

IS-F341 Software Engineering (2022-23)

T2 - *ProSys: Project Management System*

<https://prosys.vercel.app/>



Kavyanjali Agnihotri(PO), Ankesh Pandey (dev), Akshat Kumar (dev), Khooshrin Aspi Pithawalla (SM)

Student ID	Name	Role
2020A7PS0104H	Ankesh Pandey	Dev
2020A7PS0104H	Khooshrin Aspi Pithawalla	SM
2020A7PS0034H	Akshat Kumar	Dev
2020A7PS0185H	Kavyanjali Agnihotri	PO

Section 1 – Project Overview

Currently, in our campus to apply for projects under professors, an email is released that lists out all the projects being offered for the upcoming semester. Students then apply for the same by emailing the professors or consulting them in-person. Such a method is tedious and monotonous for both professors and students. The professor's inbox is unnecessarily flooded with emails and due to time constraints many students do not get a confirmed response from the professor leading to chaos and confusion. Often students are reluctant to approach professors due to lack of clarity on the application procedure.

Therefore, to create a standardized method of applying for projects, receive confirmation and for further communication during the project we propose a web application with the following functionalities:

- Professors submit their project along with student requirements and prerequisites to AUGSD for approval
- AUGSD gives feedback if necessary, otherwise approves it before releasing it
- Students are able to view approved projects along with its details
- Students apply for multiple projects
- Professors view the profiles of the applied students and rank them in a preference list
- Students accept or reject projects within a given deadline
- Accepted students along with the professors are added onto a communication channel
- Students make project-related submissions
- Professors view submissions and send the grades to AUGSD

Section 2 – Existing Work System

AS-IS Work System Snapshot

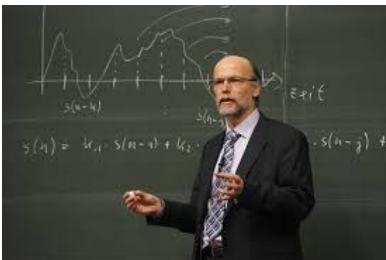
Customers	Product/Services	
<ul style="list-style-type: none"> • Students • AUGSD • Professor 	<ul style="list-style-type: none"> • Student profile and resume • Project title and prerequisites • Student enrollment for project type courses 	
Major Activities and Processes		
	<ol style="list-style-type: none"> 1. Professor decides the project titles and project pre-requisite for the upcoming semester and sends them to AUGSD. 2. AUGSD mails students the compiled list of project titles and pre-requisites and professor incharge. 3. Students apply from ERP pre-registration portal for their interested projects 4. Students consult the professor in person to get the finer details of the project. 5. Professor selects the final set of students and accepts them on the ERP faculty portal. 6. Professor contacts the student through email/google chat/whatsapp and other sources of communication. 7. Professor works with the formally selected students as well as students who are working informally. 8. Students have to email their midsems report and final report of the project work. 9. Professor grades the students' work and forwards it to AUGSD. 10. AUGSD updates the grades for students working formally on the project. 	
Participants	Information	Technologies
<ul style="list-style-type: none"> • Students • Professor • AUGSD 	<ul style="list-style-type: none"> • Student profile and resume • Project title and prerequisites • Student and professor contact details • Midsem and compre report • Student grades 	<ul style="list-style-type: none"> • Email • Communication application(Email/Whats app etc) • ERP website

Problems/Challenges

Participant/ Customer	Description of problems/challenges
Professor	Students mail without a resume and it becomes difficult to decide which student to select without a proper background knowledge.
Professor	It is difficult to physically meet all the students who apply for the projects.
Professor	Projects can be put up only in a certain duration of time and hence sometimes it becomes hectic to compile all projects at once instead of an evergreen process of putting up projects.
AUGSD	Students often mail in order to get a particular project converted into a different type of project.
AUGSD	Professor's often don't give proper description hence giving feedback for project proposals is a necessity.
Student	Professors do not reply to emails and hence it is difficult to decide whether to apply for a new project or keep waiting.
Student	Project prerequisites are often ambiguous and need further clarification with the professor.

User Personas

Tina Samuels (Student)	"Want to formally work on interesting and fascinating projects"	
	<p>Capabilities</p> <ul style="list-style-type: none"> - Comfortable with laptops - Comfortable with web portals - Decent communication skills 	<p>Goals/Objectives</p> <ul style="list-style-type: none"> - Keep track of her applications - Filter projects as per requirement - Get HoD approval for interdisciplinary projects - Send the required and relevant information in applications - Common communication channel between the professor and other candidates of the project - Make necessary submissions for the formal project
<p>Demographics</p> <p>Age: 20</p> <p>Education: College Student</p> <p>Work: Unemployed</p> <p>Family: Single</p> <p>Location: Hyderabad</p>	<p>Brief bio</p> <p>Tina is a Junior of BITS Hyderabad. She wants to go for masters after her college. She likes to experiment with different ideas, and wants to formally do projects under her professors.</p>	<p>Frustrations/Pain points</p> <ul style="list-style-type: none"> - Has to mail professors multiple times with different information - Keep track of the her applications - Tedious to physically go and ask HoD approval for an inter-disciplinary project - Different professors use different communication channel - Make submissions to different websites

Armaan Jha (Student)	“Want to informally work on interesting and fascinating projects”	
	<p>Capabilities</p> <ul style="list-style-type: none"> - Comfortable with using ERP-based system for registration of projects - Comfortable to have conservations on a platform - Decent work ethics 	<p>Goals/Objectives</p> <ul style="list-style-type: none"> - Keep track of his applications - Filter projects as per his requirement - Send the required and relevant information in applications - Common communication channel between the professor and other candidates of the project
Demographics Age: 21 Education: College Student Work: Unemployed Family: Single Location: Hyderabad	<p>Brief bio</p> <p>Armaan is a 3rd Yr CS student of BITS, Pilani and is looking forward to interesting projects to enhance his skillset. He wants to earn good work experience while working in projects</p>	<p>Frustrations/Pain points</p> <ul style="list-style-type: none"> - Keep track of his applications - Search manually to find his projects
Aryan Goel (Professor)	“Want an effective channel for proposing and collaborating for projects”	
	<p>Capabilities</p> <ul style="list-style-type: none"> - Strong communication skills - Good knowledge of computers. - Capable of using intricate web and mobile applications - Approachable to students 	<p>Goals/Objectives</p> <ul style="list-style-type: none"> - Accept students for projects by reviewing their profile - Propose project ideas and prerequisites to AUGSD - Collaborate with students for smooth flow of project work
Demographics Age: 43 Education: PhD Work: Associate Professor at BITS Hyderabad Family: Married Location: Hyderabad	<p>Brief bio</p> <p>Abhimanyu is an associate professor at BITS Hyderabad. While he is accustomed to the current procedures, he would like the process to be simplified for easier collaboration for projects.</p>	<p>Frustrations/Pain points</p> <ul style="list-style-type: none"> - Constant emails from students for interest in projects without much detail of their profile - No clear feedbacks for project proposals on how can they be refined further for better clarity

Abhimanyu Goel (AUGSD)	“BITS specific technology would ensure higher efficiency”	
	<p>Capabilities</p> <ul style="list-style-type: none"> - Strong communication skills - Experience using Web Applications in day-to-day tasks - Approachable to students 	<p>Goals/Objectives</p> <ul style="list-style-type: none"> - Accept or provide recommendations to project proposals - Mark HoD of departments to allow inter-disciplinary projects - Release the final grades of the student
<p>Demographics Age: 33 Education: Graduate Work: BITS Hyderabad AUGSD Division Family: Married Location: Hyderabad</p>	<p>Brief bio</p> <p>Abhimanyu is a long-term member of the AUGSD staff at BITS Hyderabad. While he is accustomed to the current procedures, he would like the process to be simplified using technology.</p>	<p>Frustrations/Pain points</p> <ul style="list-style-type: none"> - Constant emails from students and professors to change the type of project - Receive the final grades of the projects as per professor's convenience instead of all at once

Section 3 – System Scope

TO-BE Work System Snapshot

(moderate support)

<i>Customers</i>	<i>Product/Services</i>	
<ul style="list-style-type: none"> • Professors • Students • AUGSD 	<ul style="list-style-type: none"> • Creating and sending projects to AUGSD for approval • Viewing and approving project proposals • Viewing offered projects 	
<i>Major Activities and Processes</i>		
<ol style="list-style-type: none"> 1. <i>Users see a type of user-login so that they use the web application</i> 2. <i>Professors create and send projects to AUGSD for approval</i> 3. <i>AUGSD views and approves the project proposals</i> 4. <i>AUGSD marks the HoDs</i> 5. <i>Students view approved projects on their dashboards and apply for projects</i> 6. <i>Professors view the student applications for their project</i> 7. <i>Professors accept or reject a student's application for their project</i> 8. <i>Students can accept projects after the professor ranks them other candidates</i> 9. <i>AUGSD provides feedback for rejected project proposals</i> 10. <i>HoDs approve interdisciplinary projects</i> 11. <i>Professors rank/score the student application</i> 12. <i>Professors link project meet timings to google calendar</i> 		
<i>Participants</i>	<i>Information</i>	<i>Technologies</i>
<ul style="list-style-type: none"> • Professors • Students • AUGSD 	<ul style="list-style-type: none"> • Project Approval Status • Approved projects on dashboards • Number of students in project 	<ul style="list-style-type: none"> • MERN Stack • MongoDB Atlas • Calendar API

TO-BE Work System Snapshot (maximum support)

