



SOFTWARE REQUIREMENTS SPECIFICATION AND SOFTWARE DESIGN SPECIFICATION REPORT

IS 2102

Group: IS-10

Team Inoview




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Group Details

Details of Project Supervisor, Mentor and Client

Group Details

Group: IS-10

No.	Name	Registration no.	Index no.	Signature
1	H. B. P. Hathurusingha	2017/IS/031	17020311	
2	H. A. P. C. J. Jayathilaka	2017/IS/038	17020387	
3	K. D. H. Chamika	2017/IS/016	17020166	
4	M. S. Mushtaq	2017/IS/055	17020557	

Project supervisor, mentor and client details

- **Project supervisor**

Mr. Rangana Jayasanka

- **Mentor**

Ms. Hamsavasani

- **Project client**

mazzSolutions Galle

Owned by Mr. Ilthizam Imtiyas

Abstract

1.0 Introduction

1.1. Purpose

This documentation provides description on the requirements of **Southern Institute of Galle** which is an educational institute providing tuition for students from grade 6 to A/L. First we will take look at the limitations of the manual system currently used at the institute. Then we will evaluate the proposed system with its scope, goals, objectives, limitations and constraints. In this document system's Feasibility, requirements, architecture, design and interfaces of the proposed system will also be discussed. The proposed system's design will be described with the aid of diagrams.

1.2. Acronyms and Abbreviations

- **HTML - Hypertext Markup Language**, standard markup language for creating web pages.
- **CSS - Cascading Style Sheets**, simple design language intended to simplify the process of making web pages presentable.
- **SQL - Structured Query Language**, standard language for storing, manipulating and retrieving data from databases.
- **MySQL** - MySQL is an open source RDBMS (Relational Database Management System) that uses SQL (Structured Query Language).
- **PHP - Hypertext Preprocessor**, server scripting language, and a powerful tool for making dynamic and interactive web pages.
- **jQuery** - jQuery is an open source JavaScript library that simplifies the process of adding advanced functionality to web projects.
- **ERD - Entity Relationship Diagram**
- **IDE - Integrated Development Environment**, software suite that consolidates the basic tools developers need to write and test software.
- **CodeIgniter**- CodeIgniter is an open source software rapid development framework, for use in building dynamic web sites with PHP.

1.3. Domain description

Southern Institute in Galle is an educational institute which provides valuable education to school students in Galle as well as setting the right path for their future success. The institute offers tuition classes for students from grade 6 to A/L, throughout the week. Qualified and experienced teachers are conducting classes.

1.4. Current system

Current System is based on manual maintenance of all records relevant to the students, staff and payments which is highly inefficient. In order to join classes, students have to visit the class and see available classes or call the institution. Also the scheduling system which assigns students and staff to classes is not well maintained, leading financial mismanagement and confusion. Payment gathering from students and teachers is not done in an efficient manner and hence hard to determine those who have not made the payment in due time.

The proposed web application will automate all manual processes together with few more functionalities which will help to gain more attraction among students and teachers alike and ease the effort of maintaining records.

1. 4. 1. Stakeholders

Stakeholders of the current system are

- Admin
- Receptionist
- Teacher
- Student
- Parent

Out of the mentioned stakeholders Admin and Receptionist are primary actors while Student, Teacher and Parent are secondary actors.

1.5. Limitations of the current system

Some of the limitations that were noticed in the current system are given below.

Inefficient scheduling and hall management system

The scheduling and hall management is done manually hence there is no proper way of keeping track of any changes in class schedule or arrangement of extra classes. One crucial limitation of the current system is that any changes in schedule or hall allocation has to be informed to the particular students or teachers manually by contacting each one of them.

Inefficient payment handling

Payment handling is not done in a very efficient manner in the current system. Since all payments are gathered by the receptionist and their details are maintained manually, processing this information to identify who have not made payments in due time can be tough. This is a major limitation in the system.

Inefficiency in registration

In the current system student and staff registration is done manually, all personal details, the classes attended and classes taught are recorded manually. It is difficult to keep track of how many students attend a particular class and quickly access details about a student.

Inefficient maintenance of student and staff details

Students are registered by filling an application paper. Often these student registration forms are misplaced hence needs to handout applications everytime student details are needed to be collected. Staff details are also collected manually and there is no proper way of storing and maintaining them.

Limitation in tracking student progress

Since there is little interaction between the student and the teacher it is hard to keep track of student progress. The manual system currently in effect does not allow for report generation or analysis of student progress.

1.6. Proposed solution

As a solution to the limitations of the current system discussed above, a web application system is introduced for Southern Institute. The proposed solution will have the following functionalities,

- Online learning management system
- Registration system
- Staff management system
- Payment system
- Hall management system

The proposed solution provide (thawa liyanna)

1.7. Goals and objectives

Goal

Creating a web based system for the students and staff to maintain proper records, organize the system while enabling better interaction between students and teachers.

Objectives

- Re-engineering the business processes using technological solutions.
- Gaining competitive advantage over similar institutes.
- Automate the manual system maintained to track student attendance.
- Maintain an automated system to keep parents notified.
- Providing a web based platform for teacher-student interactions.
- Hall management and scheduling classes efficiently to reduce time wastage.

1.8. Product Scope

1.8.1. In-scope

The below functionalities are intended through this web application

- Staff management
- Hall management
- Maintaining student attendance
- Payment management system
- System to maintain student and staff data
- Automatic notification system to notify parents of student absence
- Online learning management system

1.8.2. Out-of-scope

The proposed system will not be flexible for system advancements due to future branches. Because the web application is based only around the current branch.

1.9. Assumptions

1.10. Constraints and limitations

- **Interacting with students who cannot access the internet.**

Students without internet access has no way of interacting with the web application system. No notifications are received by them and no educational material is accessed. This is a limitation of the system which cannot be eliminated.

- **Time management.**

With the high amount of functionalities required by the client, completing this web application within this time constraint is a challenging task.

1.11. Work distribution among the group members and individual contribution

No.	Name	Registration no.	Contribution
1	H. B. P. Hathurusingha	2017/IS/031	
2	H. A. P. C. J. Jayathilaka	2017/IS/038	
3	K. D. H. Chamika	2017/IS/016	
4	M. S. Mushtaq	2017/IS/055	

2. Feasibility study

2.1 Economic feasibility

The purpose of this web application is to automate the system previously run manually, in-order to reduce cost and time wastage. The cost of development and deployment is carried by the client and it is made clear to us that the client is able to carry out that cost. The reason for developing this system, in itself, is to build a better relationship with students, staff and between students and staff in-order to gain more attraction, hence improving the business.

With the help of the proposed web based system the institute will be able to reduce paperwork and improve their web presence. Data collection, storage and access will be more efficient.

With the manual system, passing on notifications is costly due to calling costs. With the new system, it is handled in a more efficient and feasible manner. It allows notifications to be sent to a mass via emails or text messages.

There will be no additional cost of technologies used for development process as free technologies are used.

2.2 Operational feasibility

The four main users of our web application are the administrator, receptionist, teacher and the student. We assume all four of these actors have basic IT knowledge. The administrator will need a demonstration of how to use the system, but other than that no need for training. There will be a user friendly interface so that the receptionist only need basic IT knowledge to use the system. Teachers and students need only an internet connection, an accessible device and basic IT knowledge to interact with the system. There is no need to train any of the users. This concludes that our system is operationally feasible.

2.3 Ethical feasibility

Personal details and payment details of the students and staff are maintained in a secure and confidential manner.

Legal issues regarding software will not arise as free and open source software are used for development. Hence our system is ethically feasible.

2.4 Technical feasibility(wenas karanna)

We are using modern and popular technologies to develop our web application. Our team has substantial knowledge on the technologies used to build the system.

