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## Project Phase 2

### SECD2613 System Analysis and Design

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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 Overview Of The Project**

In doing academic research and writing papers, graduate students and lecturers alike require immense efforts in managing and organizing their tasks and making sure they are on track. Currently, the task management system employed by those involved in paper writing is the usage of spreadsheets such as Google Sheets or Excel.

Successful management and organization of tasks enhance productivity of researchers, and ensure that tasks are completed before their deadlines. Moreover, the publishing quality would increase with proper management and organization of tasks. Quality publications, in turn, increase the reputation of researchers and their standing in the academic world.

Seeing as research and writing is such an integral part of a researcher's life, it is obvious to fill the gap that is created in their current system by creating a digital task management system that is uniquely tailored to the demands of academic research and writing.

## **2.0 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.

### 3.0 Proposed Solutions

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.

1. **Centralizing paper writing and publication**

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.

2. **Conduct virtual discussion with collaborators**

After the creation of the research paper, a virtual discussion room is automatically created with all collaborators as its members. This facilitates effective communication specifically about the paper they are working on. In addition to group discussions, users can also engage in personal chats or discussions with other individuals on the platform with whom they share a mutual group or research paper.

3. **Reminder**

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.

#### 4. **Increasing accessibility**

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.

#### 5. **Enhancing scalability**

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.

## **4.0 Information Gathering Process**

### **4.1 Method Used**

The method for the information gathering process used in this project is the interactive method. The interactive method that is involved in this project is an interview.

The interviewing process helps us to collect data on human and system information requirements. The purpose of the interview is to know the workflow of the current system, the issues of the current system, and the possibility of implementing a newer system.

In this interview process, the target interviewer is Dr. Aliif Ahmad, a UTM lecturer. We conducted the interview through online platform, Webex. We arranged the questions in a funnel structured by starting with open - ended questions and worked our way toward closed questions. This allows us to get more generalized responses and also helps to warm up the interviewee about the topic and reluctance to address the topic then conclude by narrowing the possible response using closed question which is more specific.

#### **4.1.1 Interviews**

A thorough interview with Dr. Aliif, a UTM lecturer who actively aids postgraduate students with their studies and writing processes, served as the cornerstone for our information gathering strategy. Because of Dr. Aliif's extensive experience, we were able to get valuable insights into current task management methods as well as the challenges faced by instructors and students.

We prepared a thorough set of questions ahead of time with the goal of learning about the methods, technology, and specific challenges encountered. These questions addressed many aspects of task management, including job sequence, personnel engaged, methods and technologies used, channels of communication, and any existing documentation.

During the conversation, Dr. Aliif highlighted the current state of task management, emphasizing the widespread use of digital notepads and Excel spreadsheets. He highlighted that, although being well-known and widely used, these instruments have a number of drawbacks. He noted that manually maintaining and updating these spreadsheets takes a long time and is prone to errors due to labor-intensive operations. This frequently results in information that is out of date or wrong, causing inefficiencies and misunderstandings.

Dr. Aliif also discussed the difficulties of overseeing multiple research programs at once. He emphasized that manually tracking the development of a large number of students and their projects is inefficient. Because of the lack of a centralized system, information is usually distributed across multiple papers and platforms, making it difficult to get a comprehensive

picture of ongoing tasks and deadlines. This divide reduces the amount of time available for more important academic duties and increases the administrative strain. Dr. Aliif identified one of the most important challenges as the lack of real-time collaboration features in present systems. He highlighted that the inability to update and distribute information immediately impedes effective collaboration and communication with pupils.

This lack of coordination frequently causes delays, unnecessary effort, and missed deadlines, which have a significant detrimental influence on both lecturers' and students' overall productivity. Dr. Aliif specified the need for a task management system that allows for seamless communication and real-time updates, ensuring that all stakeholders are always aware and in agreement.

This lack of coordination frequently causes delays, unnecessary effort, and missed deadlines, which have a significant detrimental influence on both lecturers' and students' overall productivity. Dr. Aliif stressed the need for a task management system that allows for seamless communication and real-time updates, ensuring that all stakeholders are always aware and in agreement.

Furthermore, Dr. Aliif provided enlightening justifications for the qualities he believes a novel task management system ought to include. He emphasized the significance of creating an intuitive user interface to lower the learning curve for novice users. Additionally, he underlined the value of automated scheduling and progress monitoring systems that may dynamically modify project timelines and deadlines. Among the other crucial components he recommended were real-time collaboration tools, robust data security protocols, and integrated communication channels.