<i>Customers</i>	<i>Product/Services</i>	
<ul style="list-style-type: none"> ● Professors ● Students ● AUGSD 	<ul style="list-style-type: none"> ● Creating and sending projects to AUGSD for approval ● Viewing and approving project proposals ● Viewing offered projects 	
<i>Major Activities and Processes</i>		
	<ol style="list-style-type: none"> 1. Users see the type of user-login so that they can use the web application 2. Professors create and send projects to AUGSD for approval and get the number of students allocated for projects 3. AUGSD views and approves the project proposals and allows students to apply 4. AUGSD marks the HoDs 5. Students view approved projects and can apply for their respective projects 6. Professors accept students up to a sanctioned number 7. Students send their applications with their resume 8. Automated word scrapping of resumes will be performed during application reviews in order to match requirements. 10. Student tracker will monitor progress of approved students and will be visible on professor dashboard 11. Automated notifications are sent to HoDs to approve inter-disciplinary student applications 12. Professors can link project meet timings to google calendar. 13. System creates communication channel for a project adding the professors and students 	
<i>Participants</i>	<i>Information</i>	<i>Technologies</i>
<ul style="list-style-type: none"> ● Professors ● Students ● AUGSD 	<ul style="list-style-type: none"> ● Project Approval Status ● Approved projects on dashboards ● Number of students in project 	<ul style="list-style-type: none"> ● MERN Stack ● MongoDB Atlas ● Chat API

TO-BE Work System Snapshot (selected for project work)

<i>Customers</i>	<i>Product/Services</i>	
<ul style="list-style-type: none"> ● Professors ● Students ● AUGSD 	<ul style="list-style-type: none"> ● Propose projects to AUGSD for approval ● View and approve project proposals ● Apply for offered projects ● Accept applications ● Communication Channel 	
<i>Major Activities and Processes</i>		
<ol style="list-style-type: none"> 1. Professors create and send projects to AUGSD for approval 2. AUGSD views and approves the project proposals 3. AUGSD provides feedback for rejected project proposals 4. AUGSD marks the HoDs 5. Students view and filter approved projects 6. Students submit applications for a project 7. Professors update their profile 8. Professors accept or reject a student application 9. Students accept projects 10. HoDs approve interdisciplinary projects 11. Professors rank/score student applications 12. Professors link project meet timings to google calendar 13. Professor creates communication channel for a project adding the students 14. Notifications are sent to HoDs to approve inter-disciplinary student applications 15. AUGSD notifies students to update profiles 		
<i>Participants</i>	<i>Information</i>	<i>Technologies</i>
<ul style="list-style-type: none"> ● Professors ● Students ● AUGSD 	<ul style="list-style-type: none"> ● Project Details ● Application Details ● Communication ● Messages ● Professor Profile ● Student Profile 	<ul style="list-style-type: none"> ● MERN Stack ● MongoDB Atlas ● Chat Library ● Calendar API

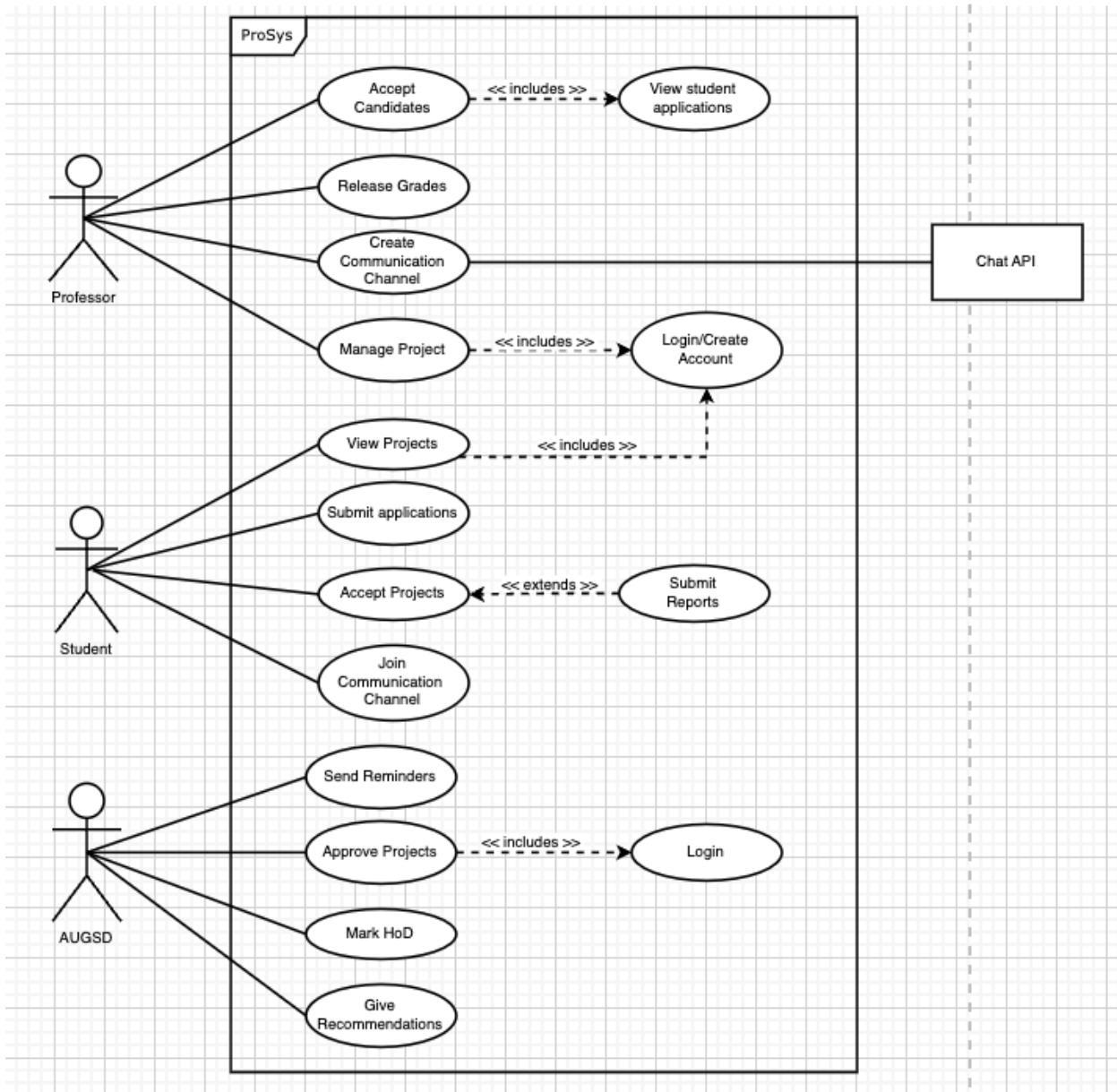
Section 4 – Product Backlog

As a	I want to	so that
Student	create a profile	I can apply for projects
Professor	create a profile	I can propose projects
Professor	submit projects for approval	I can receive applications
AUGSD	view and approve projects	students can view projects
AUGSD	view and give feedback	professors can modify accordingly
Student	view approved projects	I can apply for them
AUGSD	mark head of department	they can approve inter-disciplinary projects
Student	apply for projects	I am considered for it
Professor	view the status of my projects	I know which projects are approved
Professor	delete completed projects	students do not reapply
Student	update their profile	it is up-to-date when I apply for projects
Professor	update their profile	it is up-to-date
Professor	view student applications	I can select candidates
Professor	select candidates	I meet the number of student requirements
Student	accept offered projects	I can register for them
Professor	make a communication channel	I can communicate with students in a project
Head of Department	approve inter-disciplinary projects	students can register for them
Professor	schedule meets	I receive updates
Student	filter projects	I find specific project
AUGSD	send notification to students for profile updation	they receive a reminder for it
Professor	score the applications	I select the best candidates

Professor	create a waitlist of applicants	acceptance offers are sent
Student	make submissions	I can be graded
Professor	grade submissions	students can be graded
Student	views professor profiles	I can find matching interests

Section 5 - Use case modeling

Use case diagram



Use case description # 1

Name	Student applies for a project
Description	Students want to apply for a project so that they are considered for it.
Actors	Student
Trigger	Student creates application
Preconditions	Student is logged in and the project is approved by AUGSD
Postconditions	Student successfully submits his/her application
Main course	<ol style="list-style-type: none"> 1. System displays the approved projects along with the project details. 2. Student choose the desired project and goes to create application 3. System shows the necessary information to be filled by the student. 4. Student fills the required information (see AC1, AC2) 5. Student submits the application (see EX1, AC3, AC4) 6. System notifies the application is submitted. 7. Student goes to the Home Page.
Alternate courses	<p>AC1: Student fills incomplete information</p> <ol style="list-style-type: none"> 1. System prompts that the information is empty 2. Return to Main Course Step 3 <p>AC2: Student fills incorrect information</p> <ol style="list-style-type: none"> 1. System prompts that the information is invalid 2. Return to Main Course Step 3 <p>AC3: Student does not submit the application</p> <ol style="list-style-type: none"> 1. Return to Main Course Step 7 <p>AC4: Student has already submitted an application for the project</p> <ol style="list-style-type: none"> 1. System notifies the student 2. Go to Main Course step 1
Exceptions	<p>EX1: System failed to submit the application</p> <ol style="list-style-type: none"> 1. System notifies the student 2. Go to Main Course step 7

Use case description # 2

Name	Mark Professor as Head of Department
Description	AUGSD wants to mark change in the Head of Department for further communication and approval on interdisciplinary projects
Actors	AUGSD
Trigger	AUGSD marks a professor as Head of Department
Preconditions	AUGSD Staff logs in to the portal and heads to the modify HoD page
Postconditions	The head of the department is successfully changed and is visible to all roles
Main course	<ol style="list-style-type: none"> 1. System displays a list of all professors along with an option to mark and dismiss as HoD 2. User clicks button to appoint professor as HoD 3. System prompts a confirmation 4. User confirms to mark professor as HoD (see AC1, AC2, AC3) 5. System updates the changes across all profiles (see EX1) 6. System reloads the page with the updated professor designation
Alternate courses	<p>AC1: Professor is already marked as HoD</p> <ol style="list-style-type: none"> 1. System prompts that the professor is already head of the department 2. Return to Main Course Step 1 <p>AC2: Another Professor is already marked as HoD</p> <ol style="list-style-type: none"> 1. System prompts that another professor is marked as HoD of the department 2. System asks if user wishes to dismiss the previous HoD and appoint this professor as the new HoD (see AC3) 3. User confirms the change in HoD 4. Return to Main Course Step 5 <p>AC3: User disapproves the change in HoD</p> <ol style="list-style-type: none"> 1. Return to Main Course Step 1
Exceptions	<p>EX1: System fails to update the HoD allocation</p> <ol style="list-style-type: none"> 1. System notifies that an error has occurred 2. Return to Main Course Step 1

