****

**Takoradi Technical University**

**Faculty of Applied Sciences**

**School Management System**

**PROJECT DOCUMENTATION**



**Submitted to**

**Department of Computer Science**

**Data Management and Analytics**

***In partial fulfillment of the requirements for the end of First semester examination mini-project***

**Submitted by**

Group Three

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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 THREE

# SYSTEM DESIGN AND ANALYSIS

## 3.1 System Analysis

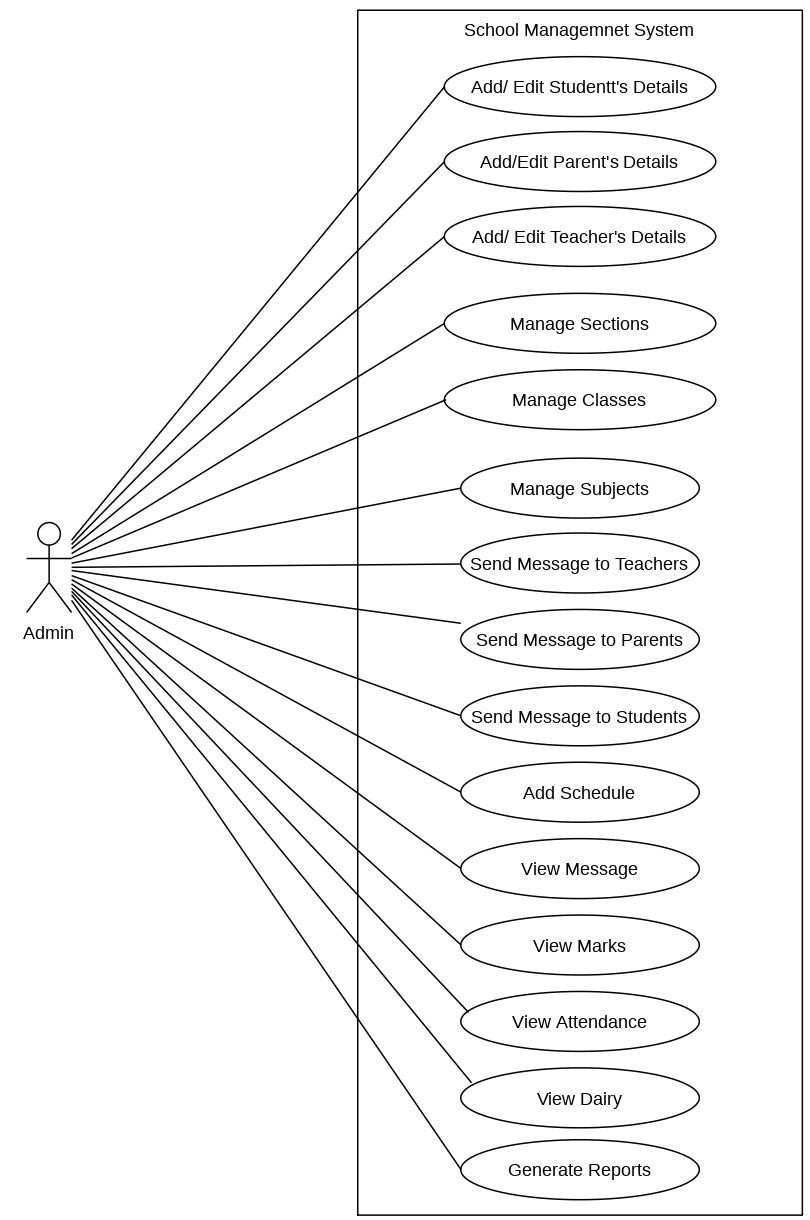
Before creating any system, it is necessary to visualize the layout, design and all features intended to be added. Requirements are necessary attributes in the system to identify characteristics of the system.

### 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**

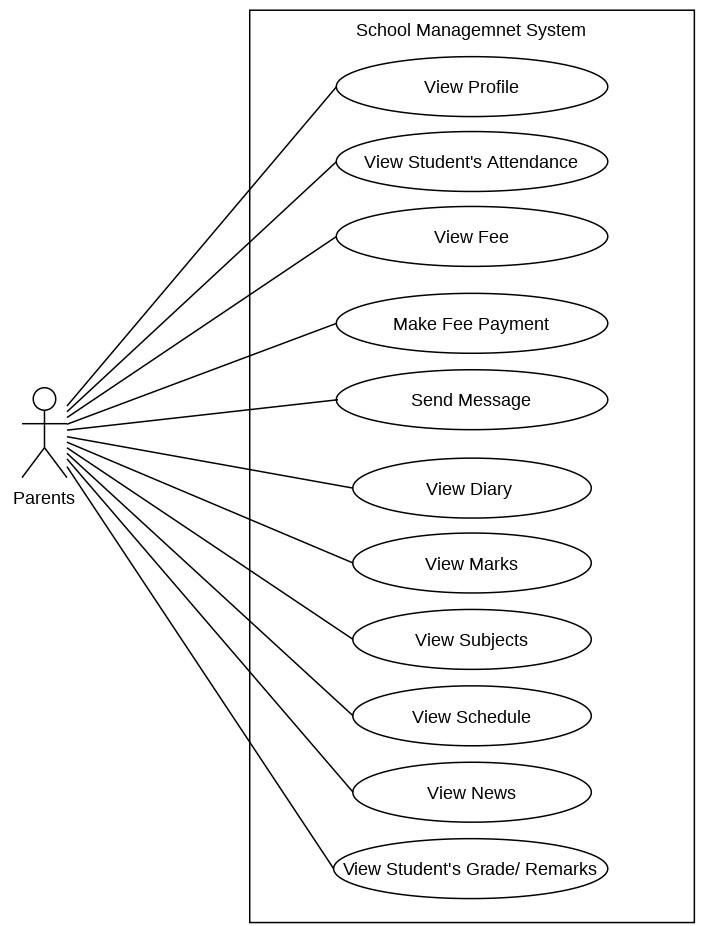
In the system, Admins can do lots of things such as: add/edit student’s details, parent’s details, and teacher’s details; manage sections, classes, and subjects; send messages to teachers, parents, and students; add schedule; view messages, marks, attendance, and diary; and generate reports.