#### **4.1.2 Interviews with Dr. Aliif**

##### **Introduction**

**Interviewer:** Good morning Dr. Aliif.

**Interviewee:** Good morning.

##### **Open Question**

**Interviewer:** So Dr. Aliif, are there any specific integrations with other tools or software that would be essential to this new system?

**Interviewee:** The main KPI is listed as I mentioned previously, such as “log in” “sign up” as student or supervisor. When logging in to the system as a student, students should be able to list all the tasks while the supervisor can track all the progress, scheduling all the tasks given and



track it based on tracking progress. It also has a reminder for the supervisor and vice versa. It also collaborates or communicates based on the submission. Let's say that the student made a draft and wants the supervisor to check it. For example communication such as Whatsapp to ask the supervisor to check on the draft but now it has direct notification and reminder. Let say the notification "Student A has submitted a draft for you to check", it also shows the deadline of the task. The supervisor then can directly check on the work and can renotify the work was checked. Previously it was manual. For now this is the main KPI. If you have a function that can help in terms of publication then it can be added.

**Interviewer:** Thank you, Dr. Aliif.

### **Closed Question**

**Interviewer:** Good morning Dr. Aliif. Since you mentioned collaboration is important such as reminder and platform to communicate, is there other specific integration or tools. For example integration with Google Calendar or other apps such as Trello ?

**Interviewee:** Yes, I am open to any integration. I agree and it depends on what you want to integrate such as basic stuff here. So it depends on your ideas, that's why there's so many groups. As you mentioned there are many ways to do collaboration and communication but I prefer your design itself. For example the draft sent by a student can be in file or link because it is stored somewhere such as Google Drive. You can have your own service to edit it. Maybe it is more difficult but I want to see it based on different groups, of course some groups will be different than others.

**Interviewer:** Thank you, Dr. Aliif.

## 4.2 Summary from Method Used

A Thorough understanding of the condition of task management in the academic setting was obtained from the interview with Dr. Aliif. Among the main conclusions drawn from our "as-is" analysis are:

1. **Understanding Current Processes:** The primary instruments utilized in modern task management processes are digital notepads and Excel spreadsheets, both of which are time-consuming and prone to error.
2. **Data Collection:** The complexities revealed by Dr. Aliif revealed the difficulties and inefficiencies resulting from manual task management techniques.
3. **Mapping Processes:** By identifying the decision-making points, interactions, and order of actions involved in handling academic assignments, the interview helped us to map the current workflows.
4. **Identifying Pain Points:** Some notable areas of concern are scattered data, manual updates being labor-intensive, real-time collaboration being impossible, and task management systems being restricted in their accessibility.
5. **Analyzing the Root Causes:** The use of outdated equipment unsuited for efficient job management and collaboration in a hectic educational environment is the main cause of these inefficiencies.
6. **Assessing Technology and Tools:** The needs of effective task management, real-time collaboration, and accessibility are not being met by the tools that are already in use, which include Excel spreadsheets and digital notepads.

**7. Documenting Findings:** When handling assignments and projects for academic credit, the outcomes of the interview with Dr. Aliff highlight the importance of an integrated task management system to increase productivity, efficiency, and coordination.

### **Overall Summary**

Dr. Aliff provided us with a wealth of information during our interview, which enabled us to perform an exhaustive "as-is" analysis of the task management practices now in use at UTM's teaching facility. The present manual methods are not user-friendly, error-prone, or equipped with all the necessary components for rapid cooperation. Our recommended platform, WorkStudio, aims to solve these issues and enhance productivity, collaboration, and overall efficiency in managing academic work and projects by providing an easy-to-use, real-time collaborative environment. This "as-is" study offers a basic comprehension of the current state of affairs, which opens the door to the creation of targeted solutions that meet the needs of professors and postgraduate students.

## 5.0 Requirement Analysis

### 5.1 Current Business Process

#### 1. Research Task Management:

- *Scenario*: A postgraduate student or lecturer currently manages their research tasks using a combination of spreadsheets, emails, and physical notes.
- *Workflow*: They create task lists manually, update them as progress is made, and communicate with collaborators through email or other messaging platforms.