HTML, CSS, JavaScript, jQuery and Bootstrap will be used for the front-end development. For the back-end development, we are using PHP and MySQL. The database management system(DBMS), MySQL which is a relational database is used.

Visual Studio is used as an IDE (Integrated Development Environment). Visual Studio provides an editor for PHP, HTML and JavaScript with on-the-fly code analysis, error prevention and automated refactorings for PHP and JavaScript code.

We hope to use GitHub and git for version control and collaboration of our project. It lets our team to share the project among the members, thus making the version control easy and efficient.

2.5 Risk feasibility

Risk of every team member not being able to complete the assigned tasks, due to unavoidable reasons within given time frame exists. In order to get over this risk the others should increase the work put in to the development of the project.

2.6 Resource feasibility

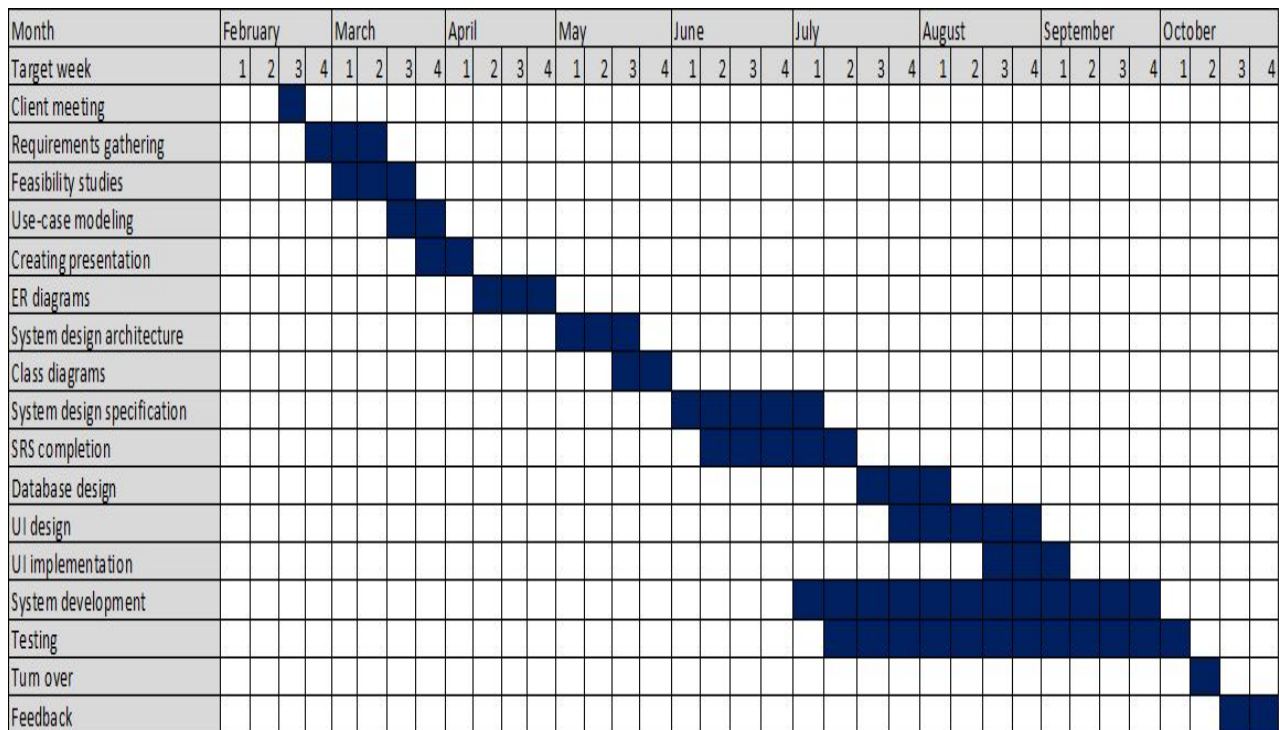
An academic year is allocated for the project completion. This resource is managed in an efficient manner by allocating time periods for all tasks.

With the project supervisor and mentor assigned to our team, necessary advice and guidance is gathered.

Resources and technologies used for the development are free and open source. Set of skills possessed by our team members have a wide variety.

2.7 Schedule feasibility

The software development methodology that we have chosen is **Incremental Methodology**. We have distributed the tasks throughout the academic year as shown below in the gantt chart. This depicts the schedule feasibility.



3. Requirements

3.1 Stakeholders

A stakeholder is a party that has an interest in a company and can either affect or be affected by the system. The stakeholders identified in this system are administrator, receptionist, teacher, student and parent.

3.1.1 Administrator

Administrator has the power to appoint a receptionist. Admin can login and log out of the system as well as change the password to the system.

Admin has the ability to view student and staff records. Admin is the only one who can create staff records as well as retrieve, update and delete all user records. Admin is responsible creating all user logins. He is also responsible for the confirmation of user accounts.

Admin has the authority to add courses to the system as well as update and delete them. He can create class schedule, update them, delete them and post them.

3.1.2 Receptionist

Receptionist can login and log out of the system. Receptionist is also responsible hall management that is allocating halls for classes according to class schedule, making sure the right halls are occupied at the right time, entering those details in the system as well as making arrangements for extra classes and new classes.

Receptionist is responsible for payment management as well. That is making sure the student fees and teacher payments are collected for the month and making sure payment details are entered in the system. Receptionist handles notifications as well as. He has the ability to enter and send notifications that includes notifying students about changes in schedule, notifying about payments due and notifying parents about absent students.

Receptionist is the one who has the ability to enter student records. Student details are entered to the system at the time of registration when the student first visits the institute.

3. 1. 3 Student

Students can log in and log out of the online learning management system. Once the user account has been created the student can view and change the password to the account as well. Students can view class schedule and course details.

Student is also able to view and download assignments posted online by the teacher of the course/courses he/she is following. Students are able to submit answers to the assignments. They can also view grades and teacher feedback to the uploaded answers as well as print them.

Student can also receive notifications, mainly about the changes in class schedule and payment concerns. They can also view notices in the online learning management system.

