

# **School Management System (SCMS)**

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of  
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# Approval Certificate

This project titled "**School Management System**" submitted by **Anupam Roy**, Student ID: **012132007**, has been accepted as Satisfactory in fulfillment of the requirement for the degree of Master of Science in Computer Science and Engineering on 13<sup>th</sup> January, 2018.

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## Declaration

This is to certify that the work entitled “**School Management System**” is the outcome of the research carried out by me under the supervision of Dr. Muhammad Nurul Huda, Professor & Coordinator MSCSE Programme.



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In my capacity as supervisor of the candidate's project, I certify that the above statements are true to the best of my knowledge.

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## **Abstract**

Education is the key to unlock the golden door of freedom. After parents this is teacher who guides children to the path of success. At this current age of education in most of the places Bangladesh is felled behind in many expects. Among many reasons one is lack communication between teacher and parents. SCMS will help to smoother and make it more effective by sharing performance information about student on daily basis.

## **Acknowledgement**

I am very grateful to my honorable project supervisor Dr. Muhammad Nurul Huda for his continuous support, assistance, instruction and encouragement, without which my work would have never been completed.

I would like to give special thanks to Mr. Shahidullah Al Mahmod , Senior System Analyst, CSL SoftwarResources Ltd for his regardless support through the whole project.

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# Chapter 1

## Introduction

Bangladesh has one of the largest education systems. There are more than 1, 22,176 schools with 1, 90, 67,761 students. In spite of this a very little part of these schools are able to deliver quality education. Most of them are not up to date with delivering quality education to students.

Main problem in our present schooling system is, there is lack of communications between teachers and students and within their parents. Parents are not aware of how their kids doing in schools, are they regularly present in classes or not, are they doing their home works; Is their results are satisfying or not. In a word parents don't get update about their children performance on daily basis.

Our ***School Management System (SCMS)*** will fill up these gaps. School Management System (SCMS) is a centralized system used by educators and administrators to collect information needed to manage education delivery, improve student achievement, and ensure accountability. Both of them can access data about student and school performance at any time through this improved information management system.

## **Chapter 2**

### **Project Overview**

#### **2.1 Project Perspective**

We all know a large portion of our school student bunk school in the middle of classes. Some doesn't even present in school while they left home for school. Parents are in dark about their children attendance and performance.

To cope up with this problem, I have integrated sms service for absent students; this will notify immediately after school start that their children is not in school. Even if schools want they can send any notice immediately to parents.

Parents will also get any information regarding their children improvement in schools, through our system anytime anywhere. Attendance history, results, home works, tutorials and payment history everything will be available in this system.

Exam marks entry and result process is one of the time consumable work is school. In this system results can be process within a short period of time.

##### **2.1.1 Project Features**

- Parents will be notified immediately about the attendance of their children.
- Parents will be kept updated about their children's result, home works, payments and other information.
- Any notice can be sent immediately through sms.
- Information can be accessed anytime, anywhere.
- Attendance can be processed within a short period of time.
- Results can be processed easily.

### **2.1.2 User Classes and Characteristics**

There will be 5 types of users in this project

- a. Student & Parents
- b. System Admin
- c. Teacher
- d. HR Admin
- e. Accounts

### **2.1.3 Operating Environment**

#### **2.1.4 Design and Implementation Constraints**

Product is developed using ASP.NET 4.5 framework. The backend is supported by SQL Server 2008. The product is accomplished with login Employers so that specific function is available to specific user. Also additional security is provided by ASP.NET 4 used during development. The system requires a database in order to store persistent data. The database should have backup capabilities.

The development of the system will be constrained by the availability of required software such as web servers, database and development tools. Much better results are expected when it will be deployed on the real environment.

##### **2.1.4.1 Design Constraints**

The system must be designed to allow web usability. That is, the system must be designed in such a way that will be easy to use and visible on most of the browsers. The designing was done with long term service and ease of maintainability in mind.

##### **2.1.4.2 Assumptions and Dependencies**

The product needs the following third party libraries and software:

- .Net (ASP.NET 4)
- SQL Server 2008
- JQuery
- Highchart
- Java script

## 2.2 System Architecture

I have developed my system in asp .net C#. I have followed n-tier architecture. In my system there are 3 tiers.

- Presentation Layer
- Business Logic Layer (BLL)
- Data Access Layer (DAL)

In presentation layer I have followed “MVC architecture”. Model–View–Controller (MVC) is a software design pattern that separates the representation of information from the user's interaction with it. The model consists of property of view classes and the controller mediates input, converting it to commands for the model or view. A view can be any output representation of data, such as a chart or a diagram. I have used razor engine in view.

Here is a diagram of my system architecture:

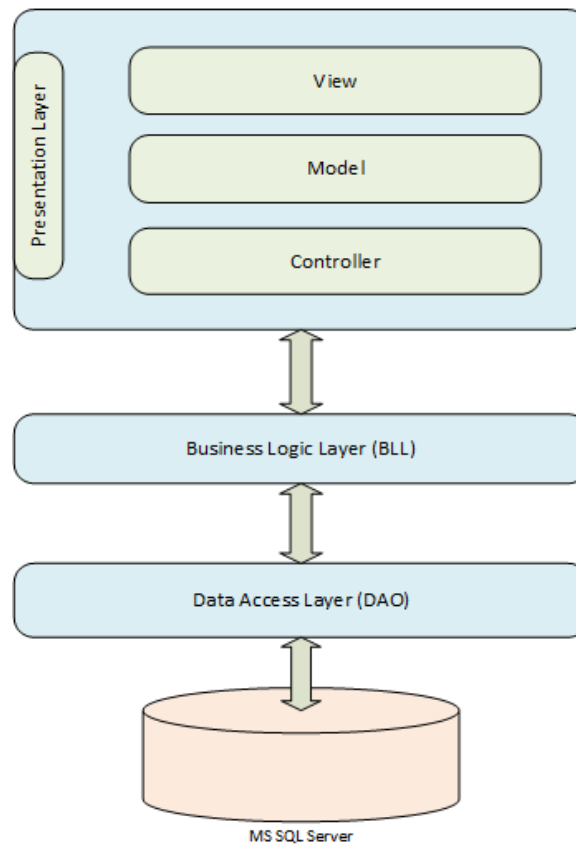


Figure 1: Application Architecture

## **Model**

The Model is the actual data representation which represents a table of database. It is simply an object to pass data between view and controller. Model could be two types, view model and data model.

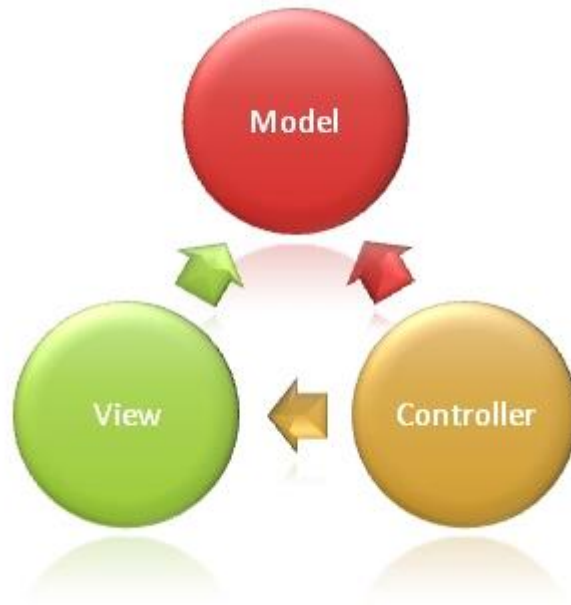


Figure 2: MVC Architecture

## **View**

The View is an interface to reading the model.

## **Controller**

The Controller (here implemented in C#) provides the interface of changing or modifying the data, and then selecting the "Next Best View" (NBV).

## **2.2 Used Technology Products**

Listed below technology have been used in these projects proposed:

- ASP.NET framework 4
- C#
- SQL Server 2008
- JavaScript
- JQuery
- Photoshop
- RazorView
- Bootstrap
- Highchart
- Rdlc Reporting

### **Requirements**

- Domain Server for hosting application
- SQL Server 2008 Database
- Third Party Security Software (optional)
- Third Party Server Load Management Tools (optional)
- High Speed Internet Connection
- Power Backup (UPS)

## Chapter 3

### UML Diagrams

“The UML is a powerful and effective means of describing and managing business and software development projects. I have used Microsoft to develop my all UML modeling’s.

