PROJECT PROPOSAL
SEMESTER **SEVEN**

COLLEGE NOTES CATALOG

BY:

SANDESH BAJRACHARYA

BACHELOR OF INFORMATION & COMMUNICATION TECHNOLOGY
SCHOOL OF SCIENCE & TECHNOLOGY
ASIA e UNIVERSITY

List of Figures

List of Tables

Table of Contents

CHAPTER 1

INTRODUCTION

1.1   Background

Students often struggle to access comprehensive study materials and final year project repositories. A centralized platform, accessible to both university students and external individuals, is needed to provide reliable and approved academic resources, enhancing learning and collaboration.

Access to quality academic resources is crucial for student success. The College Notes Catalog addresses this need by offering a centralized, digital platform where students can access a wide range of study materials, including notes, lecture summaries, and textbooks. Additionally, it features an approved final year project repository, accessible to both university students and external users. This repository not only serves as a valuable learning tool but also fosters collaboration and innovation. By providing a publicly accessible, organized collection of academic resources, the College Notes Catalog enhances the educational experience and supports academic excellence. It will be used by the following groups:

- University Students: They use the platform for accessing study materials and collaborating on projects.
- External Users: Individuals outside the university can access the final year project repository for reference or collaboration.

The main feature of the College Notes Catalog is its comprehensive, digital repository of academic resources, including notes, lecture summaries, textbooks, and final year projects. This repository is not only accessible to university students but also to external users.

The technology stack for the College Notes Catalog includes several elements. The programming languages used are NodeJS and JavaScript. The markup language is HTML, and the style sheet language is CSS. The web frameworks employed are Tailwind and ReactJS. The database is run on MySQL, and the server used is a Node Server.

1.2   Problem Definition

A significant problem students often face is the difficulty in accessing comprehensive study materials and project repositories. Often, individuals have the knowledge and skills but struggle to find academic resources that align with their learning objectives due to the vast and unorganized nature of academic materials. This lack not only prolongs the learning process but also leads to missed opportunities for both students and external individuals.

1. Difficulty in Accessing Comprehensive Study Materials and Project Repositories
2. Lack of a Centralized Platform for Academic Resources
3. Need for Collaboration Among Students and External Individuals

The College Notes Catalog aims to address these issues by offering a centralized, digital platform where students can access a wide range of study materials, including notes, lecture summaries, and textbooks. By doing so, the platform ensures that students and external individuals are provided with reliable and approved academic resources. This approach streamlines the learning process and enhances the chances of academic excellence. By organizing and prioritizing academic resources based on individual learning needs, the platform reduces the time and effort required to find relevant academic materials, benefiting both students and external users in the long run.

1.3 Objectives

The College Notes Catalog aims to effectively address the challenges faced by students and external users through the following key OBJECTIVES:

1. Centralize Academic Resources
2. Facilitate Access to Project Repositories
3. Enhance Learning Process
4. Foster Collaboration
5. Support Academic Excellence

College Notes Catalog aims to enhance the learning experience, support academic success and foster collaboration among students and external users.

1.4 Scope and Limitations

Scope:
   i.   Offer a wide range of academic resources, including notes, lecture summaries, textbooks, and final year projects.
   ii. Serve a diverse set of users, including university students and external users.
   iii. Facilitate collaboration among students and between students and external users.
   iv. Streamline the learning process by organizing and prioritizing academic resources based on individual learning needs.

Limitations:
   i.   Depends on the active participation of students and external users to contribute and update academic resources.
   ii. The quality and usefulness of resources can vary, as they are user-submitted.
   iii. While the platform is designed to be user-friendly, there may be a learning curve for some users to navigate and utilize the platform effectively.
   iv. Ensuring the privacy and security of user data can be challenging.

1.5   Target User

1. Age Group: 18-55
2. Interest: Students seeking for college notes, inspirations and references for final year project.
3. Education: +2 Passed and IT Undergrad Students
4. Profession: Students, IT Coordinators, Teachers
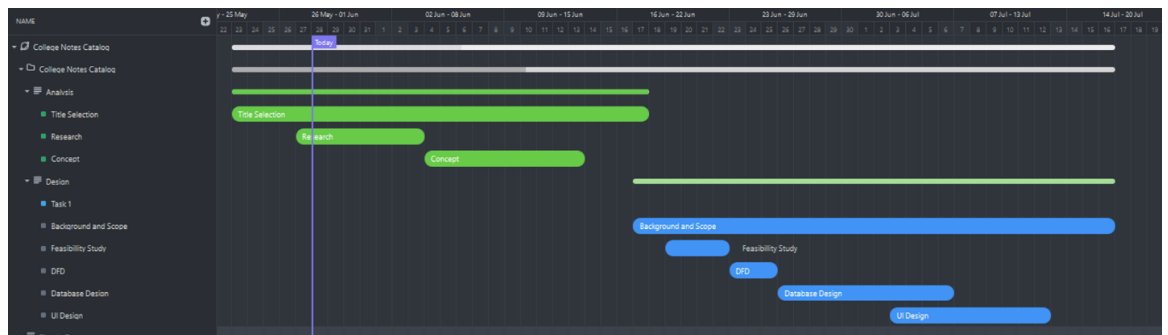
1.6   Project Timeline

Figure 1: GANTT CHART

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The College Notes Catalog aims to bridge this gap by providing a user-friendly platform for students to share and access valuable learning materials. This chapter delves into existing research on student-created learning resources and collaborative learning environments to establish the theoretical foundation for the proposed system.

