

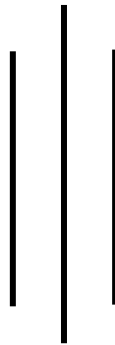


Tribhuvan University

Faculty of Humanities and Social Sciences

School Management System

A PROJECT REPORT



Submitted to

Department of Computer Application

Asian School of Management and Technology

In partial fulfillment of the requirements for the Bachelors in Computer Application

Submitted by

Aavash Basnet (11811347/2075)

September 2022

Under the Supervision of

Surya Bam



Tribhuvan University
Faculty of Humanities and Social Sciences
Asian School of Management and Technology

Supervisor's Recommendation

I, hereby, recommend that this project prepared by **Aavash Basnet** under my supervision entitled “**SCHOOL MANAGEMENT SYSTEM**” in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

Surya Bam

Supervisor

Asian School of Management and Technology

Gongabu, Kathmandu



Tribhuvan University
Faculty of Humanities and Social Sciences
Asian School of Management and Technology

LETTER OF APPROVAL

This is to certify that this project prepared by **Aavash Basnet** entitled “**SCHOOL MANAGEMENT SYSTEM**” in partial fulfilment of the requirements for the Bachelor in Computer Application degree has been evaluated. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

<p>.....</p> <p>Chakra Narayan Rawal Coordinator Asian School of Management and Technology</p>	<p>.....</p> <p>Surya Bam Supervisor Asian School of Management and Technology</p>
<p>.....</p> <p>Internal Examiner</p>	<p>.....</p> <p>External Examiner</p>

ACKNOWLEDGEMENT

I want to thank my supervisor, **Mr. Surya Bam**, for all of the helpful academic advice and guidance, frequent encouragement, and insightful suggestions he gave me throughout the course of this project. His skillful guidance was invaluable to me.

I'd like to give a huge shout out to everyone who has helped me out, inspired me, or provided moral support during any part of my project, whether it was a friend, a classmate, or a teacher. I would also like to thank the other faculty members at Asian School of Management and Technology at this occasion. Last but not the least, I would like to thank my family and friends for the support and help they have given during the course of my work.

Sincerely,

Aavash Basnet

Symbol Number: 11811347

ABSTRACT

The competitive business market makes it hard for any organization to achieve a good market despite its system and business modes. For that, an efficient, effective, and systematic management system has become a must. Particularly, talking about an educational institution, where students' volume is in increment order, it has become difficult for respective departments to properly manage students' records and surrounding factors. An effective management system plays a vital role in handling students' records as this is the digitalization era; data are being digitalized day by day due to its easy convenience in storing, modifying, and retrieving aspects.

This report comprises information about quick and cost-efficient, web-based school management system independent of hardware. Within the system, an educational institution, say, the teacher can assign marks, take attendance, send diary, view students, automatically categorize students on the base of subject-wise marks; admin can view all marks, reports, fees payments, etc.; students can view their information including diary, schedules, news, etc.; parents can make payments, view student's details, marks, attendance, etc. There is also a provision for setting exams and assigning marks. Along with that, there will be a provision for adding new subjects, teachers, courses, etc.

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LIST OF ABBREVIATIONS

API : Application Programming Interface

CRUD : Create Read Update and Delete

HTML : Hypertext Markup Language

JS : JavaScript

PHP : Hypertext Preprocessor

SMS : School Management System

CHAPTER ONE

INTRODUCTION

1.1 Introduction

School Management System is an online web-based management system designed to digitalize many records involved in any educational institution. In any educational institution, there are a number of administration staff, teaching staff, students, and so on. Proper authorities have to keep proper records of these involvements and other factors like a sending news and updates, having proper attendance, viewing students' exam reports, and so on depending on the institution. It is very necessary to have proper records for your benefit and have a better working standard. This is where the SMS comes in hand. It handles many essential activities that an educational institution involves itself on a day-to-day basis. Without it, the records would be in a hard form that would have made some work slow and inconvenient. However, searching, retrieving, and modifying data is easy with the digital system.

SMS is an advanced web program planned and designed to manage various operations in any type and scale of educational institutions. The system can easily take care of students' records, parents record, teaching members' records, fee details, and so on. The primary purpose of the system is to digitalize these things. The system has wonderful feature of automatically categorizing the students on based of their assigned subject-wise marks. Traditionally, they had to be written on some register or copy, making tables and things. If one detail had to be searched, the whole logbook has to be searched page by page.

Nevertheless, with the simple, user-friendly SMS web application, the action is on seconds. Within a click, students' records can be searched, edited, or deleted. The system also provides excellent security of data and provides robust and reliable storage options. Admins, Teachers, Students, and Parents are allowed to access the system. Other than that, no one can access it. The user interface of the system is user friendly and easy to use.

The project aims to provide a better platform to transform the paper system work, in an educational institution, to digital form.

1.2 Problem Statement

Despite technological advancement, many of today's educational institutions are running in a manual system. The record files in institutions are in large amounts and are very difficult to manage. It takes much time to find the record of a specific student or teaching member. Management of these things in hard copy form has always been a significant concern for many educational institutions. In the present situation, lots of paper works are carried out, which consumes time, workforce as well as energy. Manual Calculations are error-prone and take much time: this may sometimes result in incorrect information. To solve these kinds of issues, SMS plays a significant role.

1.3 Objectives

The project on the SMS has been developed to resolve almost all of the problems discussed earlier by implementing a web-based school management system. The following are the objectives of this project:

- To carry out school management related tasks like handling teachers, students', and parents' records, recording fees record, automatically categorizing students on based of their subject-wise marks, managing attendance records, sending news and updates, diary, setting marks and schedules, generating reports, and so on.

1.4 Scope and Limitations

Scope

To begin with, the SMS is manufactured to compile all the manual activities of administrative importance in the form of web software. This web application makes it easier for officials to finish off their work in a lesser span of time. Most of all, the system's mechanism is easy to understand that even if any school is utilizing it for the first time, the users will not have to toil hard to learn its function. On the other hand, there is a vast range of features included in this web application for different management streams in any school.

Limitations

The application is mainly limited in its horizon of features. It is not a completely extensible school management system that handles almost all the management activities. For example, it does not do anything related to the teacher payroll system and so forth. At the current stance, it does not have any library integration including others like canteen and event management. It doesn't have a proper teacher payment system yet.

1.5 Report Organization

In chapter 1, the introduction on the project is written. The chapter also consists of the objectives for the system design and implementation along with problem statements and the project's scopes and limitations. Chapter 2 is devoted to providing context for the School Management System and reviewing relevant literature, respectively. Chapter 2's literature review and brief introduction to the sports management system lay the groundwork for learning the ins and outs of the school's management structure. The functional and non-functional requirements, as well as the results of the feasibility study, are presented in Chapter 3. The viability, workflow, and operational procedures of this system are discussed in greater depth in Chapter 3. All of the proposed system's requisite Unified Modeling Language diagrams, including the Class diagram, activity diagram, use case diagram, and sequence diagram, have been shown and discussed in Chapter 3. In Chapter 4, development environments, module implementation details, and data testing procedures are covered. The results, a summary, and suggestions for improving the system make up Chapter 5.

CHAPTER TWO

BACKGROUND STUDY AND LITERATURE REVIEW

Literature Review

School Management System is a complete school management solution. Today's educational institutions need to manage more information than ever before. Without a reliable internal infrastructure for teachers, administrators, and/ or departments and faculties to share data, critical school and student information can be lost, or worse, leading to a host of problems that can affect a school's image and endurance. To remain competitive, a school needs a simple solution that can run individual function, connect their entire operation, use the web as a critical communication tool and simplify day to day operational responsibilities, giving staff more time with students.

SMS automates various scheduling activities of the school and optimizes the use of premium resources [1]. Concerned authorities can now quickly and seamlessly use the system to store, retrieve, and/ or modify necessary information of students, faculties, teachers within a click; otherwise, a time-consuming and tedious task [2]. This project contains the admin side where he/she can CRUD and manage students, fees, teachers, classes, subjects, hostels and many more [3]. This system is a cloud-based school ERP system that manages all elements of schools, including students, courses, exams, teachers, and employees in a single platform [4].

CHAPTER THREE

SYSTEM DESIGN AND ANALYSIS

3.1 System Analysis

Before creating any system, it is necessary to visualize the layout, design and all features intended to be added. Requirements are necessary attributes in the system to identify characteristics of the system.

3.1.1 Requirement Analysis

3.1.1.1 Functional Requirements

The functional requirements of this project are to create, edit, and delete student's details; add classes, teachers, and subjects; set exams and generate reports; categorize students, etc.

For Admins

In the system, Admins can do lots of things such as: add/edit student's details, parent's details, and teacher's details; manage sections, classes, and subjects; send messages to teachers, parents, and students; add schedule; view messages, marks, attendance, and diary; and generate reports.

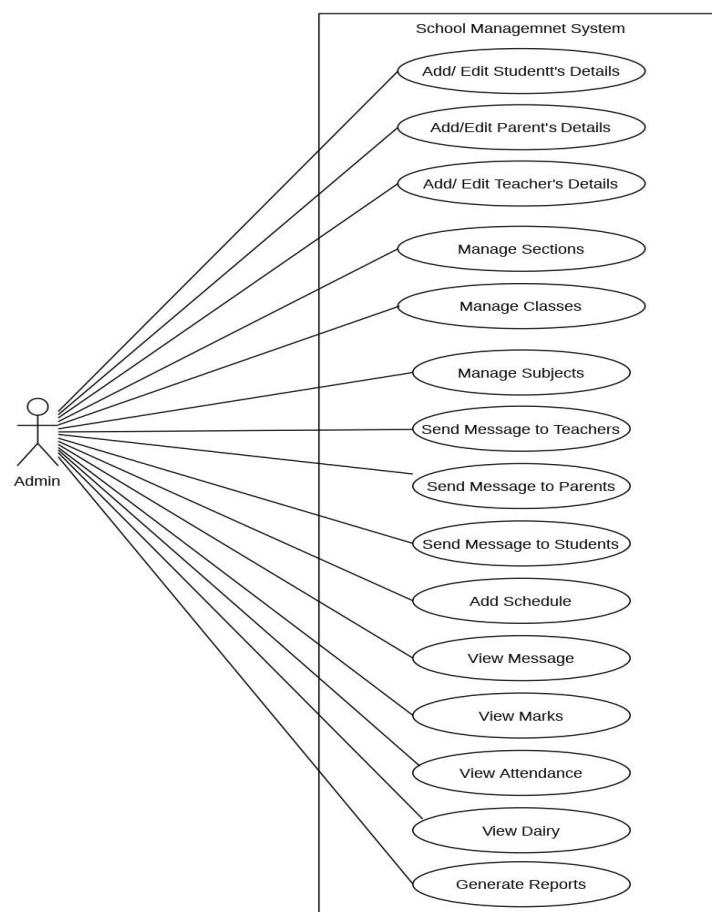


Figure 3.1 Use Case Diagram for Admin

For Parents

Parents are another module in SMS. Parents have various functionalities such as: viewing profile, student's attendance, fees, diary, marks, subjects, schedules, news, and category of their enrolled students; making fee payments; and sending messages.

