



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING, UTM

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PROJECT 3

SECD 2613: SYSTEM ANALYSIS AND DESIGN

SECTION 01

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GitHub Repository :

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1.0 Overview of The Project

To effectively manage the publication of a paper involving postgraduate students and their supervisor, it is crucial to establish a comprehensive task list. This list, which can be kept in an Excel sheet or a hardcopy format, should include deadlines, the individuals responsible for each part of the project, and a schedule for the paper's publication. A clear timeline must be outlined, specifying which tasks need to be completed by certain dates to ensure consistent progress.

Collaboration and communication are vital to the project's success. Lecturers must remain informed about all developments; for example, once a student completes a task, the supervisor should promptly review and provide feedback. To support this, reminders and alerts should be implemented to guarantee ongoing communication between students and supervisors. If either party fails to communicate within a set period, reminders should be sent to both the student and the supervisor to encourage necessary interactions. All these features should be integrated into a single system or application to facilitate progress tracking and uphold accountability throughout the project's duration.

2.0 PROBLEM STATEMENT

The current methods of thesis management within academic institutions are fraught with inefficiencies and limitations, stemming from reliance on manual processes and disparate tools. These challenges include:

1. **Inefficiency and Time Consumption:** Stakeholders, including students, faculty members, and administrators, expend considerable time and effort on manual tasks such as data entry, communication, and coordination. This not only detracts from their primary academic responsibilities but also results in decreased productivity and delays in the thesis management process.
2. **Lack of Real-Time Collaboration:** The absence of real-time collaboration features in existing tools impedes effective communication and coordination among stakeholders. This leads to delays in feedback dissemination, difficulties in scheduling reviews, and occasional duplication of efforts as individuals work with outdated information.
3. **Error-Prone Processes:** Manual management introduces a heightened risk of errors, including overlooking updates, mismanaging document versions, and missing deadlines. These errors undermine the accuracy and timeliness of thesis submissions, potentially impacting academic outcomes and student success.
4. **Limited Accessibility:** Accessibility to critical information is constrained by the fragmented nature of existing systems, which may involve locally stored files or single shared drives with restricted access. This limitation impedes transparency and collaboration among stakeholders, hindering the efficient management of thesis-related tasks.
5. **Poor Scalability:** Manual systems struggle to scale effectively with the growing volume of tasks and collaborations, leading to management challenges and decreased efficiency. As the

complexity of thesis management increases, stakeholders face difficulties in maintaining the integrity and effectiveness of existing processes.

Addressing these challenges requires a comprehensive solution that leverages modern technologies to streamline thesis management processes, enhance collaboration, ensure data accuracy, improve accessibility, and facilitate scalability. By addressing these issues, academic institutions can optimize their thesis management workflows, ultimately enhancing the academic experience for students, faculty members, and administrators alike.

3.0 Proposed Solution

To address the inefficiencies and limitations in current thesis management practices within academic institutions, implementing a comprehensive and modernized Thesis Management System (TMS) can significantly improve the overall process. The TMS should incorporate the following key features to streamline operations, enhance collaboration, ensure data accuracy, improve accessibility, and facilitate scalability:

1. **Automation of Manual Tasks:** Replace manual data entry tasks with automated processes wherever possible. Implement features such as automatic notifications, reminders, and updates to reduce the time and effort spent on administrative tasks.
2. **Real-Time Collaboration:** Incorporate real-time collaboration tools into the TMS, such as a shared dashboard for all stakeholders to view project statuses, provide feedback, schedule meetings, and collaborate seamlessly. This will enhance communication and coordination among stakeholders.
3. **Version Control and Deadline Management:** Implement robust version control mechanisms to track changes in documents and ensure that all stakeholders are working with the latest information. Integrate deadline management features to provide timely reminders and notifications for upcoming milestones.
4. **Centralized Information Hub:** Create a centralized platform where all thesis-related information, documents, feedback, and reviews are stored securely and accessible to authorized stakeholders. This will improve transparency and accessibility to critical data.
5. **Scalability and Flexibility:** Design the TMS to be scalable, allowing it to adapt to the evolving needs of academic institutions with increasing thesis volumes. Ensure that the system is flexible enough to accommodate changes in processes and workflows.

From an economic feasibility standpoint, the proposed solution would still require an initial investment into purchasing hardware such as a few servers to accommodate more users of the system and would imply the need to carry out maintenance work so that the server can function even during peak hours. However with the increasing usage of the system among the academic society, the stakeholders can expect to gain some amount of profit gradually. In terms of operational feasibility, the TMS is suitable to be used in universities given how the system works to make the daunting tasks that are academic related more manageable and convenient to faculty members, admins and students alike. The proposed system also takes user-friendliness into consideration as the factor will affect whether the system will be the de-facto system where every members in the university would be able to use it as soon as possible, Technical feasibility wise, the system would not deviate greatly from the system before and as much as improvements were made, it would still perform the same tasks so that the stakeholders using the new system can easily pick up the new system. Furthermore, fewer expertise and personnel are needed to develop and lastly maintain the system.

4.0 CURRENT BUSINESS PROCESS / WORKFLOW

1. Submission of Thesis Proposal:

- Participants: Student, Supervisor
- Current Method: Students send their proposals via email to the supervisor.
- Tools: Email
- Challenges: Emails can get lost or overlooked, and there is no central tracking system.

2. Review of Proposal:

- Participants: Supervisor
- Current Method: Supervisors read the proposal and provide feedback via email or printed copy.
- Tools: Email, Printed Documents
- Challenges: Feedback might be delayed, and there is no standardized format.

3. Approval of Proposal:

- Participants: Supervisor
- Current Method: Once the proposal is satisfactory, the supervisor sends an approval email.
- Tools: Email
- Challenges: No centralized record of approvals, and tracking progress is difficult.

4. Draft Submission:

- Participants: Student
- Current Method: Students email their draft to the supervisor.
- Tools: Email

- Challenges: Similar to proposal submission, emails can be lost, and tracking revisions is cumbersome.

5. Draft Review and Feedback:

- Participants: Supervisor
- Current Method: Supervisors review the draft and provide feedback via email or annotations on a printed copy.
- Tools: Email, Printed Documents
- Challenges: Delays in receiving feedback, difficulty in managing multiple revisions.

6. Final Submission:

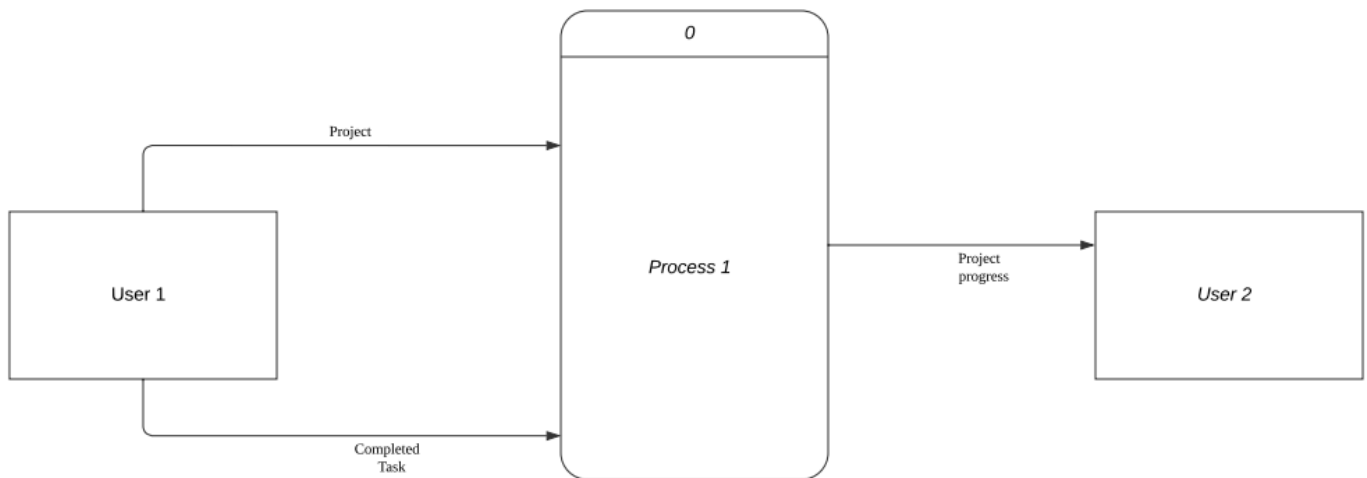
- Participants: Student
- Current Method: After incorporating feedback, students submit the final version via email.
- Tools: Email
- Challenges: Tracking final submissions and ensuring all feedback has been addressed can be challenging.

7. Approval of Final Thesis:

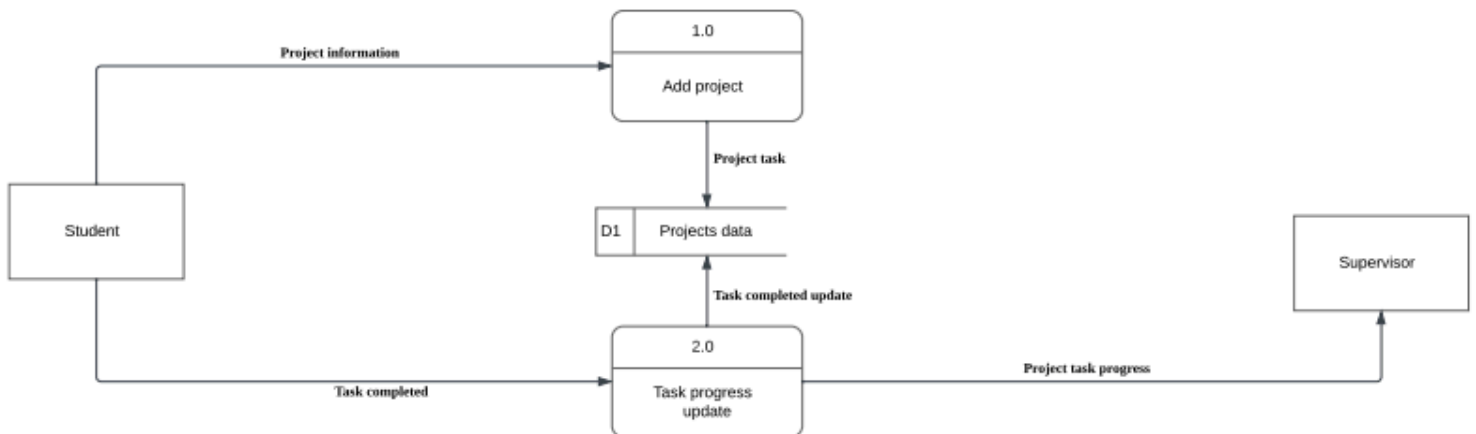
- Participants: Supervisor, Academic Committee
- Current Method: The final thesis is reviewed, and approval is communicated via email.
- Tools: Email
- Challenges: Ensuring timely approvals and maintaining records of approvals.

5.0 LOGICAL DFD (AS-IS)

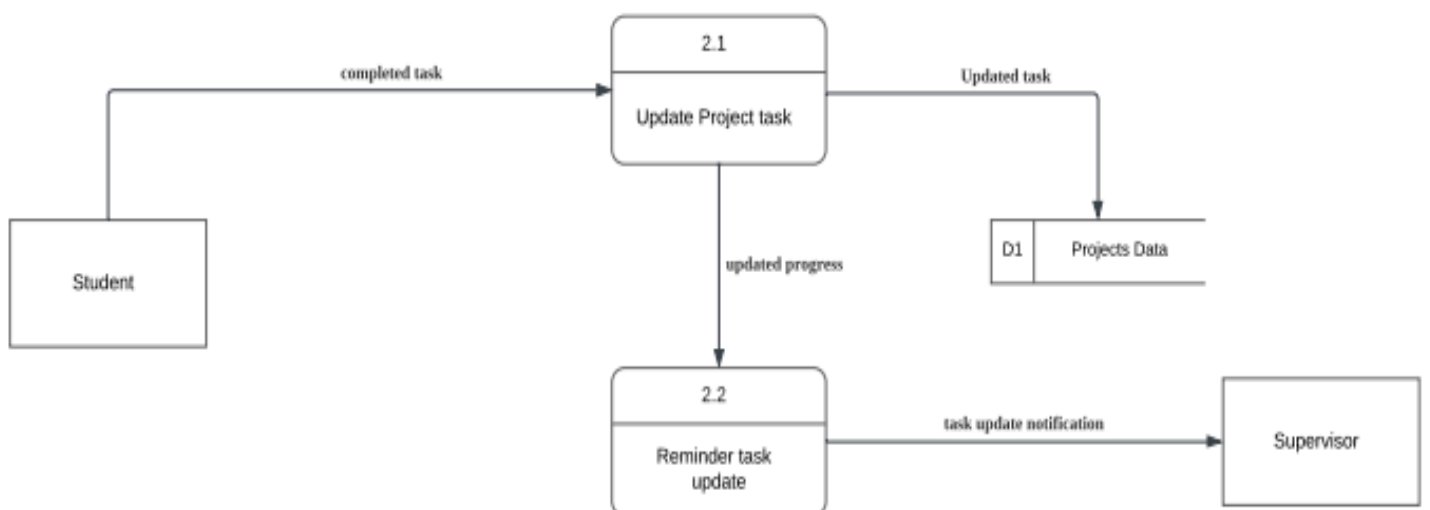
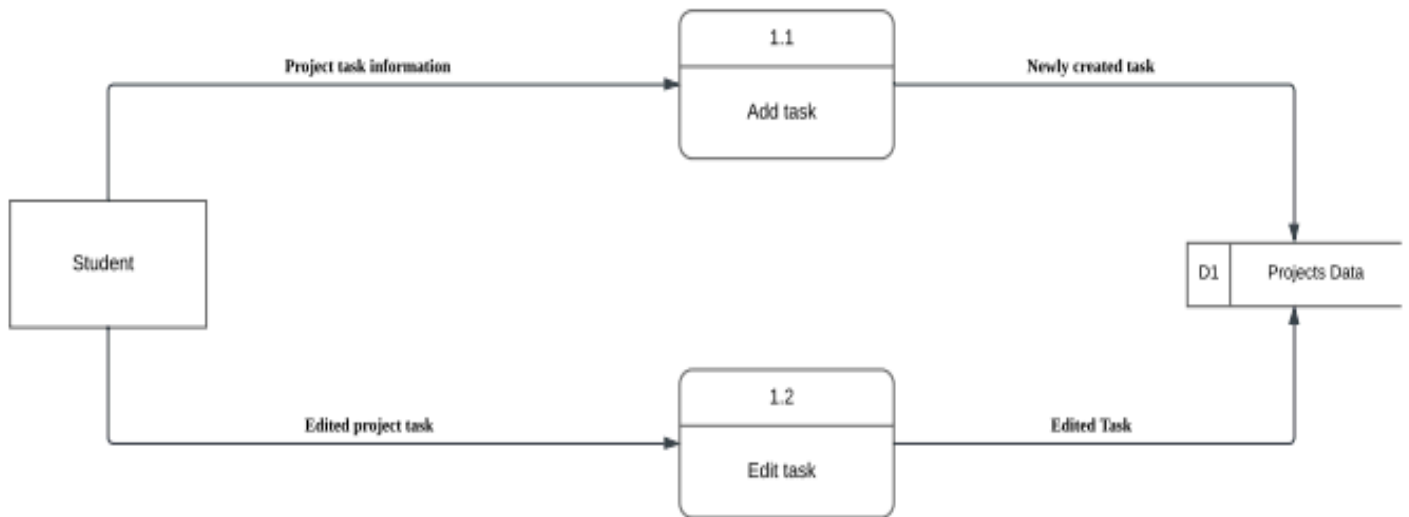
1. Context Diagram



