



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

Semester 2 2023/2024

Subject : System Analysis and Design (SECD2613)

Section : 02

Task : Project Phase 1

Lecturer: DR MUHAMMAD ALIIF AHMAD

Due : 24 April 2024 2.00pm (elearning and print 1 copy)

Group Member

	Name	Matric Number
1	FAM QAI ZEN	A23CS0223
2	MAH WILSON	A23CS0243
3	TAN JIAN MING	A23CS0275
4	TEE SOON KIET	A23CS5009

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1.0 Introduction

Postgraduate education is widely recognized for its pivotal role in enhancing research capabilities, bolstering academic reputations and generating financial gains for educational institutions. However, the effectiveness of postgraduate supervision remains a complex and evolving aspect of academia. As the demand for high-quality supervision increases, particularly amidst the diverse backgrounds of postgraduate students, the supervisory role becomes increasingly challenging.

Understanding the nuances of teaching and learning through postgraduate supervision is crucial for ensuring timely research completion, maintaining high-quality supervision, improving retention rates, enhancing student satisfaction, fostering a conducive research environment, and providing adequate administrative support services. A recent study conducted across three universities in Australia, utilising question-based surveys among postgraduate students, shed light on avenues for improving timely completion, thesis quality, and scientific publications. Central to these improvements is the pivotal role of supervisors in fostering overall satisfaction, retention, and successful completion of postgraduate studies.

Dr Ahmad Najmi, is a knowledgeable researcher and educator who uses his knowledge of computational thinking and Design Science Research to create artificial intelligence-powered expert systems and other decision support systems. Furthermore, he holds a senior lectureship at UTM in the Applied Computing and Artificial Intelligence department.

We aim to enhance the current manual methodology of postgraduate supervision at UTM by creating a more user-friendly website. In order to facilitate a smoother and easier supervision process for both the supervisor and the numerous postgraduate students under Dr. Najmi's supervision. We will outline our ideas and recommendations in our proposal for improving the manual postgraduate supervision system that is now in place, which we as users have determined is insufficient and inefficient. For instance, the time-consuming practice of the students contacting each supervisor individually and the lack of an appropriate platform for postgraduate students to locate a supervisor.

2.0 Background Study

From the insightful and productive background study that we have conducted by interviewing Dr Ahmad Najmi on the situation and circumstances that plagues undergraduates students that are looking to further their studies into postgraduate studies, we have narrowed down on a few key areas that could be resolved within our capability.

First of all, contacting lecturers is one of the main factors that is holding back a student because there is a critical lack of proper channels to contact a supervisor to supervise their postgraduate studies. Hence, students are left with the only option of contacting supervisors that they can find on social platforms such as Facebook, Instagram and so forth. The problem this situation poses is that there is no verification of the identity for both the supervisors and students which might lead to issues of identity falsification or impersonations on these platforms which are unsuitable for these types of academic communications.

Second of all, students cannot share the relevant certificates and documentations with their supervisors through social media's messaging features as it does not offer nor facilitate an appropriate level of security, encryption and only support a limited range of file types and sizes to share the aforementioned types of documents reliably, securely and swiftly.

Last but not least, students cannot easily attain information about the supervisors that they are interested in because relevant informations such as technical background/ training, academic achievements, qualifications, certifications and number of students that they have previously or are currently supervising are not displayed on public profiles of supervisors that are present on social media platforms. Hence, students will go through an unnecessarily tough and long time to find this information and ascertain and narrow down which supervisors are well suited to the students themselves.

3.0 Problem Statement

1. Difficulty Verifying the Identity of Supervisors or Students

Currently, candidates have to go through the trouble of contacting and seeking out potential supervisors by directly messaging them through social media platforms such as Facebook, Instagram and Whatsapp. A problem arises when students have no way of verifying whether the person they found is the actual supervisor they are looking for, and this problem goes both ways as supervisors have the same issue. This could lead to issues of identity theft where there is third-party impersonating a supervisor, talking to a student and trying to swindle their information and money.

2. Lack of Security and Encryption for Effective and Secure Communication

When a student does find a suitable supervisor, they have trouble sharing sensitive documentations and certifications with their supervisors as social media messaging does not grant an appropriate level of security nor encryption. The messaging platforms currently used are not equipped to handle the file types or file size.

