FACULTY OF COMPUTING
UTM Johor Bahru

<HogwartsHub.com> Project Report: Phase 1

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Comments by Grader:

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1.0 Introduction

Against the backdrop of the COVID-19 pandemic, Malaysia's educational landscape has undergone an enormous change, emphasising the importance of efficient systems in ensuring the smooth operation of universities and colleges. As institutions strive to maintain their competitive edge and commitment to academic excellence, the importance of streamlined administrative and operational processes has never been greater. A strong Campus Resource Management System (CRMS) emerges to serve as the key to this goal, allowing universities and colleges to optimise resource utilisation, improve communication and elevate the overall student experience.

In the heart of this transformative period, Hogwarts University, a renowned educational institution in Malaysia, has encountered its own set of challenges such as effectively managing its resources amidst the complexities of modern academia. From scheduling classrooms and coordinating campus events to overseeing student and faculty administration, Hogwarts University finds itself navigating a maze of outdated systems that hinder productivity and efficiency.

In this proposal, we introduce HogwartsHub.com – an innovative Campus Resource Management System (CRMS) specifically engineered to tackle these pressing challenges. With five meticulously crafted modules tailored to the unique needs of educational institutions, HogwartsHub.com presents a comprehensive solution aimed at optimising campus operations and elevating the overall student experience.

2.0 Background Study

Hogwarts University, a renowned educational institution in Malaysia, has long relied on traditional approaches for managing campus resources. Currently, facility bookings are tracked using traditional Excel spreadsheets, which allow for error and confusion. With classrooms, auditoriums, labs and athletic fields in high demand, the manual process frequently causes scheduling conflicts and disruptions. Complaints from students and faculty have become common, with situations of collapsed booking systems causing activities to be delayed or even cancelled, affecting the overall learning and teaching experience.

Furthermore, the vibrant campus life at Hogwarts is boosted by a variety of events and activities organised by various clubs and societies. However, the current event management system is far from ideal. Event organisers struggle to manage registrations, coordinate attendees, and effectively promote their events. While traditional methods, such as questionnaires, can be used to collect feedback, the process is slow and cumbersome, making analysis and timely action difficult. This inefficiency in feedback collection inhibits the improvement of future events, causing frustration for both organisers and participants.

In addition to student-centric activities, Hogwarts University's outdated student and faculty management methods cause communication breakdowns and productivity challenges, undermining the overall academic experience for both staff and students. Human resources tasks such as recruitment, scheduling, performance evaluation and leave management are primarily performed manually, resulting in inefficiencies and delays. Faculty members have difficulty accessing teaching schedules, submitting grades and communicating with students effectively. This reliance on manual paperwork and decentralised systems causes administrative inefficiencies, errors and delays, emphasising the critical importance of management system modernization and integration. Thus, we will try to deliver a system that simplifies resource allocation, scheduling, communication and decision-making processes to solve these problems.

3.0 Problem Statement

1. **Inefficient manual booking processes**

   At Hogwarts University, booking campus facilities is a cumbersome process. Staff members must manually update Excel spreadsheets to request and confirm bookings for classrooms, auditoriums, labs and athletic fields. The lack of a centralised system for facility management at Hogwarts University contributes to a lack of real-time visibility into resource availability and usage. Staff members struggle to access up-to-date information on room availability, ongoing bookings and upcoming events. Students, faculty and event organisers always need to waste valuable time waiting for confirmation of their request to use the campus resources. Therefore, the booking process lacks efficiency, resulting in delays and potential scheduling conflicts.

2. **Scheduling conflicts and disruptions**

   Due to the manual and decentralised nature of current resource management at Hogwarts University, there is a possibility that some staff members may exhibit carelessness in handling numerous bookings and communication. This manual approach is prone to errors and delays as it is hard for staff members to cross-reference availability and coordinate with other departments to confirm the reservation. It is because there is a risk that staff members may overlook the important details, fail to update the information promptly or have ineffective communications. As a result, scheduling conflicts, double bookings and last-minute changes frequently occur, causing frustration and inconvenience for students, faculty and event organisers. These conflicts can cause events to be postponed, relocated or even cancelled.

3. **Ineffective Event Management System**

   The current event management system at Hogwarts University is inefficient and cumbersome. Event organisers encounter significant difficulties in managing registrations, coordinating attendees, and effectively promoting their events. The system lacks user-friendly interfaces and automated processes cause event organisers to manage information manually which is prone to errors. Organisers struggle to track attendance, manage capacity limits and feedback. Organisers need to wait for participants to complete the feedback and then manually compile the responses to analyse the data needed. Without an efficient system to deal with the myriad of data, organisers may overlook crucial feedback, leading to missed opportunities for further improvement.