2.2 Development of Proposed System

College Notes Catalog effectively addresses student needs and delivers value quickly by utilizing the Agile development methodology. Agile prioritizes flexibility and rapid iteration. This means we'll work closely with users and stakeholders to define the platform's core functionalities and continuously refine them based on feedback. The project will be broken down into manageable phases, allowing for frequent delivery of features and adjustments based on real-world use. This iterative approach ensures the College Notes Catalog evolves alongside user needs, guaranteeing a platform that truly empowers students, educators, and external users.

The chosen technology stack, including Node.js, JavaScript, HTML, CSS, and MySQL, provides the necessary scalability and flexibility to accommodate the anticipated growth in users and uploaded resources.

This approach fosters continuous improvement and user engagement, ensuring the College Notes Catalog remains a relevant and valuable tool for the academic community.

2.3 Review of Existing Systems

INSCRIBE - College Notes Sharing Application

The "INSCRIBE - College Notes Sharing Application" by Priyanshi Jaiswal and Rashi Wadnerkar focuses on enhancing student access to educational materials through a secure, user-friendly platform. The application features user authentication, robust search functionality, and file upload capabilities supporting PDF, DOC, and PPT formats. It significantly reduces the manual efforts involved in note distribution, providing a streamlined and efficient learning environment for students (Jaiswal & Wadnerkar, 2022). The front-end of INSCRIBE utilizes HTML, CSS, and JavaScript, enabling a dynamic and responsive user interface. The back-end is managed using PHP, which processes server-side requests, and MySQL, which handles database operations. This combination ensures that the system is both robust and scalable, capable of handling large volumes of data and multiple user interactions simultaneously.

Furthermore, INSCRIBE incorporates a notification system to alert users about new uploads and updates, fostering a real-time collaborative environment. This feature is particularly beneficial in maintaining student engagement and ensuring that they have access to the latest study materials. The system's design also emphasizes user privacy and data security, with secure login protocols and encrypted data transmission. These features collectively contribute to a comprehensive notes-sharing solution that addresses the core needs of students and educators alike.

Notes Sharing Web Portal

The "Notes Sharing Web Portal" by Piyush Pathade et al. addresses the inefficiencies of manual note distribution through a centralized, secure system for both students and teachers. This web portal features role-based access, where students and teachers can register and manage their notes. The approval system for uploaded notes ensures that only high-quality and relevant materials are accessible, improving the reliability of the content (Pathade et al., 2022). The portal's synchronization feature across devices ensures that users can access their notes anytime and anywhere, enhancing the flexibility and convenience of the system.

Technologically, the Notes Sharing Web Portal employs HTML, CSS, and JavaScript for the front-end, creating a responsive and intuitive interface. The back-end is powered by PHP, which efficiently handles server-side logic, while MySQL manages the relational database, ensuring data integrity and security. The system's design incorporates data encryption and secure login mechanisms to protect user data. Additionally, the portal includes advanced search functionalities, allowing users to quickly find specific notes based on various criteria such as subject, author, or format. This feature is particularly useful during exam periods when students need quick access to specific information.

Comparison of Features

Feature	GroupNotes	Notes Sharing Web Portal	Proposed System (College Notes Catalog)
Primary Objective	Enhance student engagement	Secure online note sharing	Centralized digital repository
Technologies Used	NodeJS, operational transformation	JavaScript	NodeJS, ReactJS, MySQL
Key Features	Real-time synchronization	Document uploads, search functionality	Digital repository of academic resources
Interaction Capabilities	Real-time collaboration	Admin-managed approvals	Facilitate collaboration among users
Pedagogical Impact	Increased student engagement	Enhanced study efficiency	Streamline learning process
Challenges Addressed	Student disengagement	Manual paperwork	Lack of centralized academic resources
Limitations	Smartphone dependency	Internet dependency	User-contributed content quality

Table 1: Comparison Table

Conclusion

Lecture Management System and GroupNotes by Mark Reilly and Haifeng Shen, alongside the Notes Sharing Web Portal by Piyush Pathade et al., represent significant advancements in educational technology. Each system addresses distinct challenges in content distribution, student engagement, and resource management within educational settings. However, they also exhibit limitations related to interactivity, technological dependencies, and data security. The proposed College Notes Catalog aims to integrate the strengths of these systems by offering a centralized digital repository while fostering collaboration and accessibility among students and external users. This review underscores the evolution and ongoing efforts in leveraging technology to enhance educational experiences and outcomes.