2. Level 0 diagram



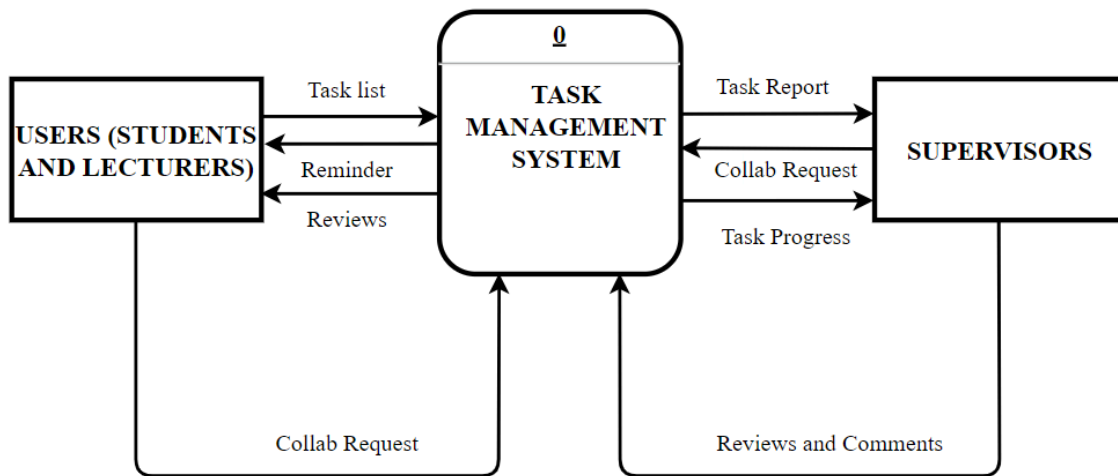
3. Child diagram



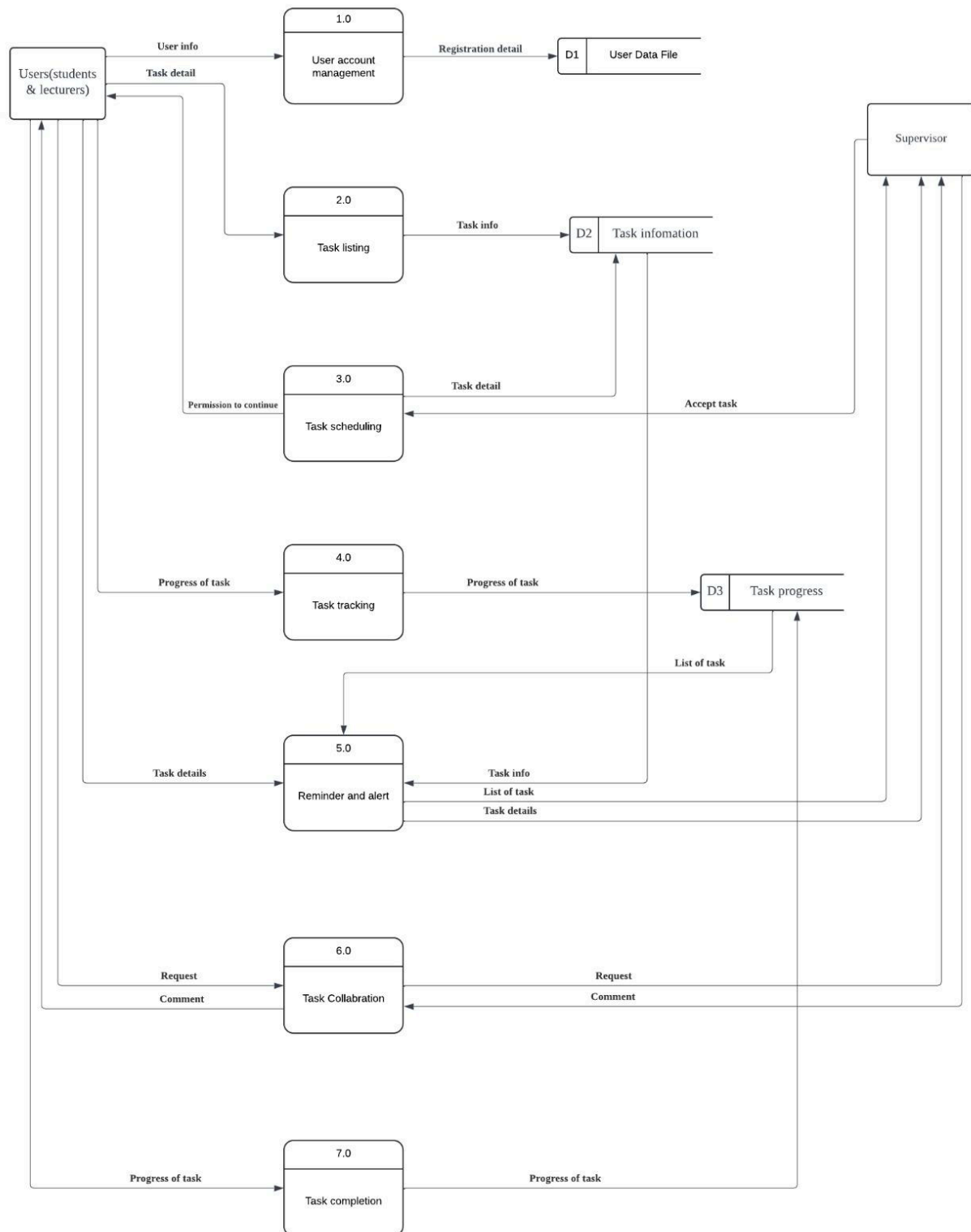
6.0 SYSTEM ANALYSIS AND SPECIFICATION

6.1 Logical DFD TO-BE system

1. Context Diagram

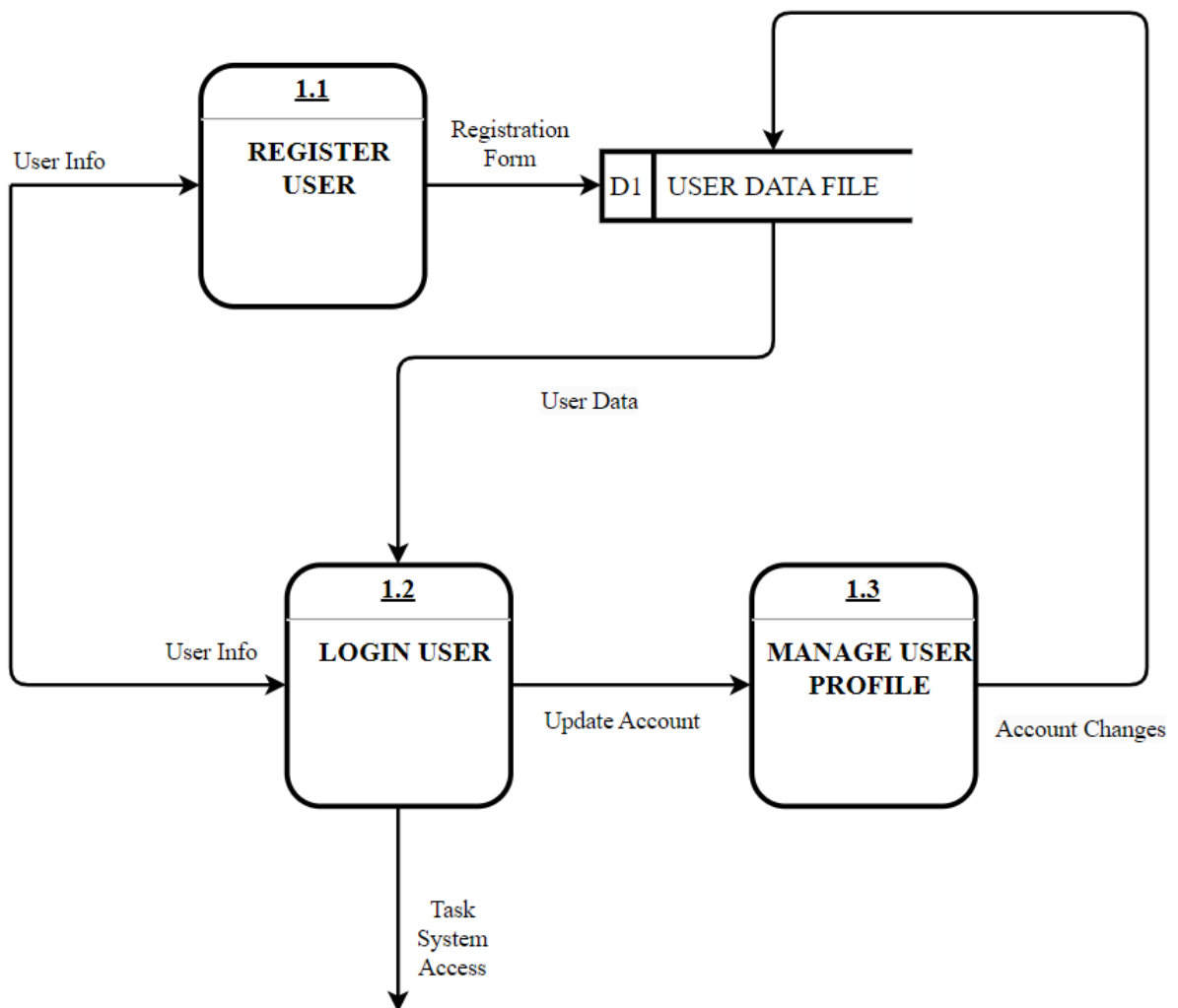


2. Level 0 Diagram

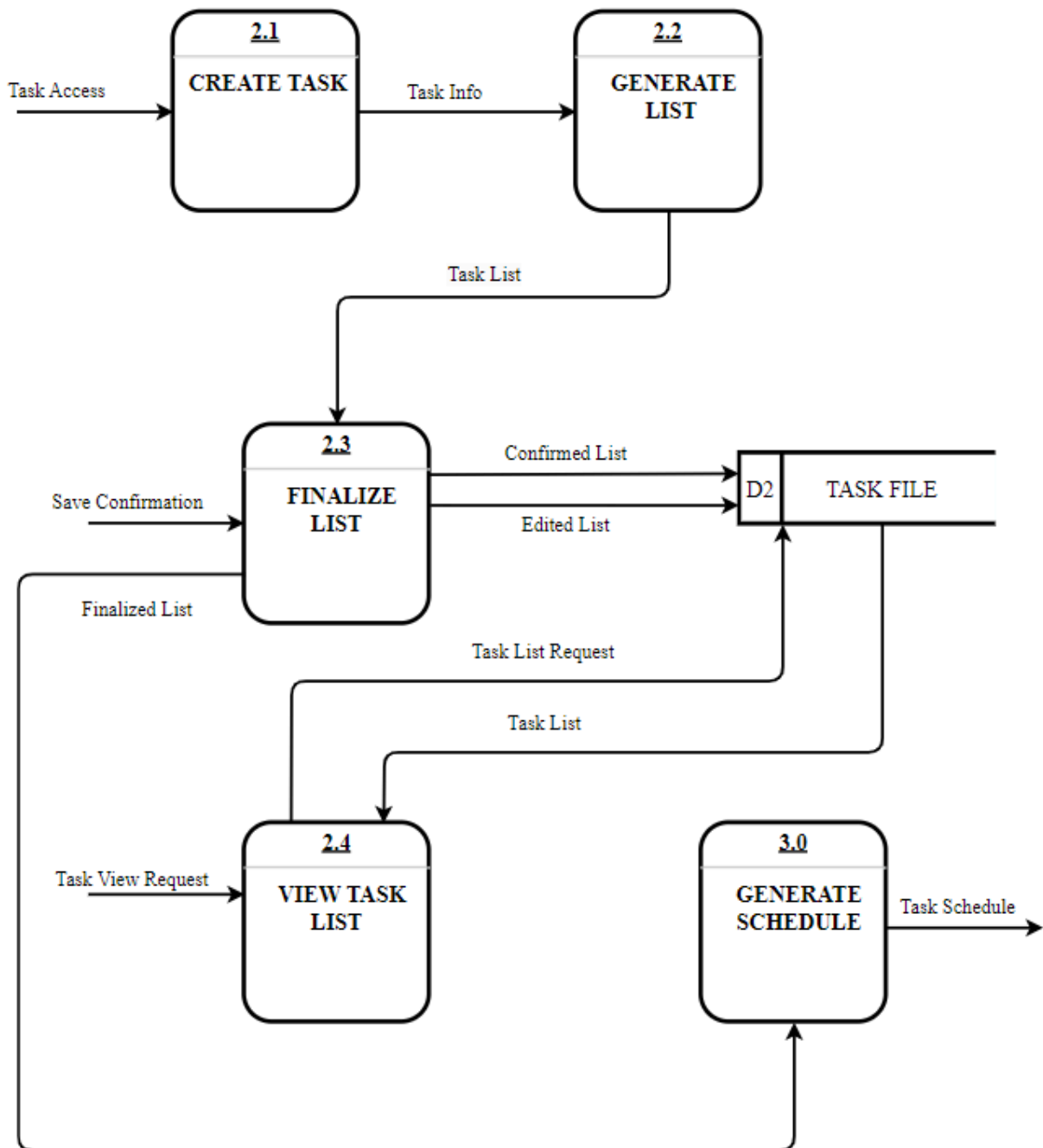


3. Child Diagram

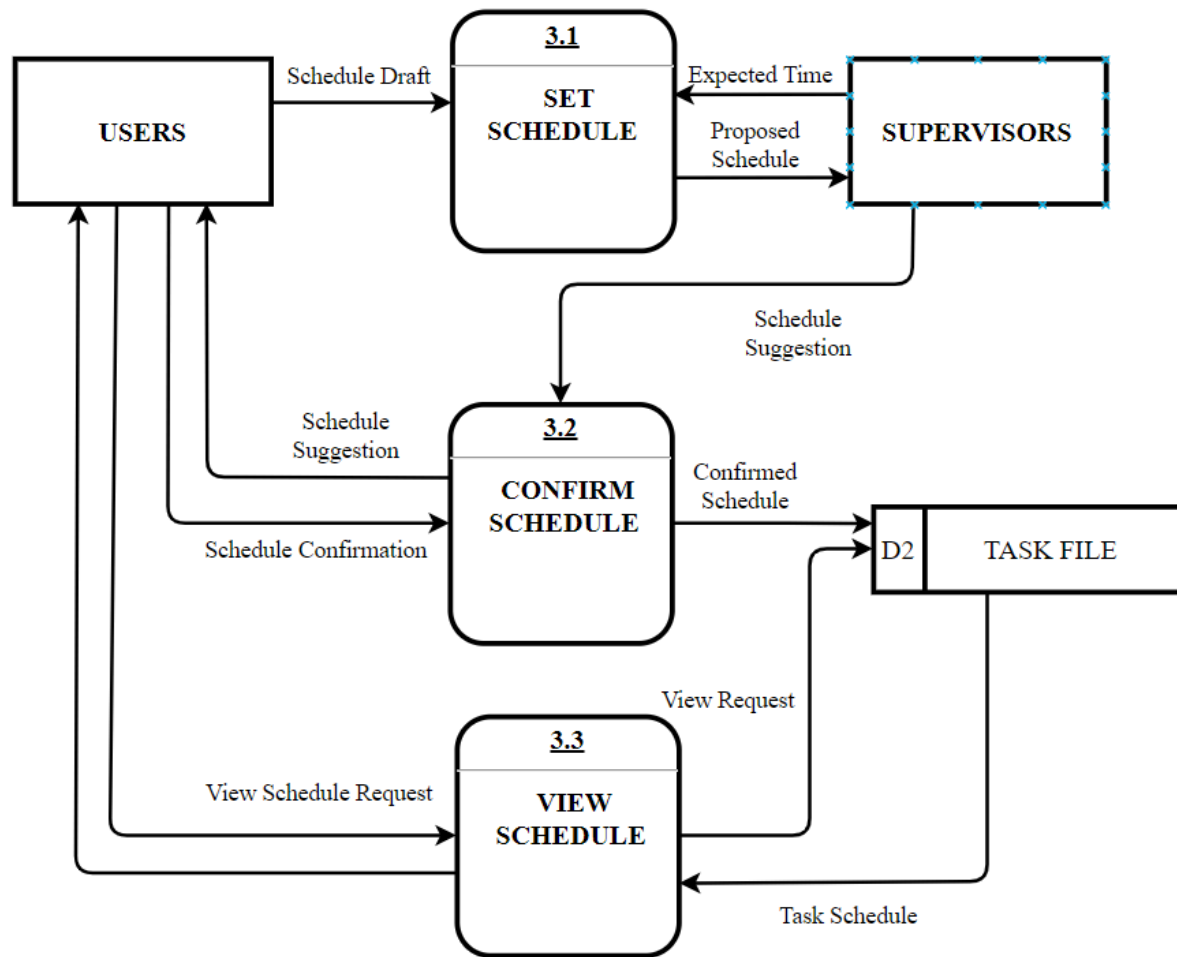
1.0 User Account Management



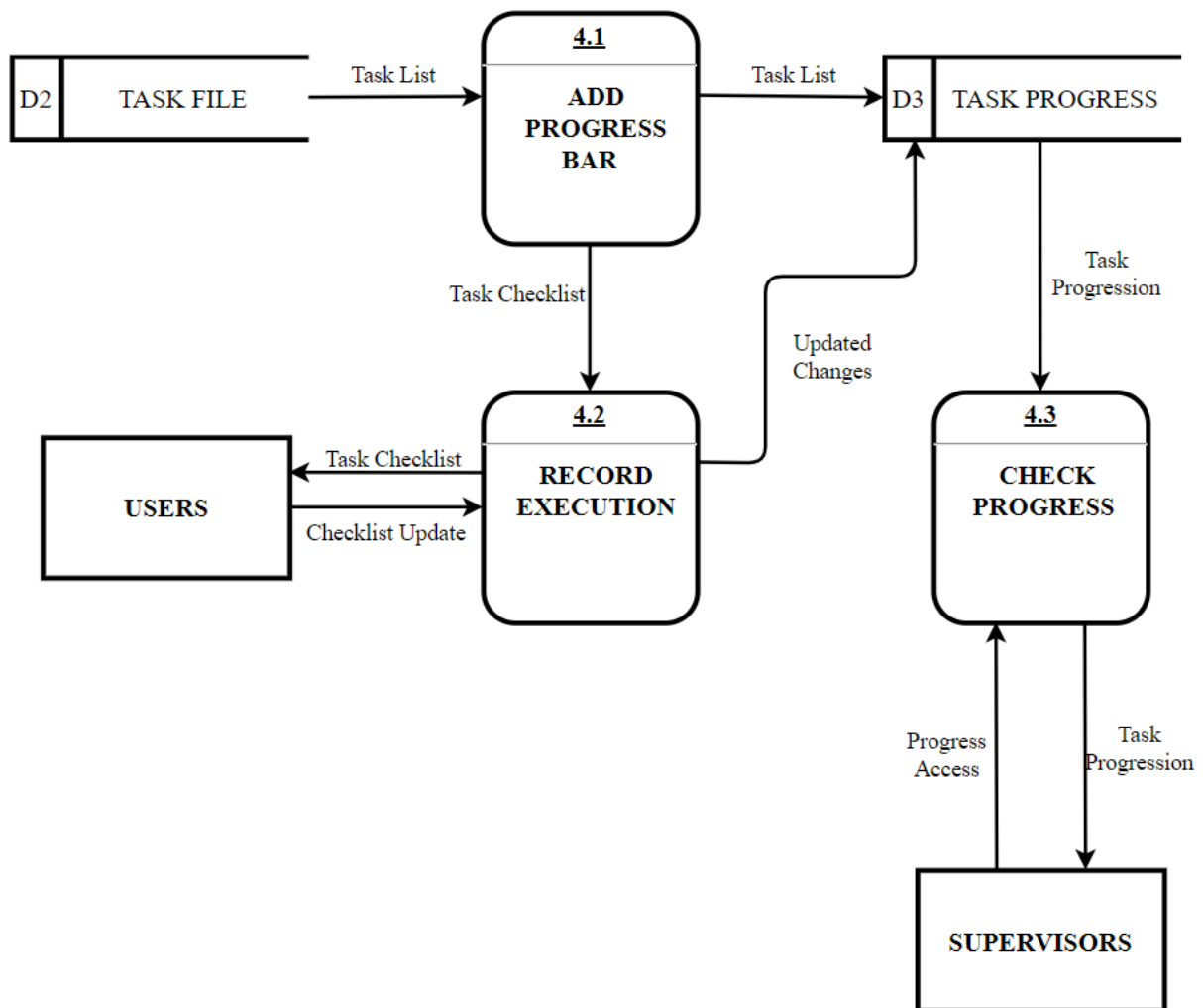
2.0 Task Listing



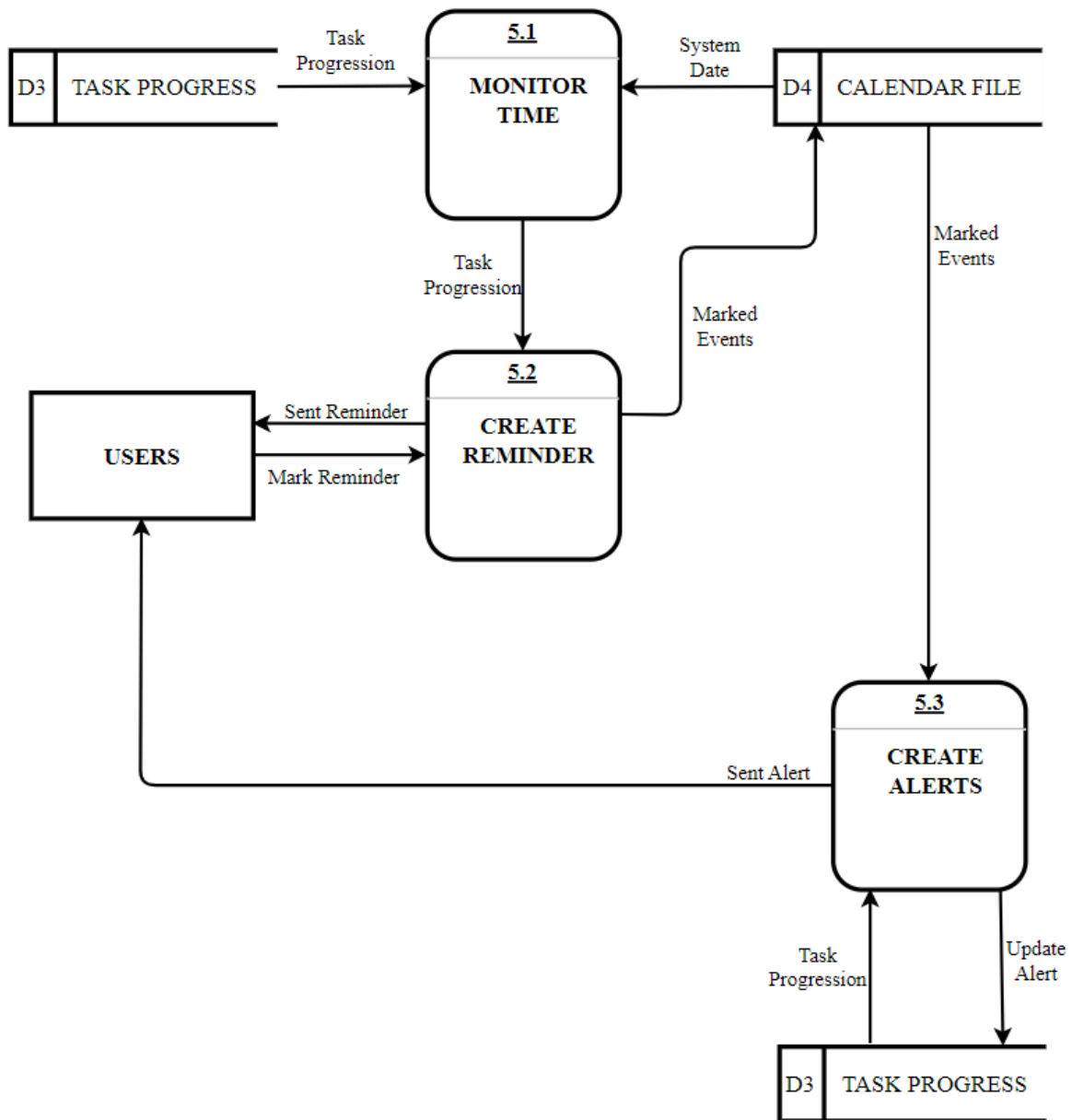
3.0 Task Schedule



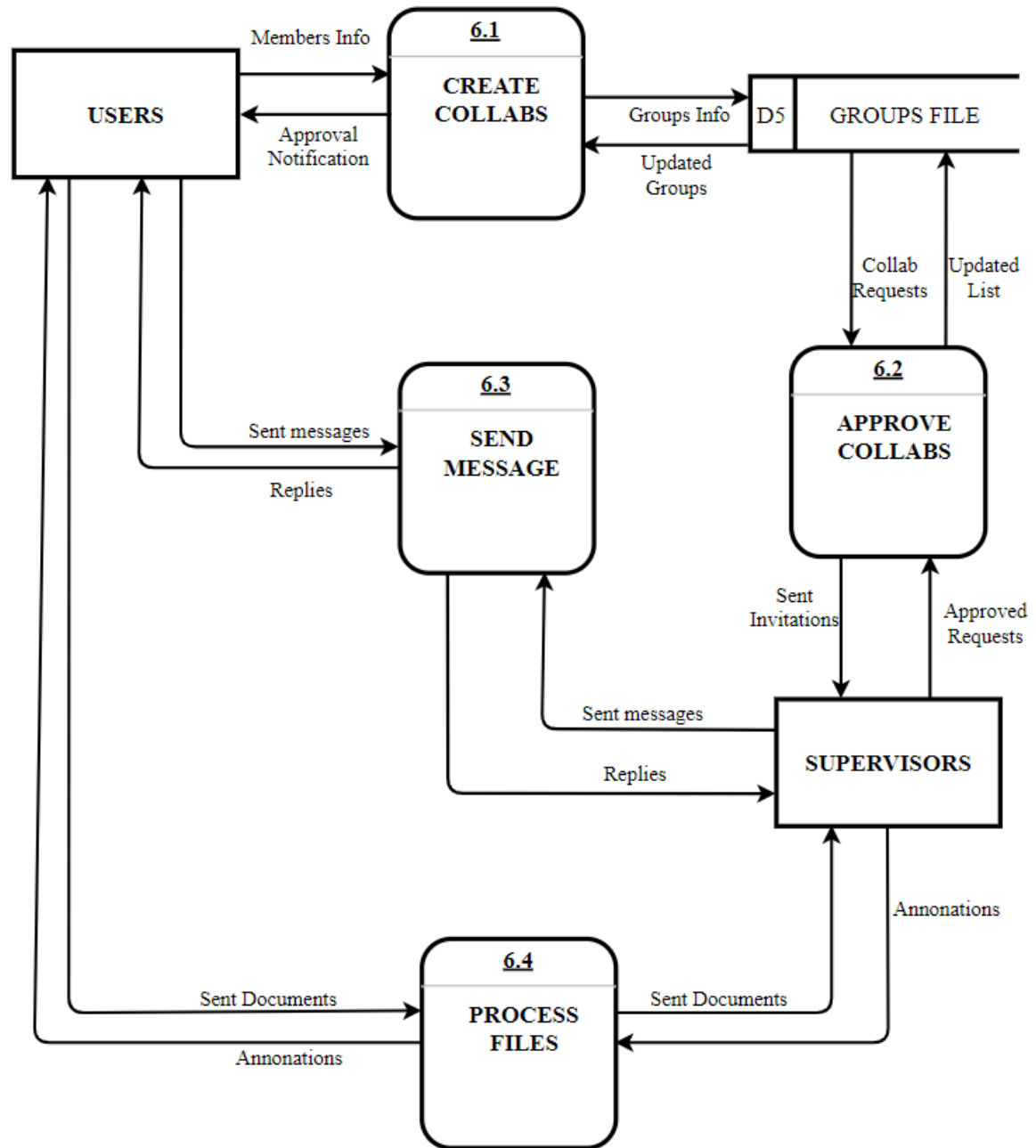
4.0 Track Progress



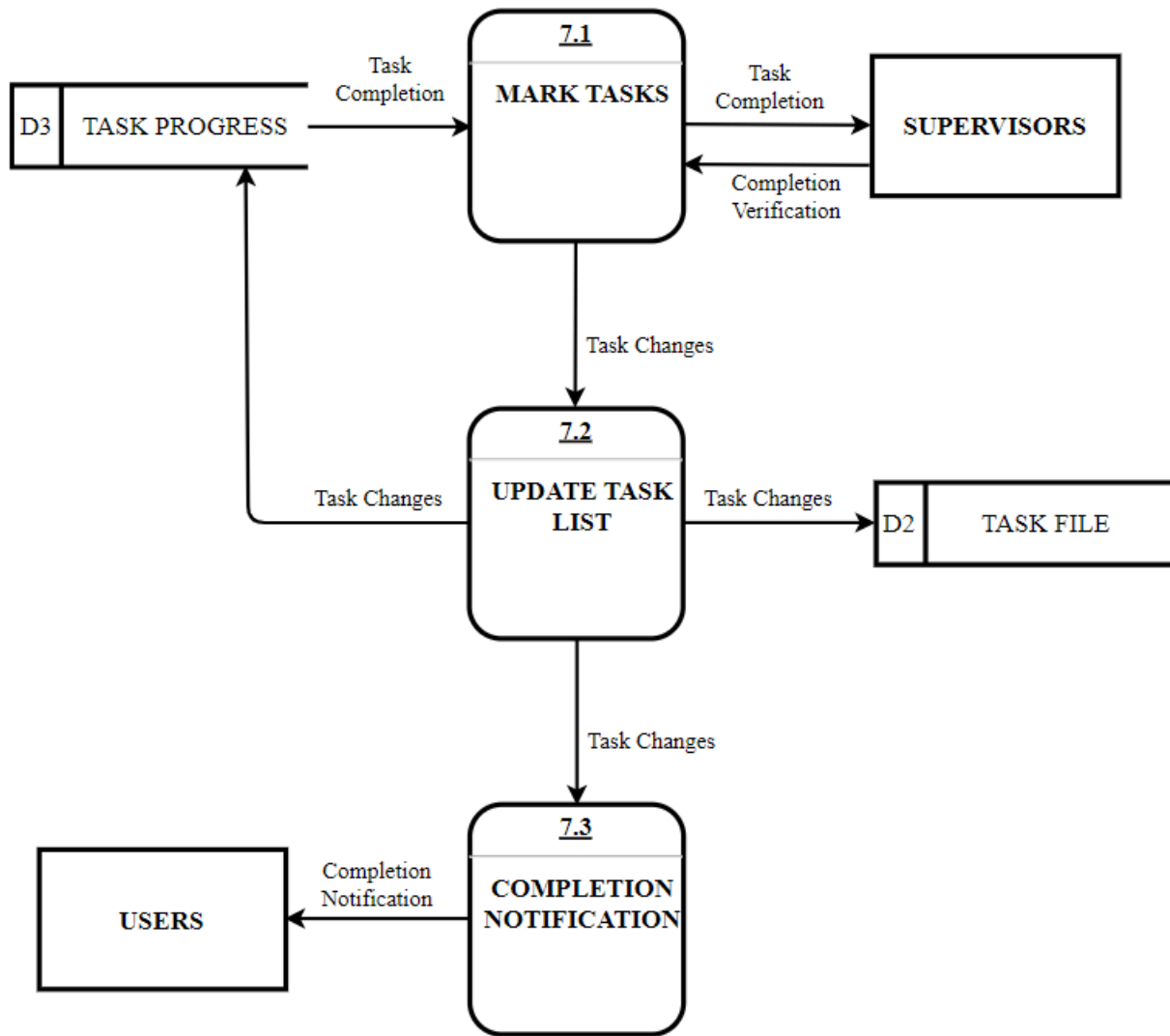
5.0 Reminders and Alerts



6.0 Collaborations



7.0 Task Completion



6.2 Process Specification (based on Logical DFD TO-BE)

PROCESS	1.1 REGISTER USER
DESCRIPTION	The first-time user keys in their credentials on the registration form.
INPUT	USER INFO
OUTPUT	REGISTRATION FORM
PROCESS	1.2 LOGIN USER
DESCRIPTION	The user keys in their info and the compares with existing record from USER DATA FILE data store. Will go to MANAGE USER PROFILE if user request to update users' data.
INPUT	USER INFO USER DATA from USER DATA FILE
OUTPUT	UPDATE ACCOUNT TASK SYSTEM ACCESS
PROCESS	1.3 MANAGE USER PROFILE
DESCRIPTION	This process is done when users wanted to make changes or edit their accounts, then store the changes to update the record in USER DATA FILE.
INPUT	UPDATE ACCOUNT
OUTPUT	ACCOUNT CHANGES
PROCESS	2.1 CREATE TASK
DESCRIPTION	Allows authorized users to create the different tasks needed to be done for a particular project or thesis.
INPUT	TASK ACCESS
OUTPUT	TASK INFO