Use case description # 3

Name	Professor make a chat room
Description	Professor makes a chat room with their accepted students for a project.
Actors	Professor
Trigger	Professor goes to the chat portal
Preconditions	Professor is logged in and their project has some accepted students
Postconditions	A chat room is created by the professor with their students
Main course	<ol style="list-style-type: none"> 1. Professor is at the dashboard 2. Professor goes to the chat portal 3. System opens the chat portal 4. Professor requests to create a chat room for their project (AC1) 5. System makes a chat room (EX1) 6. Professor adds selected students to the chat room (AC2) 7. System adds the selected students to the chat room. (EX2)
Alternate courses	<p>AC1: Chat room for the project already exists</p> <ol style="list-style-type: none"> 1. Return to Main Course Step 5 <p>AC2: There are no accepted students</p> <ol style="list-style-type: none"> 1. System prompts that there are no accepted students. 2. Return to Main Course Step 1
Exceptions	<p>EX1: System fails to make the chat room</p> <ol style="list-style-type: none"> 1. Return to Main Course Step 1 <p>EX2: System notifies that the user does not exist.</p> <ol style="list-style-type: none"> 1. Return to MC step 1

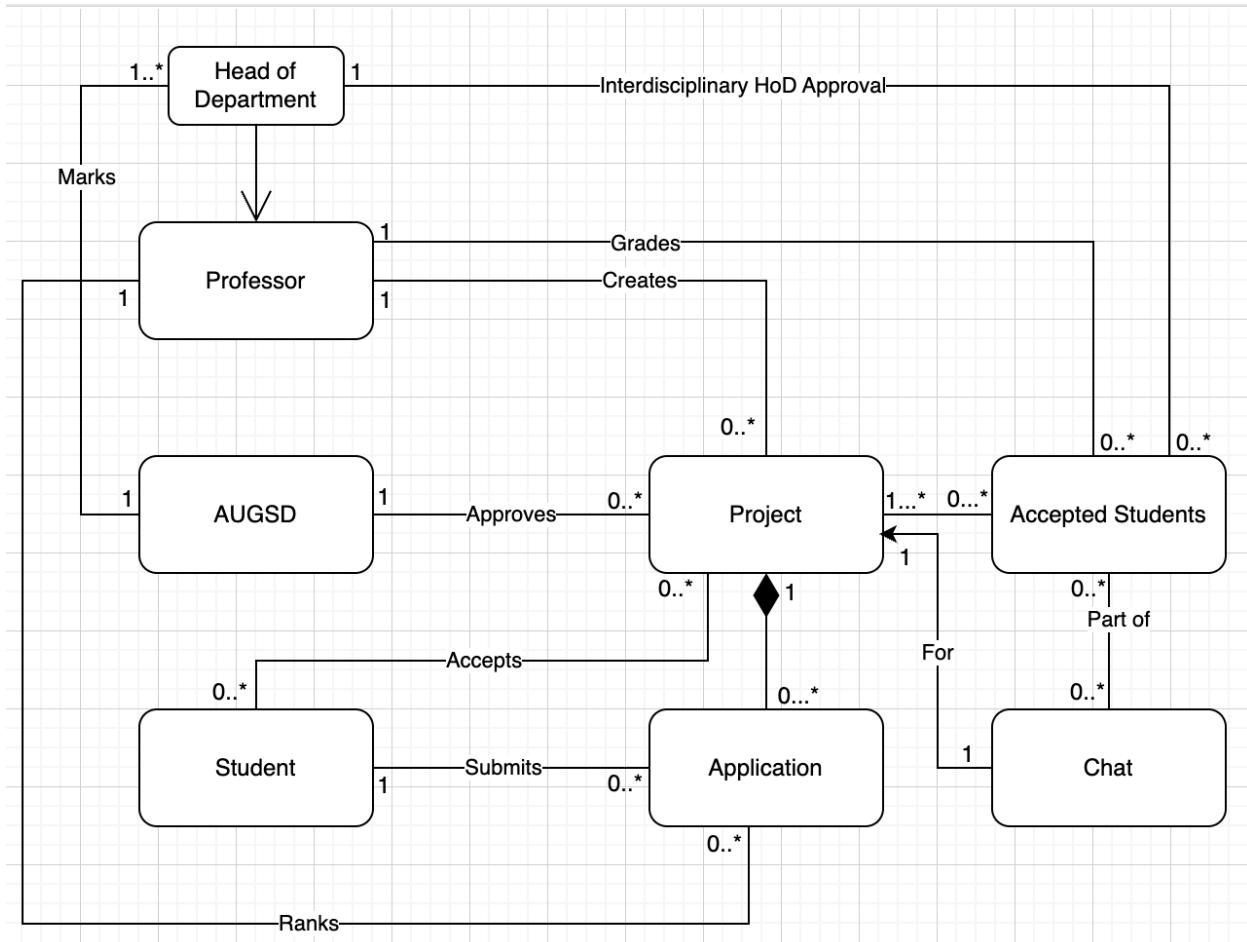
Use case description # 4

Name	Professor scores the applications
Description	Professor has a list of applications and they give them score as per the project's requirement
Actors	Professor
Trigger	AUGSD shuts the application window period
Preconditions	1. There are applications for a project
Postconditions	1. Preferred students are updated about their application.
Main course	<ul style="list-style-type: none"> 1. Professor is at the homepage 2. Professor open the project (EX1) 3. System shows the applications for the project 4. Professor gives a score on the applications (AC1) 5. System updates the score 6. Professor releases the final score (AC2) 7. System updates the status of the applicants
Alternate courses	<p>AC1: There are no applicants</p> <ul style="list-style-type: none"> 1. System notifies the same 2. Return to main course step 1 <p>AC2: Professor doesn't want to release the score.</p> <ul style="list-style-type: none"> 1. Return to main course 3
Exceptions	<p>EX1: There are no projects</p> <ul style="list-style-type: none"> 1. Return to main course step 1

Use case description # 5

Name	Create new account
Description	User creates a new account in ProSys
Actors	Professor, Student
Trigger	User wants to sign-up on ProSys website
Preconditions	<ul style="list-style-type: none"> 1. User doesn't have an account
Postconditions	<ul style="list-style-type: none"> 1. User creates his/her account 2. User logs into his/her new account
Main course	<ul style="list-style-type: none"> 1. User wishes to make an account 2. System redirects user to sign-in page 3. User clicks sign-up button and system redirects user to sign-up page 4. User enters his/her BITS Email, Name, Student/Professor ID, Department, CGPA (for students), CV (link), Performance Sheet (link), Area of Interest and Password (AC1, EX1) 5. User clicks sign-up button (AC2) 6. User is redirected to login page by the system 7. User enters BITS Email and Password and clicks sign-in button 8. System redirects user to the dashboard
Alternate courses	<p>AC1 - User has an account already</p> <ul style="list-style-type: none"> 1. BITS Email matches with one of registered emails 2. Return to Main Course step 3 <p>AC2 - User doesn't provide link to Performance Sheet and CV</p> <ul style="list-style-type: none"> 1. User can do it later through Profile Updation 2. Return to Main Course step 7
Exceptions	<p>EX1 - User isn't able to sign-up</p> <ul style="list-style-type: none"> 1. User will be notified to enter details again 2. Return to Main Course step 5

Section 6 – Class diagram



Attributes and operations

Class name	Attributes	Operations
AUGSD	<ul style="list-style-type: none"> - email - password - applicationAcceptanceStatus 	<ul style="list-style-type: none"> • acceptProject(projectID) • rejectProject(projectID) • appointHOD(profID) • dismissHOD(profID) • <u>toggleAcceptanceStatus()</u>
Student	<ul style="list-style-type: none"> - email - password - name - StudentID - department - cgpa - cv - performanceSheet - areaOfInterest 	<ul style="list-style-type: none"> • submitApplication() • acceptProject(projectID) • rejectProject(projectID) • viewProjects() • viewProfessorProfile(profID) • updateProfile()
Professor	<ul style="list-style-type: none"> - email - name - password - dept - chamber - researchInterest - websites - hod 	<ul style="list-style-type: none"> • addMembersInChatRoom(memberID, chatID) • receiveRecommendation(projectID) • viewApplications(projectID) • makeWaitlist(projectID) • scoreApplicants(projectID, applicationID) • updateProfile()
Project	<ul style="list-style-type: none"> - title - projectID - description - prerequisite - projectType - recommendation - numberOfStudents - approved - applicants - acceptedStudents 	<ul style="list-style-type: none"> • addProject() • viewProject() • filterProject(dept, profName)
Application	<ul style="list-style-type: none"> - type - statementOfPurpose 	<ul style="list-style-type: none"> • viewApplications(userID)

	<ul style="list-style-type: none"> - status - score - studentStatus 	
Chat	<ul style="list-style-type: none"> - username - password - name - emailID - groupName 	<ul style="list-style-type: none"> • createChat(members) • sendMessage(chatID) • sendMessageWithFile(chatID, file) • deleteChat(chatID)
AcceptedStudent		<ul style="list-style-type: none"> • getGrades()
Head of Department		

NoSQL documents

Document name and structure	Classe(s)	Justification(s) for embedding, referencing and denormalization
<pre>const studentSchema = new Schema ({ email: { type: String, required: true, unique: true }, password: { type: String, required: true, }, name: { type: String, required: true, unique: true }, studentID: { // verify valid id type: String, required: true, unique: true }, dept: { // dropdown type: String, required: true, }, cgpa: { // bw 0.0 and 10.0 type: Number, required: true, }, cv_link: { // upload cvlink type: String, } })</pre>	Student, AcceptedStudent	<ul style="list-style-type: none"> - Student and application are in 1:N relationship as one student can create many applications for offered projects hence we are referencing the student email.

