

Project Log Book

Group Members:

| Entry Date | Work Done |
|----------------------|---|
| September 7th, 2021 | Discussed the basic plan to build the prototype for CRM in class, noting down all constraints to be taken care of. Furthermore, we decided our next group meeting would be on September 15th, 2000 (Friday) at 5:30, meeting place: Zaida Morales' House. |
| September 15th, 2000 | Meeting at Zaida's Place: We discussed about the project objective. Using the Software Management Plan template printed from the web site, we stepped through each section and discussed what was required and what resources were available to us. We also discussed how this prototype should be flexible for other countries. There was constant reference to the "Chinese Railway Passenger Reservation System" and other related articles. |
| September 16th, 2000 | Finished a rough draft prototype and set it up on the online account. |
| September 19th, 2000 | Zaida M. Morales checked the document of the Software Project Management Plan, and she made some correction marking the corrections in red. |
| September 20th, 2000 | The mistakes were corrected on the web site, and email was sent to Zaida M. morales to check the document for any more mistakes |
| September 20th, 2000 | The document was checked by Zaida M. Morales and few more mistakes were found. These mistakes were corrected and put on the web. |
| September 22th, 2000 | Meeting at Zaida's Place: We discussed the Reservation System in more detail and added more information to the SPMP document. |
| September 25th, 2000 | Zaida M. Morales checked the document of the Software Project Management Plan, and she made some corrections. |
| September 27th, 2000 | The mistakes were corrected on the web site, and email was sent to Zaida M. morales to check the document for any more mistakes. |
| September 29th, 2000 | Meeting at Zaida's Place: We discussed parts 4 and 5 of the Software Project Management Plan in more detail and decided to update some information in the SPMP document. The different parts of the document were divided between the team for updates. |
| October 3th, 2000 | Finished updating the rough draft prototype and set it up on the online account. Sent all team members email with link to latest copy of the document. |
| October 4th, 2000 | Zaida M. Morales checked the document of the Software Project Management Plan. The mistakes were corrected on the web site. The latest version of the document is available online. |

Last Updated on March 20th, 2022

Software Requirements Specification

For

School Management System

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Syeda Raahima Batoool
Muhammad Mughees
Shah Muhammad Azhar
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March 15, 2022

| Version | Changes Made | Date |
|---------|--|------------|
| 1.0 | First Pass for Review | 10/24/2020 |
| 1.2 | Second Pass for Review | 11/07/2020 |
| 1.3 | Third Pass for Review | 11/28/2020 |
| 1.4 | MPA Review Version | 12/04/2020 |

Table of Contents

1. Introduction
2. The General Description
3. Specific Requirements
4. Supporting Information

1. Introduction

1.1 Purpose

This document describes the software requirements for the School Management System built for Metropolitan Academy (MPA).

1.2 Scope In

The MPA is requesting proposals to build a prototype of a School Management System (SMS) for their current system. This new SMS needs to be scalable enough so that it can accommodate the increase in the management and the faculty caused by the new campus building in Nazimabad.

The system will be designed to provide an electronic version of the School Management System in Karachi. The system will have a user-friendly graphical interface and will be more cost effective compared to the current non-electronic version of the management system.

The objectives of this development effort are:

1. To provide existing teachers and students with a new environment in which to make or manage all things in a proper manner
2. To provide an avenue for teachers and students to achieve their goals in a more convenient way.
3. To regain control of the teachers and students to avoid the loss of studies due to COVID situation.
4. To implement a prototype of a scaled down version of the final system to test the solution and further develop requirements.
5. To collect statistics in a more efficient manner for future enhancement in school system and maintenance.
6. To increase efficiency of the management related to teachers as well as the students.

1.3 Scope Out

The following features will not be the part of this Project:

- 1.

1.3 Definitions, Acronyms, and Abbreviations.

MPA – Metropolitan Academy
PP - Project Plan
SDD - Software Design Description
SRS - Software Requirement Specification
SDS – Software Design Specification
SPMP - Software Project Management Plan

GUI – Graphical User Interface
QAM – Quality Assurance Manager
PDM – Project Development Manager
PMP – Project Management Professional
TBD – To be determined
UML – Unified Modeling Language
PTM – Parents Teachers Meeting
STD – Students

1.4 References

- Situation Update – Chinese Railway Passenger Reservation System
[http://www.cs.swt.edu/~donshafer/Marketing Update\(1\).html](http://www.cs.swt.edu/~donshafer/Marketing Update(1).html)
- China 2000
<http://www.china2thou.com>
- Pressman, Roger S., and *Software Engineering: A Practitioner's Approach*, McGraw-Hill Companies, Inc., 1997.

