UTM
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FACULTY OF COMPUTING

SECD 2613 – SYSTEM ANALYSIS AND DESIGN (SECD/SCSD)

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PROJECT PHASE 1

MEETING ROOM BOOKING SYSTEM

GROUP 2

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TABLE OF CONTENTS

1.0 INTRODUCTION

In the current era of fast paced working environment, Majlis Bandaraya Pulau Pinang (MBPP) often needs to share meeting rooms for various purposes such as group discussions, presentations, or interviews. When more than one user wants to use the same room at the same time, it can cause problems like double bookings or confusion about who will be using the meeting room. This usually happens when bookings are done manually by using paper, phone calls or spreadsheets.

To solve this problem, we would like to propose an idea by creating a system to book meeting rooms. A simple online booking system that allows users to check room availability and book meeting rooms easily. The system will provide the data of the rooms that are available to allow users to book a time and date and will prevent other users from booking the same room at the same time. It will also send notifications and reminders to users about their bookings.

This system will be very useful for organizations because it will save time, avoid confusion and help every user stay organized. This system will help the admin to manage the rooms better by showing which rooms are used and which rooms are available. Overall, this system will make booking rooms faster, clearer, more efficient and less time consuming for all users with less human error.

2.0 BACKGROUND STUDY

Meeting rooms are essential resources in any organization, especially in dynamic and high-paced environments such as Majlis Bandaraya Pulau Pinang (MBPP). These rooms are frequently used for a variety of purposes including internal briefings, inter-departmental discussions, stakeholder engagements and interviews. However, the current approach to booking these rooms remains largely manual, often relying on whiteboards, shared calendars, spreadsheets or even verbal requests to reserve rooms for meetings. This informal system can easily have a problem with double bookings, confusion or wasted time when someone shows up to find the room that is available.

Without a proper booking system, PIC from every department might not know which rooms are available or when. This proper booking system can easily reduce the problem with confusion and stress with choosing a place for having meetings.

PIC also would be hard to handle for managing the meeting room with manual reserve. When changes or cancellations happen at the last minute, it is hard to update everyone and miscommunication is going to happen. These small inconveniences are going to be issues, especially in busy workplaces with limited meeting spaces.

Furthermore, a structured system makes it difficult to track room usage. Management misses out on rooms being overbooked on date and time. In some cases, companies may spend more on new meeting spaces without realizing better scheduling could solve the issue.

Moreover, especially with hybrid or flexible schedules, a user-friendly and transparent meeting room booking system is more important than ever. It helps people focus on what matters that work together efficiently without the distractions of poor planning or unclear communication.

3.0 PROBLEM STATEMENT

The current meeting room booking system at Majlis Bandaraya Pulau Pinang (MBPP) is a totally manual system, where staff have to call the Person In Charge (PIC) for a booking. Then PIC checks availability using a physical logbook and records bookings by hand. It is not only an outdated process but also inefficient, unreliable and susceptible to many operational issues.

The lack of a digital system results in poor visibility, potential booking conflicts and communication delays. Staff cannot check room availability on their own and the absence of automated confirmation, centralized data or system backup makes the process risky and unmanageable over time.

This situation highlights the urgent need for a more efficient, transparent and secure booking system that automates the process, improves accessibility for staff and ensures the accuracy and safety of booking data.

Identified Problems in the Current (AS-IS) System

1. **Manual Booking via Phone Call**
    - Time-consuming, especially if PIC is unavailable
    - Booking depends entirely on human interaction

2. **Use of Physical Logbook**
    - Risk of damage, loss, or limited access
    - Cannot be accessed remotely or shared easily

3. **No Visibility for Staff**
    - Staff cannot check room availability on their own before calling
    - Leads to unnecessary communication and delays

4. **Prone to Human Errors**
    - Possibility of double-booking or incorrect entries
    - No error-checking or validation mechanism

5. **No Audit Trail**
    - Past bookings are hard to trace
    - No reporting or monitoring capabilities

6. **No Digital Backup**
    - Data loss risk if logbook is misplaced or destroyed
    - No recovery option for lost bookings

4.0 PROPOSED SOLUTIONS

To address the inefficiencies and vulnerabilities in the current manual meeting room booking process at Majlis Bandaraya Pulau Pinang (MBPP), we propose the development and implementation of a centralized online Meeting Room Booking System. This system will be web-based, enabling staff to check availability, submit booking requests and receive confirmations in real time. It will enhance efficiency, reduce errors and offer stronger security and data integrity through automated processes and centralized control.