3. 1. 4 Teacher

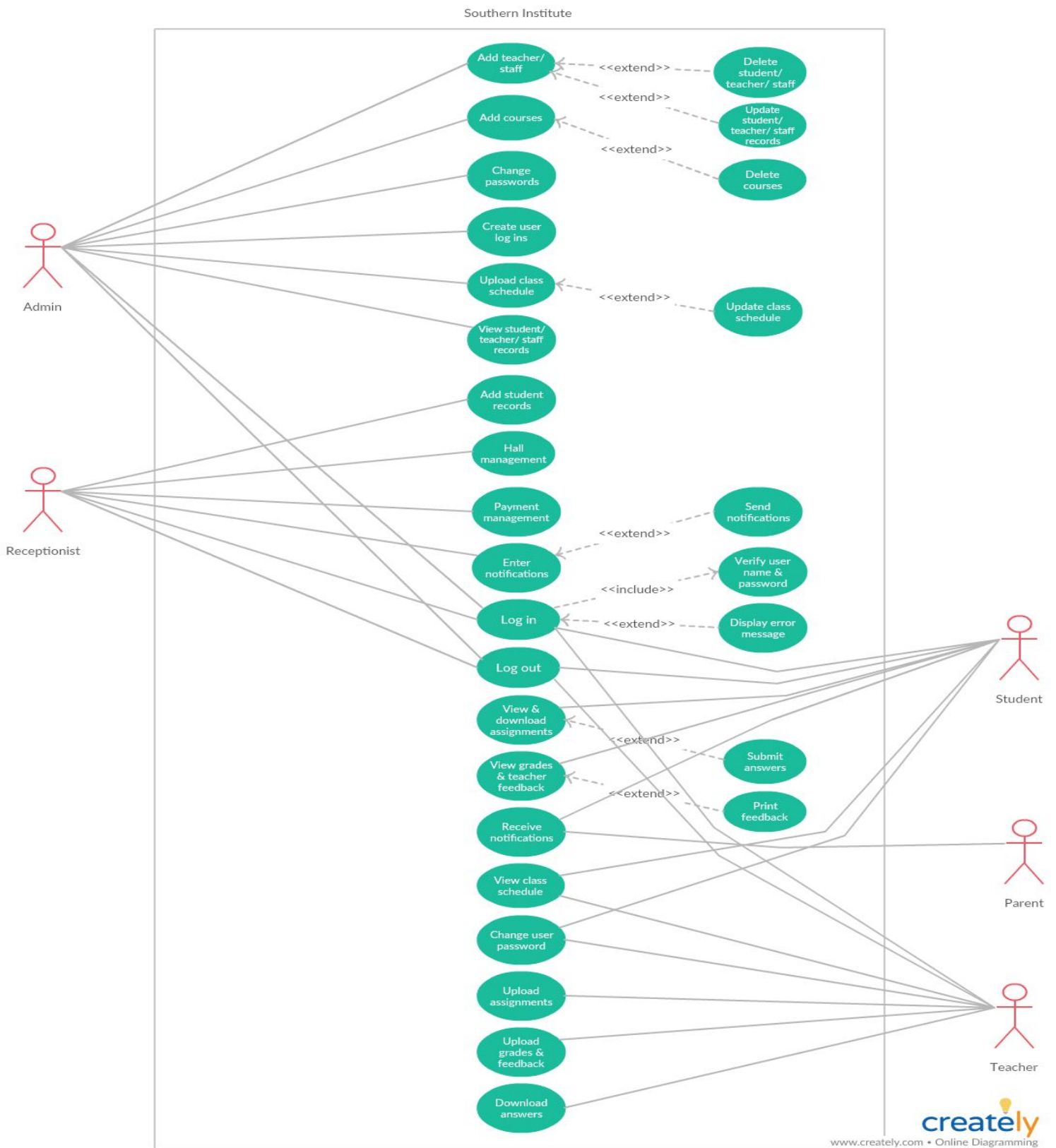
Teacher can also login and log out of the learning management system. Once the teacher's account is created he/she can change the password to it. Teacher can also view class schedules and notices.

Teacher can upload assignments, view and download student's answers and upload grades and feedback.

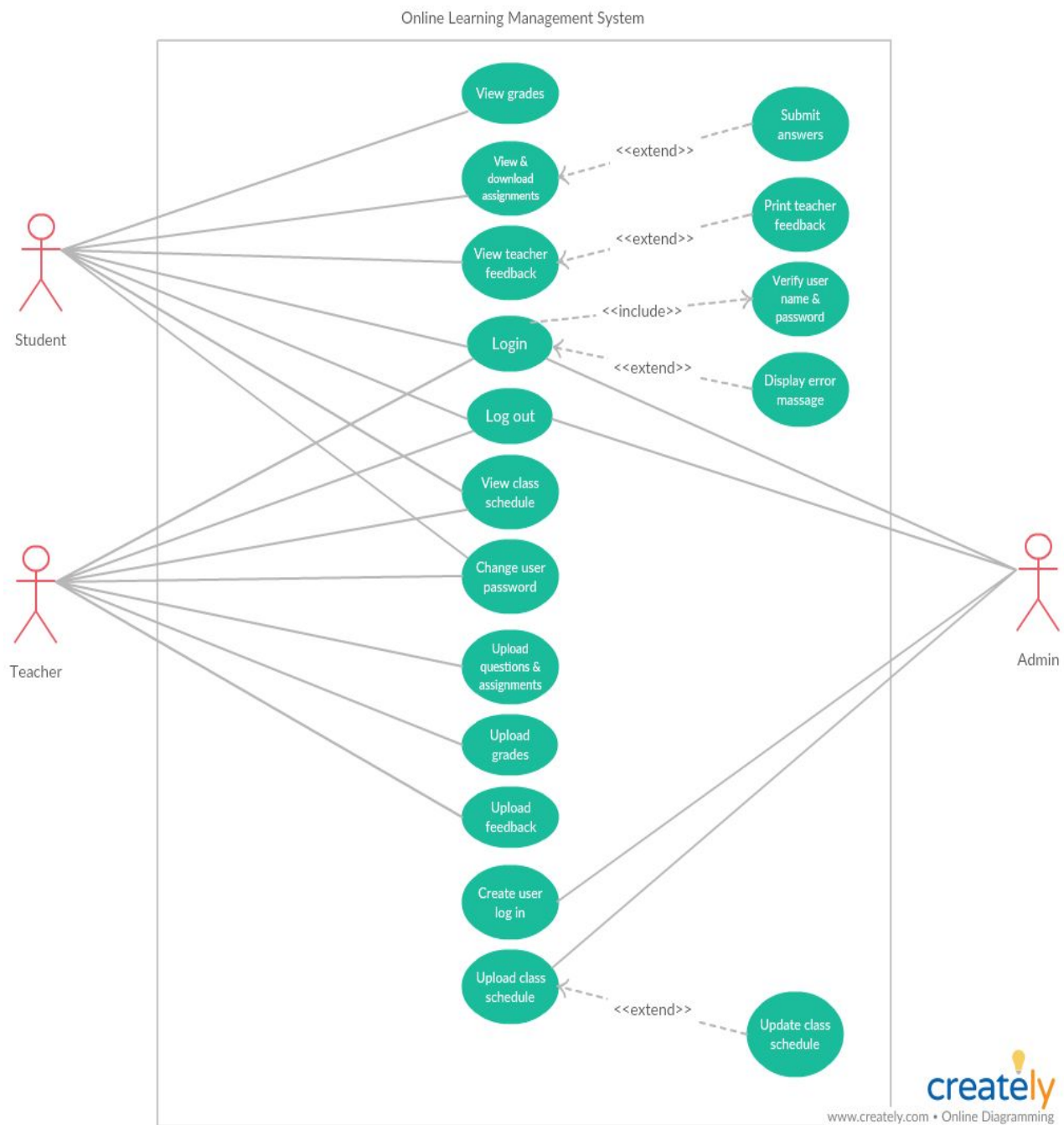
3. 1. 5 Parent

Parent in this system will only receive notifications about their children's attendance. When a student is absent for an assigned class or late more than 30 minutes, parent/guardian will receive a text message alerting them.