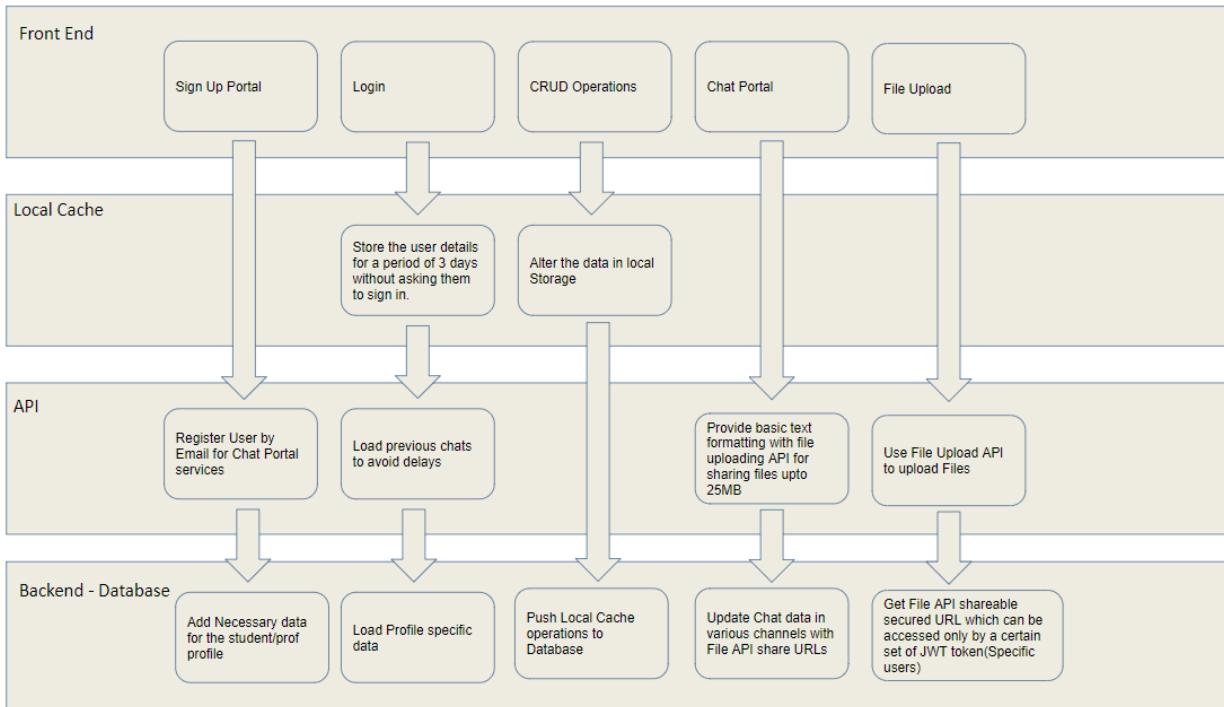
<pre> required: true, unique: true }, per_link: { type: String, // required: true, unique: true }, aoi: { // area of interest type: String, required: true, } }) </pre>		
<pre> const projectSchema = new Schema({ title: { type: String, required: true, }, projectID: { type: Number, required: true, unique: true, }, description: { type: String, required: true, }, prerequisite: { type: String, }, projectType: { type: String, required: true, }, professorEmail: { type: String, required: true, unique: true } }) </pre>	Project	<ul style="list-style-type: none"> - Professors and project are in 1:N relationship as a professor can create many projects which has been referenced by professorEmail - Project and accepted students are in 1...*:N relationships as accepted students are embedded as each project has a fixed number of accepted students and referencing applications every time is time confusing. - Applicants are embedded so as to prevent a student from re-applying multiple times to a project without which all applications would have to be fetched and compared.

<pre> type: String, required: true, }, recommendation: { type: String, default: "", }, numberOfStudents: { type: Number, required: true, }, approved: { type: Number, default: 0, }, applicants: [{ type: String, },], acceptedStudents: [{ type: String, },], }, { timestamps: true }) </pre>		
<pre> const profSchema = new Schema({ email: { type: String, unique: true }, name: String, password: String, dept: String, chamber: String, researchInterest: String, websites: String, } </pre>	<p>Professor, Head of Department</p>	<ul style="list-style-type: none"> - 1 professor can create many projects, and have many students under him hence we use referencing to the respective student application and projects with professor email. - 1 professor can create many chat rooms, hence we reference the chat room creators with the professor email.

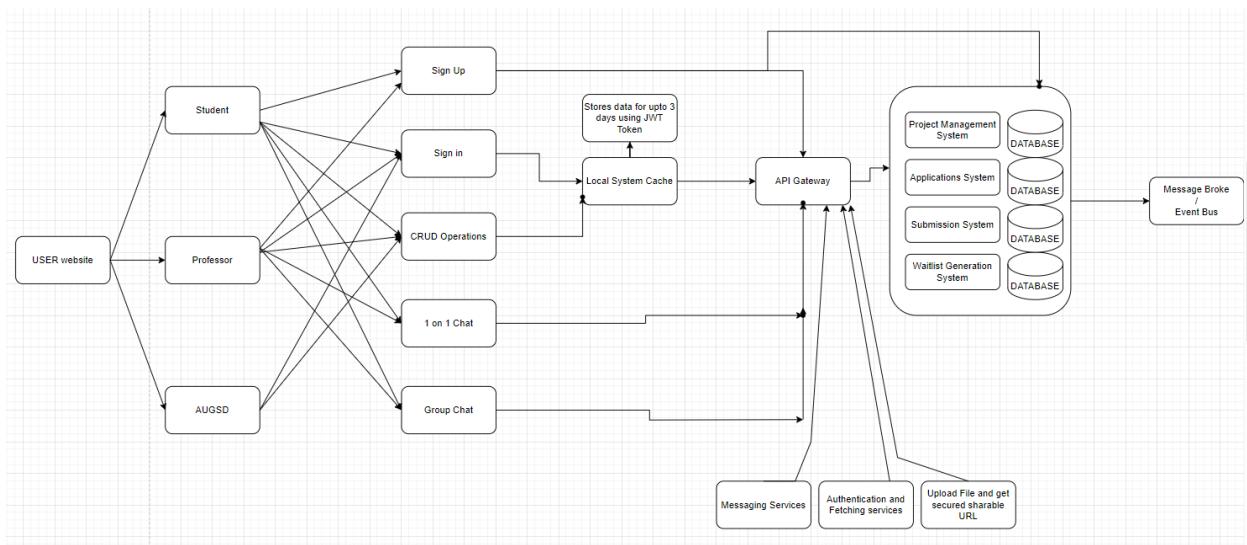
<pre> hod: Boolean, })</pre>		
<pre>const augsdSchema = new Schema({ email: { type: String, required: true, unique: true }, password: { type: String, required: true, } })</pre>	AUGSD	<none>
<pre>const applicationSchema = new Schema({ projectTitle: { type: String, }, projectID: { type: Object, }, profEmail: { type: String, // required: true }, studentEmail: { type: String, required: true, }, type: { // informal(0) or formal(1) type: Number, required: true, } })</pre>	Application	<ul style="list-style-type: none"> - Referencing project by projectID as multiple applications can be there for the same project so updating in case of embedding is not optimal - professors are referenced through profEmail as all students do not view the professor profile - students are referenced through studentEmail as one application belong to one student and one student might have multiple applications and it does not make sense to embed student details for every application - projectTitle is fetched multiple times therefore it is denormalized to prevent an extra fetch request for each application belonging to the same project

```
},
sop: {
    type: String,
    required: true,
},
status: {
    // 0-> undetermined
    // 1-> accepted,
    // 2-> rejected,
    // 3-> hod approval
    // 4->
},
studentResponded
{
    type: Number,
    default: 0,
},
score: {
    type: Number,
    default: -1,
},
studentStatus: {
    // -1-> undetermined
    // 0-> rejected,
    // 1-> accepted,
    type: Number,
    default: -1,
},
},
{
    timestamps: true
}
```

Section 7 – System Architecture



Existing Architecture flowchart



Deployable System Architecture

This system architecture breaks the entire application into 3 user specific purposes consisting of 4 independent modules(Front end, Local Cache, API Gateway and Database).

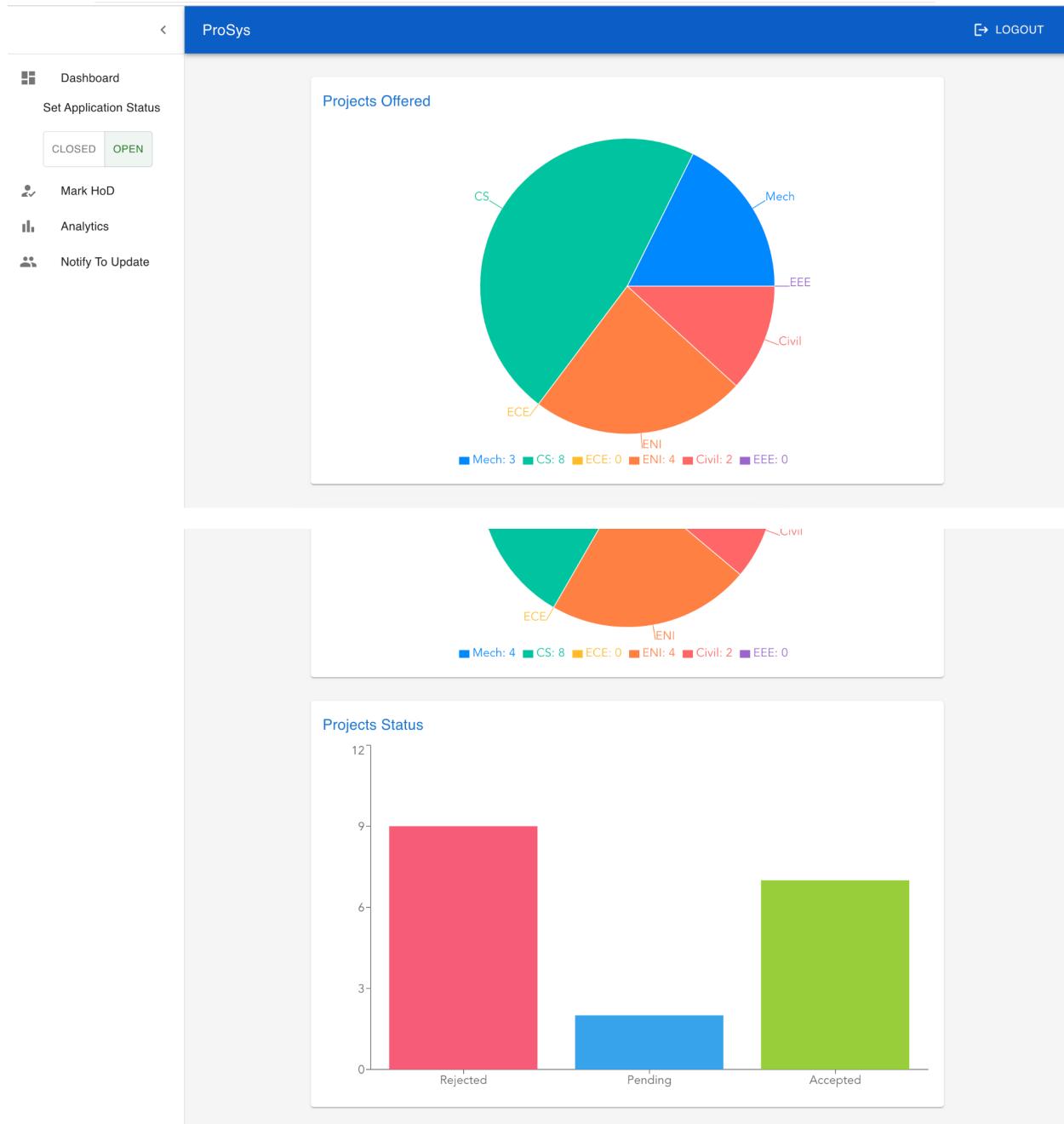
These modules serve as connecting points for optimal delivery to the users with the least amount of hassle possible.