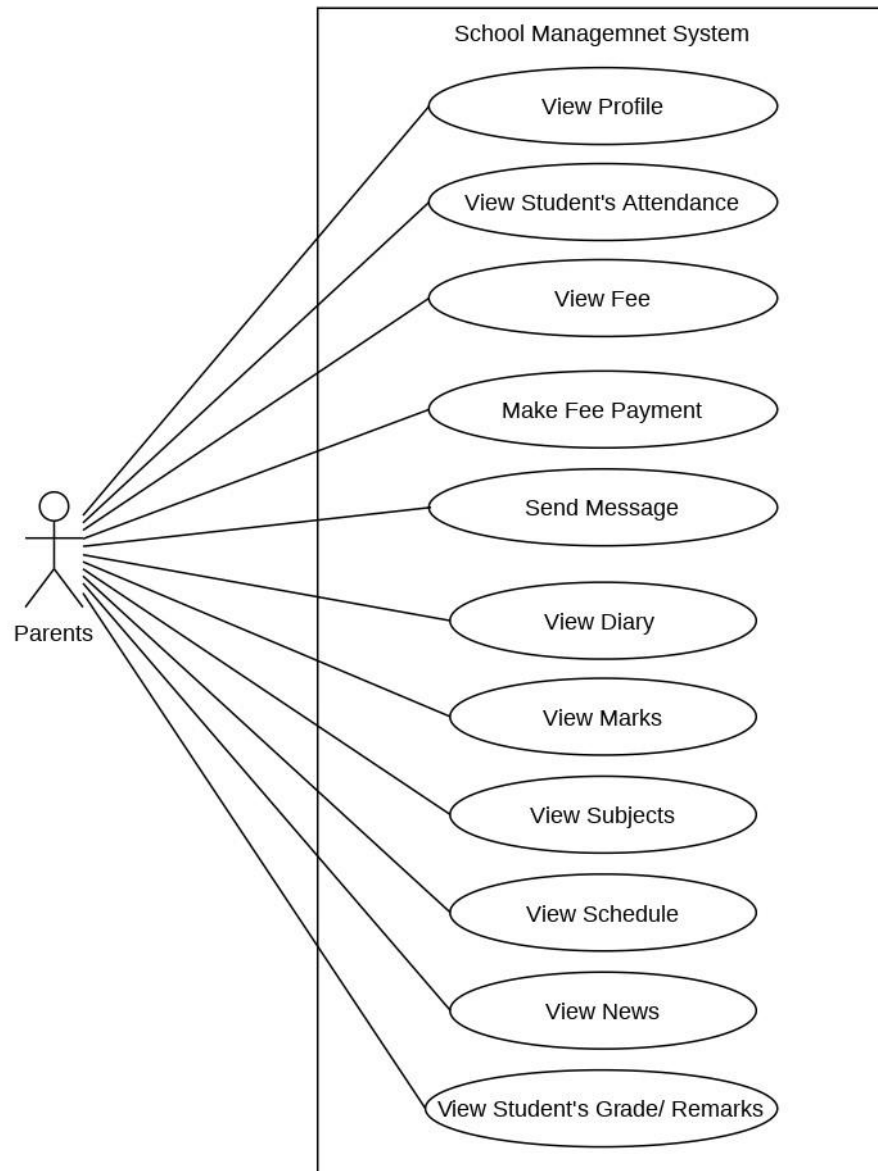


Figure 3.2 Use Case Diagram for Parents

For Students

Students in SMS can do activities such as: viewing profile, attendance, fee paid by their parents, diary, marks assigned by teachers, subjects, news sent by admin, their category based on subject-wise marks; and receive notes sent by teacher.

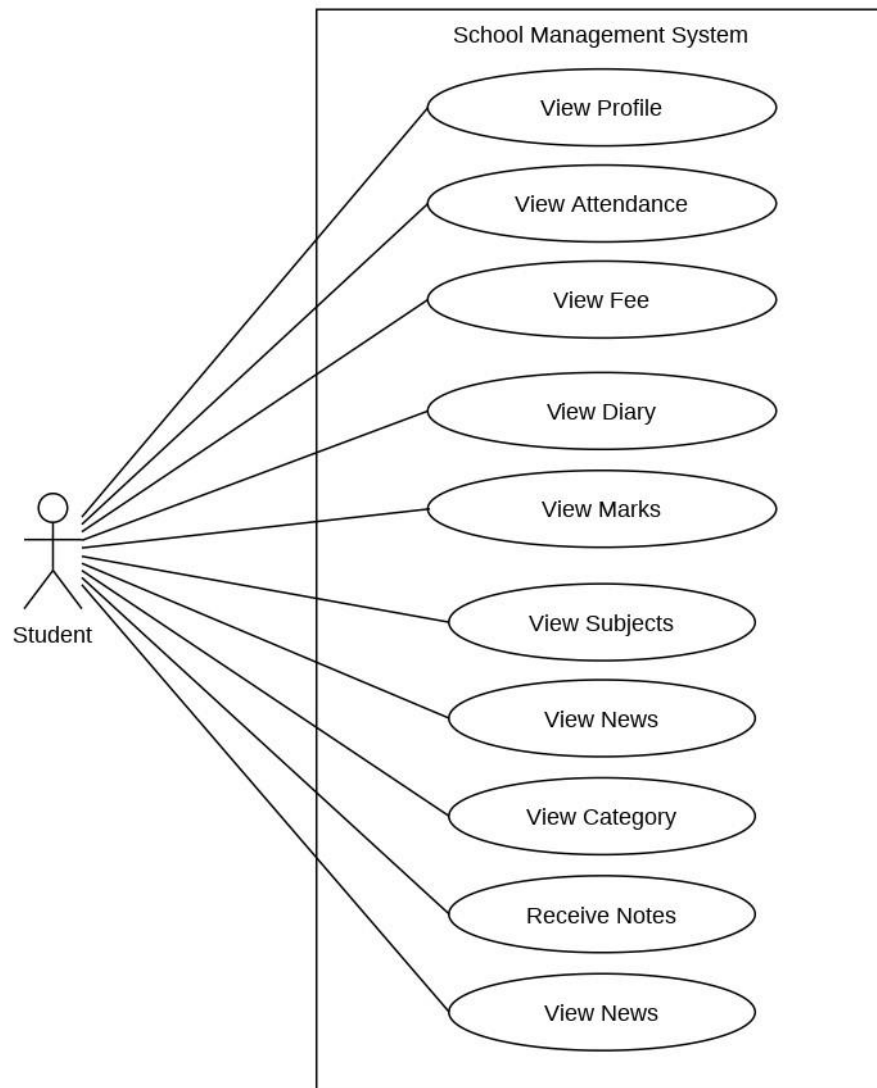


Figure 3.3 Use Case Diagram for Students

For Teacher

A teacher in the system can view profile, send diary to students, assign marks to students, generate marks report, send messages to students, do attendance, view news sent by admin, view schedule, automatically categorize students on base of their marks, and send notes to those categorized students.

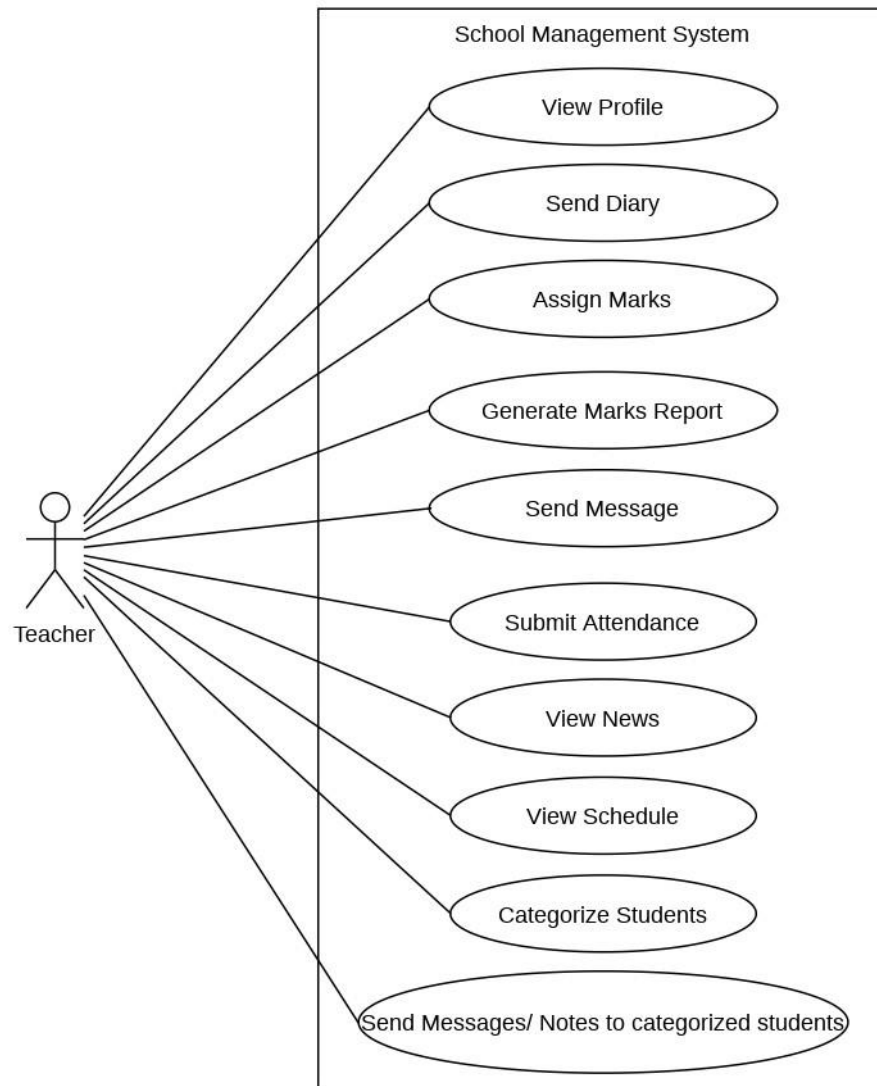


Figure 3.4 Use Case Diagram for Teacher

3.1.1.2 Non-Functional Requirements

The non-functional requirements of this project are: the system have account for the admin, parent, student, and teachers, and only them are authorized to use the system; easy tracking of records and updating can be done; the system has a fast, responsive user-friendly interface and is very interactive as well.

3.1.2 Feasibility Study

The feasibility study decides whether the system can be installed effectively for the expense, resources, time and effort that are available.

i. Technical Feasibility:

All of the equipment and software products needed to complete this project were easily accessible on the internet. It does not require any special environment to execute. All these aspects are easily affordable. The website is simple to use. It can be done with some assistance from the developer.

ii. Operational Feasibility:

The device is dependable, maintainable, usable, long-term, supportable, and cost-effective. As a result, this system can be implemented.








iii. Economic Feasibility:

As for this system, no equipment was needed to be bought, also the system is made from the equipment's and technologies that are already present, so the new system is economically feasible.

iv. Schedule Feasibility:

Since the project was completed on time, it is feasible, schedule wise as well.

Table 3.1. Working Schedule

S. N	Task name	Duration	2022				
			Feb	March	April	May	June
1.	Study and Analysis	21days					
2.	Data collection	14days					
3.	Implementation	56days					
4.	Testing and Analysis	21days					
5.	Documentation	91days					
6.	Review	7days					
7.	Presentation and Submission	1day					

3.1.3 Object Modelling Diagram

For representing the Object modelling for the project SMS, Class Diagram has been used. SMS has 7 distinctive classes with their specific attributes and operations as shown in the figure.