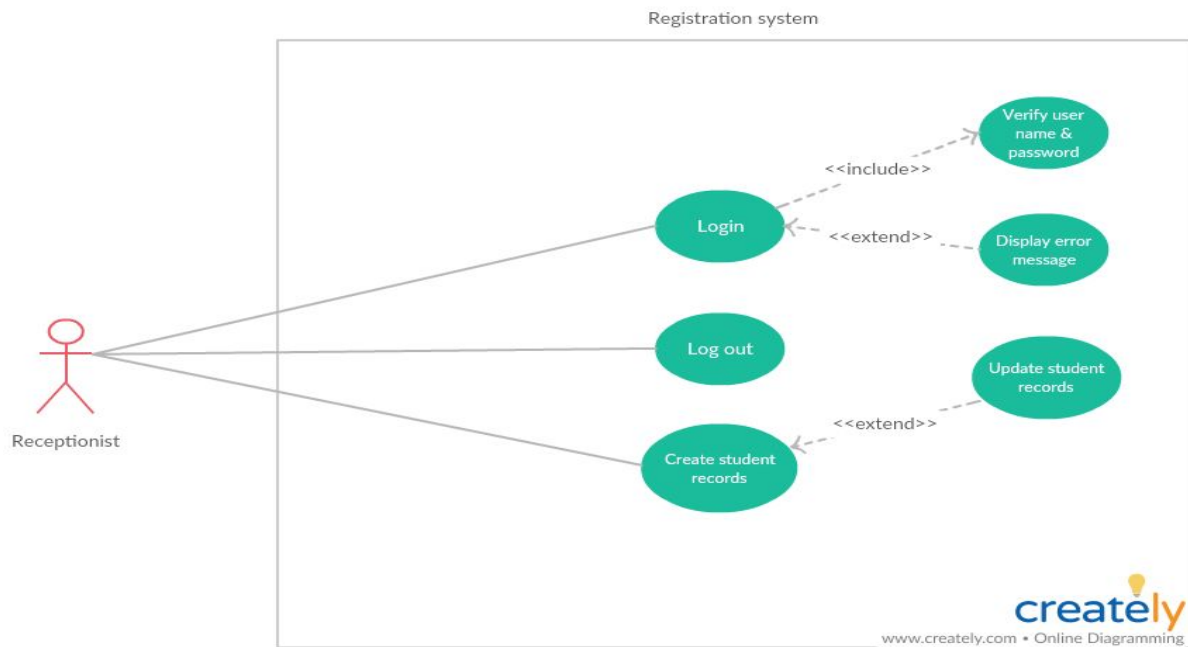
3.2 Use cases and use case diagrams



- Online learning management system



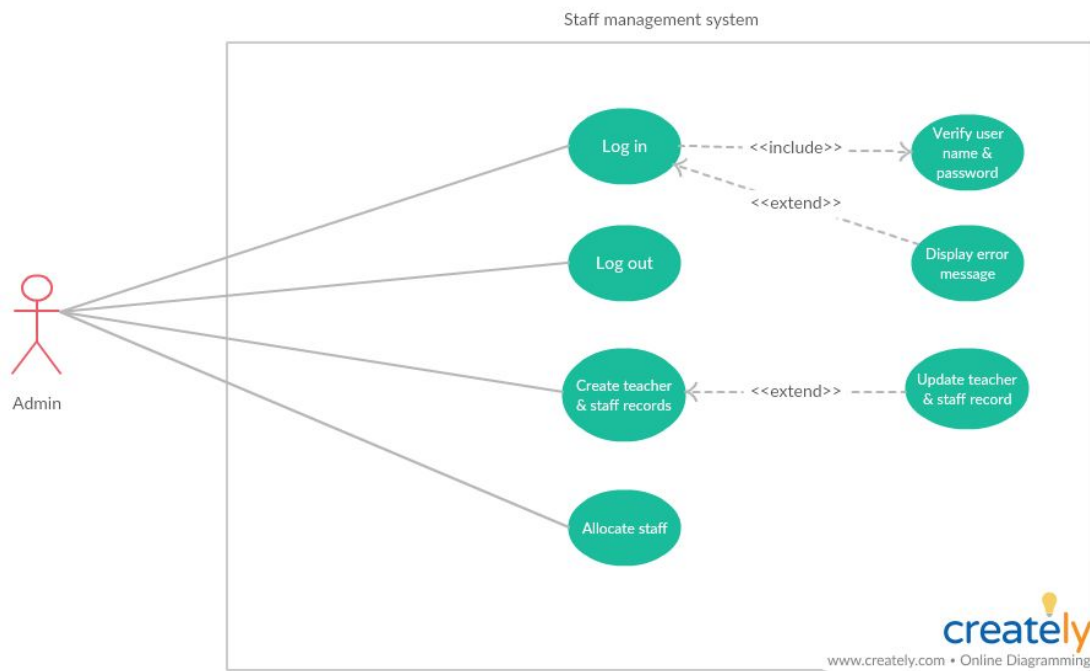
- Registration system



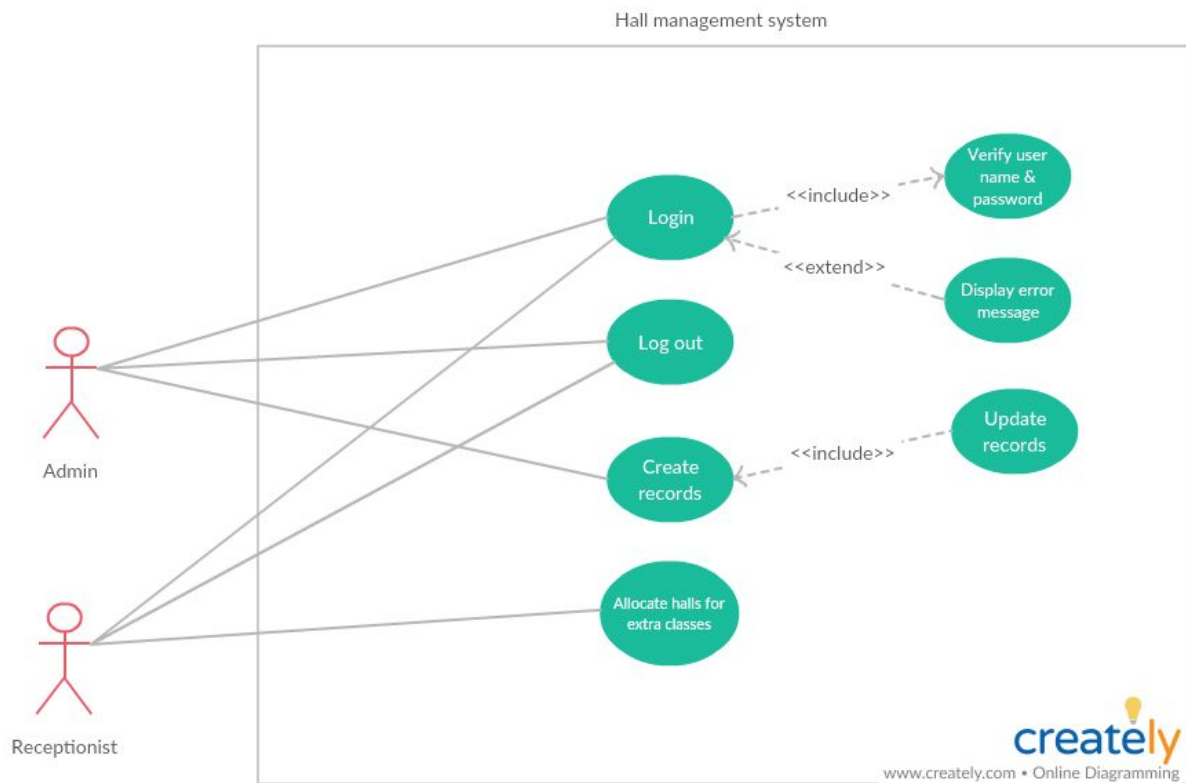
- Payment system



- Staff management system



- Hall management system



3.3 Functional Requirements

1. Login
2. Manage student records
3. Manage teacher/staff records
4. Create user logins
5. Manage user accounts
6. Change passwords
7. Manage class schedule
8. Hall management
9. Payment management
10. Sending notifications
11. Upload assignments
12. View and download assignments
13. Upload grades and feedback
14. View grades and feedback
15. Submit answers
16. Download answers

3.3.1 Use case narratives

Use case 01	Login
Primary actor	Admin, Receptionist , Student, Teacher
Preconditions	Internet connection, User account
Main flow	<ol style="list-style-type: none"> 1. Go to home page of the System 2. Go to Login 3. Enter username and password 4. Click login button
Alternative flow	If username and password entered is not valid, display error message
Post conditions	User is redirected to the homepage of the system/Online learning management system,customized according to the user type

Use case 02	Manage student records
Primary actor	Admin, Receptionist
Preconditions	Logged into the system
Main flow	<ol style="list-style-type: none"> 1. Go to Student registration 2. Select option <ol style="list-style-type: none"> a. Add student b. View student(Admin only) c. Update student(Admin only) d. Delete student(Admin only)
Alternative flow	None
Post conditions	None