#### 2. Document Sharing and Collaboration:

- *Scenario*: Collaborators exchange research papers and drafts via email attachments or shared cloud storage, leading to version control issues and confusion.
- *Workflow*: Documents are shared individually, comments are made via email or separate documents, and tracking changes becomes cumbersome.

#### 3. Progress Tracking and Reminder System:

- *Scenario*: Keeping track of project deadlines and progress relies on manual reminders and periodic check-ins.
- *Workflow*: Users set reminders on their personal devices or use calendar applications to manage deadlines. However, there's no centralized system for tracking progress across multiple projects.

#### 4. Peer Review Process:

- *Scenario*: Peer review feedback is currently exchanged through email or face-to-face meetings, making it difficult to organize and track.
- *Workflow*: Researchers send drafts to peers via email or share them in person, then compile feedback manually. This process lacks version control and can be time-consuming.

#### 5. Security and Privacy Concerns:

- *Scenario*: Users are concerned about the security of their research data and documents when using online platforms.
- *Workflow*: Users may hesitate to share sensitive information online due to fears of data breaches or unauthorized access, impacting collaboration and information sharing.

#### 6. User Registration and Authentication:

- *Scenario*: User registration and authentication processes may lack two-factor authentication (2FA), leaving accounts vulnerable to unauthorized access.
- *Workflow*: Users register using basic email addresses and passwords without additional security measures, potentially risking data breaches or account hijacking.

## **5.2 Functional Requirement**

### **1. List the tasks / projects engaged**

The application should list all the tasks in each section of the research paper that the users are currently engaged with. It should include features for sorting tasks, such as sorting by name, last modified date, or creation date. This provides users with a highly personalized and customizable interface, allowing them to access their research papers at their convenience.

### **2. Schedule the tasks into calendar**

Upon creating the research paper and listing its sections or tasks, users are asked to set a deadline for each section and suggest a final publishing date. The dates will be automatically updated in the users' calendar, providing different views such as daily, weekly, or monthly, keeping track of the progress of each section. This feature aims at effectively preventing the users from falling behind their plan and helping them finish their research paper by the scheduled publishing date.

### **3. Organize real-time collaboration of paper writing**

During the creation of the research paper, users are prompted to specify the writer and co-writer(s) along with their verified email addresses, granting editing permissions to all collaborators involved. Each collaborator can work remotely, with the latest updates auto-saved to keep everyone in sync with the most current version and progress of the paper. This real-time collaboration ensures faster and more efficient teamwork. Additionally, the system provides access to previous versions of the paper and their editors, allowing collaborators to restore earlier versions if needed, thereby serving as a safeguard against human errors.

### **4. Set reminder / alert**

In the settings module, users can customize the notification mode to either push notifications or in-app notifications. This feature also allows users to specify their preferences for the types of notifications or reminders they wish to receive.

Options include deadlines for each section of the research paper, updates from other collaborators, and new discussion messages. With flexible notification modes and types, the user-friendliness of the interaction is greatly enhanced.

### **5.3 Non-functional Requirement**

#### **1. Security**

Access to the research paper, including the title and content, is restricted solely to the writer and authorized co-writer(s). This ensures that the work remains original and protected from plagiarism by other users on the platform. Only the creator of the research paper has the authority to add new collaborators or transfer ownership to another co-writer.

To enhance users' privacy, the platform allows individuals to set up their own privacy modes concerning personal information such as their undergraduate program, profile picture, and the number of research papers they have engaged in. These modes include options for a public profile, collaborators only, and me only, providing users with flexibility in protecting their profiles and backgrounds.

By employing advanced encryption techniques, secure authentication processes, and regular security audits, we can safeguard users' personal data against unauthorized access and potential malware. This is crucial not only for complying with regulatory standards for a safe online environment but also for building trust between the platform and its users.

#### **2. Capability and usability**

While the interface will be enhanced, it is crucial to maintain the existing procedures and steps for navigating the system to minimize friction during the transition from the previous system to the new one. In areas where improvements are necessary, changes will be implemented incrementally and intuitively. For example, simplifying complex workflows or reducing the number of steps required to complete a task will be done in a way that aligns with users' cognitive processes. Tooltips or guides will be available for any new features introduced, enhancing the user experience without overwhelming them.