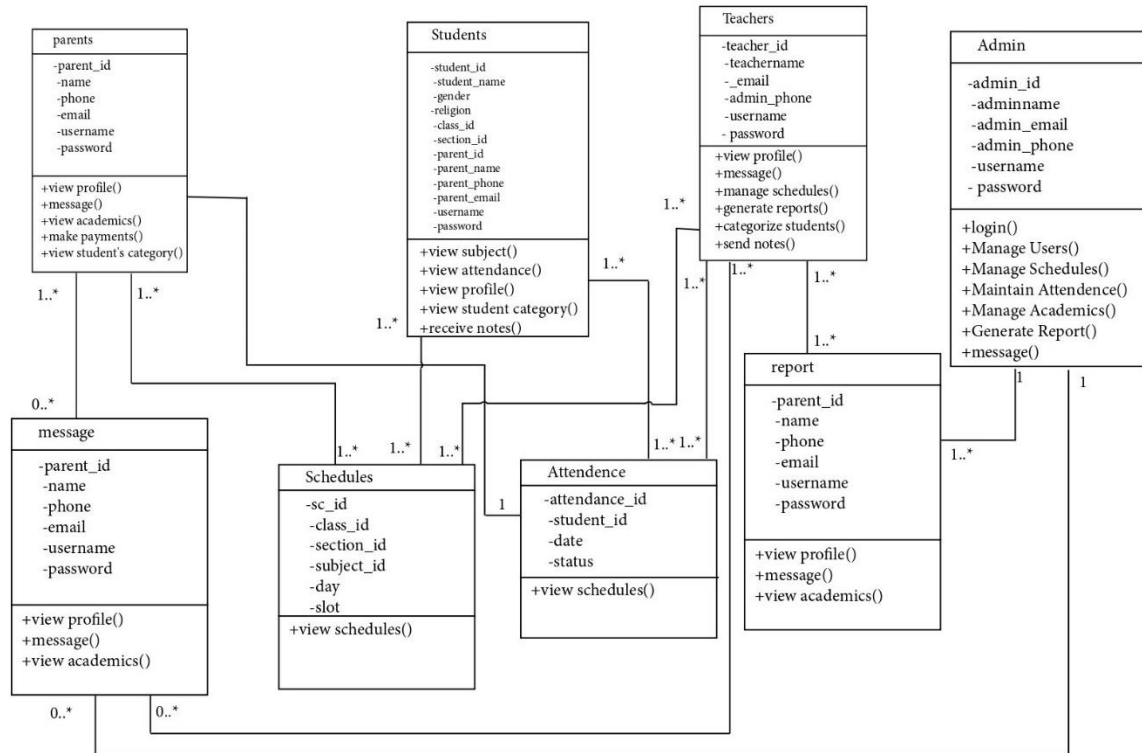


Figure 3.5 Class Diagram for SMS

The class “Parents” has its own attributes and operations as shown in figure. This class has Association relationship with 3 other classes: message, Schedules, and Attendance. Likewise, the class “Teachers” has association with classes such as Attendance, report, Schedules, and message. The class “Students” has association with Schedules and Attendance only. Each class has their respective attributes and operations, both combine defining the stance of the class. The cardinality relationship exists between different classes. One of more instances of class “Parents” can be associated with, zero or more instances of class “message”, one or more instances of class “Schedules”, one or more instances of class “Attendance”. Similarly, one or more instances of class “Students” can have one or more “Schedule” and one or more “Attendance”. One Admin can generate multiple reports and can not send or send multiple messages. The class “Teachers” has cardinality relationship of one or more to one or more of classes such as “Schedules”, “Attendance”, “message”, and “report”.

3.1.4 Dynamic Modelling

As part of the Dynamic Modelling, State Sequence Diagram has been used. Since, there are 4 separate modules in SMS, each have their own set of sequential activities.

For admin, there are different objects such as login, admin dashboard, edit users, edit schedule, marks, attendance, generate reports, and academics. The below figure represents the state sequence diagram for Admin:

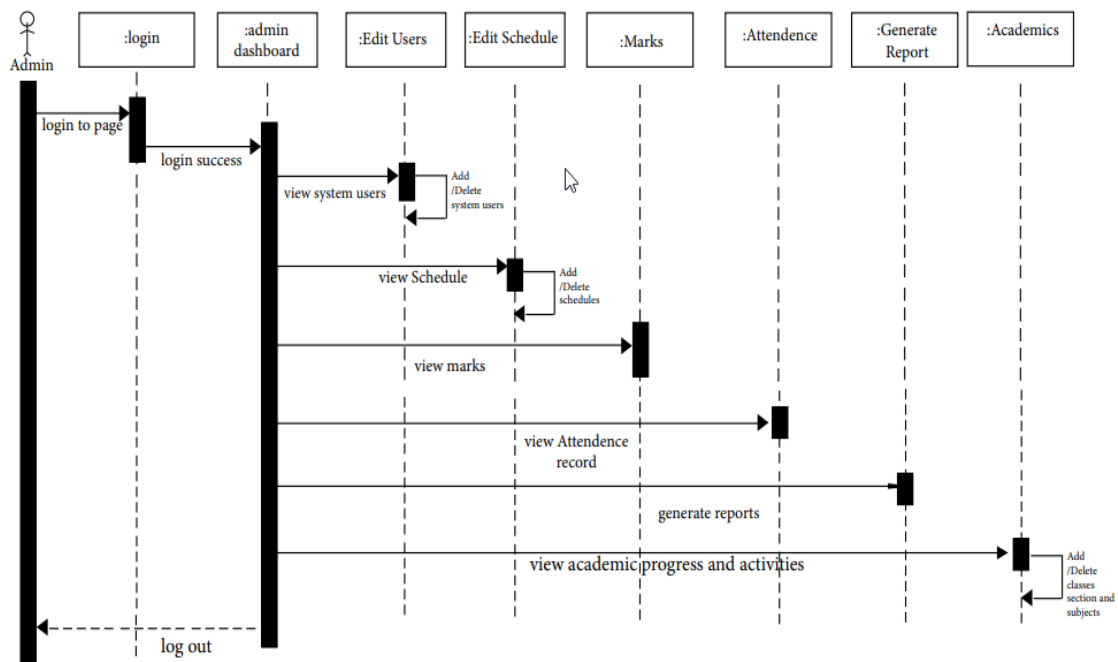


Figure 3.6 Sequence Diagram for Admin

Once admin login into the system and if the credentials are valid, s/he is redirected to admin dashboard, if not to the login page. If login is successful, then s/he is presented with options of adding/editing teachers, parents, and students. Also, s/he has the option of viewing marks, attendance records, and creating and viewing schedules for teachers along with options of generating reports for marks and attendance. Likewise, he can also add/edit or delete subjects, sections, and classes.

For Parents, there are objects such as login, profile, message, academics, payment, and viewCategory. The sequential state activities involved with these objects are depicted in the figure below:

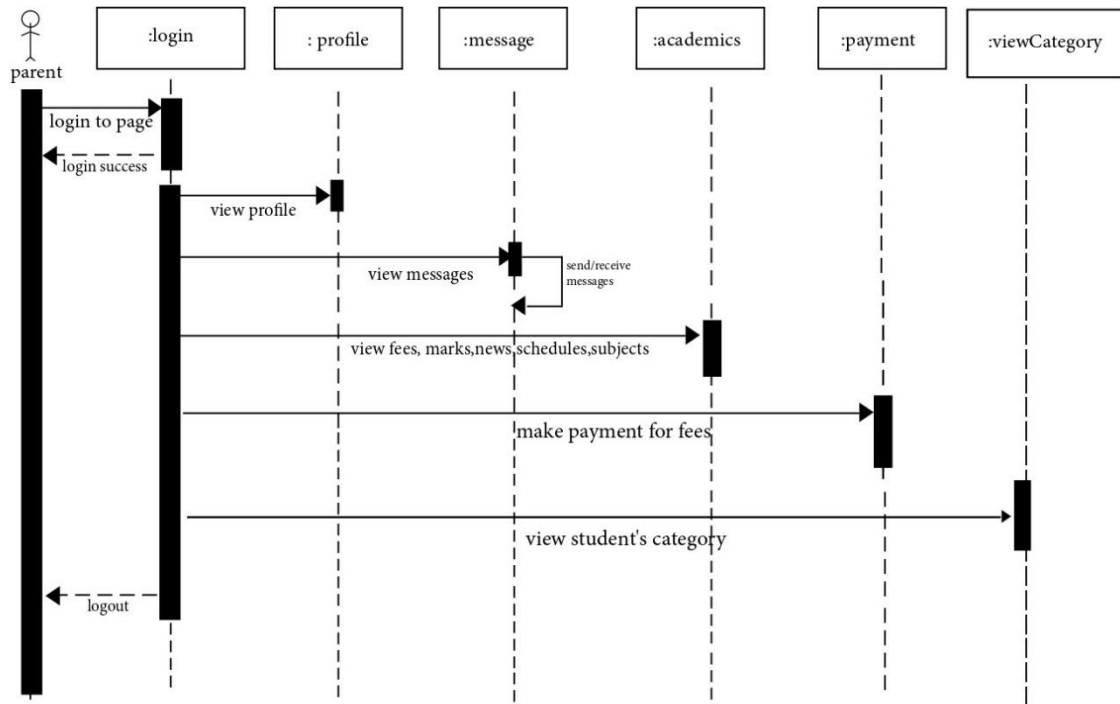


Figure 3.7 Sequence Diagram for Parents

Once parent logs into the, s/he is redirected to the profile dashboard. From that panel, s/he views messages sent to him/her along with fees, marks, news, schedules, and subjects of respective student. Parent also have the option of making payment through eSewa payment gateway on a monthly basis. Similarly, parent views the category of their respective students. Once all done, s/he can logout from the system.

For Student, the objects involved are login, profile, Academics, Notes, and Category which are shown in the below figure:

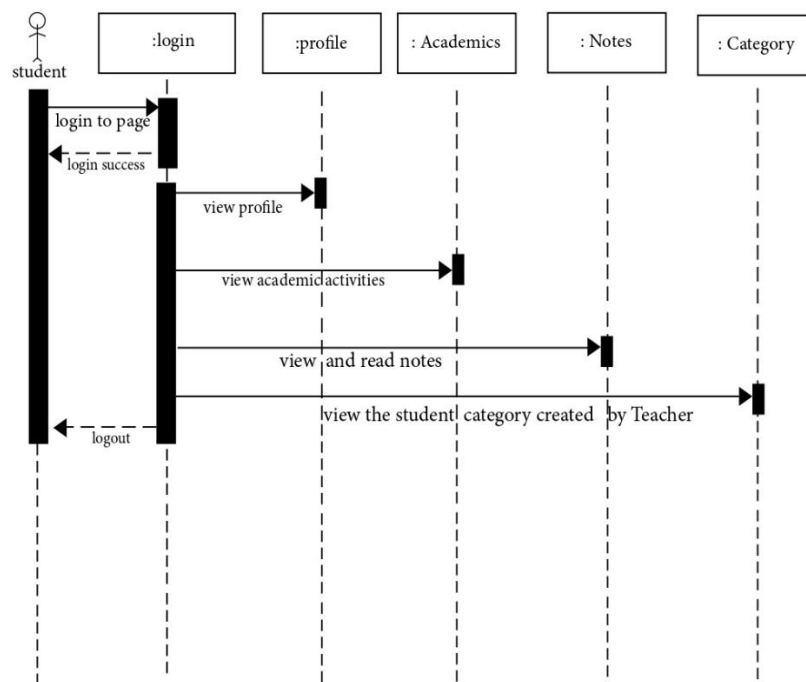


Figure 3.8 Sequence Diagram for Student

In the login panel, student logs in through his/her respective login credentials. If login is successful, the page is redirected to the profile dashboard otherwise the same login portal. From the profile dashboard, the student views profile, academic records such as marks, subjects, schedules, and messages sent by teacher. Teacher automatically categorizes the students on the base of subject-wise marks, and the student views its category and the notes sent by respective teachers.

