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SYSTEM ANALYSIS AND DESIGN(SECD2613)

PHASE 2

INFORMATION SYSTEM GATHERING AND REQUIREMENT

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1.0 Overview of the Project

This project focuses on developing a specialized task management system custom fitted to the needs of postgraduate students and lecturers locked in academic paper writing and publication. The activity stems from recognizing wasteful aspect and limitations inborn the current manual forms predominantly dependent on Excel and notepad applications for overseeing tasks.

Through an insightful interview with a master's student, Dr. Muhammad Aliif Bin Ahmad, we gained important view points on these challenges, which have guided the conceptualization of this new system. The manual task management handle currently utilized by student and lecturers includes a few basic exercises, including task posting, planning, update tracking, collaboration, communication and setting updates.

These activities are managed through conventional devices like Excel and notepad applications, which show various challenges. Manual forms can be time-consuming, error-prone, and inefficient, making it troublesome to organize numerous writing projects, keep track of timelines, and encourage compelling collaboration.

To accomplish the project's goals, the new system will utilize Data Flow Diagram (DFD), level 0 Diagram and child diagrams, to outline out its functionality. This structured approach and integrate updates, ultimately giving a more proficient solution for academic task management.

2.0 Problem Statement

2.1 Operation inefficiency and time-consuming

Manual task recording and updating requires a significant time, and effort commitment and takes important resources from important academic work. Task management is trying to manage several technologies at once for scheduling, task listing, tracking progress, and communicating results in fragmented processes and lower productivity.

2.2 Lack of Real-Time Collaboration

The smooth flow of ideas and cooperation between team members is hampered by the lack of real-time collaboration options. Collaboration breaks down in the absence of synchronized updates and shared visibility into task status which encourages misunderstandings and pointless work.

2.3 Be prone to negligence and errors

In academic settings where project requirements and deadlines are constantly changing, manual task management is inherently prone to errors. Deadlines that are missed, oversights, inconsistent version control and updates that are missed compromise the dependability and quality of research results.

2.4 Limited Accessibility

Only a small group of stakeholders have access to task-related information due to the localized storage of Excel files or notes. These restrictions make it difficult for team members to share knowledge and collaborate easily which could delay the advancement of research initiatives.

2.5 Scalability Issues

Manual systems find it difficult to handle growing user bases and demands as job volumes and complexity increase. Insufficient scalability leads to increased workload, less effectiveness and an incapacity to adjust to changing project circumstances.

2.6 Challenge in Task Prioritization

Postgraduate students and faculty members capacity to manage time and resources efficiently is hampered by the manual task management process lack of systematic approach to work prioritization. Students could find it difficult to recognize and take care of the most important activities right once without defined prioritization criteria and tools to help with decision-making. This is because it will cause delays in project completion and possible inconsistencies in reaching project objectives and deadlines.

3.0 Proposed Solutions

The proposed solution that we have pondered over and chosen is to create a centralized task management system for writing and publishing academic papers. This system will incorporate a few of essential features. Through a user-friendly interface, this system will offer assistance with task listing, scheduling, tracking of progress, collaboration, and communication. Besides, proficiency in real-time collaboration capabilities will empower consistent communication between faculty members and postgraduate students. This collaborative environment will be moved forward by features like real-time document editing, version control, comments, and quick chat.

The other solution is we set up progress tracking and status updates. This solution is pivotal for maintaining transparency and accountability. The users will be able to overhaul statuses, track progress in genuine time, and get notices when assignments are

continuous or pending. Another key purpose is to give enhanced scalability and accessibility, which incorporates making the system available by means of versatile and web stages. This design keeps up ease of use and productivity whereas assembly the needs of developing client bases and extend demands.

Furthermore, in arrange to optimize task management, we will implement algorithms for task prioritization. The users can utilize these algorithms to identify and prioritize the most important tasks, decreasing delays and progressing project results based on preset criteria or user-specified needs. Besides, automatic tasks reminders and alerts will ensure that users are ceaselessly reminded of impending due dates, assignments doled out to them, and overhauls as they approach them, advancing timely task management and decreasing the likelihood of missed deadlines.

4.0 Information Gathering Process

4.1 Method used

To gather crucial information for our project, which aimed to create a comprehensive task management system appropriate for postgraduate students engaged in paper writing and publication, we employed a variety of techniques, including interviews. We were able to delve deeply into the experiences, challenges, and preferences of postgraduate students for task management in academic writing through interviews with Dr Muhammad Aliif bin Ahmad. We gathered complex perspectives by posing open-ended inquiries concerning special procedures, trouble spots, and ideal features. Surveys provided a more comprehensive view by gauging patterns and preferences across a bigger sample size, which complemented the qualitative data. We were able to gather specific data on the kinds of tasks that students encounter, how frequently they occur, and what resources they currently use thanks to structured question formats.

4.1.1 Interviewing

4.1.1.1 What inspired you to start creating a new system, and what are your goals and aspirations for this project?

Therefore, novel desks for organizing paper planning and publication were developed for postgraduate students and lecturers since the process of writing is intricate and demanding. At the moment, there is a lack of effective tools that would answer the needs of the researchers, for example, for handling references and leveraging academic databases. It constitutes the inclination to write and distribute, augment productiveness, improve synergy, provide customization, and interface with existing academic tools, which

makes it an enormously beneficial resource that fosters academic accomplishment and effectiveness.