#### Figure 3.1 Use Case Diagram for Admin

**For Parents**

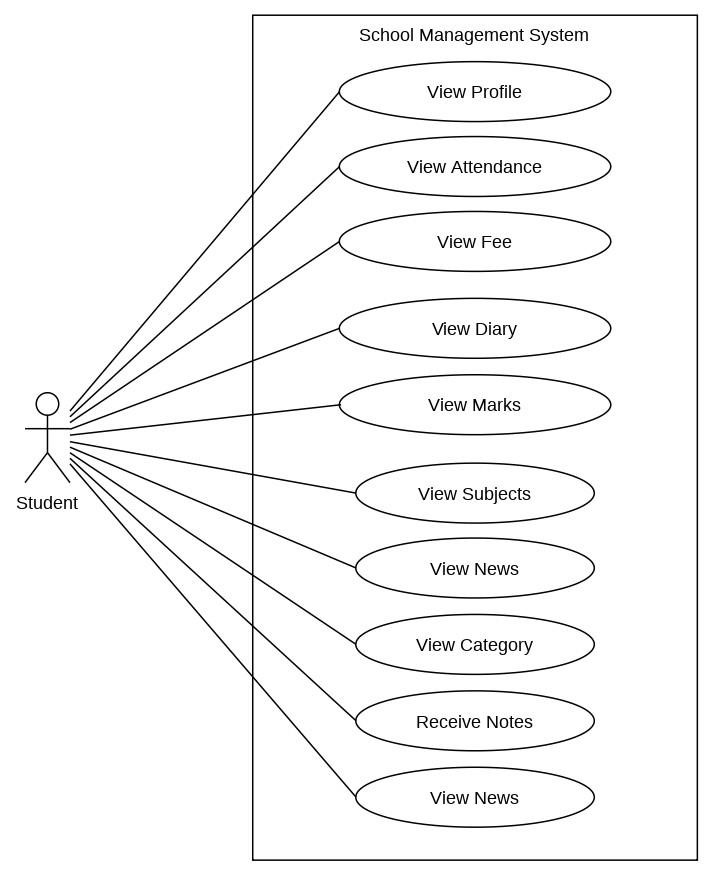
Parents are another module in SMS. Parents have various functionalities such as: viewing profile, student’s attendance, fees, diary, marks, subjects, schedules, news, and category of their enrolled students; making fee payments; and sending messages.



#### Figure 3.2 Use Case Diagram for Parents

**For Students**

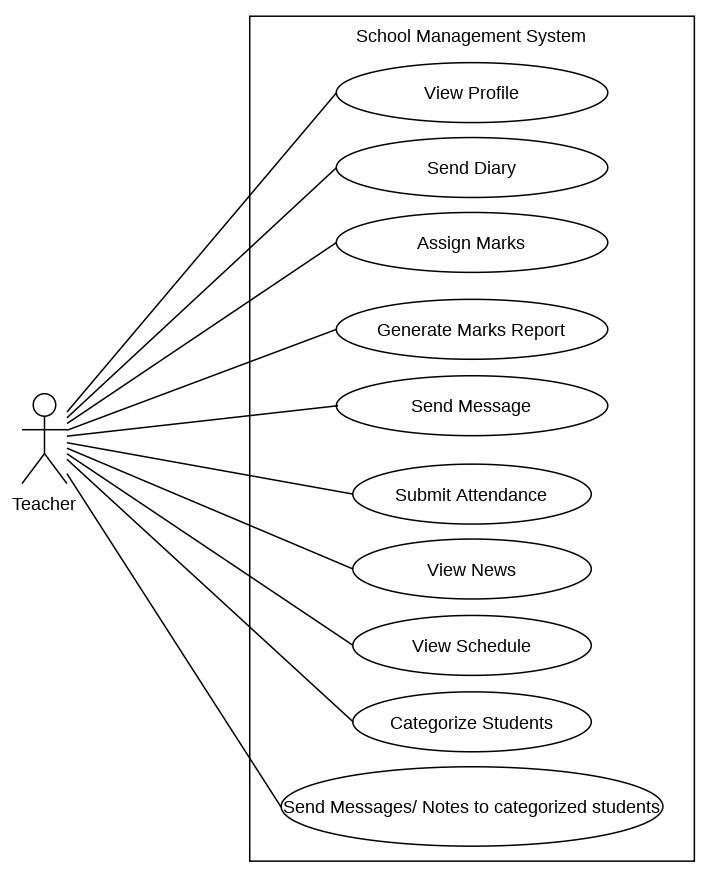
Students in SMS can do activities such as: viewing profile, attendance, fee paid by their parents, diary, marks assigned by teachers, subjects, news sent by admin, their category based on subject-wise marks; and receive notes sent by teacher.



#### 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.

1. **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.