### 3. **Well-defined user interface**

The new system aims to provide a more engaging user experience by enhancing the user interface. By reorganizing the modules and assigning well-defined functionalities to each, the interface should be more intuitive, significantly reducing the time users spend on navigating and managing their tasks.

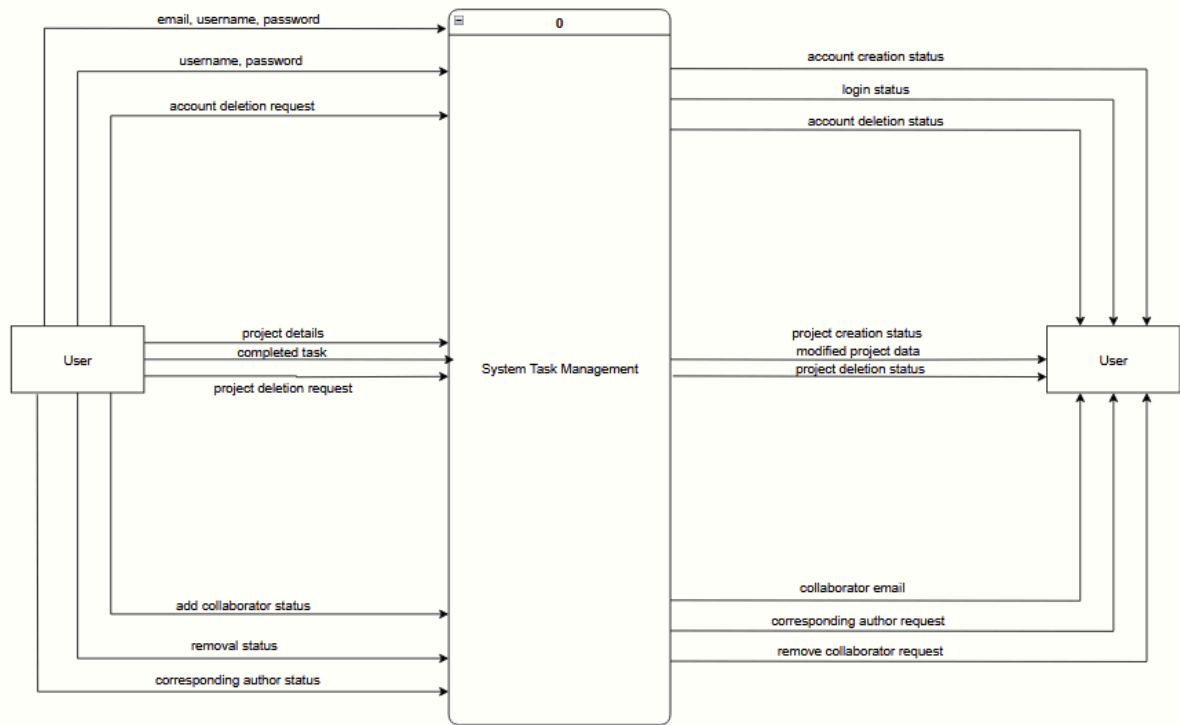
In terms of consistency and visual appeal, a consistent use of colors, fonts, and visual elements throughout the interface helps in creating a cohesive and professional look, which enhances user satisfaction. In addition, the new interface design focuses on visual simplicity and clarity. Simplified graphics and clean layouts can contribute to faster loading times, which is crucial for maintaining a responsive and effective system performance. Users can complete tasks more quickly and with less frustration, making the interface both user-friendly and efficient.

Furthermore, the new interface should support seamless switching between desktop and mobile modes, ensuring compatibility with various screen sizes and resolutions. Both designs maintain the same level of functionality and ease of use, providing a consistent user experience regardless of the device.