PROCESS	2.2 GENERATE LIST
DESCRIPTION	Generate a list to present the different task as a list in order to have a simplified view for a particular project or task.
INPUT	TASK INFO
OUTPUT	TASK LIST
PROCESS	2.3 FINALIZE LIST
DESCRIPTION	User reviews the generated list of tasks then confirms whether or not to save the list of tasks. It then stores the unchanged or edited list in the TASK FILE data store. Then, create schedule based on the list.
INPUT	SAVE CONFIRMATION
OUTPUT	CONFIRMED LIST EDITED LIST FINALIZED LIST
PROCESS	2.4 VIEW TASK LIST
DESCRIPTION	This process receives user request to view the lists of tasks. It retrieves the task list from the TASK FILE data store then presents it to the requested user.
INPUT	TASK VIEW REQUEST
OUTPUT	TASK LIST
PROCESS	3.1 SET SCHEDULE
DESCRIPTION	User submits his/her schedule draft to the Supervisors and can negotiate with the Supervisor to create a suggested schedule.
INPUT	PROPOSED SCHEDULE EXPECTED COMPLETION TIME
OUTPUT	PROPOSED SCHEDULE

PROCESS	3.2 CONFIRM SCHEDULE
DESCRIPTION	The Supervisors presents the suggested schedule for the User to review and finalize. The finalize schedule will then be stored to the TASK FILE data store after receiving confirmation from user.
INPUT	SUGGESTED SCHEDULE SCHEDULE CONFIRMATION
OUTPUT	SUGGESTED SCHEDULE CONFIRMED SCHEDULE
PROCESS	3.3 VIEW SCHEDULE
DESCRIPTION	This process receives user request to view the schedule for his/her tasks. It retrieves the task list from the TASK FILE data store then creates a schedule for user to view.
INPUT	VIEW SCHEDULE REQUEST TASK SCHEDULE from TASK FILE data store
OUTPUT	VIEW REQUEST TASK SCHEDULE
PROCESS	4.1 ADD PROGRESS BAR
DESCRIPTION	This process will receive the task list and define a progress bar in the lists of task then store the tasks list with progress bar in the TASK PROGRESS data store for future use. A task checklist is also created and sent to the user for tracking.
INPUT	TASK LIST
OUTPUT	TASK CHECKLIST TASK LIST

PROCESS	4.2 RECORD EXECUTION
DESCRIPTION	This process will update the changes on the task checklist each time the user had made any attempts to complete the task on the task list. It requests the user to input a completed task then stores the changes made to the task list based on the input.
INPUT	TASK CHECKLIST CHECKLIST UPDATE
OUTPUT	TASK CHECKLIST UPDATED CHANGES
PROCESS	4.3 CHECK PROGRESS
DESCRIPTION	Corresponding Supervisors can check in on the progress of the project or tasks being done up until the current moment.
INPUT	PROGRESS ACCESS TASK PROGRESSION from TASK PROGRESS data store
OUTPUT	TASK PROGRESSION
PROCESS	5.1 MONITOR TIME
DESCRIPTION	The process involves continuously referring the task progress and the calendar that is matched with the schedule, then sends the task progression to the next process.
INPUT	TASK PROGRESSION from TASK PROGRESS data store SYSTEM DATE from CALENDAR FILE data store
OUTPUT	TASK PROGRESSION

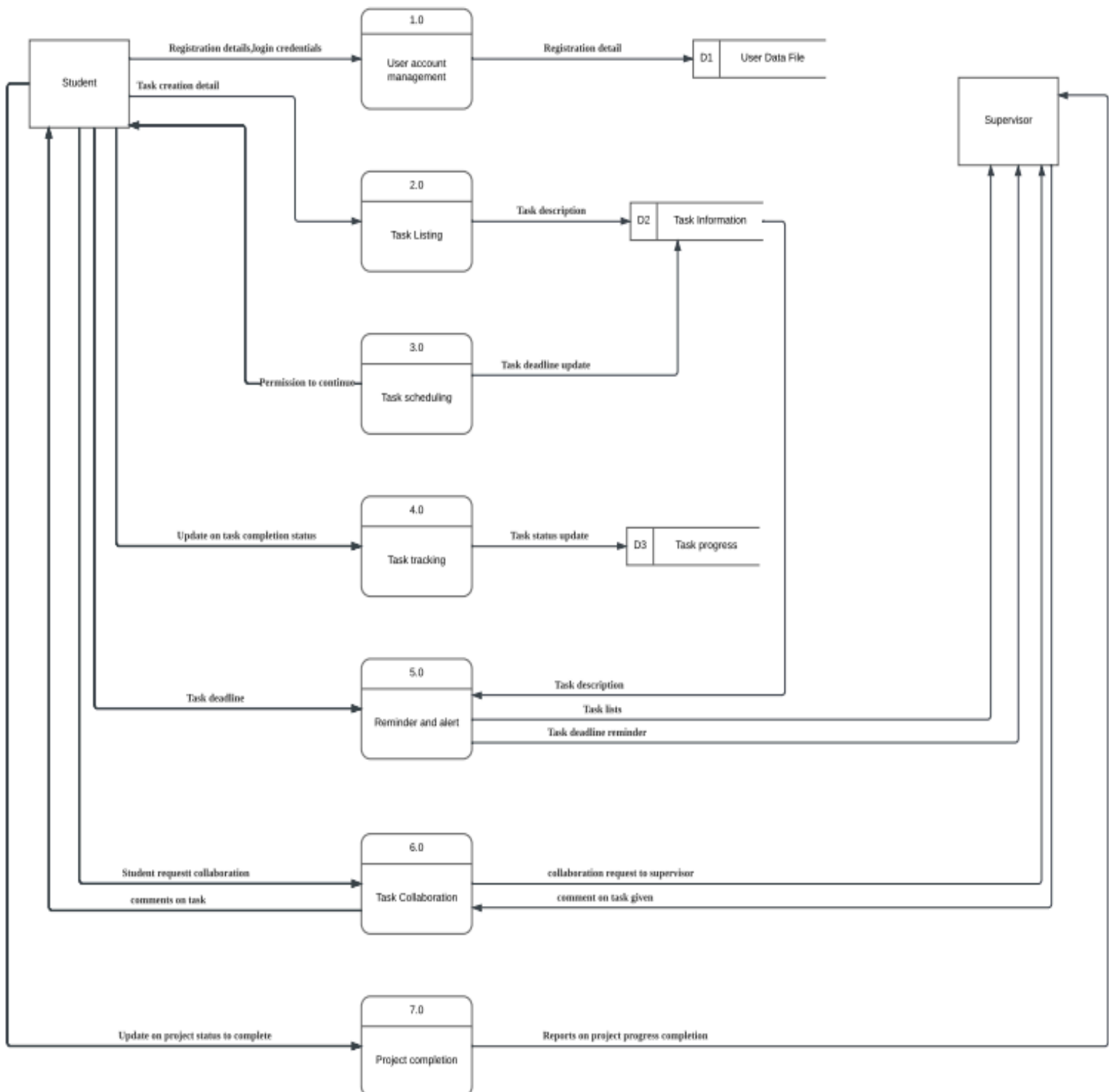
PROCESS	5.2 CREATE REMINDER
DESCRIPTION	This process will receive the updates from task progression and let users to define or mark an event on the calendar and stores the changes so that they can receive reminders.
INPUT	TASK PROGRESSION MARKED EVENT REMINDERS
OUTPUT	MARKED EVENT REMINDERS SENT REMINDERS
PROCESS	5.3 CREATE ALERTS
DESCRIPTION	In the case of user not being notified or have received any reminders, the system will then create a specialized alert to the user based on the marked calendar and stores the update the status of the alert after sending to the user.
INPUT	MARKED EVENT REMINDERS TASK PROGRESSION
OUTPUT	UPDATE ALERT SENT ALERT
PROCESS	6.1 CREATE COLLABS
DESCRIPTION	This process creates groups based on the list of related users that are involved with the same project or thesis and easy management for the corresponding supervisors.
INPUT	MEMBERS INFO UPDATED GROUPS
OUTPUT	GROUPS INFO APPROVAL NOTIFICATION

PROCESS	6.2 APPROVE COLLABS
DESCRIPTION	Supervisors will build and manage a group of users and can themselves request to be involved in the group to offer direct guidance or assistance if needed.
INPUT	COLLAB REQUESTS from GROUPS FILE APPROVED REQUEST
OUTPUT	SENT INVITATIONS UPDATED GROUP LIST
PROCESS	6.3 SEND MESSAGE
DESCRIPTION	Supervisors can send and give out replies to Users and vice versa as a way to implement communications between two sides.
INPUT	SENT MESSAGES from USERS SENT MESSAGES from SUPERVISORS
OUTPUT	REPLIES from USERS REPLIES from SUPERVISORS
PROCESS	6.4 PROCESS FILES
DESCRIPTION	Users and Supervisors send documents for the project or thesis through the collaborations module. Supervisors can edit or mark the document while Users can only view the annotated document.
INPUT	SENT DOCUMENTS from USERS ANNONATIONS from SUPERVISORS
OUTPUT	SENT DOCUMENTS ANNONATIONS

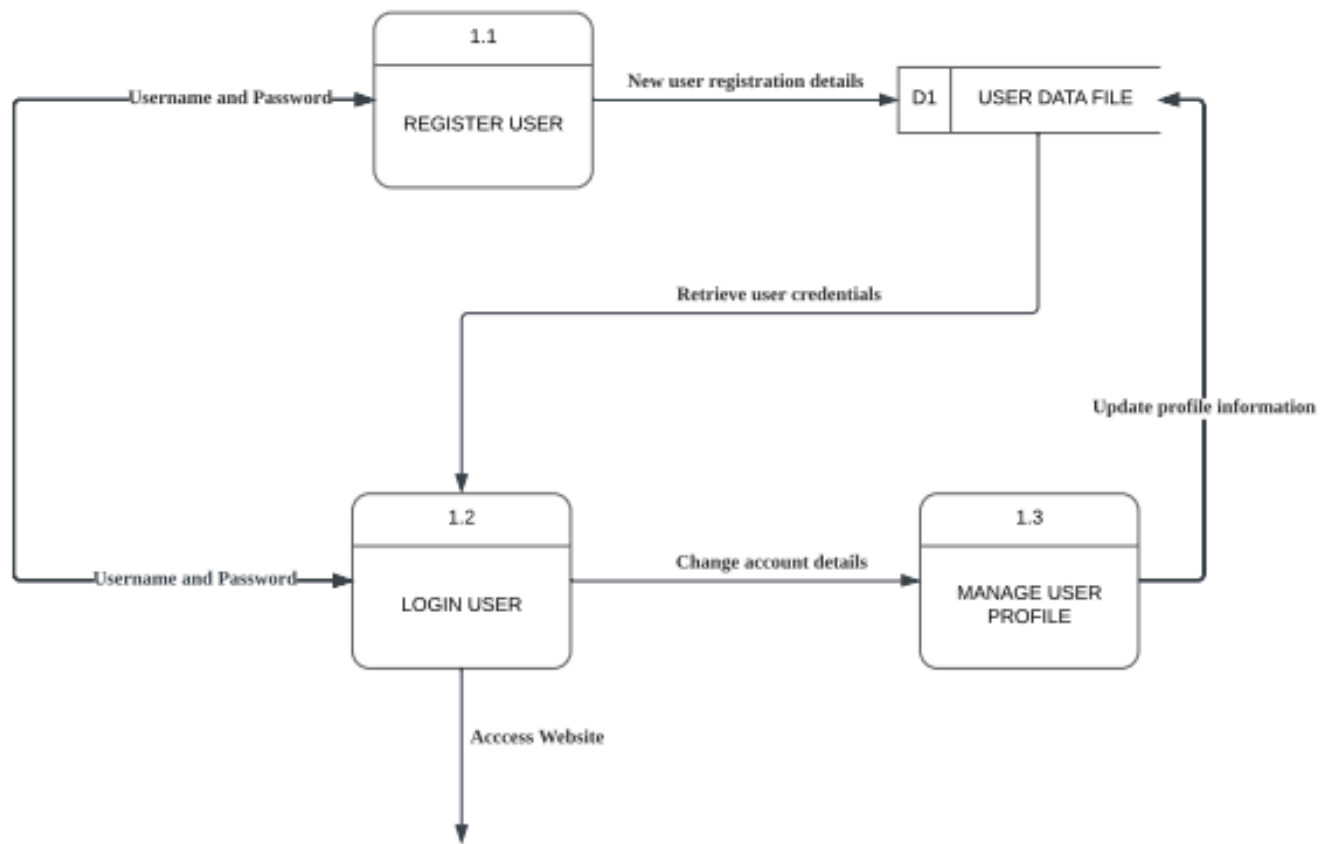
PROCESS	7.1 MARK TASKS
DESCRIPTION	The partially completed task list is sent to the SUPERVISORS for verification and validation.
INPUT	TASK COMPLETION from TASK PROGRESS FILE COMPLETION VERIFICATION
OUTPUT	TASK COMPLETION TASK CHANGES
PROCESS	7.2 UPDATE TASK LIST
DESCRIPTION	This process will update the task changes by removing the records from TASK PROGRESS and TASK FILE data store then notifies the Users about the completion.
INPUT	TASK CHANGES
OUTPUT	TASK CHANGES
PROCESS	7.3 SEND COMPLETION NOTIFICATION
DESCRIPTION	The system will send a notification to notify the Users that their task had been successfully verified by their Supervisors.
INPUT	TASK CHANGES
OUTPUT	COMPLETION NOTIFICATION