4.1 FEASIBILITY STUDY

1. **Technical Feasibility**

   The Meeting Room Booking System will be developed using modern and widely supported technologies, including:

   - HTML, CSS, JavaScript – for responsive web interface
   - PHP Laravel 12 – as the primary backend framework
   - MySQL – for secure and efficient database management
   - Visual Studio Code – as the primary development environment
   - Figma & Justinmind – for user interface and UX design mockups

   All these tools are either open-source or have free-tier access, which makes them highly suitable for public sector projects with budget constraints. The technical skill level required to develop and maintain the system is manageable and available within local IT teams or affordable through outsourcing. Hosting will initially be done on a free or low-cost web hosting platform, with an option to upgrade to a paid server as traffic grows.

   Given the maturity and reliability of the selected tools and frameworks, this project is deemed technically feasible.

2. Operational Feasibility

Operationally, the new system can be smoothly integrated into MBPP's existing administrative workflow. Required resources include:

- Programming device (Laptop)
- Hosting space (initially free or minimal cost)
- Skilled developers (internal or contracted)
- Internet connectivity (already available)

The system will include features such as:

a) **Online Registration & Authentication:** Staff will be able to register and log in using their MBPP credentials, reducing manual errors and providing traceability.

b) **Real-Time Booking Calendar:** A shared, centralized calendar will prevent double bookings and enable fast conflict resolution.

c) **Notifications & Confirmations:** Users and admins will receive automated emails or system alerts for booking approvals or cancellations.

d) **Audit Logs:** Every booking action will be recorded with time stamps, enabling complete traceability and reducing the potential for misuse or error.

e) **Administrative Dashboard:** Admins will be able to manage user roles, generate reports, and analyze room utilization trends.

f) The system's intuitive design and minimal learning curve ensure high user acceptance and minimal disruption during deployment. Therefore, it can be implemented operationally.

From these it's clear that the project Meeting Room Booking System is technically feasible.

3. Economical Feasibility

The Meeting Room Booking System is a web-based application designed to streamline scheduling while keeping costs low. Since it primarily handles text-based data and minimal multimedia content, it requires little bandwidth, which helps keep operational expenses manageable.

To keep development costs down, the system will be built using open-source and freeware tools, eliminating licensing fees and reducing initial expenses. As the system is intended for internal administrative use within MBPP, there will be no direct charges for users. However, regular maintenance such as fixing bugs, applying updates and making future improvements that will require occasional investments in technical support.

In its early stages, the system will serve MBPP's internal staff and departments. Its biggest advantage is the significant administrative savings it offers. By digitizing the room booking process, it eliminates the need for manual coordination and paperwork, freeing up staff time and reducing scheduling errors.

Additionally, the system's centralized booking management helps remove inefficiencies and redundancies often seen in traditional methods, leading to better resource allocation. Over time, these improvements can translate into measurable cost savings.

Given its low implementation and operational expenses, combined with the long-term benefits in efficiency and cost reduction, the Meeting Room Booking System is a financially sound and practical solution.

4.2 COST-BENEFIT ANALYSIS

Estimated Cost		Description
Hardware	RM 9,280.00	PC : DELL Workstation Intel i5 CPU @ 2.30 GHZ, RAM: 4GB, SSD : 500GB Hardware: Logitech webcam, QR Scanner
Software	RM 7,000.00	VMS Software Web Hosting
Training	RM 5,000.00	Team training on system
Maintenance (Annual)	RM 3,000.00	Maintenance fee for system
Support (Annual)	RM 12,000.00	Technician support for system (Upon Request)

Estimated Benefits	
Manpower savings (Annual)	RM 36,000.00
Paper & stationery (Annual)	RM 1,200.00

Assumptions	
Discount	10%
Sensitivity factor (Cost)	1.1
Sensitivity factor (Benefits)	0.9
Annual Change in Production Costs	7%
Annual Change in Benefits	5%

Development Cost	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
Hardware	RM 9,280.00				
Training	RM 5,000.00				
Software	RM 7,000.00				
TOTAL DEVELOPMENT COSTS	RM 21,280.00				

Production Cost	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
Maintenance		RM 3,300.00	RM 3,531.00	RM 3,778.17	RM 4,042.64
Licensing/Subscription of Software		RM 2,112.00	RM 2,259.84	RM 2,418.03	RM 2,587.29
Support		RM 13,200.00	RM 14,124.00	RM 15,112.68	RM 16,170.57
Annual Production Cost		RM 18,612.00	RM 19,914.84	RM 21,308.88	RM 22,800.50
(Present Value)		RM 16,920.00	RM 18,104.40	RM 19,371.71	RM 20,727.73
Accumulated Cost		RM 38,200.00	RM 56,304.40	RM 75,676.11	RM 96,403.84

