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# PROJECT 1

**SECD2613 System Analysis and Design, Semester 2, 2023/2024**

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## Section 01

**Group: Analytix**  
**“ScholarSync”**

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GitHub Link: [https://github.com/nguyuling/Analytix\\_Project1\\_SAD\\_20232024](https://github.com/nguyuling/Analytix_Project1_SAD_20232024)

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## **1.0 INTRODUCTION**

In the world of academic research and paper writing, postgraduate students and lecturers face a multitude of tasks. From conducting research to writing and publishing, managing these tasks efficiently is crucial.

Traditional tools like paper lists or basic calendars often struggle to handle the complexities of academic work. These tools can't effectively manage multiple writing projects or facilitate smooth collaboration with peers. This highlights the need for a specialized task management system tailored to the unique demands of academic research and writing.

This case study aims to design and analyze a new task management system specifically for postgraduate students and lecturers involved in paper writing and publication. By addressing the challenges seen in current methods, we intend to create a system that streamlines the process and makes academic work more organized and collaborative.

The envisioned system goes beyond basic task tracking. It aims to offer a comprehensive platform that encourages collaboration, facilitates document sharing, integrates peer reviews, and provides insights into research and writing progress. By incorporating these features, the system seeks to improve the efficiency and effectiveness of academic work, ultimately supporting success in research and publication.

## **2.0 BACKGROUND STUDY**

Currently, the process of writing and publishing papers for postgraduate students rely on a manual method that leaves much to be desired. The manual process involves several steps, including task listing, scheduling, progress tracking, collaboration and communication and reminders and alerts. Although the process is well understood and documented, it is still not well oiled or organized, which leaves room for human error. Furthermore, this process is not centralized, and shifting between tasks may cause the user to leave out information and decrease overall efficiency.

The current academic systems used by universities in Malaysia primarily serve as platforms for academic staff to distribute course materials to postgraduate students. However, these systems lack features that facilitate student collaboration, progress tracking, and task management. As a result, students often resort to manual methods to coordinate group discussions, share work progress, and keep track of deadlines. This reliance on manual checking of the system for updates can be time-consuming and inefficient, as students may miss important materials or notifications due to the lack of automated alerts. Additionally, for assignments and projects, many students turn to social media platforms like WhatsApp or Telegram for virtual group discussions. While these platforms are convenient for personal communication, using them for academic collaboration leads to issues such as files being buried under unrelated messages over time, making it challenging for students to retrieve important project drafts or proposed ideas when needed. Overall, the current reliance on disparate systems and social media platforms for academic collaboration detracts from the efficiency and effectiveness of the postgraduate student experience in Malaysia.

Postgraduate students in Malaysia commonly use Microsoft Word and Google Docs for real-time progress tracking during group report writing. However, these platforms lack features for tracking individual contributions and facilitating true group collaboration. As a result, students may struggle to coordinate their efforts and integrate their work effectively. There's a need for a more comprehensive platform tailored to the specific needs of postgraduate students, offering features like version control and seamless group collaboration to enhance efficiency.

Hence, we propose ScholarSync, a task management system for postgraduate students to track, manage and collaborate on tasks together with fellow students and advisors. ScholarSync aims to overcome the problems listed above by providing a centralized platform for task management with add-on features such as real-time collaboration and reminder systems.

### **3.0 PROBLEM STATEMENT**

#### **1. Inappropriate platform for academic**

Most project discussions among postgraduate students and announcements by academic staff are primarily conducted on social media platforms, which were not initially designed or intended to serve as virtual workspaces. This practice leads to challenges such as buried documents amidst numerous messages, causing inconvenience when accessing essential files and media. Additionally, the lack of notifications for document updates or edits hampers efficient collaboration among group members and lecturers involved in the same project.

#### **2. Social media distractions and disorganization**

In academic settings, social media platforms are often utilized for group discussions and announcements, alongside personal or non-academic conversations. This overlapping usage leads to unorganized chats, difficulty in categorizing information, and inefficient teaching and learning processes. The tendency for social media to be distracting further undermines focus and productivity during academic tasks.

#### **3. Unorganized task management**

Students struggle to balance academic and co-curricular commitments due to difficulties in organizing their schedules and meeting deadlines. The absence of a clear visualization of tasks and learning plans exacerbates this challenge. Similarly, academic staff face challenges in scheduling quizzes and tests across different sections, leading to potential overlaps in dates and locations. A solution lies in adopting weekly or monthly calendars, essential tools for enhancing productivity and tracking progress effectively.