For Teacher, the modules involved are login, profile, Academics, message, Reports, Notes, and category. The state sequence wise activities involved in the teacher module is drawn below:

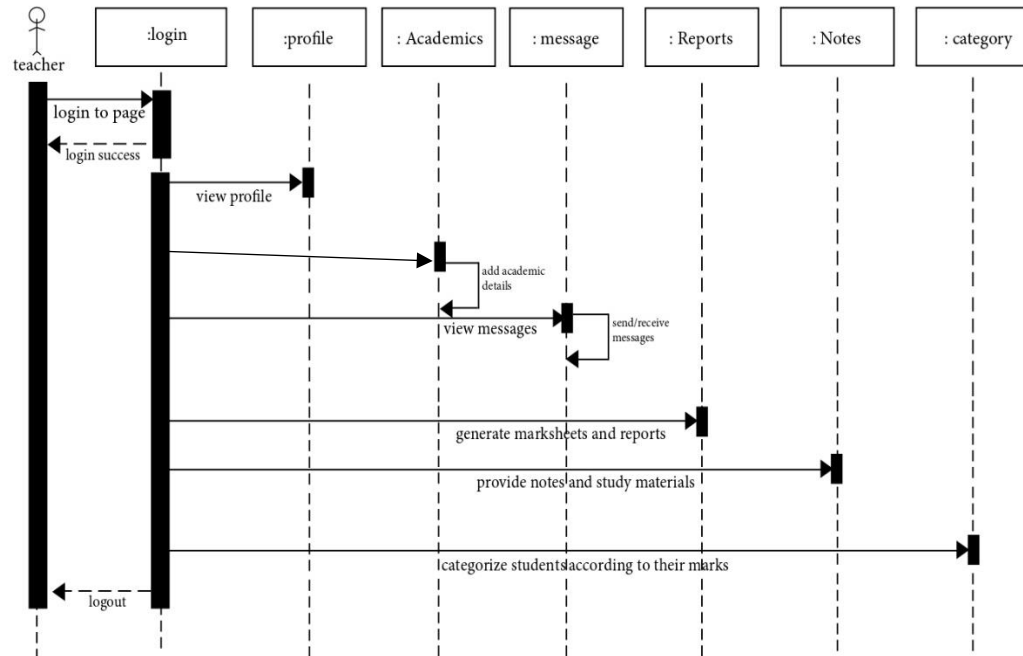


Figure 3.9 Sequence Diagram for Teacher

Teacher as like the others have to login through the login portal. If s/he enters wrong credentials, it will be redirected to login page. Teacher views profile, messages, news, marks, and attendance. Then, s/he generates report of marks and attendance. Also, the teacher can send notes to the categorized students.

3.2 Process Modelling

3.2.1 Activity Diagram

The activity diagram for the system, SMS is divided into four parts, each for individual modules such as student, parents, teacher, and admin.

For admin, the activity diagram is shown below:

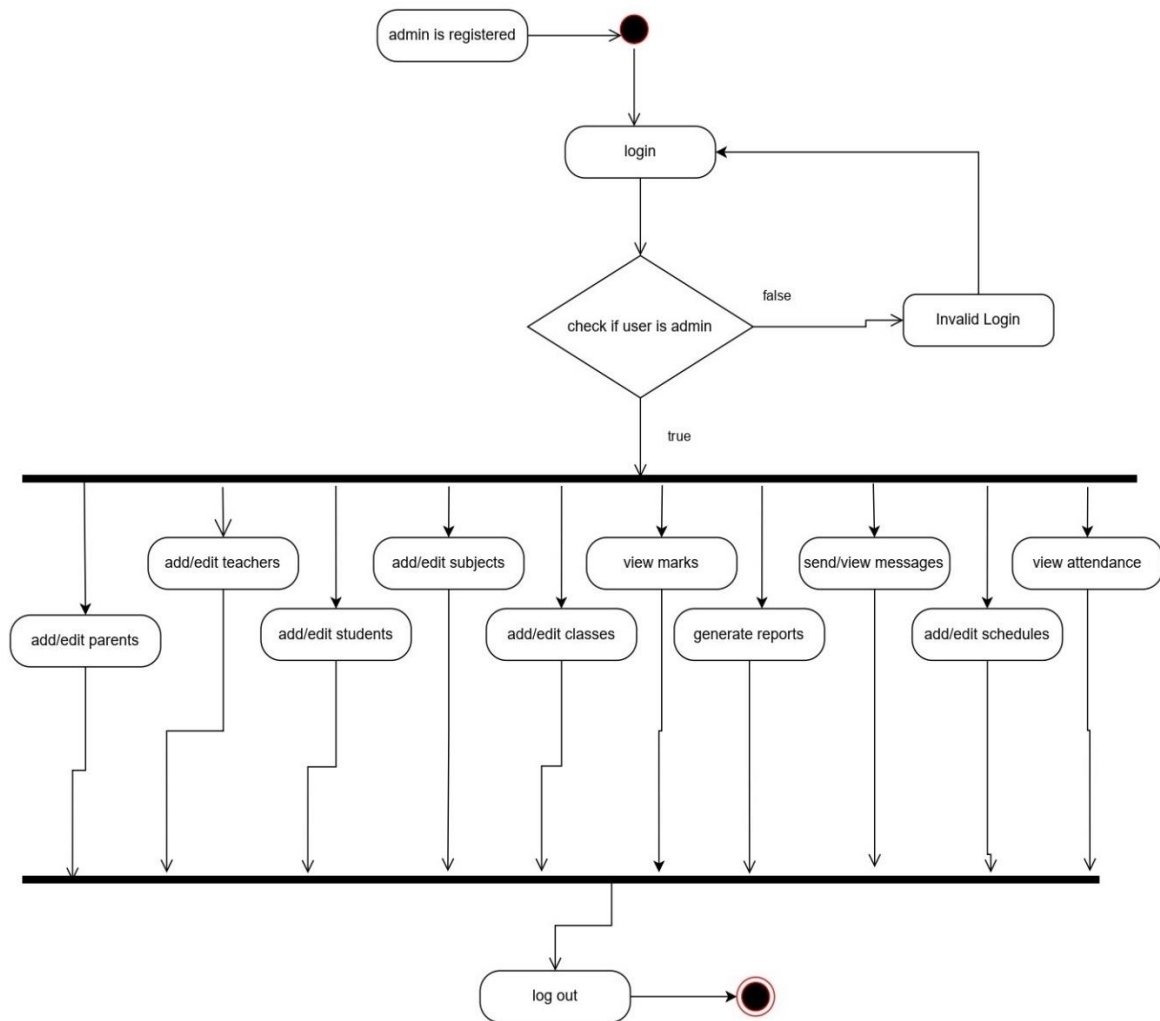


Figure 3.10 Activity Diagram for Admin

If admin is registered, s/he logs into the system. If the entered credentials match on the database, s/he proceeds further. Then, s/he can add/edit parents, add/edit teachers, add/edit students, add/edit subjects, add/edit classes, view marks, generate reports, send/view messages, add/edit schedules, and view attendance. After doing necessary things, s/he log out on the system.

The activity diagram for parents is shown below:

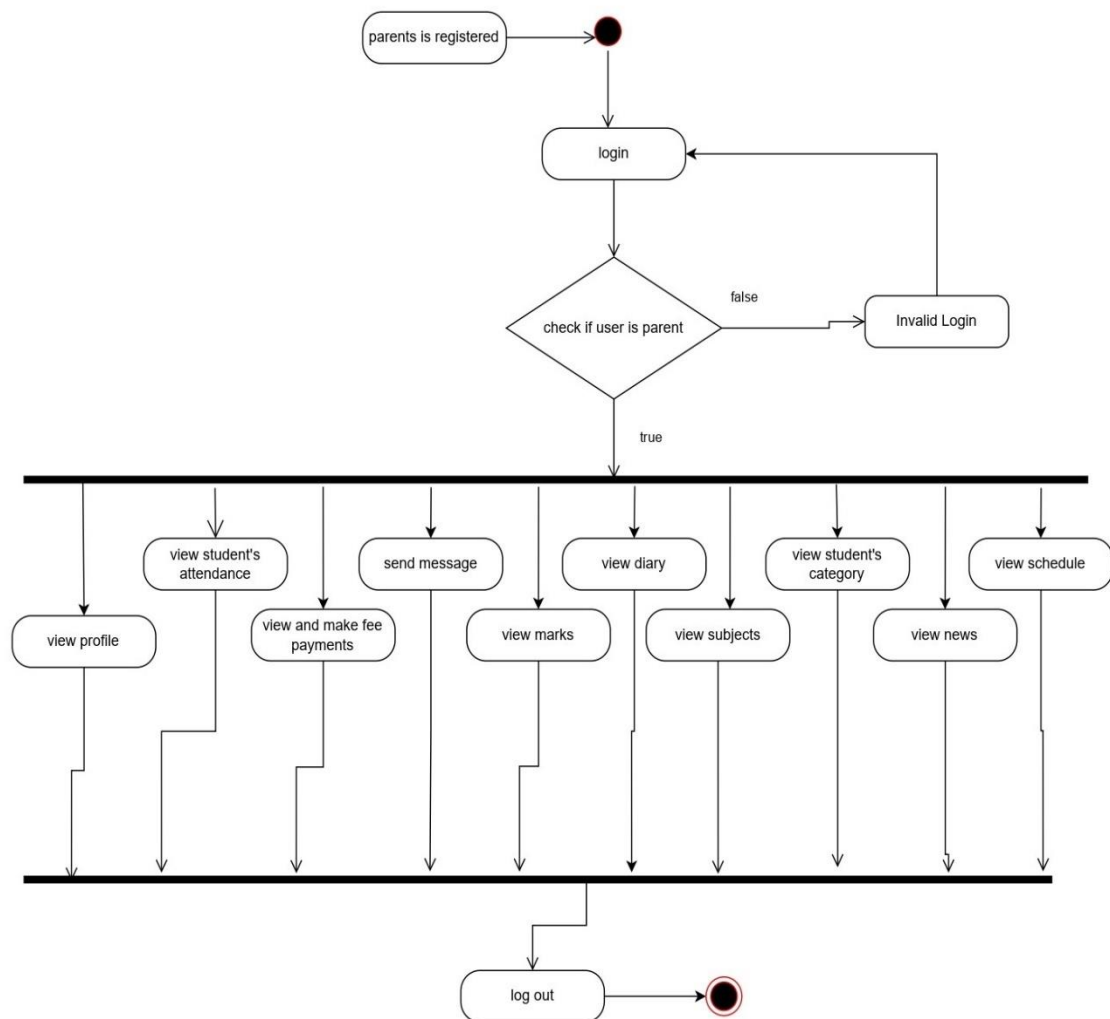


Fig 3.11 Activity Diagram for Parents

Parents if are registered, then s/he logs in the system using login portal. If the login credentials are valid, the page is redirected to dashboard otherwise the same login portal. Once login is successful, s/he will be viewing profile, viewing student's attendance, viewing and making fee payments, sending messages, viewing marks, viewing diary, viewing subjects, viewing student's category, viewing news, and viewing schedule, and finally log out on the system.

