



THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

System Requirement Specifications

Student Doubt Solving System

The Link

Submitted by:
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(Team 4 from CSBS3)

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Introduction

1.1. Purpose of this Document

The purpose of this SRS document is to provide a detailed overview of our software product, its parameters and goals. This document describes the project's target audience and its user interface, hardware and software requirements. It defines how our client, team and audience see the product and its functionality.

1.2. Scope of the Development Project

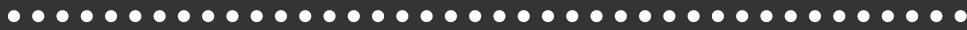
The goal is to design software for the students of Computer Science and business systems as this is a relatively new branch in our college. The work of our software is to make everyone's life easier. This project is intended to cater all the needs of students of the COBS branch.

In this website, a user will login through valid credentials via the login portal. Any registered user can view all the resources, content and other facilities available on the website. This website is designed in a way that it can be easily extended to provide more features and will be easily customizable so that it can work according to every potential user. All this data that's being accessed and the user details will be stored in the database server. All the data will be replicated onto a backup database server so that cases of data loss are minimized in case of events such as site overloading or software corruption.

The software must be able to perform:

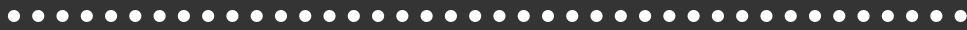
IDENTIFY AND AUTHENTICATE USER

It must be able to authenticate the details filled in by the user against the data stored in the database, only registered users can access the website.



CHECK DEADLINES AND TIME TABLE

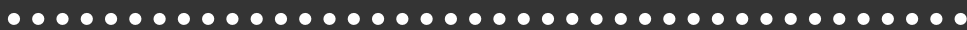
It must be able to check the deadlines of the upcoming assignments and send reminders to the user well in time.



DISPLAY RESOURCES

It must be able to display all the subjects and different years of study. Users can choose among different years of study and various subjects and topics.

Note: Users can also contribute to the noble cause by uploading documents and other study material which they find will be useful for others, for this one special portal will be there to authenticate the legitimacy of the material before putting it up on the website for others.



CHATBOT FACILITY

It must be able to show a popup of chatbot on the website through which users can interact with their respective teachers and can also get answers to frequently asked questions regarding the branch and college.

Initially we plan to implement these functionalities for the COBS branch with an intended audience of 150 users as part of the Pilot Phase. Once the Pilot Phase is successful then we plan to implement it in other branches across the institute and eventually we plan to extend applications including grade viewing, semester fee payment system, etc.

1.3. Definitions, Abbreviations and Acronyms

LMS	Learning Management System
COBS	Computer Science and Business Systems
IEEE	Institute of Electric and Electronic Engineers
Admin	Administrators

1.4. References

- <https://ada-lms.thapar.edu/moodle/login/index.php>
- <https://myherupa.com/>

1.5. Overview

The further sections of this document elaborate upon the characteristics of the users of this project, the product's software, and the functional and data requirements of the same. The second section of the document provides a glimpse of the functions, characteristics and challenges to the project. This section also discusses the feasibility of the project in the real world. The third section goes into the details of the requirements, functional or non-functional. This section also divides these requirements on the basis of the specific interfaces of respective users. And finally, the fourth section talks about the real-time nodes, branches and updates on the software.

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Overall Description

2.1. Product Perspective

Our software is basically a platform which will be a boon for the students of the Computer Science and Business Systems branch of the university.

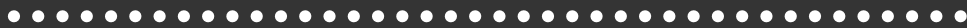
In this project, we will display the user (student), different resources like previous year papers, well completed and written notes, recommended books and sites and other resources, all culminated together at a place. They will have the feature of a chatbot to connect to the required person for any of their doubts and QR code scanner for entry into the library. 2nd type of users- Teachers will be able to upload their assignments deadlines, some resources they recommend, class links and time table and these will be displayed to the students on their portal.