## 4.0 PROPOSED SOLUTION

ScholarSync is a new system solution that aims to enhance the existing system's workflow and functionality. Therefore, this new system will have all the functionalities of the current task management system, such as adding tasks, scheduling deadlines and planning meetings with some new features in place.

One of the main improvements of this proposed system is that it centralizes every aspect of paper writing and publication for postgraduate students, so that users may accomplish everything within one app and not have to switch between apps. Initially, the manual process has been described as inefficient and time consuming, as manually updating each task and fixing deadlines in different applications required switching between multiple apps.

Another improvement that this proposed system offers is real-time collaboration. In the manual process, collaboration was difficult as the progress of a students' work is not available to another student or advisor in real time, which may cause delays and in worse cases, two people working on the same task simultaneously, wasting time and resources. The new system aims to improve this by allowing real-time collaboration among members of the same project.

Moreover, the manual process is also prone to error during the management of tasks. Users of the manual process may forget deadlines and overlook updates to a task or project. The new system aims to prevent this by setting up alerts and reminders for tasks and projects. Each new update to a task, a change in priority or collaborator and deadline will be notified to the user, so that they will not miss anything important.

In the manual process, accessibility to some files and information may be guarded when a person stores them in their local machine or relay information through personal messaging only. In the new system, we avoid this problem by allowing everyone in a project to view files related to the project as long as they are collaborators. In-app collaboration tools such as commenting and messaging also aim to improve accessibility between project members to information. Overall, accessibility to information and files will be improved through this system.

Finally, the proposed solution aims to enhance scalability for all types of end users, be it advisors or students. A scalable system would still be easy to manage and maintain even when it grows. The proposed system is scalable for advisors because each project that they are overseeing would be neatly tucked away into separate dropdowns in a menu, and can be sorted with tags. For students, it is scalable when we adopt a nested page format, in which projects can be stored within folders of folders. Finally, with the use of servers on the cloud to host the system, it can be scaled up or down according to the size of the operation.

## Technical feasibility

ScholarSync should be accessible through PCs and mobile devices for users on the go. The required technology stack for this project includes front-end technologies like React or Vue.js and Node.js for server side logic. Furthermore, a database system such as MongoDB or PostgreSQL is needed to store data from tasks to user information. Next, ScholarSync will be hosted on the cloud, through providers such as AWS or Google Cloud to allow room for scaling up or down, and is more cost efficient than hosting on-premises.

## Operational feasibility

There are several key considerations that we made while creating this task management system. Firstly, we place great emphasis on usable and intuitive graphical user interfaces. As such, we offer functionalities such as drag and drop features and color coded roles for collaborators. Next, to ensure a smooth transition from the manual process to this task management system, comprehensive training sessions and ongoing support will be provided to users of the system.

## 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	
Development costs	
Hardware	RM 10000
Software development	RM 10000
Production costs	
Cloud service	RM 3000 per year
IS Salaries	RM 35000 per year
Advertisement/Marketing	RM 5000 per year

Maintenance	RM 3000 per year
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Estimated benefits	
Increase Users	RM 50000 per year
Savings	RM 25000 per year

Costs	Year 0	Year 1	Year 2	Year 3
Development cost				
Hardware	11000			
Software development	11000			
Total	22000			
Production cost				
Cloud service		3300	3465	3638
IS Salaries		38500	40425	42446
Advertisement/Marketing		5500	5775	6063
Maintenance		3300	3465	3638
Annual Production Cost (Present Value)		50600 46000	53130 43909	55785 41912
Accumulated Costs		68000	111909	153821

Benefits	Year 0	Year 1	Year 2	Year 3
Increase Users		45000	48150	51520
Savings		22500	24075	25760
Annual Inventory Costs (Present Value)		67500 61363	72225 59690	77280 58061
Accumulated Benefits		61363	121053	179114
Gain or Loss		(6637)	9144	25293
Profitability Index (PI)	1.15			



## 5.0 OBJECTIVES

The main goal of this project is to create and provide an advanced yet user-friendly web platform specifically tailored to the needs of instructors and postgraduate students. This eliminates many problems and inefficiencies associated with using traditional academic task management systems.