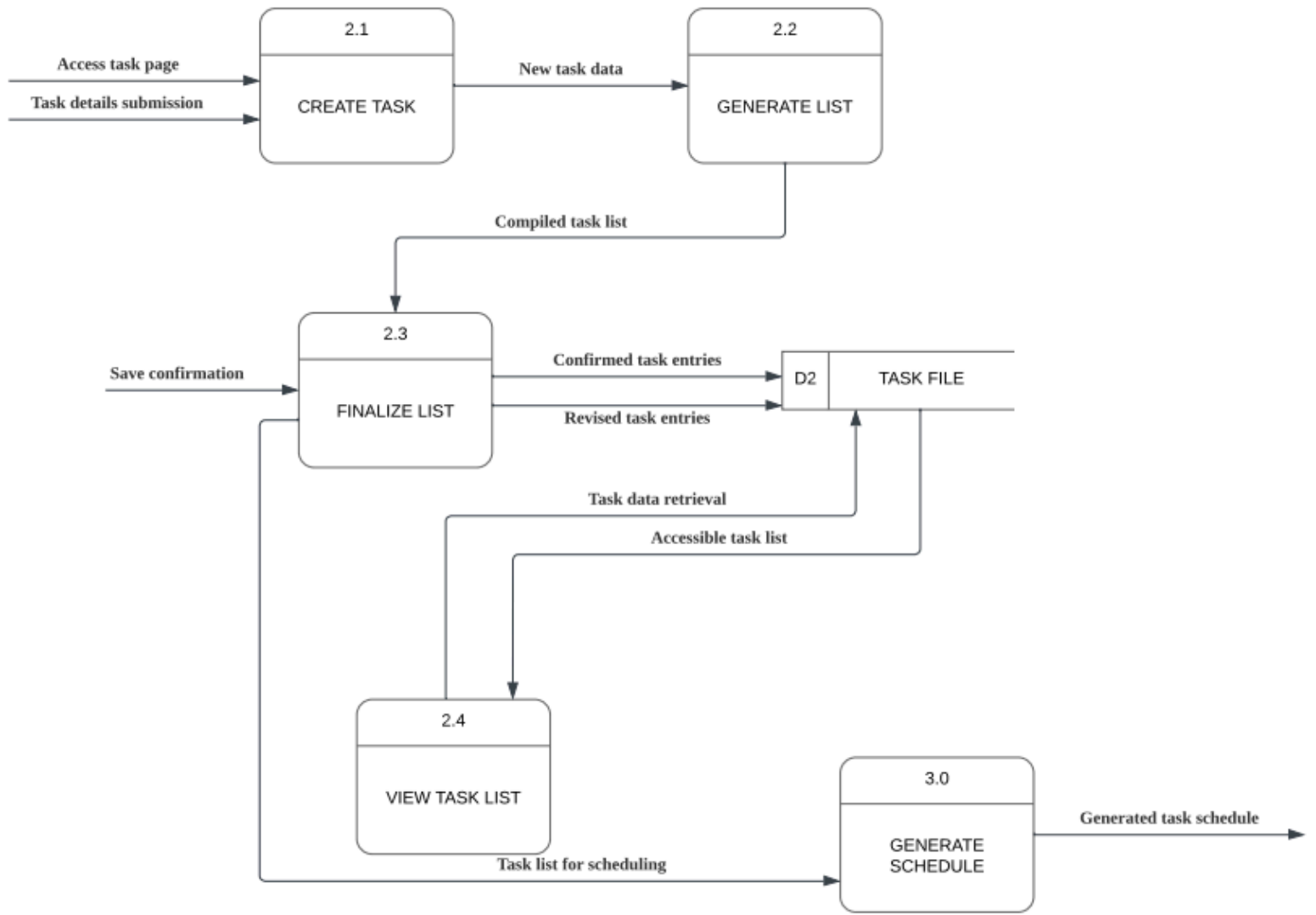
7.1 PHYSICAL DFD TO-BE

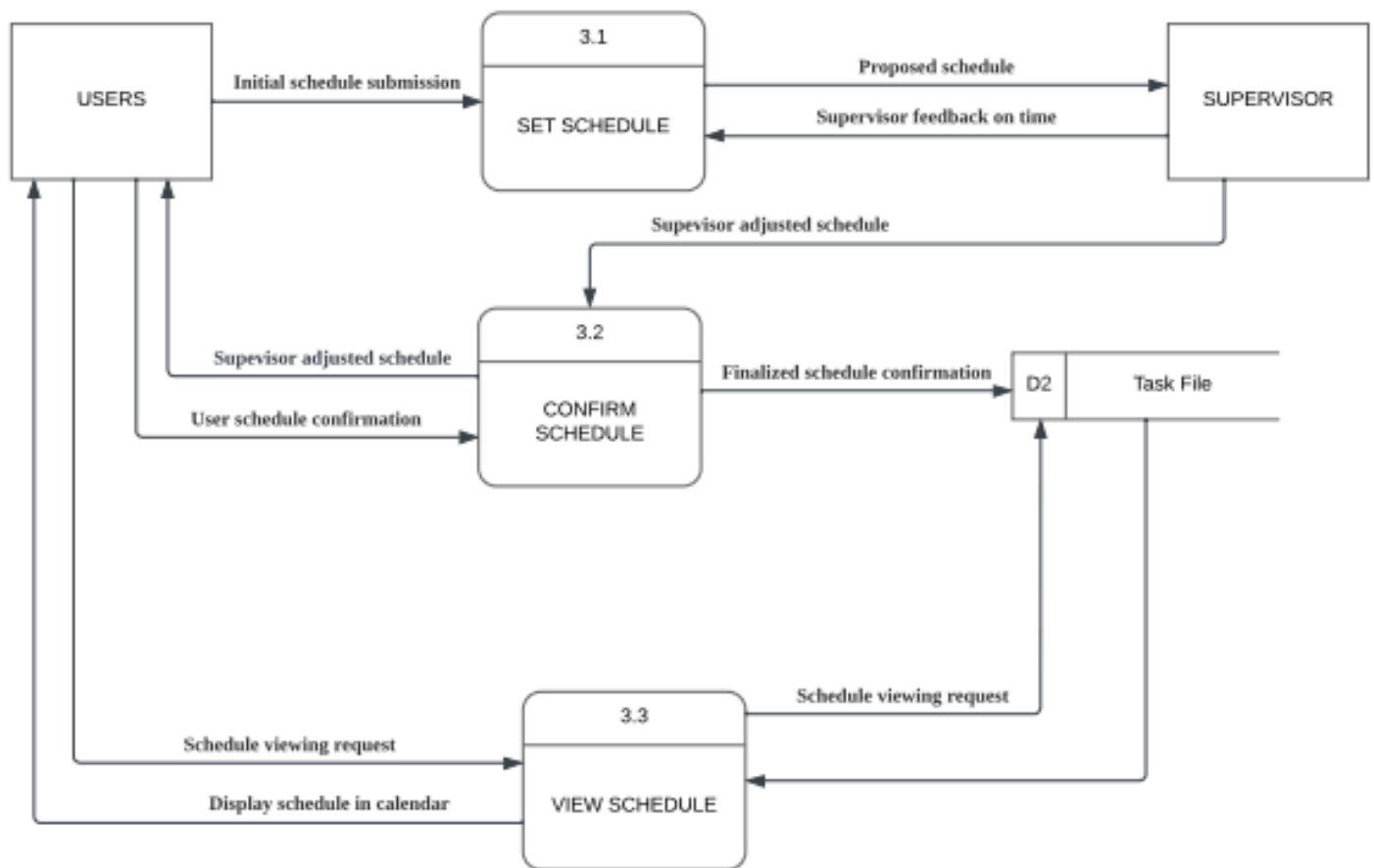
Level 0 Diagram

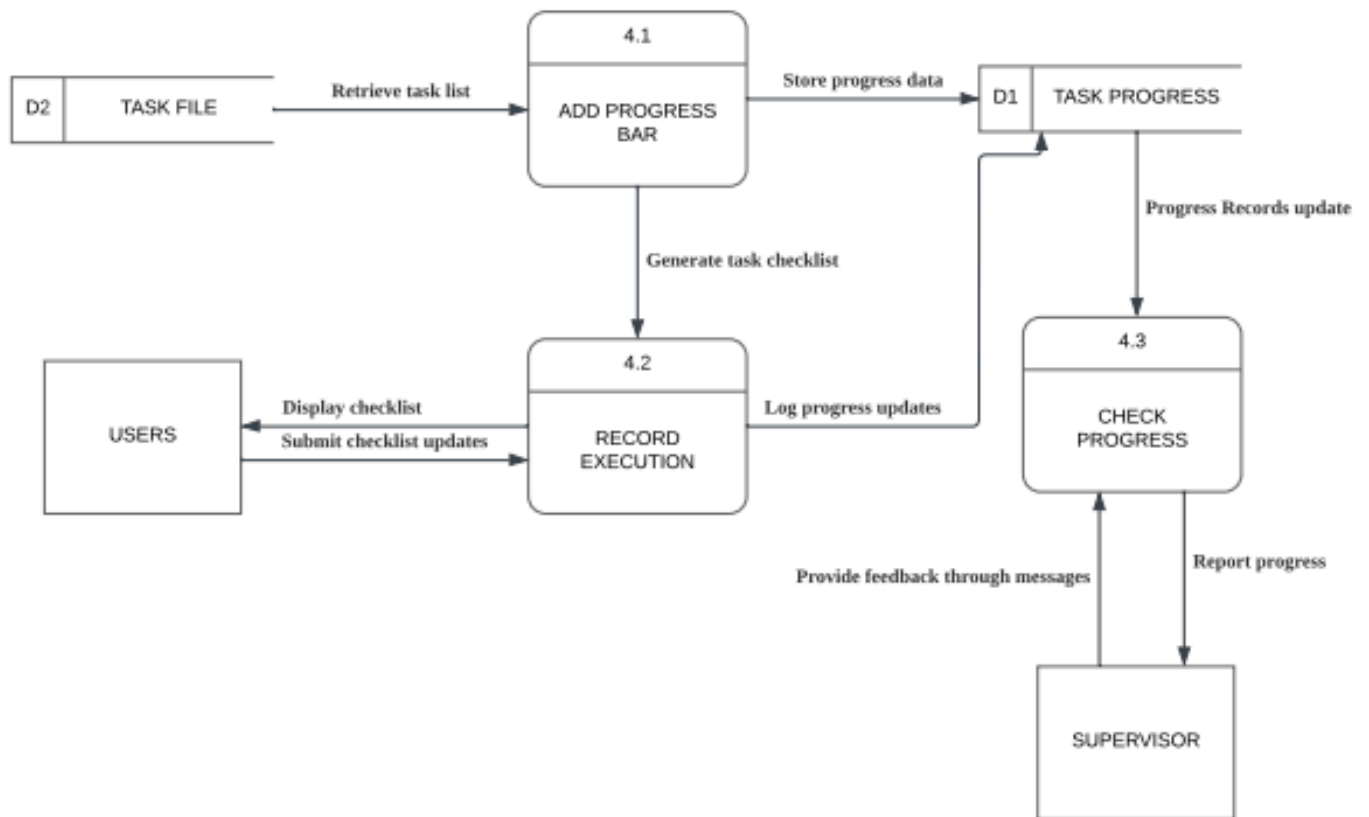


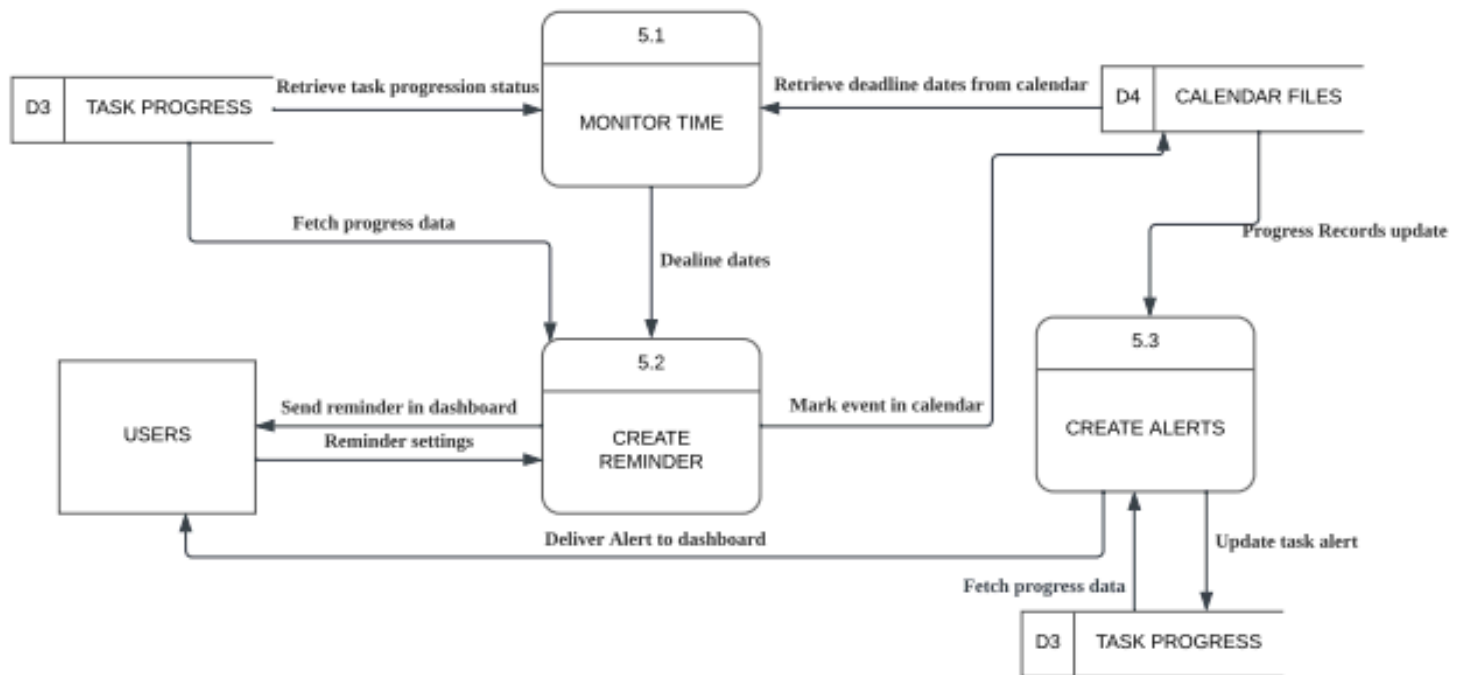
Child Diagram

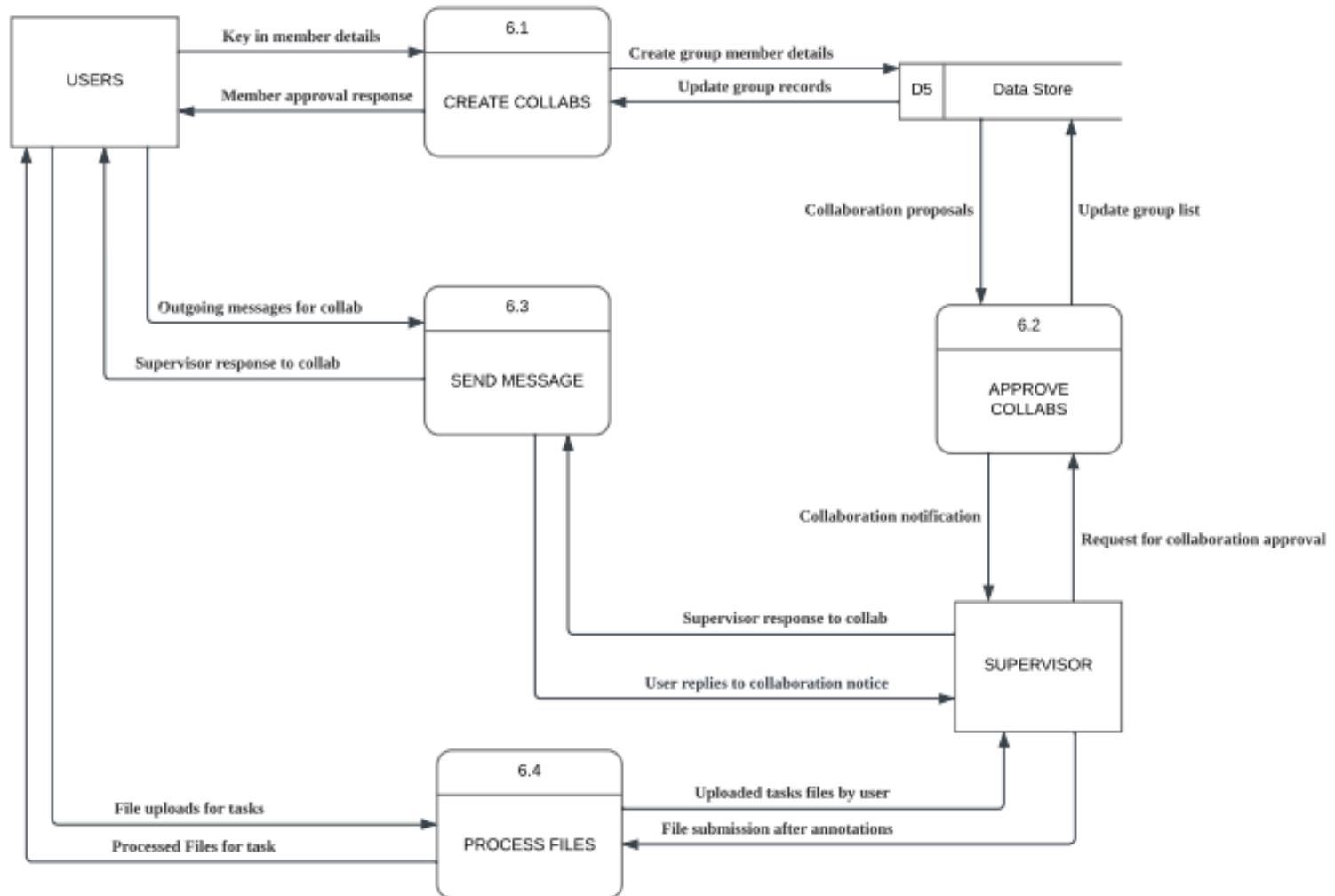


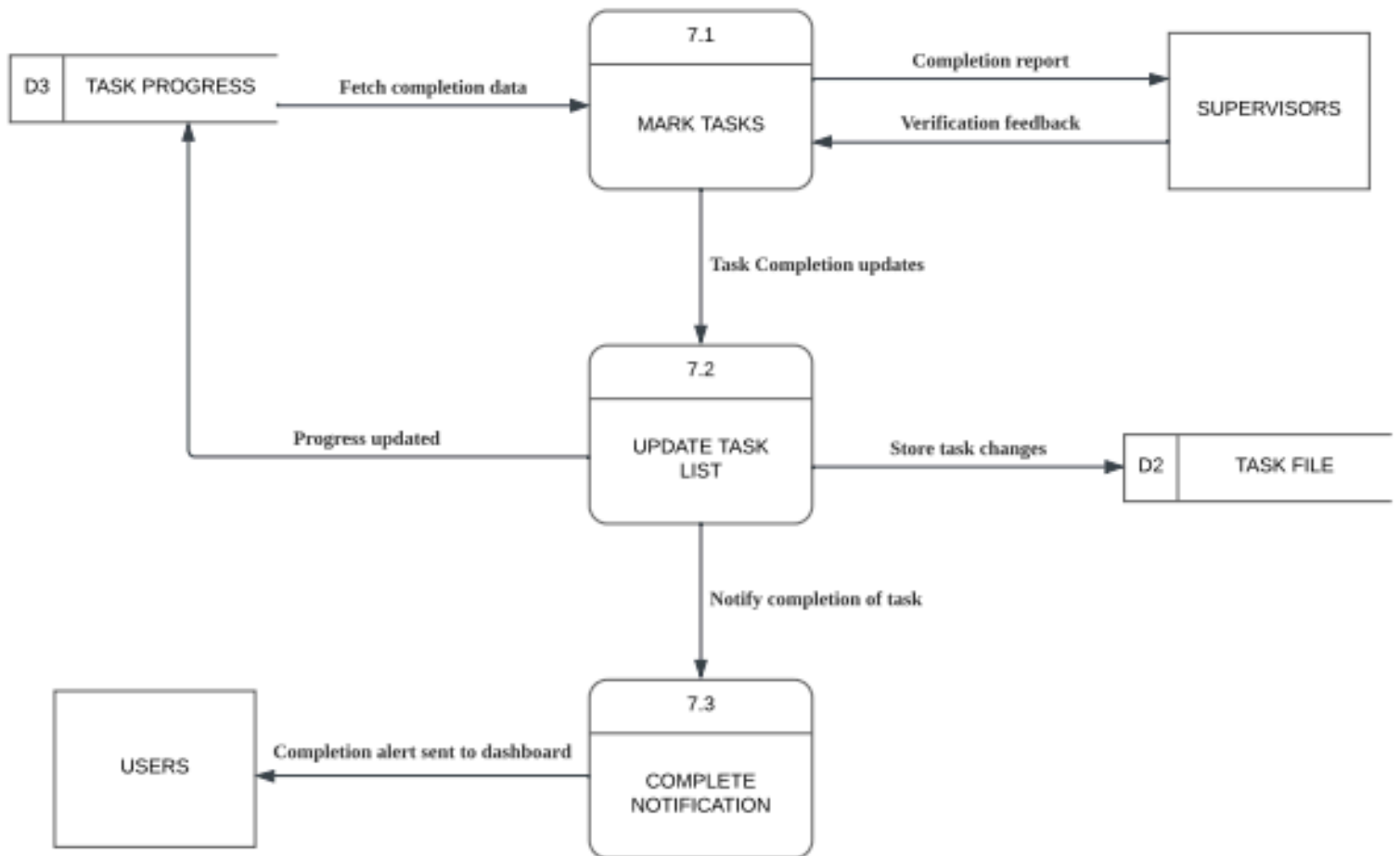












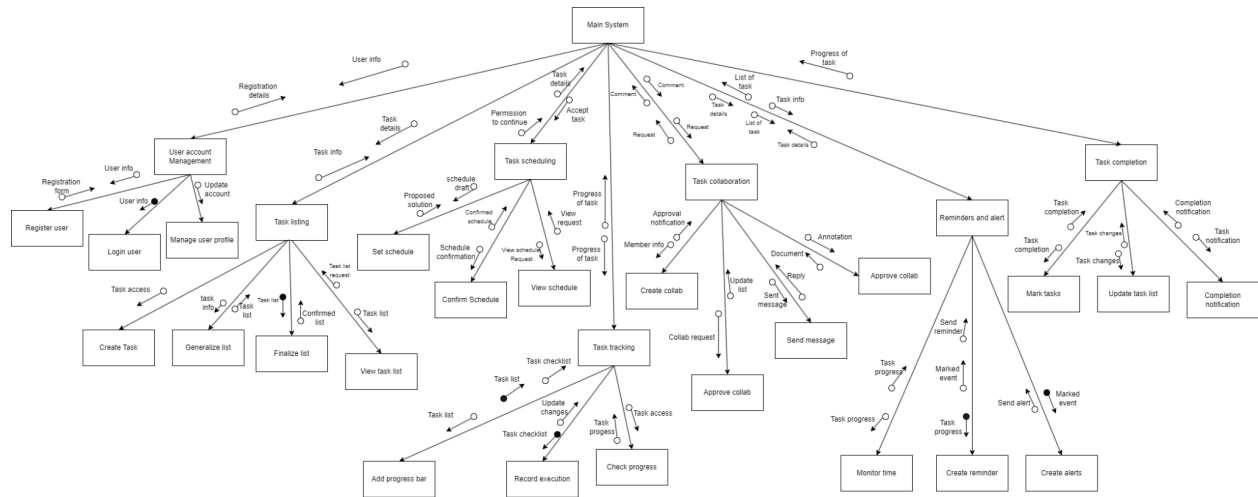
7.1 CRUD MATRIX

Activity	User(students & lecturers)	Supervisor	System
User Account management	C,R,U	R	
User task listing	R	R	R,U
Task Scheduling	C,R,U	R,U	R,U
Task tracking	R,U	R	C,R,U
System sends reminders and alert	R	R	C,R,U,D
User collaboration on tasks	C,R,U	R	C,R,U
User marks task as completed	U	R	R,U

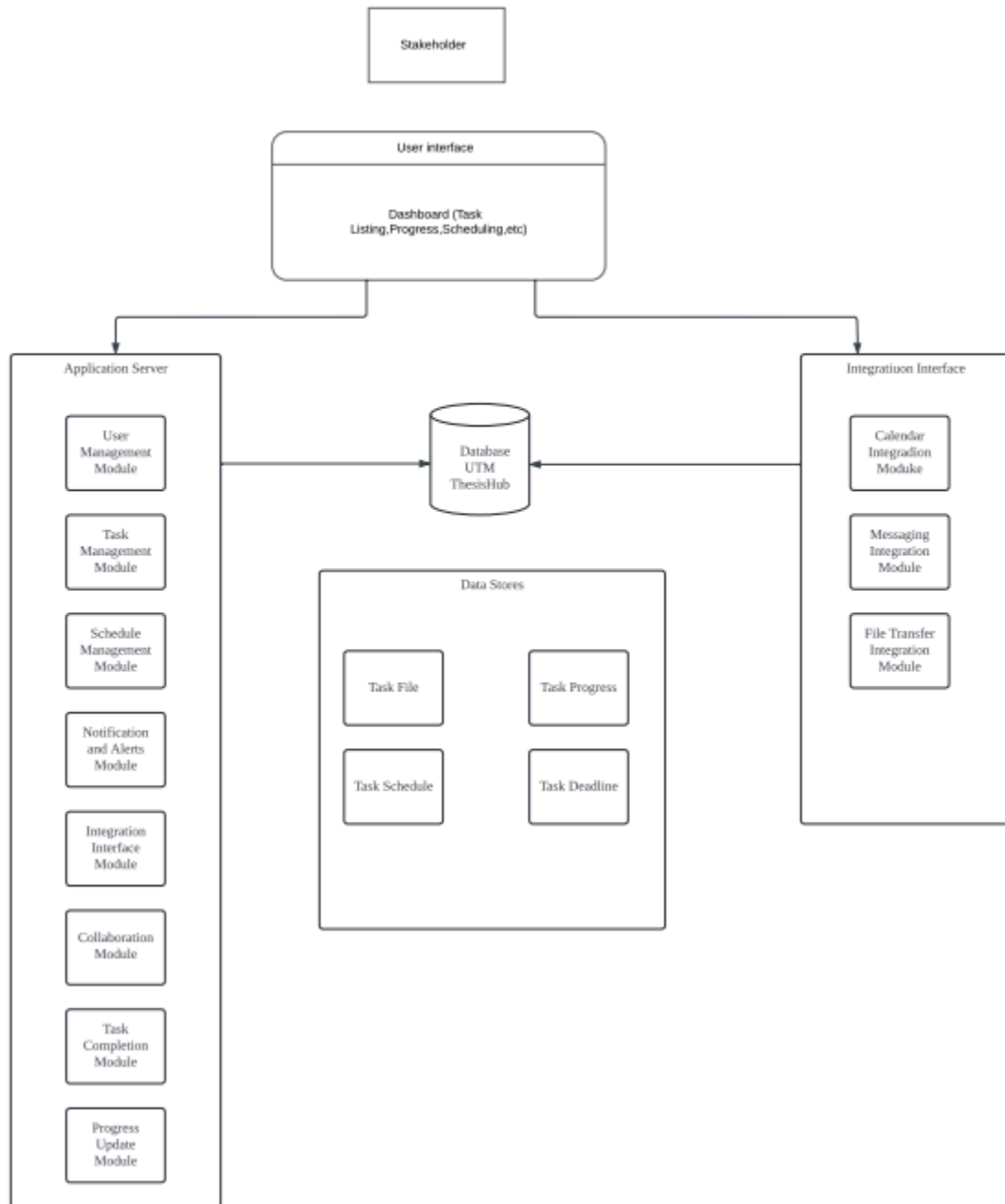
EVENT RESPONSE TABLE

Event	Source	Trigger	Activity	Response	Destination
User Account management	Users(student & lecturers)	Input user info	Receive user info and create account	Stores the user data	User Data File
User Task Listing	Users(student & lecturers)	Add task details	Add task to task list	Display Task list	Task information