4. **Outdated Student and Faculty Management System**

   Hogwarts University's reliance on outdated student and faculty management methods, characterised by manual and decentralised systems, leads to communication breakdowns. Faculty members encounter challenges in accessing vital information such as recruitment, teaching schedules, student records and grading systems. Faculty members are unable to plan and deliver courses effectively and communicate with students promptly. Students may experience delays or errors in accessing important information or receiving feedback from faculty members, leading to frustration and dissatisfaction.

4.0 Proposed Solution

4.1 Technical Feasibility

HogwartsHub.com is a website which can easily be accessed by using a gadget, such as a smartphone, tablet or computer with internet access to be accessed. A robust server infrastructure is required to host HogwartsHub.com and handle incoming requests from users. This infrastructure needs to have sufficient processing power, memory, storage and network bandwidth to support expected traffic and data processing needs. Apart from that, a robust database system is crucial for managing student, faculty and administrative data efficiently and effectively. Besides, an intuitive and user-friendly interface is vital for enhancing the user experience. Modern web development frameworks can be utilised to create responsive websites to adapt to different screen sizes and resolutions. As privacy data is needed to manage HogwartsHub.com, a security measure to protect these sensitive data is essential. Encryption, access controls and secure authentication mechanisms are needed to be implemented in HogwartsHub.com to provide data protection. Integrating HogwartsHub.com with external booking platforms or scheduling APIs facilitates seamless automation and streamlines communication and data exchange for the facility booking process at Hogwarts University.

4.2 Operational Feasibility

        Inefficiencies and opportunities for errors occur due to manual and outdated operating systems. Therefore, implementing a centralised operation and management system is one of the effective methods. This approach can avoid duplicate appointments and last-minute changes by streamlining the booking process. Staff or students can use our user-friendly and integrated system to book classrooms, playgrounds, labs and more. In addition, a centralised operating system can greatly save time and manpower for staff. The previous outdated system required staff to perform repetitive and cumbersome operations to arrange reservations so that they did not overlap. However, a centralised operating system can automatically login user actions, eliminating the process of manually logging in information. Staff, students and event organisers will get real-time visibility of accurate conditions.

4.3 Economical Feasibility

From the perspective of economic feasibility, we need to consider the initial capital and subsequent ongoing costs of developing the system. Initial funding covers the requirements for developing the new system. For example, a user-friendly website and automatic login information function, etc. The system will simplify the use of assigned classrooms, thereby improving resource utilisation. Some hardware infrastructure also requires additional purchases to reduce the time required to complete the task. At the same time, the cost of employee training is also included in the initial capital. Employees need to learn how to use and manage the new system. After that, the cost of ongoing maintenance and stabilisation of the system is also an expense. Our systems require regular updates and bug fixes. These costs need to be calculated systematically and presented in a chart.

Costs	Year 0	Year 1	Year 2	Year3	Year 4
Development Costs					
Software	62400				
Hardware	24000				
Consultant	15600				
Traning fee	13200				
Total	115200				
Production Costs					
Maintainence		2640	2851.2	3079.296	3325.64
IS Support		2880	3110.4	3359.232	3627.971
Suppliers		2160	2332.8	2519.424	2720.978
Anuual Prod.Costs(Present Value)		7680	8294.4	8957.952	9674.588
		7045.872	6981.231	6917.183	6853.722
Accumulated Costs		122245.9	129227.1	136144.3	142998

Benefits	Year 0	Year 1	Year 2	Year 3	Year 4
Reduced inventory costs (Present Value)		79560	84333.6	89393.62	94757.23
		72990.83	70981.9	69028.27	48901.37
Accumulated benefits (Present Value)		72990.83	143972.7	213001	261902.4
Gain or Loss		-49255	14745.63	76856.72	118904.4
Probability Index	1.24909771				

Since the probability index is greater than 1, we can assume that it is a good investment.

5.0 Objectives

The following objectives are established to address the aforementioned challenges and problems:

1. **To oversee the reservation and management of campus facilities**

   Administrators will be able to oversee the reservation and management of campus facilities; the system will allow administrators to define booking policies, manage reservations and track resource utilisation. Users will be able to explore, view availability and reserve a diverse range of campus facilities such as classrooms, auditoriums, labs and sports fields.

2. **To manage events held on campus**

   Administrators will be able to manage campus events such as workshops, seminars and extracurricular activities; the system will include features such as event registration, event promotion, attendee management and attendee feedback collection.

3. **To manage student affairs**

   Administrators will be able to access streamlined functionalities for managing student affairs such as enrollment, course registration, academic records and extracurricular activities.