1. **Identify Existing Challenges:** To understand the current limitations and challenges faced by postgraduate students and lecturers in academic research and paper writing.
2. **Tailored System Design:** To develop a task management system to address the demands of academic research and writing, considering the complex of multiple projects, collaboration needs, and document management.
3. **Efficiency Improvement:** To streamline the academic research and paper writing process by providing tools and features that enhance efficiency in task management, document sharing, collaboration, and progress tracking.
4. **Collaboration Facilitation:** To create a platform that fosters collaboration among researchers, students, and lecturers by offering features such as document sharing, commenting, version control, and real-time communication.
5. **Document Management:** To implement document management capabilities to enable easy organization, storage, retrieval, and sharing of research papers, drafts, notes, and related materials.
6. **Peer Review Integration:** To integrate peer review processes into the system to facilitate feedback exchange among academic peers, improving the quality of research work.
7. **User Experience Optimization:** To design an user-friendly interface that accommodates the diverse needs and preferences of postgraduate students and lecturers, ensuring ease of use.
8. **Scalability and Flexibility:** To build a scalable and flexible system capable of accommodating varying research workflows, project sizes, and collaboration structures, catering to the evolving needs of users.
9. **Support Academic Success:** To support the success of academic research and publication by equipping users with a comprehensive and effective toolset for managing tasks, collaborating with peers, and advancing research endeavors.

## **6.0 SCOPE OF THE PROJECT**

For postgraduate students and lecturers involved in academic research, paper writing, and publication tasks, we are developing a task management system especially for professionals.

### **Security, Privacy and User Registration:**

1. Users can register using email addresses.
2. Two-factor authentication (2FA) is required to gain access to maintain data security.

### **Types of Users:**

1. Postgraduate students and lecturers
  - (a) Task management: Modify, monitor and track research and writing tasks.
  - (b) Document sharing: Collaborators get to access shared drafts, research papers and resources.
  - (c) Real-time collaboration: Avoid clashing of time by working on tasks at the same time while receiving real-time updates.
  - (d) Progress tracker: Keep track of project progress and set due dates.
  - (e) Error prevention: Received reminders and notifications for task modifications, prioritizing adjustments and deadlines.
  - (f) Peer review: Regarding academic work, discussions can take place among peers.
2. Supervisor / Admin
  - (a) User management: Manage user permissions, roles and accounts.
  - (b) Project supervision: Keep update on all progress, active projects and important indicators.
  - (c) System settings: Notifications, security and preferences can be set up.

### **Key Features:**

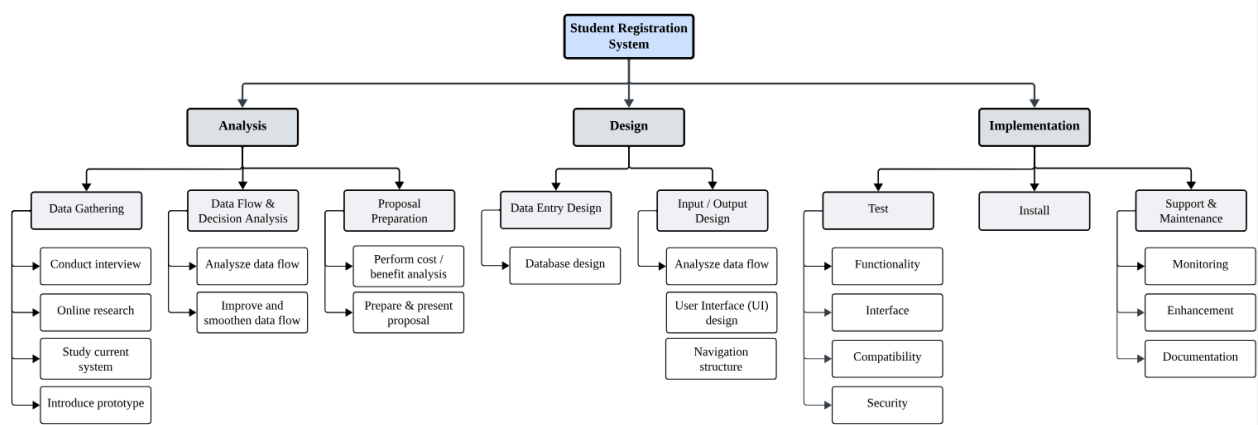
1. Verification of documents:
  - (a) Prior publishing or submission, it can confirm the condition of the document to assure the quality.
  - (b) Enhanced the accessibility of shared files within projects which enables collaborators to take a look and provide comments in the file.
2. Collaboration tools
  - (a) Integrated communication tools to promote collaboration among users.
  - (b) Discussion board for sharing resources, ideas and insights.
  - (c) Communication ways such as commenting, feedback and messaging within the app to increase information on the project's accessibility.
3. Notifications and alerts
  - (a) Receive incoming tasks and deadlines
  - (b) Alerts of insufficient resources or upcoming peer reviews.
  - (c) Task updates progress in real time to improve teamwork.

