School Communication Platform

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Statement of Submission

This is to certify that **Maira Rasul**, Roll No. 048452, and **Saira Rasul**, Roll No. 048441, have successfully completed the final project named "School Communication Platform" at the F.G Post Graduate College for Women, Kashmir Road, Rawalpindi, affiliated with Punjab University College of Information Technology, University of Punjab, Lahore, to fulfill the partial requirement of the degree of BS (Information Technology)

External Supervisor

Name:

Designation:

Project Supervisor

Ms. Sumaira Zulfiqar

Head of Department

Ms. Lubna Zakia

Abstract

Our project aims to create a School Communication Platform designed specifically for schools, enhancing interaction among school admin, principal, students, and teachers. Unlike generic apps, our platform offers tailored features for educational needs.

Research at FG Public Middle School Chamanabad highlighted the importance of features like the scheme of studies, announcements, chat rooms, timetables, and document sharing. Users will log in with their school credentials to access these features.

Our platform focuses on improving communication efficiency while ensuring data privacy and security. This ensures that important information related to academic activities is easily accessible, fostering a cohesive school community.

Security and data privacy are paramount; all data is encrypted, and only authorized members can access the platform, maintaining trust and protecting sensitive information.

Certificate for Approval

It's certified that **Maira Rasul**, Roll No. (048452) and **Saira Rasul**, Roll No. (048441), has worked under my supervision. Their thesis entitled **School Communication Platform** has been found satisfactory for submission in its present form for the requirement of degree of BS-Information Technology. I am convinced that the resultant project does not contain any spelling, punctuation, or grammatical mistakes as such. All in all, I find this document well organized, and I am in no doubt that its objectives have been successfully met.

_____

Supervisor

Ma'am Sumaira Zulfiqar

IT Department
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Dated: _____

Declaration

We, **Maira Rasul**, Roll No. (048452) and **Saira Rasul**, Roll No. (048441), Session (2020-2024) from Department of Information Technology, F.G Post Graduate College (W), Rawalpindi, hereby solemnly declare that the work submitted in this research report entitled **School Communication Platform** is our own work. This work has been completed at the Department of Information Technology, F.G Post Graduate College (Kashmir Road), Rawalpindi under the supervision of Ma'am Sumaira Zulfiqar (Lecturer of IT Department). It has not been previously presented to any other institution or university for the degree.

Dedication

In the name of Allah, the Most Merciful, the Most Beneficent. To our parents, without whose unflinching support and cooperation, a work of this magnitude would not have been possible.

Acknowledgement

First of all, we would like to extend our sincere and humble gratitude to Allah Almighty whose blessing, and guidance has been a real source of all our achievements in life, who gave us the ability and knowledge to undertake this project and who bestowed with his guidance.

We are especially grateful to our supervisor, Ma'am Sumaira Zulfiqar, whose guidance helped us complete this project. She helped us in improving our development skills with her helpful suggestions.

Maira Rasul

(048452)

Saira Rasul

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Project in Brief

Project Title	School Communication Platform
Objective	• Create a School Communication Platform designed for schools, making it easier for Principal, students, and teachers to interact. • Provide school-specific communication tools, ensuring efficient communication and data privacy.
Undertaken By	• **Maira Rasul**, Roll No. (048452) • **Saira Rasul**, Roll No. (048441)
Audited By	Ma'am Sumaira Zulfiqar
Date Started	01/01/2024
Date Completion	07/25/2024
Language and Technology Used	• JAVA • MY SQL
Tools Used	• NETBEANS • My SQL • LAUNCH4J
Operating System	Microsoft Windows 10

Table 1.1. Project Brief Description

Table of Content

Chapter 1
Introduction

1.1. Introduction:

School Communication Platform is a platform designed specifically for schools, facilitating easy information sharing and ensuring connectivity among Principal, teachers and students. It offers essential features like announcements, images and document sharing, and scheduling.
School Communication Platform aims to serve as a reliable hub for Principal, teachers, and students. During COVID-19, it became evident that significant improvements were required in the digitalization of academic systems. It meets the important requirement for effective online education, which became especially clear during challenges like COVID-19. School Communication Platform advances academic digitalization, facilitating communication among admin, Principal, teachers, and students.

1.2. Problem Statement:

Current school communication systems are fragmented and inefficient, relying on platforms, which do not provide essential educational features such as scheduling, announcements, chat rooms, timetables, messaging, images and document sharing separately. This deficiency leads to miscommunication and missed collaboration opportunities among stakeholders. To address these shortcomings, a specialized communication platform tailored for schools is proposed to streamline operations, enhance collaboration, and meet the unique needs of educational environments. Implementing this solution aims to significantly improve communication efficiency. Therefore, we conducted research within Chamanabad School and asked them how this platform could be work more convenient for you.

1.3. Introduction to Existing system:

1.3.1. Existing System: WhatsApp or Email for School Communication

Today WhatsApp or Email is widely used for communication within school communities due to its convenience and widespread availability on mobile devices. It facilitates quick messaging and group chats, which are beneficial for immediate communication among principal, teachers, and students However, WhatsApp or Email lacks specialized features tailored specifically for educational institutions, such as dedicated tools for announcements, images and document sharing, and scheduling.

1.3.2. Limitations of Existing System: This system and its limitations is given below:

- **General Purpose Platform:** While functional, WhatsApp or Email lacks specialization for school-specific communication needs.
- **Broad Usage:** WhatsApp or Email is used for various communication purposes beyond education, making it versatile but not tailored exclusively for schools.

- **Lack of School Focus:** It lacks a dedicated focus on educational or school-related conversations.
- **Missing Educational Tools:** Does not offer essential features like announcements, document sharing, and scheduling
- **Security Concerns:** General-purpose design may not meet stringent security and privacy requirements for school data.

1.4. Proposed system:

The proposed system is a Desktop-application designed to enhance the communication between Principal, Teachers and Students. It aims to overcome the limitations of existing systems and introduces new features for more effective and practical communication. Our proposed system is a Desktop-application that attempts to overcome the limitations of the existing systems and adds some new features to make the communication between Principal, Teachers and Students more effective and practical. Some of the features of this new system will be:

1.4.1. Authenticated sign-up:

This feature ensures that only authorized users can access the platform. It involves a secure registration and login process to verify the identity of the users.

1.4.2. Chat rooms:

Chat rooms are provided for different groups to facilitate focused discussions. This could include separate chat rooms for each class.

1.4.3. Real-time messaging, images and document sharing:

The system supports real-time messaging, allowing instant communication between users. Additionally, it enables document sharing, making it easy to distribute study materials and other important documents.

1.4.4. Update Timetable and Announcement :

This feature allows the school Principal to update and share timetables, announcement, and schedule events. This ensures that all users are kept up-to-date with the latest information.

1.5. Goals and Objectives:

1.5.1. Goals: The goals of our proposed system are:

• Establish School Communication Platform as a comprehensive communication platform for effective communication with principal, students, and staff.

• Provide a platform tailored to meet the specific needs of schools, facilitating interaction between principal, teachers, and students.

• Ensure efficient communication while prioritizing data privacy and security.

• Represent a significant step towards the modernization and digitalization of academic infrastructure.

• Foster a collaborative environment, promoting mutual teaching and learning.

• Key features include schedule, announcement, chat rooms, timetable, message, images and document.

• Enhance the educational experience by facilitating effective communication and collaboration.

1.5.2. Objectives:

Some of the objectives that we are aiming to achieve with this Desktop application are:

- A user-friendly communication platform for principal, teachers and students
- Authenticated sign up and log in system.
- Real time messages, images and document to ensure the effective flow of information.
- Allows the school administration to update and share timetables, announcements, and schedule events.

1.6. Scope of the project:

The scope of the school communication platform includes several key areas:

1. **User Engagement**: The platform engages all members of the school community, including students, teachers, and administrators, by providing a centralized space for effective communication and collaboration.

2. **Information Dissemination**: It serves as a hub for sharing important information such as announcements, scheme of studies and educational materials, ensuring all users have access to the latest updates and resources.

3. **Real-Time Communication**: Features like chatrooms and real-time messaging facilitate instant communication, enhancing collaboration and making discussions more efficient.

4. **Images and Document Sharing**: The platform allows for easy sharing of documents, which is particularly useful for distributing study materials, assignments, and other important documents.

5. **Security and Privacy**: Designed with robust security measures, the platform ensures data privacy and protects user information.

6. **Customization**: Customizable features cater to the specific needs of a school community, including notifications, user roles, and more.

Chapter 2:
System Analysis

2.1. Proposed methodology:

The proposed methodology for developing the School Communication Platform will follow the Waterfall model, which is a linear and sequential approach. Each phase must be completed before moving on to the next, ensuring a systematic and structured development process. The development of the School Communication Platform using the Waterfall methodology involves the following phases:

- **Requirement Analysis:** Gather and document the needs of stakeholders, including features like scheduling, announcements, chat rooms, timetables, scheme of studies, messaging, images and document sharing, with a focus on security and data privacy.
- **System Design:** Create detailed design documents outlining system architecture, user interfaces, database schemas, and security mechanisms, ensuring all requirements are addressed.
- **Implementation:** Develop and unit test each module, such as user authentication and chat rooms, based on the design documents. Integrate these modules into a cohesive system.
- **Integration and Testing:** Conduct extensive testing, including system, integration, and user acceptance tests, to ensure the platform meets performance, usability, and security standards. Fix any identified issues.
- **Deployment:** Install the platform in the school environment, configure the system, set up user accounts, train users, and migrate any existing data if necessary.
- **Maintenance:** Monitor the platform for issues, perform updates, fix bugs, and add new features based on user feedback, ensuring the system remains functional, secure, and up-to-date.

2.2. Software requirement specifications:

Software Requirement Specifications (SRS) is a comprehensive document that outlines the functional and non-functional requirements of a software system.

2.1.1. Functional requirements:

Functional requirements describe the specific functions or capabilities that the software system should perform. This includes features like user authentication, data input/validation, calculations, data manipulation, and reporting. Functional requirements specify what the system should do. Here are some functional requirements for the SCP:

1. **User Authentication and Authorization**

- Users (admin, Principal, teachers, and students) should be able to log in using their school credentials.

- Different roles (admin, Principal, teacher, students) should have specific permissions (e.g., principal can update timetable, announcements and admin can manage user record).

2. **Communication Features**

- Users should be able to send direct messages to each other within the platform.
- Principal should be able to post announcements visible to teachers and students.
- Teachers can create chat rooms where students can participate under their supervision.

3. **Information Sharing**

- Users should be able to share documents (e.g., assignments, notices, timetable) securely.

4. **Weekly Planner**

- Teachers can share weekly plans with students.

5. **System Administration**

- Admin should be able to manage user data.

2.1.2. Non-functional Requirements:

Non-functional Requirements specifies the criteria that the system must meet in terms of performance, security, usability, reliability and other qualities. Non-functional requirements specify how the system should behave. Here are some non-functional requirements for the SCP:

1. **Performance**

Ensures quick message delivery and real-time updates to support seamless communication among Principal, teachers, students.

2. **Security**

Implements end-to-end encryption and secure logins to protect sensitive information from unauthorized access.

3. **Usability**

Provides an intuitive, user-friendly interface with easy navigation to facilitate effective communication for all users.

4. **Privacy**

Safeguards user data through strict privacy policies and permission-based data access to protect user identities and information.

5. **Reliability**

Delivers consistent uptime and dependable performance to ensure the platform is always accessible when needed.

2.2. Use-case analysis:

2.2.2. Use-case Model:

A Use Case Model describes the proposed functionality of a new system. A Use Case represents a discrete unit of interaction between a user (human or machine) and the system. This interaction is a single unit of meaningful work.

A school communication platform use case represents a specific interaction between users (such as principal, teachers, and students) and the system, enabling tasks like sending announcements, sharing Images, and scheduling events.

Fig 1.1. Use Case Diagram

2.2.3.Use Case description:

2.2.3.1. Login

Use Case ID:	**UC-01**
Use Case Name:	Login
Created By	Saira Rasul & Maira Rasul

Description:	This use case describes the process by which users (such as admin, principal, teachers, and students) authenticate and access their respective functionalities within the system.
Actors:	Admin, Principal, Teacher, Student, Database System
Pre-condition:	The user has clicked the "Get Started" Button.
Post-condition:	The user gains access to functionalities tailored to their role, such as viewing announcements, timetables, and schemes of studies.
Includes:	Application, MySQL
Basic Flow:	• User navigates to the login page of the application. • User enters their username and password. • System verifies the credentials against the MySQL database. • If authentication is successful, then user is redirected to their dashboard displaying relevant information.
Frequency of use:	Multiple times daily, depending on users' tasks
Alternative Flow:	If the admin cannot create a user due to a system error, then display Invalid user data.
Exception:	If the login attempt fails due to incorrect credentials then display Invalid user data.
Assumption:	The user has a valid account and correct credentials.

Table 1.2. Login Use case Description

2.2.3.2. Insert user data

Use Case ID:	**UC-02**
Use Case Name:	Insert user data
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which the administrator inserts records of teachers and students from the system.
Actors:	Admin, Database System
Pre-condition:	The administrator must be logged into the system.
Post-condition:	User records (teachers and students) are successfully managed in the MySQL database.
Includes:	Application, MySQL
Basic Flow:	• Administrator chooses to insert user records. • System prompts for necessary details (e.g., username, or personal information). • Administrator submits the form, and the system updates the MySQL database accordingly.

Frequency of use:	As needed for adding new users existing ones.
Alternative Flow:	If the admin cannot create a user due to a system error then display Invalid user data.
Exception:	If a user profile cannot be updated due to invalid data, an error message is displayed, and the admin is prompted to correct the data.
Assumption:	The admin has the necessary permissions to manage user accounts.

Table 1.3. Insert User Data Use Case Description

2.2.3.3. Delete user data

Use Case ID:	**UC-03**
Use Case Name:	Delete user data
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which the administrator deletes records of teachers and students from the system.
Actors:	Admin, Database System
Pre-condition:	The administrator must be logged into the system.
Post-condition:	User records (teachers and students) are successfully managed in the MySQL database.
Includes:	Application, MySQL
Basic Flow:	• Administrator chooses to delete user records. • System prompts for necessary details (e.g., username, personal information). • Administrator submits the form, and the system updates the MySQL database accordingly.
Frequency of use:	As needed for adding new removing existing ones.
Alternative Flow:	If the admin cannot create a user due to a system error, then display Invalid user data.
Exception:	If a user profile cannot be updated due to invalid data, an error message is displayed, and the admin is prompted to correct the data.
Assumption:	The admin has the necessary permissions to manage user accounts.

Table 1.4. Delete user Data Use case Description

2.2.3.4. Update user data

Use Case ID:	**UC-04**
Use Case Name:	Update user data

Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which the administrator updates records of teachers and students from the system.
Actors:	Admin, Database System
Pre-condition:	The administrator must be logged into the system.
Post-condition:	User records (teachers and students) are successfully managed in the MySQL database.
Includes:	Application, MySQL
Basic Flow:	• Administrator chooses to update user records. • System prompts for necessary details (e.g., username or personal information). • Administrator submits the form, and the system updates the MySQL database accordingly.
Frequency of use:	As needed for adding update users record existing ones.
Alternative Flow:	If the admin cannot create a user due to a system error, then display Invalid user data.
Exception:	If a user profile cannot be updated due to invalid data, an error message is displayed, and the admin is prompted to correct the data.
Assumption:	The admin has the necessary permissions to manage user accounts.

Table 1.5. Update user data Use case Description

2.2.3.5. Update Announcement

Use Case ID:	**UC-05**
Use Case Name:	Update Announcement
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which Principal update or modify announcements.
Actors:	Principal, Database System
Pre-condition:	The Principal must be logged into the system.
Post-condition:	Updated announcements are reflected in the system for users to view.
Includes:	Application, MySQL
Basic Flow:	• Principal navigates to the announcements section of their dashboard. • System saves the updated announcement details in the MySQL database.
Frequency of use:	As needed, whenever there are updates or corrections to be

	made in announcements.
Alternative Flow:	If the update fails due to a system error then does not display new announcements.
Exception:	If there is a problem with updating the announcement, then does not display new announcement.
Assumption:	The system has the necessary permissions and the system is operational.