2.4 Methodology

The College Notes Catalog embraces the Agile development methodology to deliver a learning platform that is both effective and responsive to the evolving needs of students, faculty, and external users. Agile development departs from traditional, linear approaches, prioritizing flexibility and rapid iteration. This translates to a collaborative environment where user feedback and stakeholder input are woven into the very fabric of the system's development.
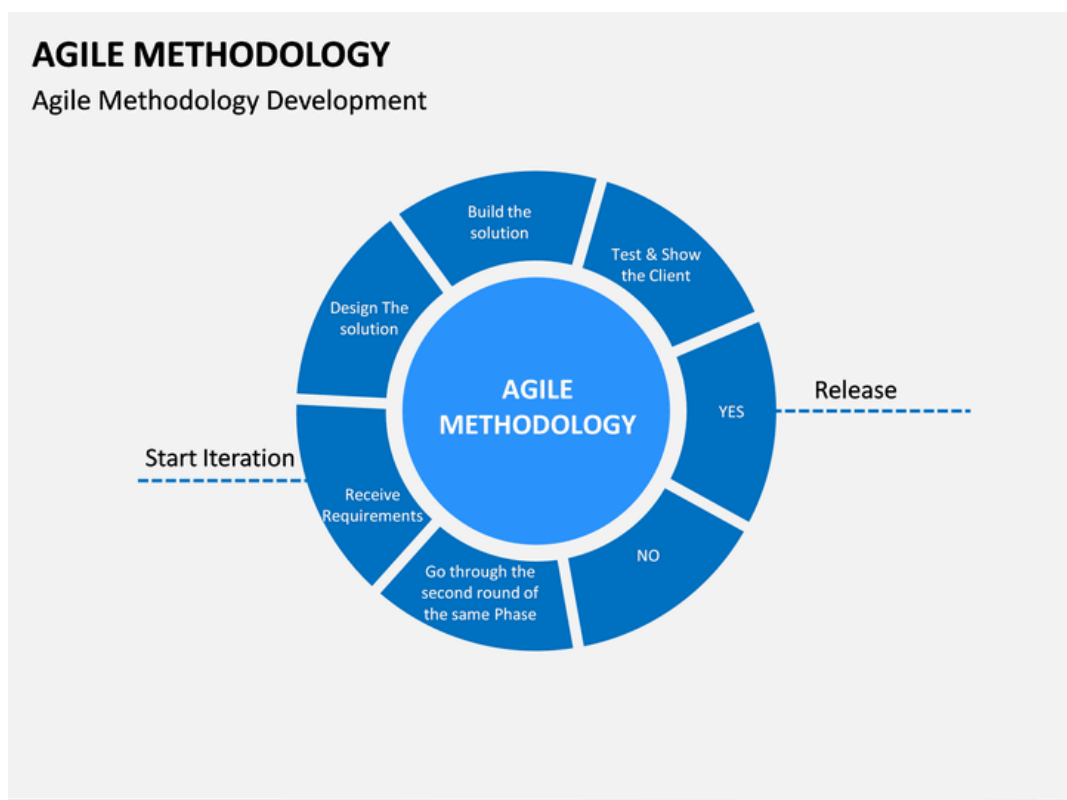

Figure 2: Agile Methodology

At the core of Agile lies the concept of sprints, short, focused development cycles. Each sprint tackles a specific set of functionalities, ensuring early delivery of value to the user community. This iterative approach allows users to experience the platform's capabilities early on, providing vital feedback that informs subsequent development cycles. By continuously refining features based on real-world use, the College Notes Catalog can address unforeseen challenges and adapt to emerging user needs. This ensures the platform remains relevant and addresses the most pressing academic resource requirements.

The College Notes Catalog leverages Agile's emphasis on collaboration to foster a dynamic learning ecosystem. Regular communication channels are established between developers, students, faculty, and external users. This allows stakeholders to voice their needs and concerns, while developers gain a deeper understanding of how the platform is being utilized. This collaborative spirit fosters a sense of ownership and investment, ensuring the College Notes Catalog evolves alongside the academic community it serves. By harnessing the power of Agile, the College Notes Catalog transcends a static repository of resources, transforming into a living, breathing platform that empowers academic success.

CHAPTER 3

SYSTEM ANALYSIS

3.1 Functional Requirements

3.1.1 Manage Users

    i.   The system shall allow a SuperAdmin to create, read, update and delete (CRUD) user accounts.

    ii.   The system shall authenticate users logging into the system.

    iii.   The system shall assign user roles (e.g., student, teacher, SuperAdmin)

3.1.2 Manage Notes

    i.   The system shall allow students and teachers to upload notes, lecture summaries, and other approved academic resources.

    ii.   The system shall allow students and teachers to CRUD notes and lecture summaries that they uploaded.

    iii.   The system shall allow students to search for notes and lecture summaries based on various criteria (e.g., course, subject, keyword).