1. **Operational Feasibility:**

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

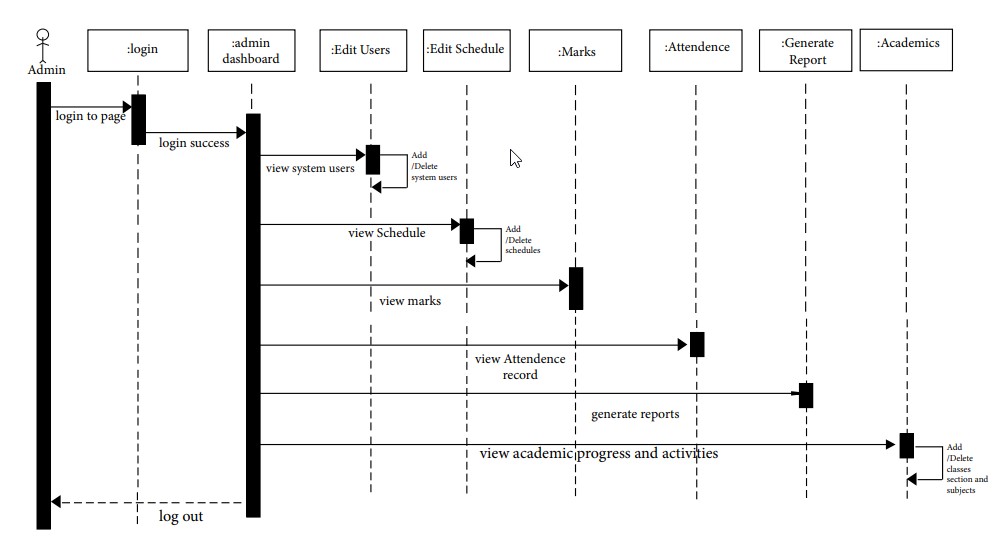
1. **Economic Feasibility:**

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.

### 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.

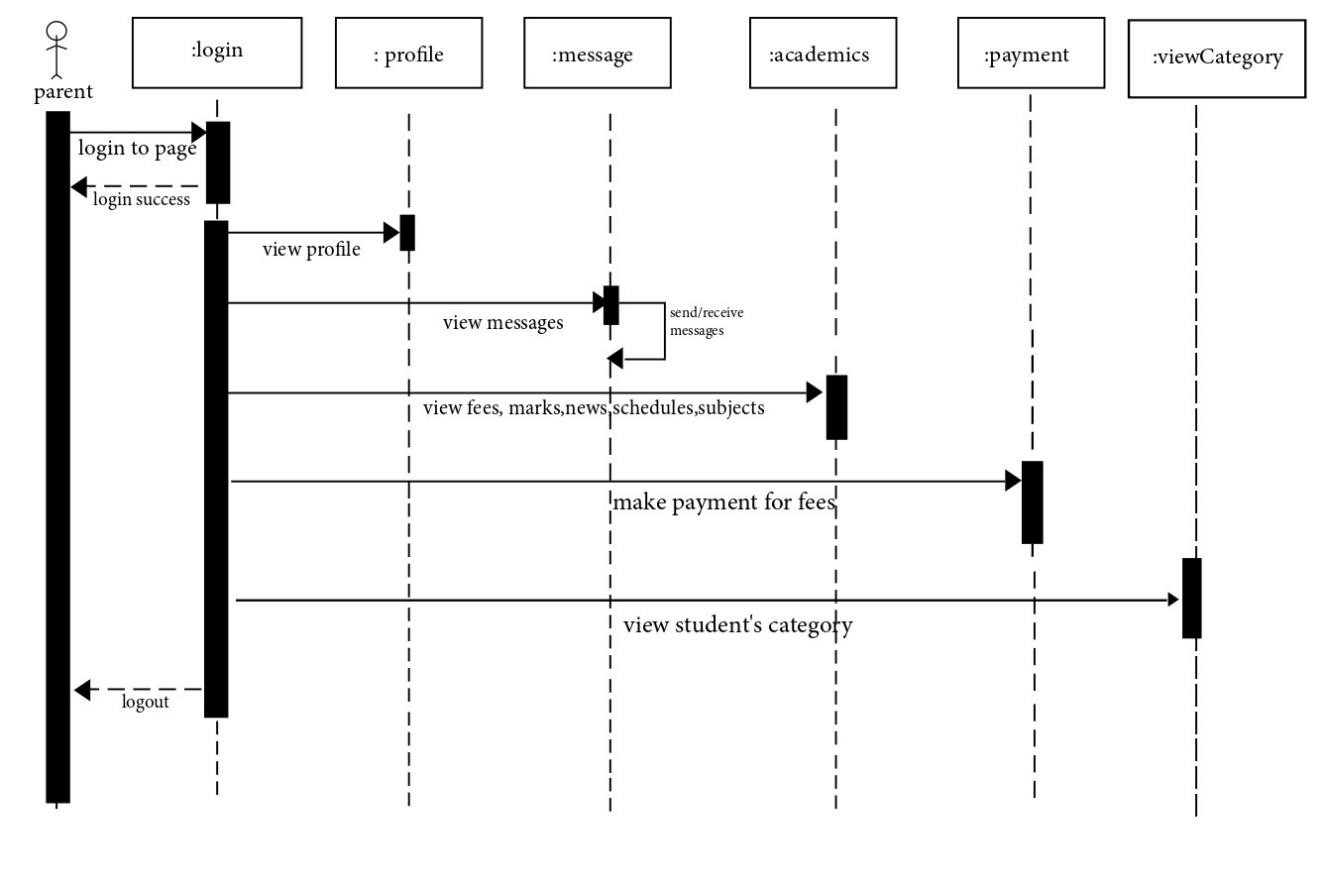
For admin, there are different objects such as login, admin dashboard, edit users, edit schedule, marks, attendance, generate reports, and academics. The below figure represents the state sequence diagram for Admin:



#### 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.

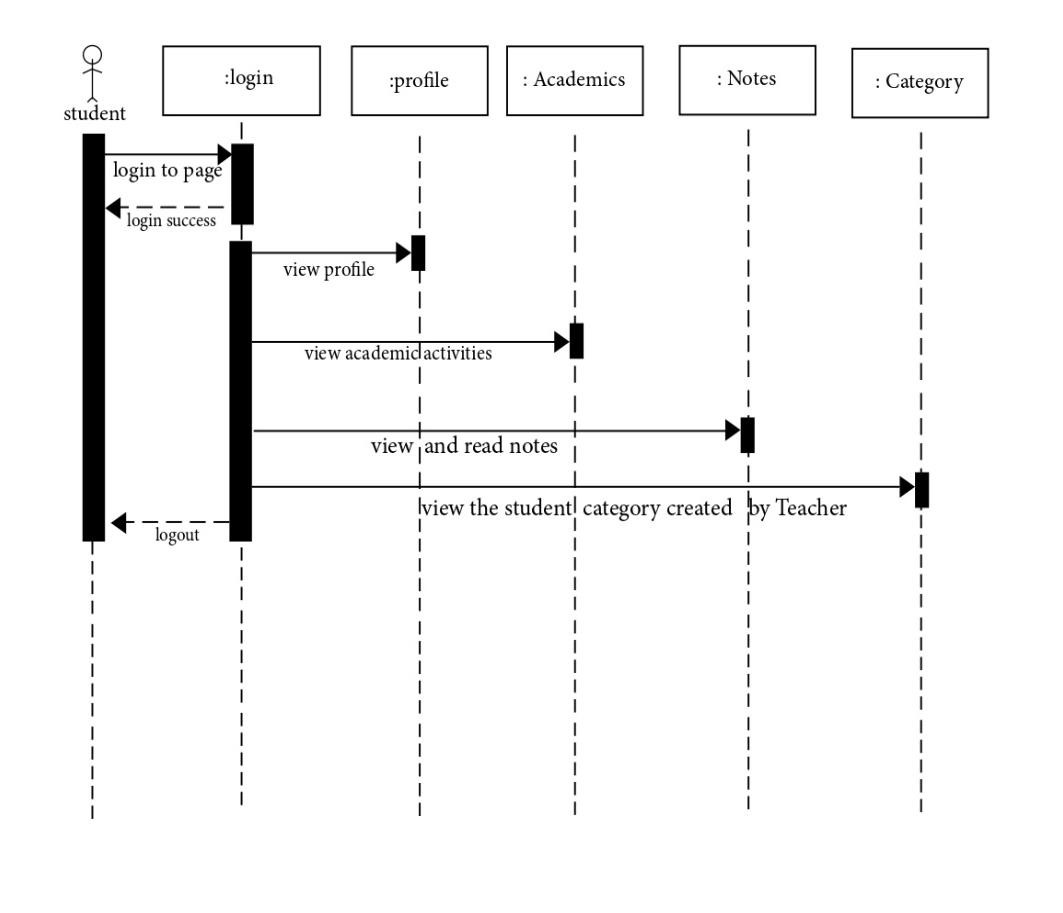
For Parents, there are objects such as login, profile, message, academics, payment, and viewCategory. The sequencial state activities involved with these objects are depicted in the figure below:



#### Figure 3.7 Sequence Diagram for Parents

Once parent logins 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.

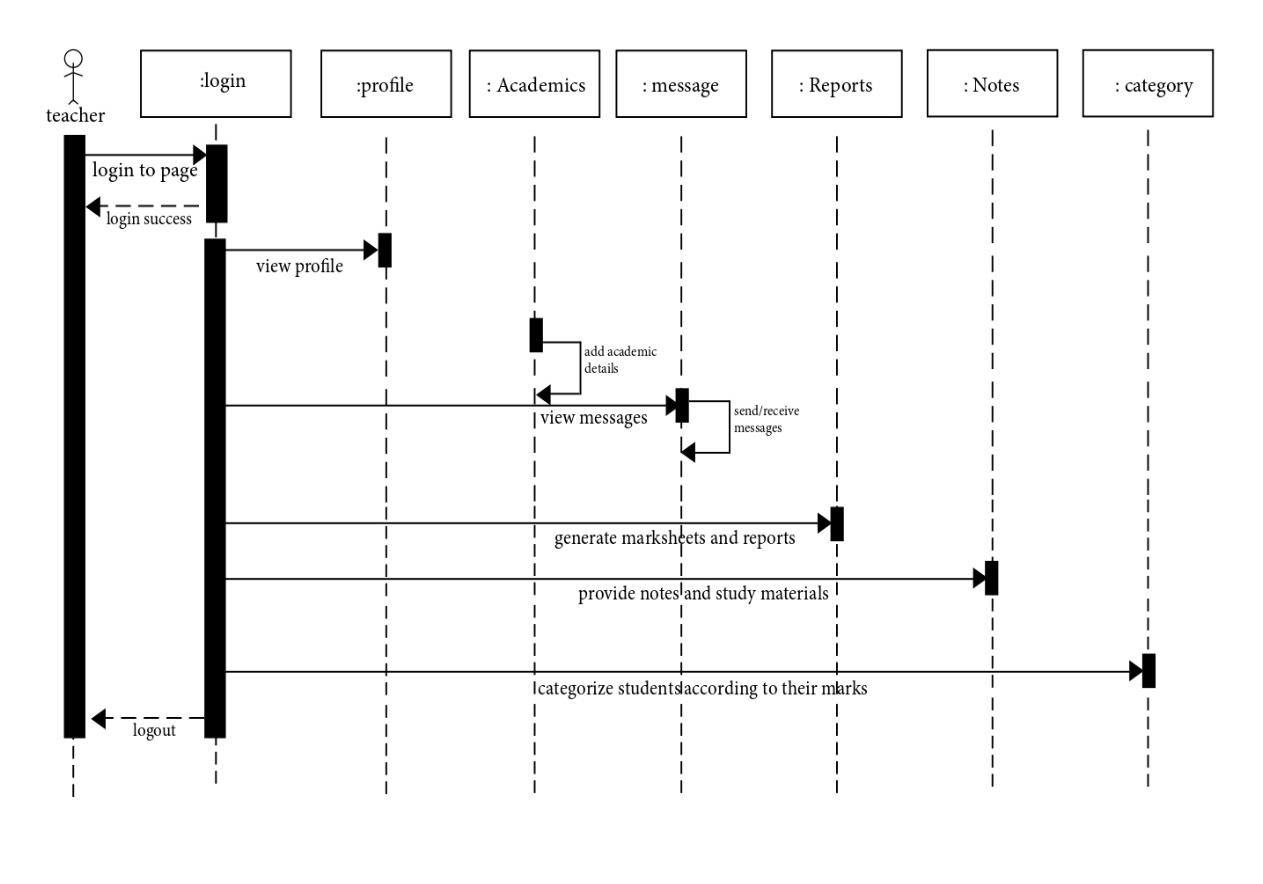
For Student, the objects involved are login, profile, Academics, Notes, and Category which are shown in the below figure:



#### Figure 3.8 Sequence Diagram for Student

In the login panel, student logins 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

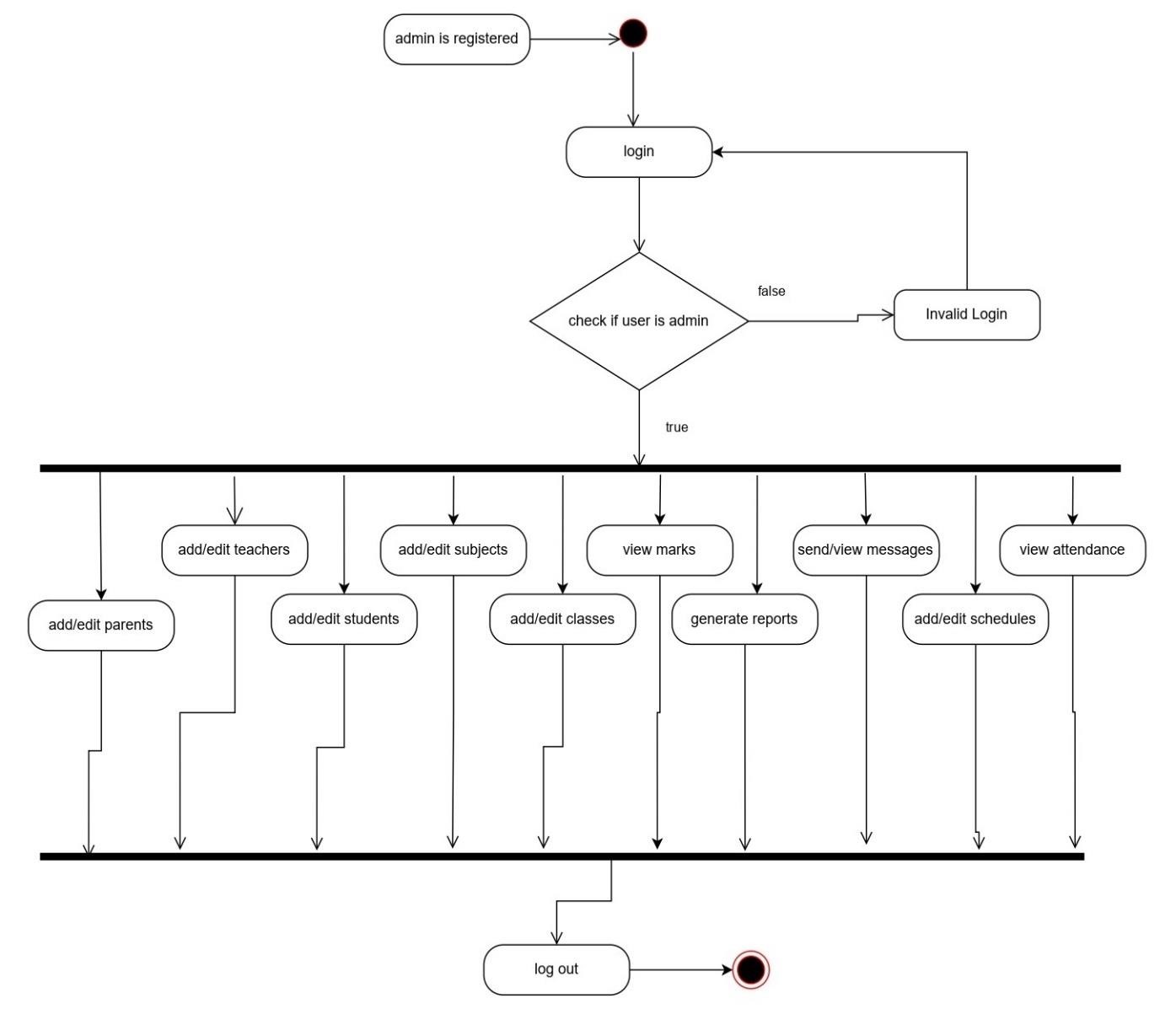
Teacher as like the others have to login through the login portal. If s/he enters wrong credentials, it will be redirected to login page. Teacher views profile, messages, news, marks, and attendance. Then, s/he generates report of marks and attendance. Also, the teacher can send notes to the categorized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