This project has been divided into 3 main modules:

- User module
- Faculty module
- Admin module

USER MODULE

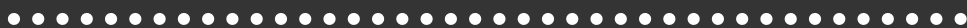
A new user(student) can register himself for the platform by filling some important details like name, roll number, Email ID etc. For authentic user verification, the Email ID should be of the “thapar.edu” domain. Then the user would be assigned a unique username and password which he can login to enter the platform anytime. Here the user can now use all the features intended for him like accessing the study resources, previous year papers and books, Get the timetable and link, make to-do lists, get notifications for deadlines, Chat bot etc.



FACULTY MODULE

By logging in with faculty login, the teachers would be able to upload new study resources directly for the students to go through. They will add the assignment deadlines and can update the class link when required., and these notifications will go to the students.

They will also be able to answer any doubts the students post for them or get in touch with the student through the chatbot.



ADMIN MODULE

Admin manages all the data of users. Admin can view the registered users as well as faculty members. They will be able to add authentic previous year paper and notes from the backend for the students to read from them.

2.2. Product Functions

1. It must be able to perform identification of each user by using login ID and password:
 - User: Whenever the correct user login is identified, the student must be directed to the corresponding page with all the features intended for them. A class representative (which will be verified by the faculty) will land into the same page as user but with a few additional features like the ability to add new links for classes etc.
 - Faculty: Whenever the faculty login is identified, the faculty must be directed to the apt page where he/she can add resources, links etc.
 - Admin: Whenever admin login is identified, the admin is directed to pages where he/she can add notes, previous year papers, handle the data of the added users of the platform etc.
2. The user must be able to view all the pages containing the different features like chatbot, QR code scanner, resources etc.
3. The teacher must get the options of uploading resources and links and answering the questions of the students.
4. The admin must be able to handle the database of the users as well as faculty registered to the platform and also handle all the database of resources displayed on the platform.

2.3. User Classes and Characteristics

Our goal is to design a website which helps the students in their academics and makes connecting with their branch seniors easier.

In our system we have four user classes which are as:

1. Admin
2. User
3. Faculty

Admin would be the developers of the website who'll handle the traffic on the website and make necessary updates from time to time.

The users in the above list would be the students of the CSBS branch of TIET. As the user is from a computer science background, he/she would be more than capable to access the website for his/her benefit.

The class representative would be given remote access to update schedules for each batch or for adding more verified resources as shared by the faculty members or the submission links for various assessments.

Faculty would be assisting the user (students) with queries and doubts that they put in the chatbot as well as sharing additional resources.

2.4. General Constraints, Assumptions and Dependencies

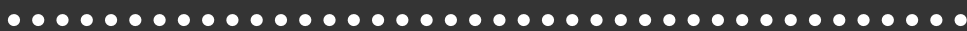
1. We as admins, would be uploading only verified and complete notes (from reliable sources only) into the platform.
2. Administrators would be responsible for updating the resources in a timely manner.
3. The product must have a user-friendly interface that is simple enough for all types of users to understand.

2.5. Apportioning of the Requirements

There will be three phases for the implementation of this project. Hence, the requirements will be apportioned accordingly with the scale and measure of the users and interaction of the software.

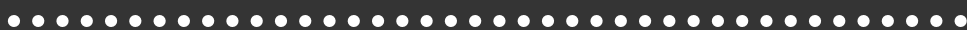
PILOT PHASE

This software will initially be implemented for COBS students, because that is where we got our inspiration from. It is relatively a new and small branch. This will make it easier to take feedback and then implement the changes and updates suggested by the students.



INSTITUTE-WIDE DEPLOYMENT

This software can then be extended to all the branches and years slowly and gradually. Further, this small software can also be integrated into the already existing LMS. While different platforms like LMS and Web Kiosk exist for different functions, they all can be combined on this single platform. This will reduce the tediousness of logging in and remembering the passwords for all these different platforms.