#### 3.1 Data Flow Diagram

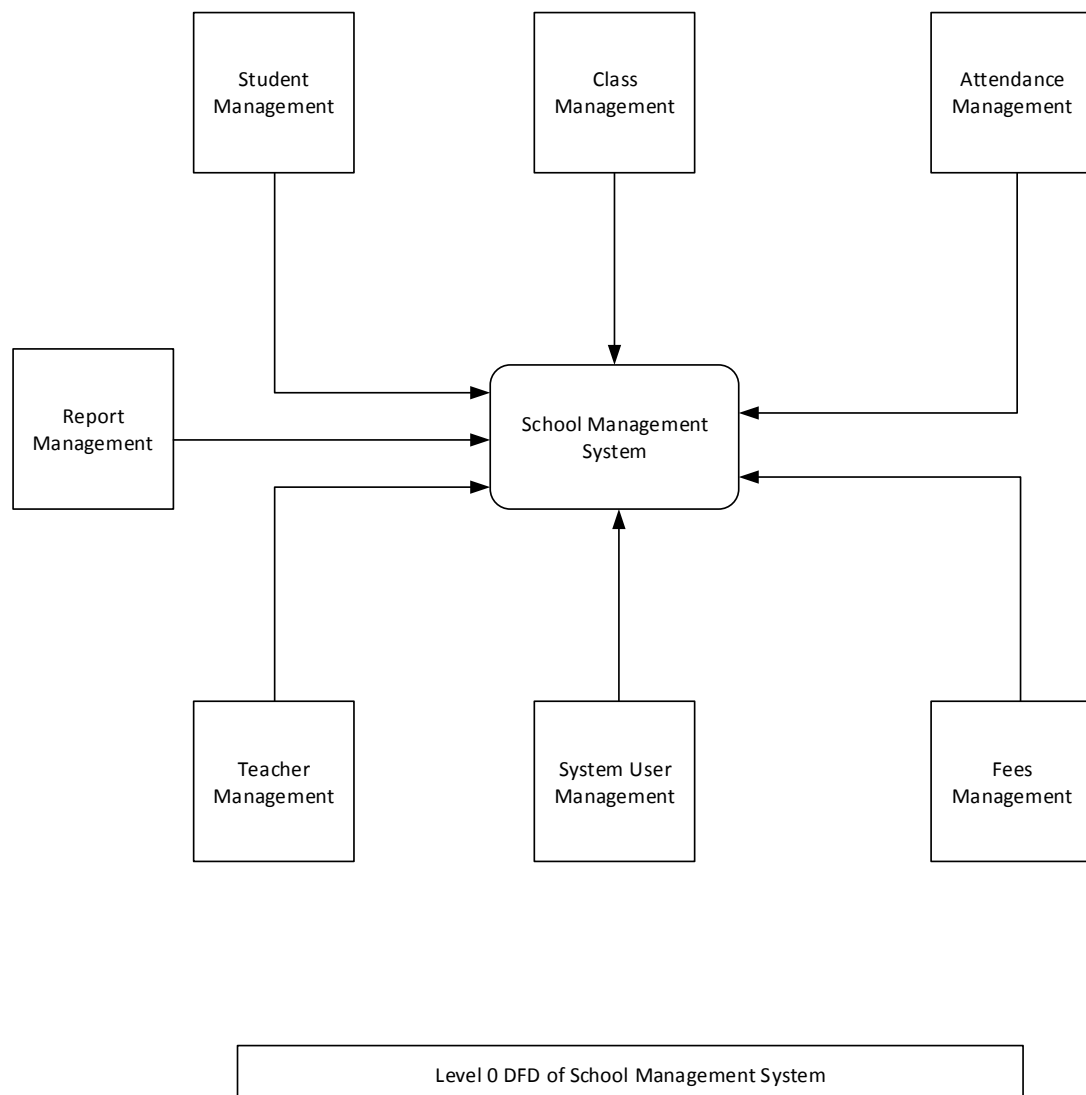


Figure 3: Level 0 – DFD

This is the level 0 Data Flow Diagram. As we can see student management, class management, attendance management, teacher management, fees management, system user management and report management are the key modules of SCMS.

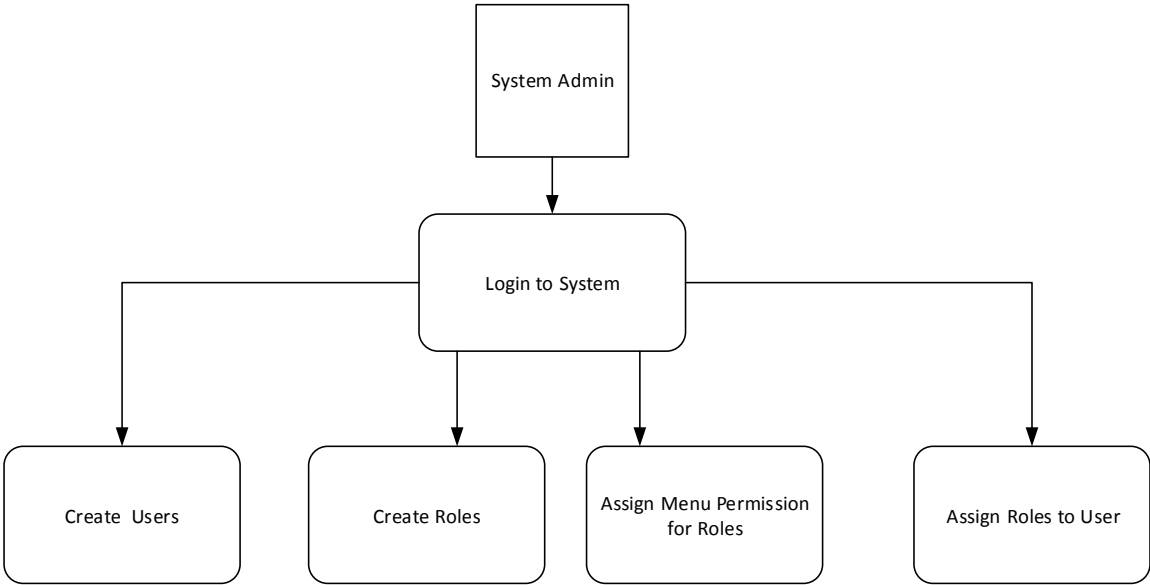


Figure 4: Level 1 – DFD

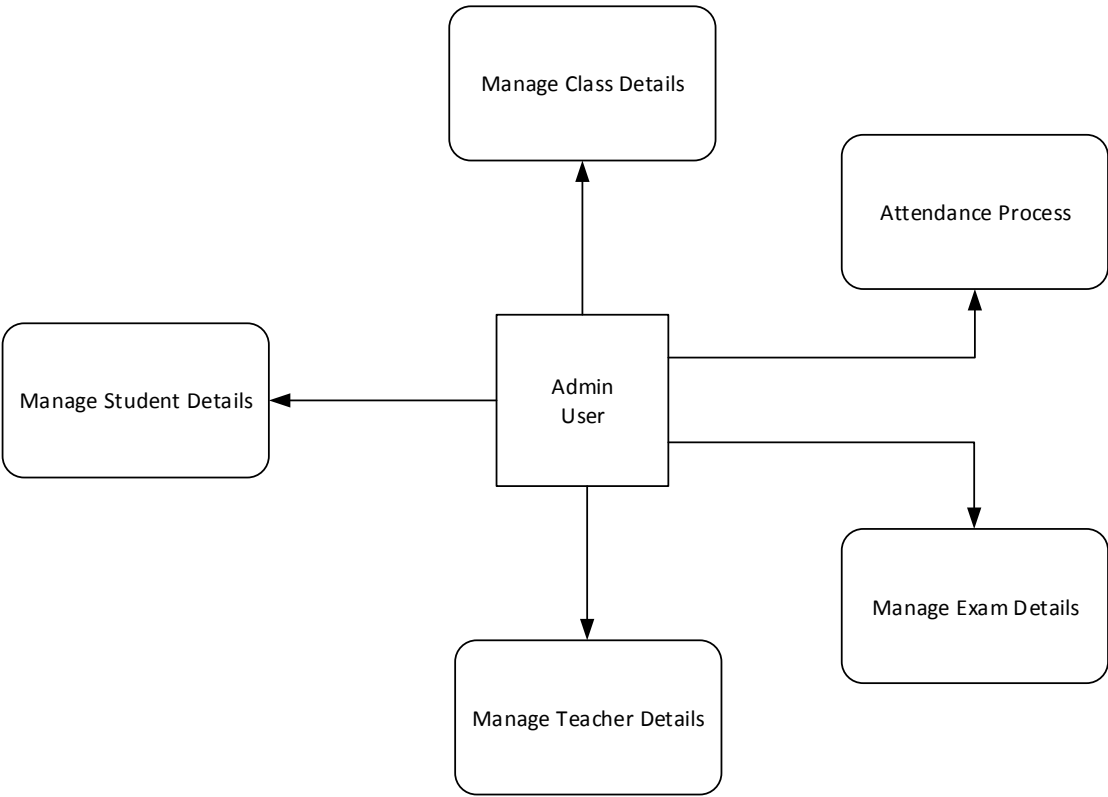


Figure 5: Level 1 – DFD

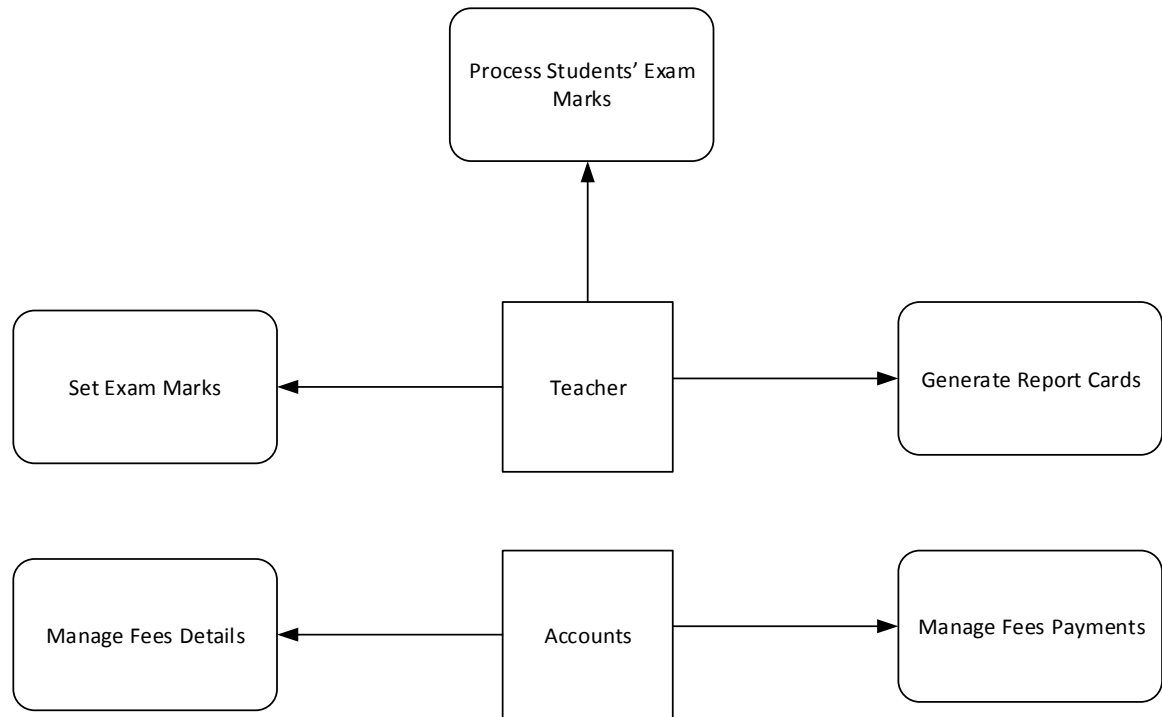


Figure 6: Level 1 – DFD

These are the level 1 DFD. This is more derived data flow diagram.