3. Difficulty Finding Reliable and Trusted Information

Reliable and valid information regarding supervisors, specifically, the data detailing their technical background, academic achievements, qualifications, certifications and the number of students they are currently supervising is not easy to attain. Without a centralised platform, students could be aimlessly finding supervisors who could not help the students as the supervisor may not be qualified or suitable to the research interest of the student, thus increasing the time and effort needed to find a suitable supervisor.

4.0 Proposed Solution

1. Secure and encrypted direct messaging to facilitate direct communication between student and supervisor
2. Profile page for supervisors and students that shows the detailed and relevant information such as achievements, qualifications, research interest, publications and academic background
3. Collaborative tools such as video meet and whiteboards.
4. Progress tracking and monitoring tools/metrics
5. Search and filter feature to find supervisors with specific criterias such as research interest, proximity, academic background and availability
6. An appointment scheduling functionality to allow students to schedule appointments with supervisors will be added, making it easier to manage meeting times.
7. Notification system to keep students informed about new supervisors matching their criteria, responses from supervisors, and upcoming appointments.
8. Feedback and reviews feature to allow students to provide feedback and review their interactions and experiences with supervisors to help future students make informed decisions.
9. Document sharing functionality to enable students to share documents such as research proposals and papers with supervisors securely through the platform.
10. Resource library feature to provide students with access to a library of resources related to postgraduate studies, such as guides, templates, and tips.
11. Community forums and chat rooms facilitate and nurture a culture of community where students can discuss their experiences, ask questions, and share advice with each other comfortably.

Technical Feasibility

1. Technology

Suitable technologies will be used to form the basis of our system such as web technologies like HTML, CSS, JavaScript for the front end, and backend technologies like Node.js, Django, or Flask for the server side.

2. Database Design

A native database will be developed in-house to store user profiles, supervisor profiles, messages, and other relevant information. Relational databases like MySQL or PostgreSQL will also be taken into consideration for further improvements to the system's database.

3. Scalability

Our system can be scaled to handle a larger amount of users, traffic and data using cloud services such as AWS or Azure to scale our resources in a short amount of time.

4. Security

Specific security measures will be implemented to protect user data, such as encryption for sensitive information and secure authentication mechanisms.

5. User Experience (UX)

An user friendly and intuitive interface to interact and contact with supervisors will be developed for ease of use for our users.

6. PC and Mobile Compatibility

Our system will be developed with both PC and Mobile users in mind for the convenience of our users.

7. Testing

Our system will be thoroughly and consistently tested to ensure proper functionality of our system and that it is free of bugs or vulnerabilities.

8. Maintenance and Support

System maintenance and support will be prepared to ensure that our system is in its peak condition, up to date and operating at its optimal performance.

Conclusively, the technical feasibility of such a system depends on factors like the complexity of the technical requirements, the availability of resources, and the expertise of the development team.

Operational Feasibility

1. User Acceptance

Surveys and interviews will be conducted to gather feedback, measure the willingness of students and supervisors to adopt this system, and ensure that the system meets their needs.

2. Resource Availability

Our team will ensure that the resources required to operate the system, such as hardware, software, and personnel will be sufficiently easy to attain and access at all times.

3. Compatibility

Our team will ensure that the system is compatible with existing systems and processes at universities or academic institutions. This also includes compatibility with different browsers, operating systems, and devices.

4. Training and Support

Training and support will be provided to help users to adapt and use this system efficiently. Training materials such as tutorials, documentation, and help desk support will also be prepared.

5. Legal and Regulatory Compliance

The system will undergo compliance testing and changes to make sure that it complies with relevant laws and regulations, such as data protection and privacy laws. This includes implementing measures to protect user data and ensure confidentiality.

6. Risk Management

Our team will identify and mitigate potential risks associated with the system, such as security breaches, data loss, or system downtime and develop a risk management plan to address these risks.

7. Feedback and Continuous Improvement

Our system will include mechanisms for gathering feedback from users and stakeholders to identify areas for improvement by using this feedback to continuously improve the system and ensure its long-term viability.