Table 1.6. Update Announcement Use case Description

2.2.3.6. Update Timetable

Use Case ID:	**UC-06**
Use Case Name:	Update Timetable
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which principal update or modifies the schedule of classes and activities.
Actors:	Principal, Database System
Pre-condition:	The Principal must be logged into the system.
Post-condition:	Updated timetable is reflected in the system for users to view.
Includes:	Application, MySQL
Basic Flow:	• Principal navigates to the timetable section of their dashboard. • System saves the updated timetable information in the MySQL database.
Frequency of use:	As needed, whenever there are changes in class schedules or activities.
Alternative Flow:	If the update fails due to a system issue, then does not display new timetable.
Exception:	If there is a problem with updating the timetable, then does not display new timetable.
Assumption:	The system has the necessary permissions and the timetable system is functional.

Table 1.7. View Timetable Use case Descriptio

2.2.3.7. View Scheme of studies

Use Case ID:	**UC-07**
Use Case Name:	View Scheme of studies
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which users view the

	academic program details.
Actors:	Principal, Teacher, Student, SCP System
Pre-condition:	The user must be logged into the system.
Post-condition:	Users can access and review the academic program details
Includes:	Application, MySQL
Basic Flow:	• User navigates to the scheme of studies section of their respective dashboard. • System retrieves and displays the scheme of studies information from the MySQL database. • User views the curriculum details, including courses, subjects, credits, and any additional information provided.
Frequency of use:	Multiple times daily, depending on users' tasks
Alternative Flow:	If the scheme of studies cannot be loaded, error message display.
Exception:	If there is an issue with the scheme data, then again application start.
Assumption:	The scheme of studies is accurately updated and available.

Table 1.8. View Scheme of studies Use case Description

2.2.3.8. Participate in Group Chat

Use Case ID:	**UC-08**
Use Case Name:	Participate in Group Chat
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which users engage in group discussions and collaborations.
Actors:	Principal, Teacher, Student
Pre-condition:	The user must be logged into the system.
Post-condition:	Users can communicate and collaborate effectively within designated chat groups.
Includes:	Application, MySQL
Basic Flow:	• User accesses the chat group dashboard. • Enters ID and password. • System verifies credentials. • If correct, "Join Class" option is displayed. • User clicks "Join Class." • Chat room opens. • User can participate in conversations.
Frequency of use:	Daily, as users participate in discussions and share information.
Alternative Flow:	If the chat cannot be initiated due to a system error, then error

	message is displayed Invalid Id or password.
Exception:	If there is an issue with the group chat service, an error message is displayed.
Assumption:	Users are part of active groups and the chat service is operational.

Table 1.9. Participate in Group Chat Use Case Description

2.2.3.9. Send and Receive Message

Use Case ID:	**UC-09**
Use Case Name:	Send and Receive Message
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which users send and receive text messages within the group chat.
Actors:	Principal, Teacher, Student, Database System
Pre-condition:	The user must be logged into the chat group.
Post-condition:	Messages sent by users are delivered to the intended recipients within the group chat.
Includes:	Application, MySQL
Basic Flow:	• User navigates to the group chat section of their dashboard. • User selects the chat group or opens a new chat conversation. • User types a text message and sends it to the group. • System stores the message in the MySQL database and delivers it to all participants in the chat group. • Participants receive the message and can view it in the chat interface.
Frequency of use:	Multiple times daily, as users engage in discussions and communication.
Alternative Flow:	If a message fails to send, then does not display itself message.
Exception:	If there is an issue with message delivery, does not display itself message.
Assumption:	The messaging system is operational and users has valid contacts.

Table 1.10. Send and Receive Message Use Case Description

2.2.3.10. Send and Receive Attachment

Use Case ID:	**UC-10**
Use Case Name:	Send and Receive Attachment
Created By	Saira Rasul & Maira Rasul

Description:	This use case describes the process by which users share and receive images and documents within the group chat.
Actors:	Principal, Teacher, Student, Database System
Pre-condition:	The user must be logged into the chat group.
Post-condition:	Images and Documents shared by users are uploaded to the system and made accessible to all group members.
Includes:	Application, MySQL
Basic Flow:	• User navigates to the group chat section of their dashboard. • User selects the chat group or opens a new chat conversation. • User uploads an images and document from their device to the chat interface. • System stores the images and document in the MySQL database and makes it available for download by all participants in the chat group. • Participants can open the images and document from the chat interface for viewing or further action.
Frequency of use:	Occasionally, when users need to share files or documents related to discussions in the chat group.
Alternative Flow:	If a images and document fail to open, does not display itself message.
Exception:	If there is an issue with images and document handling, does not display itself message.
Assumption:	The images and document handling system are functional and users have valid permissions.

Table 1.11. Send and Receive Attachment Use Case Description

2.2.3.11. View Announcement

Use Case ID:	**UC-11**
Use Case Name:	View Announcement
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which users view announcements posted within the system.
Actors:	Principal, Teacher, Student, SCP System
Pre-condition:	The user must be logged into the system.
Post-condition:	Users can access and read announcements relevant to their role or school community.
Includes:	Application, MySQL

Basic Flow:	• User navigates to the announcements section of their respective dashboard. • System retrieves and displays the latest announcements from the MySQL database. • User reads the announcements and can choose to view more details if provided.
Frequency of use:	Daily, as users check for new updates and information.
Alternative Flow:	If the announcement cannot be loaded, error message display.
Exception:	If there is an issue with the announcement, then again application start.
Assumption:	Announcements are posted and accessible in the system.

Table 1.12. View Announcement Use Case Description

2.2.3.12. View Timetable

Use Case ID:	**UC-12**
Use Case Name:	View Timetable
Created By	Saira Rasul & Maira Rasul
Description:	This use case describes the process by which users view the schedule of classes and activities.
Actors:	Principal, Teacher, Student, SCP System
Pre-condition:	The user must be logged into the system.
Post-condition:	Users can access and refer to the timetable to plan their activities and schedules.
Includes:	Application, MySQL
Basic Flow:	• User navigates to the timetable section of their respective dashboard. • System retrieves and displays the timetable information from the MySQL database. • User views the schedule, including class timings, subjects, and any additional details
Frequency of use:	Daily, as users check their class timings and activities.
Alternative Flow:	If the timetable cannot be loaded, error message display.
Exception:	If there is an issue with the timetable, then again application start.
Assumption:	The timetable data is correctly entered and available in the system.

Table 1.13. View Timetable Use Case Description

Chapter 3:
System Design Diagrams

3.1. System Design Diagram:

3.1.1. Entity-Relationship Diagram (ERD):

An entity relationship diagram (ERD), also known as an entity relationship model, is a graphical representation that depicts relationships among people, objects, places, concepts or events in an information technology (IT) system.

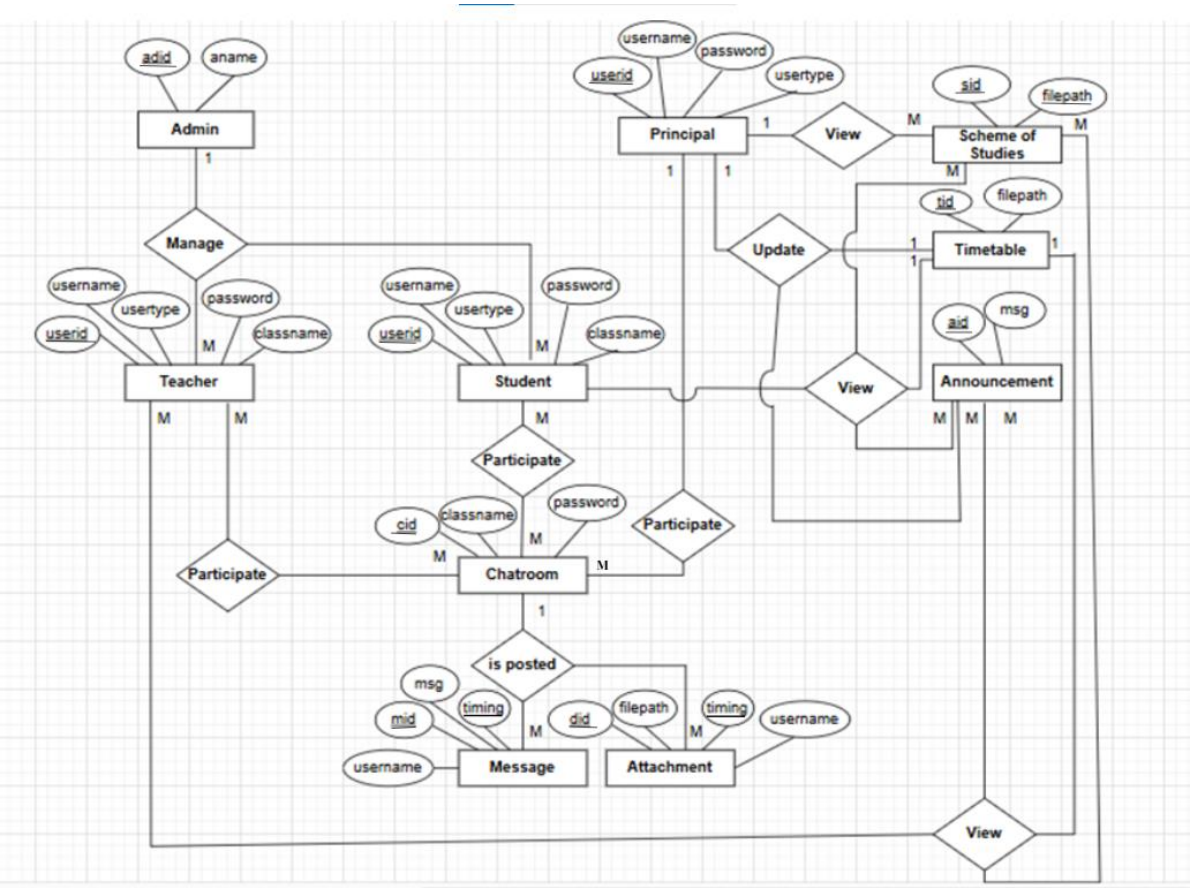


Fig 1.2. Entity Relationship Diagram

3.1.2. Enhanced Entity–Relationship (ERR):

The enhanced entity–relationship (EER) model (or extended entity–relationship model) in computer science is a high-level or conceptual data model incorporating extensions to the original entity–relationship (ER) model, used in the design of databases.

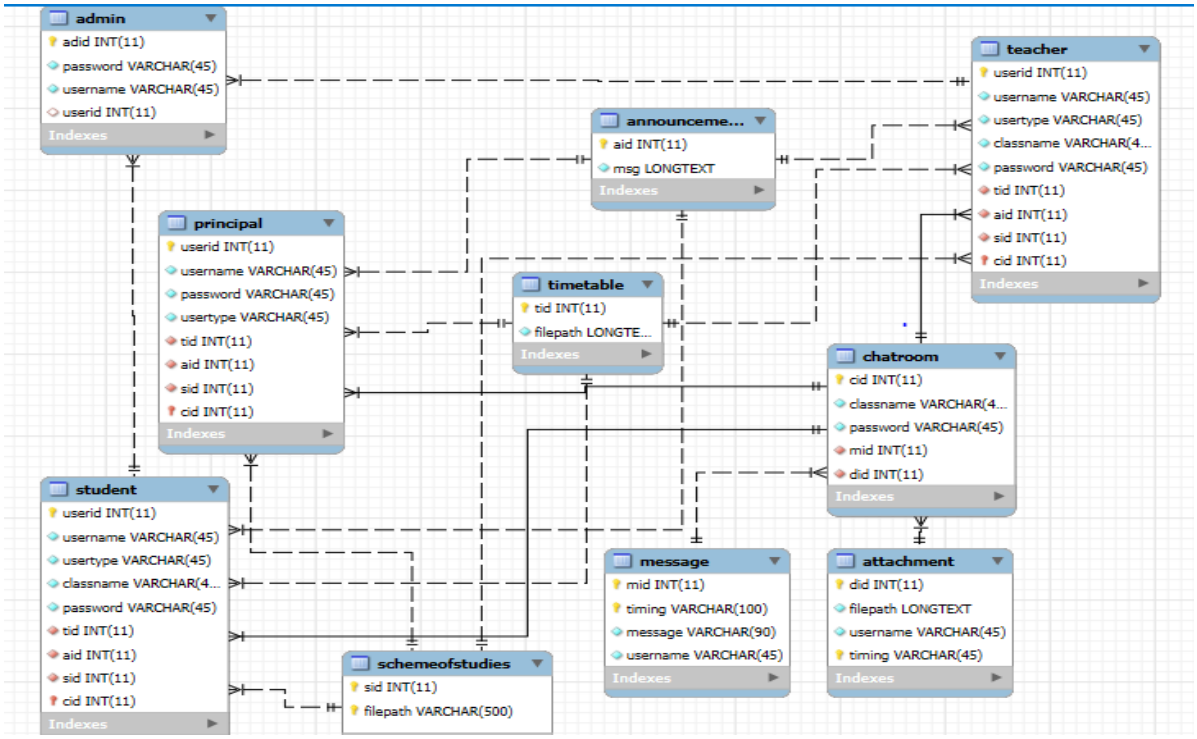


Fig 1.3. Enhanced Entity–Relationship Diagram

3.1.3. Context Diagram:

A Context Diagram of a school communication platform represents the entire system as a single process, showing its interactions with external entities such as Admin, Principal, Teacher, and Student through data flow.

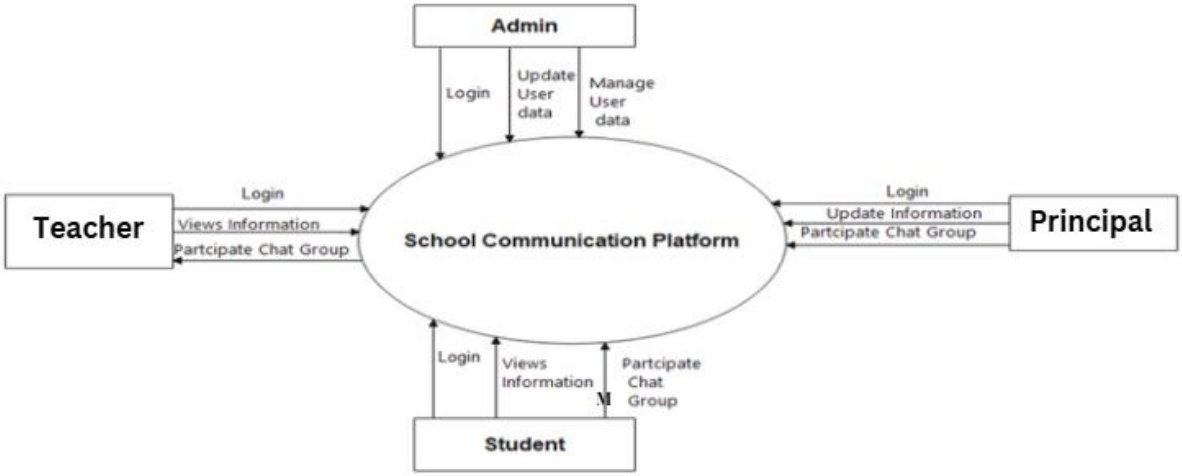


Fig 1.4. Context Diagram

3.1.3. DFD Diagram

A data flow diagram (DFD) is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement. They

are often elements of a formal methodology such as Structured Systems Analysis and Design Method (SSADM).