### 3.2 Use Case Diagram

In software and systems engineering, a use case is a list of steps, typically defining interactions between a role or an actor and a system to achieve a goal. The actor can be a human or an external system.

Here we have five types of users

- a. System admin
- b. HR Admin
- c. Teacher
- d. Accountant
- e. Student

We are going to break down our use-case diagram into four sections for simplicity based on management system.

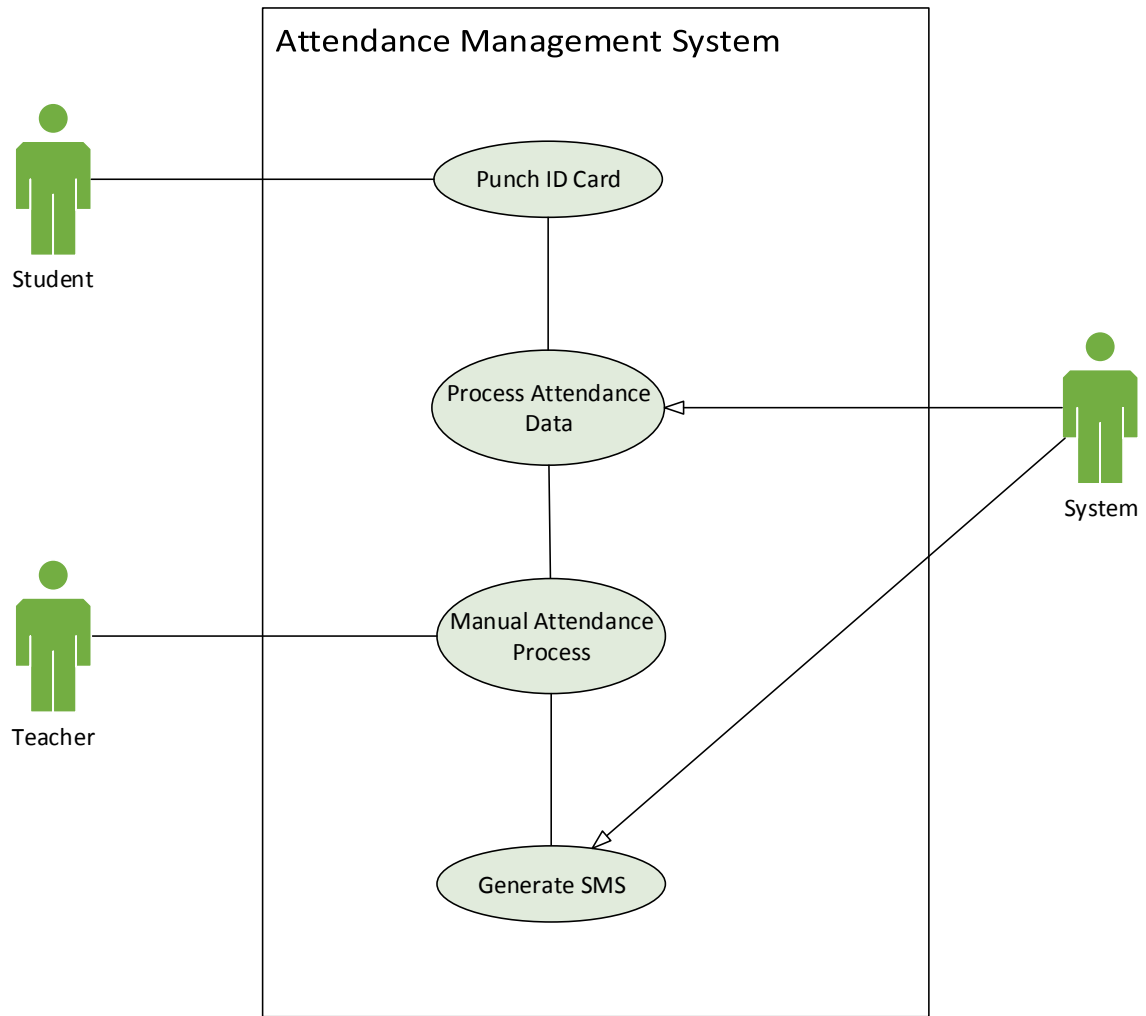


Figure 7: Use Case Diagram – Attendance Management

In attendance management system, teacher and students will first punch their card when they reach school. System will take those raw data. When admin will process those data. System will first get the synchronized data of each student and teacher and then based on his in time system will decide whether he is present or in leave or absent.

If a student somehow misses to punch his card, teacher can manually process his attendance if he or she is really present.

After process the data, if a student is still absent system will send a sms to his parents about his absence. Thus parents will be notified if their children is not present In school.

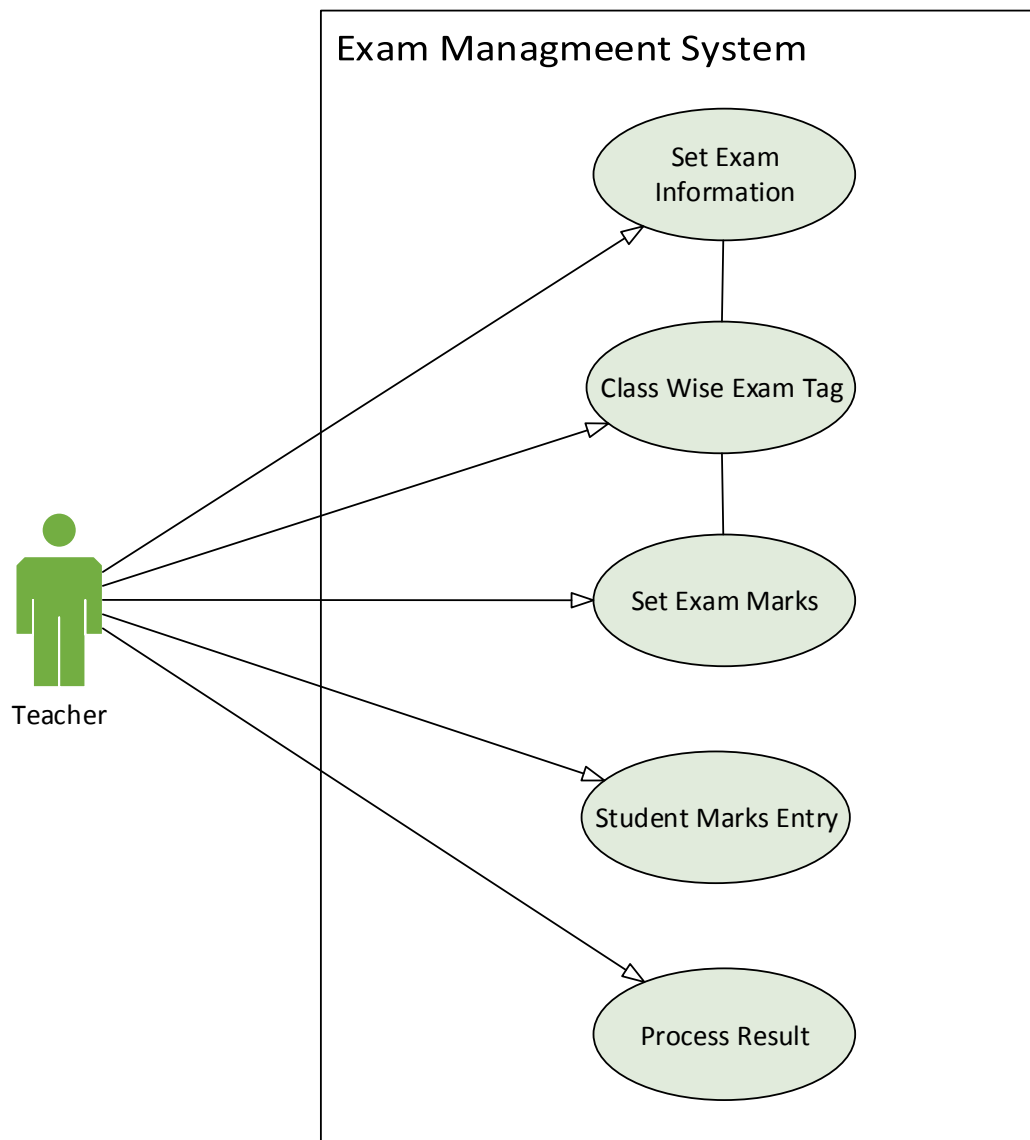


Figure 8: Use Case Diagram – Exam Management

For exam management there should be some configuration set before a teacher can entry marks. First of all teacher will create exam term and exams. Then he will assign those exams to specific class, as exams for class 8 and exams for 10<sup>th</sup> grade are not same.

After that he needs to assign subject with pass marks and total marks to those exams according to classes, as in every exam every subject might not be included.

After exam, teachers will entry the marks of individual students. When all entries are done, they will process the result data and can generate report cards.