## 7.0 PROJECT PLANNING

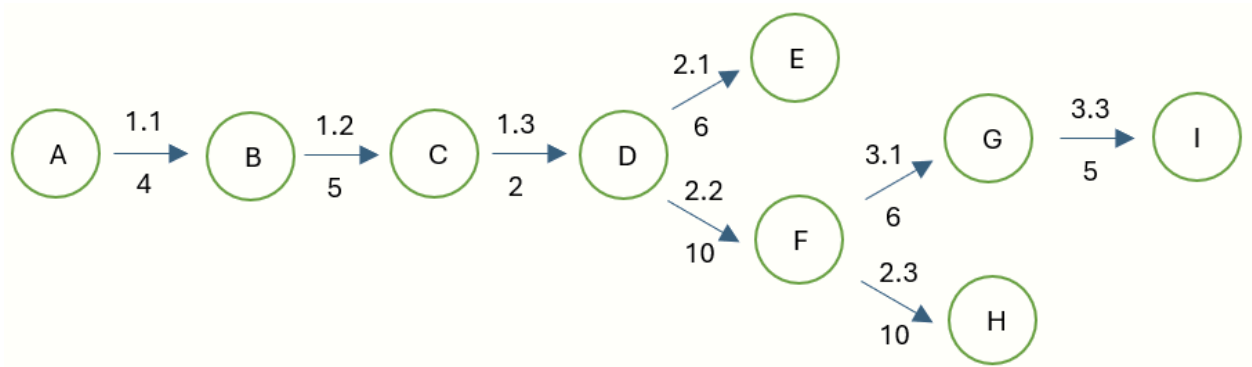
### 7.1 HUMAN RESOURCE

1. Ngu Yu Ling - Project Lead
  - (a) Leads the overall project and ensures everyone stays on track.
  - (b) Coordinates with team members and communicates with stakeholders.
2. Phavanee Katriya Phon-Amnuaisuk - Project Analyst
  - (a) Handles project data and calculations.
  - (b) Provides technical advice and insights when needed.
3. Amelia Adlina binti Azrul - Project Strategist
  - (a) Plans project strategies and coordinates tasks.
  - (b) Offers creative ideas to enhance project success
4. Welson Woong Lu Bin - Project Specialist
  - (a) Assists with various project tasks.
  - (b) Supports the team and helps execute plans.

### 7.2 Work Breakdown Structure (WBS)



### 7.3 PERT Diagram



## 7.4 Gantt Chart

[illegible]

## **8.0 BENEFIT AND OVERALL SUMMARY OF THE PROPOSED SYSTEM**

This case study endeavors to design a task management system explicitly to postgraduate students and lecturers involved in academic paper writing and publication. By addressing the inefficient current methods, our goal is to create a system that not only streamlines processes but also fosters organization and collaboration, thereby enhancing the academic journey.

Firstly, by streamlining task management, document sharing, collaboration, and progress tracking, the system significantly enhances efficiency in academic work. This improvement enables users to accomplish more in less time, thereby maximizing productivity and allowing for a more focused approach to research and writing.

Secondly, the system facilitates improved collaboration among researchers, students, and lecturers through features such as document sharing, commenting, version control, and peer review integration. By fostering a culture of teamwork and knowledge exchange, the system improves the quality of their work.