3.1.3 Manage Repositories

    i.   The system shall allow teachers to upload final year projects.

    ii.   The system shall allow SuperAdmin to manage (CRUD) final year project repositories.

    iii.   The system shall allow students and external users to search for final year projects based on various criteria (e.g., department, keyword).
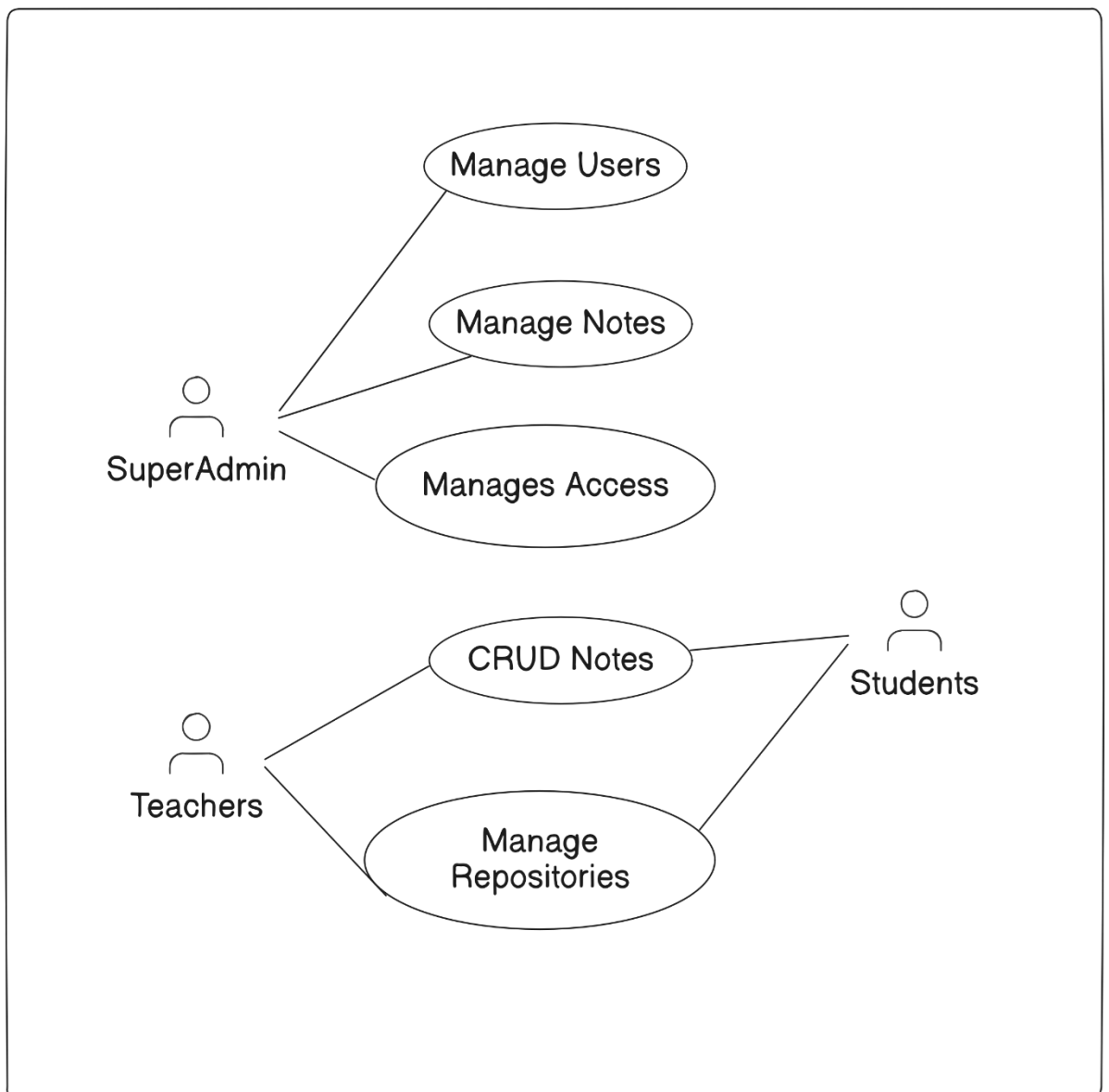
3.2   Use Case Diagram

Figure 3: Use Case Diagram

3.3   Non Functional Requirements

The College Notes Catalog prioritizes a set of non-functional requirements that cultivate a robust and dependable platform for both students and faculty. These requirements ensure a seamless learning experience, fostering academic excellence and collaboration.

i.   Performance: The College Notes Catalog delivers exceptional performance, minimizing page load times and ensuring rapid response to user actions, even during periods of high user concurrency. This responsiveness translates to a frustration-free learning environment where students can focus on acquiring knowledge without technical interruptions.

ii.   Scalability: The platform is architected with scalability in mind. It anticipates a growing user base and an expanding repository of academic resources. The College Notes Catalog seamlessly adapts to accommodate this growth, maintaining optimal performance and user experience regardless of the increasing volume of data.

iii.   Reliability: Unwavering availability is a cornerstone of the College Notes Catalog. The system boasts minimal downtime, ensuring consistent access to critical learning materials for students and faculty contributions. Regular backups and a well-defined disaster recovery plan safeguard data integrity and guarantee system accessibility in the face of unforeseen circumstances.

iv.   Portability: The College Notes Catalog leverages a technology stack that prioritizes platform independence. This allows for effortless deployment on various servers or cloud platforms, should future needs necessitate such a migration. This flexibility ensures the system can adapt to evolving technological landscapes without significant disruptions to ongoing academic activities.

v.   Security: The College Notes Catalog prioritizes the security of sensitive user data and uploaded resources. It implements robust security measures that include multi-factor user authentication, granular access controls that restrict unauthorized access, and industry-standard encryption techniques that protect data confidentiality.

vi.   Usability: The College Notes Catalog fosters a user-centric environment through an intuitive and user-friendly interface. Designed with clarity and simplicity in mind, the interface caters to users with varying levels of technical expertise. A well-organized navigation system, a powerful search function with customizable filters, and clear labeling of functionalities all contribute to a smooth user experience. This user-friendliness maximizes the system's effectiveness as a learning and collaboration tool for the entire academic community.