Task scheduling	Supervisor	Accept new task	Add task to students schedules	Grants permission to continue task	Users
Task tracking	Users(student & lecturers)	Progress update of task	Update task progress data store	Progress updated	Task progress
System sends reminders and alert	System	Task details Task info	Sends reminder and alert notification	Reminder and alert sent	User
User collaboration on tasks	Users(student & lecturers)	Comment	Collab to do tasks	Replies	Supervisor
User marks task as completed	Users(student & lecturers)	Task progress	Update task progress	Task marked as complete	Task progress

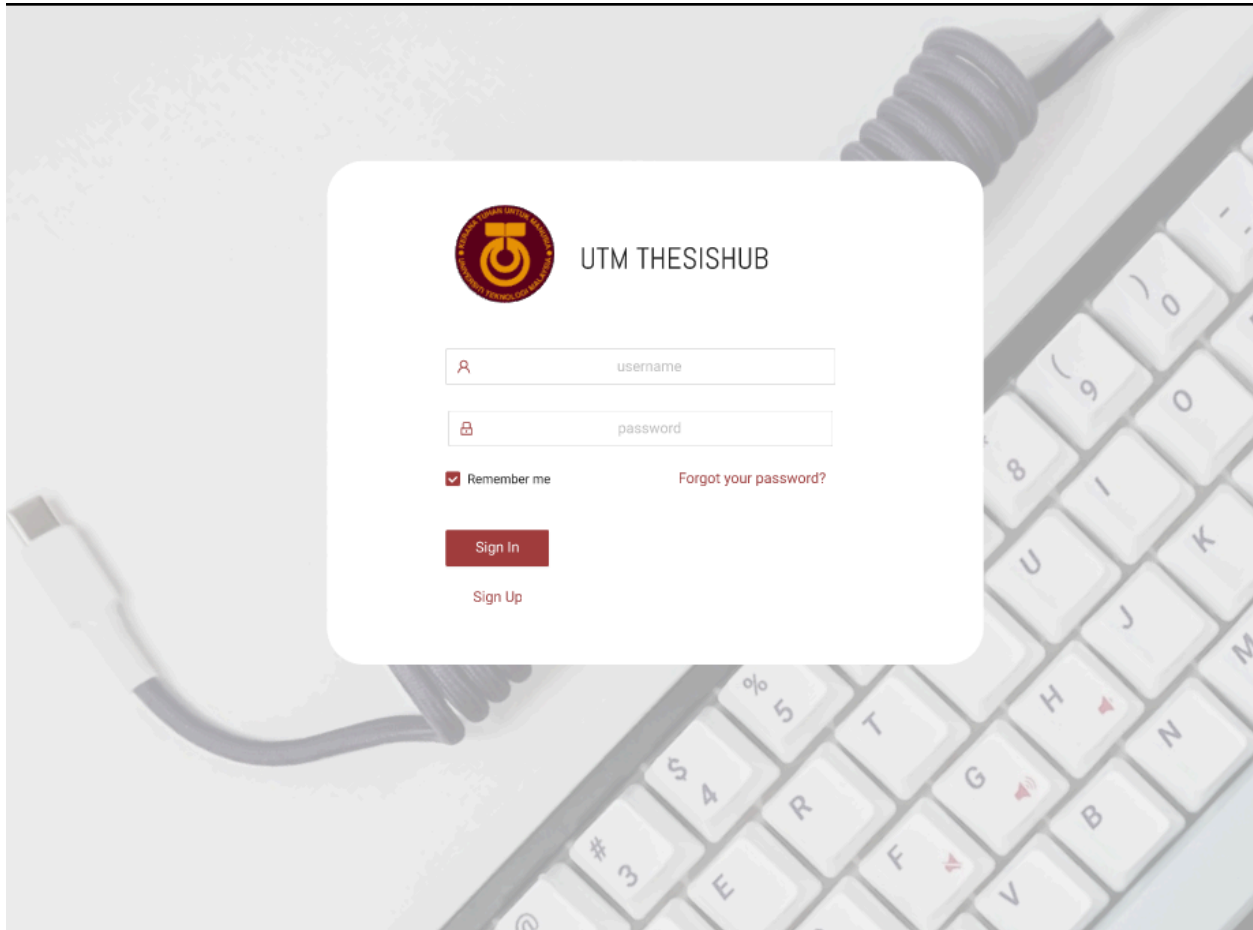
STRUCTURE CHART



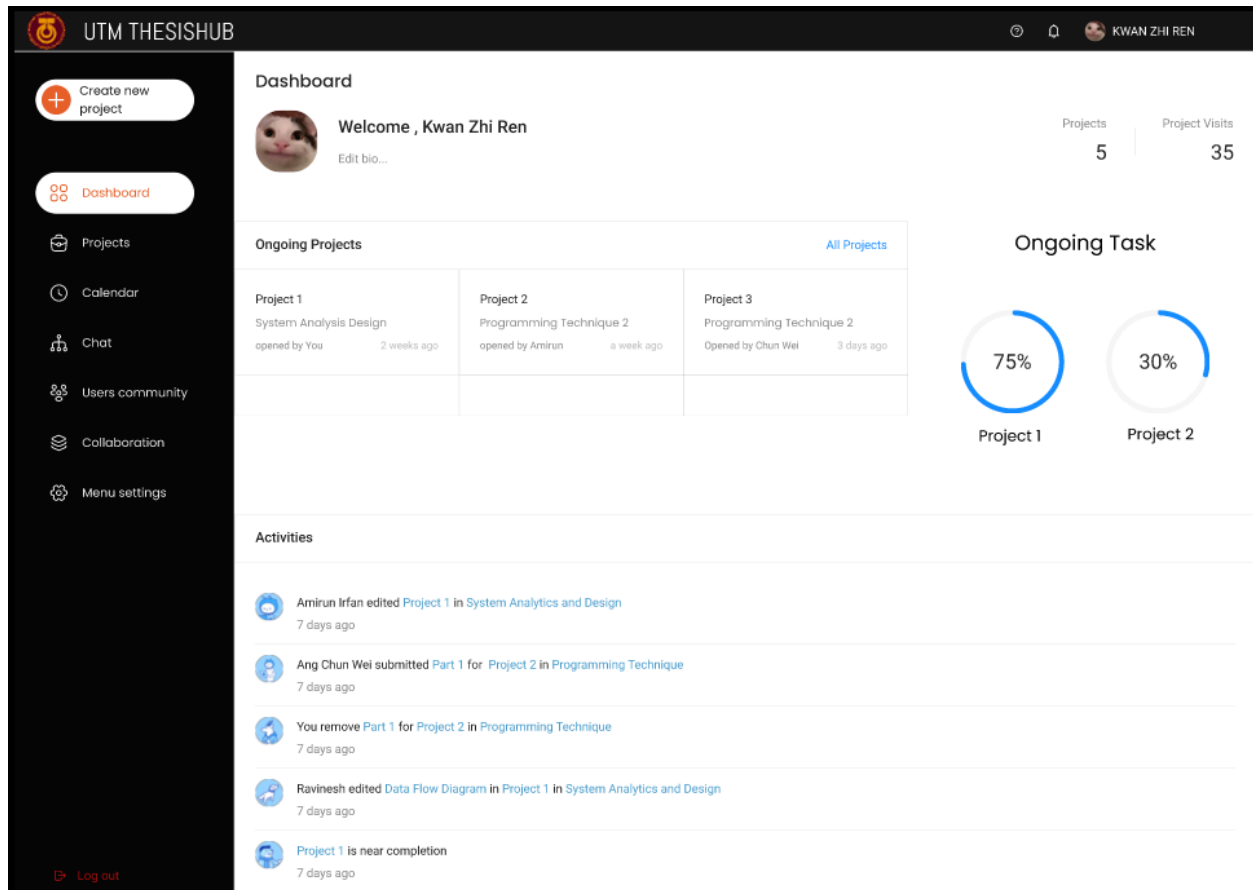
SYSTEM ARCHITECTURE



8.0 SYSTEM WIREFRAME



The wireframe depicts a login page for "UTM Thesishub" with a clean, professional design. It features a logo and title at the top, followed by a user-friendly login form with fields for username and password, a "Remember me" checkbox, a "Forgot your password?" link, and a "Sign In" button. There's also a "Sign Up" link for new users at the bottom, all set against a blurred keyboard background.