4. **To manage staff and faculty affairs**

   Administrators will be able to manage staff and faculty affairs such as recruitment, scheduling, performance evaluation and leave management. Faculty members will be able to access teaching schedules, submit grades and communicate with students.

6.0 Scope of the Project

The scope for HogwartsHub.com involves developing a Campus Resource Management System (CRMS).

The system will include a Facility Booking and Management Module. This module will allow administrators to establish reservation guidelines, oversee reservations and monitor resource utilisation. Users will also be able to utilise this module to explore, verify availability and reserve campus facilities such as classrooms, auditoriums, labs and sports fields.

Next, the system will include an Event Management Module. This module will allow administrators to create, arrange and oversee campus events such as workshops, seminars and extracurricular activities. Features will include event registration, event promotion, attendee management and attendee feedback collection.

Other than that, the system will include a Student Management Module. This module will allow administrators to manage student enrollment, course registration, academic records and student activities. Students will also have access to their academic profiles, course registration, schedules, et cetera.

Finally, the system will include a Faculty and Staff Management Module. This module will enable administrators to manage faculty and staff data, including recruitment, scheduling, performance evaluation and leave management. Faculty members will also have access to teaching schedules, grade submissions and communication tools with students.

Through these modules, HogwartsHub.com will serve as a platform to enhance efficiency, communication and organisation across various aspects of campus resource management. It aims to streamline processes, improve accessibility and promote coordination among students, faculty, staff and administrators.

From an administrator's perspective, HogwartsHub.com will facilitate efficient management of campus resources. Administrators will be able to oversee campus facilities, manage campus and manage student, staff and faculty affairs. Thus, ensuring smooth operations across various departments.

From a user perspective, HogwartsHub.com will provide intuitive interfaces designed for ease of use and accessibility. Users, including faculty staff and students, will have personalised dashboards displaying relevant information and functionalities. They will be able to utilise campus facilities, participate in campus events, access and update relevant academic records and communicate with pertinent stakeholders. The system will prioritise user experience, offering seamless navigation and responsive support to meet diverse needs and preferences.
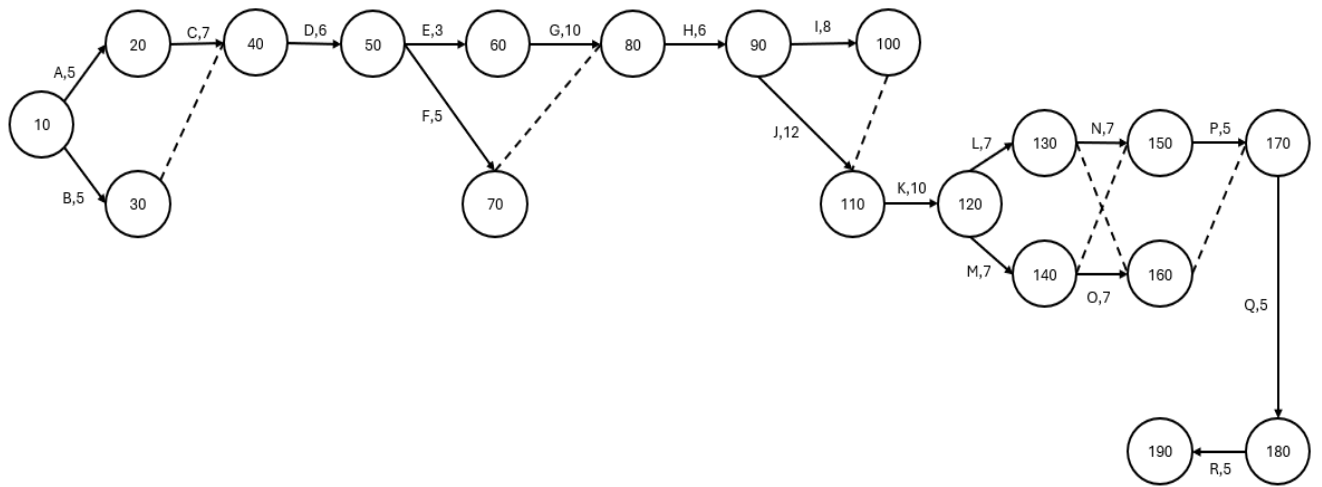
7.0 Project Planning