1.5 Overview

Chapter 2 of the SRS is a brief description of the characteristics of the software to be built, its functions, its users, its constraints and its dependencies.

Chapter 3 is about specific requirements, such as functional requirements, external interface requirements, performance requirements, and also design constraints and quality characteristics.

Finally, chapter 4 includes all the supporting information, such as the Table of Contents, the Appendices, and the Index.

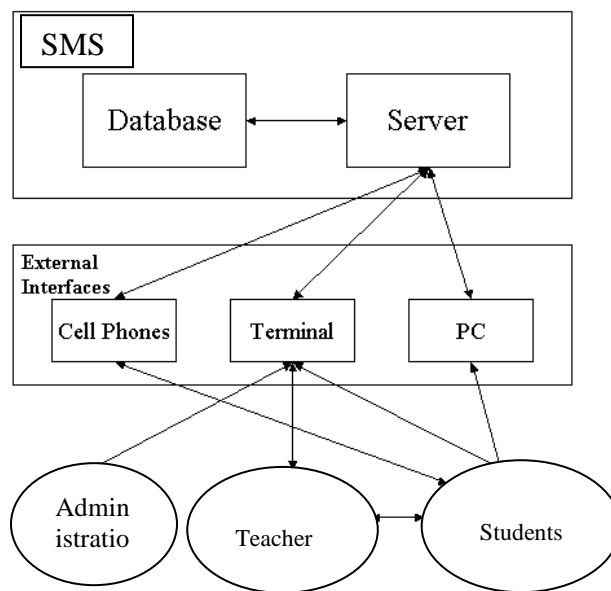
2. The General Description

This section describes the general factors that affect the product and its requirements. This section consists of five subsections that follow. This section does not state specific requirements. Each of the subsections makes those requirements easier to understand, it does not specify design or express specific requirements. Such detail is provided in section 3.

2.1 Product Perspective

The School Management System diagram showing the overview of the system's modules and the relationship of the system to external interfaces is presented in Figure 2.1.

Figure 2.1 Overview/Architecture Diagram of the SMS



Functions of System Components:

Database:

- Stores data
- Creates reports
- Provides access to data
- Updates information

Server:

- Provides access to the database
- Authenticates users
- Processes reservations
- Performs backups
- Produces reports

External Interfaces:

Terminal

- Users use terminals to access the server
- Students and Teachers use terminals to manage their work and to get information about the courses, marks etc.
- Administration may use terminals to see the reports generated by the database software.

Personal Computers

- Users (Students, Teachers, and Administration) may use personal computers to obtain a remote access to the server and the reservation database via the Internet.

Cell Phones

- Serve as a medium of accessing the server and the SMS database.
- Students may use cell phones and the latest telecommunication technologies to access the server and the SMS database via Internet, or they may use cell phones to call teachers to inquire about courses and marks distribution information.

Computer Hardware and Peripheral Equipment to be used:

- 30 workstations, which include CPUs, monitors, keyboards, and mice
- Printers
- Network
- Terminals
- Cell phones to test connection to the server via remote access