By prioritizing these non-functional requirements, the College Notes Catalog establishes a foundation for a seamless learning experience, empowering students and faculty to achieve academic excellence.

3.4 Feasibility Analysis

i. Economic Feasibility: The economic viability of the College Notes Catalog hinges on a cost-benefit analysis. Development costs associated with the technology stack and ongoing maintenance must be weighed against the potential benefits. These benefits include improved student learning outcomes, increased faculty productivity, and potential cost savings for the university through reduced reliance on physical learning materials.

ii. Operational Feasibility: The operational feasibility of the College Notes Catalog requires an assessment of its integration into existing university workflows. The system's user management processes, content moderation protocols, and access control mechanisms must align with the university's policies and procedures. Furthermore, a dedicated team with the necessary technical skills and expertise will be needed to manage the platform's ongoing operation and user support.

iii. Technical Feasibility: The technical feasibility of the College Notes Catalog revolves around the chosen technology stack's ability to deliver the desired functionalities. The scalability of the chosen technologies must be evaluated to ensure they can accommodate the anticipated growth in users and uploaded resources. Additionally, the technical expertise available within the university or through potential partnerships with external vendors must be sufficient to develop, deploy, and maintain the platform effectively.

3.5   Process Modeling
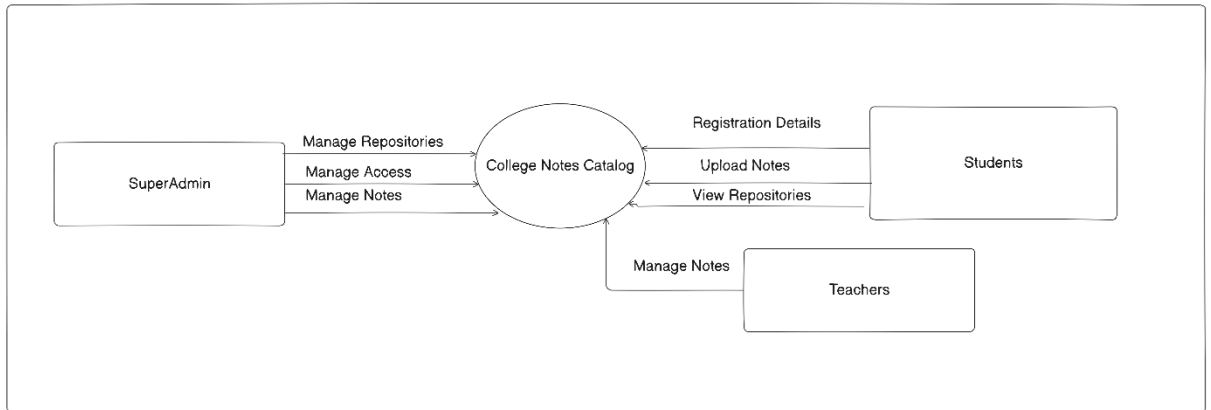
3.5.1 Context Diagram

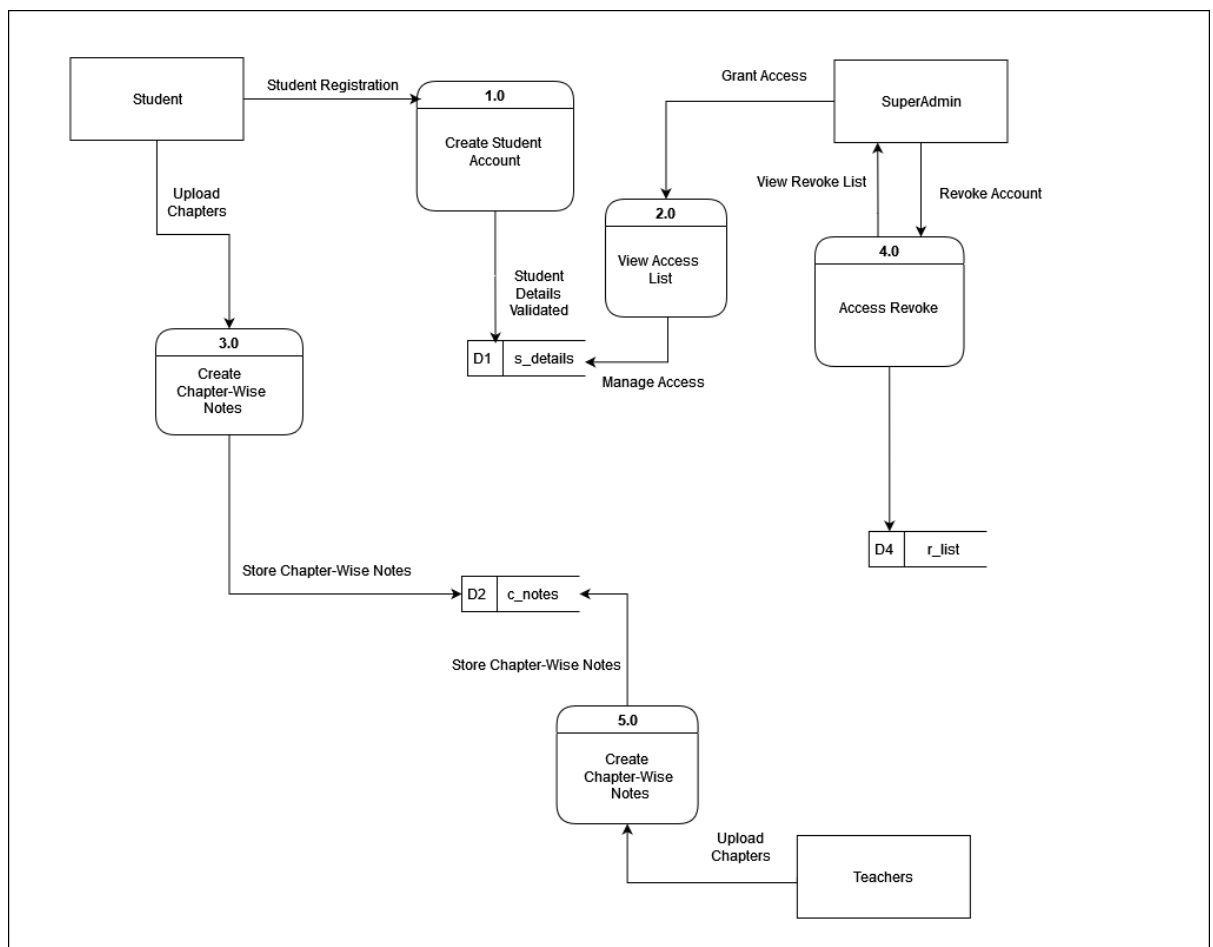Figure 4: Context Diagram

3.5.2 Data Flow Diagram (DFD) Level

Figure 5: DFD Level 1

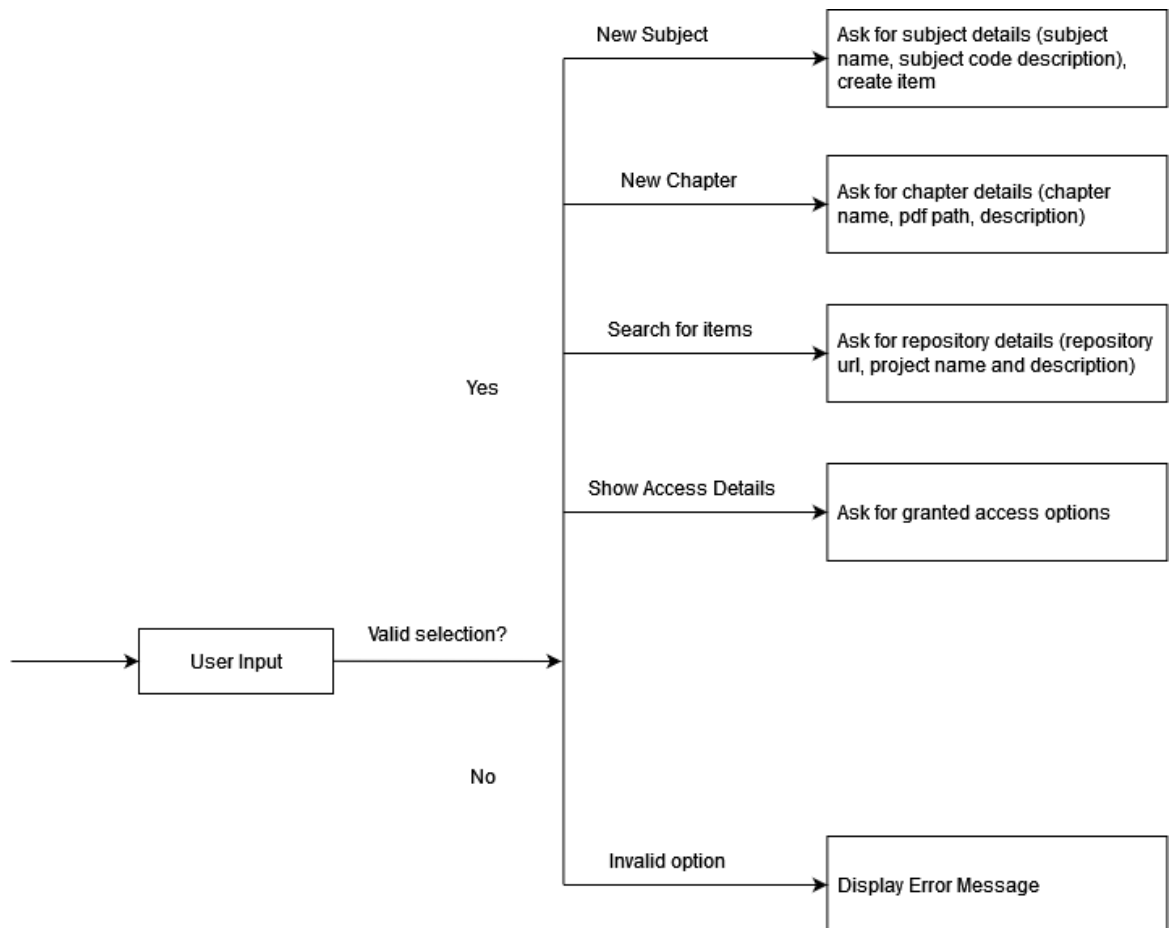## 3.6 Logic Modeling

3.6.1 Decision Tree and Decision Table

Figure 6: Decision Tree of User Input

Conditions	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5	Rule 6	Rule 7	Rule 8
Upload Date	F	F	F	F	F	F	F	F
Subject Code	F	F	F	F	T	T	T	T
Repository URL	F	F	T	T	F	F	T	T