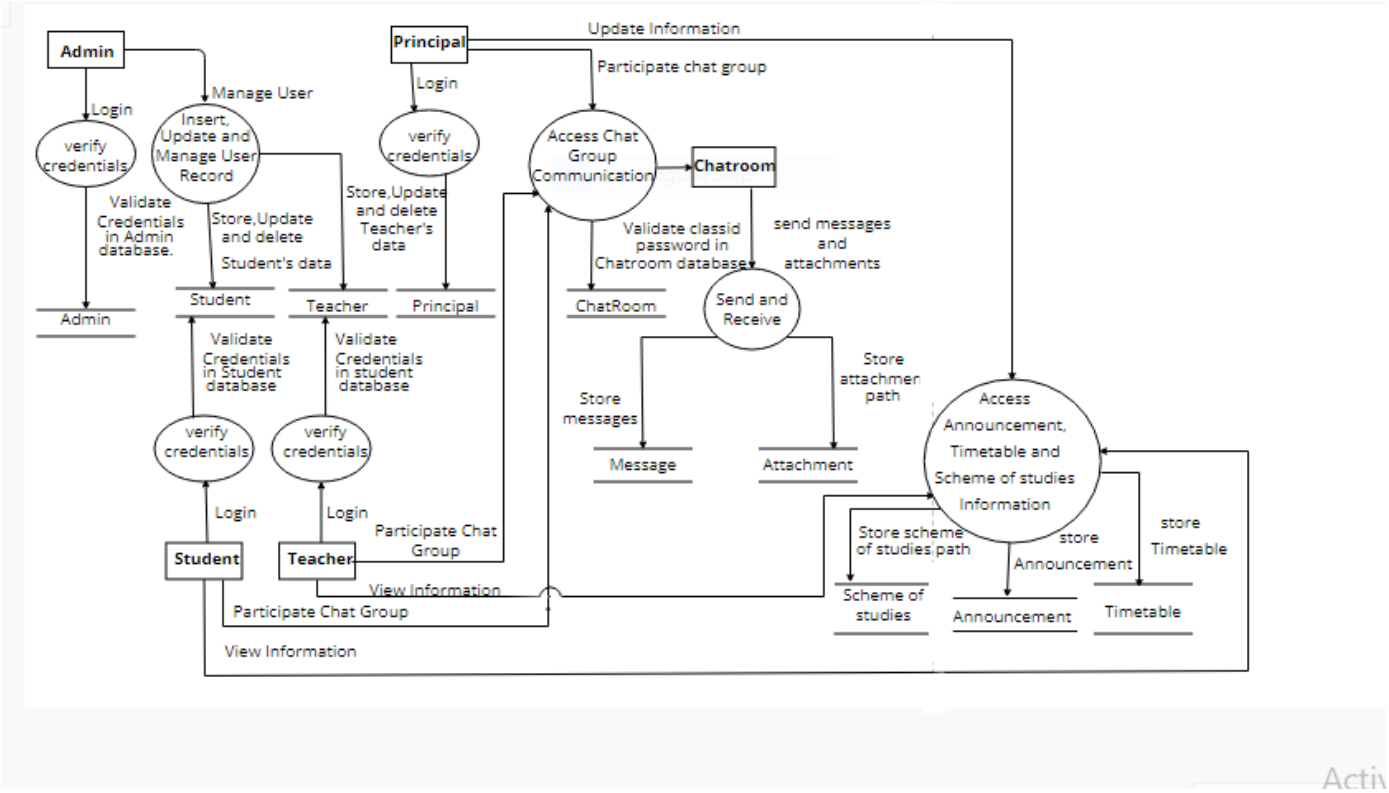


Fig 1.5. DFD Diagram

3.1.4.Class Diagram:

A class diagram is a visual representation of class objects in a model system, categorized by class types. Each class type is represented as a rectangle with three compartments for the class name, attributes, and operations. A class diagram illustrates the classes or objects in a system, their attributes, and the relationships between them. It is used in object-oriented modeling.

A class diagram for a school communication platform represents the static structure of the system, illustrating the system's classes, their attributes, methods, and the relationships among the classes This diagram helps in understanding the architecture and behavior of the platform by showcasing the core components and their interactions in a structured format.

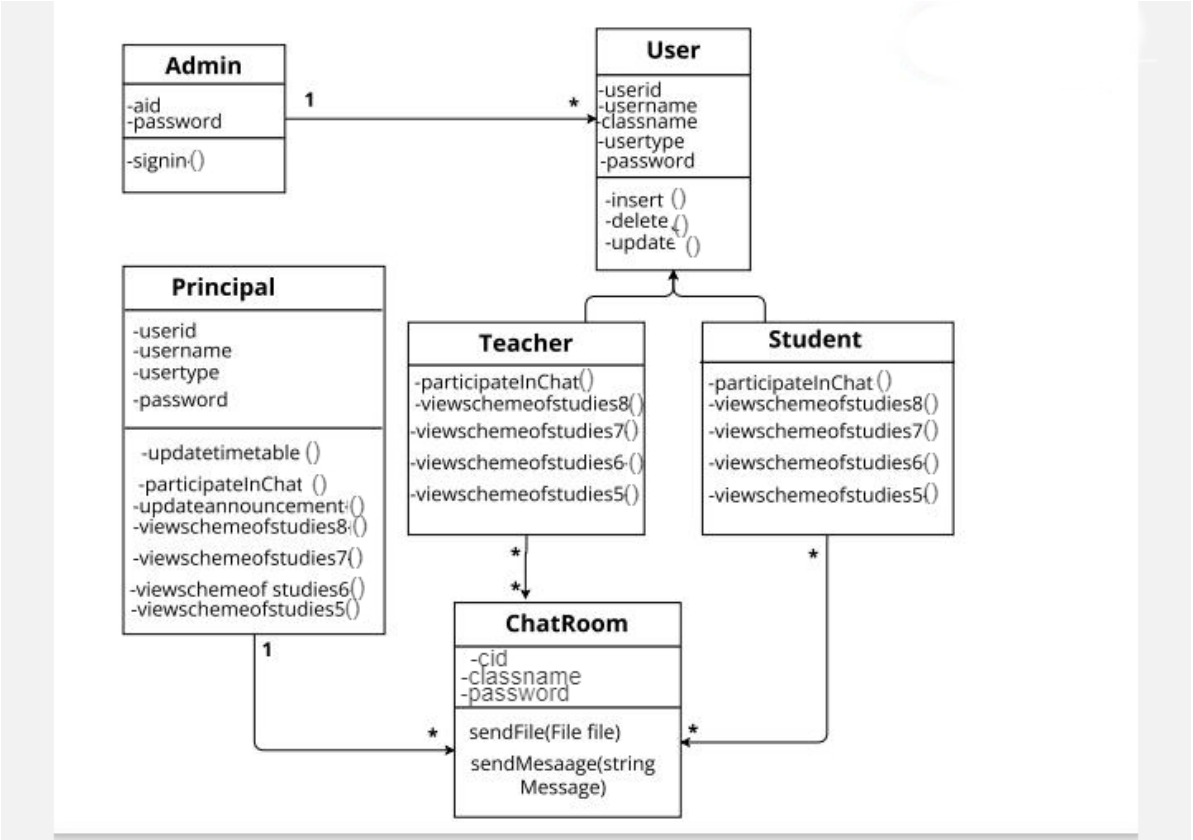


Fig 1.6. Class Diagram

3.1.5. Activity Diagram:

An activity diagram is a type of Unified Modeling Language (UML) flowchart that shows the flow from one activity to another in a system or process. It's used to describe the different dynamic aspects of a system and is referred to as a 'behavior diagram' because it describes what should happen in the modeled system.

An activity diagram for a school communication platform illustrates the sequence of actions users take to perform tasks like sending messages or participating in chat rooms. It visually represents the flow of activities, decisions, and interactions within the system, aiding in understanding and designing system processes efficiently. It helps developers and stakeholders visualize and refine the workflow for optimal user interaction and system functionality.