Use case 03	Manage teacher/staff records
Primary actor	Admin
Preconditions	Logged into the system
Main flow	<ol style="list-style-type: none"> 1. Go to staff management 2. Select option <ol style="list-style-type: none"> a. Academic b. Non-academic 3. Select option <ol style="list-style-type: none"> a. Add b. View c. Update d. Delete
Alternative flow	None
Post conditions	None

Use case 04	Create user logins
Primary actor	Admin
Preconditions	Logged into the system
Main flow	<ol style="list-style-type: none"> 1. Log in to the system. 2. Click on Sign up button. 3. Enter student/teacher/receptionist username and password. 4. Click Submit.
Alternative flow	None
Post conditions	None

Use case 05	Change passwords
Primary actor	Admin, Student, Teacher
Preconditions	Logged into the system
Main flow	<ol style="list-style-type: none"> 1. Go to System/Online learning management system homepage 2. Click on change password 3. Type new password 4. Confirm password 5. Approve new user password(Admin only)
Alternative flow	Password does not change until admin approves
Post conditions	Change password

Use case 06	Manage class schedule
Primary actor	Admin
Preconditions	Logged into the system
Main flow	<ol style="list-style-type: none"> 1. Click on Class Schedule. 2. Update the class schedule. 3. Click Submit.
Alternative flow	None
Post conditions	None

Use case 07	Hall management
Primary actor	Receptionist
Preconditions	Logged into the system
Main flow	<ol style="list-style-type: none">1. Go to Hall Booking.2. Enter date and time.3. View free halls.4. Book the hall.
Alternative flow	None
Post conditions	None

Use case 08	Payment management
Primary actor	Receptionist
Preconditions	Logged into the system
Main flow	<ol style="list-style-type: none">1. Read the student's barcode.2. View student payment details.3. Mark student payment.4. Notify students to make payments.5. Calculate and view the income.
Alternative flow	None
Post conditions	None

Use case 09	Sending notifications
Primary actor	Receptionist
Preconditions	Logged into the system
Main flow	1. Click the Notifications tab. 2. Enter the notification.
Alternative flow	None
Post conditions	None

Use case 10	Upload assignments
Primary actor	Teacher
Preconditions	Logged into Online learning management system
Main flow	1. Go to Assignments 2. Select Upload File 3. Select the file to upload 4. Click Submit button
Alternative flow	None
Post conditions	None

Use case 11	View and download assignments
Primary actor	Student
Preconditions	Logged into Online learning management system
Main flow	<ol style="list-style-type: none">1. Go to Assignments2. Click on the assignment to view3. Click on Download button
Alternative flow	None
Post conditions	None

Use case 12	Upload grades and feedback
Primary actor	Teacher
Preconditions	Logged into Online learning management system
Main flow	<ol style="list-style-type: none">1. Go to Feedback2. Select Upload File3. Select the file to upload4. Click Submit button
Alternative flow	None
Post conditions	None

Use case 13	View grades and feedback
Primary actor	Student
Preconditions	Logged into Online learning management system
Main flow	<ol style="list-style-type: none">1. Go to Assignments2. Select feedback file3. Click on file to view grades/feedback
Alternative flow	None
Post conditions	None

Use case 14	Submit answers
Primary actor	Student
Preconditions	Logged into Online learning management system
Main flow	<ol style="list-style-type: none">1. Go to Assignments2. Select submission link3. Select the file to submit4. Click on Submit button
Alternative flow	None
Post conditions	None

Use case 15	Download answers
Primary actor	Teacher
Preconditions	Logged into Online learning management system
Main flow	<ol style="list-style-type: none">1. Go to assignments.2. Select the assignment link.3. Select the student.4. Select the submission file.5. Click download.
Alternative flow	None
Post conditions	None

3.4 Non-functional requirements

- **User friendliness**

Our proposed web application is simple, easy to use, has a consistent user interface and has a responsive design. This will aid the users to interact with the system easily. This will also be a key factor to gain more attraction to the institute.

- **Security**

The web site should be secure since personal details of student and staff are maintained. Only authorized users can access and view this information. Also the payment details should be handled in a secure manner in order to eliminate any frauds. Since multiple user types interact with the system, in order to maintain the security, every user type must have access control when using the system.

- **Portability**

This system is responsive to mobile phones, tablets as well as desktop computers. The web application should be lightweight so that it can run on a variety of connection speeds. This will improve the portability of the system.

- **Performance**

Time that the system takes to send messages and notifications should be minimized. Also database updates between the backend server and the web application should be minimized. In addition to these features the system should be able to handle many users at any given time. Thus the performance of the system is managed.

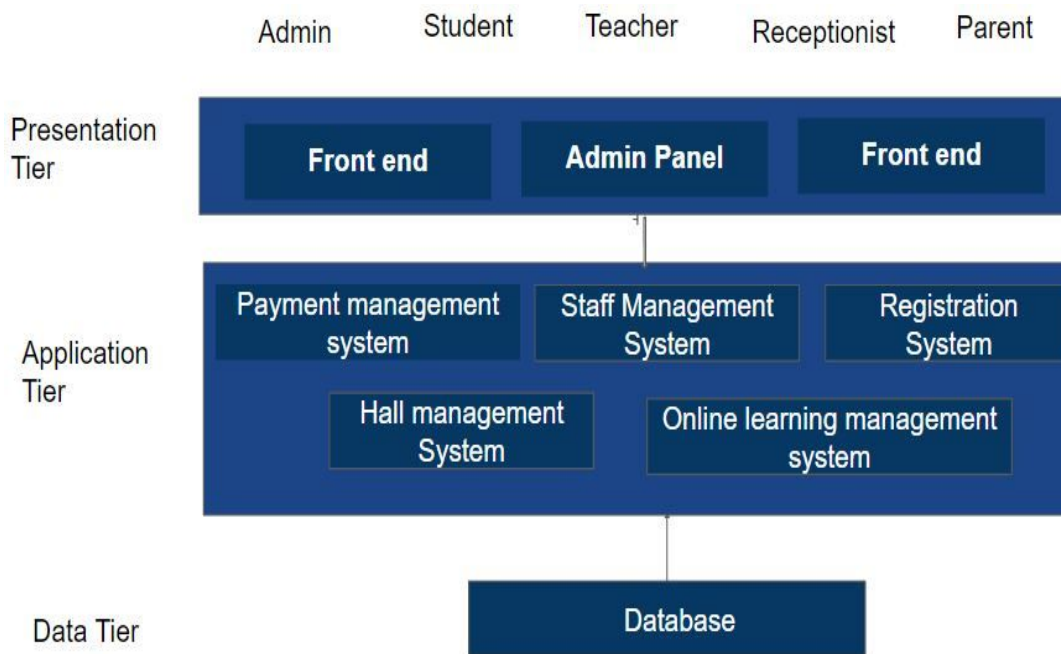
- **Accuracy and reliability**

Our system guarantees the security and accuracy of the user records and details of payments.

4. Proposed system architecture

4.1 High Level Architecture (Three-tier architecture)

We have chosen Three-Tier Architecture as our software architecture. It consists of Presentation Tier, Application Tier and Data Tier. It allows any one of the three tiers to be upgraded or replaced independently.



4.2 Layers and responsibilities

Three-tier architecture has three layers as described below.