7.1 Human Resource
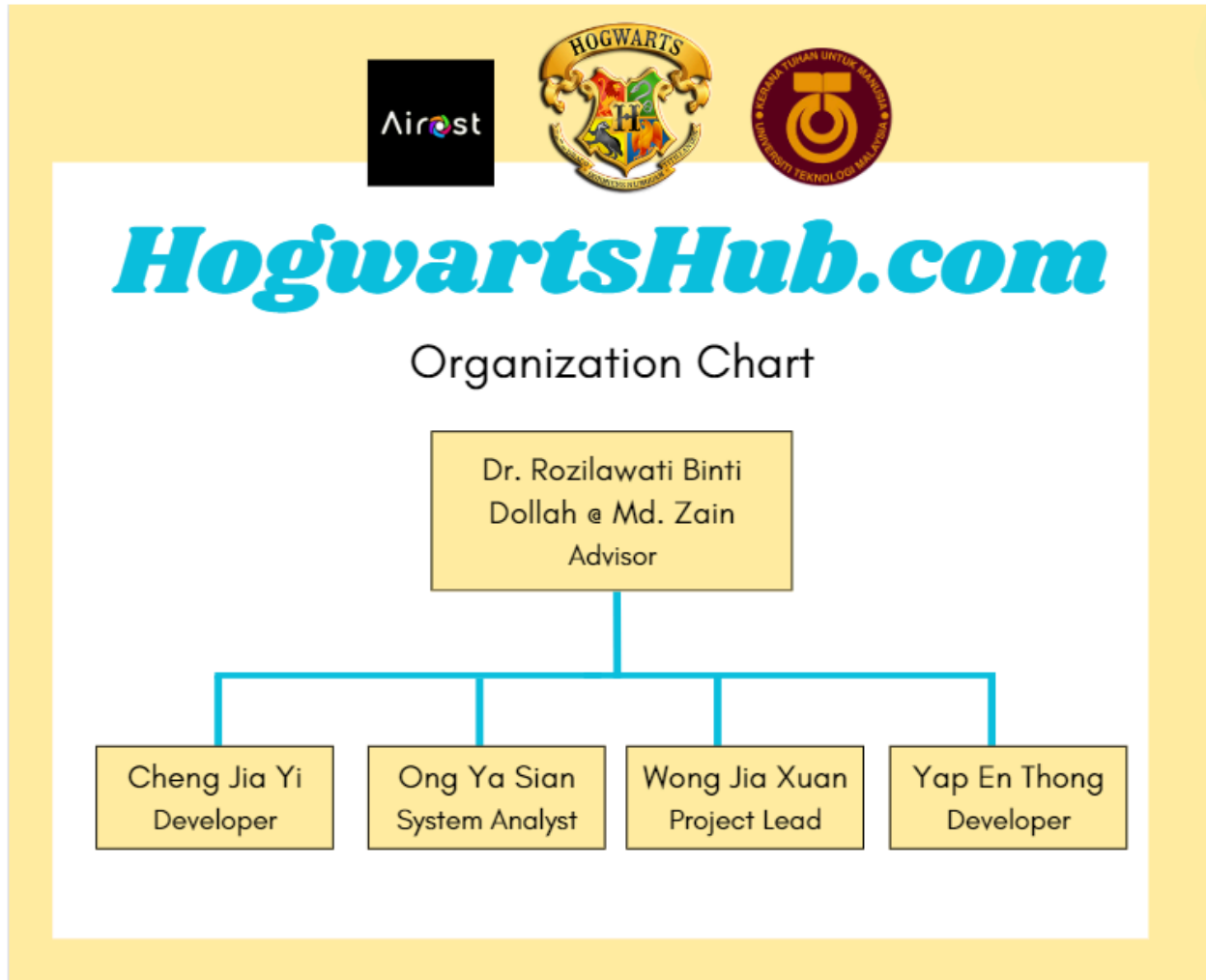
7.2 Work Breakdown Structure (WBS)
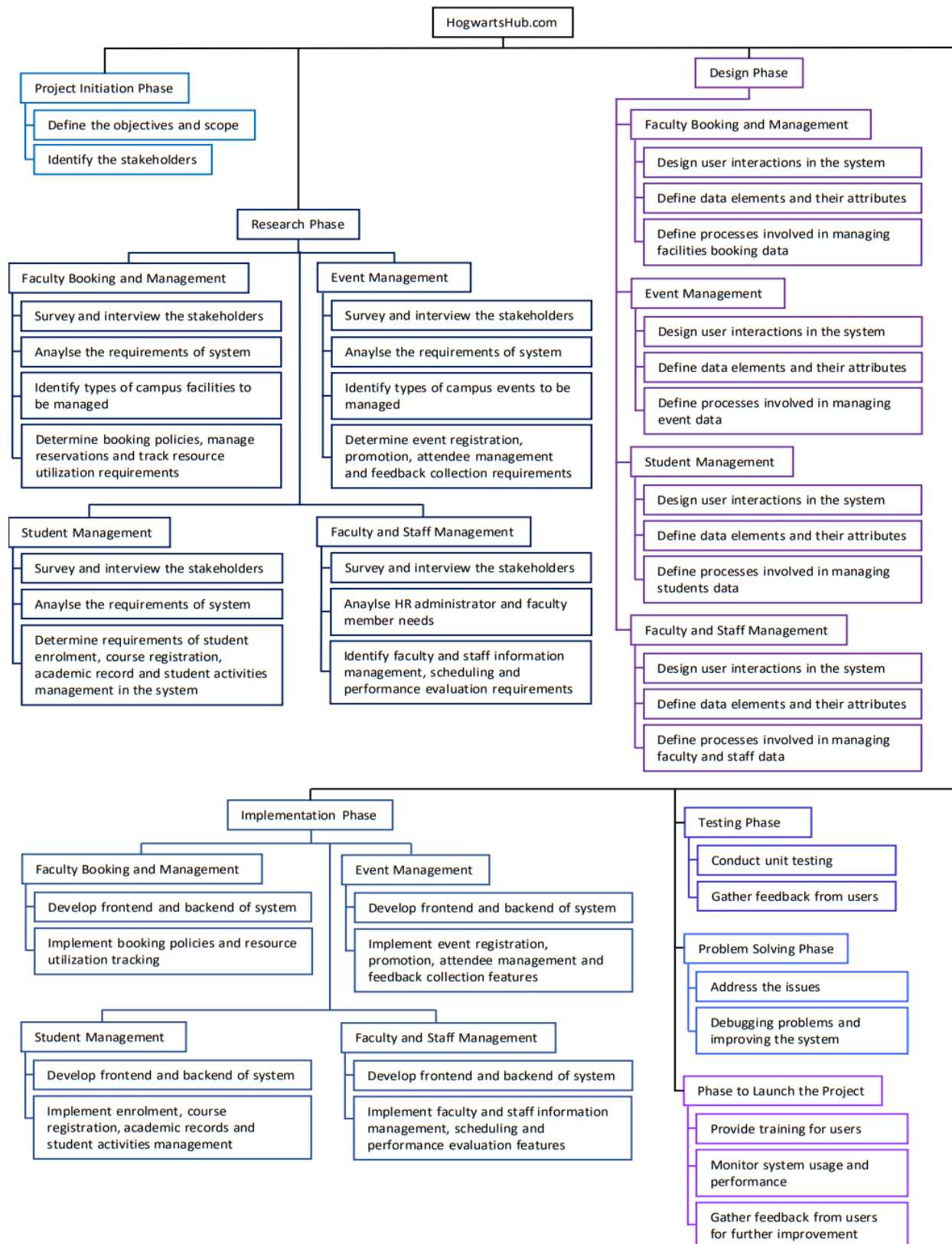
7.3 PERT Chart