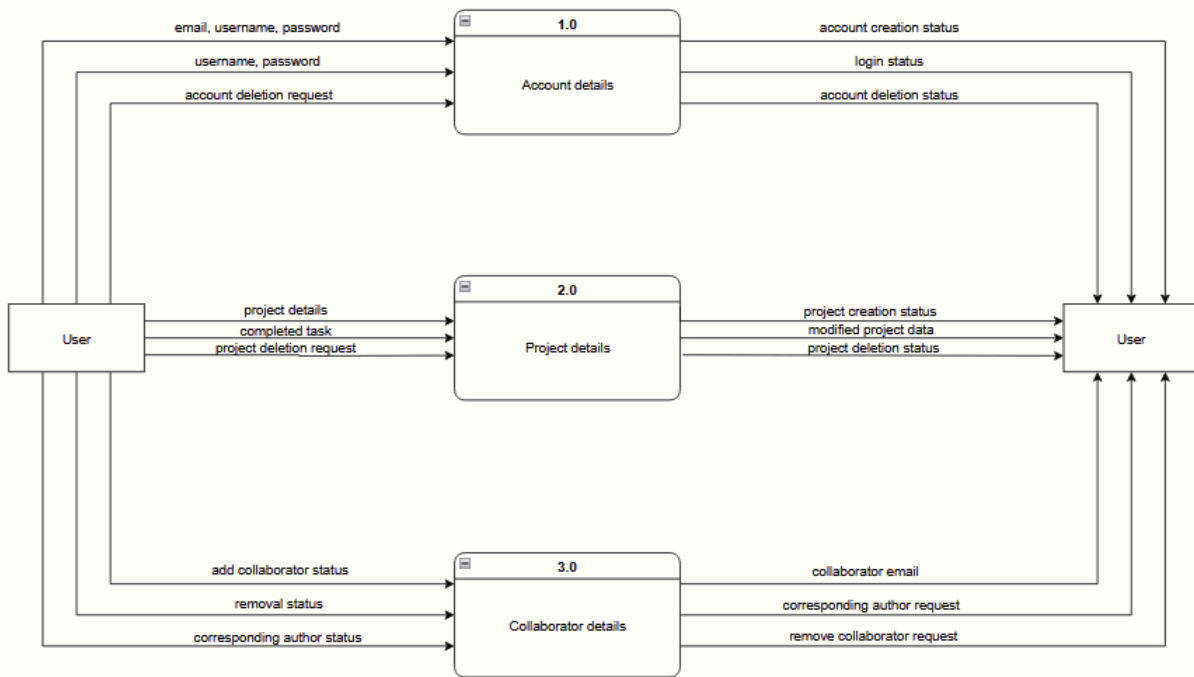


5.4 Logical DFD AS-IS System (Context Diagram, Diagram 0, Child Diagram)