Local Caching of Signin details if not logged out for 3 days, and CRUD operations makes the system more versatile in terms of sustaining activities with slight loss of connection.

The API serves as the middleware between the Backend and Database. Not only does it provide additional functionality of chatting and file upload but also helps to store the messages in the database and enable sharing of files.

Frontend is entirely in React and makes the necessary calls to the respective servers and APIs.

Section 8 – Dashboard



ProSys

New Projects

Project Title	Project Type	Professor Name	Description	Pre-requisites	No. of Students	Operations
Fraud Detection in Credit Card Transactions using Data Mining	Laboratory Project	bhanu@gmail.com	In this project, we will use data mining techniques to detect fraud in credit card transactions. Credit card fraud is a significant issue, and detecting fraudulent transactions is crucial to prevent financial losses. We will use a dataset containing credit card transactions and features such as transaction amount, merchant category code, and time of transaction to build a fraud detection model. The project will involve data preprocessing, exploratory data analysis, feature engineering, and model training and evaluation. The goal of this project is to build a model that can accurately predict fraudulent transactions and identify the factors that contribute to them.	Proficiency in Python programming language Familiarity with data analysis and data visualization libraries such as Pandas, NumPy, and Matplotlib Knowledge of data mining techniques such as association rule mining, clustering, and anomaly detection Understanding of data preprocessing techniques such as data cleaning, feature scaling, and feature encoding Experience with model training and evaluation techniques such as cross-validation and hyperparameter tuning Familiarity with machine learning frameworks such as scikit-learn and TensorFlow.	3	<input checked="" type="button"/> ACCEPT <input type="button"/> REJECT

Approved Projects

Project Title	Project Type	Professor Name	Description	Pre-requisites	No. of Students
Spam Ham Data Collection	Laboratory Project	manik@gmail.com	Identifying and configuring to detect spam and ham emails	NLP, BERT, DL	1
Design and Analysis of a Sustainable Multi-Story Building	Design Project	tejas@gmail.com	The project involves designing and analyzing a multi-story building that incorporates sustainable materials and practices to reduce its environmental impact. The building will be designed using software such as AutoCAD or Revit, and will include features such as solar panels, rainwater harvesting systems, and green roofs.	Knowledge of building design and construction principles. Familiarity with software such as AutoCAD or Revit for building design.	2
5G Analogue Devices	Design Project	sradhika@gmail.com	Developing 5G analogue devices for home appliances	Networks, IoT	3
Solar Powered Vehicle	Design Project	sradhika@gmail.com	Exploring the usage of solar energy to power vehicle engines	EEE, Control Systems	3
Analysis of biomechanics materials	Lab	prachee@gmail.com	medical applications that are designed to interact with biological systems, such as tissues, organs, or cells. These materials play an important role in the development of medical devices, implants, and other products used in the field of medicine. Needs	NA	2

Rejected Projects						
Project Title	Project Type	Professor Name	Description	Pre-requisites	No. of Students	Recommendations
Predicting Customer Churn for a Telecom Company using Machine Learning	Design Project	bhanu@gmail.com	In this project, we will use machine learning algorithms to predict customer churn for a telecom company. Customer churn is a critical metric for telecom companies, as it represents the number of customers who have terminated their services. We will use a dataset containing customer demographic information, call details, and other relevant features to build a predictive model. The project will involve data preprocessing, exploratory data analysis, feature engineering, and model training and evaluation. The goal of this project is to build a model that can accurately predict customer churn and identify the factors that contribute to it, which can help the company to take proactive measures to retain customers.	Proficiency in Python programming language Familiarity with data analysis and data visualization libraries such as Pandas, NumPy, and Matplotlib Knowledge of machine learning algorithms such as logistic regression, decision trees, and random forests Understanding of data preprocessing techniques such as data cleaning, feature scaling, and feature encoding Experience with model training and evaluation techniques such as cross-validation and hyperparameter tuning Familiarity with machine learning frameworks such as scikit-learn and TensorFlow.	2	Add few more students to accept for project
Design of a Building	Design	aniket@gmail.com	The project will include various stages such as conceptual design, detailed design, construction planning, and execution supervision. The	Knowledge of civil engineering principles and practices, including structural analysis, materials science, and	0	Reduce

Section 9 – Conclusion

Our application allows the professor to add a project to the system, and the students can apply for the project by submitting their applications. The professor can then score all the student applications, and the system generates a waitlist of students based on their scores. After the evaluation process, the accepted students are added to a chat room where they can collaborate on the project. The students can submit their project work, and the professor can view and grade the submissions.

Our challenges and learnings:

1. The project highlighted the challenges of identifying and resolving bugs, as well as the importance of thorough testing to ensure the application's functionality and performance. Integration of the work of each member while ensuring all functionalities remain intact was an ongoing challenge that was resolved by the developers by collaborative git merges.
2. Using modern technologies like the MERN stack allowed the application to be developed quickly and efficiently. The technologies also provided a robust and scalable foundation for the application, ensuring its longevity and adaptability. API integration further contributed to the completeness of the functionalities of the project and hosting gave us insight into real-world applications.

Current Limitations:

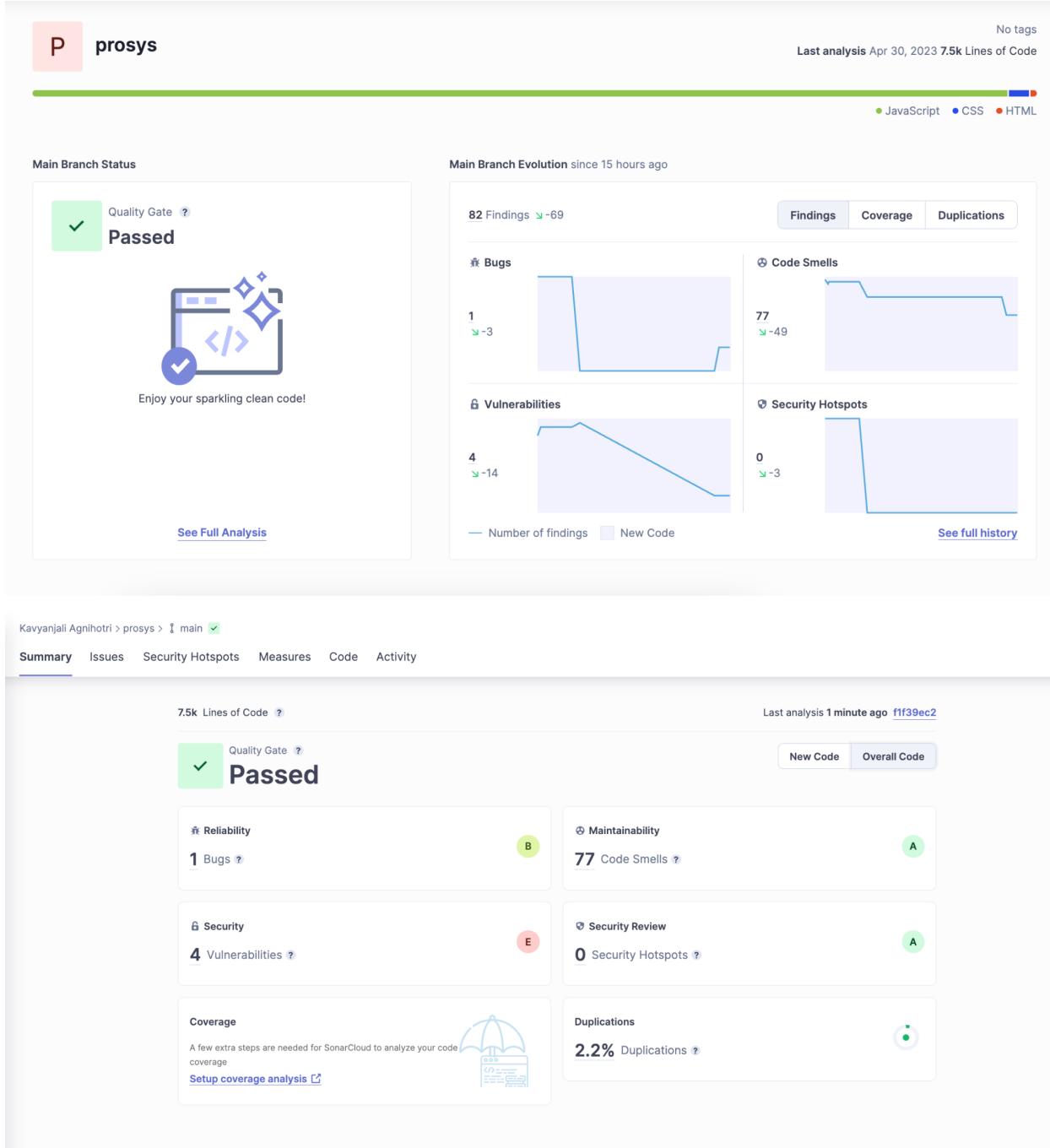
1. Chat portal is limited to only 10 users as we did not avail the paid API service.
2. The current hosting is limited to a fixed number of server requests per month.