4.2.1 Presentation Tier

4.2.2 Application Tier

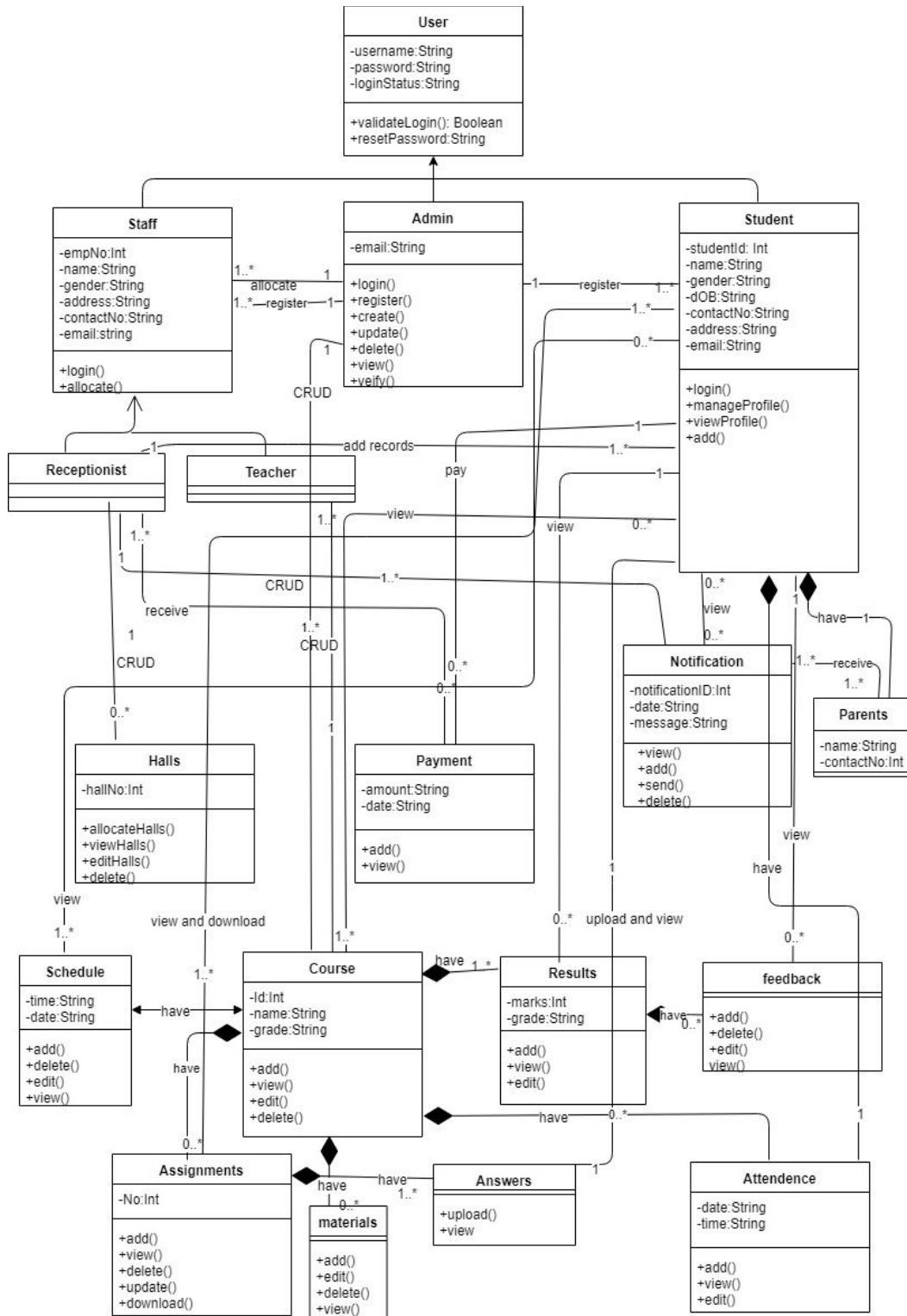
4.2.3 Data Tier



4.3 Component Interactions

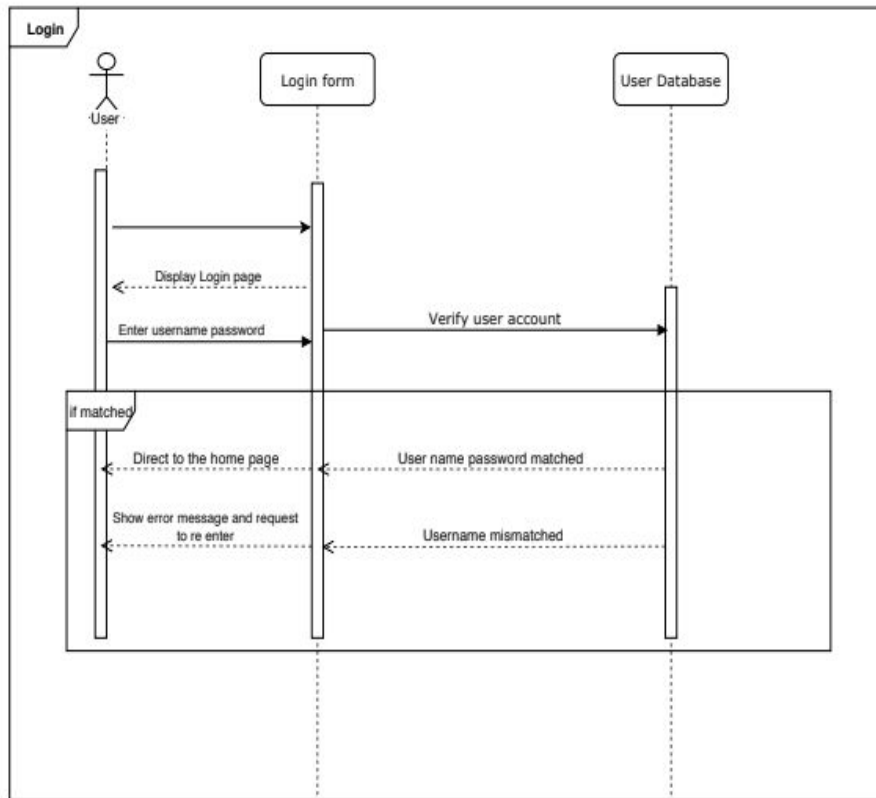
5.1 Class Diagram

5.1 Class Diagram



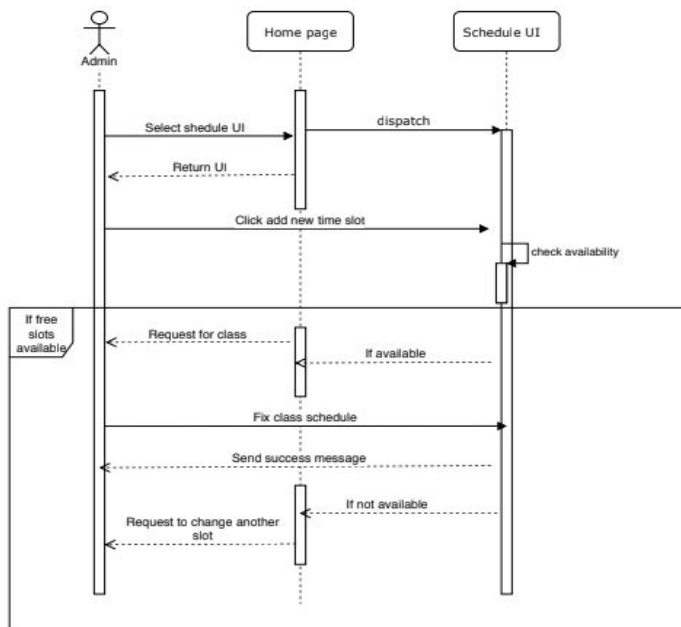
5.2. Sequence Diagrams

5.2.1 Login



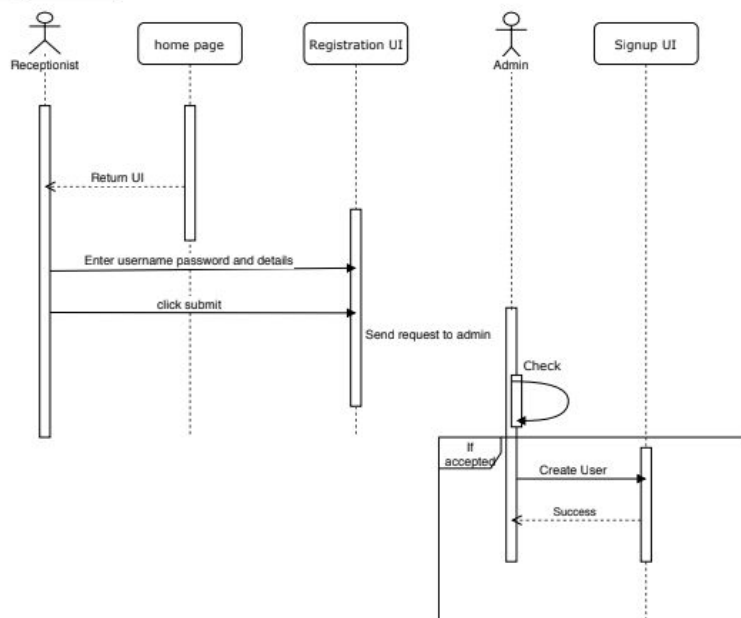
5.2.2 Manage Class Schedule

Manage class schedule