3.1.5.1. Admin Side Activity Diagram

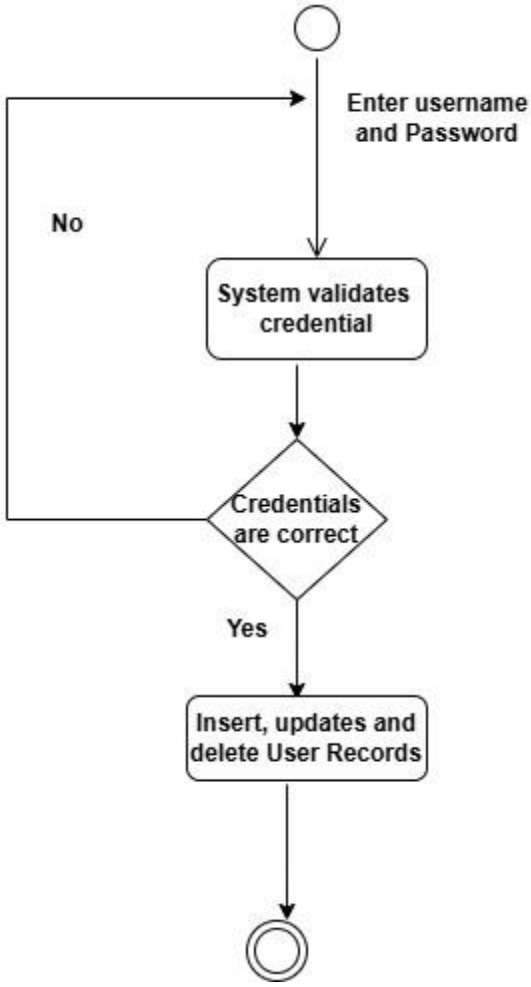


Fig 1.7. Admin Side Activity Diagram

3.1.5.2. Principal Side Activity Diagram:

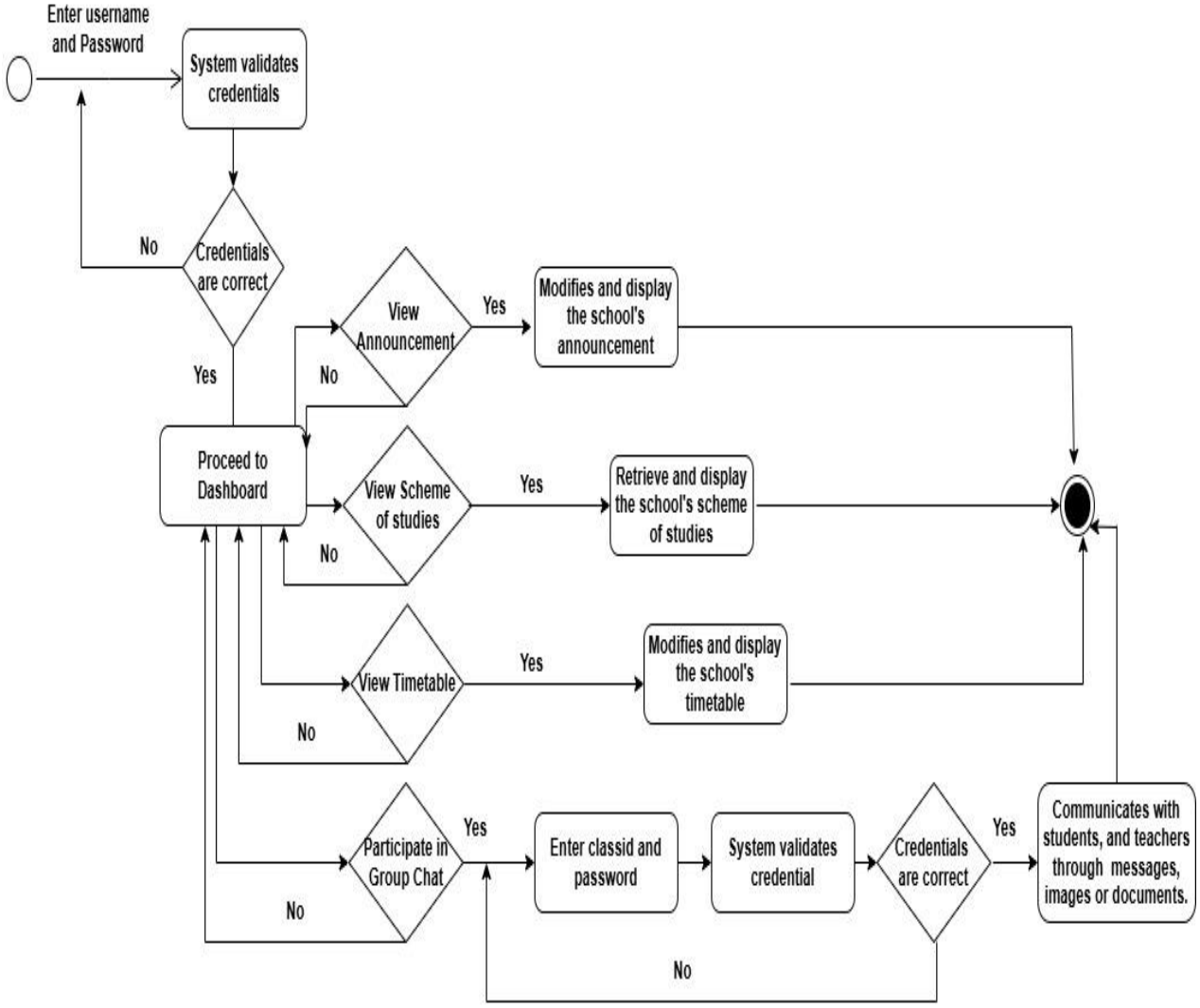


Fig 1.8. Principal Side Activity Diagram

3.1.5.3. Teacher Side Activity Diagram:

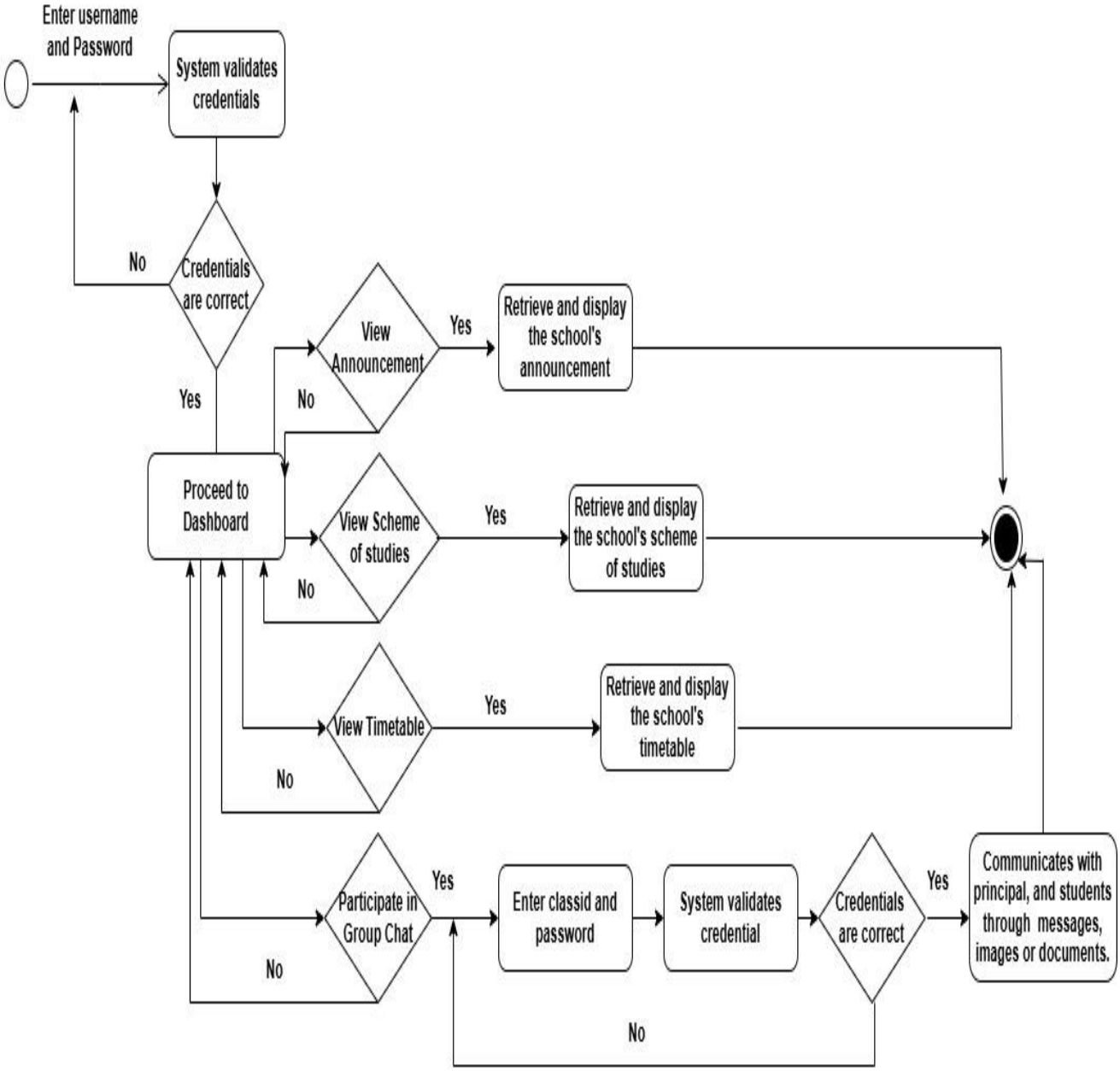


Fig 1.9. Teacher Side Activity Diagram

3.1.5.4. Student Side Activity Diagram:

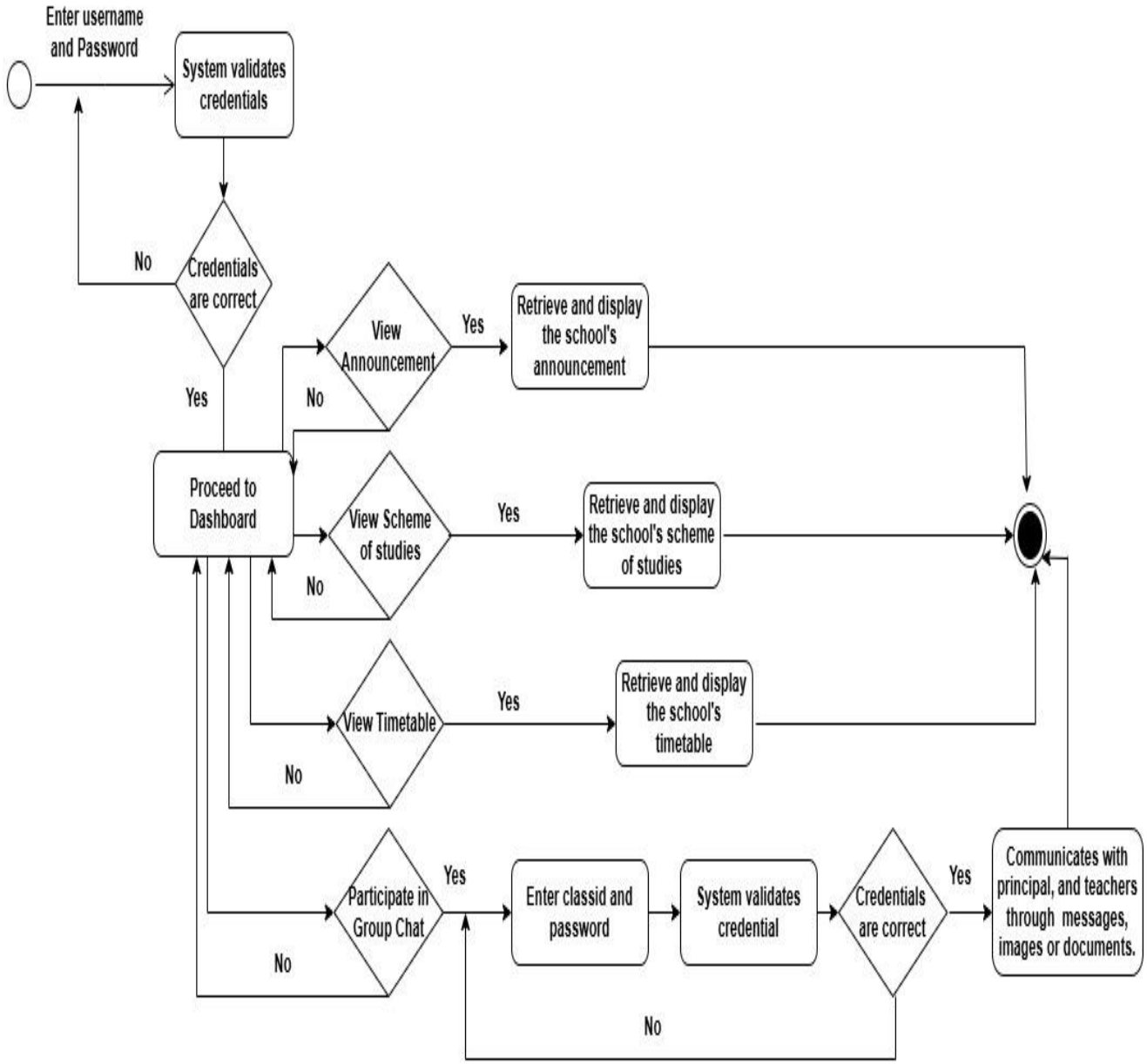


Fig 1.10. Student Side Activity Diagram

3.1.6.Sequence Diagram:

A sequence diagram is a Unified Modeling Language (UML) diagram that illustrates the sequence of messages between objects in an interaction. A sequence diagram consists of a group of objects that are represented by lifelines, and the messages that they exchange over time during the interaction.

3.1.6.1. Admin Side Sequence Diagram:

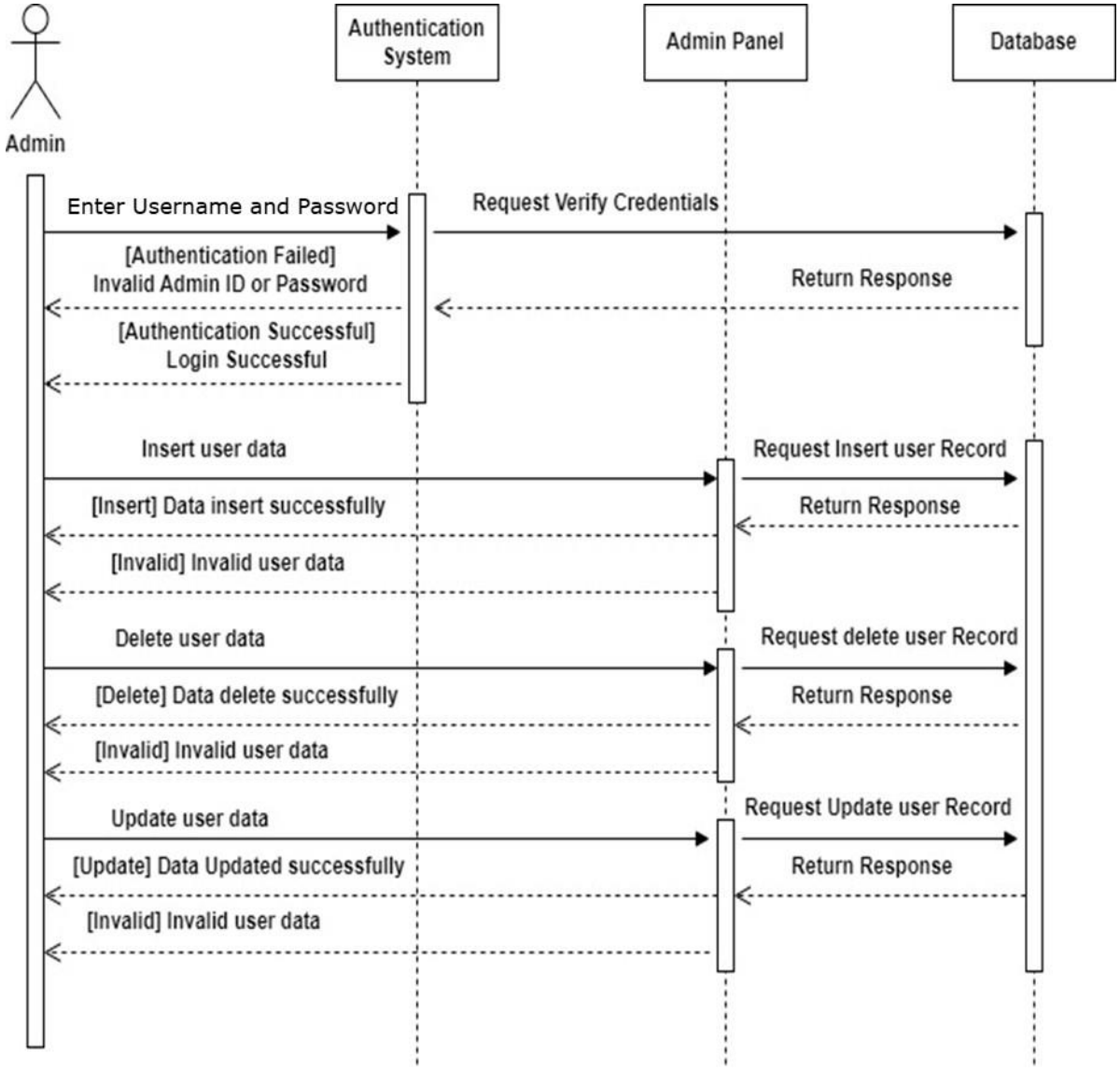


Fig 1.11 Admin Side Sequence Diagram

3.1.6.2. Principal Side Sequence Diagram:

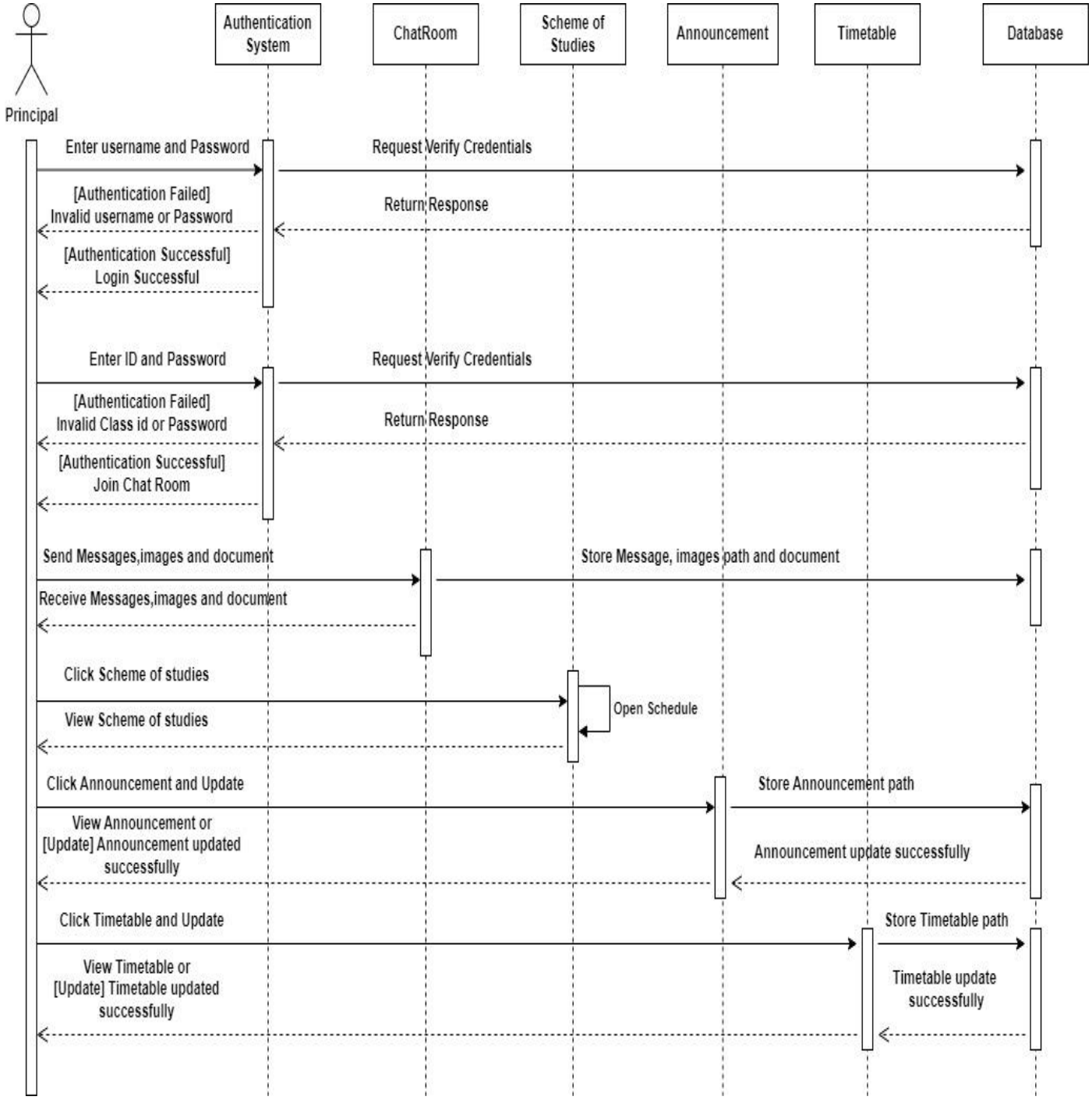


Fig 1.12 Principal Side Sequence Diagram

3.1.6.3. Teacher Side Sequence Diagram:

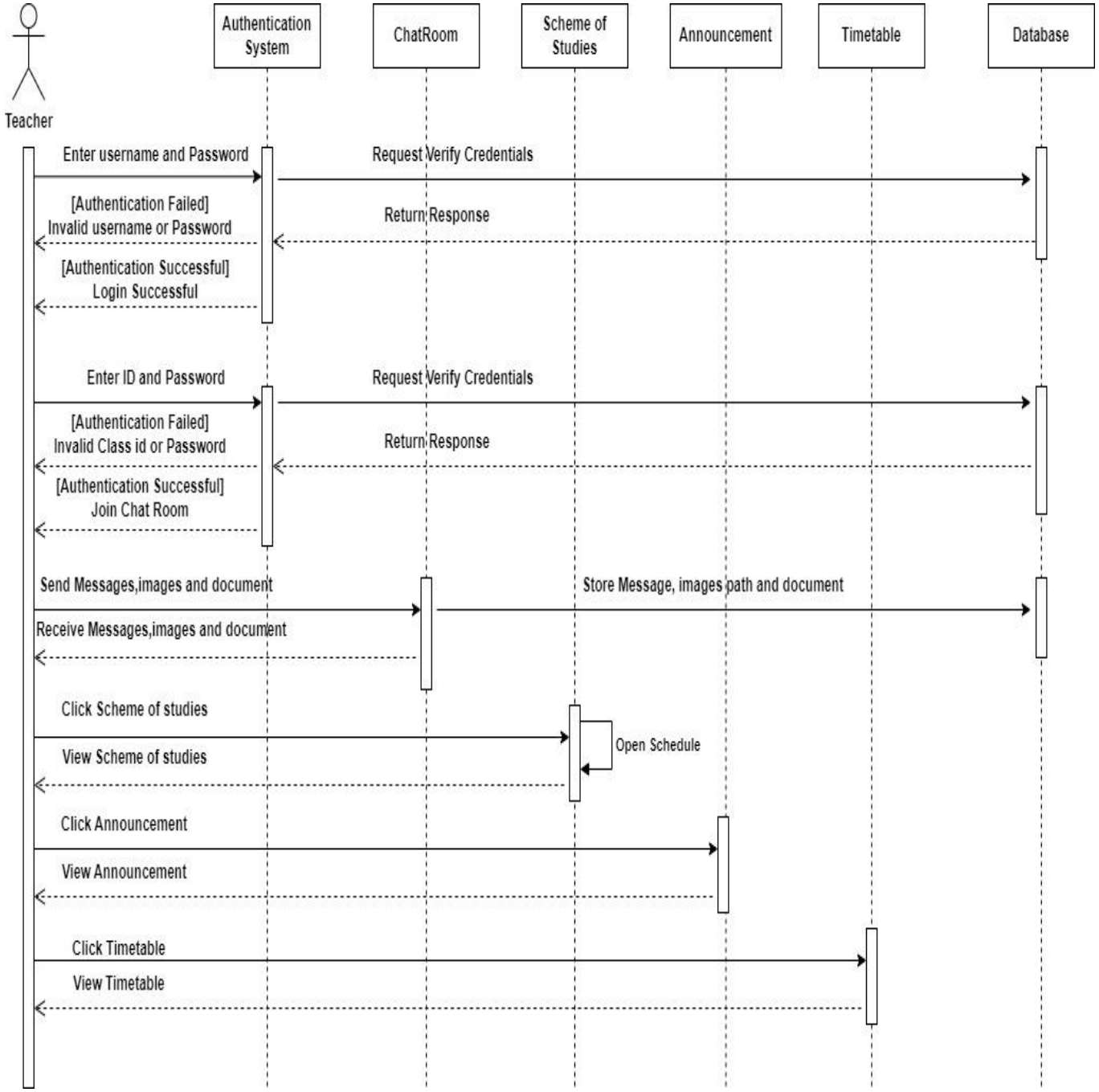


Fig 1.13. Teacher Side Sequence Diagram

3.1.7.Student Side Sequence Diagram:

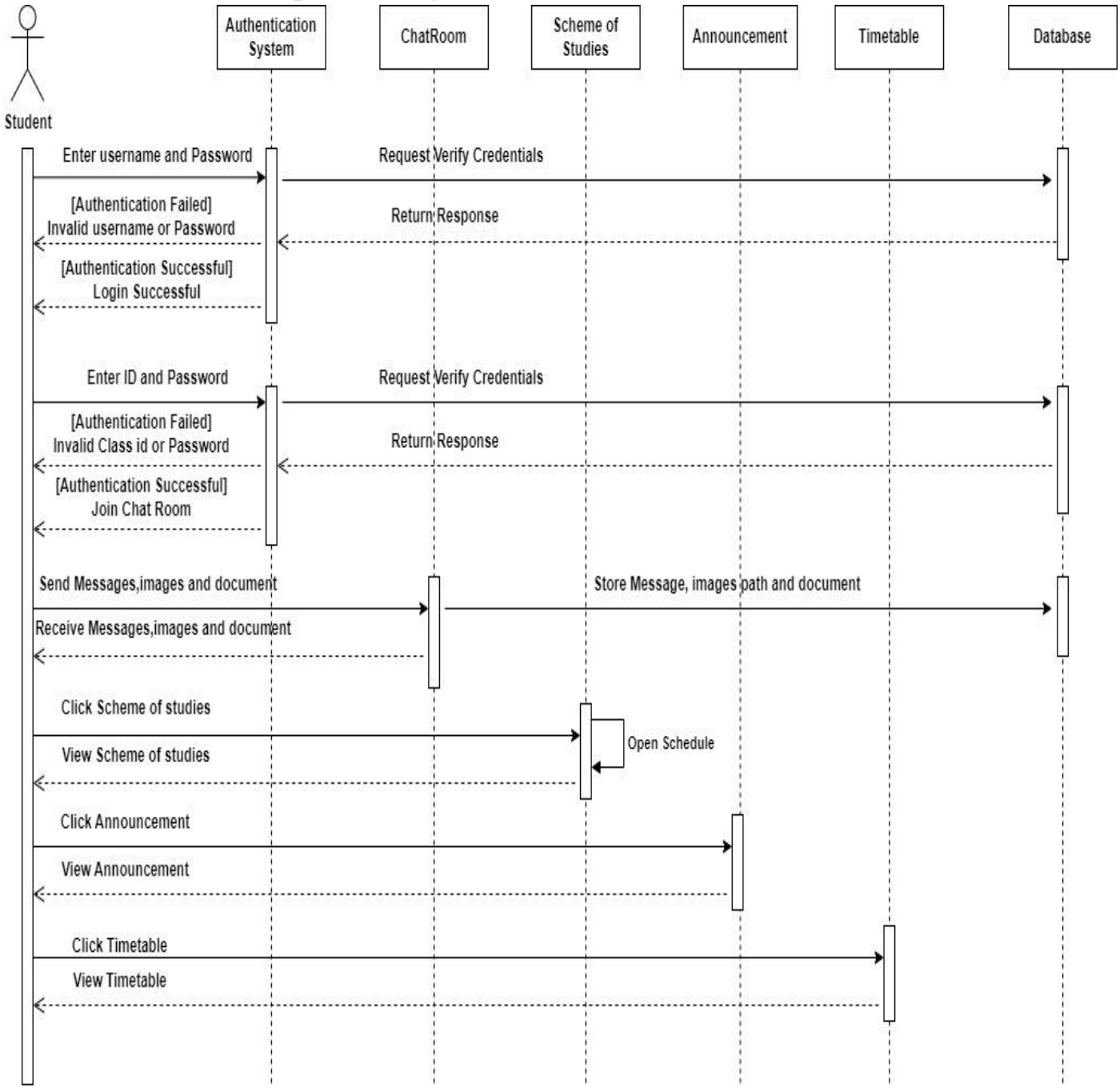


Fig 1.14. Student Side Sequence Diagram

3.1.8. State Transition Diagram:

A state transition diagram for a school communication platform is a visual representation showing the different operational states of the platform (e.g., idle, processing, error) and how it transitions between these states in response to events such as user actions (e.g., login, sending messages), system processes (e.g., data retrieval), or external triggers (e.g., network events).

3.1.8.1. Admin Side State-transition Diagram:

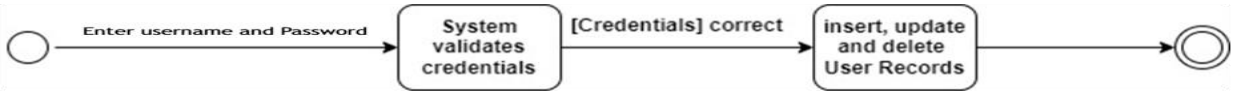


Fig 1.15. Admin Side State-transition Diagram

3.1.9.2. Principal Side State-transition Diagram:

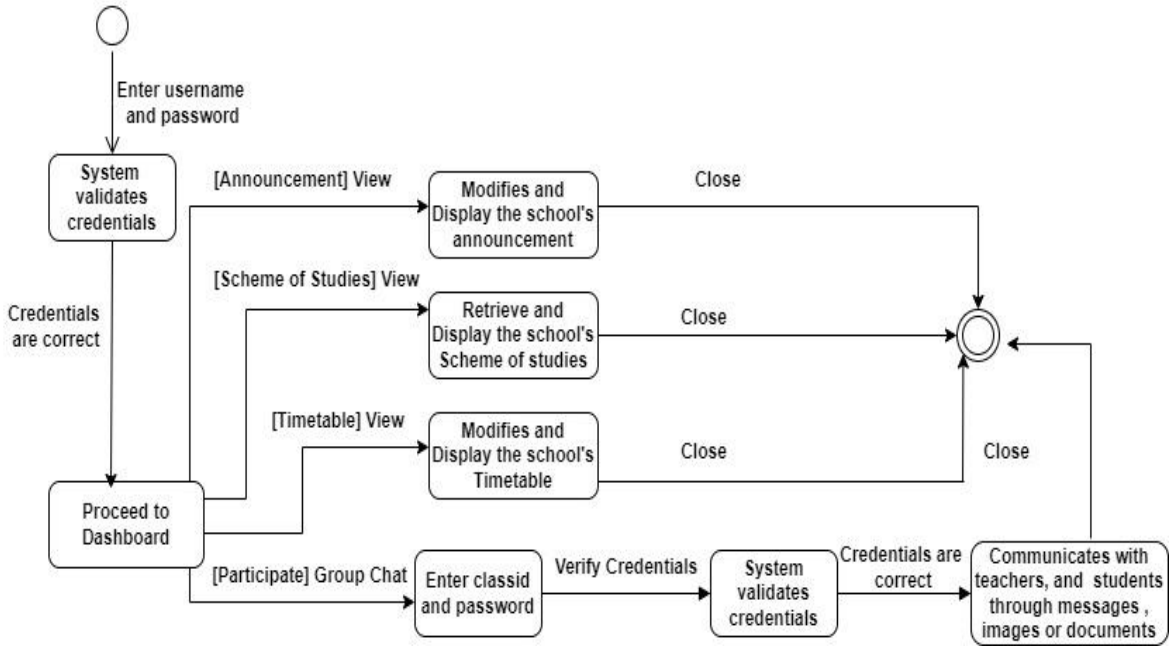


Fig 1.16. Principal Side State-transition Diagram

3.1.9.3. Teacher Side State-transition Diagram:

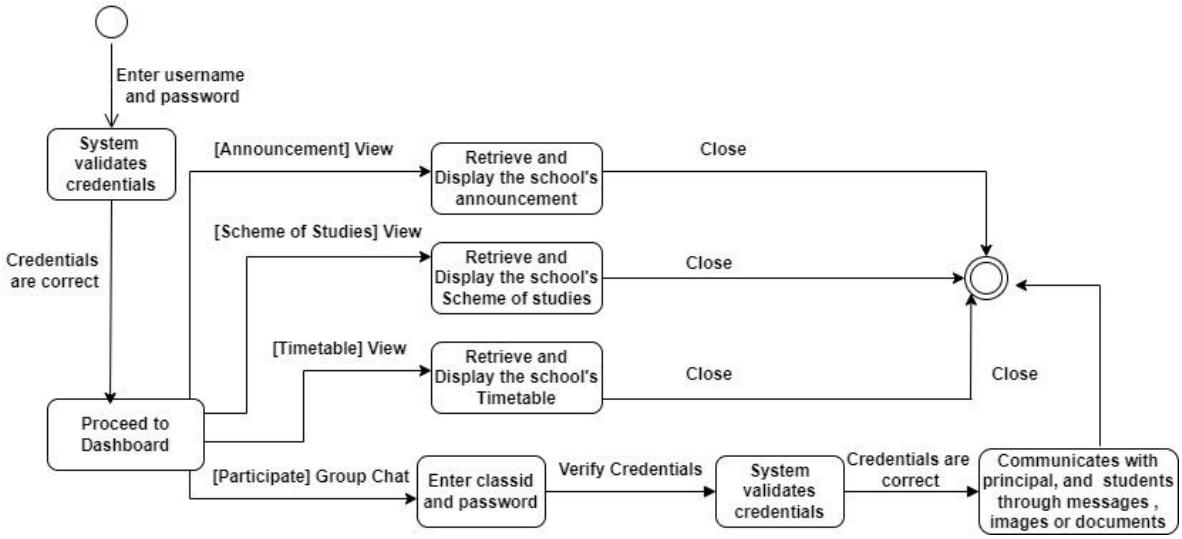


Fig 1.17. Teacher Side State-transition Diagram

3.1.9.4. Student Side State-transition Diagram:

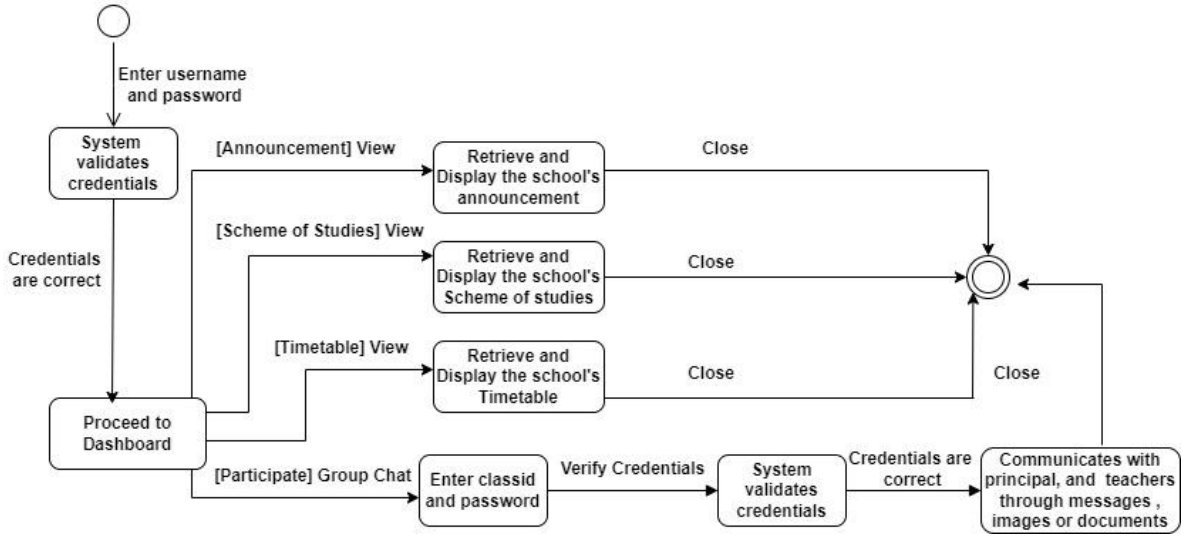


Fig 1.18. Student Side State-transition Diagram

3.1.10. Deployment Diagram:

A Deployment Diagram illustrates the physical deployment of software components across hardware nodes in a networked environment. A Deployment Diagram for a school communication platform visually represents how its software components are distributed across hardware nodes. It shows servers, databases, and devices involved, indicating where each component runs.

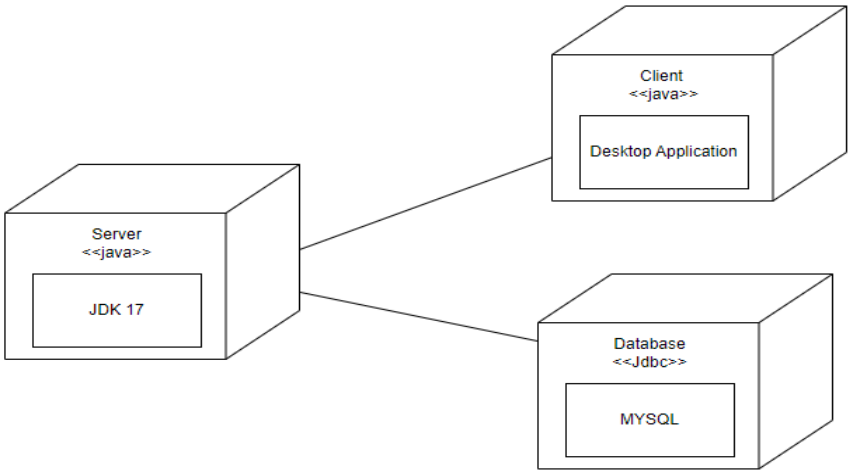


Fig 1.19. Deployment Diagram

3.1.11. Component Diagram:

A Component Diagram for a school communication Platform visually represents the architecture of a software system by showing its components, interfaces, and relationships.

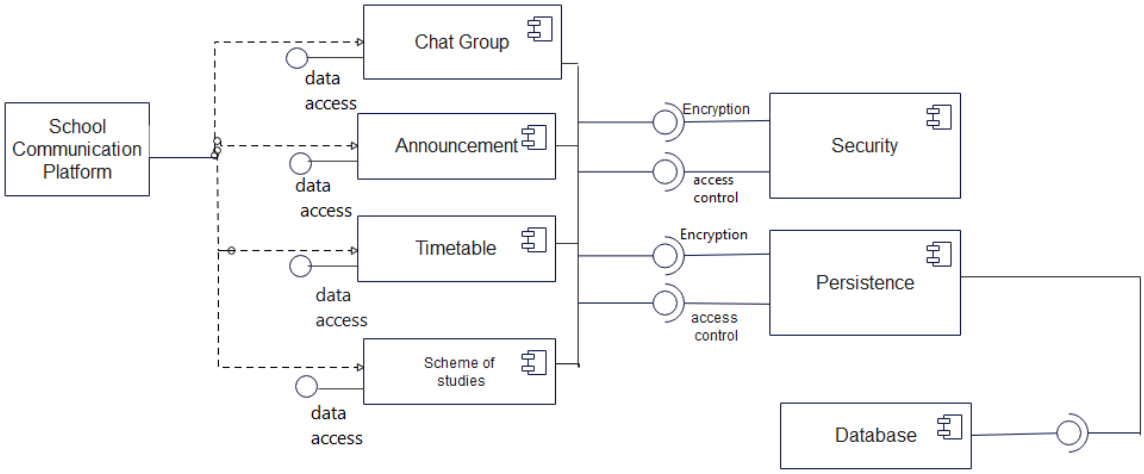


Fig 1.20. Component Diagram

3.1.12. Collaboration Diagram:

A Collaboration Diagram, also known as a Communication Diagram.A Collaboration Diagram for a school communication platform that shows how these entities exchange messages, images and documents within chat groups. A Collaboration Diagram helps depict the flow of information and collaboration paths in the platform.

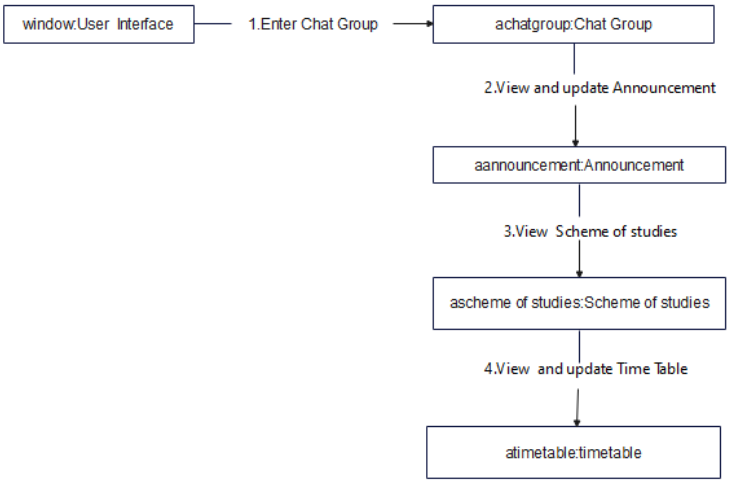


Fig 1.21. Collaboration Diagram

3.1.13.Swim lane Diagram:.

A swim lane diagram helps visualize the process flow of the school communication platform, showing how different users interact with the system.