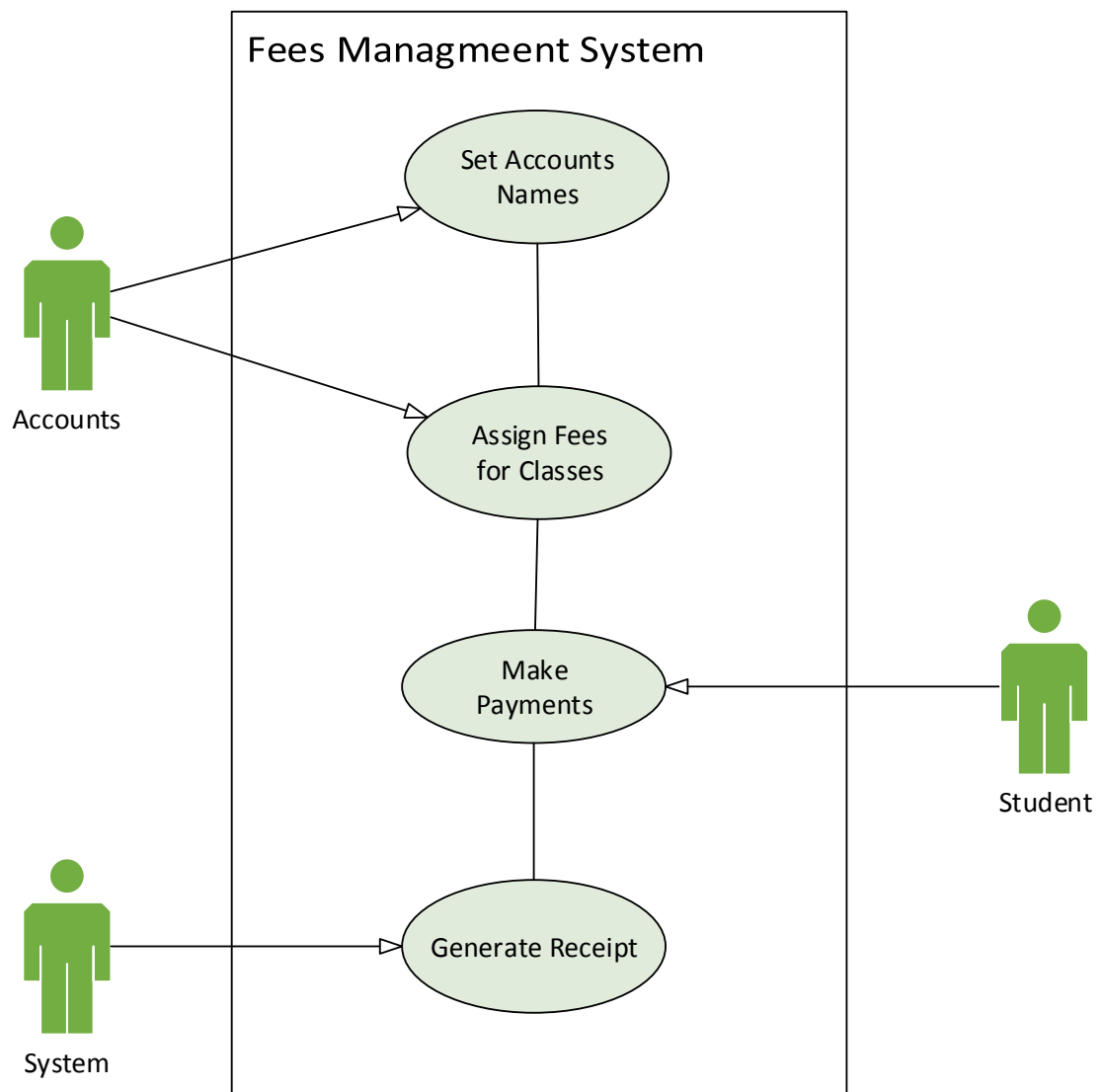


Figure 9: Use Case Diagram – Fees Management

Accountant can set the account names for student payments. And set the payment amount for each class and subject group. When student will make payment they will entry and can print a receipt for students. When student will login to system they will also get the payment history list.

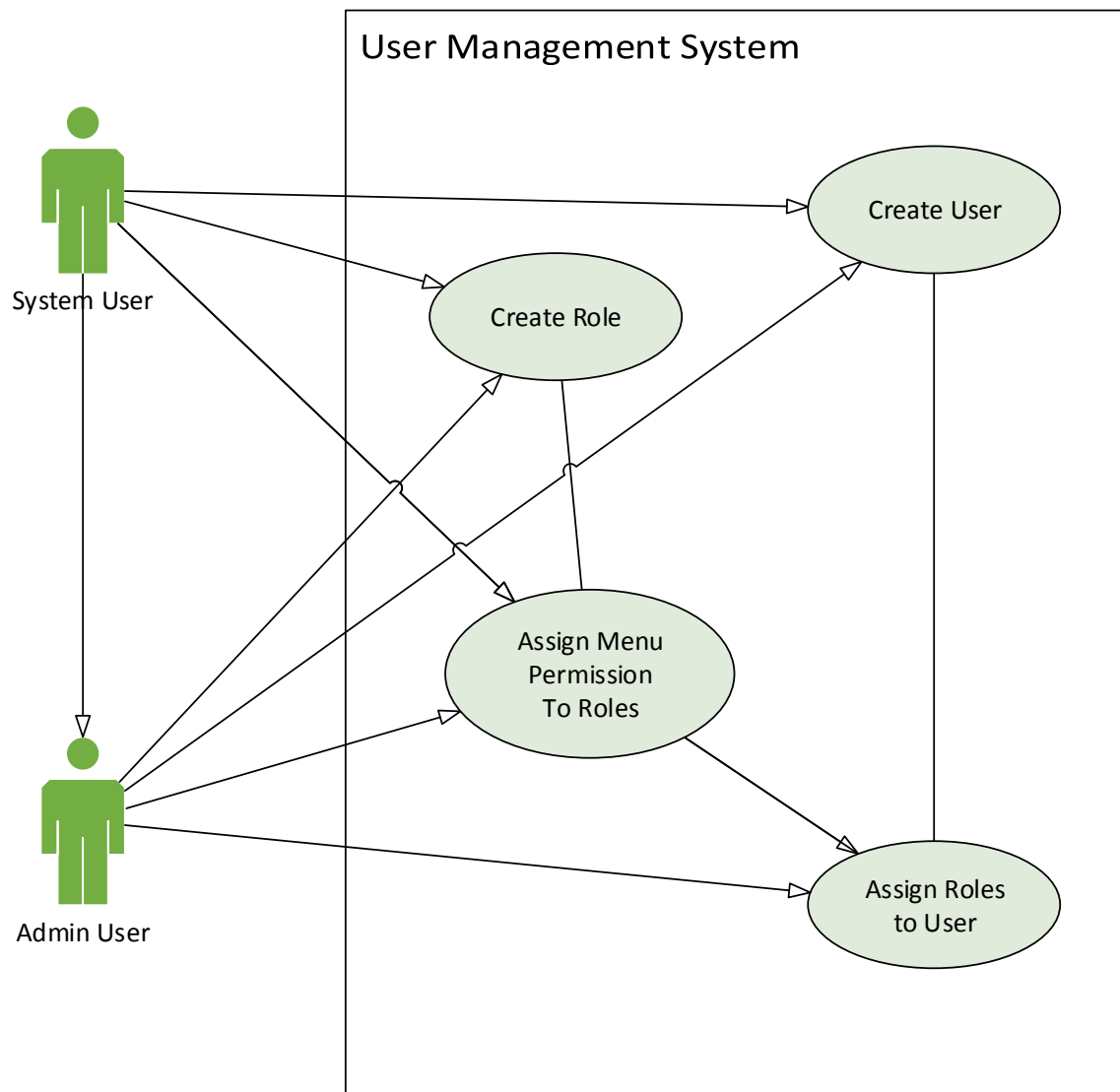


Figure 10: Use Case Diagram – User Management System

There will be a system user who will create users, roles and set menu permissions to those roles. And tag users with specific role or multiple roles.

### 3.4 Sequence Diagram

A **sequence diagram** in a Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams typically are associated with use case realizations in the Logical View of the system under development.

In our system a power user will first create a system admin user for the school who can create users, and roles and set menu permission to those roles. Then he can tag those roles to the users. In a word power user will pass the authority to create and update user and set menu permission to a system user. He can create users like admin, accountant, teacher etc.

An admin can create all the configurations like session, shifts, classes, groups, designations and others. He can then admit students and edit their information.

Here are the Sequence diagram of our proposed system.