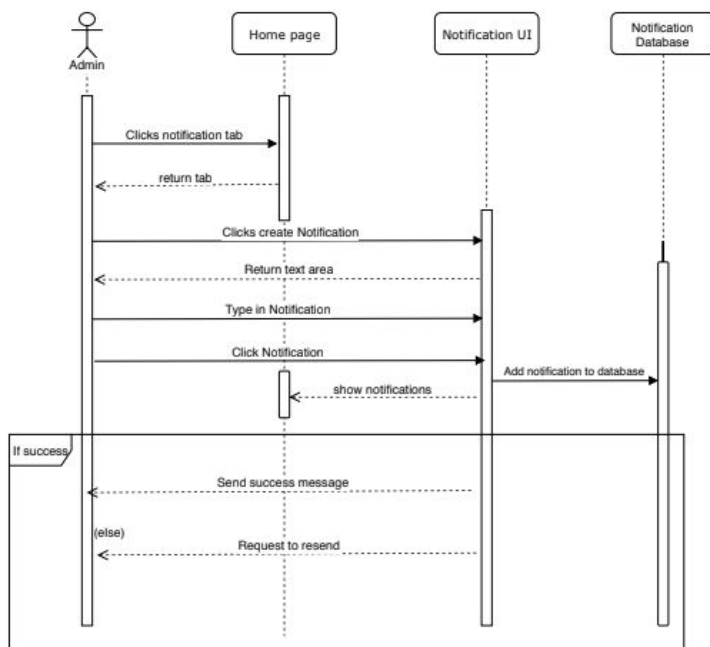
5.2.3 Manage user records

Manage user records



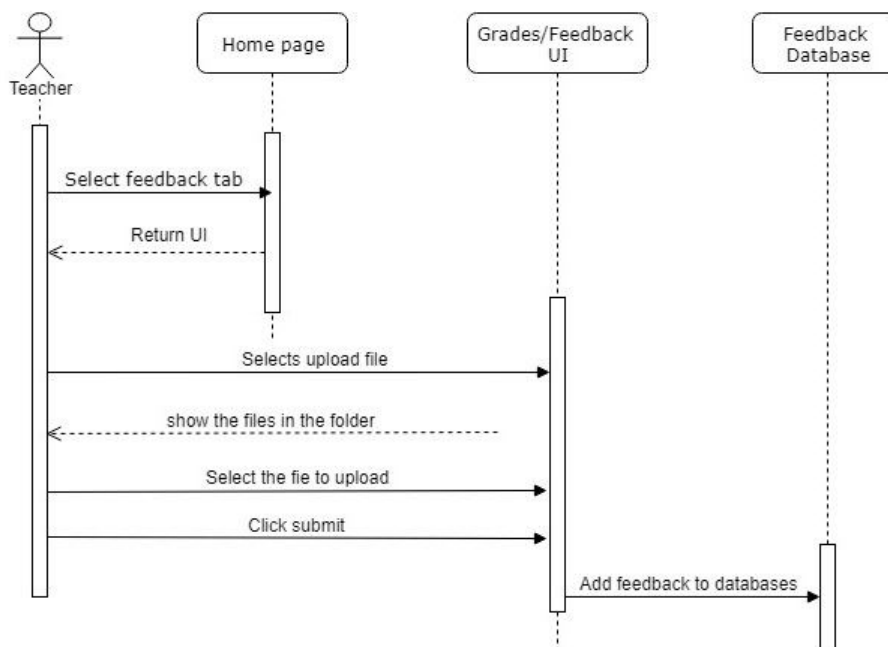
5.2.4 Sending notifications

Sending notifications



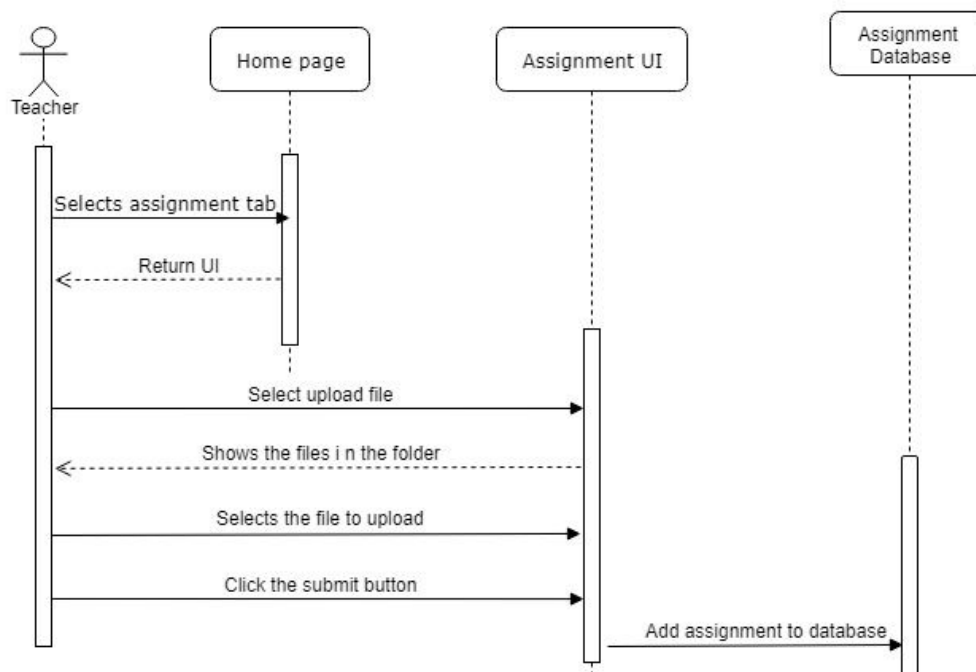
5.2.5 Upload grades and feedback

Upload grades and feedback



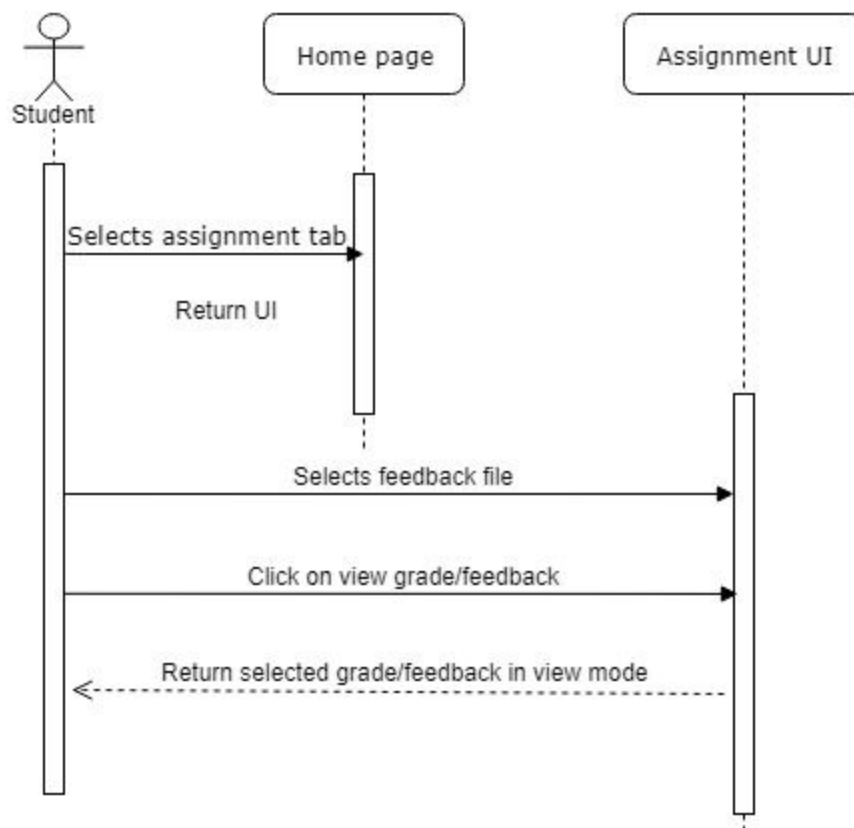
5.2.6 Upload assignments

Upload assignments