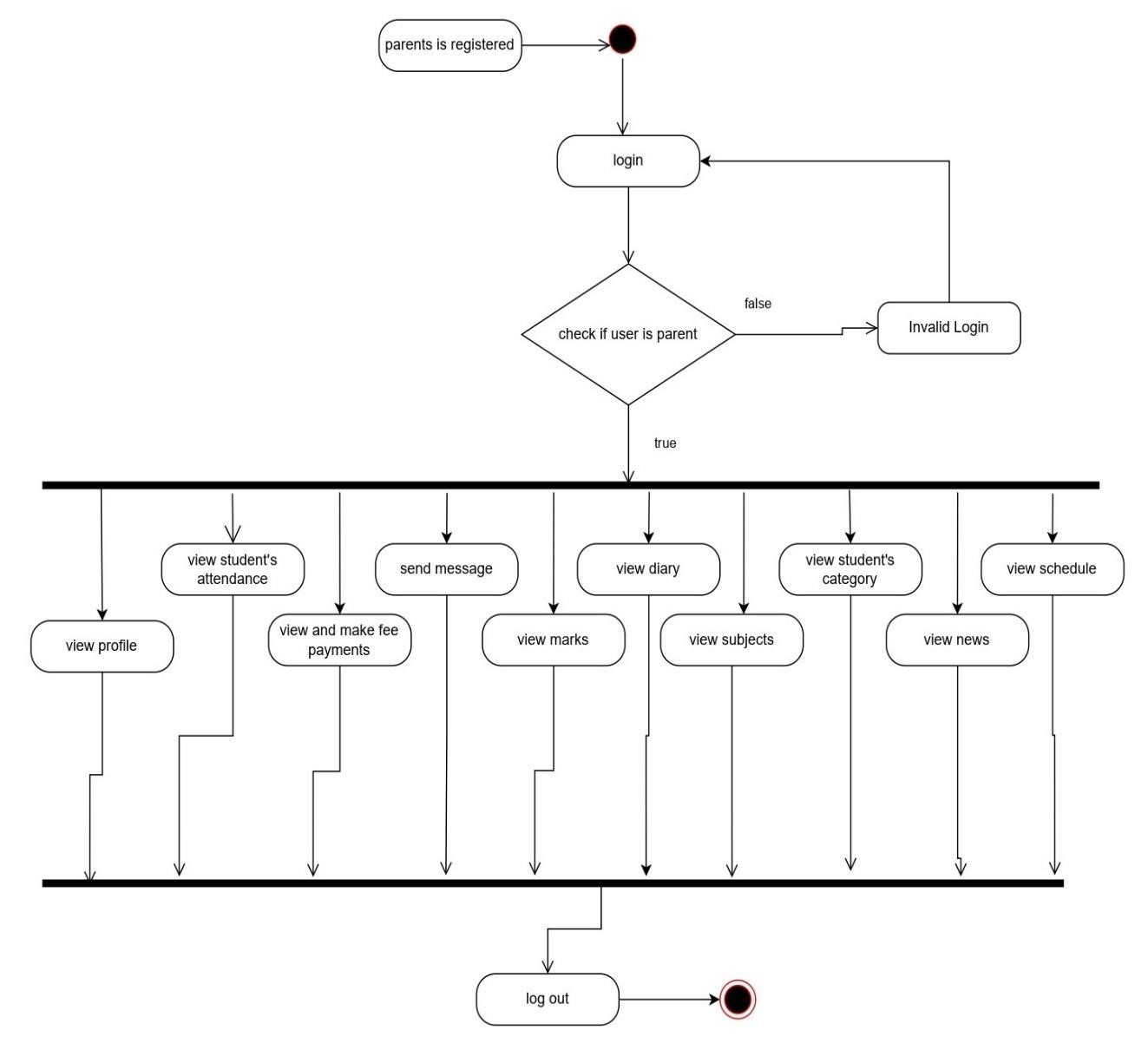
For admin, the activity diagram is shown below:



#### Figure 3.10 Activity Diagram for Admin

If admin is registered, s/he logins 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.

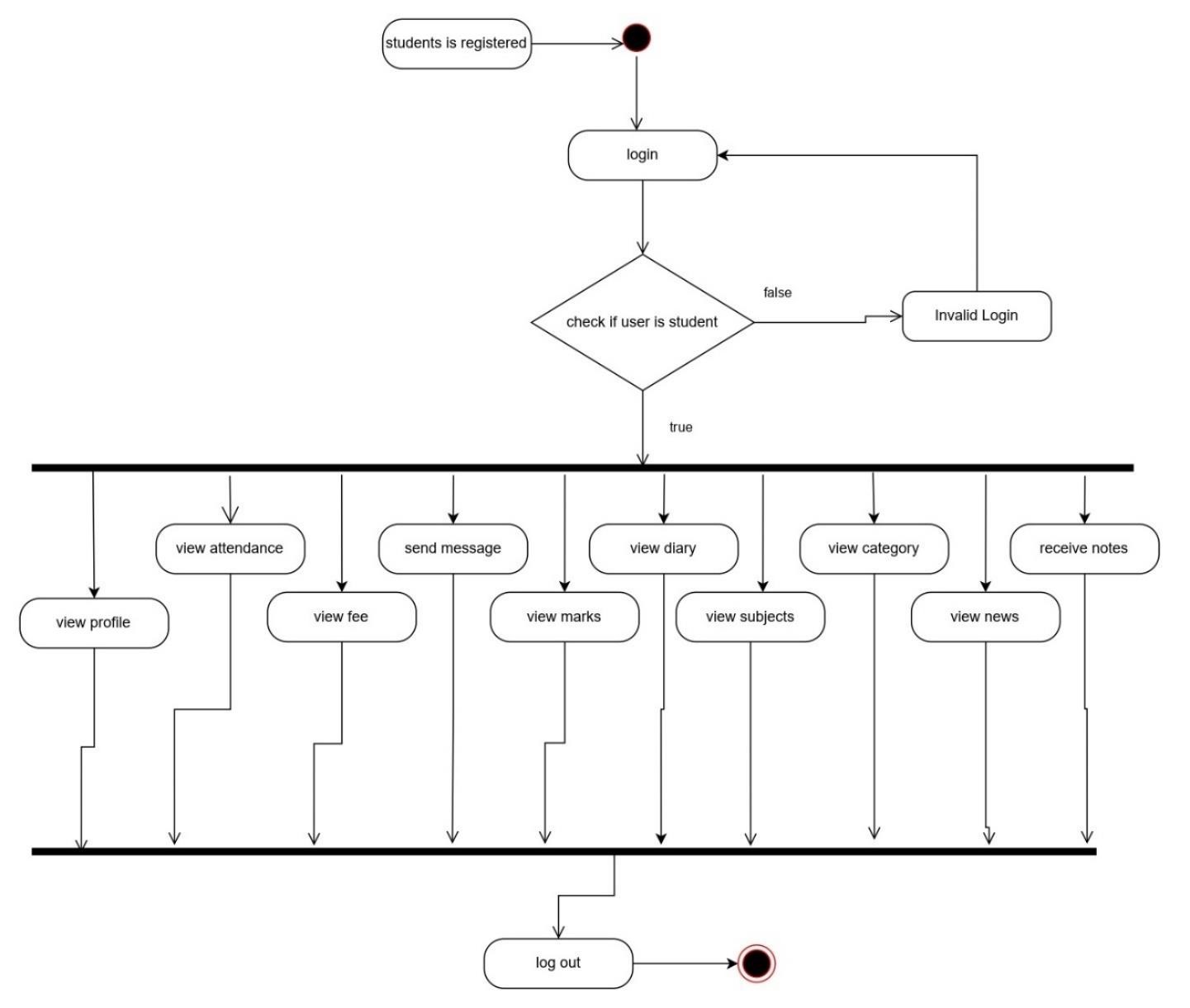
The activity diagram for parents is shown below:



#### Fig 3.11 Activity Diagram for Parents

Parents if are registered, then s/he logins on 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.

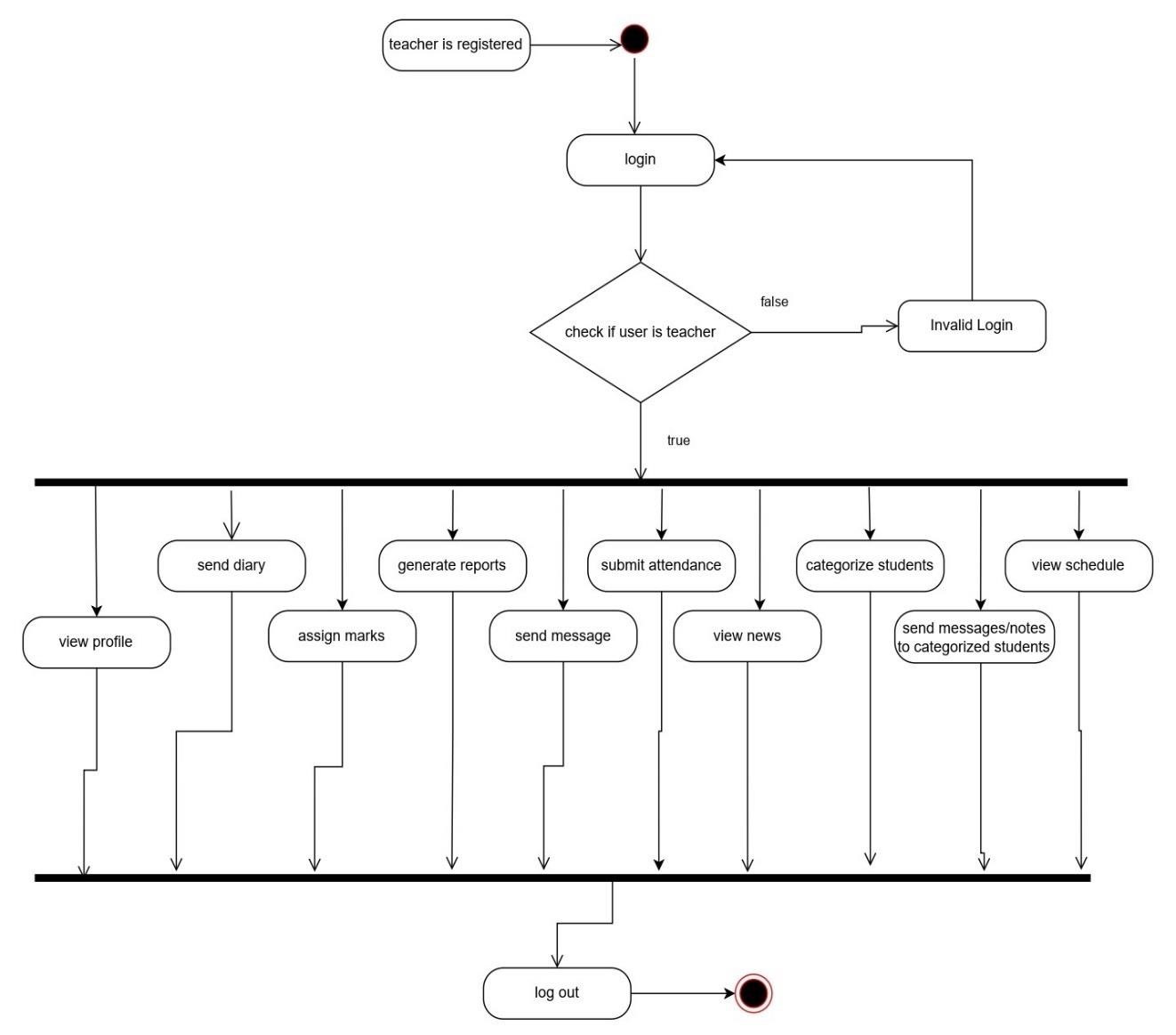
The activity diagram for students is represented in the figure below:



#### 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:



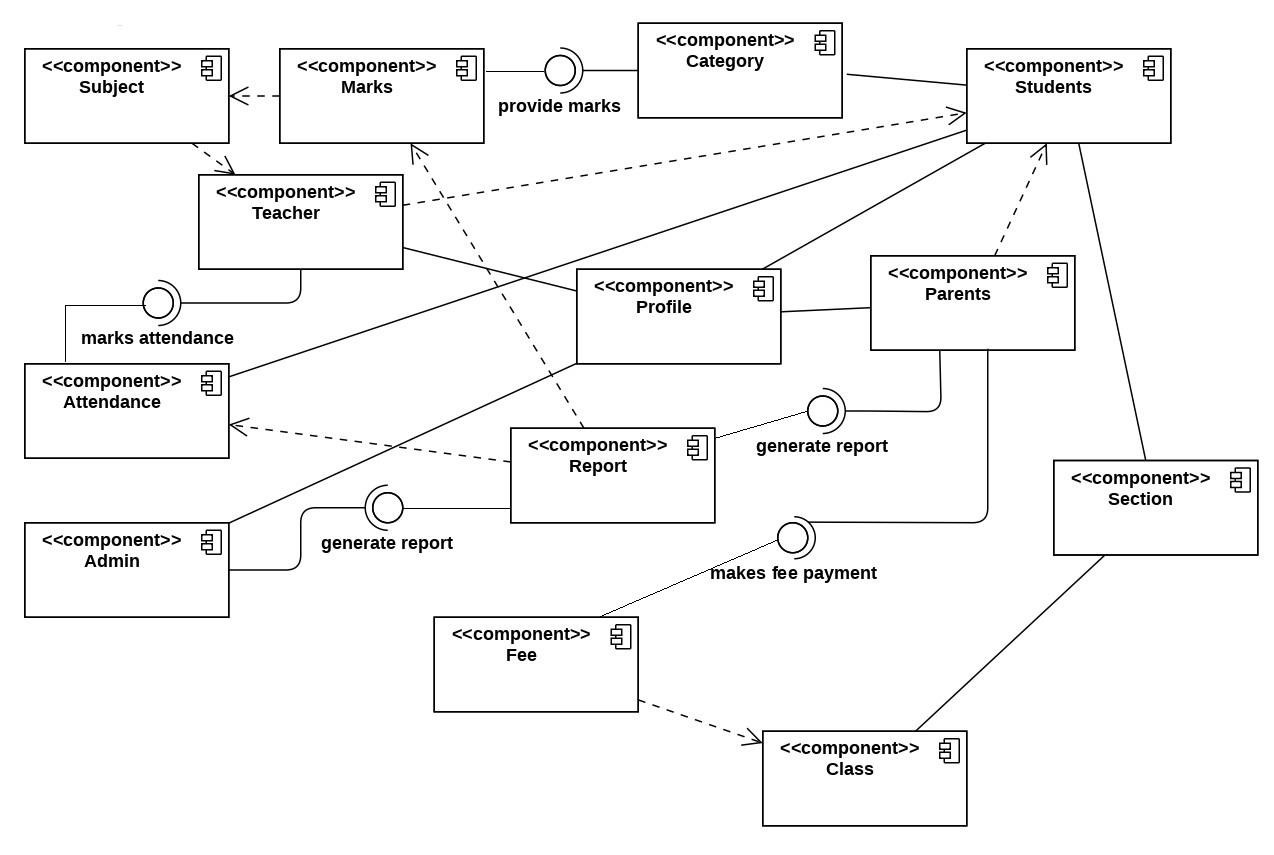
#### Fig 3.13 Activity Diagram for Teacher

If teacher is registered, and once s/he logins 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:

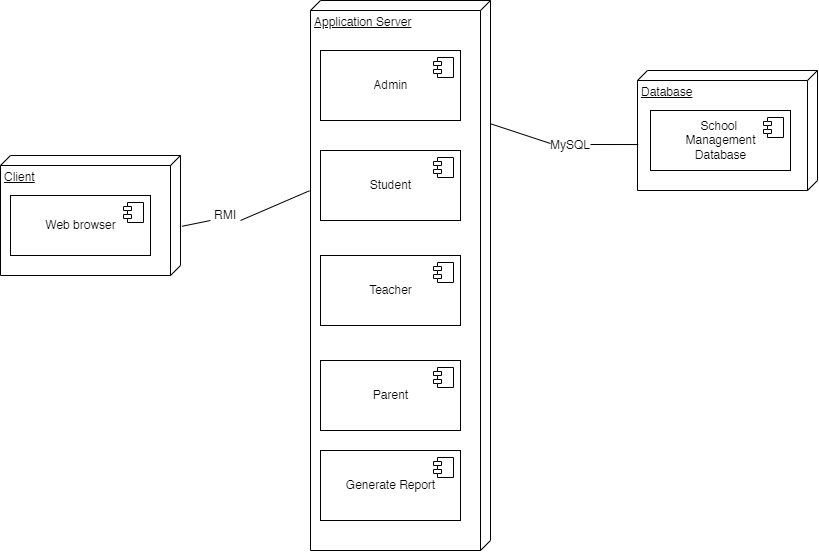


#### Figure 3.14 Component Diagram

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.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Edit data | Class Name: One  Class Price: 500 | Edit the data as requested and update in database | Edited and updated in database | 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** | **Remark**  **s** |
| Login for admin | Username: **admin**  Password: **1234** | Admin  login success and land on admin dashboar d | Login Success and redirects to admin homepag  e | 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 dashboar d from  Admin’s session | **localhost\\sms6\Application\teacher\profile.p hp** | 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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