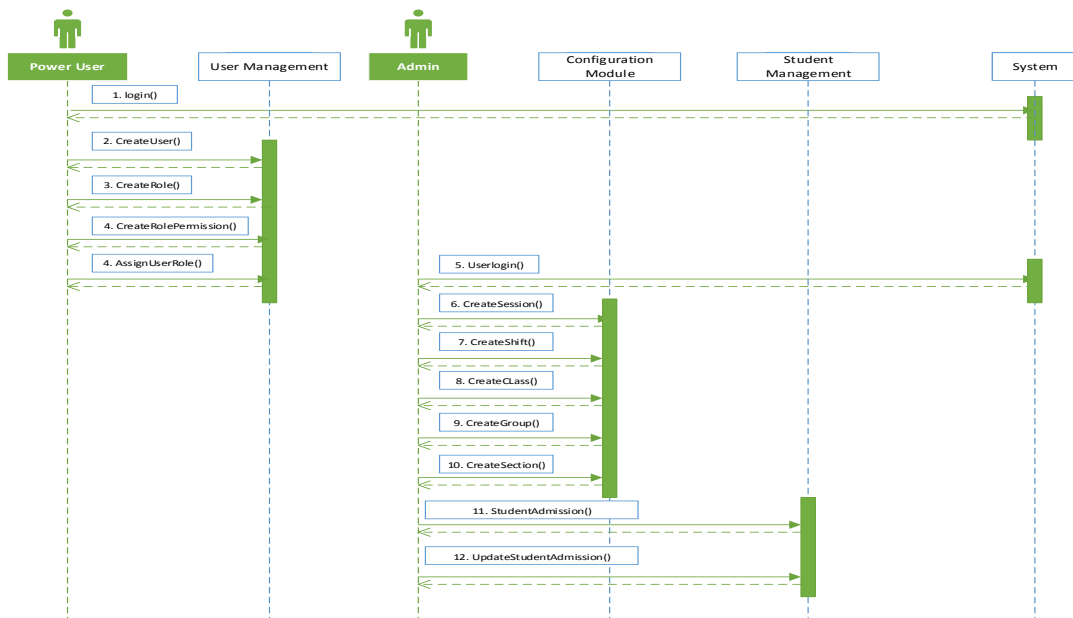


Figure 11: Sequence Diagram 1

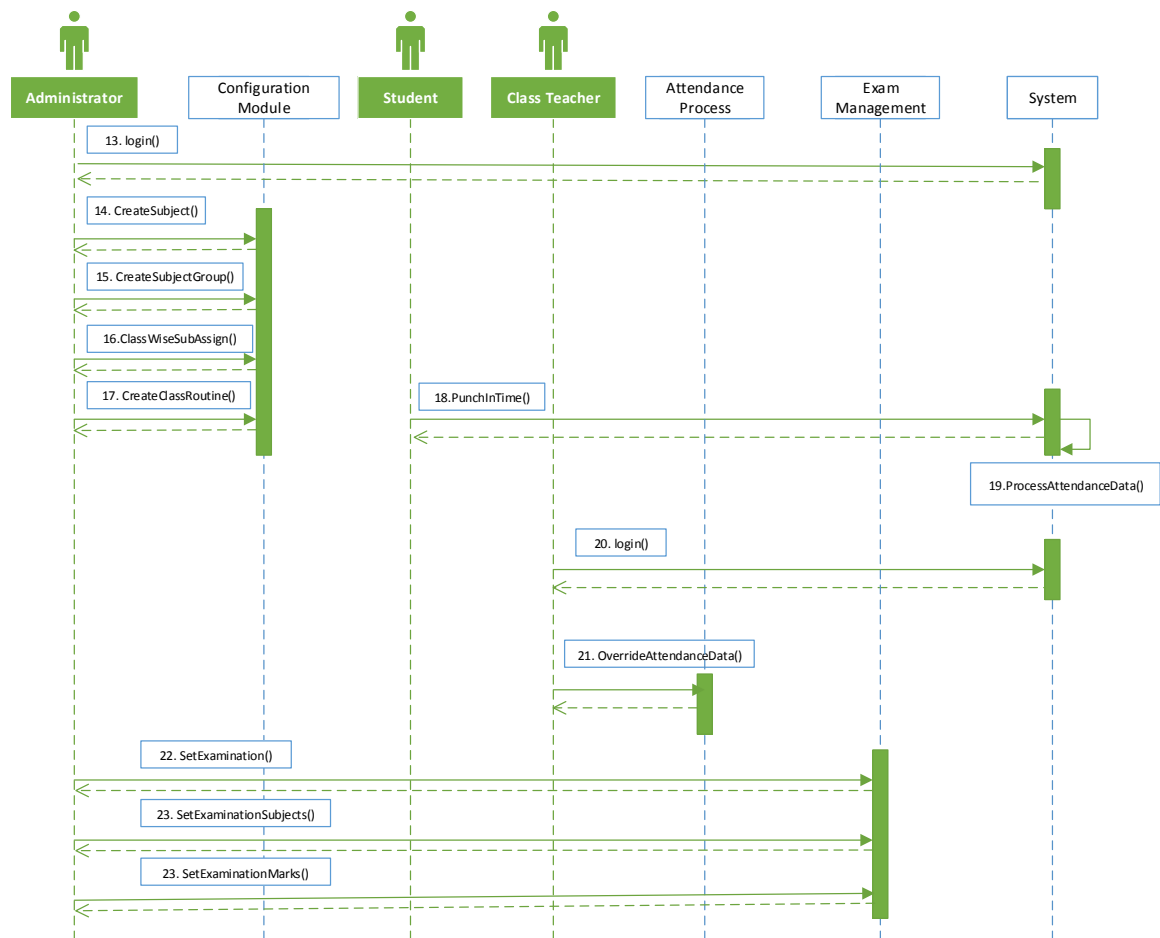


Figure 12: Sequence Diagram 2

Admin can also set exams and tag those exams with classes. Then he can tag subjects with exams and set marks. Class teacher will login and entry exam marks, and will generate report card. Teacher will also manually override student attendance if a student misses to punch his ID card. Teacher will also give home works and tutorials for a specific class.

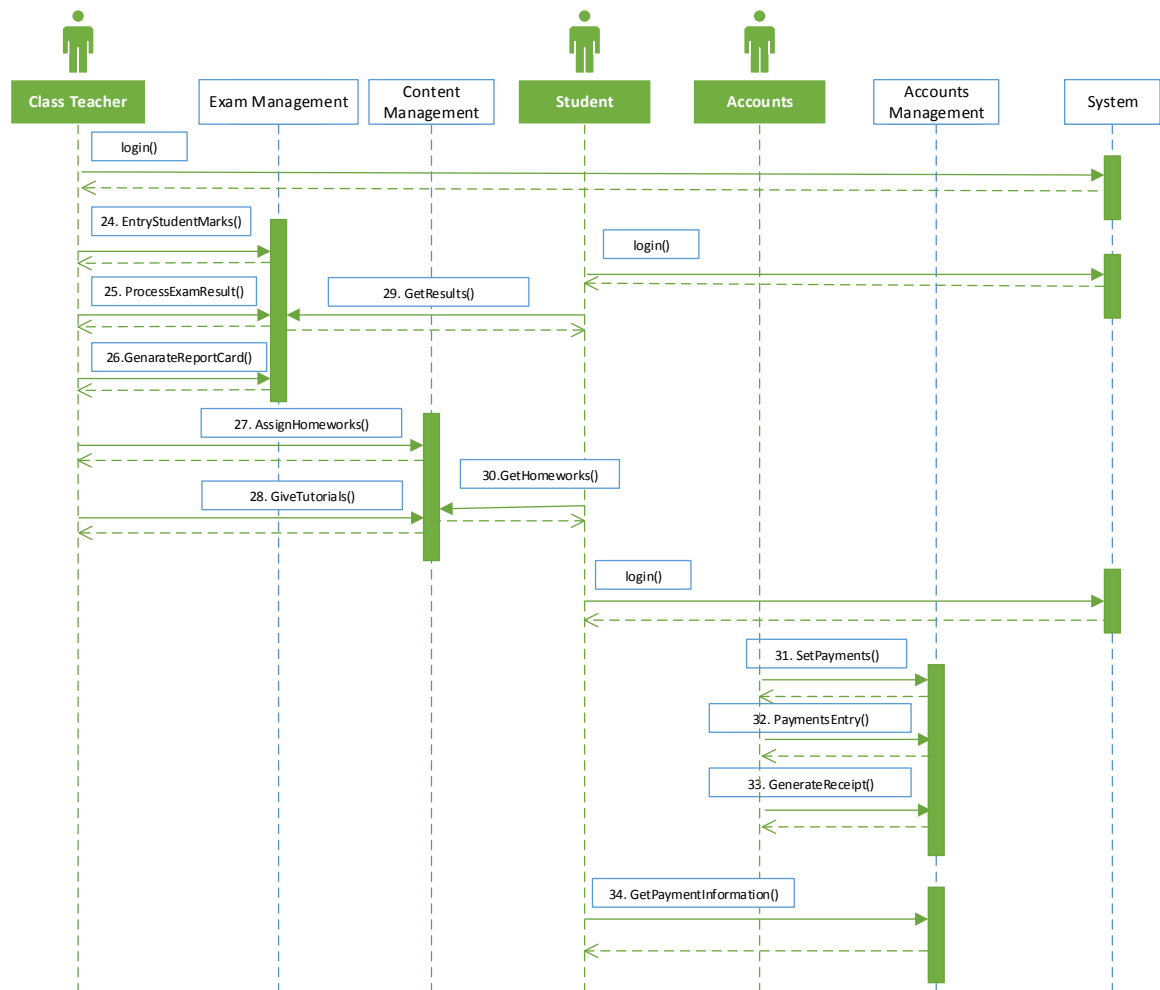


Figure 13: Sequence Diagram 3

Student will login and get all the information they need. They will have access to the tutorials, can check home works. Can check attendance history, payment history and others.

### 3.5 Activity Diagram

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the UML, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system.

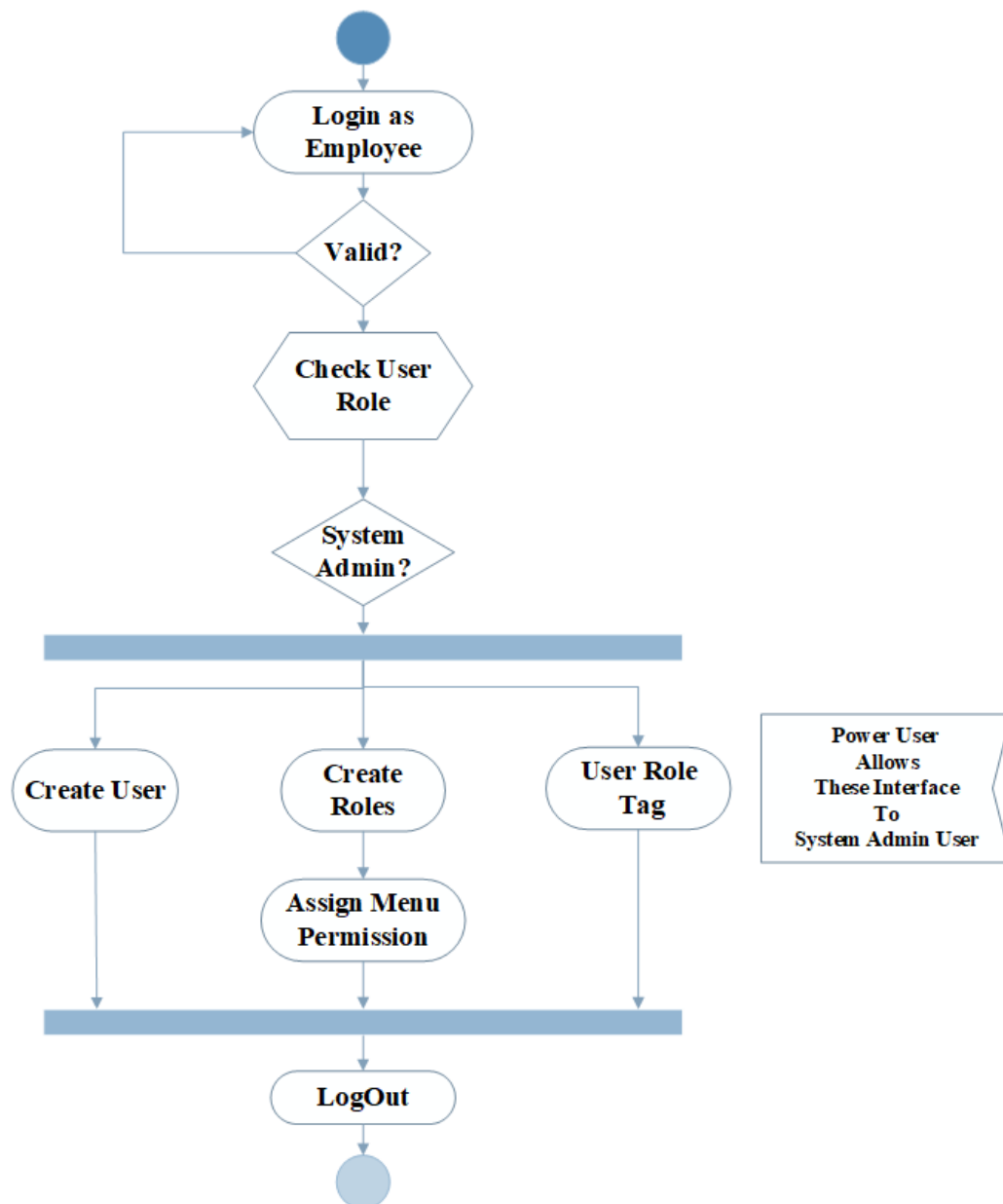


Figure 14: Activity Diagram – System Admin

This is activity diagram of system admin. A system admin can create user, roles and assign permission to roles. He can tag those roles to users.