Chapter Name	F	T	F	T	F	T	F	T
Expected results	Error	Error	Error	Error	Error	Error	Error	Error
	Empty fields	Empty fields	Empty fields	Empty fields	Empty fields	Empty fields	Empty fields	Empty fields

Conditions	Rule 1	Rule 2	Rule 3	Rule 4
Username	F	T	F	T
Password	F	F	T	T
Expected Results	Error: Username or password is incorrect.	Error: Password is incorrect.	Error: Username is incorrect.	Success: User is logged in.

Table 2: Decision Table

3.6.1 Flowchart

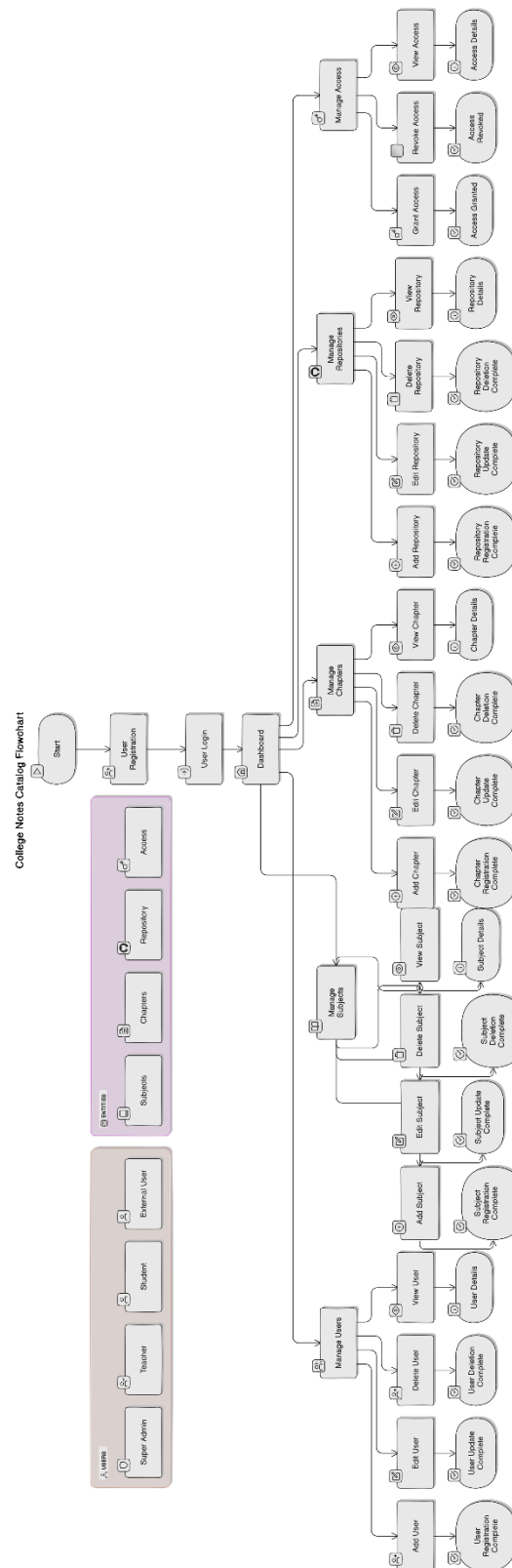
Figure 7: Flowchart of Entire System

3.7   Conceptual Modeling

3.7.1   Data Dictionary

    i.   Users

Purpose: To store information about users, including university students, external users, and super admins.

Column Name	Data Type	Constraints
user_id	INT	PRIMARY KEY, AUTO_INCREMENT
username	VARCHAR	NOT NULL, UNIQUE
email	VARCHAR	NOT NULL, UNIQUE
password_hash	VARCHAR	NOT NULL
role	ENUM	NOT NULL (values: 'student', 'external', 'admin')
created_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP

    ii.   Subjects

Purpose: To store information about the subjects offered.