	Task	Predecessor	Duration (Days)
A	Define Objective	None	5
B	Identify Stakeholder	None	5
C	Conduct Survey	A, B	7
D	Analyse Requirements	C	6
E	Identify Types	D	3
F	Determine Requirements	D	5
G	Design User Interface	E, F	10
H	Define Data Elements	G	6
I	Data Organisation	H	8
J	Develop System	H, I	12
K	Implementation and Evaluation	J	10
L	Conduct Unit Testing	K	7
M	Gather Feedback	K	7
N	Address Issues	L, M	7
O	Debug Problems	L, M	7
P	Provide Training	N, O	5
Q	Monitor System	P	5
R	Gather Feedback	Q	5

Network diagram:

10 —A,5→ 20
10 —B,5→ 30
20 —C,7→ 40
30 ⇢ 40 (dashed)
40 —D,6→ 50
50 —E,3→ 60
50 —F,5→ 70 (to 70)
60 —G,10→ 80
80 ⇢ 70 (dashed)
80 —H,6→ 90
90 —I,8→ 100
90 —J,12→ 110
100 ⇢ 110 (dashed)
110 —K,10→ 120
120 —L,7→ 130
120 —M,7→ 140
130 —N,7→ 150
140 —O,7→ 160
130 ⇢ 160 (dashed)
140 ⇢ 150 (dashed)
150 —P,5→ 170
160 ⇢ 170 (dashed)
170 —Q,5→ 180
180 —R,5→ 190