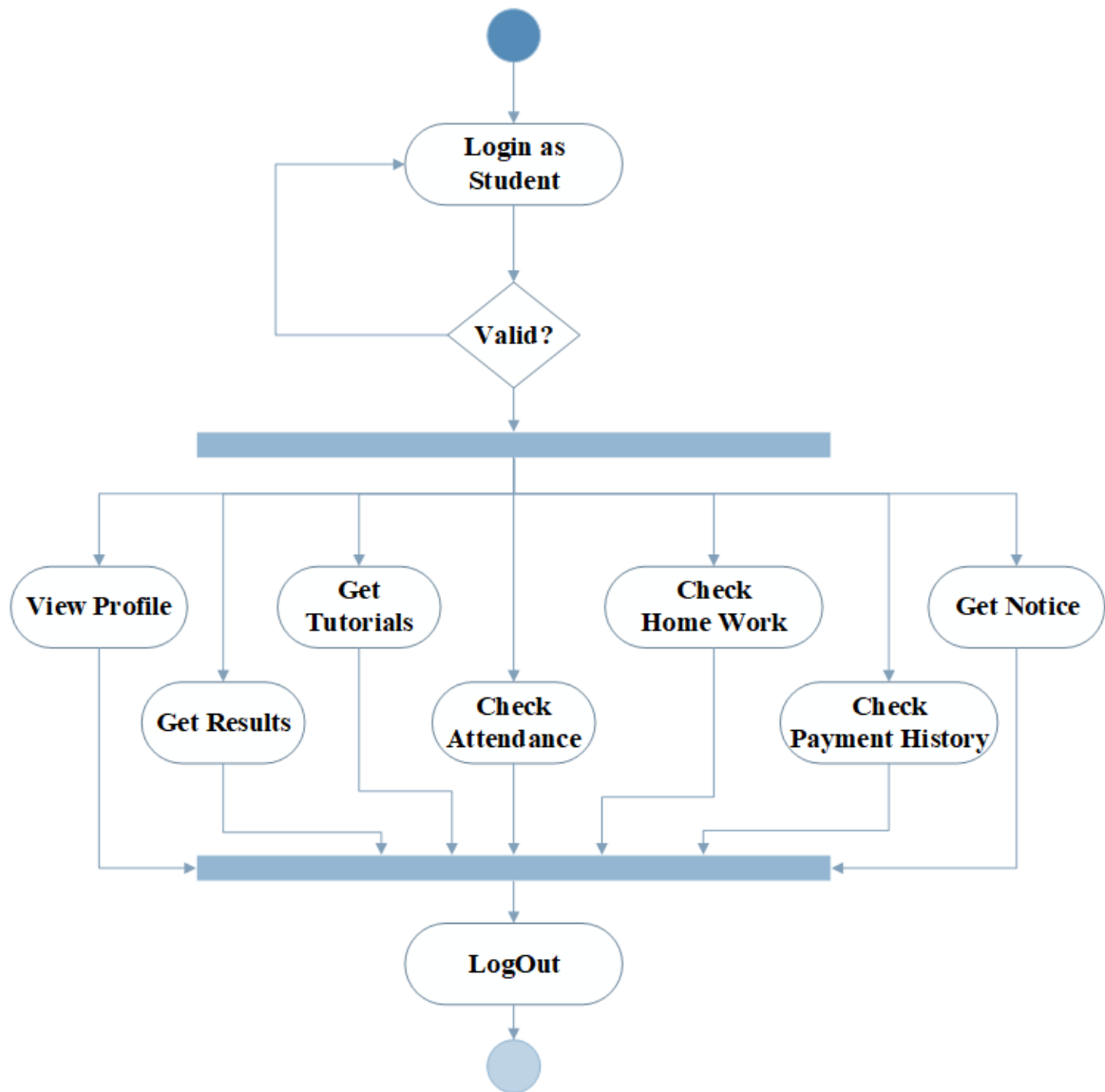


Figure 15: Activity Diagram - Student

Student can login to the system and get any information related to him. Their parents can check their attendance history, home works, payment information, study materials and others.

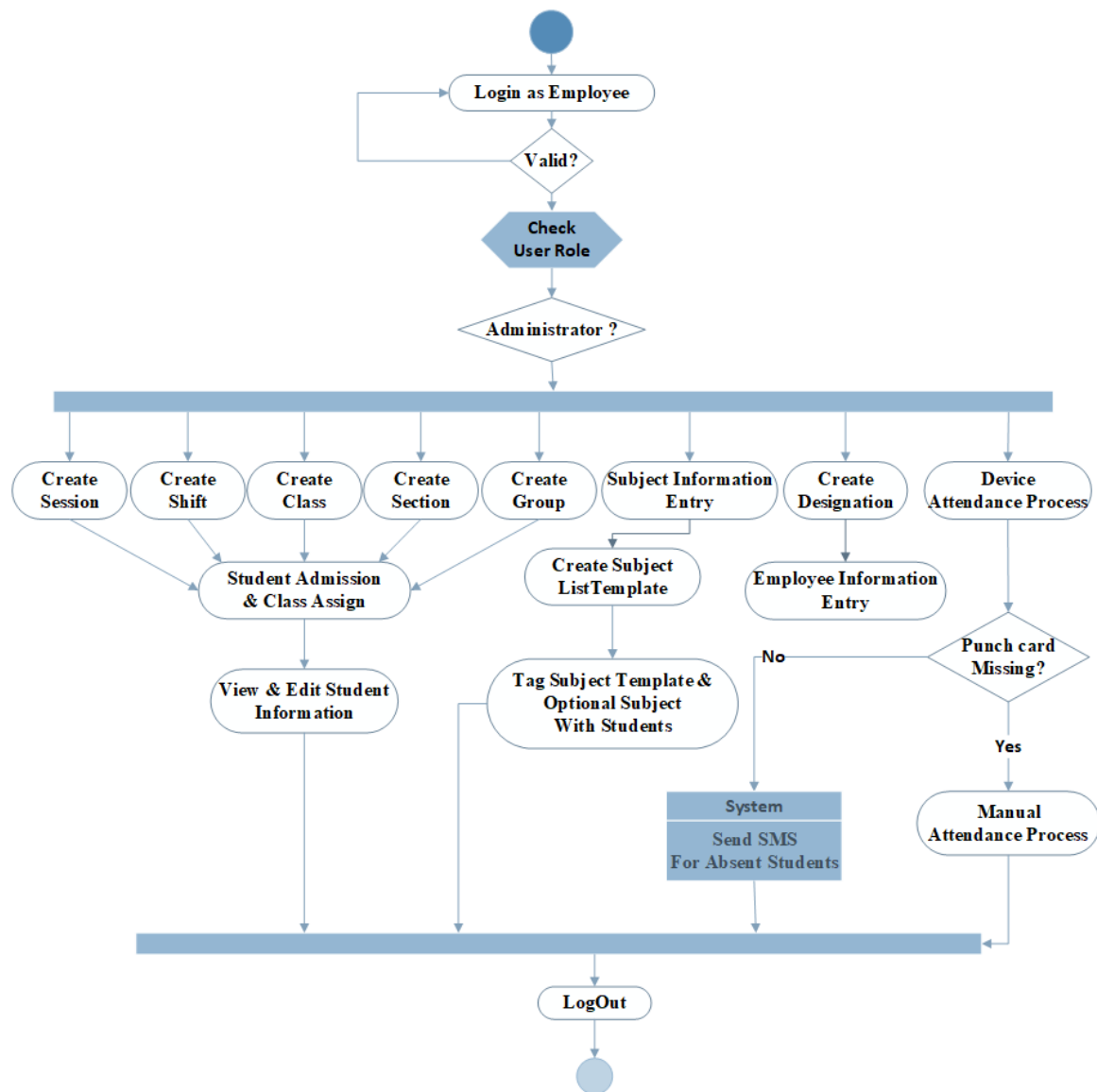


Figure 16: Activity Diagram - Administrator

As an admin s/he can create all the settings data, like session, shifts, classes, sections, groups etc. S/he can admit student and edit his information. Admin can assign class and section and shift to a student. An admin can also update employee information.

Basically an admin can do anything which are permitted by system user. Like he can create subject list and subject template, which can be tagged later with student.

When student will arrive in school, they will punch their card and system will keep their punch data. Admin will manually process the attendance data. System will get the synchronized punch data and save the data with present status in database.

If any student misses to punch his card, admin can manually override his attendance from manual attendance process.