The activity diagram for students is represented in the figure below:

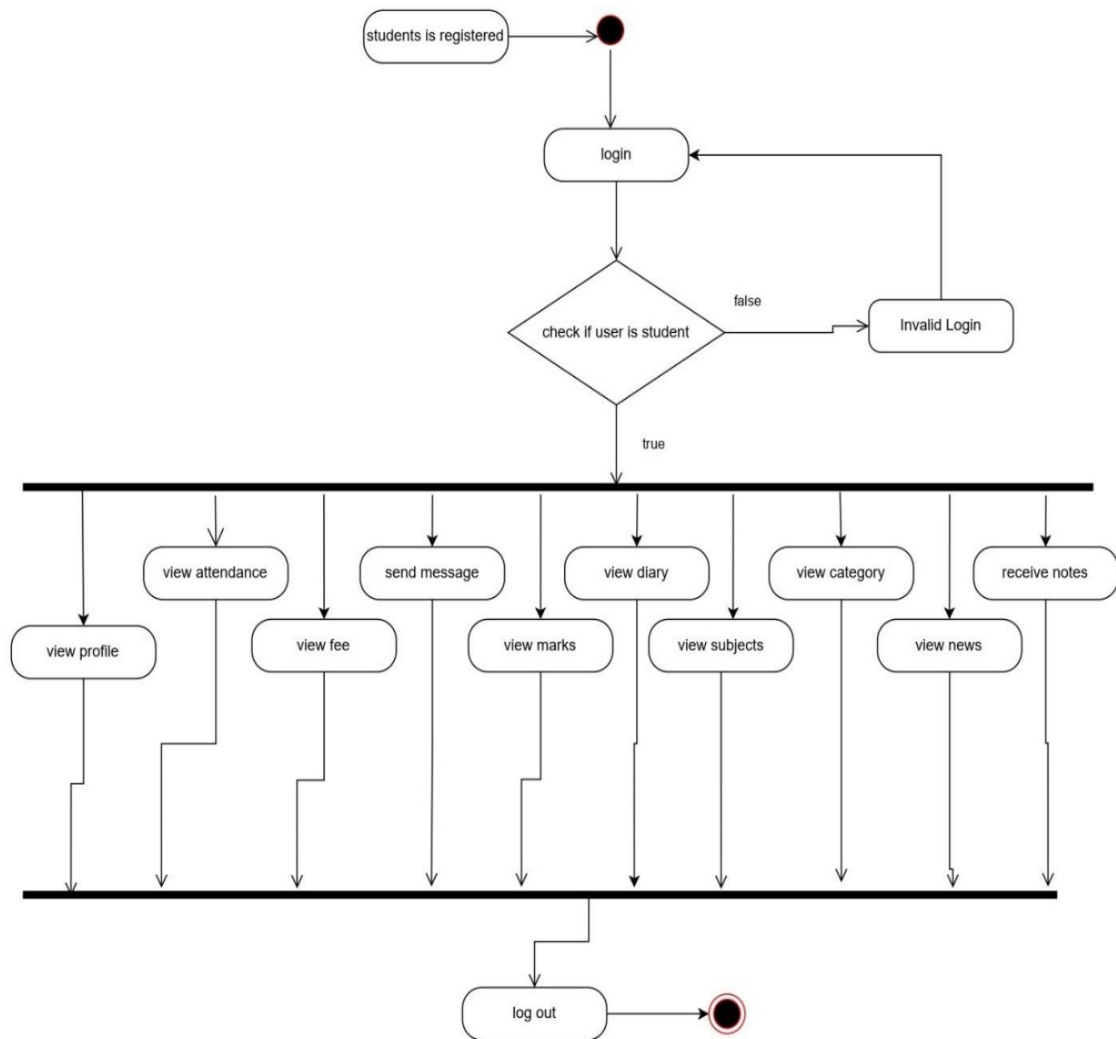


Fig 3.12 Activity Diagram for Students

Like all the other modules, the activity diagram for students is similar. Once the students enter correct credentials, s/he view profile, marks, diary, subjects, category, attendance, and fee. S/he receives the notes sent or uploaded by the teacher. Once, everything done, s/he log out on the system.

The activity diagram for Teacher is exactly represented on the diagram below:

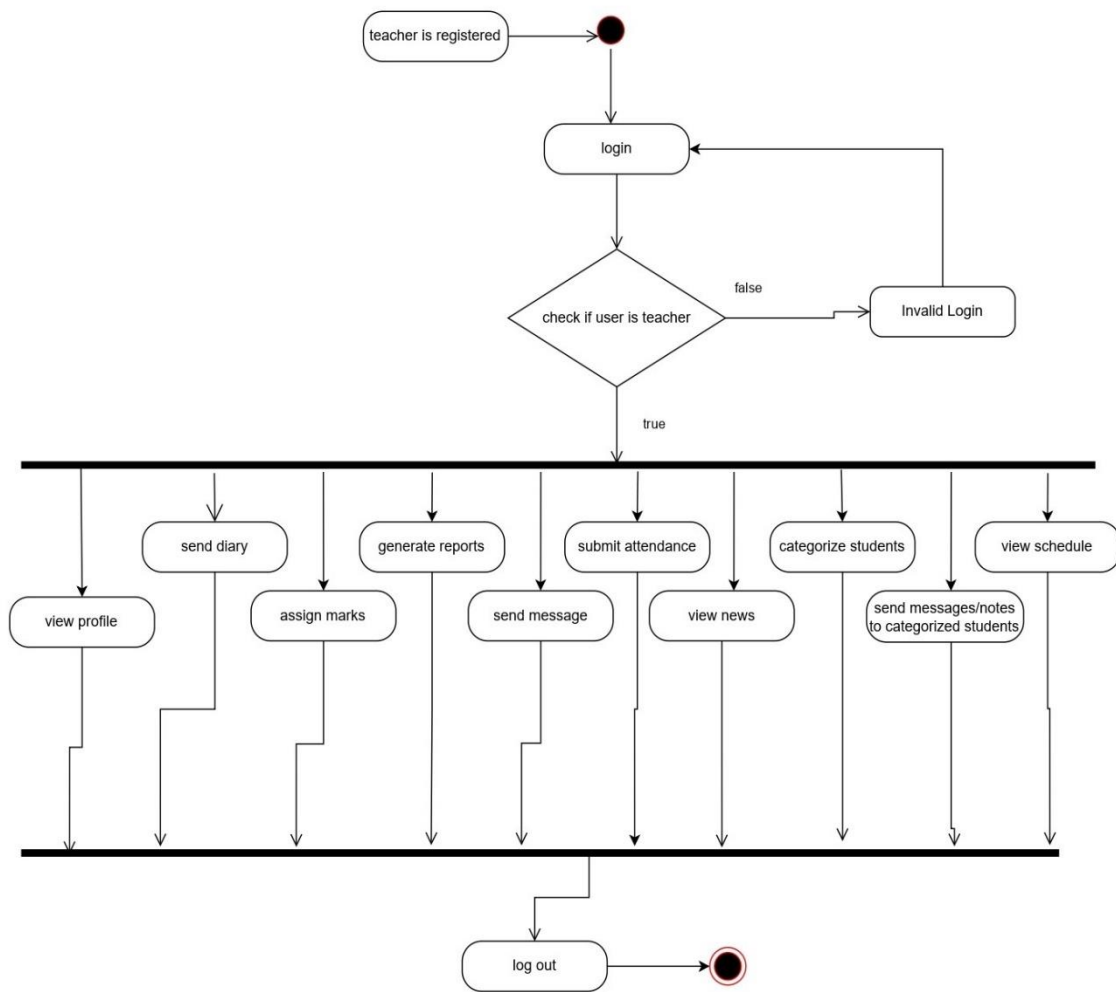


Fig 3.13 Activity Diagram for Teacher

If teacher is registered, and once s/he logs on the system with correct credentials, s/he will be viewing profile, sending diary, assigning marks, generating reports, sending messages, submitting attendance, viewing news, categorizing students, sending messages/notes to categorized students, and viewing schedule. At last, s/he log out on the system.

3.3 System Design

3.3.1 Component Diagram

The components involved on SMS are Admin, Teacher, Student, Parents, Attendance, Report, Profile, Fee, Section, Class, Category, Marks, and Subject. The component diagram representing the actual components and their relationships and associations is in the figure below:

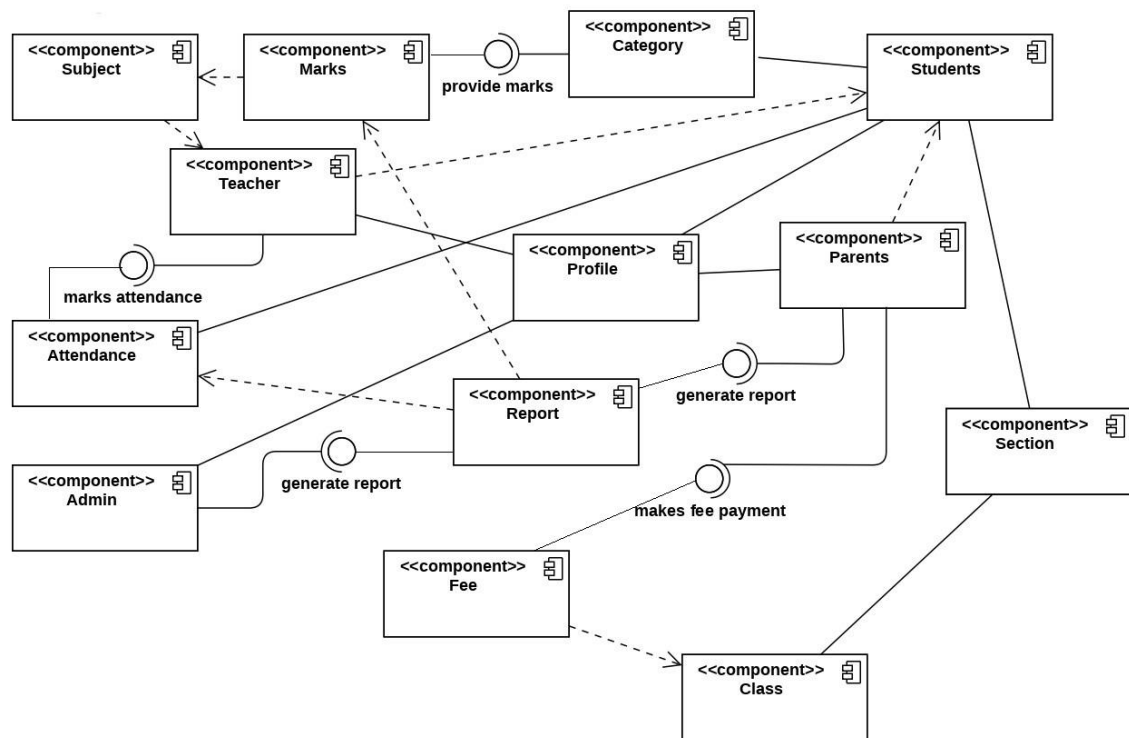


Figure 3.14 Component Diagram

The system, SMS has many components involved on it such as Admin, Teacher, Student, Parent, Attendance, Report, Profile, Fee, Section, Class, Category, Marks, and Subject. So, some has dependencies on some components without which they cannot be derived. For example, without subjects, marks can't be assigned; without class, fee can't be determined and paid; without students, parents are not assigned; without attendance and marks, report can't be generated. Students, Teachers, Parents, and Admin have their profile dashboards. Likewise, making fee payment and parents are associated and parents and also generate report and same can do the admin for attendance and marks. Teachers marks attendance and classes have sections.