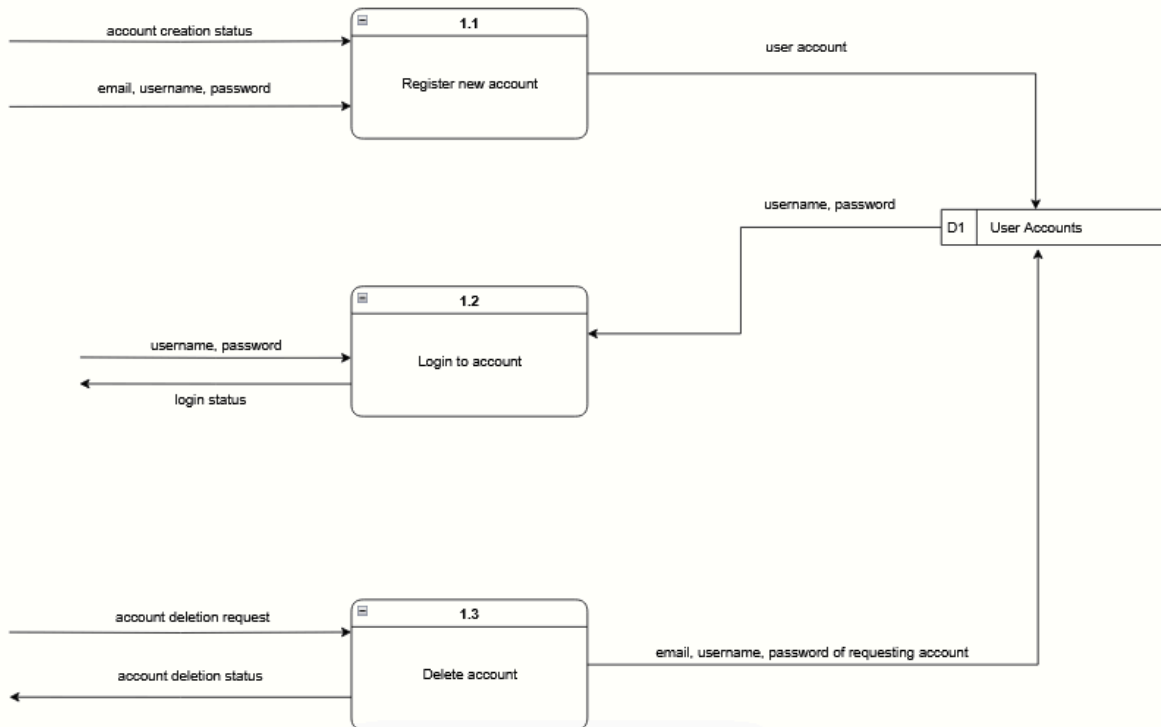
1. Context diagram

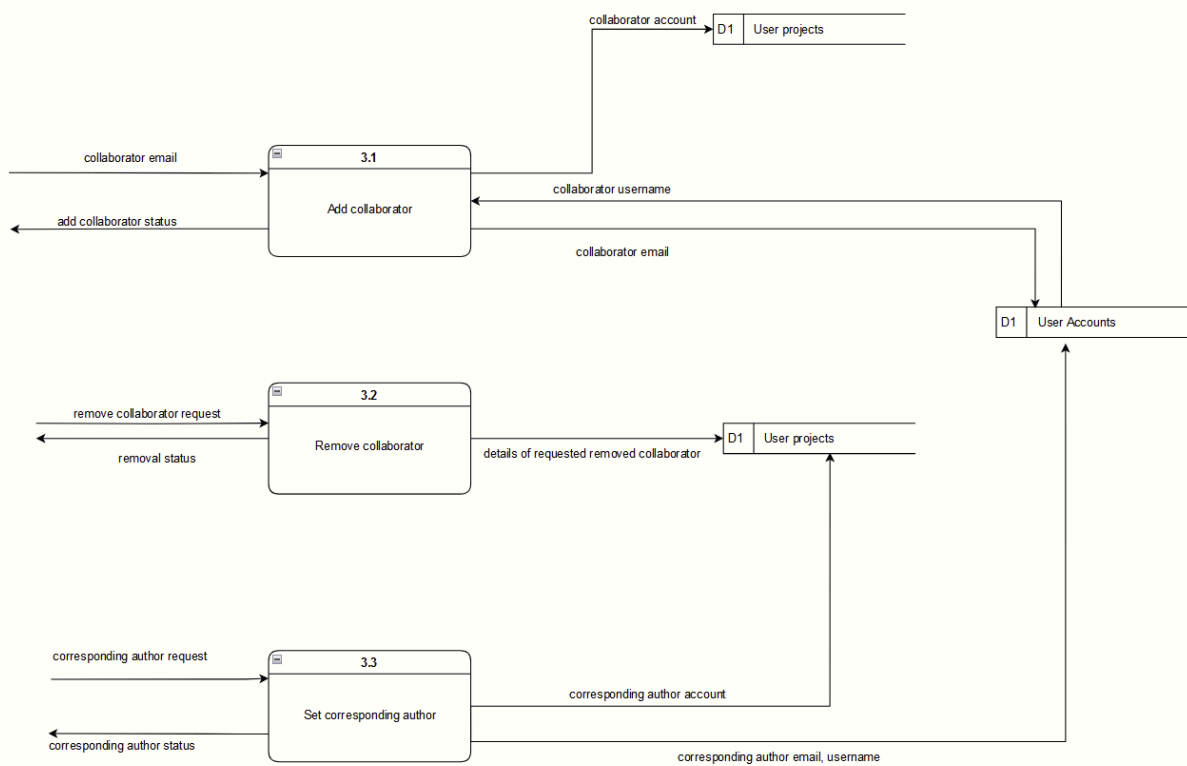
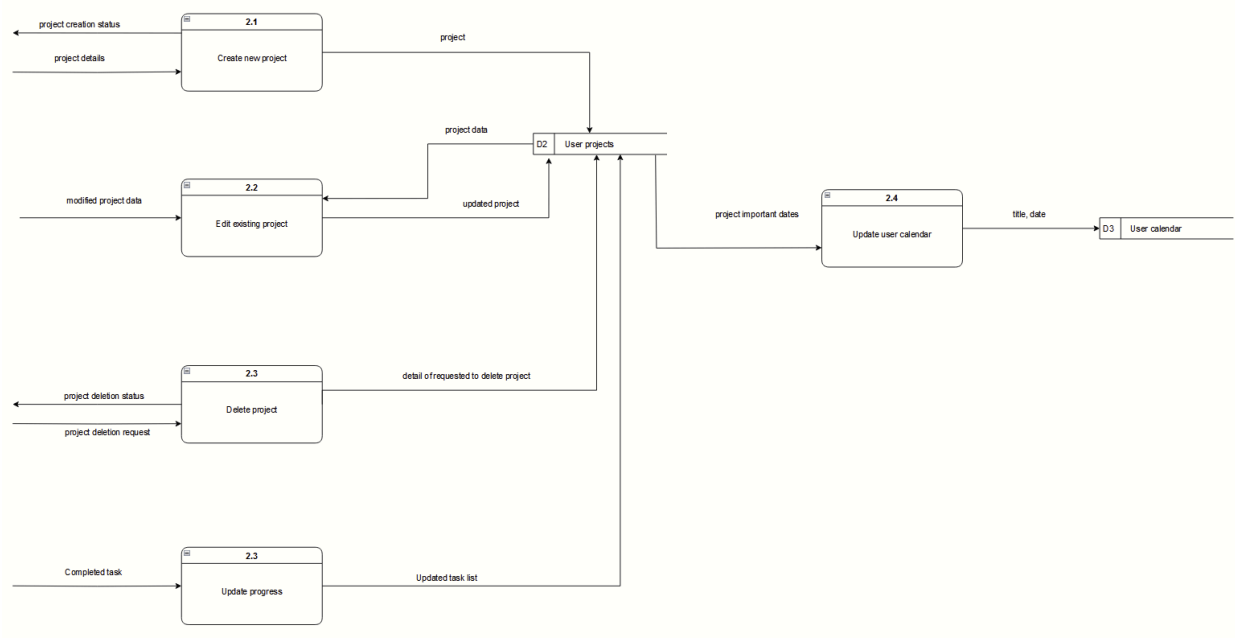