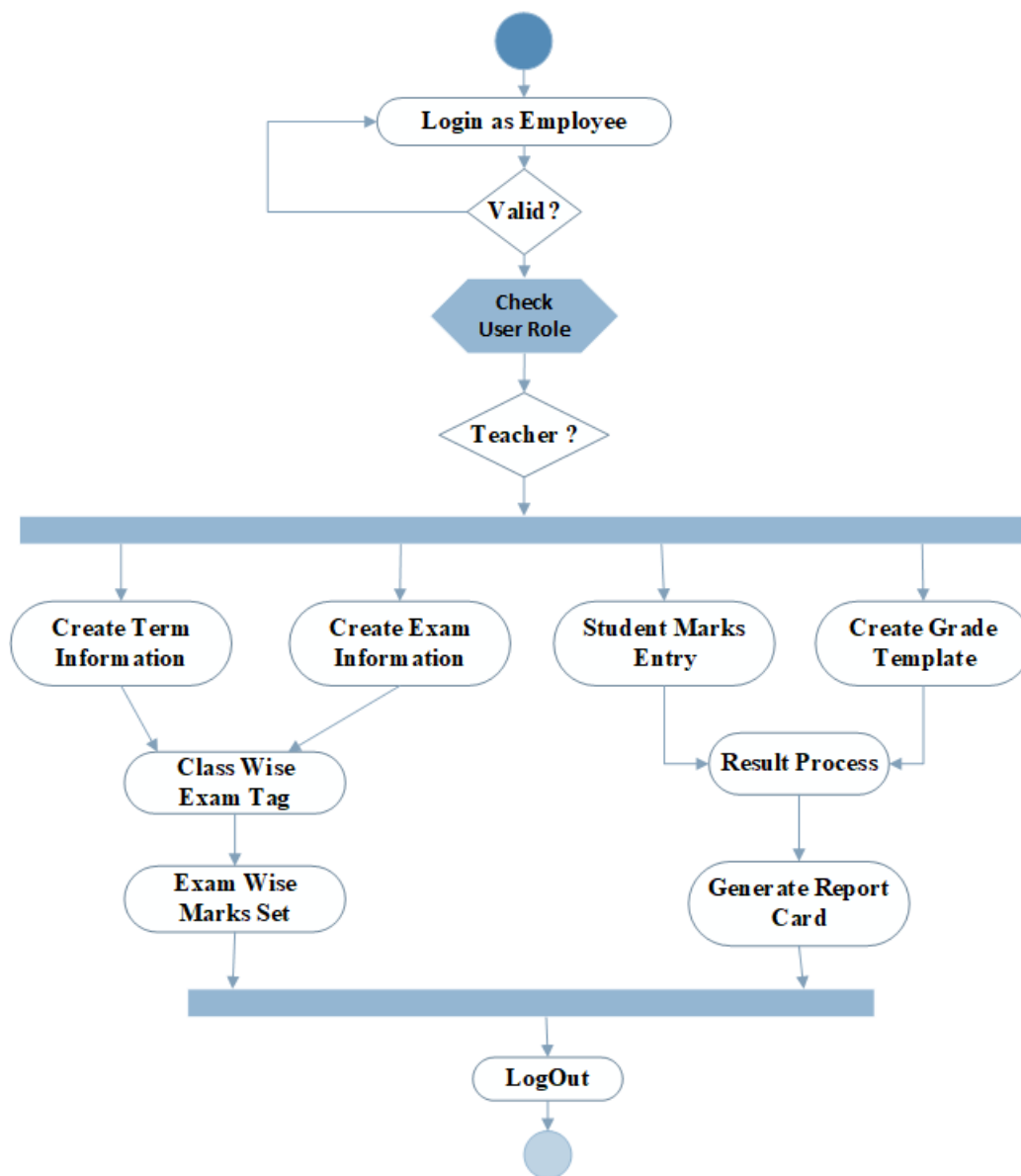


Figure 17: Activity Diagram – Teacher

These are the things a teacher can do when s/he log in to system. Teacher can set exam information and tag subject to those exams. He can set pass and total marks for those exams. After entry marks of students he can process result within a short period of time. Reports card can be generate after that.

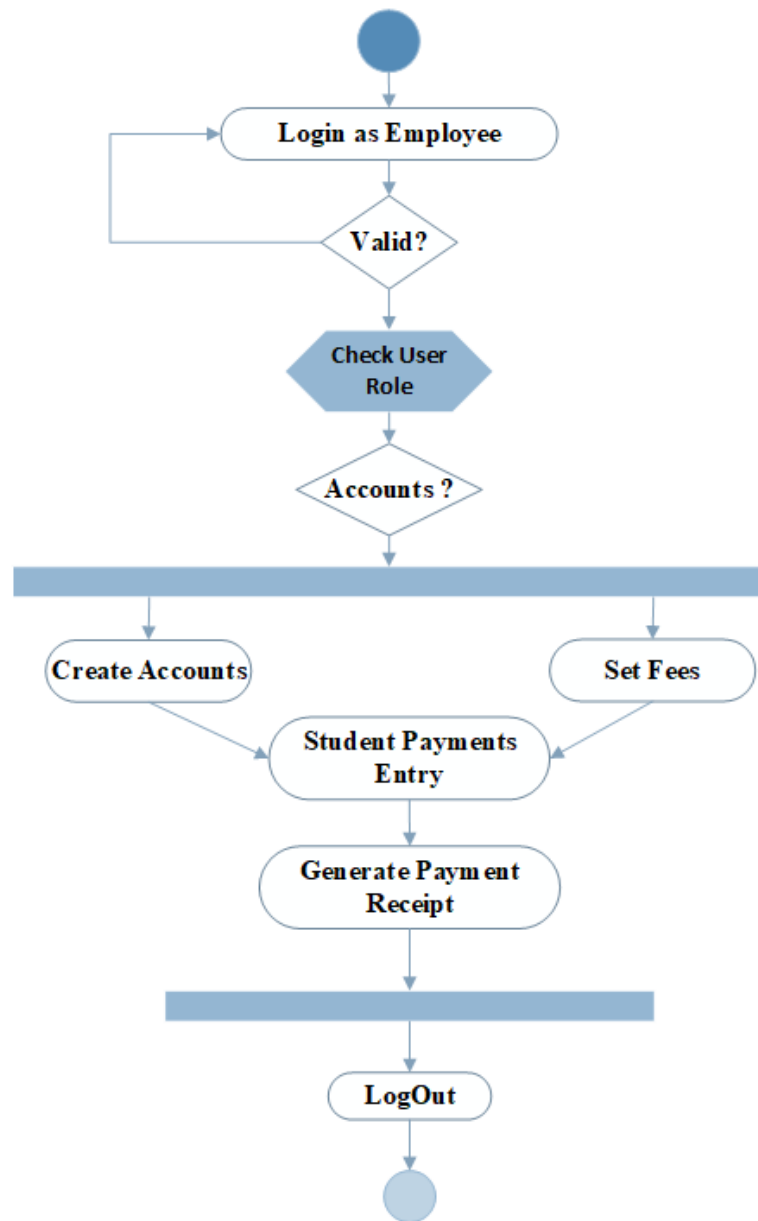


Figure 18: Activity Diagram – Accounts

An accountant can login to system and entry student payments and generate receipt for those payments.

### 3.6 Class Diagram

In software engineering, a **class diagram** in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes.

In MVC architecture Class diagram consist of Model class, Controller class and view.

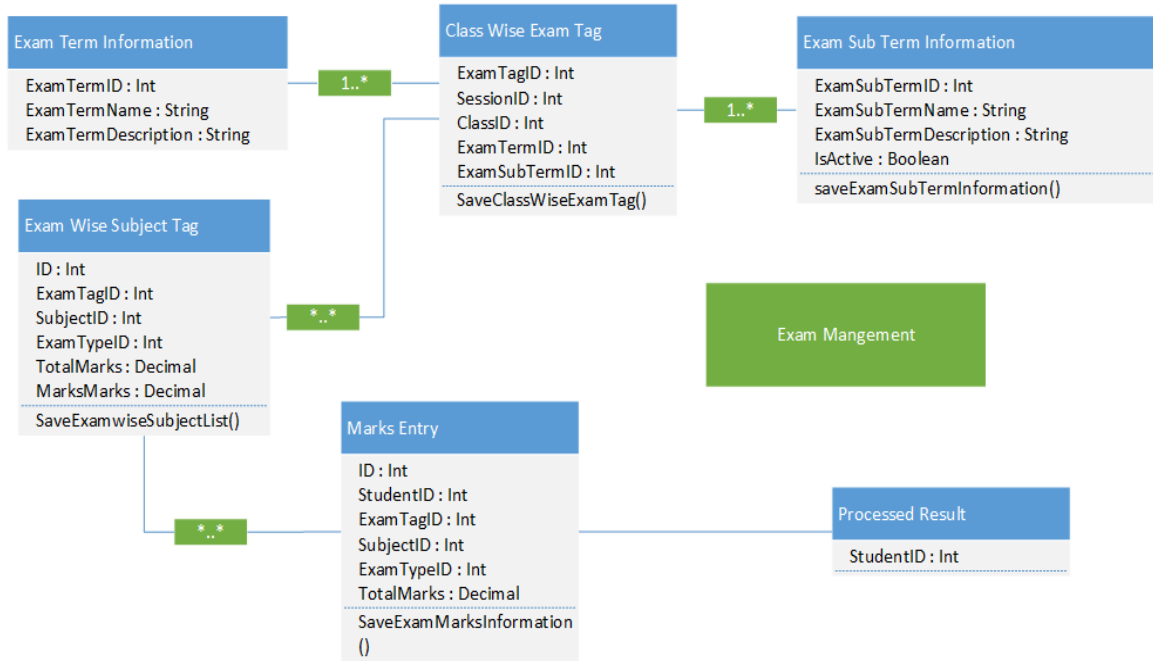


Figure 19: Class Diagram – Exam Management

This is the class diagram of exam management process.