3.1.13.2. Admin Side Swim lane Diagram

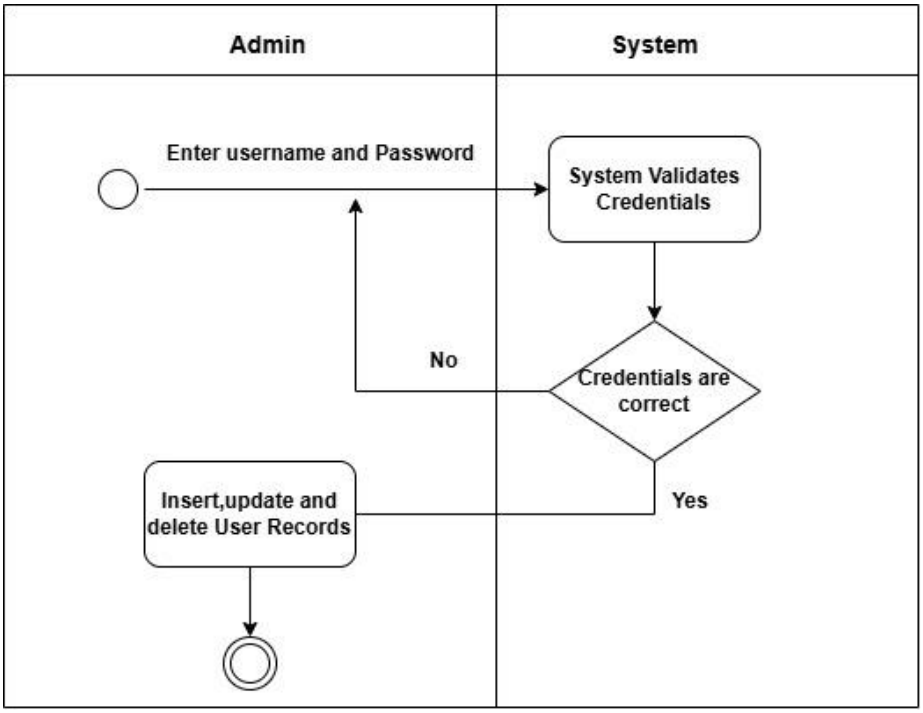


Fig 1.22. Admin Side Swim lane Diagram

3.1.13.3. Principal Side Swim lane Diagram

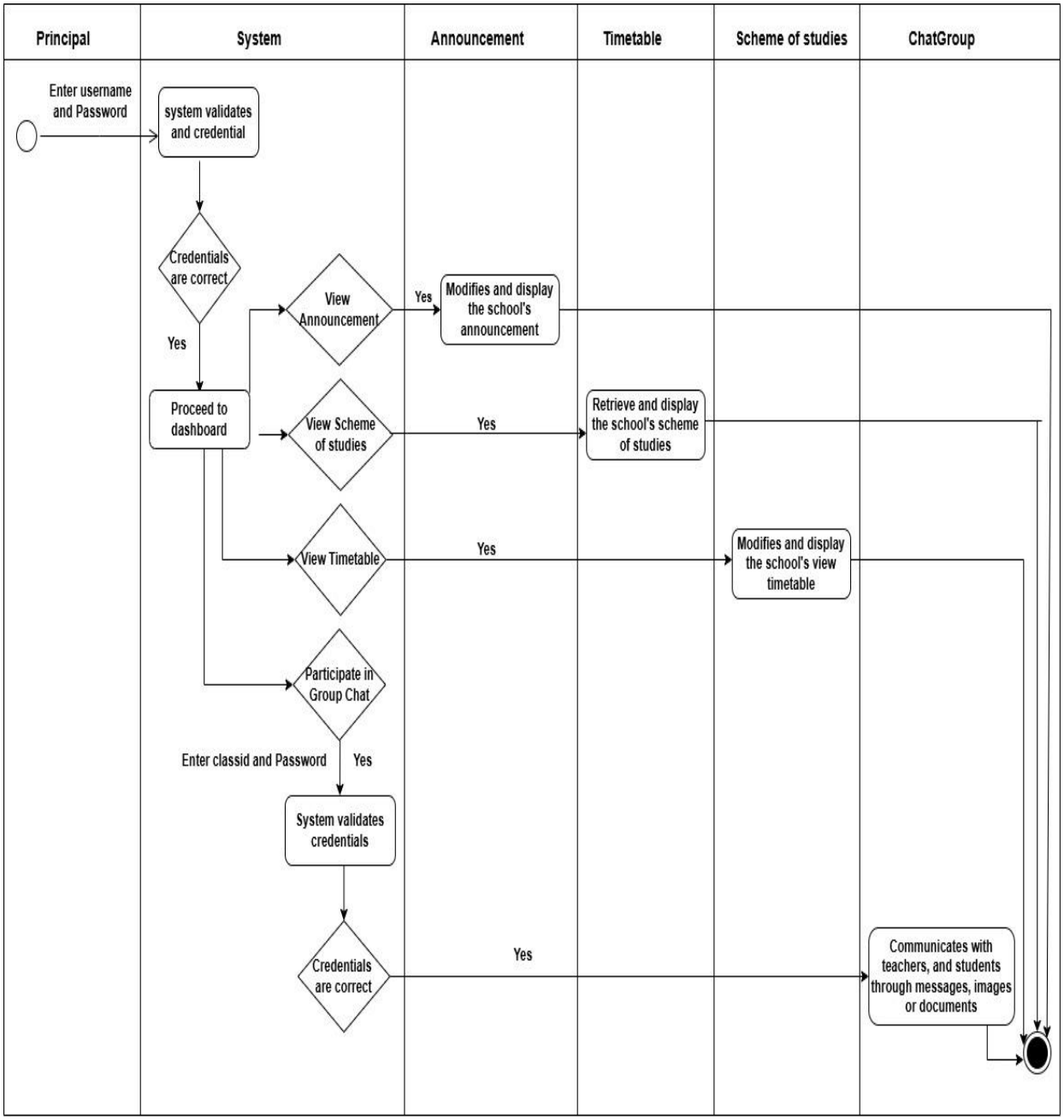


Fig 1.23. Principal Side Swim lane Diagram

3.1.13.4. Teacher Side Swim lane Diagram

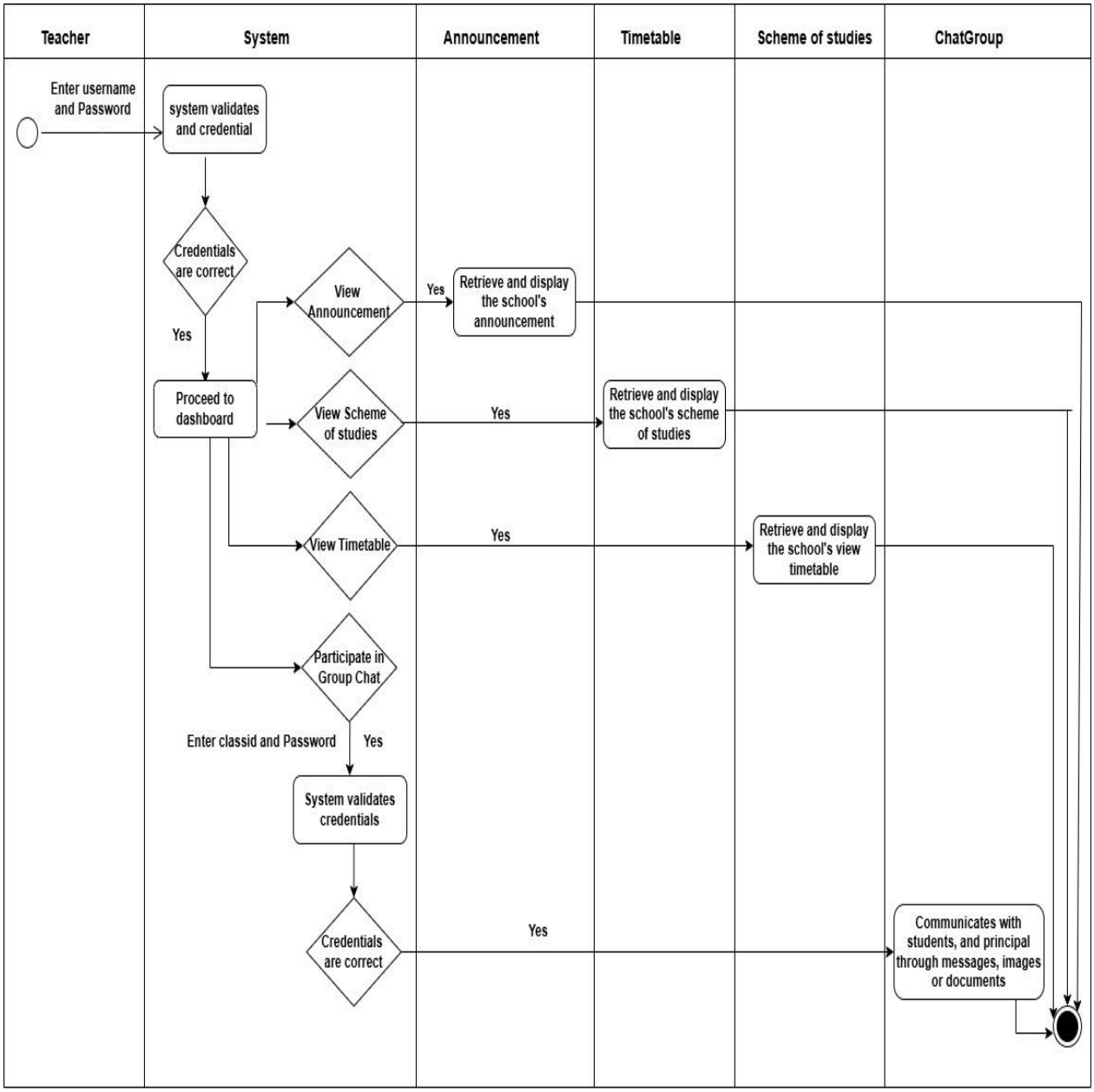


Fig 1.24. Teacher Side Swim lane Diagram

3.1.13.5. Student Side Swim lane Diagram

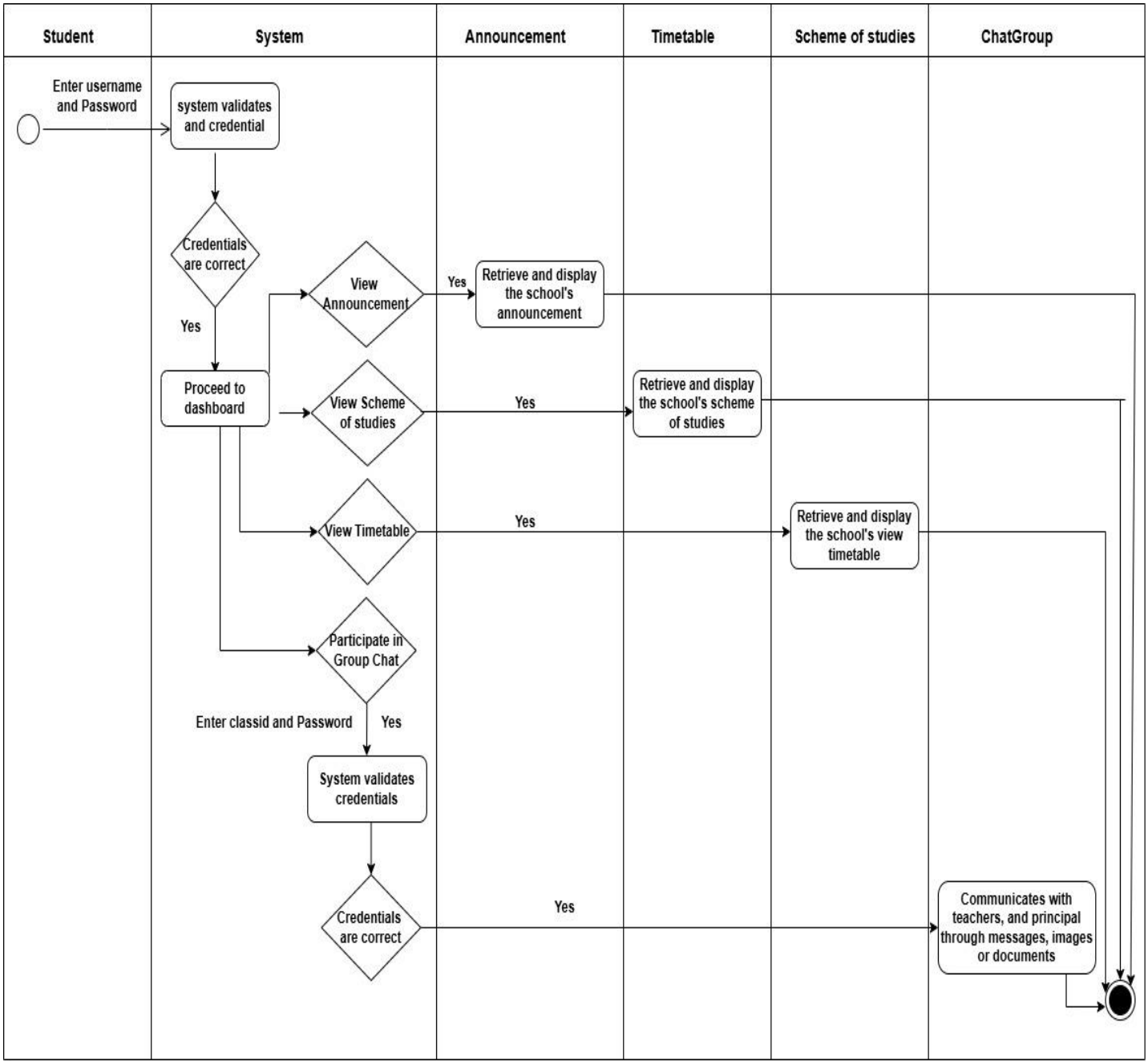


Fig 1.25. Student Side Swim lane Diagram

Chapter 4:
System Development

4.1. Architectural Interface:

An Architectural Interface defines the points of interaction between different system components or modules.. This ensures compatibility and efficient integration within the overall system architecture.