8. Sustainability

The system will be developed with sustainability as one of the key focuses as well to ensure that it is sustainable in the long term, both in terms of its technical capabilities and its ability to meet the requirements of users and stakeholders.

Overall, the operational feasibility of such a system depends on factors such as user acceptance, resource availability, compatibility, and legal compliance.

Economic feasibility

A cost-benefit analysis will be conducted to determine the economic feasibility of the system. Certain factors such as development costs, maintenance costs, and potential benefits to students and supervisors will be taken into consideration.

CBA Analysis Table

Estimated Costs				
Hardware				RM 45000
Software				RM 10000
Training				RM 15000
Consulting				RM 25000
Data Conversion				RM 15000
Supplies				RM 10000 per year
IS Salaries				RM 45000 per year
Upgrades				RM 15000 per year
Estimated Benefits				
Customer Service				RM 120000 per year
Productivity				RM 115000 per year

Assumptions	
Discount rate	10%
Sensitivity factor (costs)	1.1
Sensitivity factor (benefits)	0.95
Annual change in production costs	8%
Annual change in benefits	10%

CRITERIA	YEAR			
	0	1	2	3
1. COST				
A. DEVELOPMENT				
Hardware	49500			
Software	11000			
Training	16500			
Consulting	27500			
Data Conversion	16500			
Total Development Cost	121000			
B. PRODUCTION				
Supplies		11000	11880	12830.4

IS Salaries		49500	53460	57736.8
Upgrades		16500	17820	19245.6
Total Production Cost		77000	83160	89812.8
Present Value (PV)		70000	75600	81648
Accumulated Cost		191000	266600	348248
2. BENEFITS				
Customer Service		114000	125400	137940
Productivity		109250	120175	132192.5
Total Benefits		223250	245575	270132.5
Present Value (PV)		212087.5	233296.25	256625.875
Accumulated Benefits		212087.5	445383.75	489922.125
Gain/Loss		21087.5	178783.75	141674.125
Profitability Index (PI)	1.17			

Conclusion for Economic Feasibility

Based on the CBA analysis conducted, the forecasted cost versus benefit has resulted in a profitability index of 1.17 which means that this system is a profitable investment venture in the long term.

5.0 Objectives

Developing a User-Friendly System

The main goal is to develop an easy-to-use system that is specifically designed for postgraduate supervision in the UTM Faculty of Computing.. Under the guidance of Dr. Ahmad Najmi, this system will function as a single centralised platform for supervisors and postgraduate students.

Enhancing Communication and Collaboration

Improving communication and collaboration between postgraduate students and supervisors is one of the main goals. The website will make it easier for people to participate, share information, and provide feedback, which will promote a positive environment for research.

Enhancing Postgraduate Supervision Efficiency

The project's goal is to improve postgraduate supervision efficiency through the application of system design and analysis to develop this system. This includes cutting down on manual labour, automating repetitive procedures, and making the best use of available resources to guarantee prompt study completion and excellent supervision.

Streamlining Supervision Processes

By offering effective tools and features on the internet, the initiative seeks to streamline the supervision process. This covers features like resource sharing, communication channels, progress tracking, and supervisor-student matching.

6.0 Scopes of the Project

System Development

The project's main goal is to create, develop, and launch a centralised system for postgraduate supervision within UTM's Faculty of Computing..

Implementation of Functionalities

To support supervision processes, the website will have a number of functionalities, such as the ability to match supervisors with students and provide messaging, video conferencing, progress tracking, resource sharing and document management tools.

User Interface Design

In order to improve the user experience (UX) for postgraduate students as well as supervisors, consideration will be made to creating an aesthetically beautiful and intuitive user interface (UI).