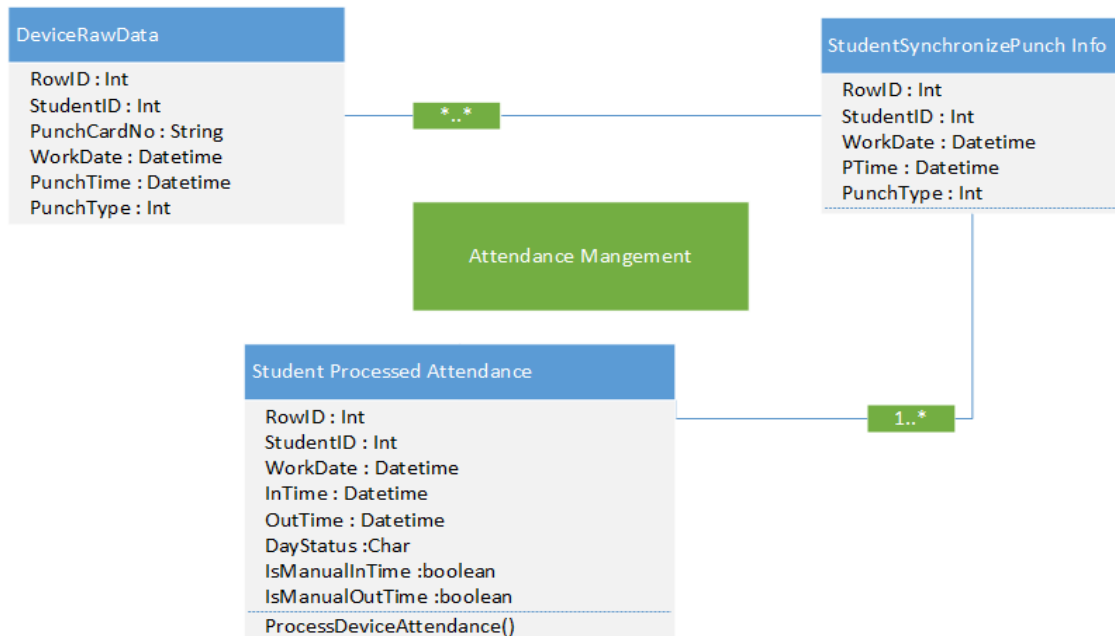


Figure 20: Class Diagram – Attendance Management

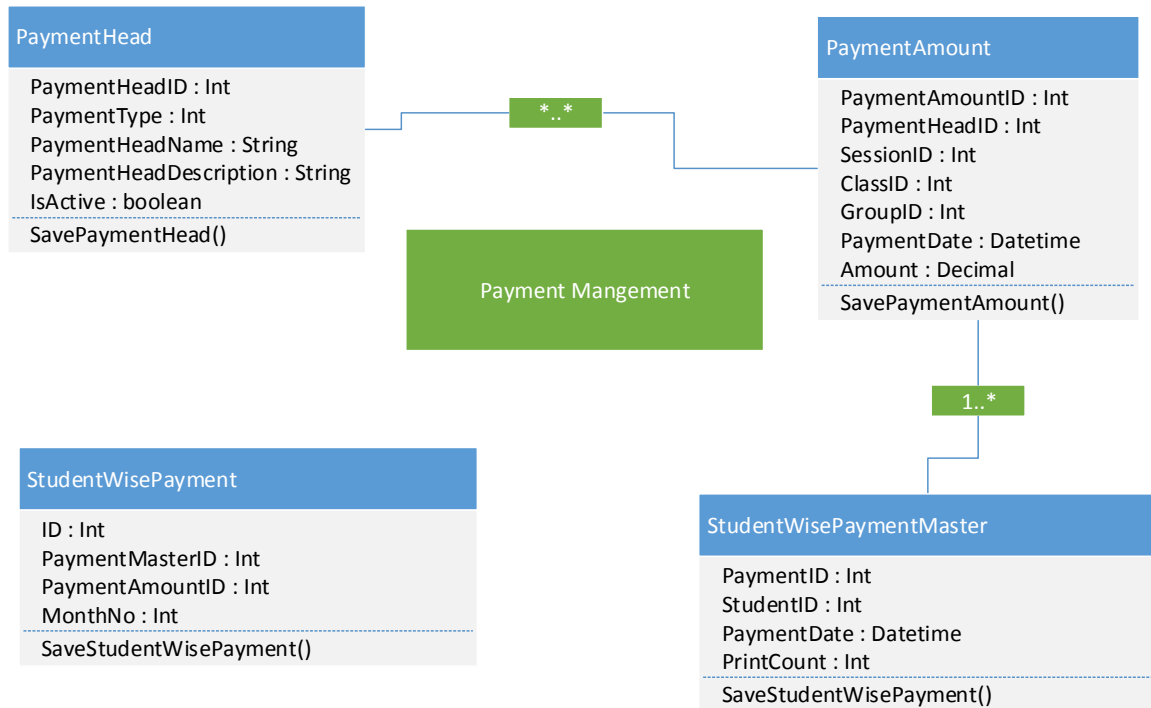


Figure 21: Class Diagram – Payment Management

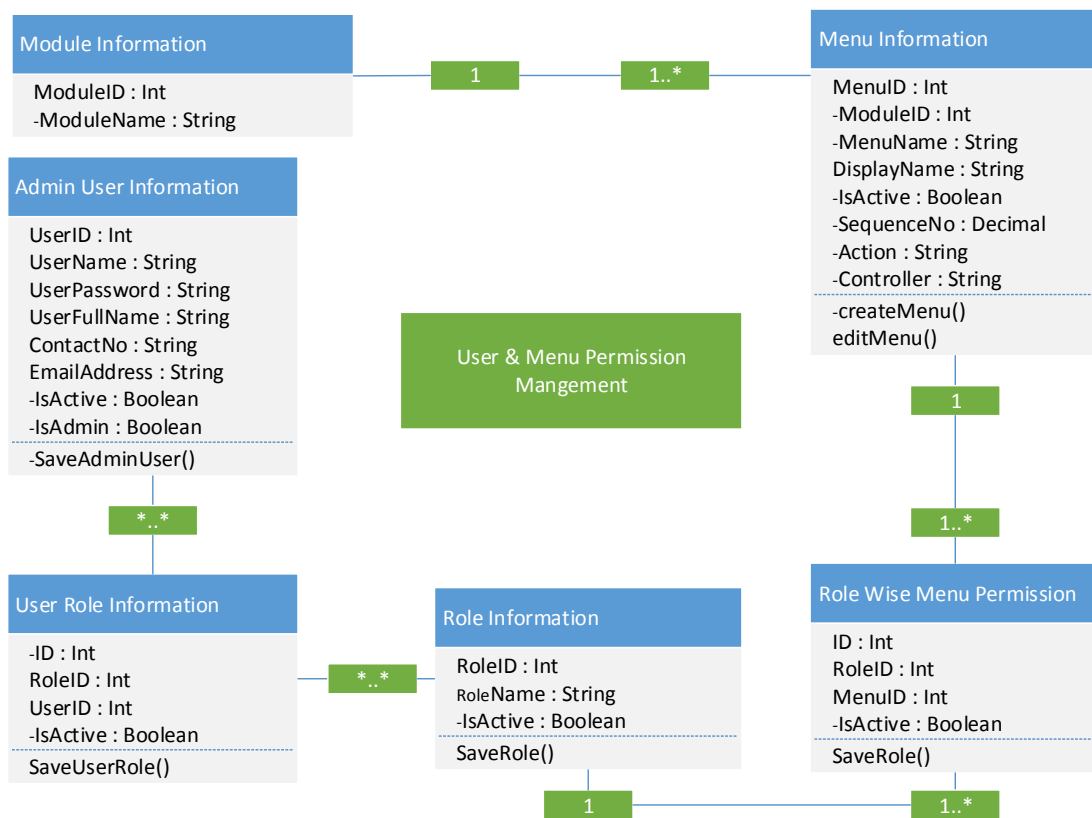


Figure 22: Class Diagram – User & Role Management

### 3.7 UI Diagram

User Interface or UI is the design of [Software](#) Applications with the focus on the [user's experience](#) and interaction. The goal of our system's UI design is to make the user's interaction as simple and efficient as possible, in terms of accomplishing user goals - what is often called "[user centered design](#)"

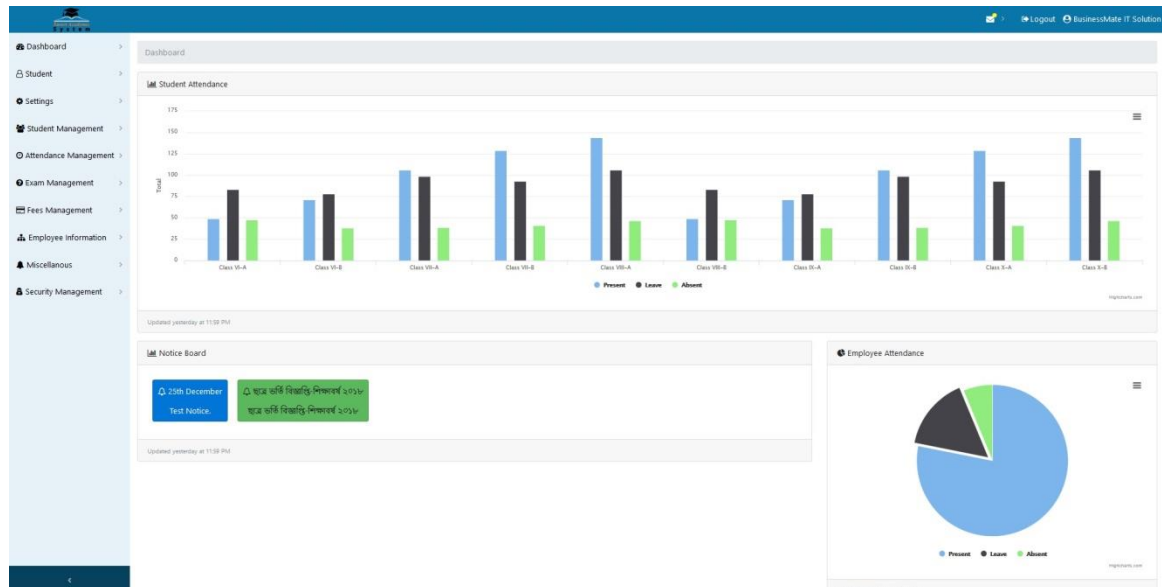


Figure 23: UI Diagram – Dashboard

This is the dashboard of my system. It can be modified based on client's requirement. Initially a user can see the attendance status of students and teacher. They can also check the notice board.

## **Chapter 4**

### **Conclusion**

According to my assumption this system is going to make teachers and parents more closely. It will help them to ensure better education for the students, by communicating on basis of student's performance in schools. Parents do not need to worry about the attendance of their children in schools. Parents can concentrate more about their study by checking home works and day to day update.

## Chapter 5

### Limitations & Future Plan

There are some limitations in my current system. Like, marks should be entry by a subject teacher. But in current system any teacher can entry marks of any subject. I need to fix this first.

There are many future plans to enhance this system.

- Intergrade content management system.
- Library management system.
- Transport management system.
- Hostel management system.
- Accounts.
- HR module.
- Dynamic result card template.
- Class routine generates.

## References

There are some web solutions which I study before develop this system. I had few meetings to get the requirements and brain storming on those requirements.

[1] Annual Primary School Census 2015. ( <http://dpe.portal.gov.bd/> )

[2] Ekattor School Management system.

[3] <http://web-school.in/>

[4] <https://www.highcharts.com/>