The wireframe shows a dashboard for "UTM Thesishub," welcoming the user "Kwan Zhi Ren" with a profile picture and options to edit the bio. It includes sections for ongoing projects and tasks, showing progress percentages for each project. The sidebar provides navigation links to create new projects, view the dashboard, projects, calendar, chat, user community, collaboration, and menu settings. The dashboard also lists recent activities related to the user's projects. The top right corner displays project statistics, and there's a logout option at the bottom of the sidebar.

UTM THESIS HUB

Create new project

Dashboard

Projects

Calendar

Chat

Users community

Collaboration

Menu settings

Log out

Add New Project

Kwan Zhi Ren

Edit bio...

Projects

5

Project Visits

35

ADD NEW PROJECT

Project Name:

Project Author:

Project Description:

Comments:

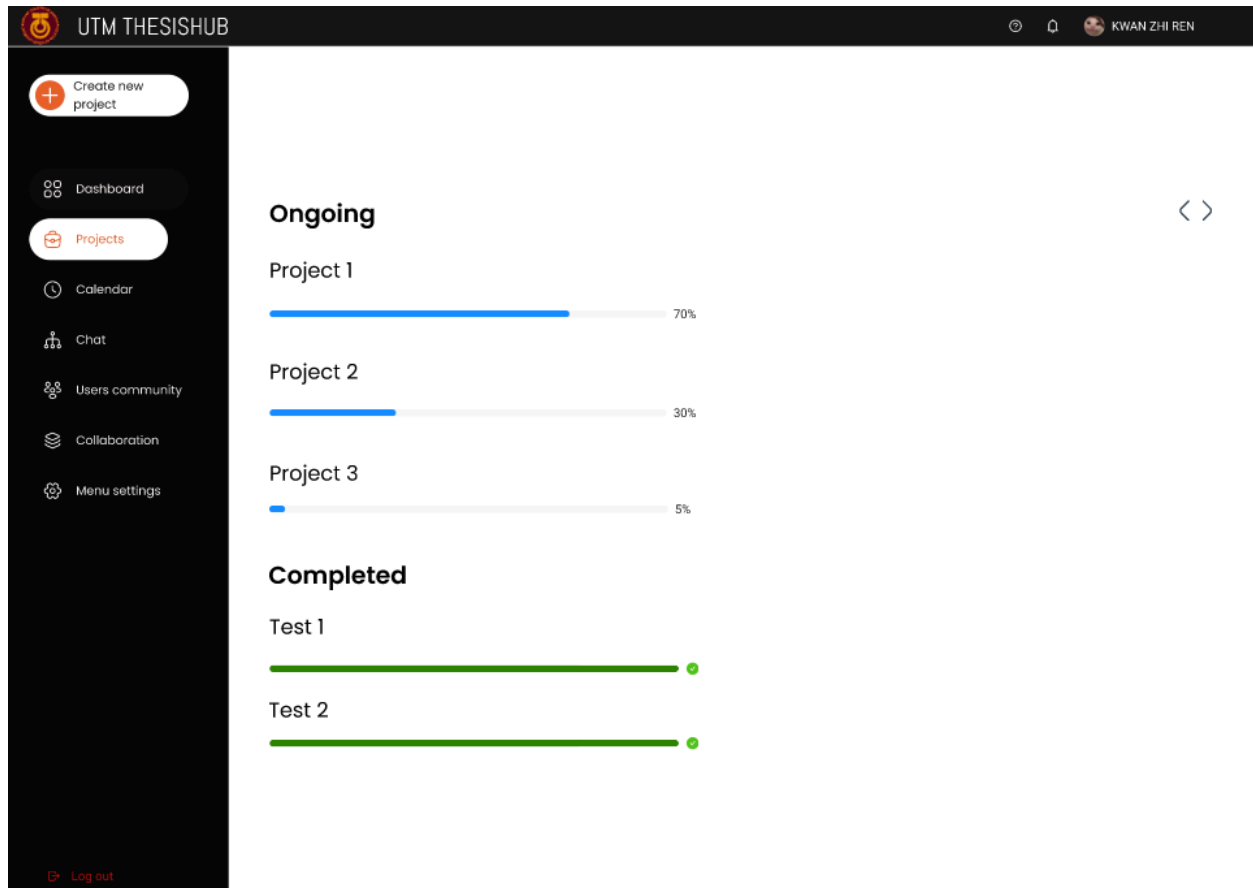
Click or drag file to this area to upload

Target disclosure: ☒ Public ☐ Partially public ☐ Private

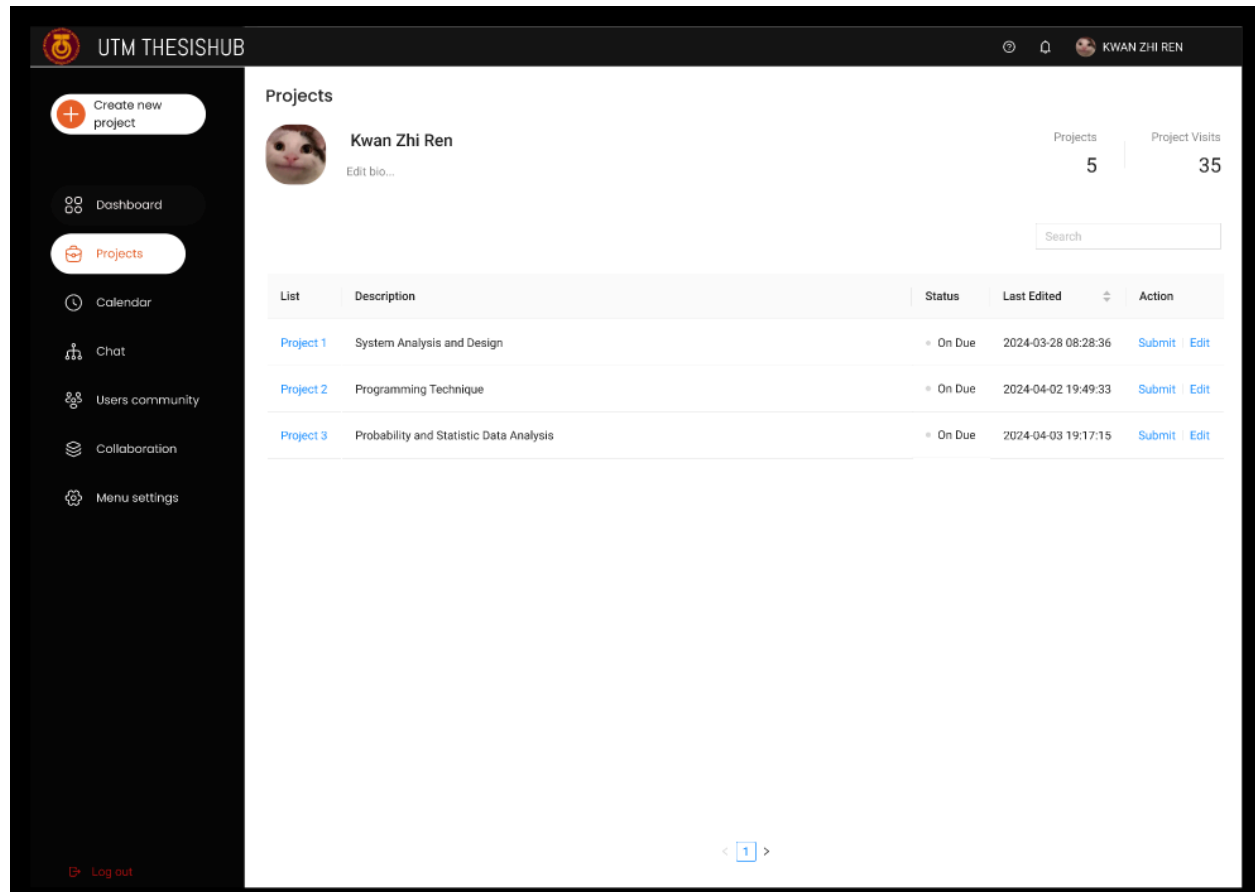
Submit

Save

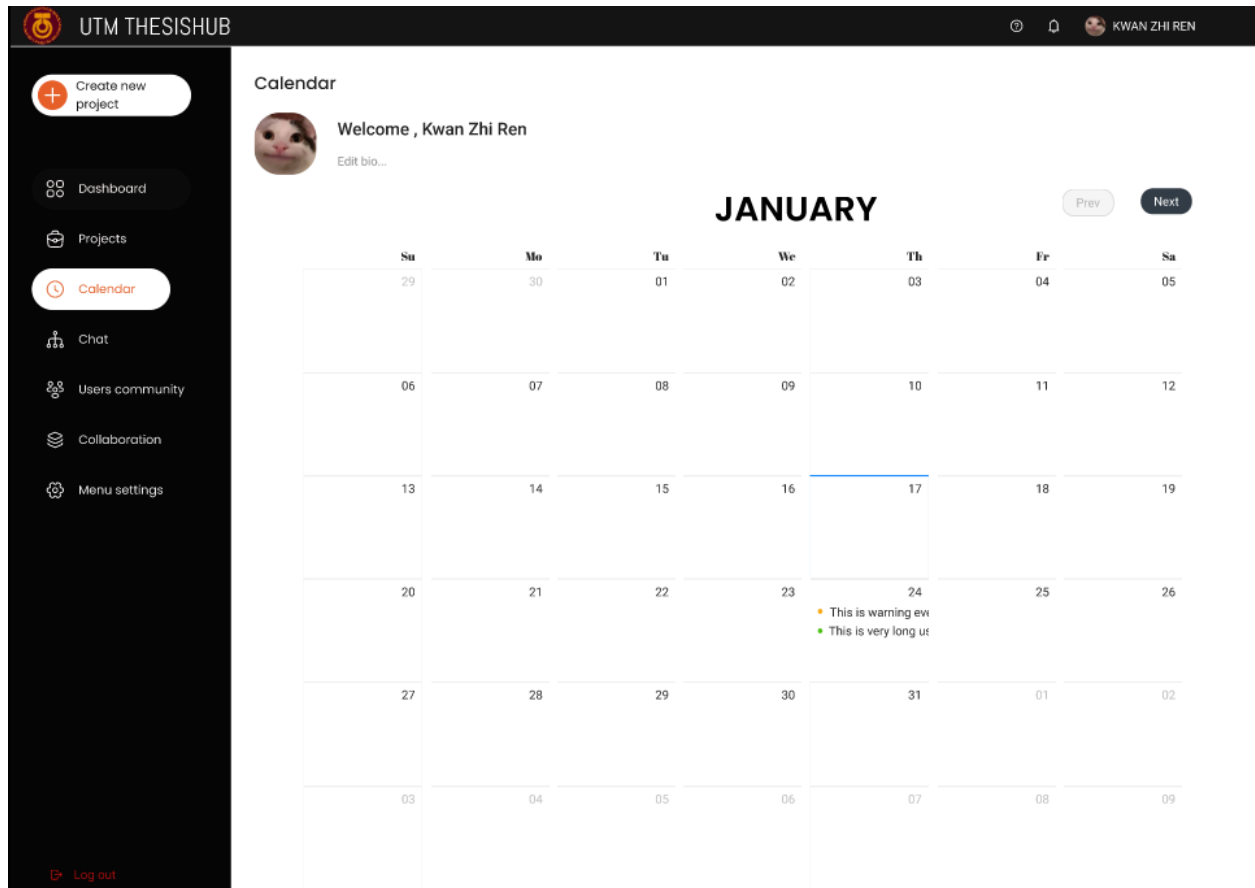
The wireframe illustrates an "Add New Project" page on the "UTM Thesishub" platform, designed for user Kwan Zhi Ren. It includes fields for entering the project name, author, description, and comments. There's an area for file upload with drag-and-drop functionality. Users can set the project's visibility as public, partially public, or private. The page also features a "Submit" button to create the project and a "Save" button for draft saving. Navigation options on the left include dashboard, projects, calendar, chat, user community, collaboration, and menu settings, with a logout option at the bottom.



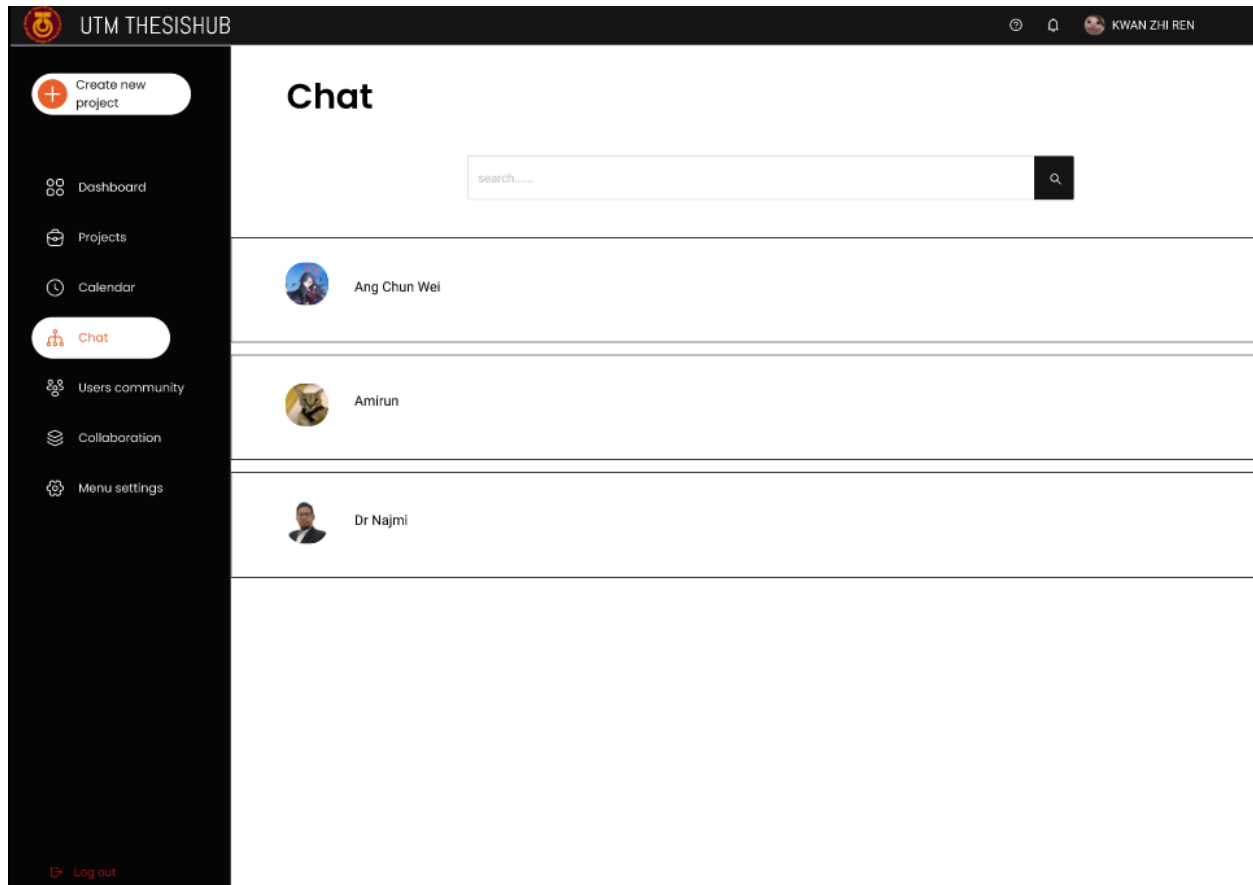
The wireframe shows the "Projects" section of the "UTM Thesishub" platform for user Kwan Zhi Ren. It is divided into "Ongoing" and "Completed" projects. Each ongoing project (Project 1, Project 2, Project 3) has a progress bar indicating its completion percentage. Completed projects (Test 1 and Test 2) are listed with green progress bars showing 100% completion. The sidebar provides navigation links to create a new project, view the dashboard, projects, calendar, chat, user community, collaboration, and menu settings, with a logout option at the bottom. The top right corner displays the user's profile.