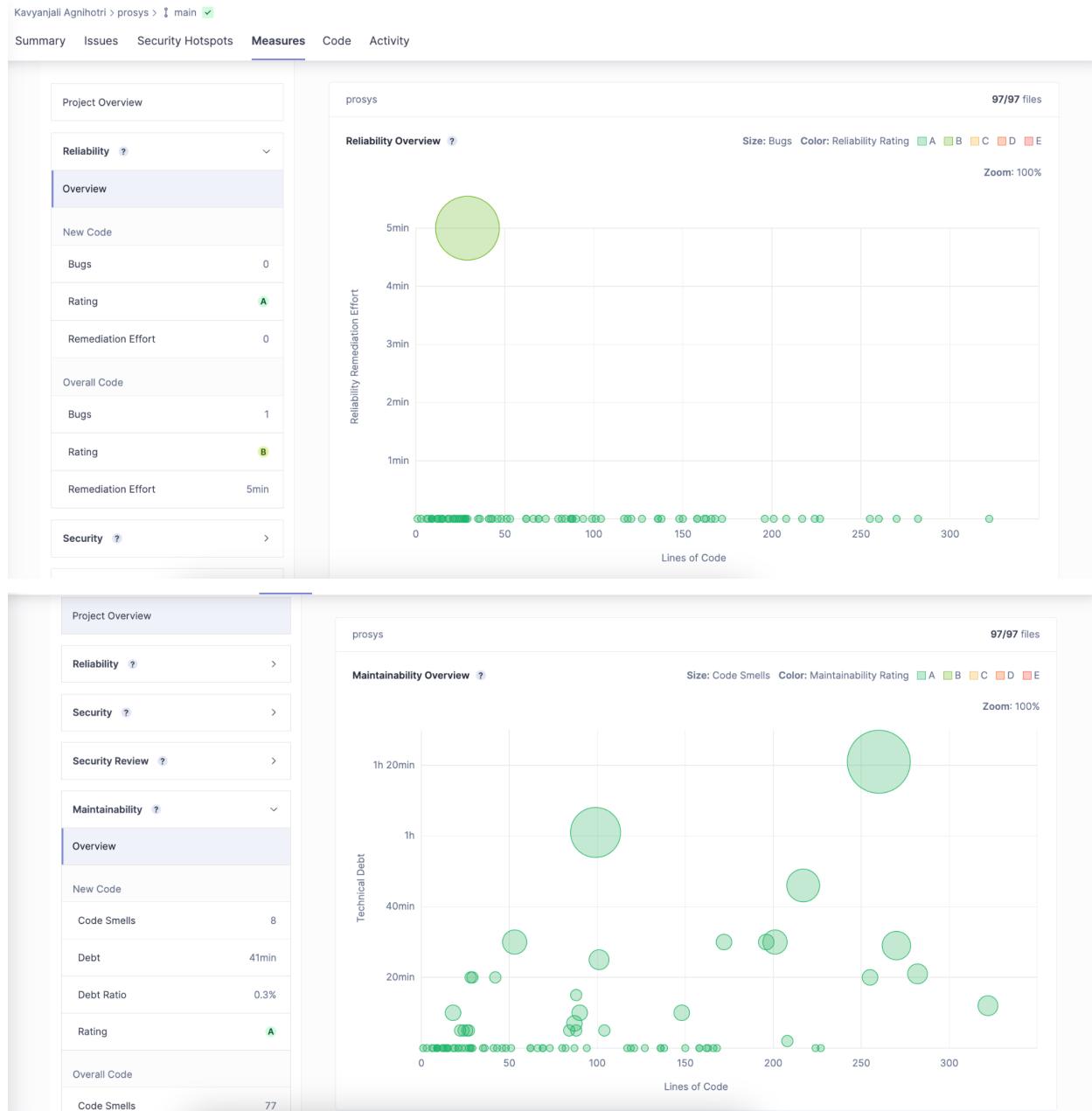
Possible Improvements:

1. Better user interface: The application could benefit from an improved user interface that is more intuitive and visually appealing. This could include better use of color and typography, more consistent layout, and improved navigation.
2. Additional features: The ability to schedule project meetings and appointments, provide reminders of upcoming deadlines, and the option to share files directly through the application are the features which can be added to our project.

Appendix A - Code Quality Reports

<2 to 3 pages; add the following items of your code quality report obtained from SonarCloud>

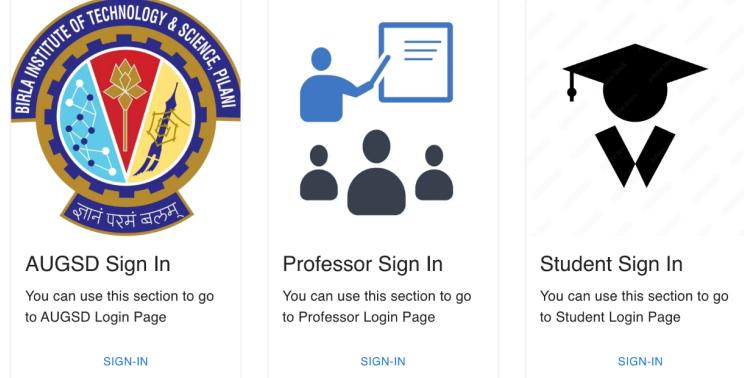




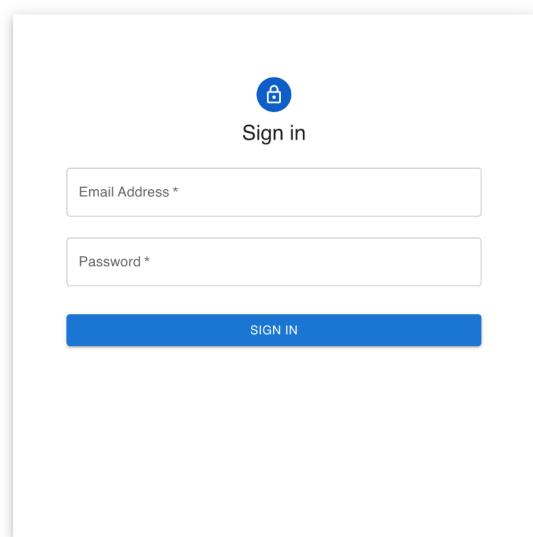


Appendix B - Sample screenshots

ProSys
Welcome to Project Approval & Registration Portal



The screenshot shows the main landing page of the ProSys system. At the top center is the ProSys logo with the text "Welcome to Project Approval & Registration Portal". Below the logo are three large rectangular boxes, each containing a circular icon and text. The first box on the left contains the Birla Institute of Technology & Science, Pilani logo and is labeled "AUGSD Sign In". It includes a description: "You can use this section to go to AUGSD Login Page" and a blue "SIGN-IN" button. The middle box contains an icon of a person pointing at a document and is labeled "Professor Sign In". It includes a description: "You can use this section to go to Professor Login Page" and a blue "SIGN-IN" button. The third box on the right contains an icon of a student wearing a graduation cap and is labeled "Student Sign In". It includes a description: "You can use this section to go to Student Login Page" and a blue "SIGN-IN" button.



The screenshot shows a sign-in form window. At the top right is a blue circular icon with a white padlock symbol. To its right, the text "Sign in" is displayed. Below this are two input fields: the top one is labeled "Email Address *" and the bottom one is labeled "Password *". Both fields have a thin gray border. At the bottom of the form is a large blue rectangular button with the white text "SIGN IN".

ProSys

New Projects

Project Title	Project Type	Professor Name	Description	Pre-requisites	No. of Students	Operations
Fraud Detection in Credit Card Transactions using Data Mining	Laboratory Project	bhanu@gmail.com	In this project, we will use data mining techniques to detect fraud in credit card transactions. Credit card fraud is a significant issue, and detecting fraudulent transactions is crucial to prevent financial losses. We will use a dataset containing credit card transactions and features such as transaction amount, merchant category code, and time of transaction to build a fraud detection model. The project will involve data preprocessing, exploratory data analysis, feature engineering, and model training and evaluation. The goal of this project is to build a model that can accurately predict fraudulent transactions and identify the factors that contribute to them.	Proficiency in Python programming language Familiarity with data analysis and data visualization libraries such as Pandas, NumPy, and Matplotlib Knowledge of data mining techniques such as association rule mining, clustering, and anomaly detection Understanding of data preprocessing techniques such as data cleaning, feature scaling, and feature encoding Experience with model training and evaluation techniques such as cross-validation and hyperparameter tuning Familiarity with machine learning frameworks such as scikit-learn and TensorFlow.	3	<input checked="" type="button"/> ACCEPT <input type="button"/> REJECT

Approved Projects

Project Title	Project Type	Professor Name	Description	Pre-requisites	No. of Students
Spam Ham Data Collection	Laboratory Project	manik@gmail.com	Identifying and configuring to detect spam and ham emails	NLP, BERT, DL	1