Benefits	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
Reduced cost		RM 33,480.00	RM 35,154.00	RM 36,911.70	RM 38,757.29
(Present Value)		RM 30,436.36	RM 31,958.18	RM 33,556.09	RM 35,233.90
Accumulated Benefits (Present Value)		RM 30,436.36	RM 62,394.55	RM 95,950.64	RM 131,184.53
Gain or Loss		(RM 7,763.64)	RM 6,090.15	RM 20,274.53	RM 34,780.70
Profitability Index	**1.63**				

Profitability Index,

$$\frac{RM\ 34,\ 780.70}{RM\ 21,\ 280.00} = 1.63$$

This investment idea will be good because its profitability index is over 1. It's not way over, but it's enough to show a good investment, so it's worth developing the system.

5.0 OBJECTIVES

a) To develop an easy to use and efficient system to replace the existing manual system so that MBPP staff can book meeting rooms easily and efficiently.
b) To develop and improve the user interface to achieve the highest level of user satisfaction and usability, with easy to use navigation and hassle-free booking.
c) To develop an automated system that manages meeting room reservations online, records all booking details and user information and provides real-time updates and confirmations.

6.0 SCOPE OF THE PROJECT

The Meeting Room Booking System (MRBS) has been specifically designed to automate and enhance the process of meeting room booking within Majlis Bandaraya Pulau Pinang (MBPP). The project scope is to determine the requirements, system features, development approach, integration features, reporting, administrative controls and user support, with the objective of delivering a secure, stable and user-friendly platform tailored to MBPP's internal needs of staff and administration.

The scope of the Meeting Room Booking System includes the following:

1) **User and System Requirements Specification**
    a) Clear documentation of system requirements including functionality, performance, usability, reliability and security to ensure all stakeholder expectations are met.

2) **User Registration and Authentication**
    a) Secure login system with role-based access (e.g., Administrator, Person-in-Charge (PIC), Normal User).
    b) Authorization control to restrict access based on user roles.

3) **Meeting Room and Resource Management**
    a) Admins can add, update, deactivate meeting rooms and associated resources (e.g., projectors, microphones).
    b) Each room profile will contain key details such as location, capacity and available equipment.

4) **Booking and Scheduling**
    a) Real-time booking interface showing room availability
    b) Conflict detection to prevent double-booking.
    c) Bookings can be created, modified or canceled by authorized users.

5) **Calendar and Software Integration**
    a) System will integrate with MBPP’s existing calendar software (e.g., Microsoft Outlook or similar) to enhance visibility and coordination of meetings.

6) Automated Notifications

a) Email or in-system alerts will be sent to notify users of new bookings, updates, cancellations and reminders for upcoming meetings.

7) Reporting and Analytics

a) System will generate reports on:
   i) Meeting room usage
   ii) Attendance logs (if integrated)
   iii) Peak booking periods and underutilized resources