EXTENSION OF THE COMPONENTS TO OTHER APPLICATIONS

Some of the components of this project can also be extended to some other applications. For instance, the notification feature can easily be implemented for the teachers too. Another example can be the QR code, which can also be used for attendance of students in classes.

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Specific Requirements

3.1. Detailed Description of Functional Requirements

3.1.1. Login Screen

Purpose	The main purpose of this screen is for authentication of the users.
Inputs	The login ID and password of the users of the platform.
Processing	Authenticates valid users and only allows them to log in to the platform.
Outputs	The home page loads after successful login

3.1.2. Study Material Screen

Purpose	The purpose of this screen is to show the study material that can be availed by the students.
Inputs	The student can view a page full of different options like- First year, second year and the course subjects within, different resources. The student can view a specific resource by clicking on the desired option. Selection is performed on a simple keyboard Enter key or click.
Processing	The page responds to the selection by loading and presenting a page with the requested pre-written text.
Outputs	The output consists of a screen on which the required resource, that the student selected, is displayed.

3.1.3. Doubt Upload/View Screen

Purpose	The purpose of this screen is to upload doubts and get doubt clearances from the faculty.
Inputs	The students can view a page which has a menu of different faculty members they can contact for their doubts and then select the desired option. The selection can be done simply through a mouse click or a keyboard Enter key. On that page, the student can now type/upload their doubts and press Send.

Processing	The page responds to the send option, by sending the doubt to the faculty (visible in the faculty view of the platform). Here the faculty answers/uploads the solution.
Outputs	The output is the display of the solution to the question posted by the student. The answer uploaded by the faculty is visible on this page to the student.

3.1.4. QR Scanner Page

Purpose	The purpose of this screen is to validate entry to the library and eliminate the tedious process of carrying id cards everywhere by the students.
Inputs	The page will have a scanner which will read the scanner code from the library entry. It will help in validating the students since the platform is linked to the Thapar Email ID of the students and have the information about year and roll number.
Processing	The scanner after scanning will process whether the user is a legitimate student of the college.
Outputs	The output will display a page with text confirming the validation of the user as a Thapar student and can be shown to the library guard for entry purposes.

3.2. Performance Requirements

1. **Responsiveness:** The system running on one platform should be converted easily to run on another platform.
2. **Reliability:** Reliability should be good, i.e., the ability of the system to behave consistently in the manner accepted by the user when operating in the environment for which the system was intended.
3. **Availability:** The system should be always available, which means that the user can access the system using a web browser, limited only by the downtime of the server on which the system is running.
4. **Maintainability:** The commercial database should be used to maintain the database, and the application server should be responsible for the application.
5. **Security:** Secure access to confidential data such as customer information.
6. **User friendly:** Website must be user-friendly so that it is easy for the customer to use it.
7. **Performance:** The performance of the website should be fast.
8. **Efficient:** Website must be efficient so that it does not get stuck during heavy traffic.

3.4. Logical Database Requirements

Our software basically requires four databases to function efficiently, which are as following:

1. **Study Material Database:** All the resources available to the users will be stored and accessed from this database.
2. **Library Database:** Student details will be stored and can be accessed from here.
3. **Notification Database:** Processed Notification data from faculty which would be displayed to the students in appropriate time.
4. **Doubts and Solutions Database:** All the doubts from the student will be uploaded in this database and also the solutions provided by the faculty will be accessed by the students via this database.

3.5. Quality Attributes

This software is targeted towards the university students. The product must load quickly and work well on a variety of devices. It must also accept a variety of input possibilities and uploads from the users.

3.6. Other Requirements

None at this time.