2. Diagram 0



### 3. Child diagram





## 6.0 Summary Of Requirement Analysis Process

Functional needs that aim to fully address difficulties in academic research and paper writing have been determined via the ScholarSync requirement analysis process. By displaying a list of all ongoing projects and tasks and enabling users to categorize and schedule them into their calendars with real-time updates, the platform will streamline task and project management. With rights provided to collaborators, real-time collaboration tools will allow for seamless editing and version control for paper authoring. Customizable reminder/alert settings will help users by guaranteeing that updates and deadlines are sent to them on time.

Non-functional requirements emphasize security, capability, usability, and a well-defined user interface. Security measures will restrict access to research papers and protect users' personal data through encryption and authentication processes. The interface will undergo enhancements for enhanced engagement, consistency, and visual appeal, while maintaining simplicity and responsiveness across desktop and mobile modes.

By addressing these requirements, ScholarSync aims to streamline academic research and paper writing processes, enhancing collaboration, productivity, and overall user satisfaction.

## Appendix

The screenshot displays a Webex interface during an interview. On the left, a digital whiteboard titled 'Untitled 13' contains a hand-drawn flowchart. The flowchart starts with 'Task listing', which leads to 'Schedule'. 'Schedule' then leads to 'Track Progress', which further branches into 'Collab or Communicate' and 'Reminders, Alerts'. On the right side of the interface, there is a 'Participants' list. The list includes names and join/leave times. 'Muhammad Aliif Ahmad' is highlighted in blue. Below the participants list, a video player shows a timestamp of 18:12 / 44:41 and a zoom level of 0.75X.

Participants	Join/Leave
MUHAMMAD HAFIZ BIN MOHD SHAHARUDDIN A23CS0130	10:28 / 11:13
amelia	10:28 / 11:13
Nuur Aisyah	10:28 / 11:13
ANG CHUN WEI A23CS0046	10:28 / 11:13
Karen Yam	10:28 / 11:13
<b>Muhammad Aliif Ahmad</b>	10:28 / 11:13
Ravinesh	10:28 / 11:13
Nurish	10:28 / 11:13
nurul athirah	10:28 / 11:13
zafir	10:28 / 11:13
Chin Pei Wen	10:28 / 11:13
Haziq	10:28 / 11:13
natijah	10:28 / 10:53

*Interview with Dr. Aliif through Webex*

**Dump**