8) Administrative Control Panel

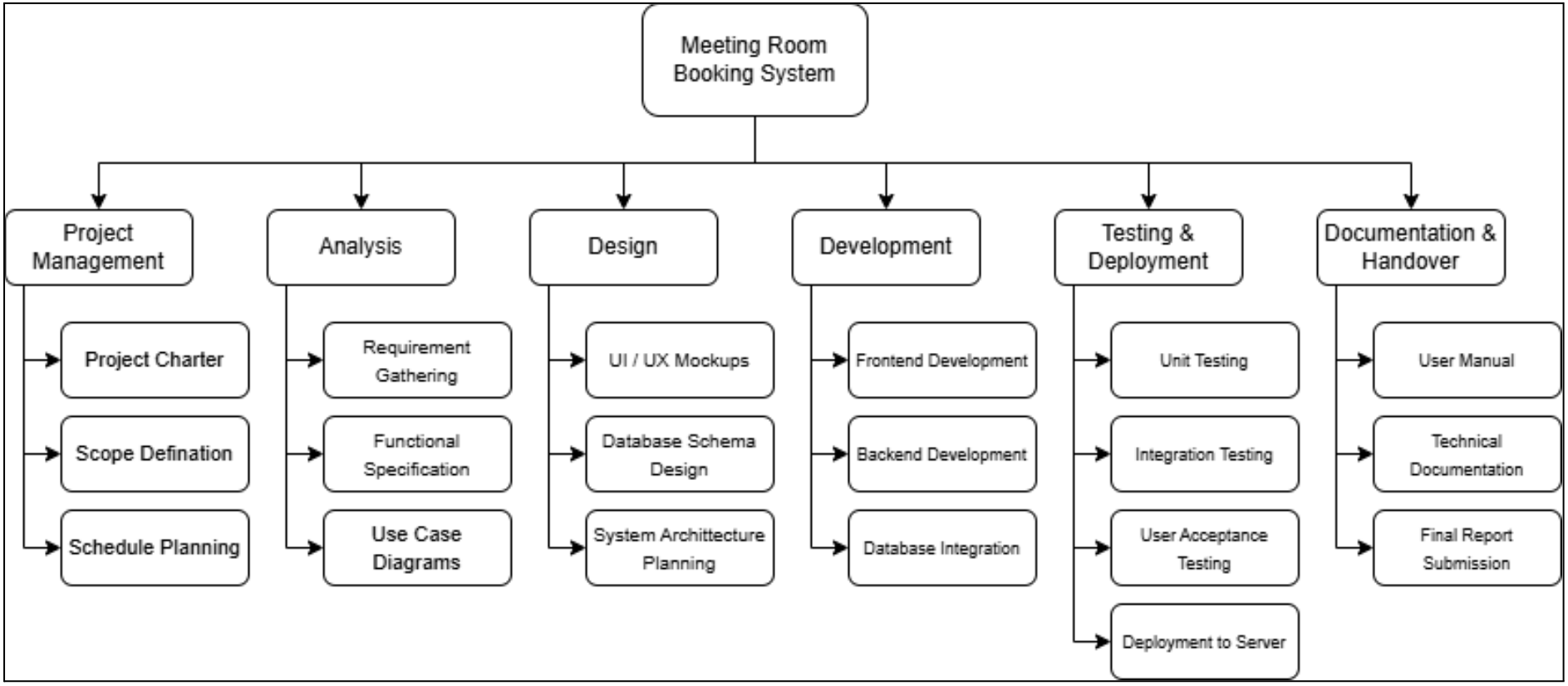
a) Designated admins will have the ability to manage booking rules, application approval, assign PICs and generate administrative reports.

7.0 PROJECT PLANNING

7.1 HUMAN RESOURCE

a. Project Manager: Nuriylia
b. System Analyst: Aisyah Umairah
c. Graphic and UX Designer: Siti Munirah
d. Programmer: Muhammad Syafiq

7.2 WORK BREAKDOWN STRUCTURE (WBS)



7.3 PERT CHART

7.4 GANTT CHART

8.0 BENEFIT AND OVERALL SUMMARY OF PROPOSED SYSTEM

Summary for this project , in many organizations managing meeting spaces can be a daily challenge. Employees or PIC often struggle with finding an available room, checking on overlapping reservations or wasting time to have a look around to check availability with manual booking. The proposed Meeting Room Booking System is designed to decrease frustration and overlapping booking. This system will serve as an easy-to-use, that allows staff to view room availability in real-time, book a room meeting and even can request equipment for the room on the date that has been booked. Furthermore, with this system it would show which room is available or fully booked on the date and time. This issue would make the PIC on every department happy and comfortable on booking a room for having a meeting without any double booking, miscommunication and rescheduling issue. The system is not just about booking rooms, it's about improving workplace flow, encouraging better collaboration and making everyday work life smoother for everyone that is involved.

Benefits of Meeting Room Booking System

1. Time-Saving

One of the benefits of the system is the time it saves. Instead of sending emails, writing department names on paper with the date and time or walking to different floors to find an available room, PIC can book a meeting space or room in just a few clicks and don't have to walk and find an available room. This helps reduce delays and allows people to focus more on their work.

2. Double Bookings and Miscommunication

The system ensures that PIC from any departments don’t have to accidentally book the same room at the same time with any miscommunication or having a double booking room between departments. It brings clarity and transparency to the entire scheduling process, reducing misunderstandings and scheduling errors.

3. Collaboration and Productivity

By making it easier to organize and reserve suitable spaces, the system supports a more collaborative environment. PIC of every department can quickly find available rooms that meet their needs such as a projector, whiteboard or video conferencing setup helping them work together more effectively.

4. Fairness and Accountability

Everyone in the organization will have access to do a booking room or space. The system logs all bookings, it's easy to trace who booked a room, when and for what purpose. This transparency promotes accountability and discourages misuse of shared spaces.