4.1.1.2 How do you overcome operational constraints when implementing the new system?

Regrettably, implementing a new system often incorporates operational constraints that can stem from technical problems to resistance from stakeholders. However, as it will be seen if a strategic approach is undertaken then these problems could be effectively resolved. Preparation and analysis Before embarking on taking the real exam, several vital steps should be taken to ensure positive results. Examining the present infrastructure, assessing potential flow constriction, and taking thorough risk appraisal can greatly reduce emergent effects. Moreover, adequate preparation of card templates and communication, support channels, and staff training can assist in overcoming organized and passive opposition effectively. In addition, the concept of the scalable solution and utilizing agile procedures empower one to be flexible with the kind of procedure that is utilized to address the issues that may be unpredictable at times. It is more acceptable to make slight changes gradually, which is very effective in the long run since it makes way for change and a culture of receiving as well as giving feedback. Through preemptively addressing limiting factors in operations with this holistic approach, all the possibilities that have been promised by the new system can be realized and therefore make the organizational performance permanently great.

4.1.1.3 What specific challenges with the current manual process led to the idea of developing a new task management system?

The current traditional management of tasks has several crucial aspects that call for the creation of a novel approach that has not been used before. One major disadvantage of the manual approach is that it is susceptible to human errors which result in missed timelines and overlooked work. The lack of a central stage results in moderation and misunderstandings in communications, jeopardizing commitments, and it is challenging to maintain openness and responsibility in this case. Moreover, the uses of manual updating and records keeping are slow and irrelevant thus, yield is low due to these delays. The added real-time advance monitoring capability prevents a fast stimulation of shifting demands. These problems raise the need for automated task management or enhancement of the existing one

that would increase accuracy, efficiency, and cooperation among the teams.

4.1.1.4 What are the budgetary limitations for developing and implementing the new system?

Budgeting is the other factor that is normally stringently followed when implementing or implementing a new system because must be designed and put in place to ensure that it is not over funding. These limitations include; funds for the initial and basic research and development, purchase or acquisition of the required assets, and their adaptability to the existing systems. Additionally, the issue of inadequate funding can hamper the recruiting and training of skilled personnel essential for the project as well as continuous reinforcement and encouragement of staff once the system is implemented. Issues that may affect the technical capacity or the scope may also compromise the budget. As a result, project managers have to look for necessary characteristics and working capacities, be cost-effective, and assess costs properly and effectively to avoid going beyond the project costs while, at the same time, delivering value.

4.1.1.5 How much time is spent on managing tasks manually, and how does this impact daily operations?

Manual handling of tasks is time-consuming and could also create a central beam on daily operations. Instead of doing something productive and productive work, managers and other organizational members have to spend their time on the planning, monitoring, and maintenance of tasks. This often leads to employees being overwhelmed by daily errands, which cause low efficiency as well as greater chances for errors or omissions. This inefficiency can result in limited coordination across teams and failed deadlines meaning some teams will have to redo their work while others will not have timely access to information. Thus, it is possible to emphasize that the whole workflow is alienated in such a case, adversely affecting the results obtained at the individual level as well as organizational outcomes and goal attainment. Thus, in the extremely long term, the immunity to manual task management may no longer yield the benefits of competitive advantage and flexibility that a company needs in a high-velocity market.

5.0 Requirement Analysis (based on AS-IS analysis)

5.1 Current business process (scenarios, workflow)

Below are the scenarios and workflow on how Postgraduate Task Management System current business process:

User Registration

- Users register a personal account on the postgraduate task management system.
- In case the user already has an account, one can log in; otherwise, one can register or even recover the password, if lost.
- The system also validates the user's email through email validation process.

Dashboard Access

- Once the email is validated, users can go to the dashboard.
- The dashboard also includes various tasks and progress bar concerning their postgraduate studies.

Task Management

- Due dates for assigned tasks and submissions can be set.
- It allows users to edit tasks and receive notification on the due date and reminder dates.

Proposal Submission

- Users submit their proposals through the system.
- The system checks if the proposal needs approval.
- If approval is required, the system alerts the supervisor.
- When the supervisor approves the proposal, it is saved in the database.
- If not approved, the user receives an alert notification so as to edit the details accordingly.

Progress Tracking

- The system provides calendar integration to help users manage their schedules.

Notifications and Alerts

- Users receive notifications for due dates, task updates, and alerts for pending approvals.

Publishing

- Once tasks or proposals are approved, users can proceed to publish their work or update their progress status.