Approved Projects

Project Title	Project Type	Professor Name	Description	Pre-requisites	No. of Students
Design and Analysis of a Sustainable Multi-Story Building	Design Project	tejas@gmail.com	The project involves designing and analyzing a multi-story building that incorporates sustainable materials and practices to reduce its environmental impact. The building will be designed using software such as AutoCAD or Revit, and will include features such as solar panels, rainwater harvesting systems, and green roofs.	Knowledge of building design and construction principles. Familiarity with software such as AutoCAD or Revit for building design.	2
5G Analogue Devices	Design Project	sradhika@gmail.com	Developing 5G analogue devices for home appliances	Networks, IoT	3
Solar Powered Vehicle	Design Project	sradhika@gmail.com	Exploring the usage of solar energy to power vehicle engines	EEE, Control Systems	3
Analysis of biomechanics materials	Lab	prachee@gmail.com	medical applications that are designed to interact with biological systems, such as tissues, organs, or cells. These materials play an important role in the development of medical devices, implants, and other products used in the field of medicine. Needs Biocompatibility, correct Degradation behavior, etc	NA	2
Face Recognition attendance system	study	Hota@gmail.com	A software to see users from a photograph and mark their attendance, potentially implementation in class attendance and mess attendance to ensure contactless attendace marking	OpenCV and python	4
Open Data Collection using MySQL	Lab Project	manik@gmail.com	Android application for medical survey data collection	Android Development, MySQL	2

Rejected Projects						
Project Title	Project Type	Professor Name	Description	Pre-requisites	No. of Students	Recommendations
Predicting Customer Churn for a Telecom Company using Machine Learning	Design Project	bhanu@gmail.com	In this project, we will use machine learning algorithms to predict customer churn for a telecom company. Customer churn is a critical metric for telecom companies, as it represents the number of customers who have terminated their services. We will use a dataset containing customer demographic information, call details, and other relevant features to build a predictive model. The project will involve data preprocessing, exploratory data analysis, feature engineering, and model training and evaluation. The goal of this project is to build a model that can accurately predict customer churn and identify the factors that contribute to it, which can help the company to take proactive measures to retain customers.	Proficiency in Python programming language Familiarity with data analysis and data visualization libraries such as Pandas, NumPy, and Matplotlib Knowledge of machine learning algorithms such as logistic regression, decision trees, and random forests Understanding of data preprocessing techniques such as data cleaning, feature scaling, and feature encoding Experience with model training and evaluation techniques such as cross-validation and hyperparameter tuning Familiarity with machine learning frameworks such as scikit-learn and TensorFlow.	2	Add few more students to accept for project
Design of a Pedestrian Bridge	Design Project	tejas@gmail.com	The project will include various stages such as conceptual design, detailed design, construction planning, and construction supervision. The final product should be a functional and safe pedestrian bridge that meets the needs of the community.	Knowledge of civil engineering principles and practices, including structural analysis, materials science, and geotechnical engineering. Familiarity with design software such as AutoCAD, SolidWorks, and SAP2000.	3	Reduce Prerequisite

ProSys LOGOUT

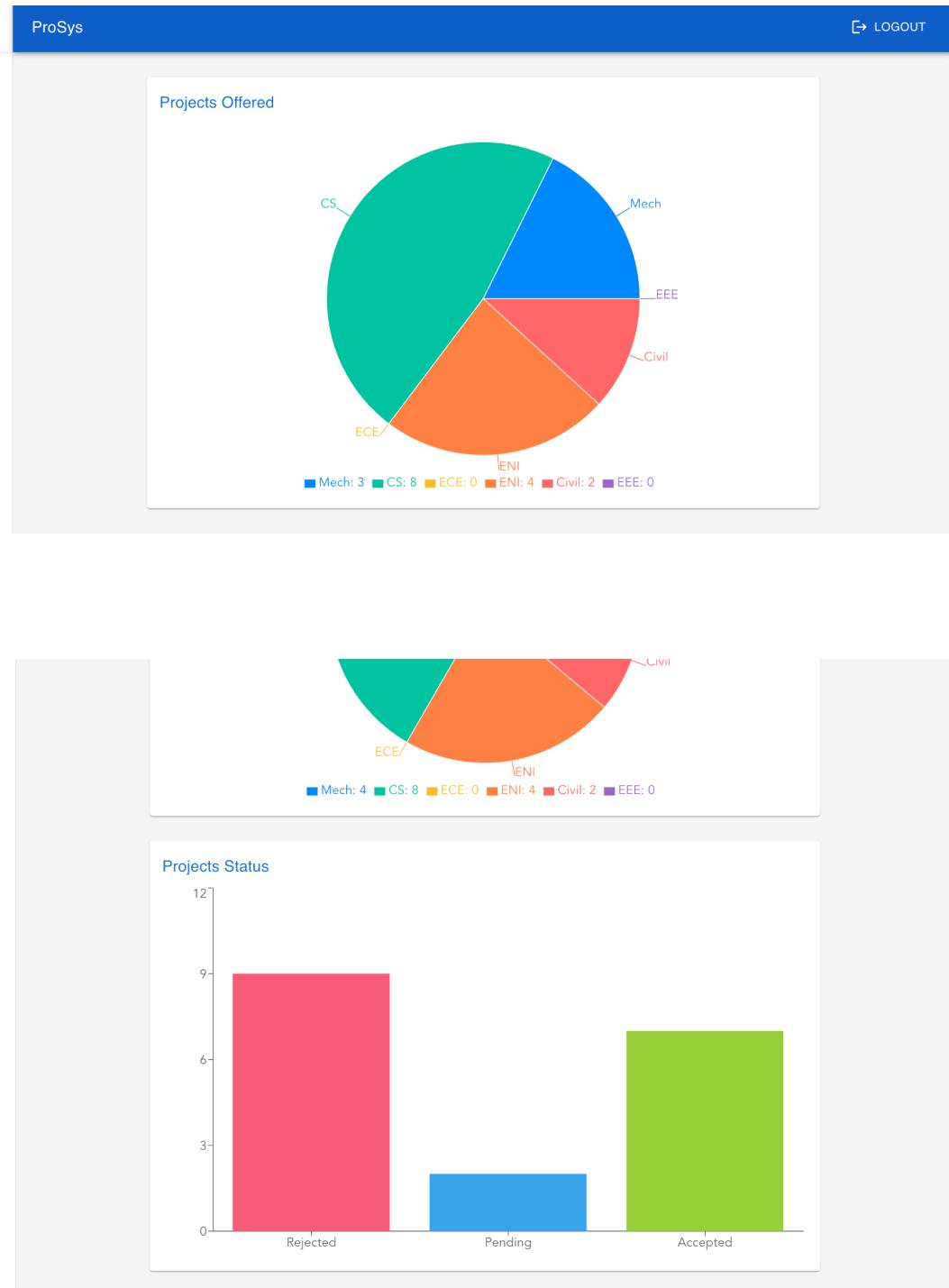
- Dashboard
- Set Application Status CLOSED OPEN
- Mark HoD
- Analytics
- Notify To Update

Current HODs

Professor Name	Department	Dismiss as HOD
bhanu	CS	- DISMISS AS HOD
Prachee Saxena	Mech	- DISMISS AS HOD
Aditya Kapoor	ECE	- DISMISS AS HOD

Other Faculties

Professor Name	Department	Appoint as HOD
aryan	Mech	+ APPOINT AS HOD
Manik Gupta	CS	+ APPOINT AS HOD
Chitraranjan Hota	CS	+ APPOINT AS HOD
Joyjit Mukherjee	ECE	+ APPOINT AS HOD
Dipanjan Chakrobarty	CS	+ APPOINT AS HOD
Sudha Radhika	ENI	+ APPOINT AS HOD







Faculty Log in

Email Address *

Password *

LOG IN

Don't have an account?
[Sign Up](#)

ProSys - Professor Manik Gupta [LOGOUT](#)

- Dashboard
- Chat Portal
- Personal
- Projects
- Add Projects
- Profile

Rejected						
Title	Project Type	Description	Prerequisite(s)	Number of Students	Delete Project	Recommendations
Mathematical Conversational agent	study project	A conversational agent which can solve any level of mathematical problem	Python programming	2		Specify level of mathematics required
Explainable AI for Pollution Datasets	Lab Project	AQ Bench Dataset	Data Science	1		Very similar to another project

Pending					
Title	Project Type	Description	Prerequisite(s)	Number of Students	Delete Project

Approved						
Title	Project Type	Description	Prerequisite(s)	Number of Students	View Application	Delete Project and all Applications
Spam Ham Data Collection	Laboratory Project	Identifying and configuring to detect spam and ham emails	NLP, BERT, DL	1		
Open Data Collection using MySQL	Lab Project	Android application for medical survey data collection	Android Development, MySQL	2		

Final Project Report

ProSys: Project Management System

< Professor Chat Portal

Manik Gupta

LOGOUT

My Chats

+

ICMR Data collection app	Apr 28
my chamber	
Kavyanjali-Manik	Apr 28
1 image	
Ankesh-Manik	Apr 28
1 image	

ICMR Data collection app

Active 8:15 AM, Fri, Apr 28, 2023

8:09 AM, Fri, Apr 28, 2023

f20200104@hyderabad.bits-pilani.ac.in

F2 Hello Ma'am can you let us know the weekly schedule for project meets?

f20200185@hyderabad.bits-pilani.ac.in

F2 Yes Ma'am it'd be helpful to plan our academics accordingly

Students:

The decided time for the meet is **Wednesday 12:30PM to 1:30PM**

We can keep it in a classroom

or

my chamber

ICMR Data collection app

People <

Photos <

Options <

B I U S ↵ ⌂ ⌂ ⌂

↑



ProSys - Professor

Manik Gupta

LOGOUT

-  Dashboard
-  Chat Portal
- Personal
-  Projects
-  Add Projects
-  Profile

**SPAM HAM DATA
COLLECTION**

IDENTIFYING AND CONFIGURING TO
DETECT SPAM AND HAM EMAILS

**OPEN DATA COLLECTION
USING MYSQL**

ANDROID APPLICATION FOR MEDICAL
SURVEY DATA COLLECTION

< PROSYS - PROFESSOR Manik Gupta LOG OUT

Project Proposal

Details

Project Title *

Project ID *

Description *

Prerequisite(s) *

Project Type * Number of Formal Students *

Your Email
manik@gmail.com

SUBMIT PROPOSAL

< ProSys - Professor Manik Gupta LOG OUT

Dashboard Chat Portal

Personal Projects Add Projects Profile

Your Profile

Your Email * manik@gmail.com

Chamber * H-128

Research Interest *
AI/ML
Data Mining
App Development

Your Websites *
google.gl
<https://www.bits-pilani.ac.in/hyderabad/manik/Profile>

UPDATE PROFILE

The screenshot shows the 'PROSYS - PROFESSOR' interface. At the top, there's a blue header bar with the text 'PROSYS - PROFESSOR' on the left, the user's email 'manik@gmail.com' in the center, and a 'LOGOUT' button on the right.

