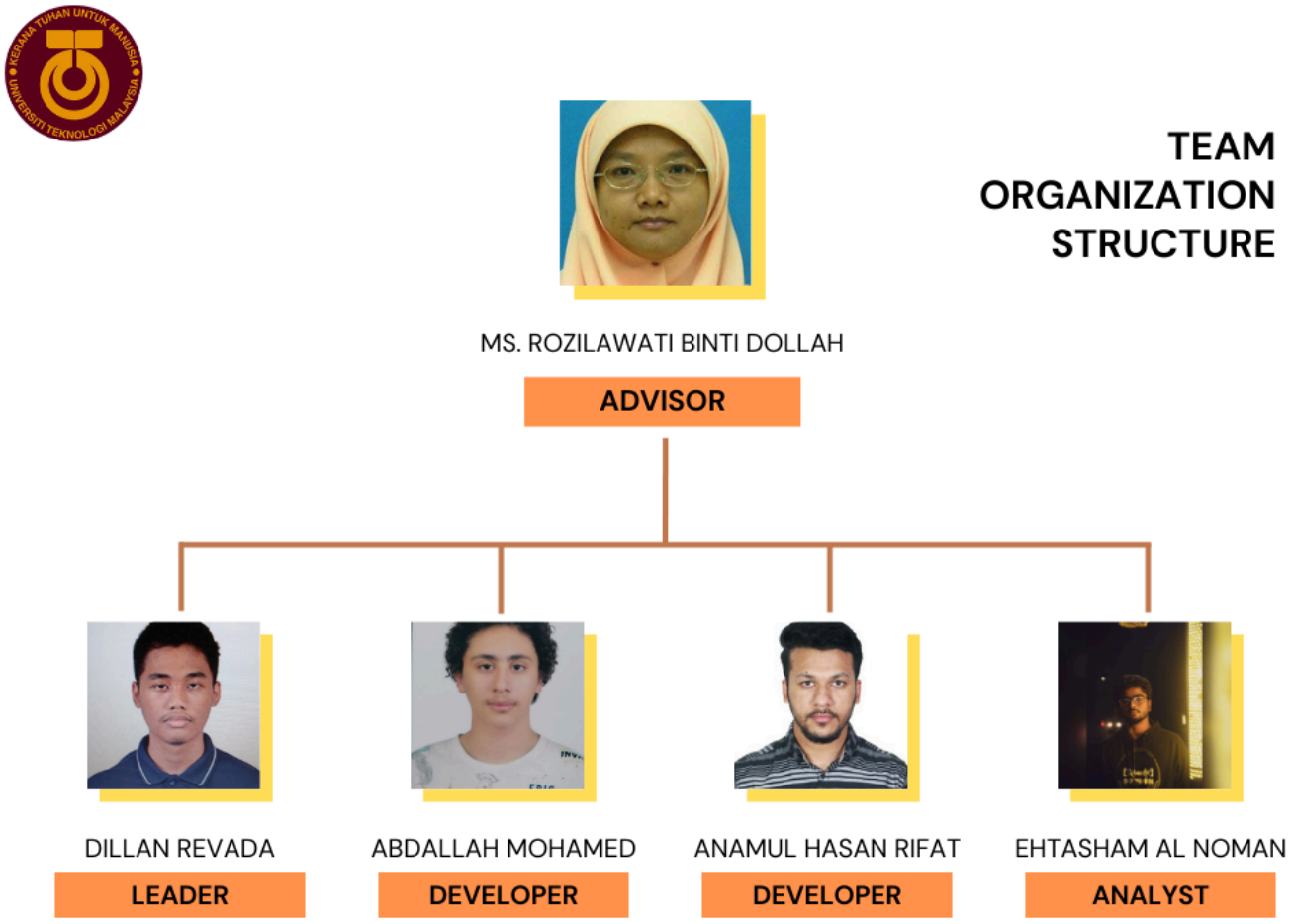
6. Project Scope

- **Engagement and needs assessment:** Involve the campus community, including students, faculty, and staff, to gather detailed needs through surveys, interviews, and focus groups. This comprehensive approach ensures that the system meets the diverse needs of all users.
- **Design and create prototypes**: Develop a unified digital platform designed to simplify the management and booking of campus resources. Create an initial prototype that includes essential features such as reservation systems, user feedback modules and dashboards to track usage. This prototype will be iteratively refined based on user input.
- **Test and iteratively improve:** Implement a phased testing approach where the prototype is tested by a select group of users. Gather feedback, identify weaknesses and make necessary adjustments. This iterative process ensures that the final system is both functional and user-friendly.