Path 1	: A-C-D-E-G-H-I-J-K-L-N-P-Q-R	Length	: 96
Path 2	: B-C-D-E-G-H-I-J-K-L-N-P-Q-R	Length	: 96
Path 3	**: A-C-D-F-G-H-I-J-K-L-N-P-Q-R**	**Length**	**: 98**
Path 4	**: B-C-D-F-G-H-I-J-K-L-N-P-Q-R**	**Length**	**: 98**
Path 5	: A-C-D-E-G-H-J-K-L-N-P-Q-R	Length	: 88
Path 6	: B-C-D-E-G-H-J-K-L-N-P-Q-R	Length	: 88
Path 7	: A-C-D-F-G-H-J-K-L-N-P-Q-R	Length	: 90
Path 8	: B-C-D-F-G-H-J-K-L-N-P-Q-	Length	: 90
Path 9	: A-C-D-E-G-H-I-J-K-M-O-P-Q-R	Length	: 96
Path 10	: B-C-D-E-G-H-I-J-K-M-O-P-Q-R	Length	: 96
Path 11	**: A-C-D-F-G-H-I-J-K-M-O-P-Q-R**	**Length**	**: 98**
Path 12	**: B-C-D-F-G-H-I-J-K-M-O-P-Q-R**	**Length**	**: 98**
Path 13	: A-C-D-E-G-H-J-K-M-O-P-Q-R	Length	: 88
Path 14	: B-C-D-E-G-H-J-K-M-O-P-Q-R	Length	: 88
Path 15	: A-C-D-F-G-H-J-K-M-O-P-Q-R	Length	: 90
Path 16	: B-C-D-F-G-H-J-K-M-O-P-Q-R	Length	: 90
Path 17	: A-C-D-E-G-H-I-J-K-L-O-P-Q-R	Length	: 96
Path 18	: B-C-D-E-G-H-I-J-K-L-O-P-Q-R	Length	: 96
Path 19	: A-C-D-E-G-H-I-J-K-M-N-P-Q-R	Length	: 96
Path 20	: B-C-D-E-G-H-I-J-K-M-N-P-Q-R	Length	: 96
Path 21	**: A-C-D-F-G-H-I-J-K-L-O-P-Q-R**	**Length**	**: 98**
Path 22	**: B-C-D-F-G-H-I-J-K-L-O-P-Q-R**	**Length**	**: 98**
Path 23	**: A-C-D-F-G-H-I-J-K-M-N-P-Q-R**	**Length**	**: 98**
Path 24	**: B-C-D-F-G-H-I-J-K-M-N-P-Q-R**	**Length**	**: 98**
Path 25	: A-C-D-E-G-H-J-K-L-O-P-Q-R	Length	: 88
Path 26	: B-C-D-E-G-H-J-K-L-O-P-Q-R	Length	: 88
Path 27	: A-C-D-E-G-H-J-K-M-N-P-Q-R	Length	: 88
Path 28	: A-C-D-E-G-H-J-K-M-N-P-Q-R	Length	: 88
Path 29	: A-C-D-F-G-H-J-K-L-O-P-Q-R	Length	: 90
Path 30	: B-C-D-F-G-H-J-K-L-O-P-Q-R	Length	: 90
Path 31	: A-C-D-F-G-H-J-K-M-N-P-Q-R	Length	: 90
Path 32	: B-C-D-F-G-H-J-K-M-N-P-Q-R	Length	: 90

Since the critical path is the longest path through the network diagram, Path 3, Path 4, Path 11, Path 12, Path 21, Path 22, Path 23 and Path 24 are the critical paths.