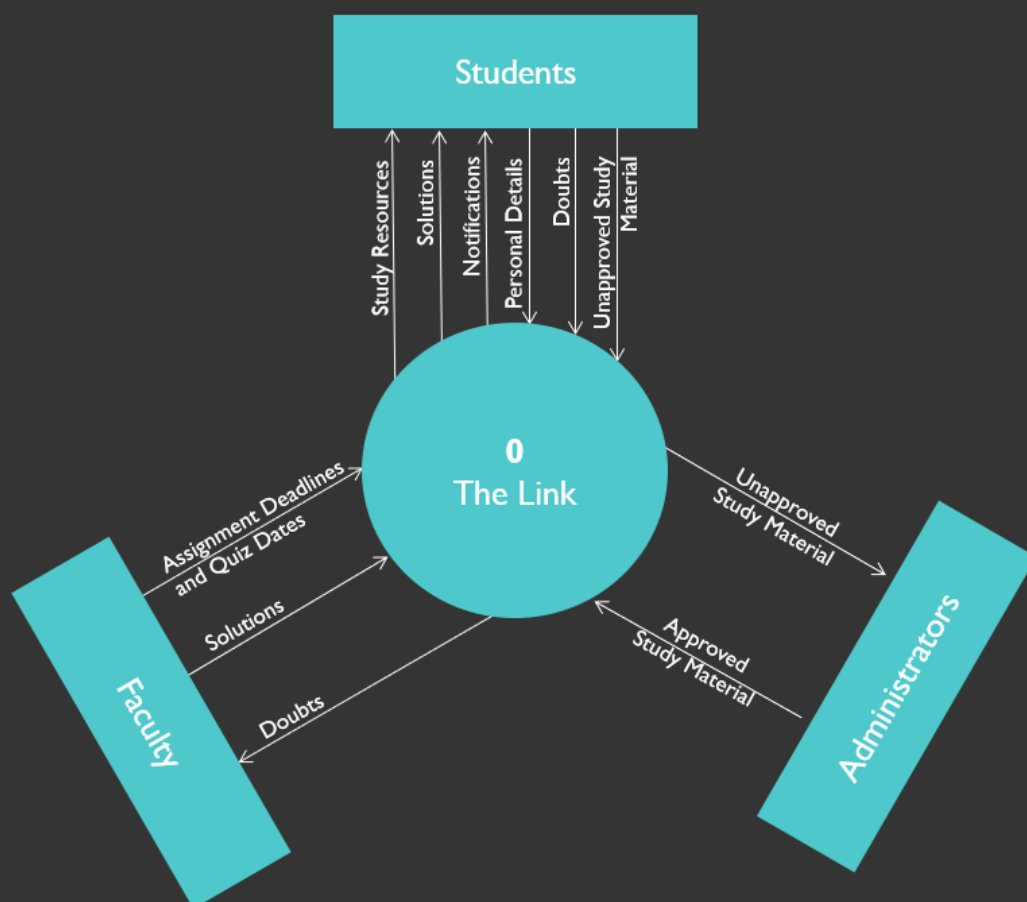
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Software Diagrams