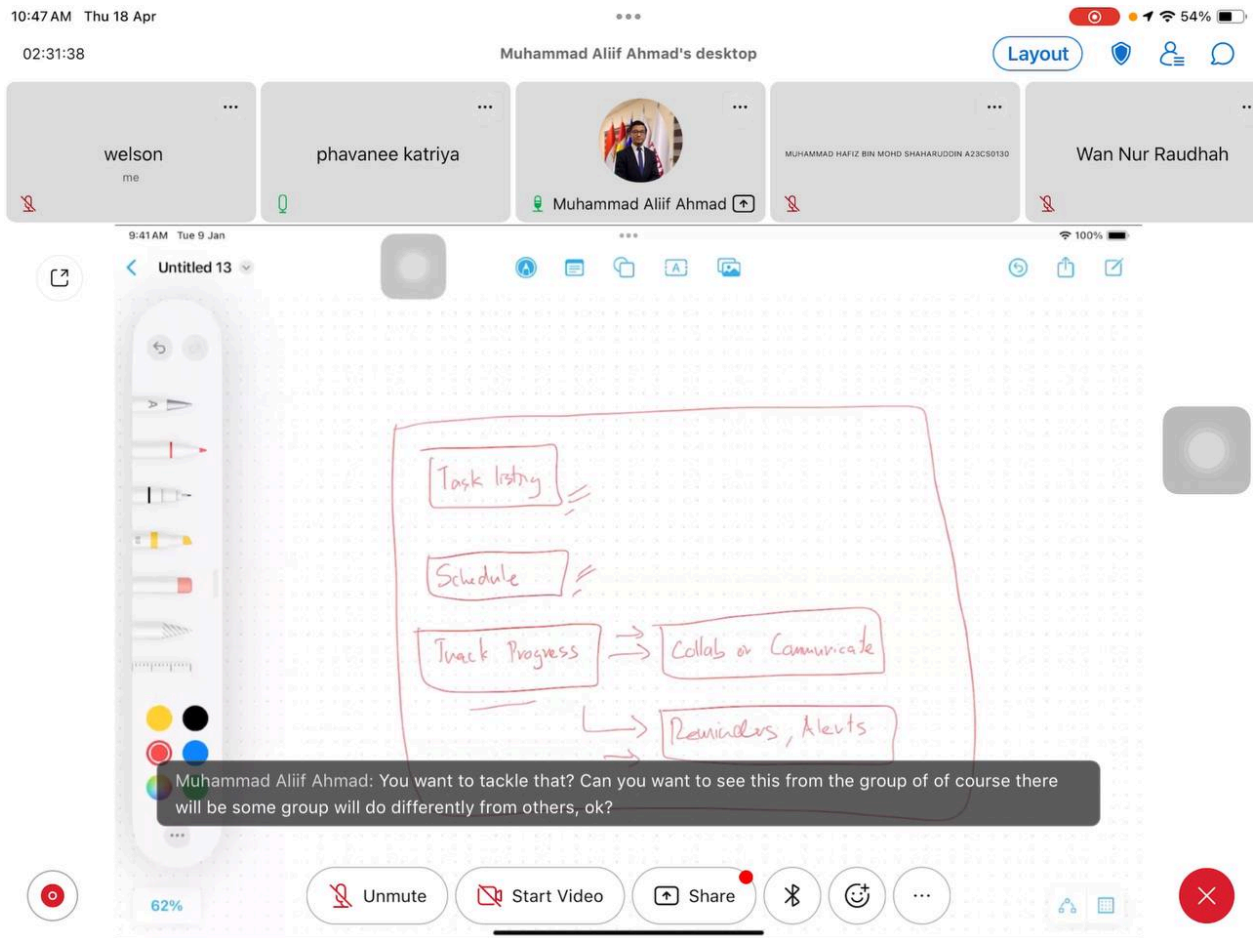
Furthermore, robust document management capabilities enable users to organize, store, retrieve, and share research papers, drafts, notes, and related materials with ease. This enhances productivity and ensures that valuable research assets are readily accessible whenever needed.

In addition, insightful analytics and reporting functionalities provide users with valuable insights into their research and writing progress. By tracking their work users can optimize their workflow and stay on track towards achieving their academic goals.

Finally, an intuitive and user-friendly interface ensures that the system is easy to use and adopt, accommodating the diverse needs and preferences of postgraduate students and lecturers.

In summary, the proposed task management system is designed to address the unique challenges faced by postgraduate students and lecturers in academic research and paper writing. By offering a comprehensive platform that enhances efficiency, fosters collaboration, improves organization, and provides valuable insights, the system aims to empower users to succeed in their academic endeavors.

## APPENDIX



### *Appendix 1: Interview session with Dr Alif through Webex on 18 April 2024*

Group: analytix

Q1: Are there specific metrics or key performance indicators that you hope to improve with this system? (background)

Kpi: - students should be able to make task, supervisors can check task, scheduling of tasks, tracking of tasks (reminders, collaboration features)

Q2: How do you prioritize tasks within the current manual process, and are there any challenges or inconsistencies in this prioritization method? (current manual process)

Q3: Please rank the following factors in order of importance for the development of the new system: usability, accessibility, and functionality. (stakeholder needs and expectations)

Q4: Are there any specific integrations with other tools or software that would be essential to this new system? (desired features and functionalities)

Q5: How do stakeholders anticipate managing potential disruptions or downtime during the transition from the current manual process to the new system? (technical and operational constraints)

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### *Appendix 2: Question proposed for the interview*