5.1.1 Workflow

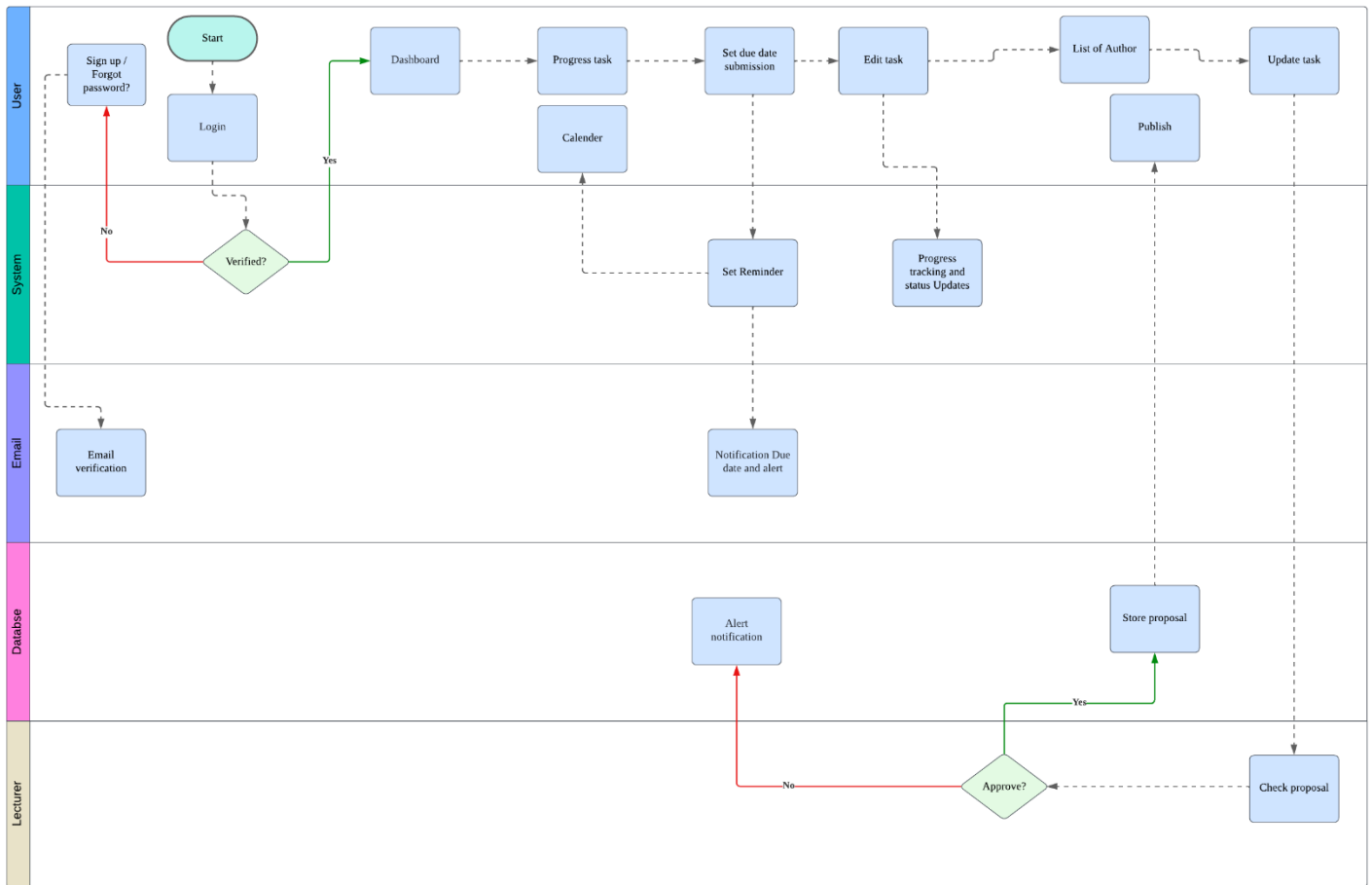


Figure 1

5.2 Functional Requirement (input, process and output)

5.2.1 Context Diagram

Process	Input	Output
Task Management System	Student and Lecturer Information	University Management
	Task Submission	Lecturer
	Task Assignment	Postgraduate Student
	Task Information	Postgraduate Student
	Submission Status	Postgraduate Student
	Task Data	University Management
	Feedback and Grading	Lecturer
	Grade and Feedback Information	Email Server
	Notification	Postgraduate Student

5.2.2 Level – 0 Diagram

Input	Process	Output
Student Information	Update Student Profile	Student Data
Task Submission	Submit Task and Assignment	Task Detail Task Data
Task Data Student Record Lecturer Record	Update University Data	University Data Student Data Lecturer Data
Lecturer Information	Update Lecturer Profile	Lecturer Data
Task Information	Create Task and Assignment Details	Task Assignment
Grade and Feedback	View Grading and Feedback	Grade and Feedback Details Grade and Feedback Information
Submission Status Details	Track Submission Status	Notification
Email Details	Receive Email Submission	Information Email Email Data

5.2.3 Child Diagram

Process 1.0

Input	Process	Output
Student notification	Collect Students information	Student Information
Student Information	Verify Student Information	Conformation of accuracy data
Conformation of accuracy data	Update Statements Records	Updated Students profile list
Updated Students profile list	Stored Updated Information in Student File	Students Data

Process 2.0

Input	Process	Output
Task Submission	Receive Task Submission	Task Submission Receipt Information
Task Submission Receipt Information	Validate Submission Details	Validation Status of Submission
Validation Status of Submission	Check Submission Deadline	- Deadline check status - Validated Task Data Submission
Deadline check status	Updated Task Details	Task Details
Validated Task Data Submission	Submit Task to Lecturer	Task Data

Process 3.0

Input	Process	Output
Task Data	Receive Data Update Request	Data Update Request
Data Update Request	Validate Data Update Request	Validation of Data
Validation of Data	Check Data Accuracy	Result for Data Accuracy
Result for Data Accuracy	Update University Data File	University Data File Record
University Data File Record	Confirm Data Update	University Data

Process 4.0

Input	Process	Output
Lecturer Information	Receive Lecturer Information	Received Lecturer Information
Received Lecturer Information	Validate Lecturer Information	Validated Lecturer Information
Validated Lecturer Information	Check for Existing Lecturer Profile	Lecturer Profile Status
Lecturer Profile Status	Update Lecturer File	Lecturer Data

Process 5.0

Input	Process	Output
Task Information	Gather Assignment Requirements	Detailed Requirements Information
Detailed Requirements Information	Create Task Outline	Draft Task Outline
Draft Task Outline	Review Task Outline	Approved Task Outline
Approved Task Outline	Put the Task Details into University Database	Task Details Recorded
Task Details Recorded	Notify Students about New Task Assignment	Task Assignment

Process 6.0

Input	Process	Output
Grade and Feedback	Access Lecturer's Feedback	Feedback Information
Feedback Information	Retrieve Task Grade	Grade data report
Grade data report	Compile Feedback and Grade	Combined Feedback and grade report
Combined Feedback and grade report	Review Compiled Report	-Compiled report -Reviewed feedback and grades report
Compiled report	Display Grade and Feedback to Students	Grade and Feedback Details
Reviewed feedback and grades report	Notify students of Compiled Reports	Grade and Feedback Information