The main content area displays a project summary table:

Title	Open Data Collection using MySQL
Professor Email	manik@gmail.com
Description	Android application for medical survey data collection
Prerequisite	Android Development, MySQL
Project Type	Lab Project
Accepted Students	Ankesh

Below the table, a student submission card is shown for 'Ankesh (f20200104@hyderabad.bits-pilani.ac.in)'. It lists several URLs under 'Student Submission(s)':

- <https://www.google.com>
- <wikipedia.com>
- <quora.com>
- <twitch.com>
- <https://www.youtube.com/>
- <https://www.youtube.com/>
- <https://www.youtube.com/>

There are two dropdown fields for 'Midsem Grade' and 'Compre Grade', both set to 'A'. A large blue 'SUBMIT GRADE' button is at the bottom.

The screenshot shows the 'Faculty Sign up' form. At the top, there's a blue header bar with the text 'PROSYS' on the left.

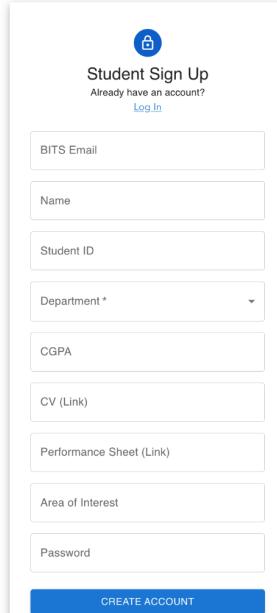
The form fields include:

- Email
- Name
- Department * (dropdown menu)
- Chamber
- Research Interests (separate line by line)
- Social Profiles (separate line by line)
- Password

A 'CREATE ACCOUNT' button is located at the bottom of the form.



The screenshot shows the ProSys Project Management System interface. At the top, there is a blue header bar with the PROSYS logo. Below the header, there is a large white area containing a blue graduation cap icon with a yellow tassel. To the right of the icon is a "Student Log in" form. The form includes fields for "Email Address *", "Password *", and a "LOG IN" button. Below the log in form is a link "Don't have an account? [Sign Up](#)".



The screenshot shows the ProSys Project Management System interface. At the top, there is a blue header bar with the PROSYS logo. Below the header, there is a "Student Sign Up" form. The form includes fields for "BITS Email", "Name", "Student ID", "Department *", "CGPA", "CV (Link)", "Performance Sheet (Link)", "Area of Interest", and "Password". At the bottom of the form is a "CREATE ACCOUNT" button.

ProSys - Student

Ankesh Logout

Projects

Department	Professor	Title	Type	Description	Prerequisite	Offered By	Number of Students	Status
		Spam Ham Data Collection	Laboratory Project	Identifying and configuring to detect spam and ham emails	NLP, BERT, DL	MANIK GUPTA	1	APPLIED
		Design and Analysis of a Sustainable Multi-Story Building	Design Project	The project involves designing and analyzing a multi-story building that incorporates sustainable materials and practices to reduce its environmental impact. The building will be designed using software such as AutoCAD or Revit, and will include features such as solar panels, rainwater harvesting systems, and green roofs.	Knowledge of building design and construction principles. Familiarity with software such as AutoCAD or Revit for building design.	TEJAS	2	+ APPLY
		5G Analogue Devices	Design Project	Developing 5G analogue devices for home appliances	Networks, IoT	SUDHA RADHIKA	3	+ APPLY
		Solar Powered Vehicle	Design Project	Exploring the usage of solar energy to power vehicle engines	EEE, Control Systems	SUDHA RADHIKA	3	+ APPLY

Student Chat Portal

Ankesh Logout

My Chats

ICMR Data collection app

Active 8:15 AM, Fri, Apr 28, 2023

8:09 AM, Fri, Apr 28, 2023

Hello Ma'am can you let us know the weekly schedule for project meets?

f20200185@hyderabad.bits-pilani.ac.in

Yes Ma'am it'd be helpful to plan our academics accordingly

manik@gmail.com

Students:

The decided time for the meet is Wednesday 12:30PM to 1:30PM

We can keep it in a classroom

or

my chamber

B I U S ↻ % ⌂ ↑

ICMR Data collection app

People

Photos

ProSys - Student Ankesh [LOGOUT](#)

- [Dashboard](#)
- [Chat Portal](#)
- Personal
- [Applications](#)
- [Projects](#)
- [Profile](#)

Your Applications

Approved				
Title	Offered By	Statement of Purpose	Type	Status
Open Data Collection using MySQL	MANIK GUPTA	I have work experience in MySQL and Android development	Formal	Accepted

Needs HoD Approval				
Title	Offered By	Statement of Purpose	Type	Status
Open Data Collection using MySQL	MANIK GUPTA	I have work experience in MySQL and Android development	Formal	Pending

Your Projects

Title	Offered By	Statement of Purpose	Type	Your Response
Open Data Collection using MySQL	MANIK GUPTA	I have work experience in MySQL and Android development	Formal	Accepted

ProSys - Student Ankesh [LOGOUT](#)

- [Dashboard](#)
- [Chat Portal](#)
- Personal
- [Applications](#)
- [Projects](#)
- [Profile](#)

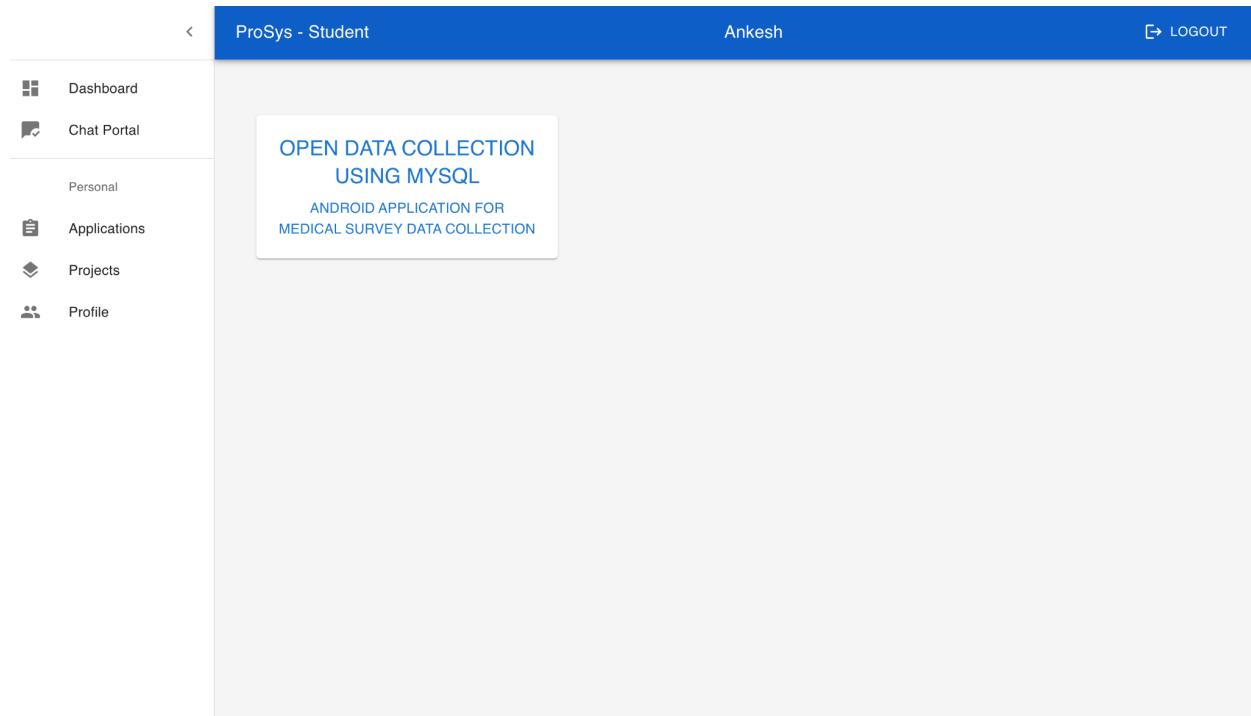
Title	Offered By	Statement of Purpose	Type	Your Response
Open Data Collection using MySQL	MANIK GUPTA	I have work experience in MySQL and Android development	Formal	Accepted

Pending

Title	Offered By	Statement of Purpose	Type	Status
Face Recognition attendance system	CHITRANJAN HOTA	Attendance system that will be used in the college. Have good skills in python.	Formal	Pending

Rejected

Title	Offered By	Statement of Purpose	Type	Status
Spam Ham Data Collection	MANIK GUPTA	Worked under your previous semester. Have done NLP projects before	Formal	Rejected
Analysis of biomechanics materials	PRACHEE SAXENA	Bio-mechanical computations are important and useful	Formal	Rejected



ProSys - Student

Ankesh

[LOGOUT](#)

Dashboard

Chat Portal

Personal

Applications

Projects

Profile

Student Profile Update

Your Email * f20200104@hyderabad.bits-pilani.ac.in

CGPA * 8.88

CV Link * <https://docs.google.com/document/d/1TDrbgj-L8sdT4ohEA7tu4tgbXb0xWTqGej7fg07fyk/edit>

Performance Sheet Link * <https://www.cs.umd.edu/class/spring2020/cpsc754/Lects/lect10-dcel.pdf>

Areas of Interest * IOT, ML, AI, Development

UPDATE PROFILE

PROSYS - STUDENT

Ankesh

[LOGOUT](#)

Title	Open Data Collection using MySQL
Professor Email	manik@gmail.com
Description	Android application for medical survey data collection
Prerequisite	Android Development, MySQL
Project Type	Lab Project
Accepted Students	Ankesh
Midsem Grade	Compre Grade
A	A
My Submission(s)	
https://www.google.com wikipedia.com quora.com twitch.com https://www.youtube.com/ https://www.youtube.com/ https://www.youtube.com/	
Your submission <input type="text"/>	
SUBMIT LINK	

Appendix C – Project management