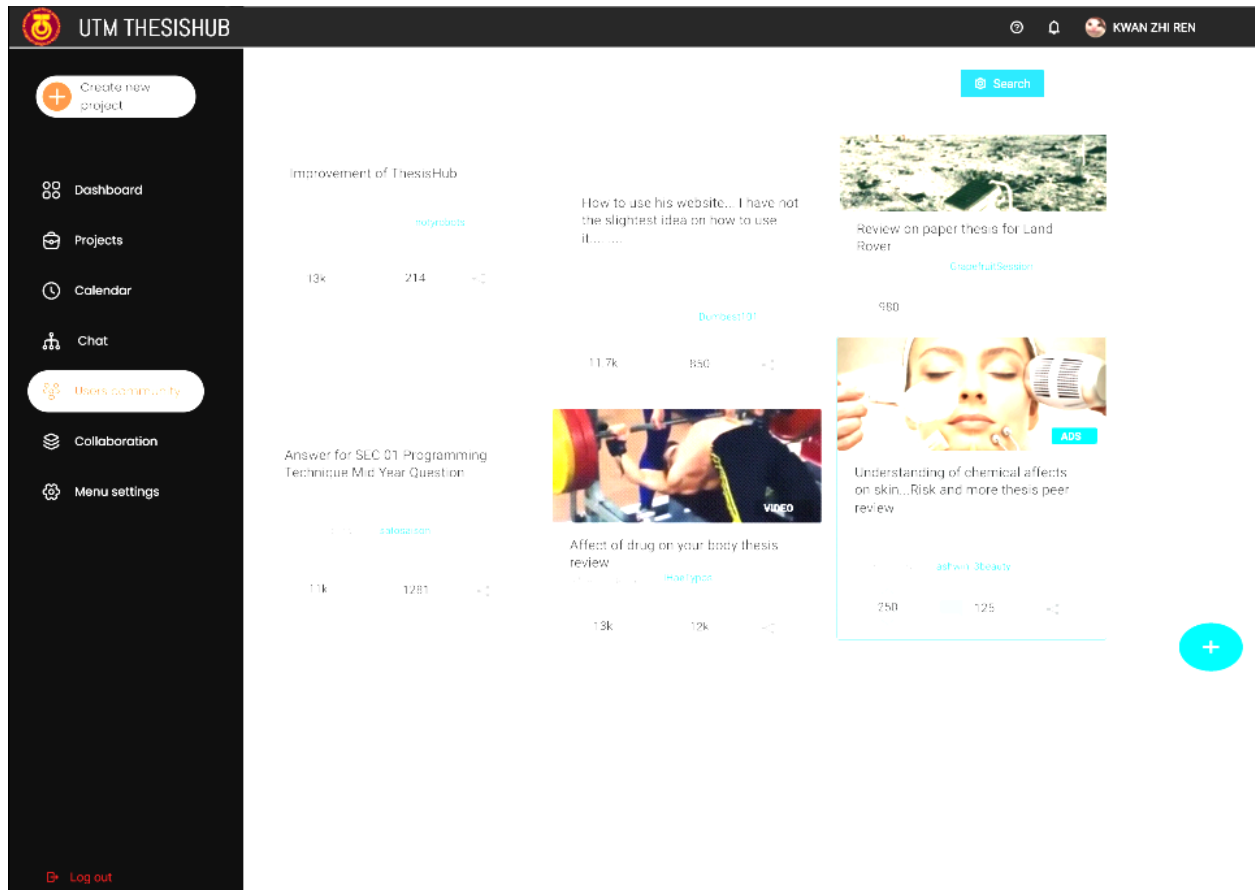
The wireframe shows the "Projects" page on the "UTM Thesishub" platform for user Kwan Zhi Ren. It lists three projects: Project 1 (System Analysis and Design), Project 2 (Programming Technique), and Project 3 (Probability and Statistic Data Analysis). Each project entry displays its status as "On Due," the last edited date and time, and action links to "Submit" or "Edit" the project. The left sidebar provides navigation links to create a new project, view the dashboard, projects, calendar, chat, user community, collaboration, and menu settings. The top right corner displays the user's profile, and there's a logout option at the bottom of the sidebar. The right side also shows the total number of projects and project visits.



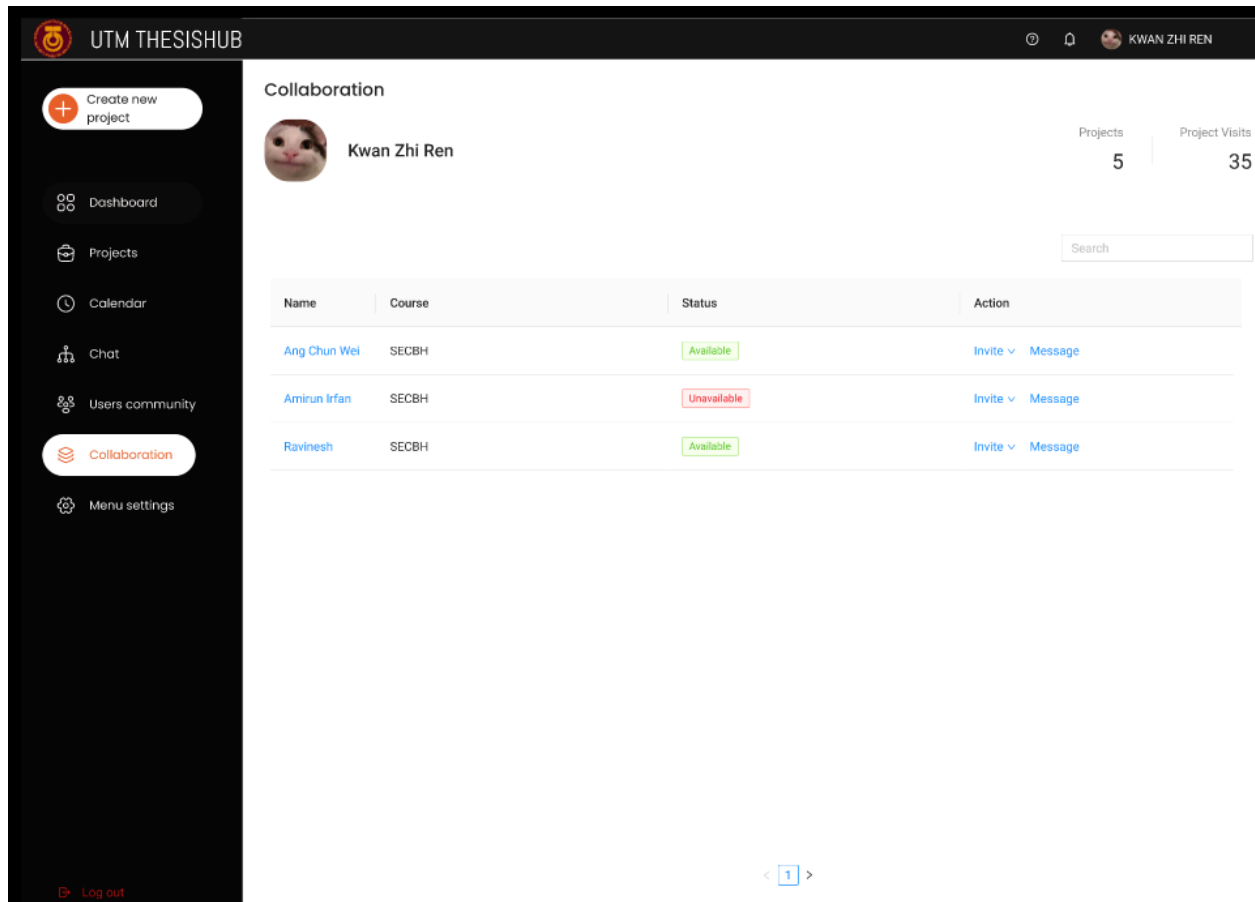
The wireframe depicts the "Calendar" section of the "UTM Thesishub" platform for user Kwan Zhi Ren. It shows a monthly calendar view, currently displaying the month of January. Specific dates are marked with events, such as a warning event on the 17th and a longer event on the 24th. Navigation buttons labeled "Prev" and "Next" allow the user to move between months. The left sidebar provides links to create a new project, view the dashboard, projects, calendar, chat, user community, collaboration, and menu settings. The top right corner displays the user's profile, and there's a logout option at the bottom of the sidebar.



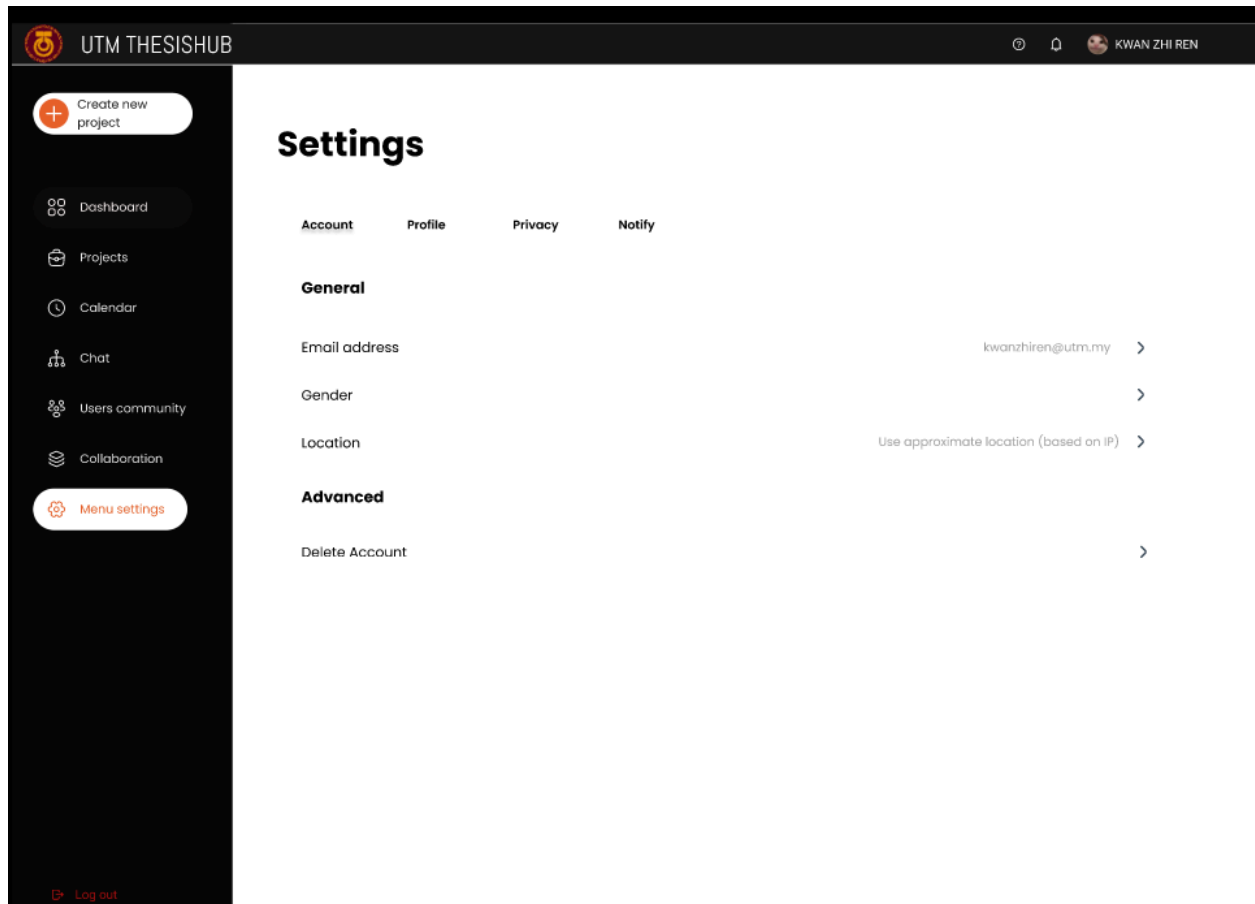
The wireframe shows the "Chat" section of the "UTM Thesishub" platform for user Kwan Zhi Ren. It includes a search bar at the top for finding specific contacts or conversations. Below the search bar, there are listed contacts: Ang Chun Wei, Amirun, and Dr. Najmi, each with a profile picture. The left sidebar provides navigation links to create a new project, view the dashboard, projects, calendar, chat, user community, collaboration, and menu settings. The top right corner displays the user's profile, and there's a logout option at the bottom of the sidebar.



The wireframe shows the "Users Community" section of the "UTM Thesishub" platform for user Kwan Zhi Ren. This section includes a variety of posts related to thesis topics, such as "Improvement of ThesisHub," "Review on paper thesis for Land Rover," and "Understanding of chemical effects on skin." Each post has associated statistics like views, likes, and comments. The interface features a search button at the top for finding specific posts. A prominent plus button in the lower right corner likely allows users to add new posts. The left sidebar offers navigation to create a new project, dashboard, projects, calendar, chat, user community, collaboration, and menu settings. The user's profile is displayed at the top right corner, with a logout option at the bottom of the sidebar.



The wireframe shows the "Collaboration" section of the "UTM Thesishub" platform for user Kwan Zhi Ren. It lists collaborators along with their names, courses, status (available or unavailable), and actions (invite or message). The left sidebar provides navigation options to create a new project, dashboard, projects, calendar, chat, user community, collaboration, and menu settings. The top right corner displays the user's profile, with total projects and project visits stats, and a logout option at the bottom of the sidebar.



The wireframe depicts the "Settings" section of the "UTM Thesishub" platform for user Kwan Zhi Ren. The settings are divided into four categories: Account, Profile, Privacy, and Notify. Under the "Account" tab, there are options for managing email address, gender, and location, with an advanced option to delete the account. Each option has a corresponding link to navigate to detailed settings. The left sidebar provides navigation links to create a new project, dashboard, projects, calendar, chat, user community, collaboration, and menu settings. The user's profile is displayed at the top right corner, and there's a logout option at the bottom of the sidebar.

9.0 Summary of Proposed System

Graduate students and lecturers engaged in academic research and writing often struggle with task management and organization. The use of spreadsheets and social media for these purposes tends to lead to disorganization, lost documents, missed notifications, and constant distractions, ultimately affecting productivity and the quality of work. Existing methods do not provide clear task visualization, complicate the balance between academic and extracurricular activities, and present scheduling and collaboration challenges.

UTM ThesisHub aims to resolve these issues by offering a centralized digital task management system tailored for academic writing and research. A key feature is real-time collaboration, which allows users to view and update each other's progress instantly, thereby preventing task duplication and delays and ensuring efficient use of time and resources. In-app tools for commenting and messaging further enhance communication and information sharing.

The system will also include strong alert and reminder functions to minimize the risk of missed deadlines and overlooked updates. Notifications will be triggered for every task update, priority change, or deadline adjustment, keeping users well-informed and on schedule. With enhanced accessibility, all collaborators can access essential files and information stored centrally, rather than relying on individual devices or personal messages.

Projects are organized in an intuitive format with features like nested pages, tags, and dropdown menus to keep everything orderly. Cloud server utilization ensures the system can scale according to the operation's size, maintaining efficiency regardless of user or project volume.

UTM ThesisHub is designed to be scalable, meeting the needs of both students and advisors. The platform streamlines workflows, eliminating the need to manually update tasks and deadlines across various apps. This comprehensive solution is poised to significantly improve the efficiency, organization, and quality of academic research and writing, addressing the shortcomings of current task management methods and fostering higher productivity and better-quality publications.

Furthermore, UTM ThesisHub prioritizes the security and privacy of research data with advanced user authentication measures. This centralized system ensures that all data is protected, giving users peace of mind as they work on their projects.