Training and Support

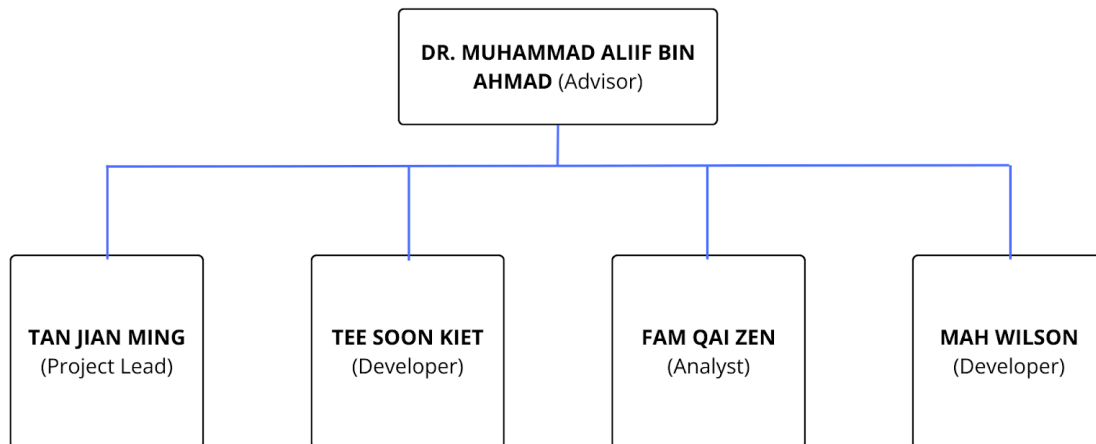
To acquaint supervisors and postgraduate students with the features and operations of the website, sufficient training and assistance will be given. Helpdesk support, tutorials and user manuals may fall under this category.

Scalability and Sustainability

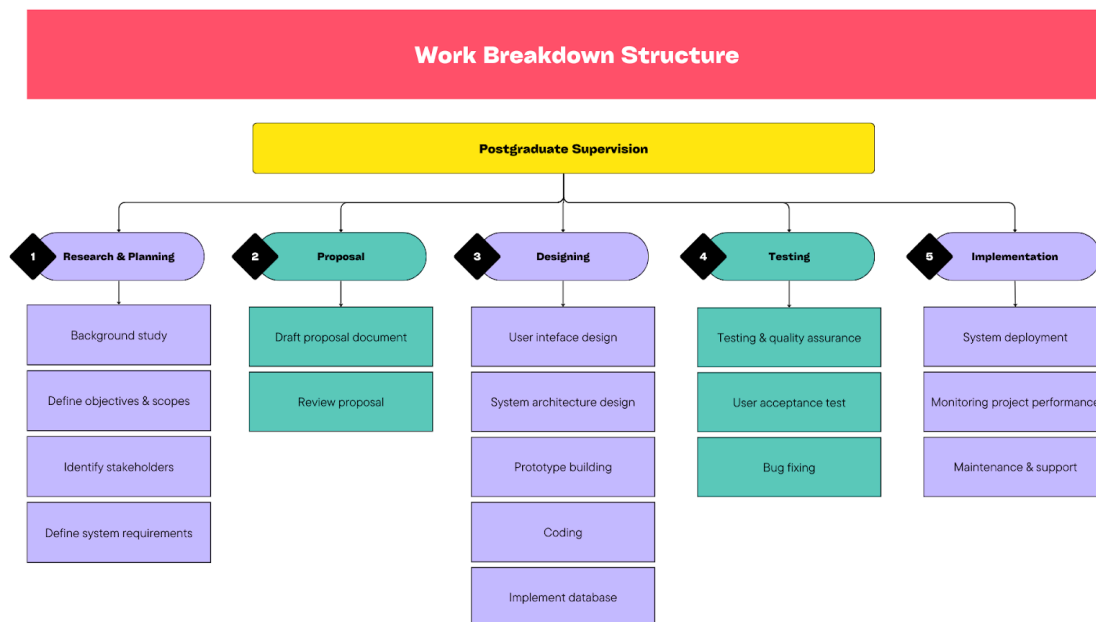
The website's scalability and sustainability will be taken into account to make sure it can handle future increases in the number of users and developments in technology. There will also be an explanation of plans for continued support and maintenance.