5. Improves Space Utilization

The system keeps track of how often rooms are booked and which ones are most in demand. With this data, management can make decisions about how to better use existing spaces or when to consider expanding facilities.

6. Reduces Administrative Work

Office managers and IT staff will no longer need to manually manage schedules or respond to room-related complaints. The system automates much of the process, freeing up valuable time for other responsibilities.

7. Supports Additional Services

The system can be customized to offer more than just bookings. Users can request additional services like catering, technical support or specific room setups, making it a one-stop solution for planning successful meetings.

9.0 GITHUB

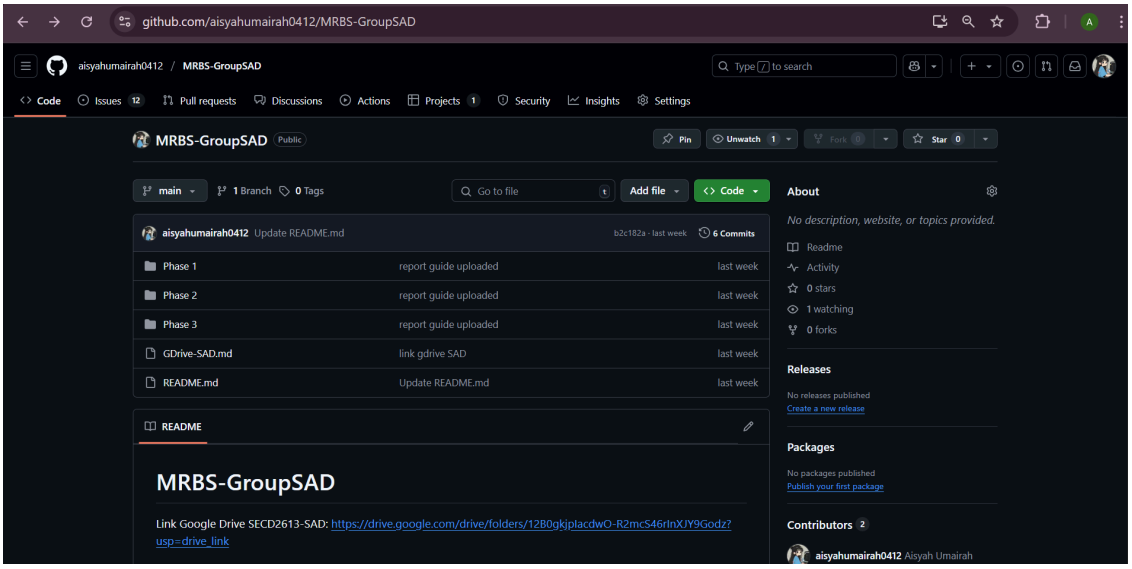
9.1 GITHUB URL

The complete project source code, documentation, and management artifacts are available at the following repository:

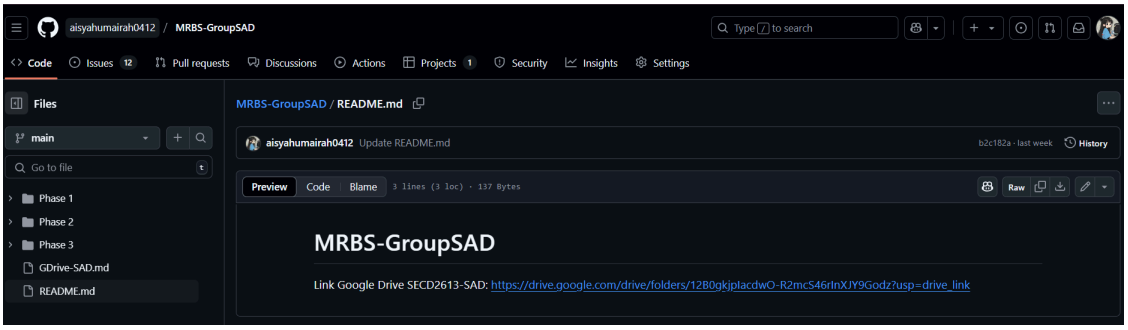
https://github.com/aisyahumairah0412/MRBS-GroupSAD

9.2 REPOSITORY SNAPSHOT

a. Folder Structure



b. README



c. Commit History

d. Contributors

9.3 KANBAN BOARD INTEGRATION

To ensure effective task management and visual tracking of progress, a GitHub Project (Kanban-style) has been created:

https://github.com/users/aisyahumairah0412/projects/1