Process 7.0

Input	Process	Output
Submission Status Details	Check Submission Status	Submission Status Request
Submission Status Request	Retrieve Submission Information	Submission Information
Submission Information	Update Submission Status	Record for Submission status
Record for Submission status	Generate Submission Report	Submission Report
Submission Report	Notify Students of Submission Status	Notification

Process 8.0

Input	Process	Output
Email Details	Receive Email Data	Email Data
Email Data	Analyse Email Data	Analysis Report
Analysis Report	Check for Spam or Phishing	-Check for Spam or Phishing - Spam/Phishing Check Result
Check for Spam or Phishing	Notify Recipient of New Email	Information Email
Spam/Phishing Check Result	Store Email Data	Email Data

5.3 Non-functional Requirement (performance and control)

5.3.1 Access Control

The system shall implement role-based access control (RBAC) where:

- i. It allows postgraduate students to create, view, and manage their tasks.
- ii. The lecturer can accept, decline, or give comments to any tasks and proposals submitted by the members.
- iii. Every role should have different levels of authorization because users should perform only the operations associated with their roles.

5.3.2 Backup and Recovery

- i. The system shall also back up all other essential data stored within the program such as users, tasks, and documents on a daily basis.
- ii. Another important aspect is that it is advisable to store backups at a different location with the access restricted to the owner.
- iii. The system must be capable of restoring data within two hours in case of a critical failure, to limit the damage as much as possible.