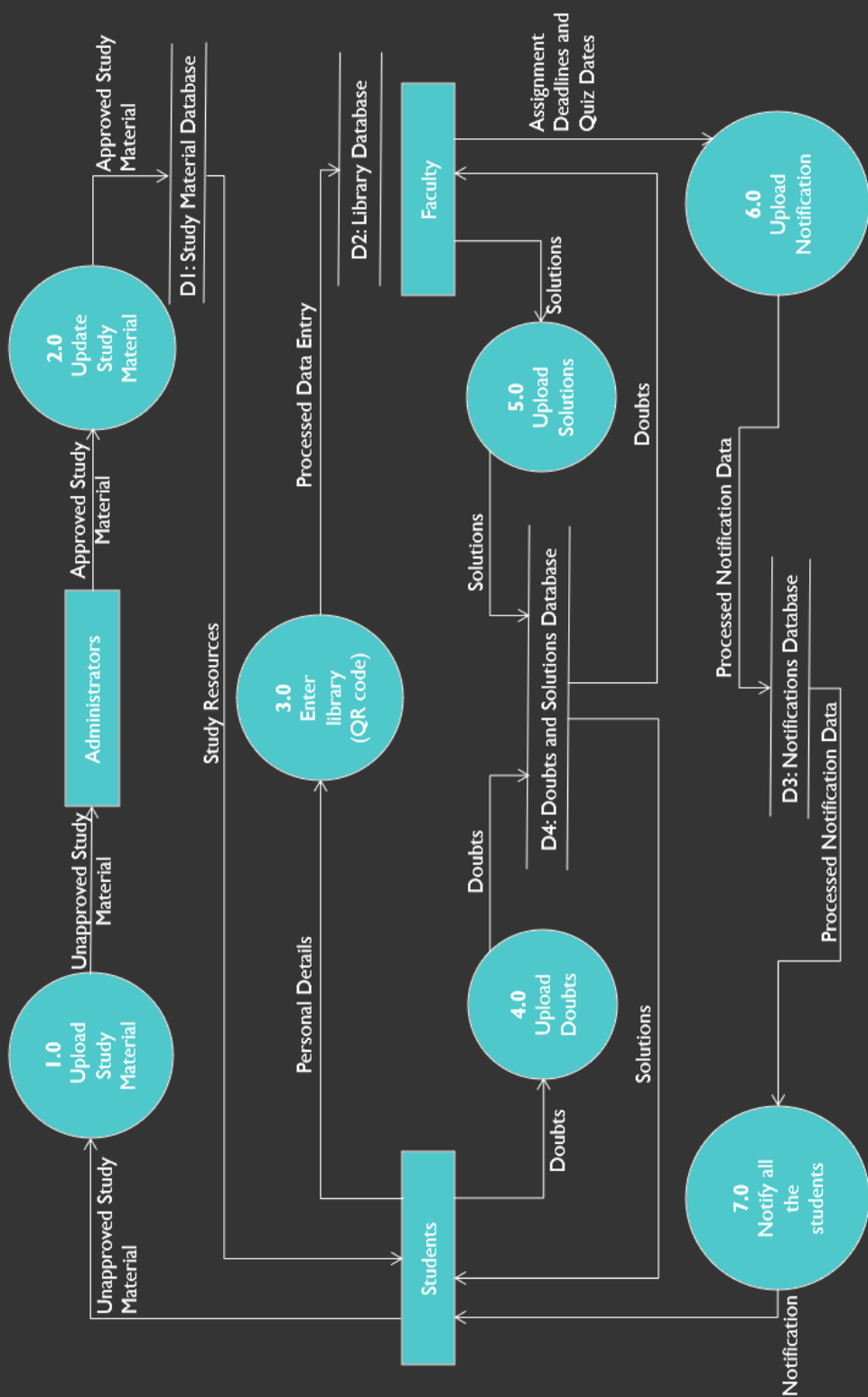


4.1. Data Flow Diagram

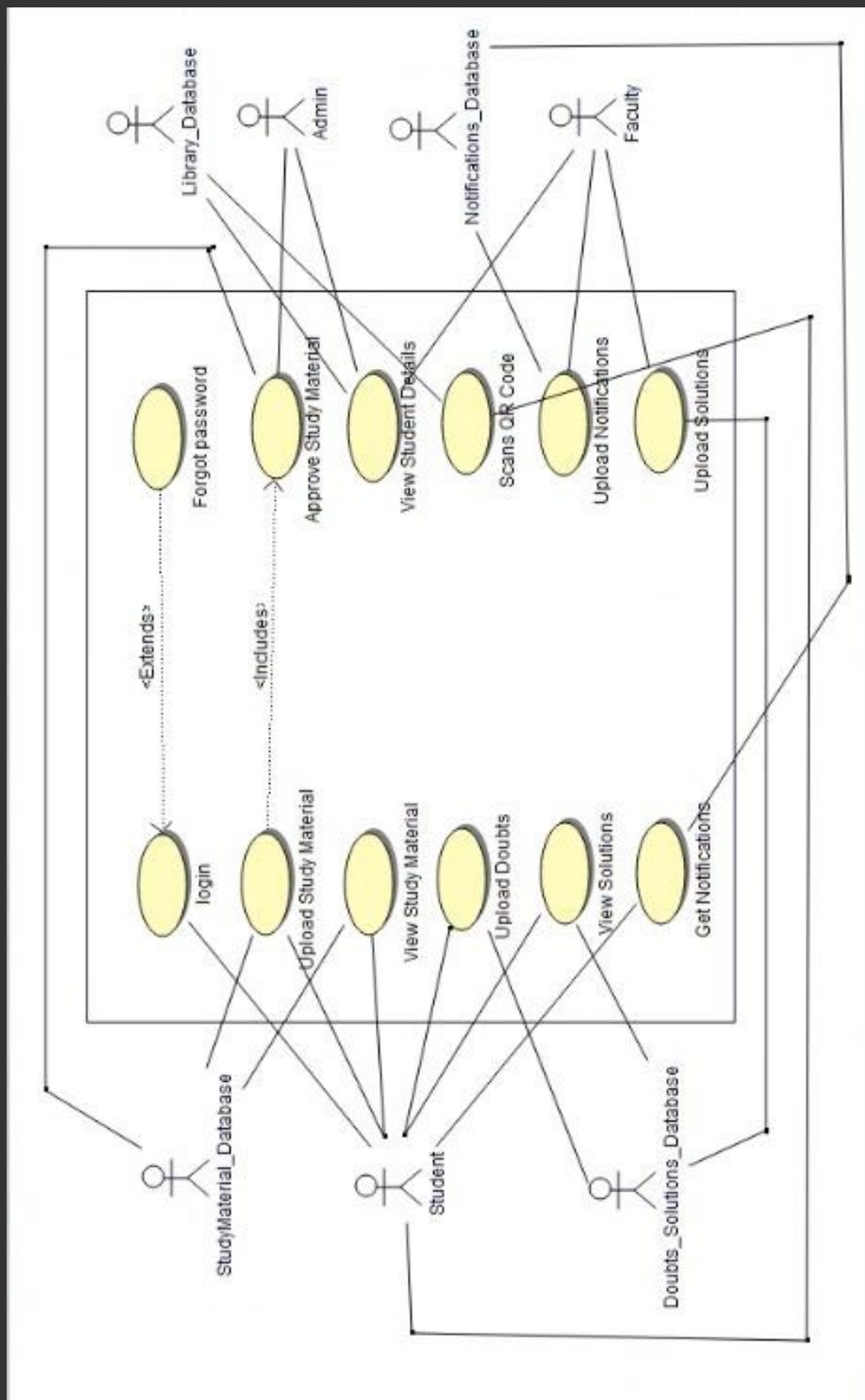
Level 0 Data Flow Diagram



Level 1 Data Flow Diagram



4.2. Use Case Diagram



4.3. Use Case Scenarios

Use Case Scenario 1

Use Case ID	UC-01
Use Case	Upload Study Material
Use Case Purpose	To upload study material from user's end to the server.
Use case Description	The goal of this use case is to accumulate the study material, which will be available to all the students. The study material may include previous year papers, notes etc.
Assumptions	The person operating the device must have the basic knowledge of operating the electronic devices, stable internet connection and must have some valid study material for uploading.
Variations	As of now, there is no variation in the upload method.
Trigger	User navigates to upload study material page and clicks on the button.
Primary Actors	The primary actors here are students and faculty.
Secondary Actors	The secondary actors are admin and study material database.
Pre-Conditions	User must be associated with the institute. User must be logged in to system.
Normal Scenario	<u>Actor Action (AA)</u> User uploads the material and presses the submission button.