3.3.2 Deployment Diagram

The system, SMS is deployed on three different levels as shown in the figure below:

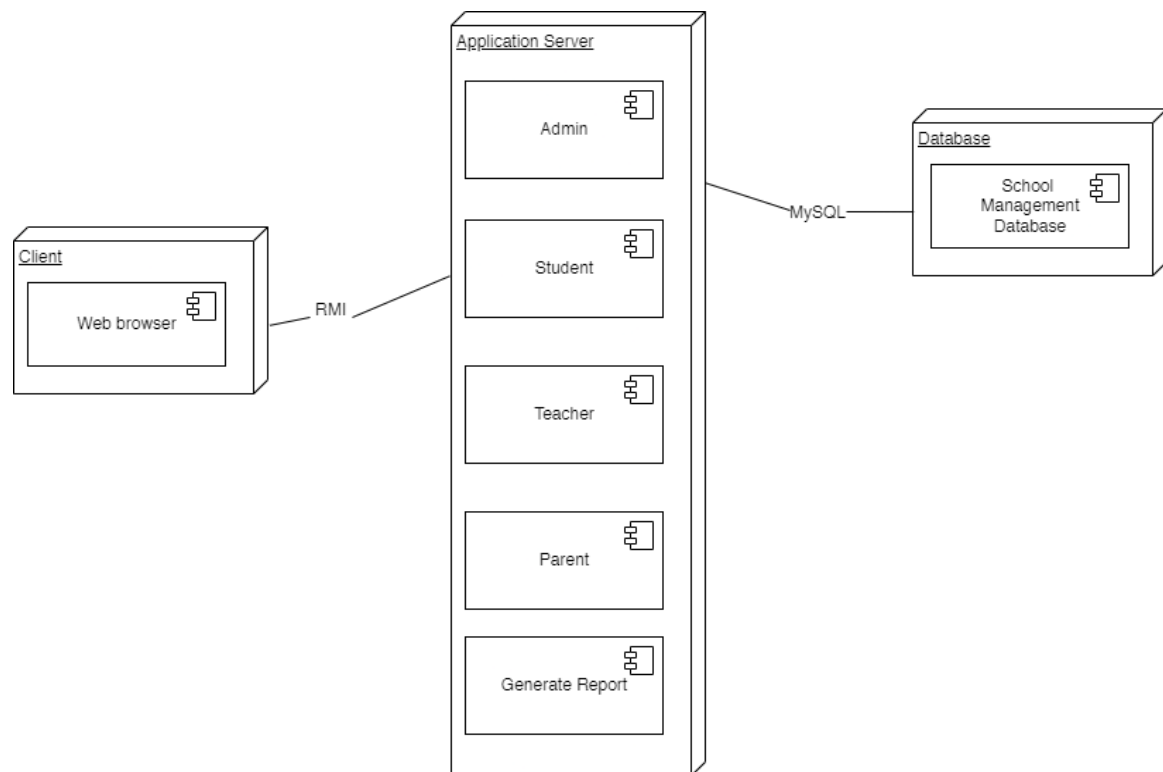


Figure 3.15 Deployment Diagram

The project, SMS is deployed on three different levels. One is client where we can access the web-application of SMS through web browser. The next lies the application server where the internal functioning of modules like admin, student, teacher, parents, and report generation are deployed and run. This is directly linked through PHP scripting language maintained at MySQL database storing, retrieving, and manipulating the data and information values.

CHAPTER FOUR

IMPLEMENTATION AND TESTING

4.1 Implementation

A SDLC model is a conceptual framework describing all activities in a software development project from planning to maintenance. This process is associated with several models, each including a variety of tasks and activities. For this project, we have used waterfall model to describe the SDLC process.

4.1.1 Programming Technologies Used

i. HTML:

Whatever we see on a website is built using HTML, CSS, BOOTSTRAP, and other GUI frameworks. HTML has been used to display the contents.

ii. CSS:

CSS is used to beautify the website. CSS has been used to make the web application responsive, faster, and user-friendly.

iii. JS:

JS is a scripting language, and it is used it to display some content without refreshing the site like deleting students' detail without refreshing the whole page. Those are done dynamically.

iv. PHP:

PHP is a general-purpose scripting language that connects the front end with the database. PHP is used to transfer the data from the webpage to the database. PHP has been used to manipulate the data within the database like for updating student details, cutting the fees, and so on.

v. MYSQL:

MYSQL is an open-source relational database management system. It is a beautiful database system for the project, and it has been used it to full extension. It has been used to delete, edit, and retrieve data from the database.

vi. VS CODIUM:

Vs Codium was used as a platform for coding the project.

4.1.2 Implementation Module

Admin Module:

For admin part, at first login systems were made. Then different functionalities like adding/managing another admin, parents, students, and teacher were made. By the time, the options of adding/managing new classes, sections, subjects, were concurrently added. Then, the functions like sending and viewing news updates, marks, diary was added. Using PDF extended from FPDF class, a report generation system was the built for generating reports of marks, results, and attendances.

Student Module:

Admin once generates the student details along with credentials, student can login on the system. Then, student's functionalities like viewing marks, fees, news, message, schedule, attendances, subjects, etc. were implemented.

Teacher Module:

Teacher module was then implemented. Admin had to assign students and classes to teachers. So, relating that, functionalities like marking and submit attendances, sending notes, remarks, etc. were made. Also, using PDF extended from FPDF class, a report generation was implemented for generating marks. Later, the system of sending messages were added. At last, based on the marks submitted, the categorization system for students were implemented by using a VIEW (virtual table) from MySQL.

Parents Module:

At last, the parents module was implemented. Parents and students were linked at the very beginning while creating student account. Since, parents and students are linked, based on that, functionalities like viewing attendance, diary, fees, marks, messages, were implemented. Later, the system of making fee payment through eSewa gateway (used Dummy API) was implemented for a better purpose.

4.2 Testing

4.2.1 Test Cases for Unit Test

Unit test was done by feeding the system with several test cases. The unit test was performed by inserting data. System worked fine.

Table 4.1 Test Case for Unit Test

Input	Test Data	Expected Outcome	Actual output	Remarks
Insert data	Std Name: Ram Gender: Male Religion: Hindu Class: Ten Section: A Parent: Hari Thapa Parent Phone: 9841000000 Username: ram Password: 1234	Throws error saying insert full name	Error thrown saying Please insert first name and last name in alphabets	Test Success

Screenshot:

Students List Add Students

* First add Class and Section before adding Student

Name: Ram

Gender: Male

Religion: Hindu

Class: Ten Section: A

Parent Name: Hari Thapa

Parent Phone: 9841000000

Email: ram@gmail.com

Username: ram

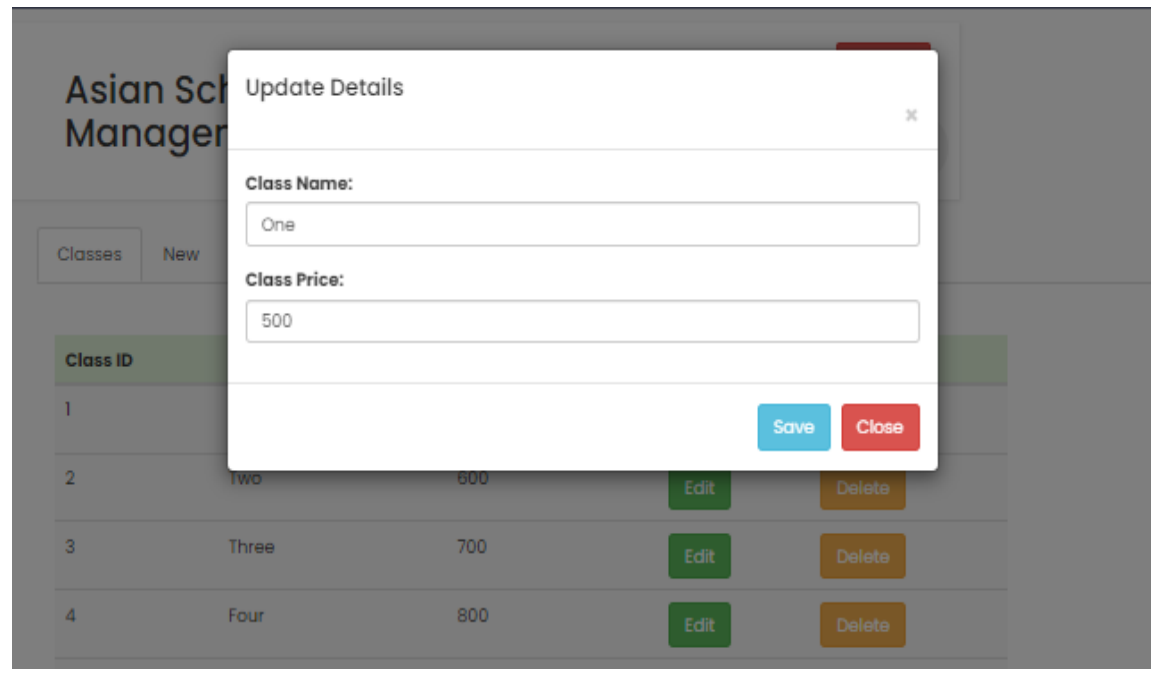
Password: 1234

Add Student

Please match the format requested. please insert first name and last name in alphabets