5.3 Logical DFD AS-IS system (Context Diagram, Diagram 0, Child)

5.3.2 Context Diagram

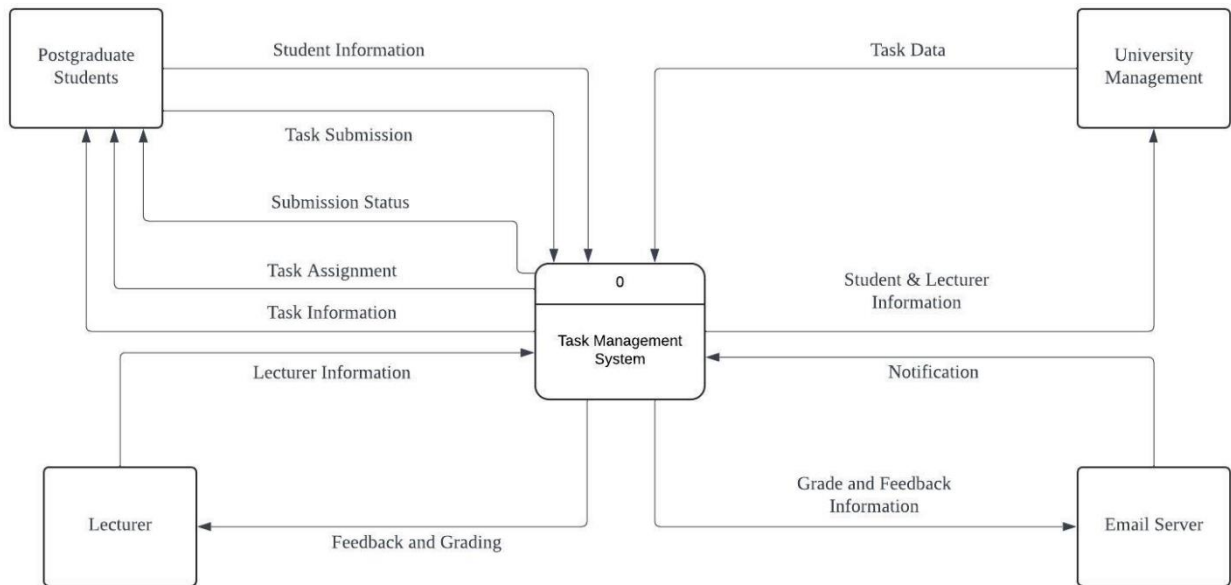


Figure 2

5.3.3 Level - 0 Diagram

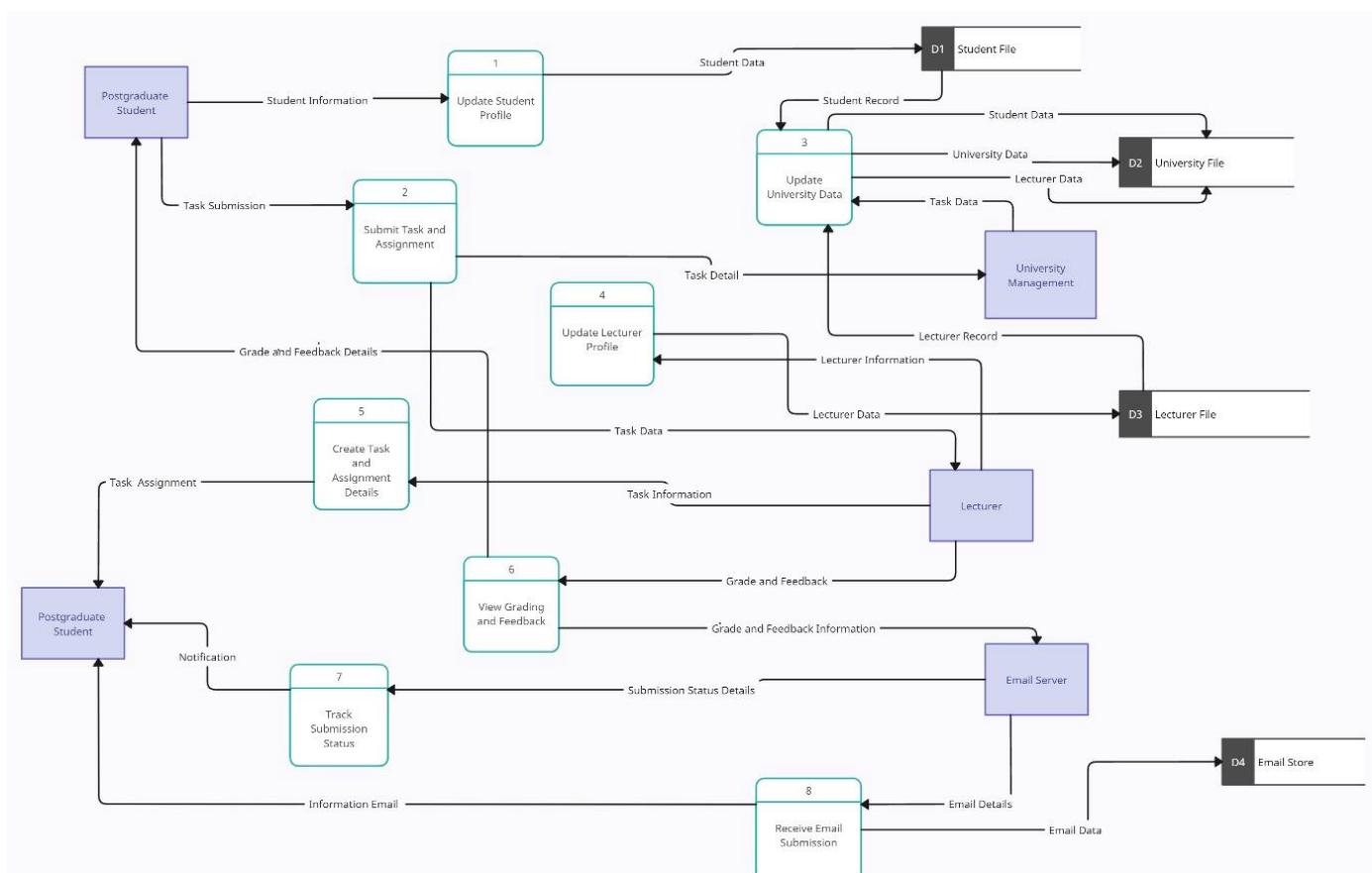


Figure 3

5.3.4 Child diagram

Process 1.0

Child Diagram : Process 1

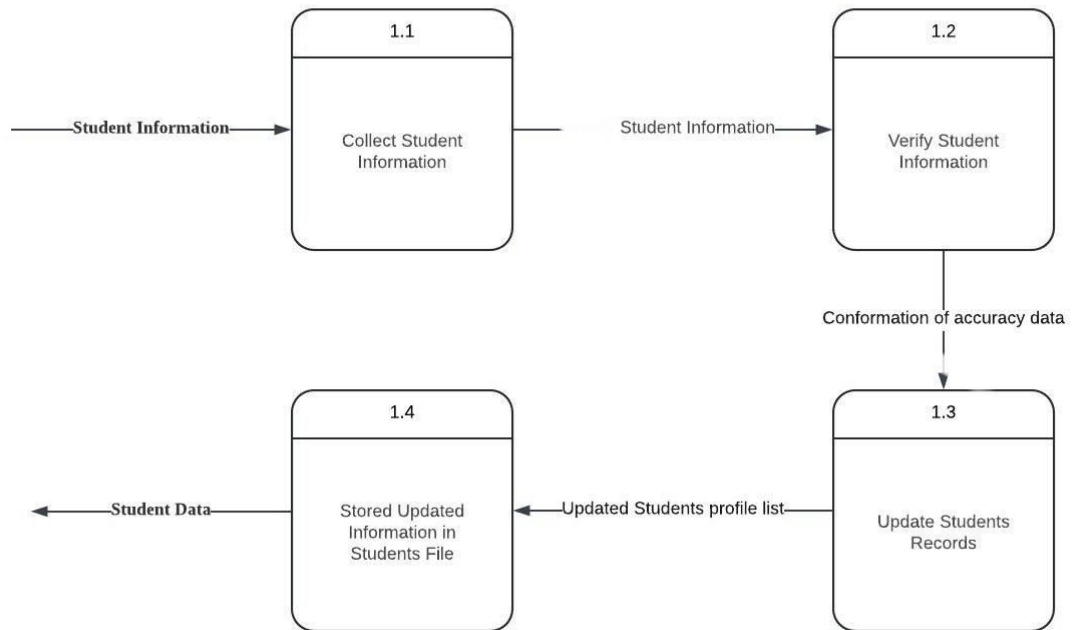


Figure 4

Process 2.0

Child Diagram : Process 2

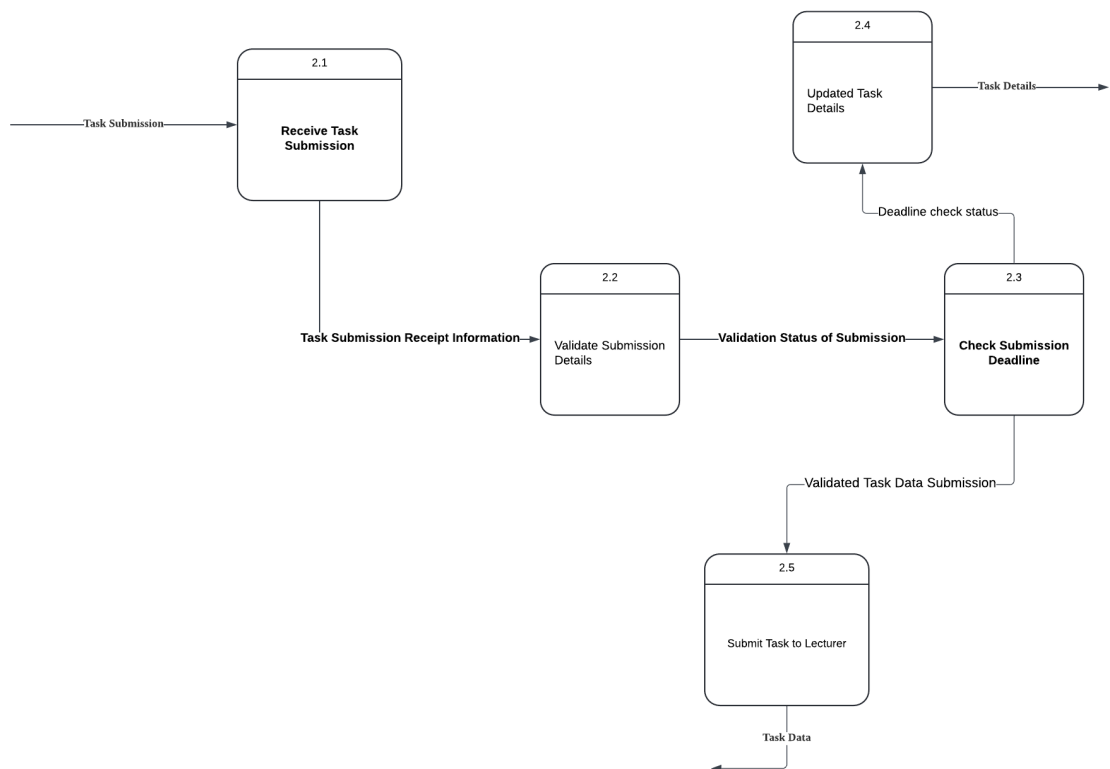


Figure 5

Process 3.0

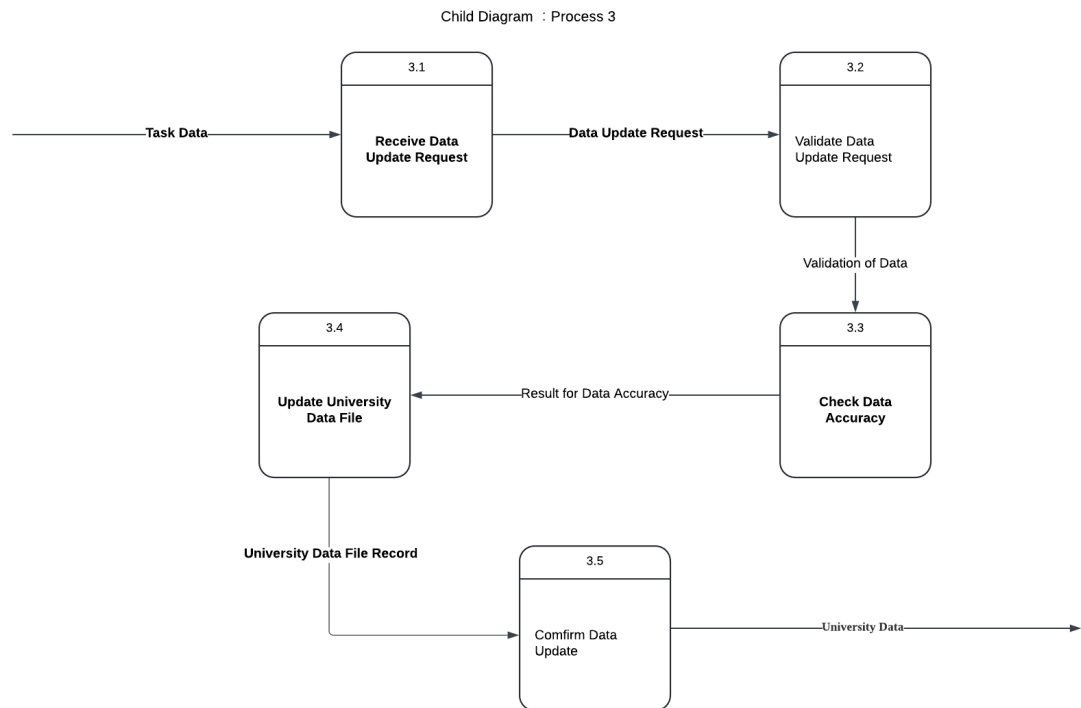


Figure 6

Process 4.0

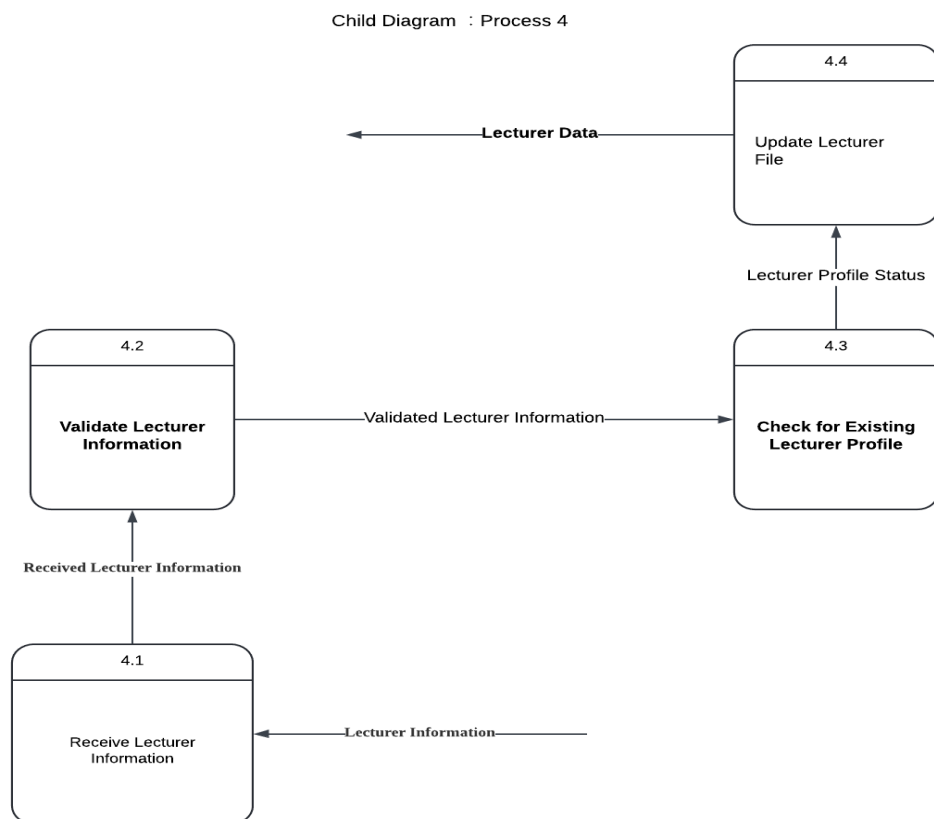