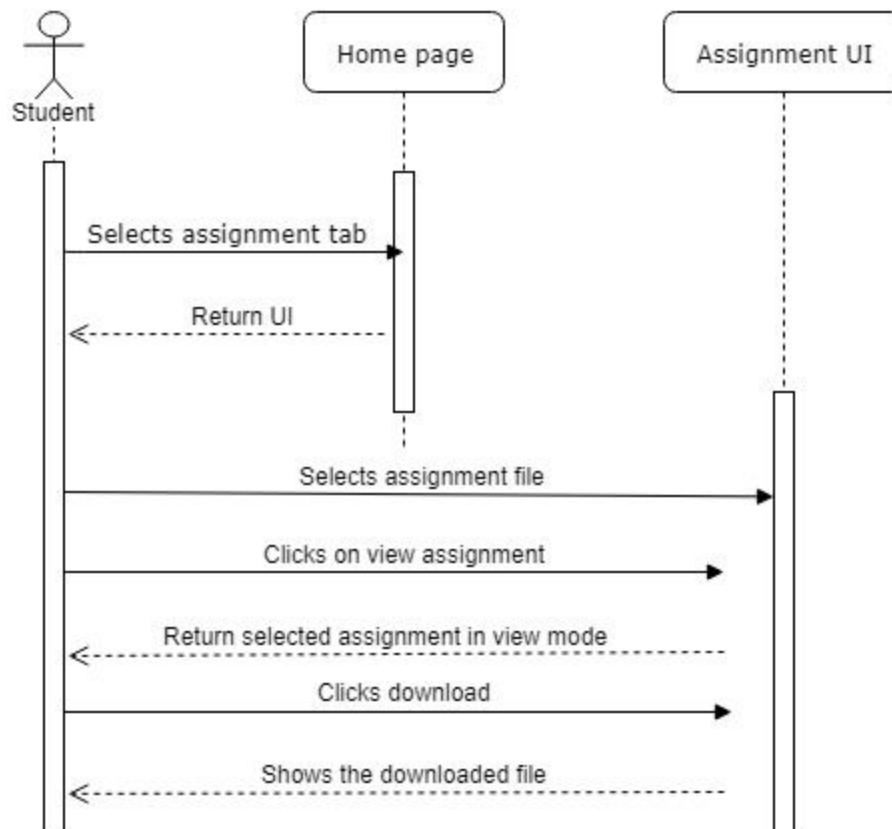
5.2.7 View grades and feedback

View grades and feedback



5.2.8 View and download assignments

View and download assignments

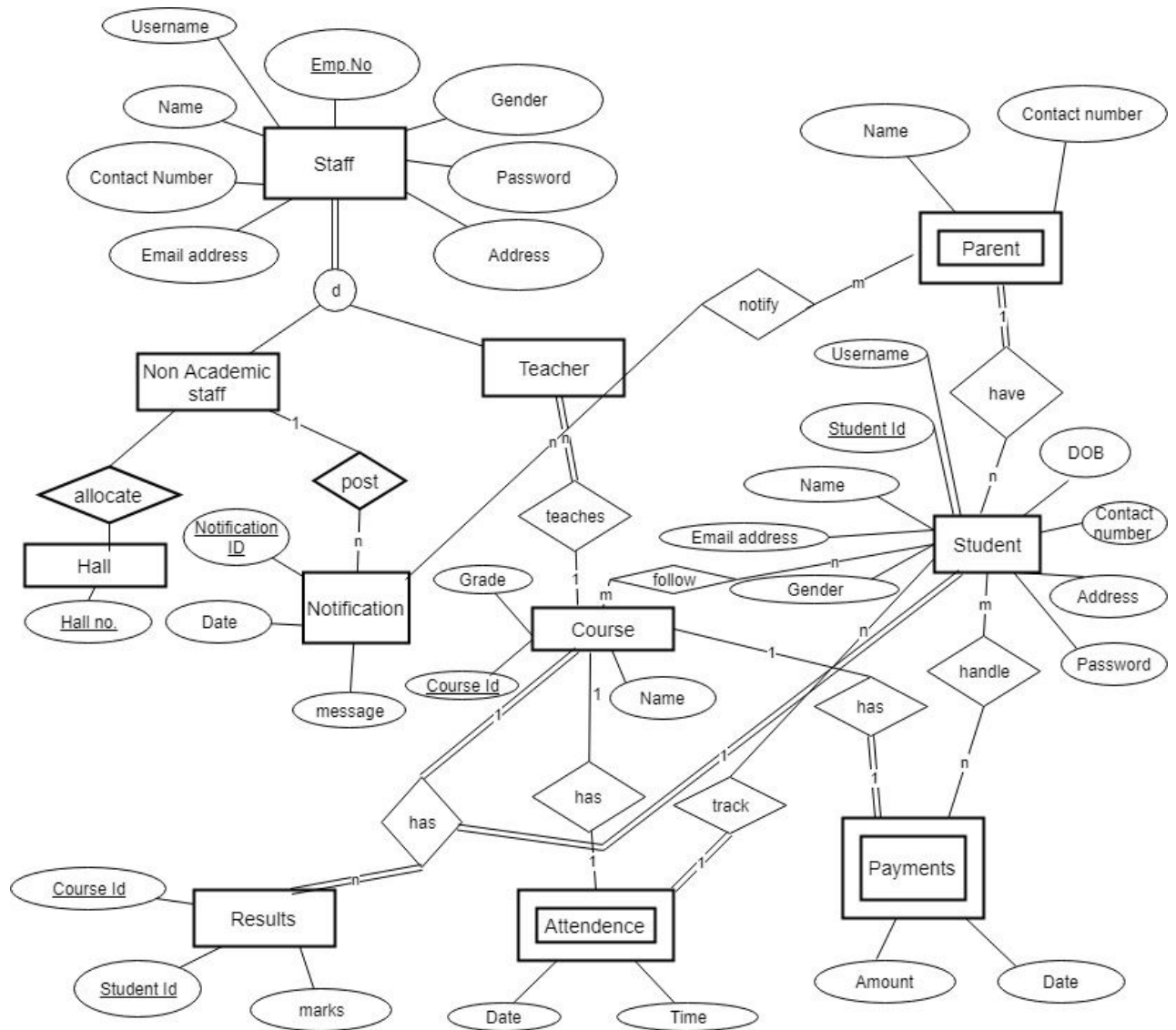




5.3. Activity Diagrams

5.4 Database Design

5.4.1 Entity Relationship Diagram (ERD)



Assumptions:



6. INTERFACES

6.1 User Interface Flow Diagrams

6.2 User Interface Mockups