7.0 Project Planning

7.1 Human Resource

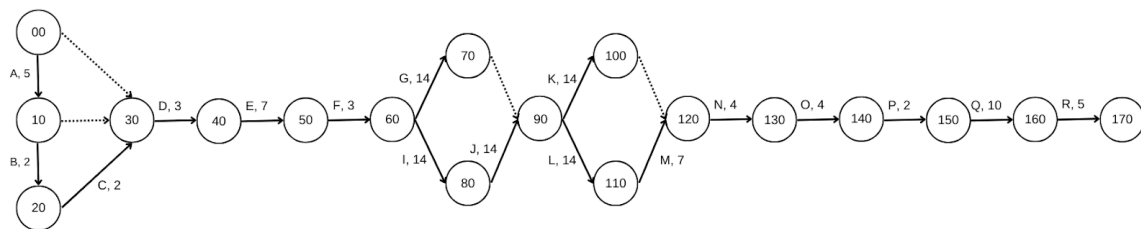


7.2 Work Breakdown Structure (WBS)



7.3 PERT Chart

No	Task	Duration (days)	Predecessor
Research & Planning			
A	Background study	5	None
B	Define objectives & scopes	2	A
C	Identify stakeholders	2	B
D	Define system requirements	3	A, B, C
Proposal			
E	Draft proposal document	7	D
F	Review proposal	3	E
Designing			
G	User interface design	14	F
I	System architecture	14	F
J	Prototype building	14	G, I
K	Coding	14	J
L	Implement database	14	J
Testing			
M	Testing & quality assurance	7	K, L
N	User acceptance test	4	M
O	Bug fixing	4	N
Implementation			
P	System deployment	2	O
Q	Monitor project performance	10	P
R	Maintenance & support	5	Q



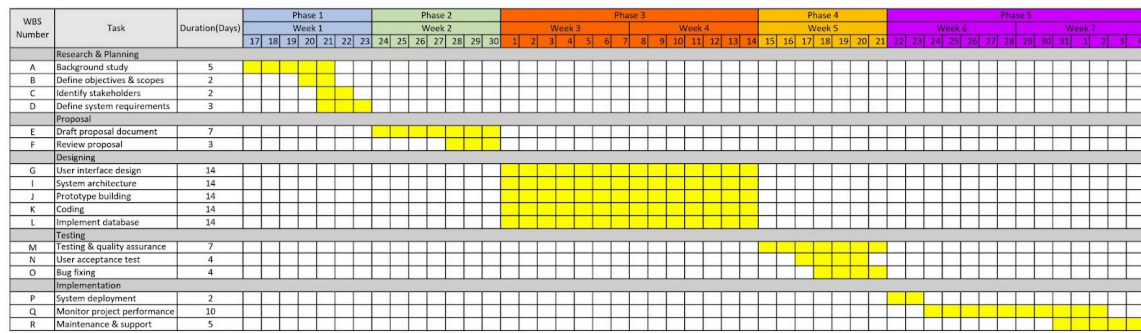
Critical path:

$A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow F \rightarrow I \rightarrow J \rightarrow L \rightarrow M \rightarrow N \rightarrow O \rightarrow P \rightarrow Q \rightarrow R$

Duration (days):

$5 + 2 + 2 + 3 + 7 + 3 + 14 + 14 + 14 + 7 + 4 + 4 + 2 + 10 + 5 = 96 \text{ days}$