- **Development and deployment plan:** Formulate a comprehensive plan that outlines the entire development lifecycle from initial coding to final deployment. Include detailed timelines, resource requirements and risk mitigation strategies. Define clear success metrics to measure the impact of the system after implementation.
- **User training and ongoing support:** Prepare comprehensive training materials and conduct training for all user groups to ensure a smooth rollout of the new system. Provide ongoing support to resolve any technical issues and facilitate user onboarding.
- **Scalability and future-proofing:** Design the system with scalability in mind to accommodate future growth and changing campus needs. Plan for regular updates and maintenance to keep the system current with technological advances and changing user needs.

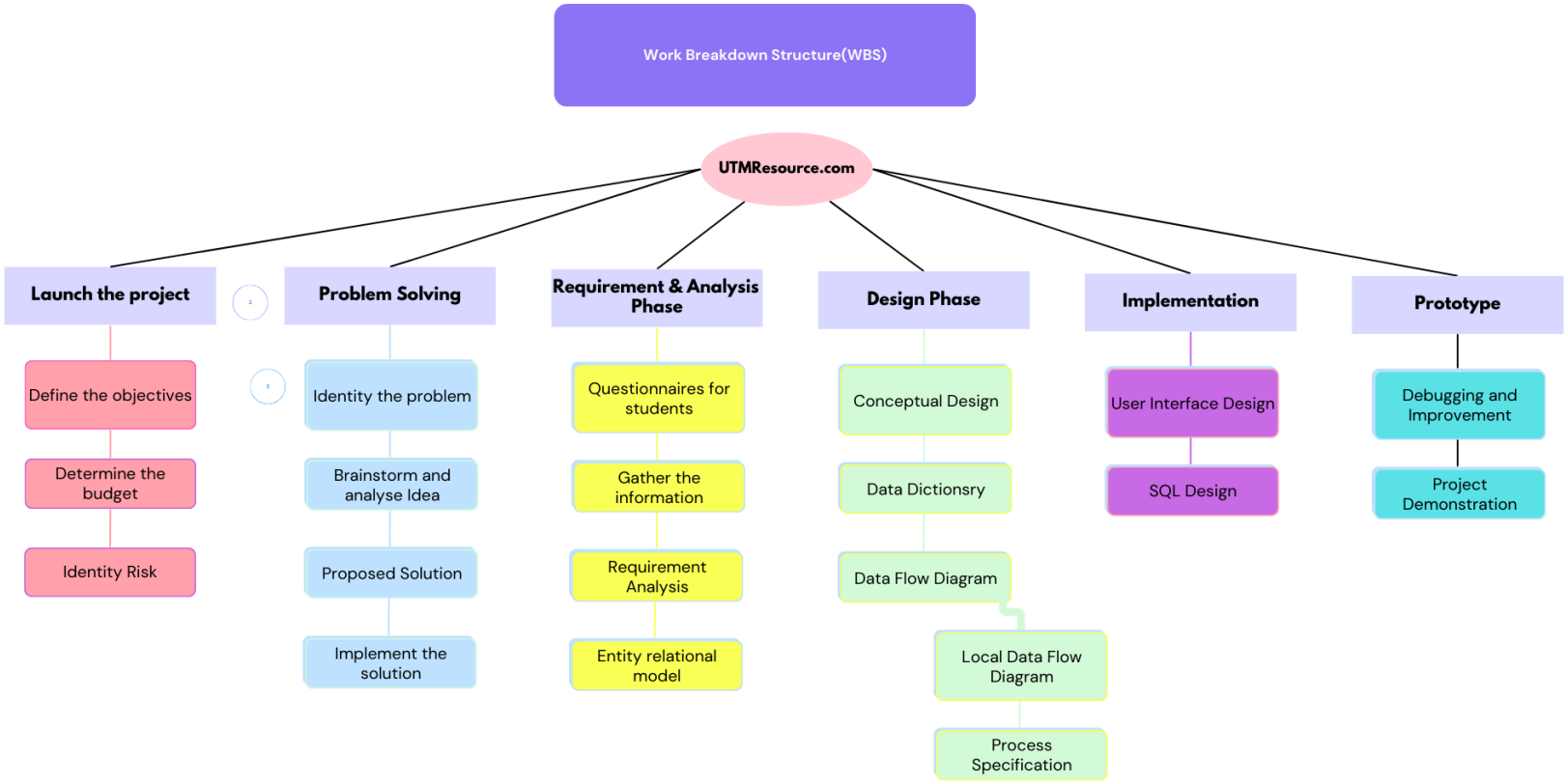
With this strategy, the campus resource management system is developed in a comprehensive and user-centered manner, increasing efficiency, transparency, and user happiness for all campus users.