4.1.1. First Page

Fig 1.26.First Page

4.1.2. Login :

Fig 1.27.Admin Login

4.1.3. Admin Panel :

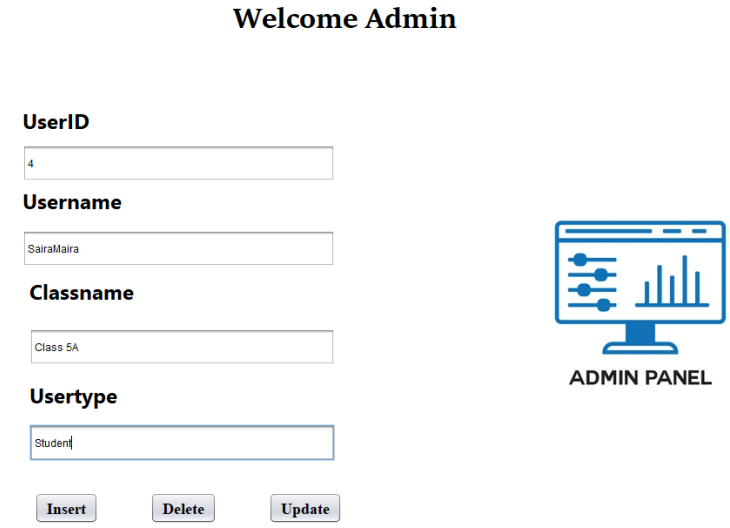


Fig 1.28.Admin Panel

4.1.4. Dashboard Page:

4.1.4.1. Group Chatting:

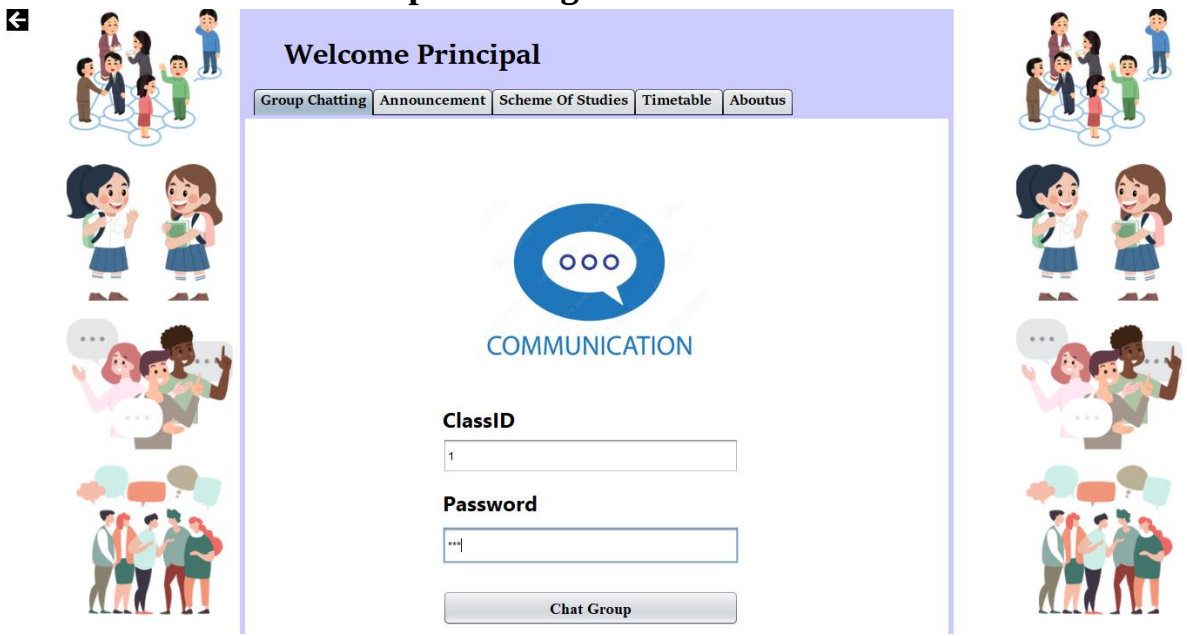
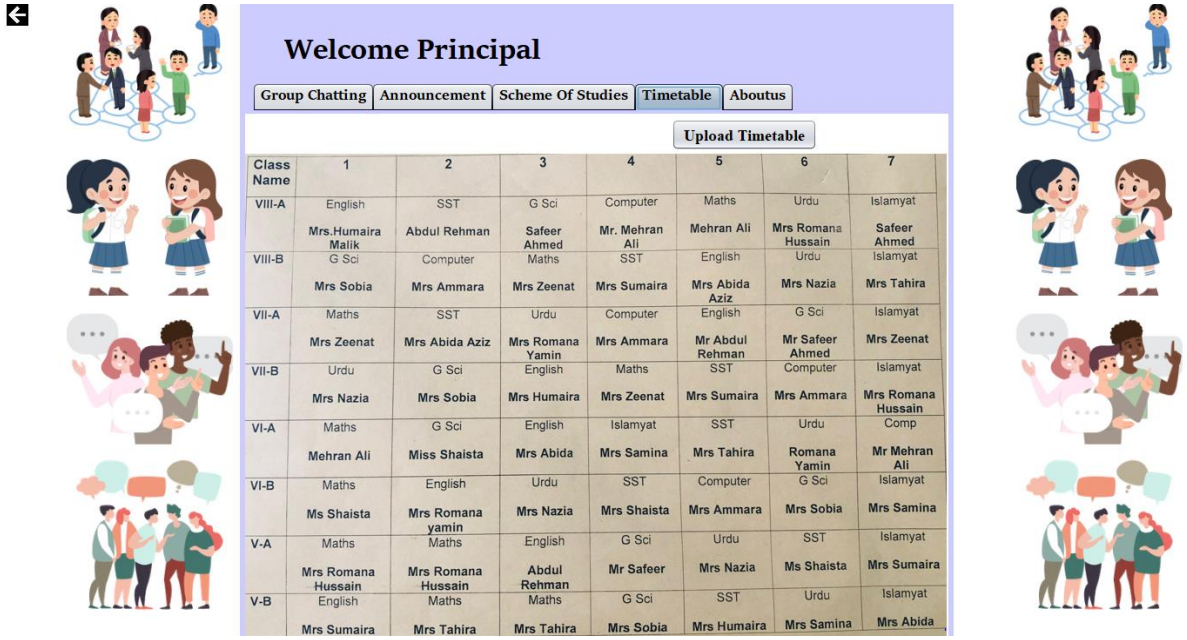


Fig 1.29.Group Chatting

4.1.4.1.1. Send and Receive Messages and Attachments:

Fig 1.30. Send and Receive Messages and Attachments

4.1.4.2. Timetable:



Class Name	1	2	3	4	5	6	7
VIII-A	English Mrs.Humaira Malik	SST Abdul Rehman	G Sci Safeer Ahmed	Computer Mr. Mehran Ali	Maths Mehran Ali	Urdu Mrs Romana Hussain	Islamyat Safeer Ahmed
VIII-B	G Sci Mrs Sobia	Computer Mrs Ammara	Maths Mrs Zeenat	SST Mrs Sumaira	English Mrs Abida Aziz	Urdu Mrs Nazia	Islamyat Mrs Tahira
VII-A	Maths Mrs Zeenat	SST Mrs Abida Aziz	Urdu Mrs Romana Yamin	Computer Mrs Ammara	English Mr Abdul Rehman	G Sci Mr Safeer Ahmed	Islamyat Mrs Zeenat
VII-B	Urdu Mrs Nazia	G Sci Mrs Sobia	English Mrs Humaira	Maths Mrs Zeenat	SST Mrs Sumaira	Computer Mrs Ammara	Islamyat Mrs Romana Hussain
VI-A	Maths Mehran Ali	G Sci Miss Shaista	English Mrs Abida	Islamyat Mrs Samina	SST Mrs Tahira	Urdu Romana Yamin	Comp Mr Mehran Ali
VI-B	Maths Ms Shaista	English Mrs Romana yamin	Urdu Mrs Nazia	SST Mrs Shaista	Computer Mrs Ammara	G Sci Mrs Sobia	Islamyat Mrs Samina
V-A	Maths Mrs Romana Hussain	Maths Mrs Romana Hussain	English Abdul Rehman	G Sci Mr Safeer	Urdu Mrs Nazia	SST Ms Shaista	Islamyat Mrs Sumaira
V-B	English Mrs Sumaira	Maths Mrs Tahira	Maths Mrs Tahira	G Sci Mrs Sobia	SST Mrs Humaira	Urdu Mrs Samina	Islamyat Mrs Abida

Fig 1.31. Timetable

4.1.4.3. Scheme Of Studies:

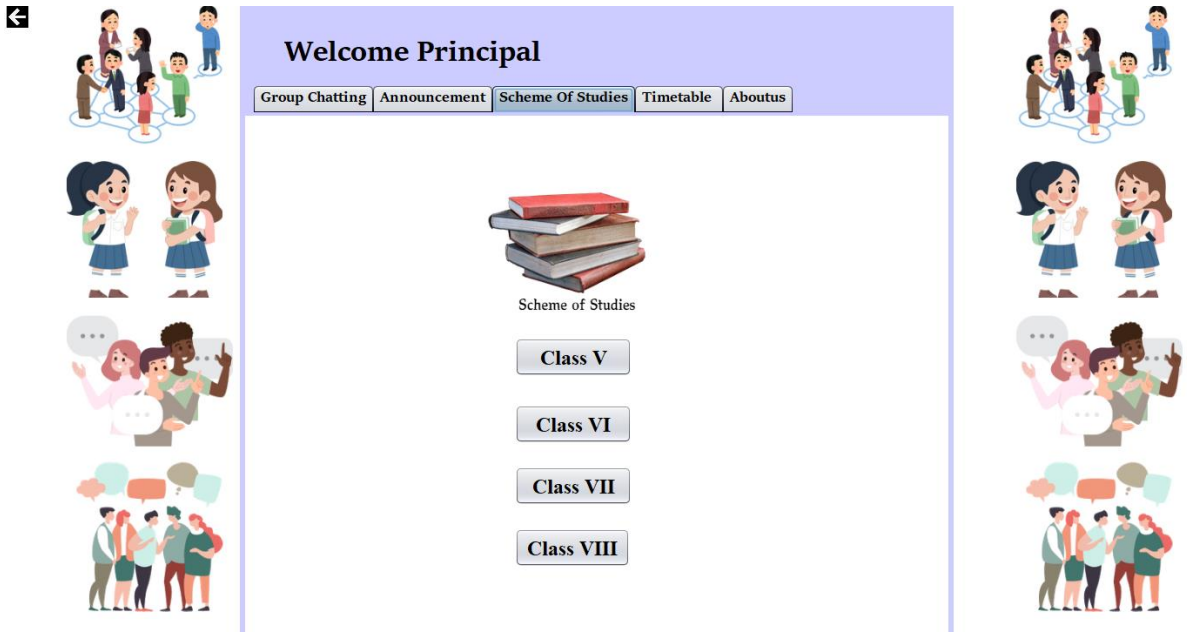


Fig 1.32. Scheme of studies

4.1.4.4. Announcement

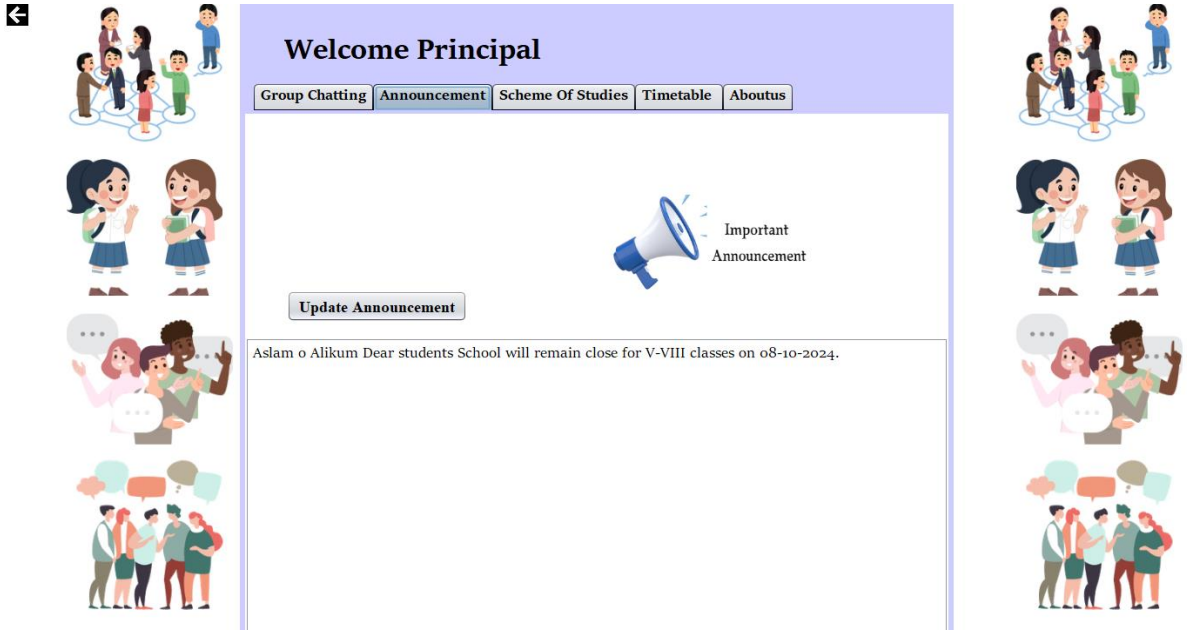


Fig 1.33. Announcement

4.1.4.5. About us:

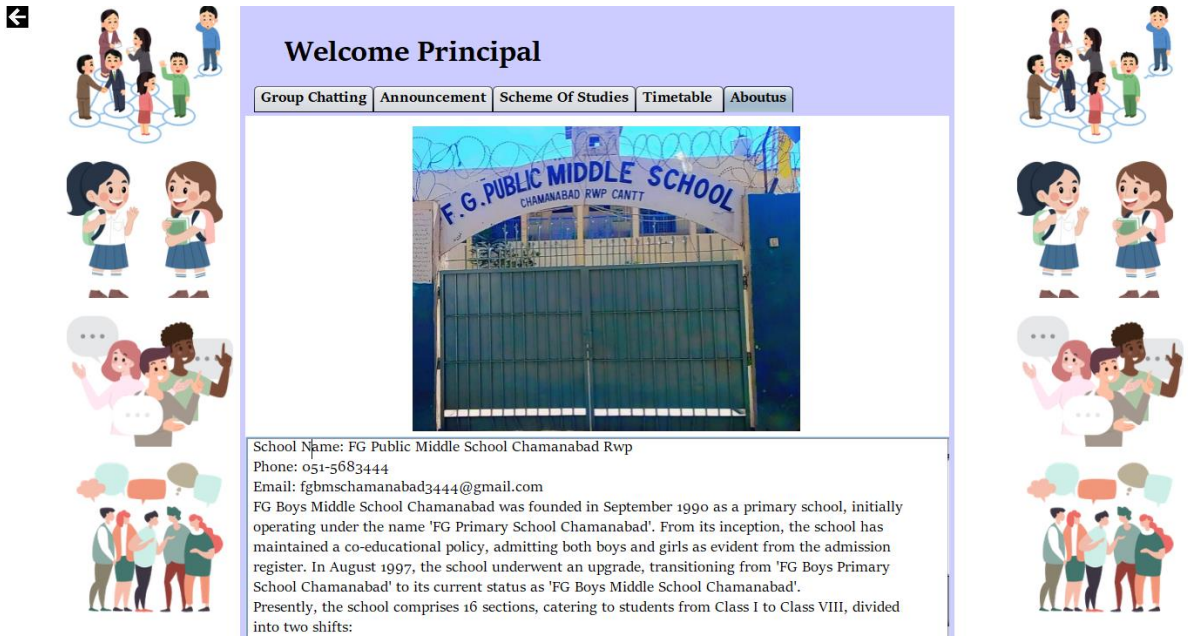


Fig 1.34. About Us

4.2. Architectural Design

Architectural Design represents the structure of data and program components that are required to build a computer based system.. The architectural style we use for our system is a Layered Architectural, where all of the modules are working at different layers. There are total of 4 layers and its components are as follows:

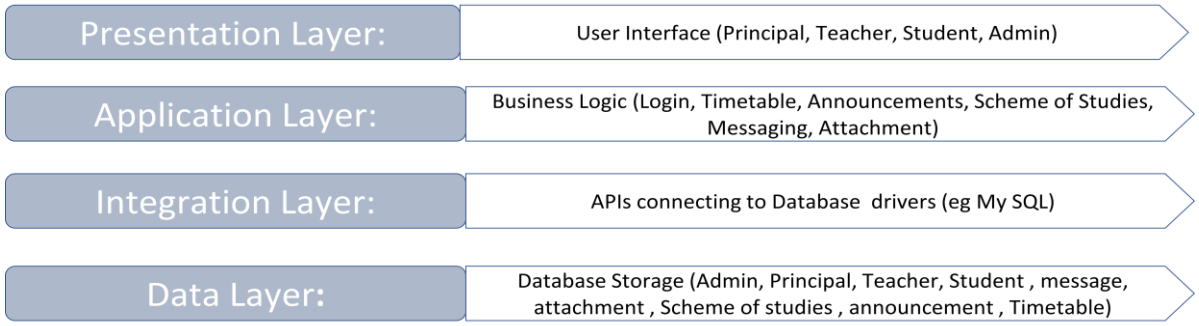


Fig 1.35. Architectural Design

4.3. Architecture Diagram:

An architectural diagram is a visual representation that maps out the physical implementation for components of a software system. It shows the general structure of the software system and the associations, limitations, and boundaries between each element.

Creating an architecture diagram for a school communication platform involves several key components that interact with each other to provide the required functionalities.