Column Name	Data Type	Constraints
subject_id	INT	PRIMARY KEY, AUTO_INCREMENT
subject_name	VARCHAR	NOT NULL, UNIQUE
subject_code	VARCHAR	NOT NULL, UNIQUE
description	TEXT	

iii.   Chapters

Purpose: To store information about chapters within subjects.

Column Name	Data Type	Constraints
chapter_id	INT	PRIMARY KEY, AUTO_INCREMENT
subject_id	INT	FOREIGN KEY REFERENCES Subjects(subject_id)
chapter_name	VARCHAR	NOT NULL
pdf_path	VARCHAR	NOT NULL
uploaded_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP
uploaded_by	INT	FOREIGN KEY REFERENCES Users(user_id)
description	TEXT	

iv.   Repository

Purpose: To store information about the GitHub repositories related to final year projects.

Column Name	Data Type	Constraints
repository_id	INT	PRIMARY KEY, AUTO_INCREMENT
repository_url	VARCHAR	NOT NULL, UNIQUE
project_name	VARCHAR	NOT NULL
description	TEXT	
created_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP
created_by	INT	FOREIGN KEY REFERENCES Users(user_id)

v.   Access

Purpose: To manage user access to notes and projects.

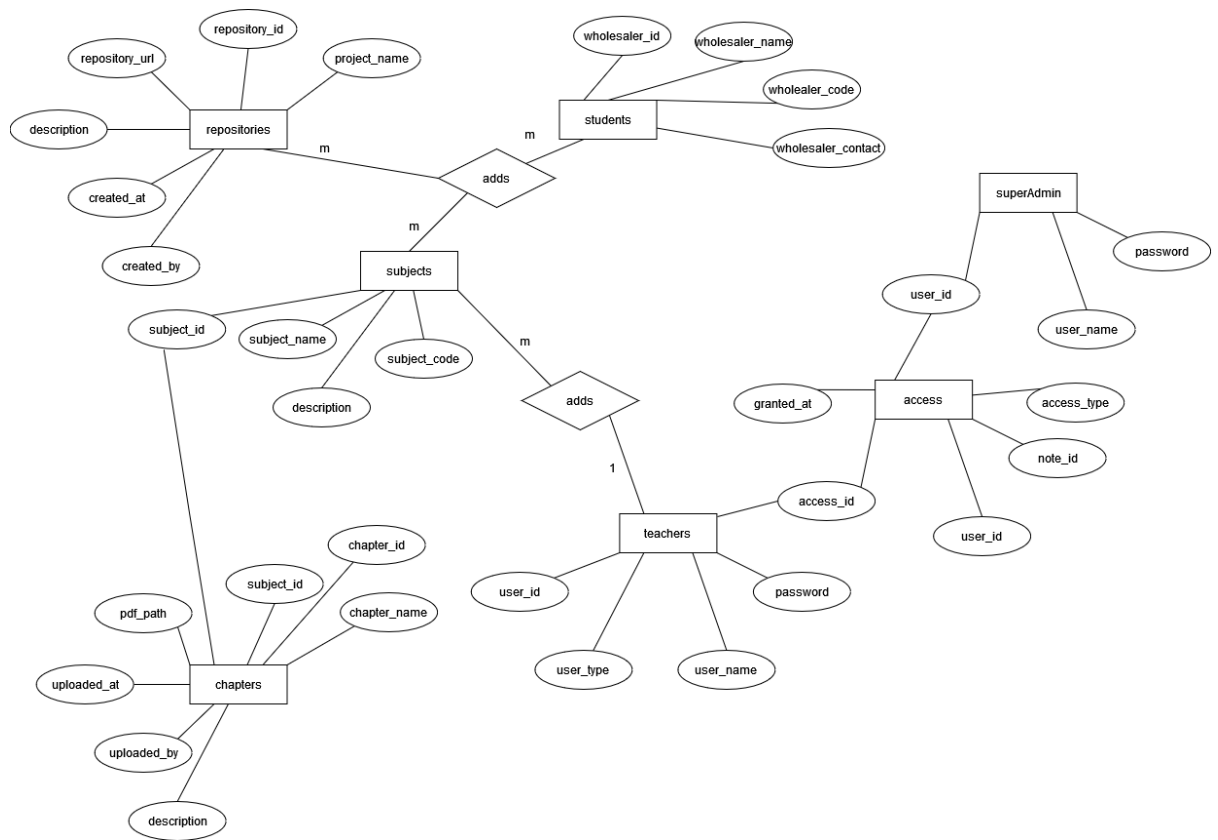| Column Name	Data Type	Constraints
access_id	INT	PRIMARY KEY, AUTO_INCREMENT
user_id	INT	FOREIGN KEY REFERENCES Users(user_id)
note_id	INT	FOREIGN KEY REFERENCES Notes(note_id)
access_type	ENUM	NOT NULL (values: 'view', 'edit', 'download')
granted_at	TIMESTAMP	DEFAULT CURRENT_TIMESTAMP

3.7.2 ER Diagram

Figure 9: Entity Relationship Diagram (ERD)