7. Project Planning

7.1 Human recourses

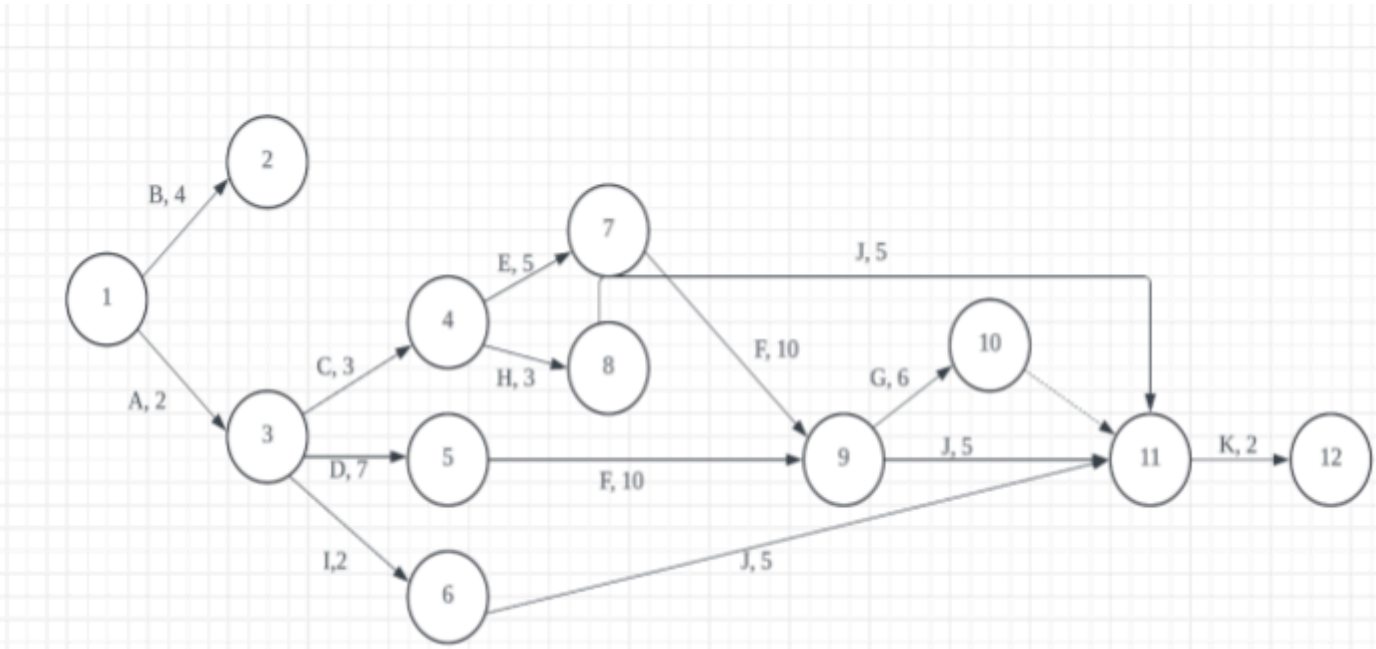


7.2 Work Breakdown Structure (WBS)



7.3 Pert Chart

Activity		Predecessor	Duration
A	Define the objectives	None	2
B	Database Setup	None	4
C	Resource Usage Analysis	A	3
D	Scheduling System Development	A	7
E	Real-Time Communication System	C	5
F	User Interface Design	D,E	10
G	Integration with IT Infrastructure	F	6
H	Reporting and User Input	C	3
I	Security Enhancements	A	2
J	Final Integration and Testing	F, H, I	5
K	Project Demonstration	J	2