Figure 7

Process 5.0

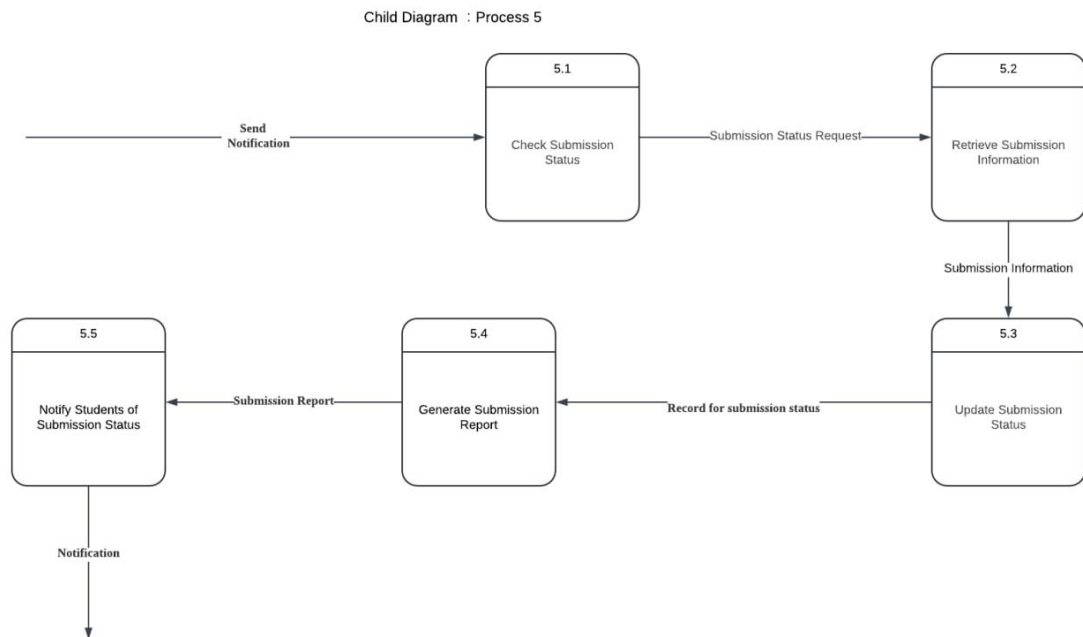


Figure 8

Process 6.0

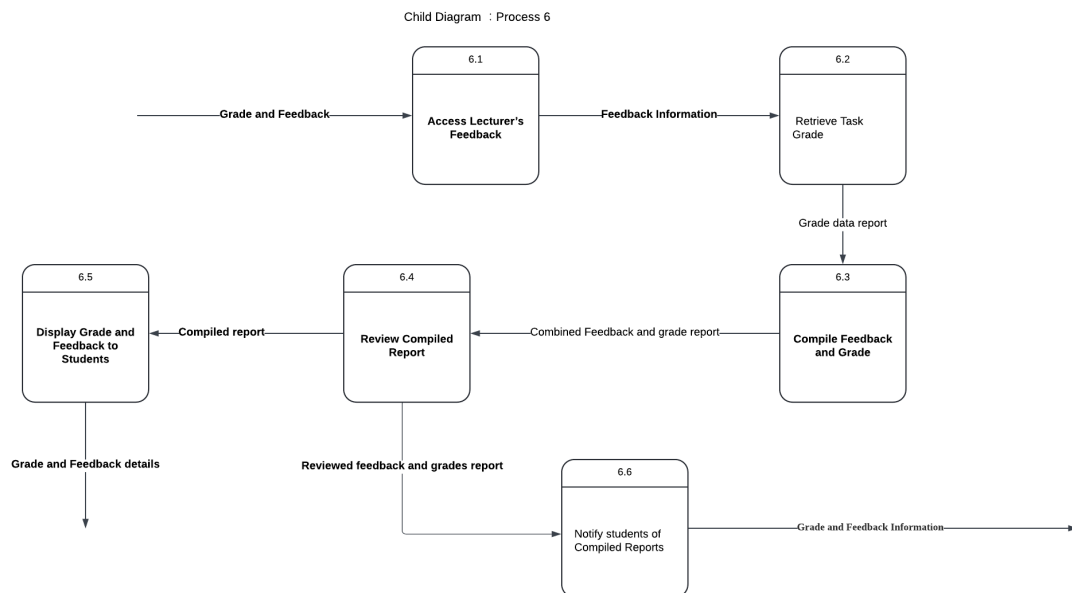


Figure 9

Process 7.0

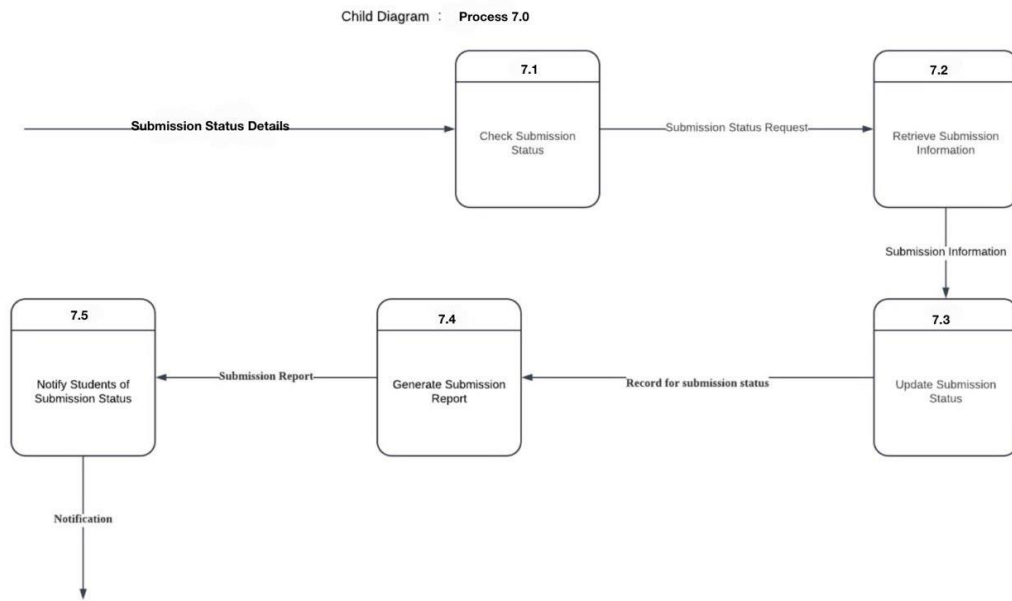


Figure 10

Process 8.0

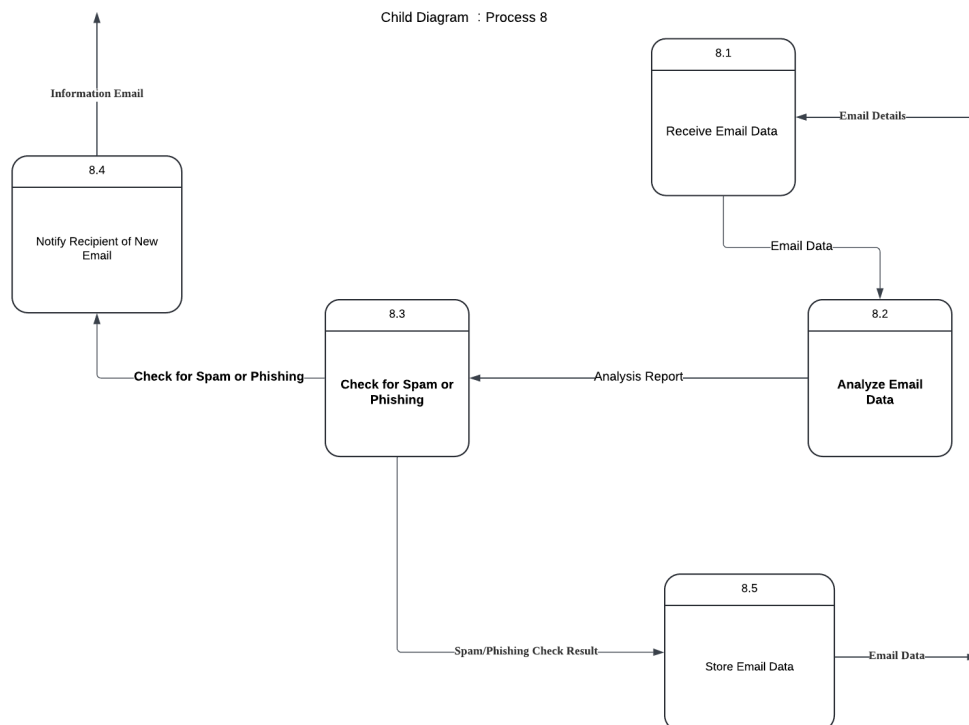


Figure 11

6.0 Summary of Requirement Analysis Process

In conclusion, the process of requirement analysis process for a task management system designed for postgraduate students who write papers and publish them entails determining and recording the unique requirements and difficulties these students encounter. This process includes gathering information through our surveys and questionnaire and holding focus groups with faculty and students to understand their workflows, needs for collaboration and current tools. The aim is to ensure the system meets the unique requirements of academic writing and publication, increase the efficiency and also simplify the whole process. Besides, some areas also can be improved to the task management system to enhance the productivity.

The following areas can be improved in the task management system:

1. Develop a mobile application and ensure a responsive design for better accessibility on various devices such as smartphones, tablets, laptops and so on.
2. Simplify the interface and allow customization to make it more user-friendly.
3. Integrate with popular academic tools and ensure cross-platform compatibility for easy access.
4. Advanced data encryption and provide privacy settings to protect users' information.
5. Provide comprehensive help documentation, tutorials and customer support services to help users solve problems.