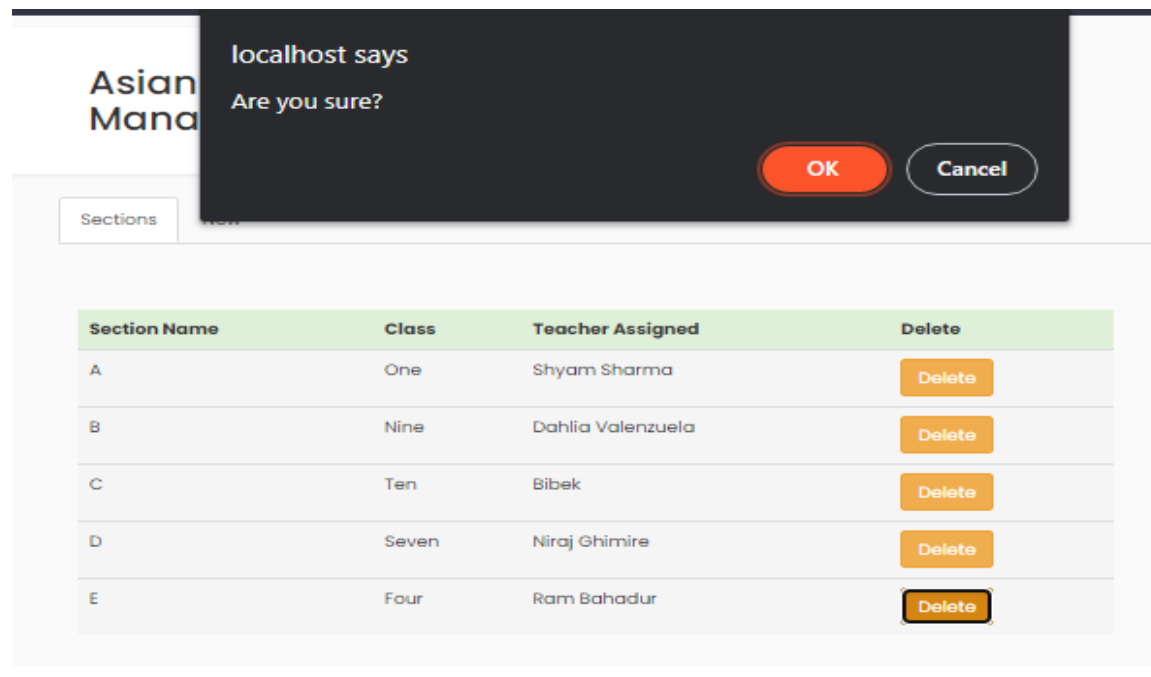
Edit data	Class Name: One Class Price: 500	Edit the data as requested and update in database	Edited and updated in database	Test Success
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Screenshot:



Delete data	Delete Teacher named Ram Bahadur	Delete the teacher	Teacher data deleted	Test Success
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Screenshot:



Generate Report	Clicked on generate report of Attendance	Generate the report with .pdf extension and shows on the browser	Pdf report generated and displayed accordingly	Test Success
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Screenshot:



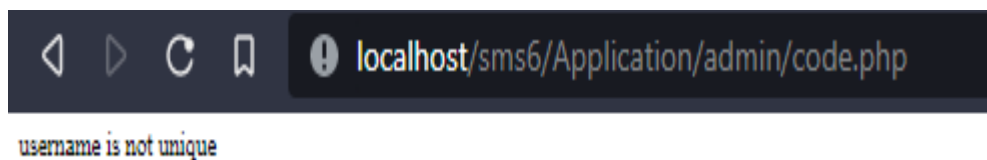
Student Attendance Report

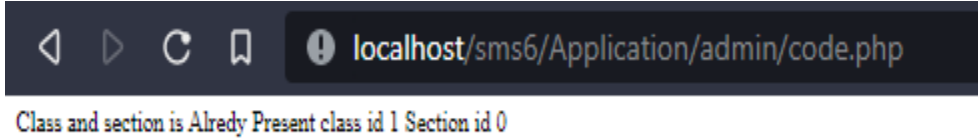
January, 2021

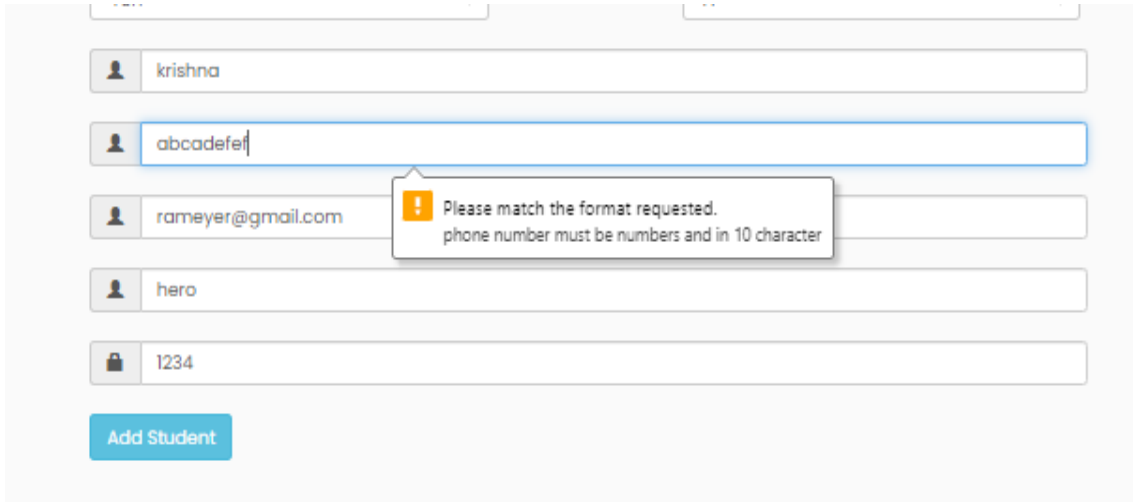
ID	Name	Total
7	Alec Fry	P=0, A=0, L=0
10	Aavash basnet	P=0, A=0, L=0
11	Asdasd	P=0, A=0, L=0
12	A123	P=0, A=0, L=0
13	Ram thapa	P=0, A=0, L=0

Insert data	Name: Ram Password: Ram123	Throws error saying username is not unique	Did throw error	Test Success
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Screenshot:



Insert data	Class: 1 Section: A	Throws error saying class and section already exists	Threw error saying class and section already present	Test Success
Screenshot: 				

Insert data	Name: Hari Last Name: Krishna Phone number: abcadefef Gmail: rameyer@gmail.com Username: hero Password: 1234	Throws error saying password must be 10- digit numeric value	Threw error saying phone number must be numbers and in 10 characters	Test Success
Screenshot: 				

4.2.2 Test Case for System Test

The system was tested to ensure that the application doesn't fail and does any privacy off works. Expectedly, satisfactory results were obtained.

Table 4.2 Test Cases for System Test

Test Case	Input	Expected Outcome	Outcome	Remarks
Login for admin	Username: admin Password: 1234	Admin login success and land on admin dashboard	Login Success and redirects to admin homepage	Test Pass
Login for admin	Username: admin Password: admin	Admin login fail and land on login portal	Login Failed and redirects to login panel	Test Pass
Access Teacher's dashboard from Admin's session	localhost\\sms6\Application\teacher\profile.php	Invalid session	Redirects to login panel	Test Pass

CHAPTER FIVE

CONCLUSION AND FUTURE RECOMMENDATIONS

5.1 Conclusion

Hence, the system is able to perform various basic school management activities that was expected. The output is the most important and direct source of information from the user. The system is a functional web-based School Management System, which will help in the process of collecting, collating, and retrieving various information related to any educational institution. Also, the wonderful feature of automatically categorizing students played well. Overall, it fulfilled the objectives of designing the system.

5.2 Lesson Learnt and Outcome

At the end, the outcome of the project is what was expected it to be and has. The four modules: admin, teacher, parents, and students have their part to play with respective functionalities. The tricky part of automatically categorizing students got integrated into the system well. It was a wonderful experience right from the start of the project up to its completion. The experience was interesting even though it was a dusting task at the same time.

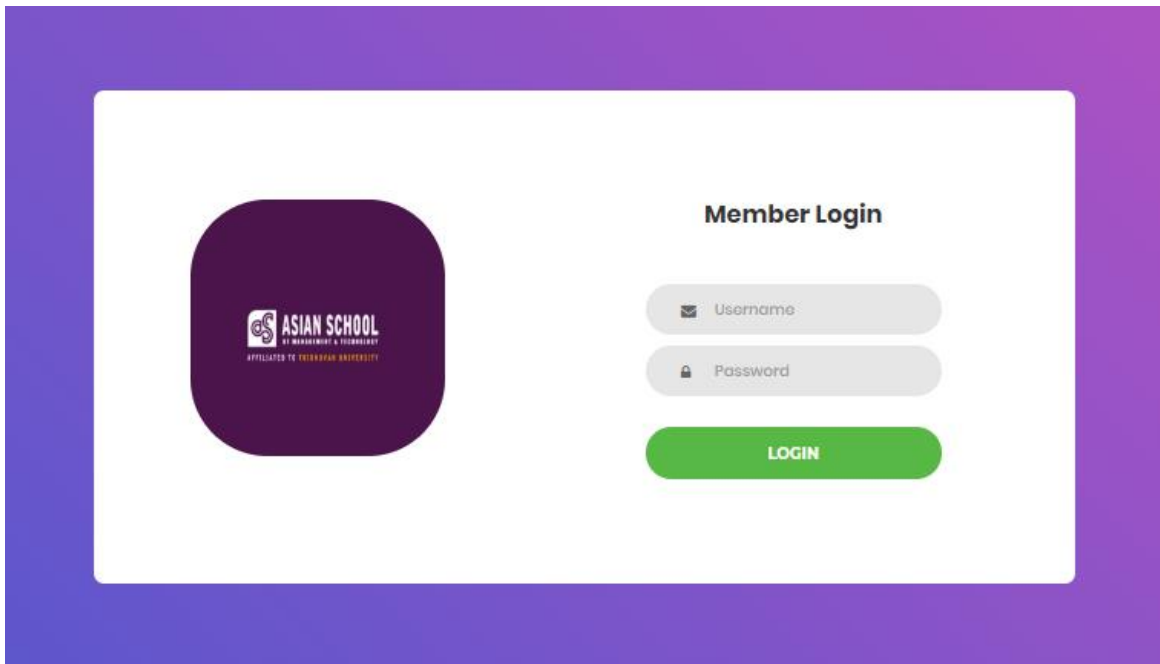
5.3 Future Recommendations

In future, the system can have added functionalities like more payment gateways, library management system, canteen management, event management, proper teacher payroll system, automatic routine scheduling system, etc. Also, a mobile application version of the system can be implemented.