1
2
3
4
5
6
7
8
9
10
11
12
B, 4
A, 2
C, 3
D, 7
I,2
E, 5
H, 3
F, 10
J, 5
G, 6
F, 10
J, 5
J, 5
K, 2

All the path are:

Path 1: A – C – E – F – J – K

Length: 2 + 3 + 5 + 10 + 5 + 2 = 27

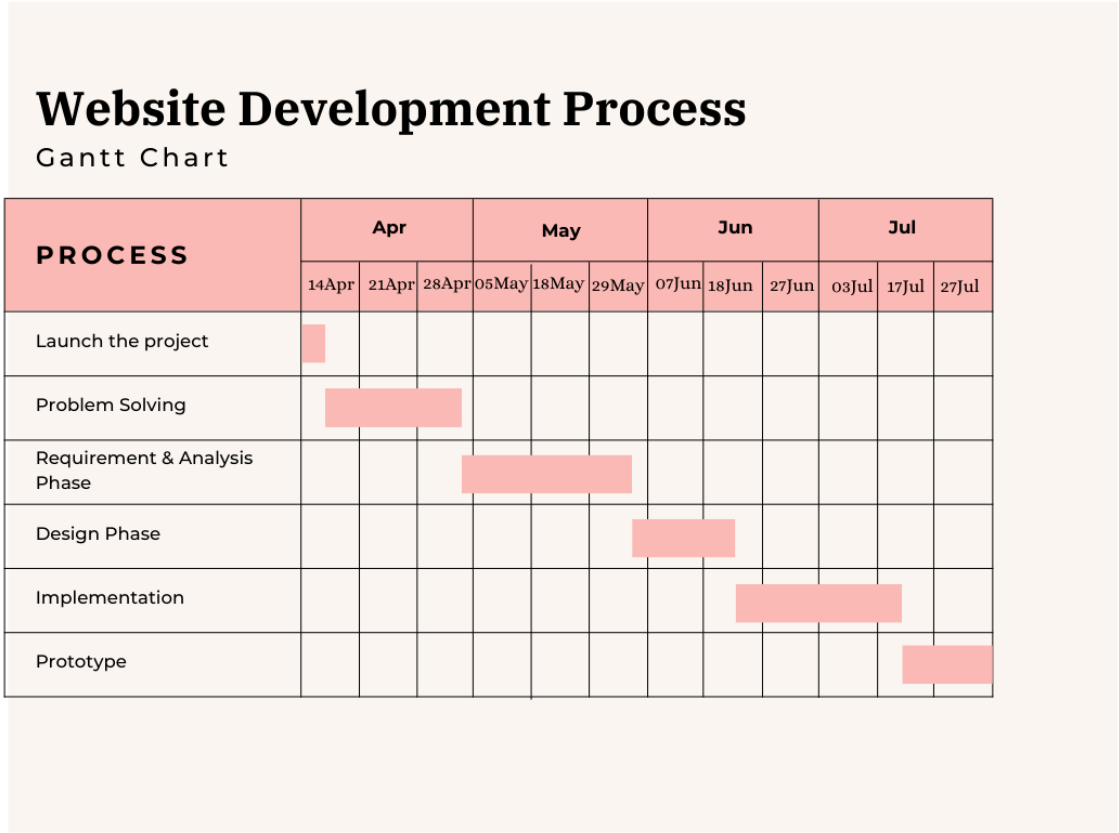
Path 2: A – C – H – J – K
Length: 2 + 3 + 3 + 5 + 2 = 15

Path 3: A – D – F – J - K
Length: 2 + 7 + 10 + 5 + 2 = 26

Path 4: A – I – J – K
Length: 2 + 2 + 5 + 2 = 11

Here, Path 1 is the critical path that has a duration of 27 days.