	<p><u>System Response (SR)</u> System flashes a confirmation message after user has successfully uploaded the material.</p> <p><u>System Action (SA)</u> Load the data and upload it to the database of unverified (if the user is student) or verified (if user is faculty) study material.</p>
Extension points	There are no extension points to the main flow of the use case.
Alternate Scenario	Instead of uploading the material, the user presses cancel button and navigates back to the dashboard and come out of the use case.
Post Conditions	<p><u>Success end condition</u> The study material is uploaded on the server and the database is updated to reflect the changes.</p> <p><u>Failure end condition</u> The user is unable to upload the study material, due to unstable internet etc. Henceforth, the data base remains unchanged.</p> <p><u>Minimal Guarantee</u> No unauthorized usage can be made of the resources uploaded by the user. User is logged out of the system.</p>

Special Requirements

1. **Responsiveness:** The system running on one platform should be converted easily to run on another platform.
2. **Reliability:** Reliability should be good, i.e., the ability of the system to behave consistently in the manner expected by the user when operating in the environment for which the system was intended.
3. **Availability:** The system should be always available, which means that the user can access the system using a web browser, limited only by the downtime of the server on which the system is running.
4. **Maintainability:** The commercial database should be used to maintain the database, and the application server should be responsible for the application.
5. **Security:** Secure access to confidential data such as customer information.
6. **User friendly:** Website must be user-friendly so that it is easy for the customer to use it.
7. **Performance:** The performance of the website should be fast.
8. **Efficient:** Website must be efficient so that it does not get stuck during heavy traffic.

Use Case Scenario 2

Use Case ID	UC-02
Use Case	Approve study material
Use Case Purpose	To authenticate the study material uploaded by the users.
Use case Description	The goal of this use case is to make sure that only valid resources are made available for all.
Assumptions	The person operating the device must have the basic knowledge of operating the electronic devices, stable internet connection and must have a Thapar ID.
Variations	As of now, there is no variation in the approval method.
Trigger	Admin will navigate to approve study material page, and clicks on the button.
Primary Actors	The primary actor here is admin.
Secondary Actors	The secondary actors are students and faculty.
Pre-Conditions	User must be an administrator. Uploaded material should be in pdf format.
Normal Scenario	<u>Actor Action (AA)</u> Admin validates the resources uploaded by students. <u>System Response (SR)</u> System flashes a confirmation message after authentication of resources.

	<u>System Action (SA)</u> Update the status to verified and make the material visible to all.
Extension points	There are no extension points to the main flow of the use case.
Alternate Scenario	Instead of validating the resources, the admin discards the uploaded the material.
Post Conditions	<u>Success end condition</u> The resources are authenticated and uploaded to the database to reflect the changes. <u>Failure end condition</u> The admin is unable to verify the study material, due to unstable internet etc. Henceforth, the data base remains unchanged. <u>Minimal Guarantee</u> No unauthorized usage can be made of data uploaded.
Special Requirements	1. Responsiveness: The system running on one platform should be converted easily to run on another platform. 2. Reliability: Reliability should be good, i.e., the ability of the system to behave consistently in the manner accepted by the user when operating in the environment for which the system was intended.

- | | |
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| | <ul style="list-style-type: none">3. Availability: The system should be always available, which means that the user can access the system using a web browser, limited only by the downtime of the server on which the system is running.4. Maintainability: The commercial database should be used to maintain the database, and the application server should be responsible for the application.5. Security: Secure access to confidential data such as customer information.6. User friendly: Website must be user-friendly so that it is easy for the customer to use it.7. Performance: The performance of the website should be fast.8. Efficient: Website must be efficient so that it does not get stuck during heavy traffic. |
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Change History



Name	Date	Changes	Version
Student Doubt Solving System; Initial Release			V1.0



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Document Approvers

This document has been approved and checked by:

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