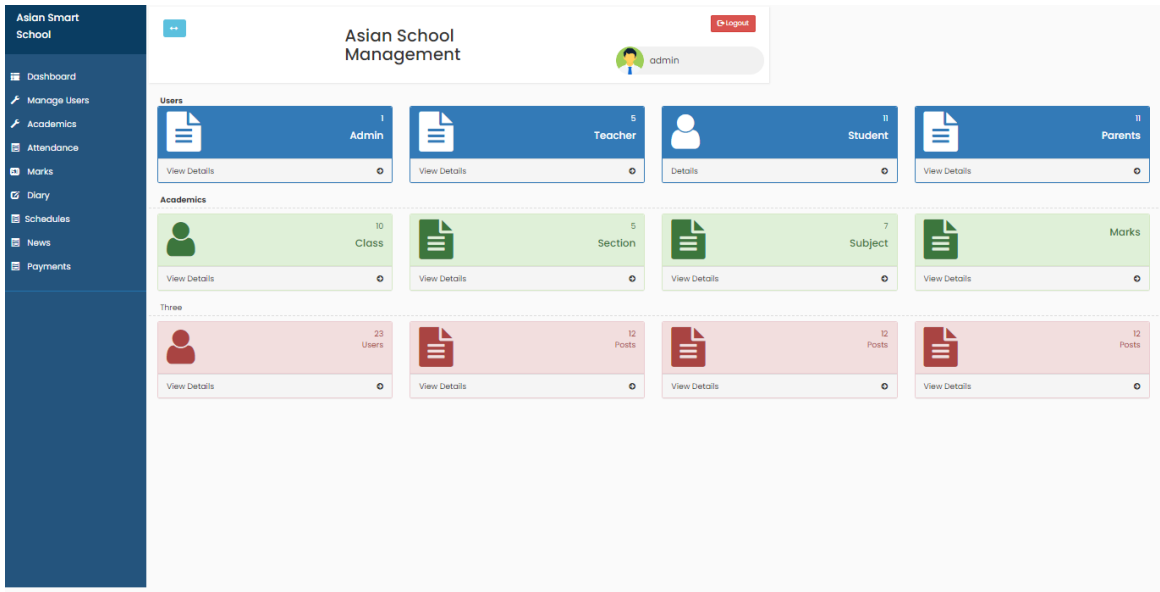
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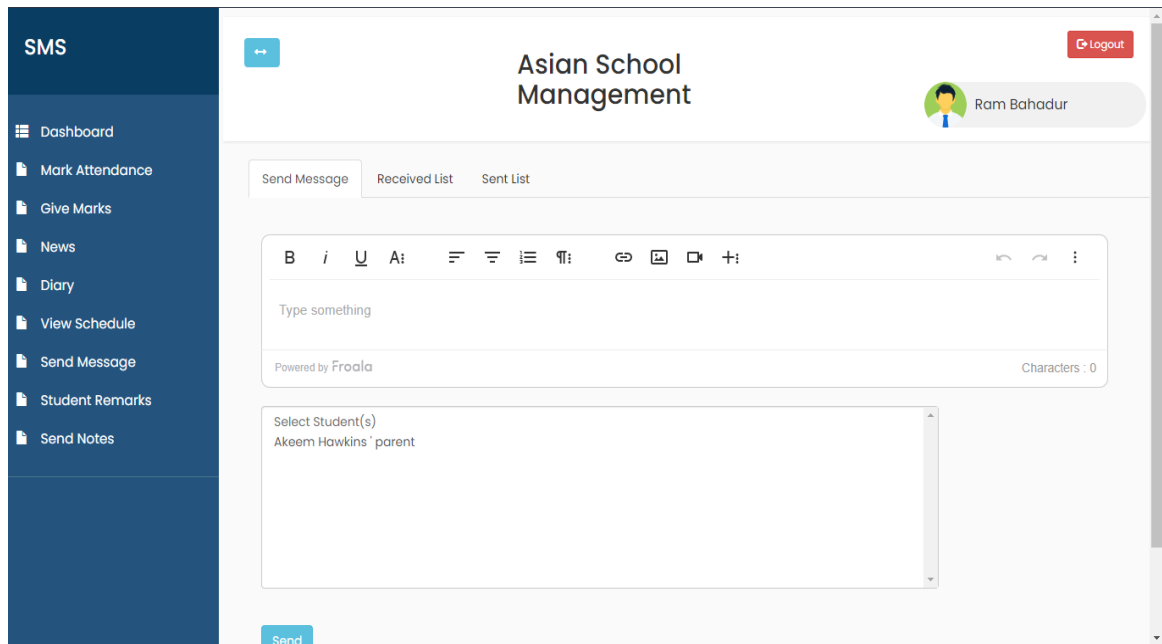
APPENDICES



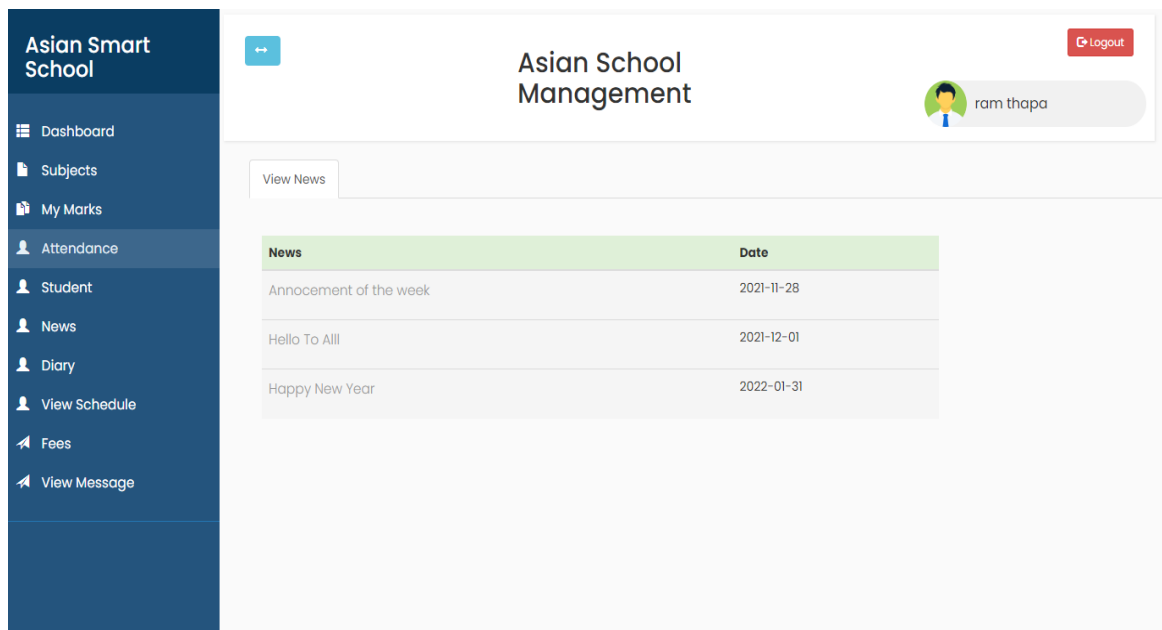
Appendix 1: Member Login Panel



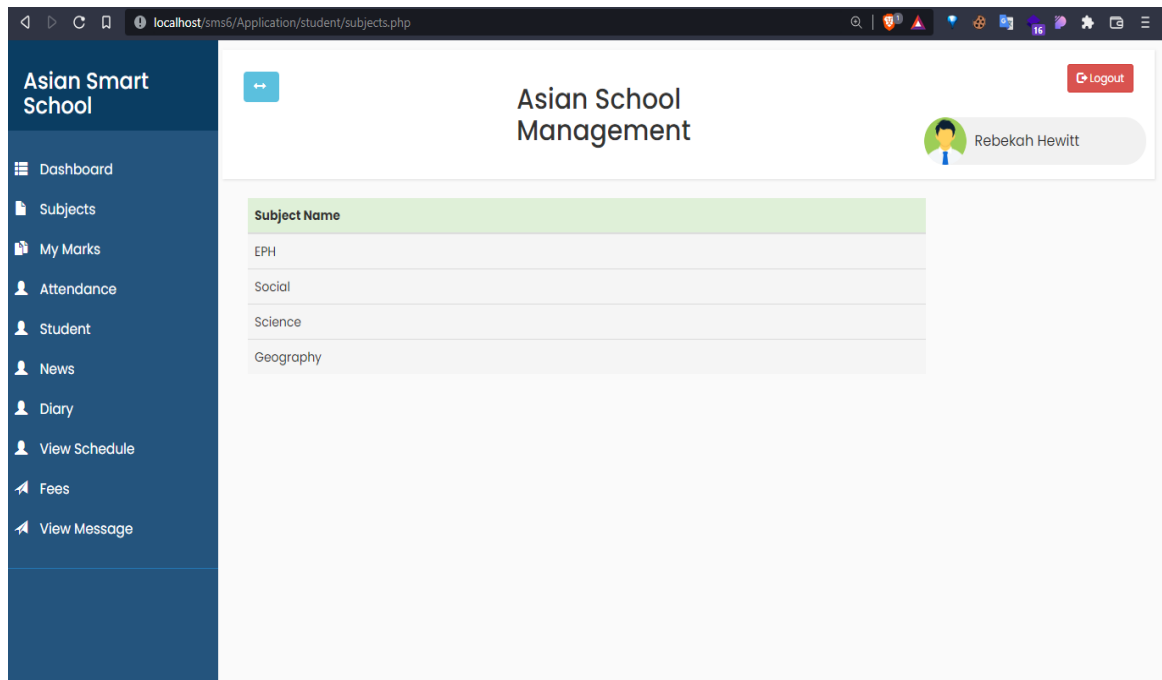
Appendix 2: Admin Dashboard



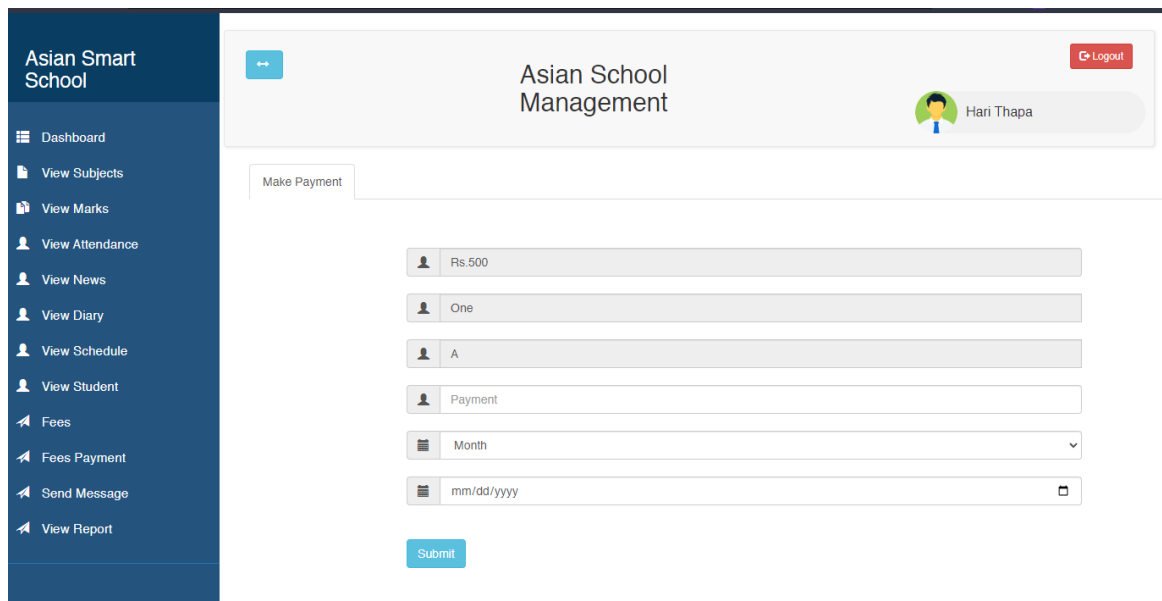
Appendix 3: Send Message interface for Teacher



Appendix 4: User interface for student's announcement viewing



Appendix 5: Viewing enrolled subject as student



Appendix 6: Payment interface for Parents

localhost/sms5/Application/parent/ViewStudent.php

Asian Smart School

Dashboard

View Subjects

View Marks

View Attendance

View News

View Diary

View Schedule

View Student

Fees

Fees Payment

Send Message

View Report

View News

News

Date

Class

One

Section

A

student_name

ram thapa

gender

Male

religion

Hindu

parent_name

Hari Thapa

parent_phone

9841000000

parent_email

hari@gmail.com

username

ram

Logout

Hari Thapa

Appendix 7: Parents interface for viewing their student details