7.4 Gantt Chart

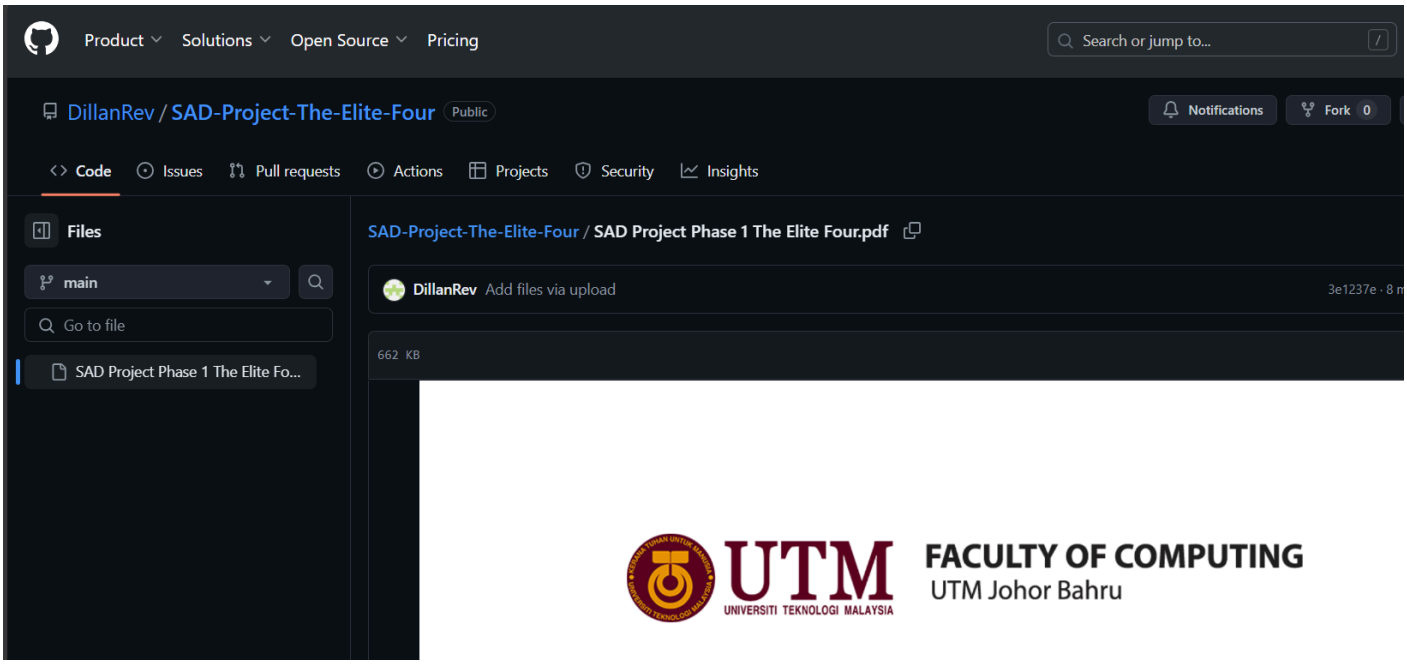


8. Benefits and Summary of Proposed System

The proposed Campus Resource Management System is designed to streamline the management and utilization of campus resources through a centralized, technologically advanced platform. This system offers several key benefits that not only enhance operational efficiency but also improve the overall user experience for both students and administrators. The system's use of a single database for all reservations and correspondence related to the college's resources ensures comprehensive control and monitoring. This centralization simplifies the management process, reduces redundancy, and minimizes the likelihood of resource conflicts, thereby optimizing resource utilization. The system's sophisticated algorithms automate the scheduling process, ensuring that reservations do not overlap and providing alternative options when conflicts arise. Real-time notifications about reservations, including confirmations, rescheduling, and important updates, keep all users informed and engaged. Seamless integration with existing campus IT systems, such as calendar applications and student information systems, facilitates cross-platform data synchronization and a unified user experience. State-of-the-art security measures, including data encryption and secure login procedures, protect users' sensitive information. Regular security checks ensure that the system remains protected against potential cyber threats, providing users with peace of mind regarding their data privacy.

In summary, the proposed Campus Resource Management System is a comprehensive solution designed to enhance the efficiency of resource management in educational institutions. By automating essential functions, providing real-time updates, and integrating seamlessly with current IT infrastructure, the system promises to improve both administrative efficiency and user satisfaction, ultimately fostering a more resource-efficient campus environment.

9. Project Documentation:

https://github.com/DillanRev/SAD-Project-The-Elite-Four

SAD-Project-The-Elite-Four/SAD Project Phase 1 The Elite Four.pdf at main · DillanRev/SAD-Project-The-Elite-Four · GitHub