7.4 Gantt Chart
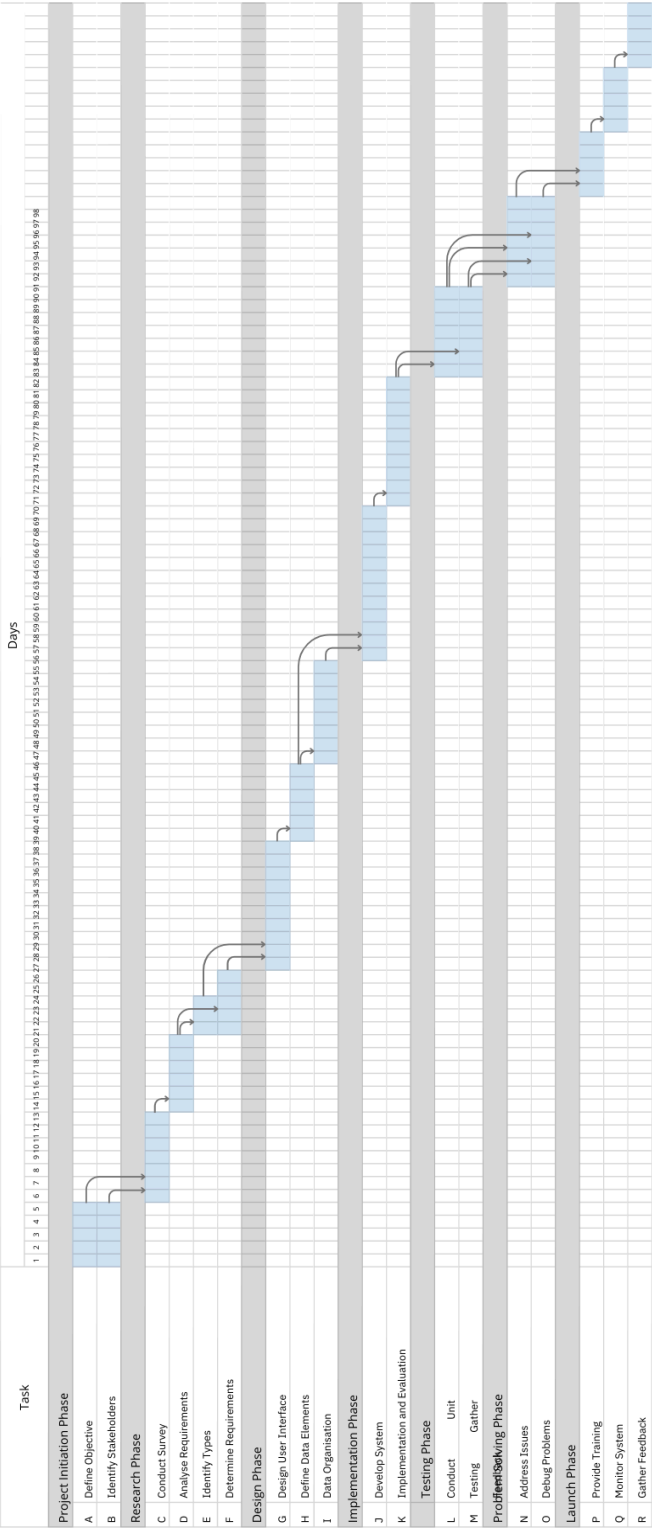
8.0 Benefit and Overall Summary of Proposed System

Regarding benefits, HogwartsHub.com which we proposed provides a comprehensive solution for managing campus resources effectively. The system centralises and streamlines various administrative processes by incorporating modules for facility booking, event management, student affairs and faculty/staff management. HogwartsHub.com helps students, faculty, staff, and administrators communicate and coordinate more effectively by providing real-time visibility into resource availability and usage. Users can easily access information, make reservations, and collaborate, which reduces the possibility of scheduling conflicts and disruptions. Moreover, HogwartsHub.com's user-centric design provides all stakeholders with an intuitive and user-friendly experience. Personalised dashboards and tailored functionalities cater to the specific needs of students, faculty, and staff, increasing user engagement and satisfaction with the system. By centralising student, faculty and administrative data, HogwartsHub.com reduces the need for manual paperwork and decentralised systems. This centralised approach improves data accuracy, accessibility and security, allowing for more effective decision-making and administrative oversight.

From our proposed system, HogwartsHub.com provides an innovative Campus Resource Management System (CRMS) tailored to Hogwarts University's needs, addressing resource management challenges in modern academia. In response to the evolving educational landscape, HogwartsHub.com simplifies administrative procedures, improves communication and enriches the student experience. By emphasising efficiency, communication and user-centric design, this system addresses immediate challenges and establishes a foundation for long-term success and academic excellence. Implementing HogwartsHub.com as soon as possible is critical for streamlining campus operations, encouraging collaboration and ensuring a smooth transition to digital-age resource management.

9.0   Project Management Explanation (GitHub)

GitHub Repository URL:

https://github.com/cheng-jiayi/SECD2613-SAD-Section07-GroupHappy

Screenshot of GitHub Repository:
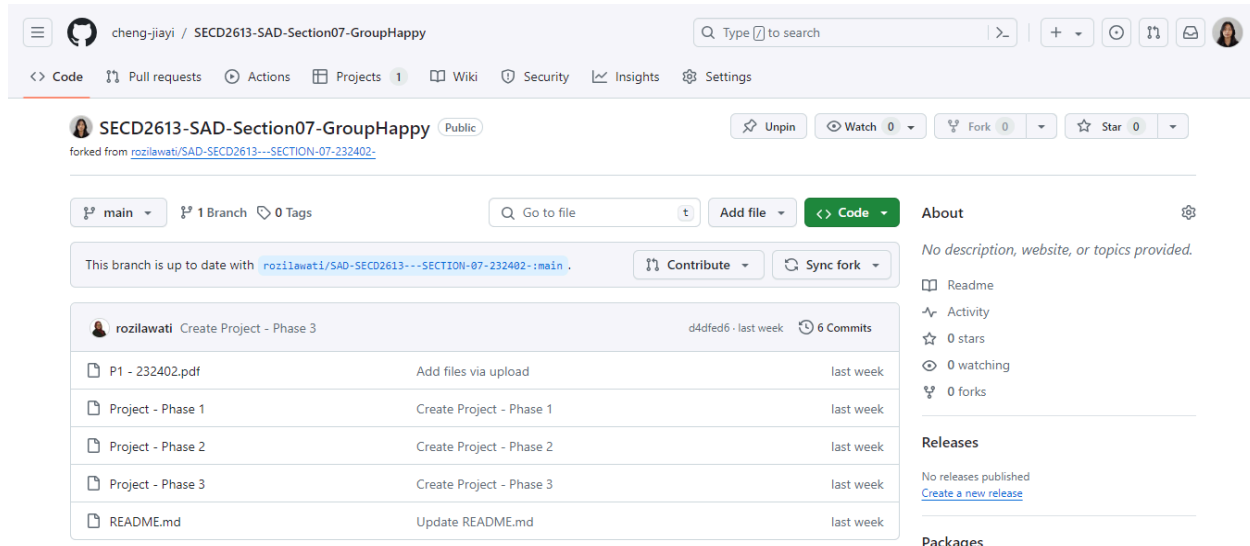
       The GitHub Repository allows for Version Control Practices, such as feature branching, pull requests and code reviews. These practices are critical for efficient collaboration and code quality in GitHub projects.

       Feature branching allows for parallel development while keeping the main branch stable. Additionally, pull requests enable peer review and ensure changes meet quality standards before merging. Code reviews also improve code quality by identifying bugs and sharing knowledge with team members.

       Emphasising these practices promotes a disciplined and collaborative approach to software development, resulting in successful project outcomes.

GitHub Project URL:

https://github.com/users/cheng-jiayi/projects/3

Screenshot of GitHub Project:
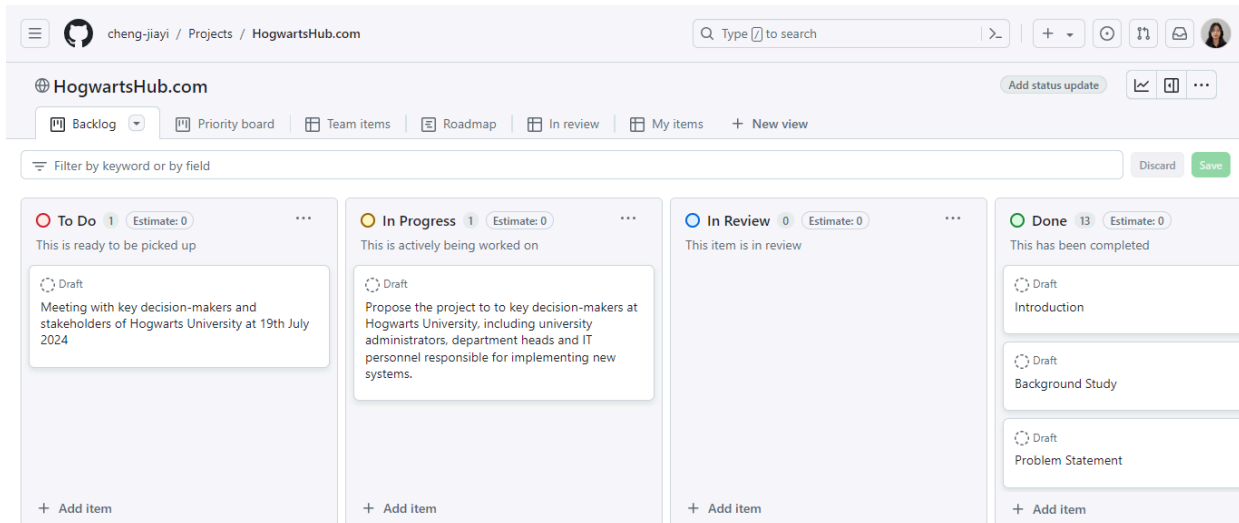
The GitHub Project allows the Integration of the Kanban Board.

1. **Task Creation**

   The Kanban Board breaks the project down into manageable tasks. A card is created for each task, allowing the task to be clearly defined and assigned to a team member.

2. **Column Setup**

   The Kanban Board is organised into columns that represent the workflow stages, such as To Do, In Progress, Review and Done.

3. **Progress Tracking**

   The Kanban Board is regularly updated to reflect the current status of each task. This is done by moving cards across columns as work progresses.

4. **Meeting Milestones**

   The Kanban Board is used to help the team meet milestones by visually tracking progress and identifying bottlenecks early on.