7.4 Gantt Chart



8.0 Benefit and Overall Summary of Proposed System

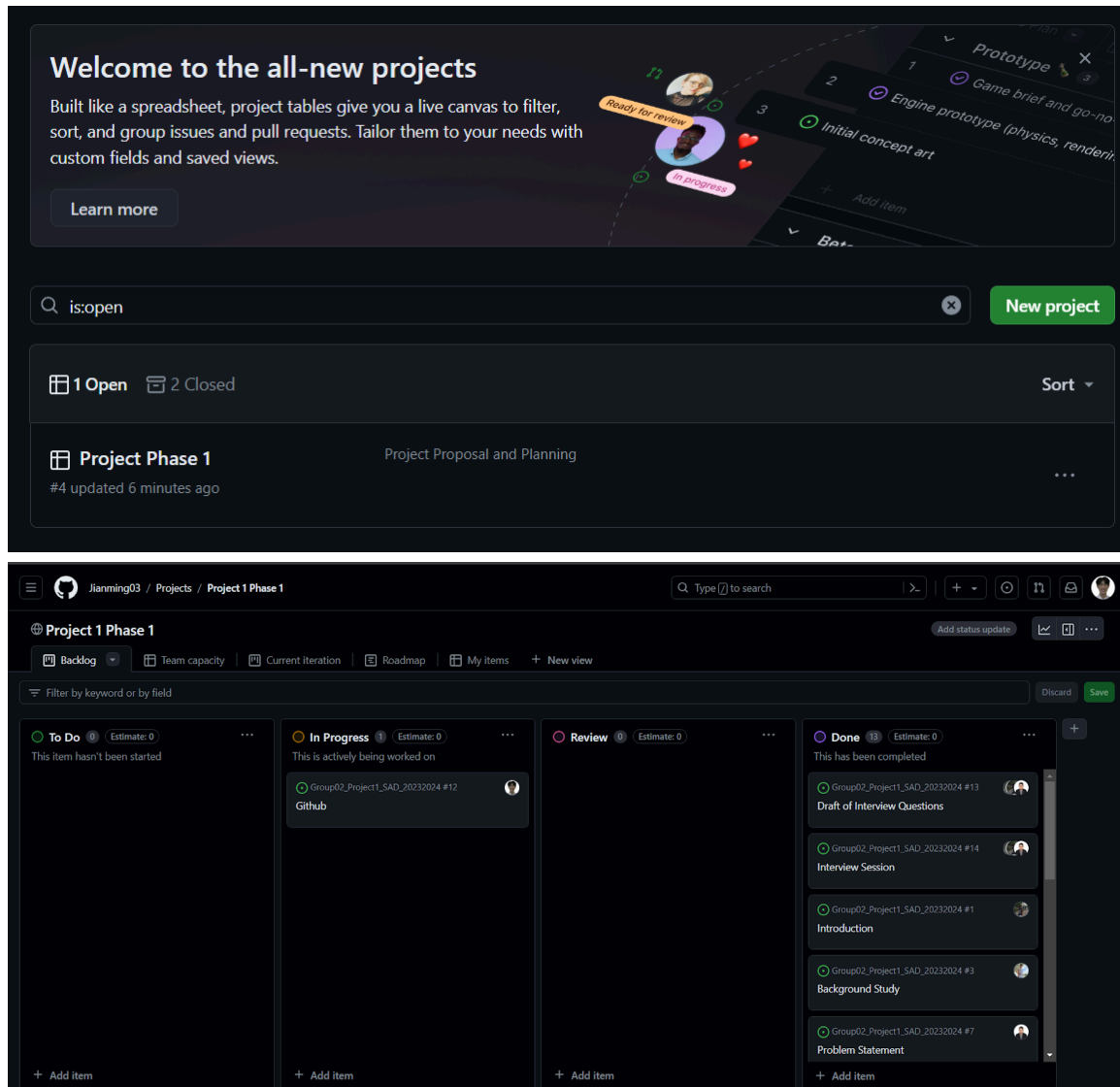
The goal of the suggested postgraduate supervision system is to improve postgraduate research quality, effectiveness and experience overall by addressing common issues and putting workable solutions into place. Regardless of where they are physically located, supervisors and students will be able to work more efficiently through the development of an intuitive website. Supervisors will be able to spend more time helping students with their research instead of handling administrative duties as a result. Easy access to tools and support will help students succeed in their academic endeavours by increasing their odds of success. The ultimate goal of this initiative is to cultivate an academic environment that values quality and teamwork in order to produce the next generation of scholars and researchers.

9.0 Github

9.1 Github Repository Link

Link: https://github.com/Jianming03/Group02_Project1_SAD_20232024

9.2 Repository Snapshot



9.3 Kanban Board Integration

Link: <https://github.com/users/Jianming03/projects/4/views/1>

9.4 Version Control Practices

Feature Branching:

The branching feature allows us to work on specific features. Each feature has their own branch without affecting the main branch. It allows for parallel development and avoids conflicts between different tasks.

Pull Requests:

Pull request is an essential tool for discussing proposed changes, providing feedback, and ensuring code quality. It also serves as a record of past code changes and discussions.

Code Reviews:

Code reviews are an essential part of maintaining code quality and encouraging collaboration among development teams. They aid in the detection of bugs, improving code readability, and ensuring compliance with coding standards.