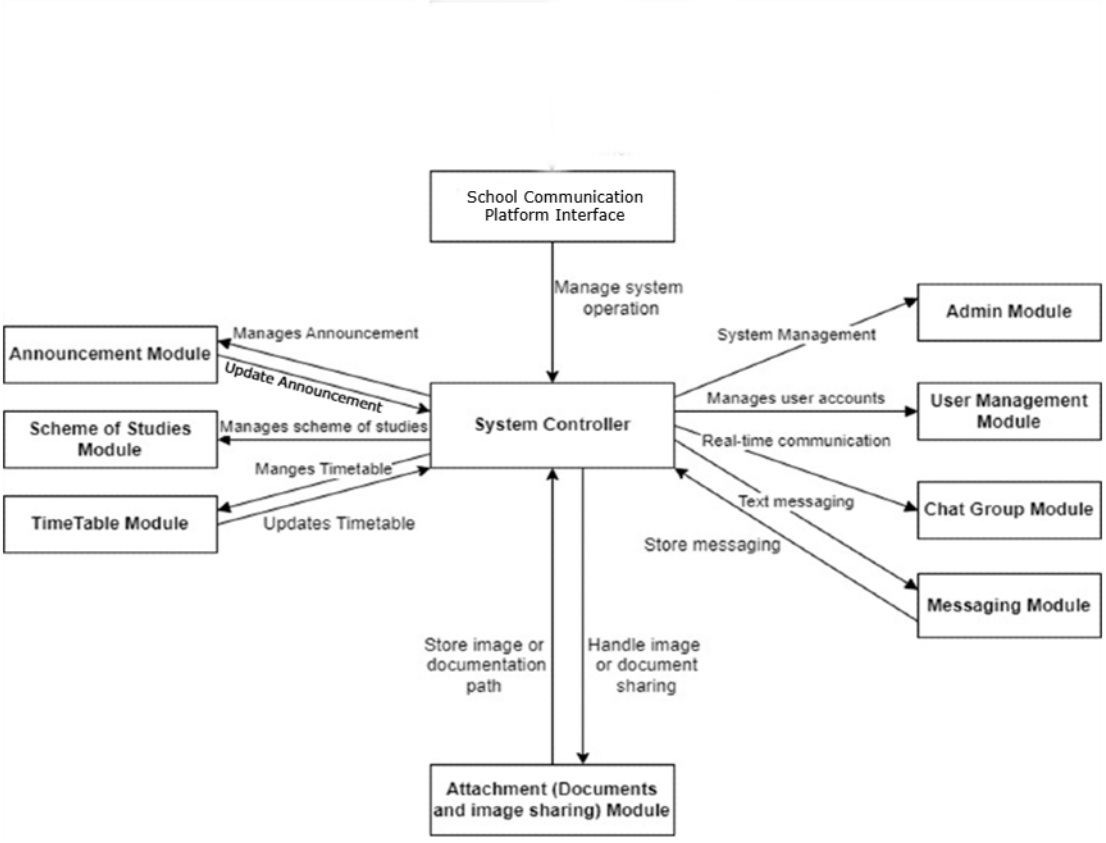


Fig 1.36. Architecture Diagram

Chapter 5:
System Testing

5.1. Introduction:

Software testing is the process of evaluating and verifying that a software application meets the specified requirements and functions correctly. It involves executing the software to identify any defects, errors, or gaps in the expected behavior. Testing can be done manually or through automated tools to ensure the software's quality, reliability, and performance.

Software testing of a school communication platform involves verifying that the system meets specified requirements, functions correctly, and ensures seamless communication. It includes checking features like user login, announcements, timetables, scheme of studies, and group chat functionalities. Testing aims to identify and fix any defects to ensure the platform's reliability and efficiency.

Two of the most important testing techniques are:

5.1.1. White-Box Testing:

White Box testing the internal structures or workings of an application, as opposed to its functionality. In this approach, the tester has knowledge of the internal code and designs tests based on the logic and structure of the code.

White box testing, also known as clear box or glass box testing, involves testing the internal structures or workings of an application. In the context of a school communication platform, this technique ensures that the underlying code and logic for features like user authentication, database interactions, and message handling are functioning correctly.

5.1.2. Black-Box Testing:

Black Box focuses on testing the functionality of the application without any knowledge of the internal workings or code structure. The tester only knows the inputs and expected outputs and validates whether the application behaves as expected

Black box testing focuses on examining the functionality of an application without knowing its internal code structure. For the school communication platform, this involves verifying that user-facing features such as login, announcements, timetables, and chat functionalities work as intended from the end-user's perspective.

5.2. Test Case Specifications:

We will provide some of the test cases specific to our application to see how it works under various circumstances.

Test Case Specification for School Communication Platform

- **Test Case Code**: A unique identifier for the test case.
- **Test Case Description:** A brief summary of the purpose of the test case.
- **Testing Goal:** The objective or confirmation we aim to achieve with the test.
- **Prerequisites:** Conditions or setups required before running the test, such as system configurations or user permissions.
- **Input Actions:** The specific actions or data inputs needed to execute the test.

- **Expected Results:** The anticipated outcome or behavior of the system post-test.
- **Testing Steps:** Step-by-step instructions to conduct the test.
- **Expected Results:** The expected outcome after each step.
- **Pass/Fail Criteria:** The conditions that determine the success or failure of the test.
- **Notes/Comments:** Additional observations or information relevant to the test case.

5.2.1. Black-Box Test-Cases:

5.2.1.1. Login

Test Case ID:	**TC-01**
Test Case:	Login
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case aims to verify the functionality of the user login process on the School Communication Platform without knowing the internal workings of the system.
Operation procedure:	Attempt to log in with valid and invalid user credentials.
Pre-conditions:	The user has clicked the "Get Started" button. The application and database are properly set up.
Post-conditions:	The system either grants access to the Dashboard

Table 1.14. Login Test Case

5.2.1.2. Insert user data

Test Case ID:	**TC-02**
Test Case:	Insert user data
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case verifies the functionality of managing users (inserting user records) by the Admin on the School Communication Platform.
Operation procedure:	Insert user records using the Admin interface.
Pre-conditions:	Admin is logged in and has appropriate permissions.

Post-conditions:	User records are successfully inserted in the system.

Table 1.15. Insert User Data Test Case

5.2.1.3. Delete user data

Test Case ID:	**TC-03**
Test Case:	Delete user data
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case verifies the functionality of managing users (deleting user records) by the Admin on the School Communication Platform.
Operation procedure:	Delete user records using the Admin interface.
Pre-conditions:	Admin is logged in and has appropriate permissions.
Post-conditions:	User records are successfully deleted in the system.

Table 1.16. Delete user Data Test Case

5.2.1.4. Update user data

Test Case ID:	**TC-04**
Test Case:	Update user data
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case verifies the functionality of managing users (updating user records) by the Admin on the School Communication Platform.
Operation procedure:	Update user records using the Admin interface.
Pre-conditions:	Admin is logged in and has appropriate permissions.
Post-conditions:	User records are successfully updated in the system.

Table 1.17. Update user data Test Case

5.2.1.5. Update Announcement

Test Case ID:	**TC-05**
Test Case :	Update Announcement
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case verifies the functionality of updating announcements by Principal on the School Communication Platform.
Operation procedure:	Edit an existing announcement and ensure changes are saved correctly.
Pre-conditions:	Principal is logged in and has permissions to update announcements.
Post-conditions:	Announcements are updated and displayed correctly as per the modifications made.

Table 1.18. Update Announcement Test Case

5.2.1.6. Update Timetable

Test Case ID:	**TC-06**
Test Case :	Update Timetable
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case validates the functionality of updating the timetable by Principal on the School Communication Platform.
Operation procedure:	Modify the class schedule and ensure changes are reflected accurately.
Pre-conditions:	Principal is logged in and has permissions to update the timetable.
Post-conditions:	Timetable changes are saved and displayed correctly in the system.

Table 1.19. View Timetable Test Case

5.2.1.7. View Scheme of studies

Test Case ID:	**TC-07**
Test Case :	View Scheme of Studies
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case ensures the functionality of viewing the scheme of studies by users on the School Communication Platform.
Operation procedure:	Access the scheme of studies section and verify the display of academic program details.
Pre-conditions:	User is logged in and has access permissions to view the scheme of studies.
Post-conditions:	Scheme of studies information is displayed correctly as per the system design.

Table 1.20. View Scheme of studies Test Case

5.2.1.8. Participate in Group Chat

Test Case ID:	**TC-08**
Test Case:	Participate in Group Chat
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case validates the functionality of participating in group chats (sending and receiving messages) on the School Communication Platform.
Operation procedure:	Join a chat group, send messages, and receive messages.
Pre-conditions:	User is logged in and has access permissions to participate in group chats.
Post-conditions:	Messages, images and Documents are sent and received correctly within the chat group.

Table 1.21. Participate in Group Chat Test Case

5.2.1.9. Send and Receive Message

Test Case ID:	**TC-09**
Test Case:	Send and Receive Messages
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case verifies the functionality of sending and receiving messages on the School Communication Platform.
Operation procedure:	Send a message from one user to another and ensure it is received correctly.
Pre-conditions:	Users involved are logged in and have access permissions to send and receive messages.
Post-conditions:	Messages are sent and received without loss or distortion.

Table 1.22. Send and Receive Message Test Case

5.2.1.10. Send and Receive Attachment

Test Case ID:	**TC-10**
Test Case:	Send and Receive Attachment
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case ensures the functionality of sending and receiving images and documents on the School Communication Platform.
Operation procedure:	Send an images and document from one user to another and verify successful receipt.
Pre-conditions:	Users involved are logged in and have access permissions to send and receive images and documents.
Post-conditions:	Images and Documents are sent and received intact, with proper handling by the system.

Table 1.23. Send and Receive Attachment Test Case

5.2.1.11. View Announcement

Test Case ID:	**TC-11**
Test Case:	View Announcement
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case ensures the functionality of viewing announcements by users on the School Communication Platform.
Operation procedure:	Access the announcements section and verify the display of announcements.
Pre-conditions:	User is logged in and has access permissions to view announcements.
Post-conditions:	Announcements are displayed correctly as per the system design.

Table 1.24. View Announcement Test Case

5.2.1.12. View Timetable

Test Case ID:	**TC-12**
Test Case:	View Timetable
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	Black box testing
Product Name:	School Communication Platform
Test Item:	Application, MySQL
Documented Date:	05/21/2024
Test case description:	This test case verifies the functionality of viewing the timetable by users on the School Communication Platform.
Operation procedure:	Access the timetable section and verify the display of the class schedule.
Pre-conditions:	User is logged in and has access permissions to view the timetable.
Post-conditions:	Timetable information is displayed correctly as per the system design.

Table 1.25. View Timetable Test Case

5.2.2. White-Box Test-Cases:

Following are the test cases designed for our School Communication Platform:

5.2.2.1. **Successful login**

Test Case ID:	TC-01
Test Case :	Successful Login
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	White box testing
Product Name:	School Communication Platform
Documented Date:	05/21/2024
Test case Objective:	To verify the functionality of successful user login using white box testing techniques.
Pre-conditions:	The user credentials are correctly stored in the database.
Test Steps:	• Enter valid user credentials (username and password). • System verifies the credentials against the database. • User is granted access to the dashboard upon successful verification.
Expected Results:	User is logged into the system and redirected to the appropriate dashboard.
Actual Result:	Verify if the user successfully accesses the dashboard.
Pass / Fail criteria:	Pass: User logs in successfully; Fail: User cannot log in due to incorrect credentials or system error.
Test Environment:	Application environment with MySQL database.
Test case Status:	Pass

Table 1.26 Successful login

5.2.2.2. **Successful Registration**

Test Case ID:	TC-02
Test Case :	Successful Registration
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	White box testing
Product Name:	School Communication Platform
Documented Date:	05/21/2024
Test case Objective:	To verify the functionality of successful user registration using white box testing techniques

Pre-conditions:	Registration form is correctly implemented and accessible.
Test Steps:	• Enter valid registration details. • System validates input data. • Data saved in database. • Apply Insert, Delete, and Update operations. • Verify successful registration.
Expected Results:	User registration is completed successfully, and the user can now log in with the registered credentials.
Actual Result:	Verify if the user registration process completes without errors.
Pass / Fail criteria:	Pass: User successfully registers and can log in; Fail: Registration fails due to errors in data validation or database operation.
Test Environment:	Application environment with MySQL database.
Test case Status:	Pass

Table 1.27 Successful Registrations

5.2.2.3. Successful Join Chat Group:

Test Case ID:	TC-03
Test Case :	Successful Join Chat Group
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	White box testing
Product Name:	School Communication Platform
Documented Date:	05/21/2024
Test case Objective:	To verify the functionality of successfully joining a chat group using white box testing techniques.
Pre-conditions:	Chat group functionality is implemented and accessible.
Test Steps:	• Navigate to the chat group section. • Select an existing chat group or create a new one. • Send a join request or create the group and invite others.
Expected Results:	User successfully joins the chat group and can participate in discussions.
Actual Result:	Verify if the user can view and interact with the selected chat group.
Pass / Fail criteria:	Pass: User joins and interacts with the chat group; Fail: Joining fails due to system error or incorrect functionality.
Test Environment:	Application environment with MySQL database.

Test case Status:	Pass

Table 1.28 Successful Join Chat Group

5.2.2.4. Send and Receive Message

Test Case ID:	TC-04
Test Case :	Send and Receive Messages
Test Case ID:	TC-04
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	White box testing
Product Name:	School Communication Platform
Documented Date:	05/21/2024
Test case Objective:	To verify the functionality of sending and receiving messages using white box testing techniques.
Pre-conditions:	Messaging feature is implemented and accessible.
Test Steps:	• Access the messaging interface. • Compose and send a message to another user. • Receive and view messages sent by other users.
Expected Results:	Messages are sent and received without loss or delay.
Actual Result:	Verify if messages are successfully transmitted and received.
Test Environment:	Application environment with MySQL database.
Test case Status:	Pass

Table 1.29 Send and Receive Message

5.2.2.5. Send and Receive Attachment

Test Case ID:	TC-05
Test Case :	Send and Receive Attachment
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	White box testing
Product Name:	School Communication Platform
Documented Date:	05/21/2024
Test case Objective:	To verify the functionality of sending and receiving images and documents using white box testing techniques.
Pre-conditions:	Images and Document sharing feature is implemented and accessible.
Test Steps:	• Access the images and document sharing interface. • Upload an image and document to send to another user. • Receive and download images and documents sent by other

	users.
Expected Results:	Images and Documents are uploaded, sent, received, and downloaded without corruption.
Actual Result:	Verify if images and documents are successfully transmitted and received without errors.
Pass / Fail criteria:	Pass: Images and Documents are sent and received correctly; Fail: Images and Document transmission fails or images and documents are corrupted during transmission.
Test Environment:	Application environment with MySQL database.
Test case Status:	Pass

Table 1.30 Send and Receive Attachment

5.2.2.6. Update Announcement

Test Case ID:	TC-06
Test Case :	Update Announcement
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	White box testing
Product Name:	School Communication Platform
Documented Date:	05/21/2024
Test case Objective:	Verify that an authorized user can successfully update an existing announcement.
Pre-conditions:	1. Valid login credentials. 2. Existing announcement. 3. Principal has permission to update announcements.
Test Steps:	1. Login with valid credentials. 2. Navigate to announcements section. 3. Select existing announcement. 4. Update announcement details. 5. Save changes. 6. Verify updated announcement.
Expected Results:	1. Announcement updated successfully. 2. Updated announcement reflects in the database. 3. No errors or exceptions.
Actual Result:	Announcement updated successfully.
Pass / Fail criteria:	Pass: Announcement update success Fail: Announcement update failure
Test Environment:	Application environment with MySQL database.

Test case Status:	Pass

Table 1.31 Update Announcements

5.2.2.7. Update Timetable

Test Case ID:	TC-07
Test Case :	Update Timetable
Wrote By:	Maira Rasul and Saira Rasul
Test Type:	White box testing
Product Name:	School Communication Platform
Documented Date:	05/21/2024
Test case Objective:	Verify that an authorized user can successfully update an existing timetable.
Pre-conditions:	1. Valid login credentials. 2. Existing timetable. 3. Principal has permission to update timetable.
Test Steps:	1. Login with valid credentials. 2. Navigate to timetable section. 3. Select existing timetable. 4. Update timetable details. 5. Save changes. 6. Verify updated timetable.
Expected Results:	1. Timetable updated successfully. 2. Updated timetable reflects in the database. 3. No errors or exceptions.
Actual Result:	Timetable updated successfully.
Pass / Fail criteria:	Pass: Timetable update success Fail: Timetable update failure:
Test Environment:	Application environment with MySQL database.
Test case Status:	Pass

Table 1.32 Update Timetable

Chapter 6:
Future Enhancement

6.1. Future Enhancement

The upcoming release of the School Communication Platform will include several enhancements and additional features:

1. LMS Integration
Streamline information sharing and course management.
Seamlessly integrate Learning Management System (LMS) for efficient data exchange.
2. Mobile App
Access platform features anywhere, anytime.
Stay connected with teachers, students, and parents' on-the-go.
Downloadable app for Android devices.
3. Parental Engagement
Foster strong parent-teacher relationships.
Improve communication through regular updates and notifications.
Increase parental involvement in student learning.
4. Real-time Communication
Enhance collaboration through video conferencing.
Make voice calls and send instant notifications.
Facilitate seamless communication among users.
5. Security Enhancement
Protect user data with advanced security protocols.
Ensure confidentiality, integrity, and availability.
6. Multilingual Support
Support multiple languages for international users.
Break language barriers for effective collaboration.

Chapter 7:
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