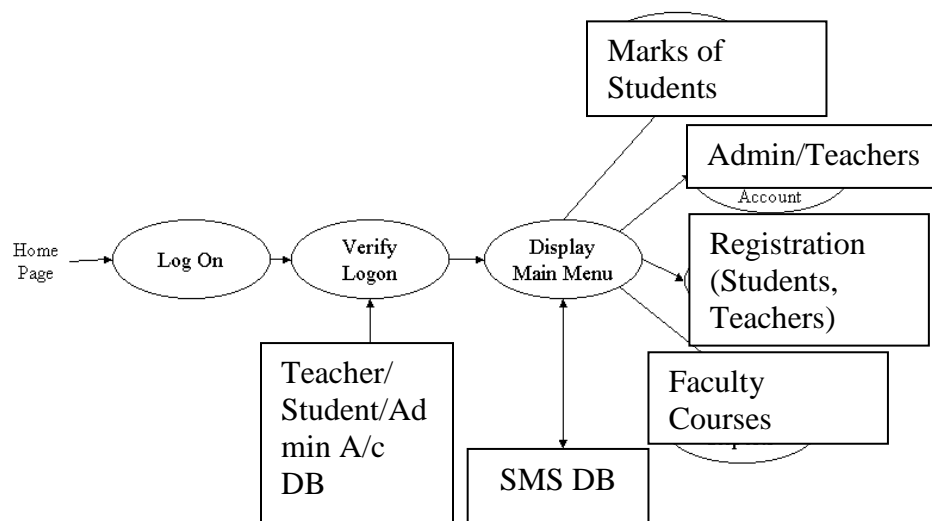
2.2 Product Functions

This section provides a summary of the functions that the software will perform.

2.2.1 Function Relationships

Figure 2.2 to 2.6 depict the relationships among the functions to be implemented by the system.

Figure 2.2 SMS **General Function Relationship/Higher Level Usecase Diagram**



2.2.2 Function Descriptions (Functional Requirement Listings)

2.2.2.1 Log in Function (All)

Description: This function ensures that only authorized users gain access to the SMS databases. An authorized user is a user who has an account on the system. Users include Admin or administration, Official Students, and Official Teachers. The user must type a valid username and password to gain access.

2.2.2 Module 1: Registration (62606)

Description: This function allows the Teacher and Students to register on the portal and the admin gets an email by allowing them for further process on account registration for the user. Due to this the confidentiality maintains.

If the user have already registered so they can proceed to the next module.

2.2.3 Module 2: Marks - Students (64413 - GL)

Description: This function comes under Teacher's module where he or she will upload the marks of students related to their subjects. Also they have rights to update or upload the marks and write remarks as well.

If the Student only watch their marks by just simply login to their Student's module. If they have any query related to their marks just simply write an email.

2.2.4 Module 3: Faculty Courses (62749)

Description: This function allows the faculty (Teacher) to add them in which course they want but the courses shows on the Teacher's module s from the Admin side. Basically, they choose from the categories and the administration department will assign according to it.

2.2.5 Module 4: Notice Board & PTM (64335)

Description: This function allow the students to check the important notice on their portal from the management so they can easily aware thing really well.

Also this module allows the parents to attend the PTM sessions from the management of the school. Due to this they will aware about their children's activities and performance.

2.2.6 **Module 5: Timetable (62822)**

Description: This function allows both Teacher's & Student's portal to check the timetable on each portal. By using this both will manage their class timings in a good manner.

2.3 User Characteristics

The main users of the system will be the Administration, Students and Teachers who can manage their task easily, the admin that process registration for students and teachers, and the MPA administration that access the reports generated by the system. The users are not required to have knowledge in the computer field. The graphical interface provides an easy way of using the SMS system with minimum of training.

2.4 General Constraints

The constraints for the project are:

- The functional prototype should be available after 30 days upon the arrival of the management team. This may prove to be a serious time constraint on the development of a successful prototype.
- Communication with the team members may prove to be difficult.
- Team members are restricted from bringing their own equipment, and insufficient equipment supply may hinder project development.
- Team members are restricted to bringing only the analysts of the team to China. This might affect the project development if more people are needed or the required skills are not available.

2.5 Assumptions and Dependencies or **Business Logic**

The assumptions for the project are:

- Three modules can be divided into Teachers, Students and Administration Department. These modules has some features by using it every one can manage their work easily.
- there are three classes of modules as listed below
 - Administration – They manage all the things, inside this there is some classes as well.
 - Teacher- They select the courses, check time table, Upload marks, etc. Inside this there is some classes of related to their work.
 - Student – They select the courses, check marks, check timetable, contact to the faculty etc.
- Admin can allow the permission to register for the account.

- Teachers can select the courses which they want to teach and admin can approve them.
- Only official Students and Teachers allow to register on a portal. It's restriction from the administration because they control all the account handling.

3. Specific Requirements

This section of the SRS contains design requirements for the **School Management System (SMS)**.

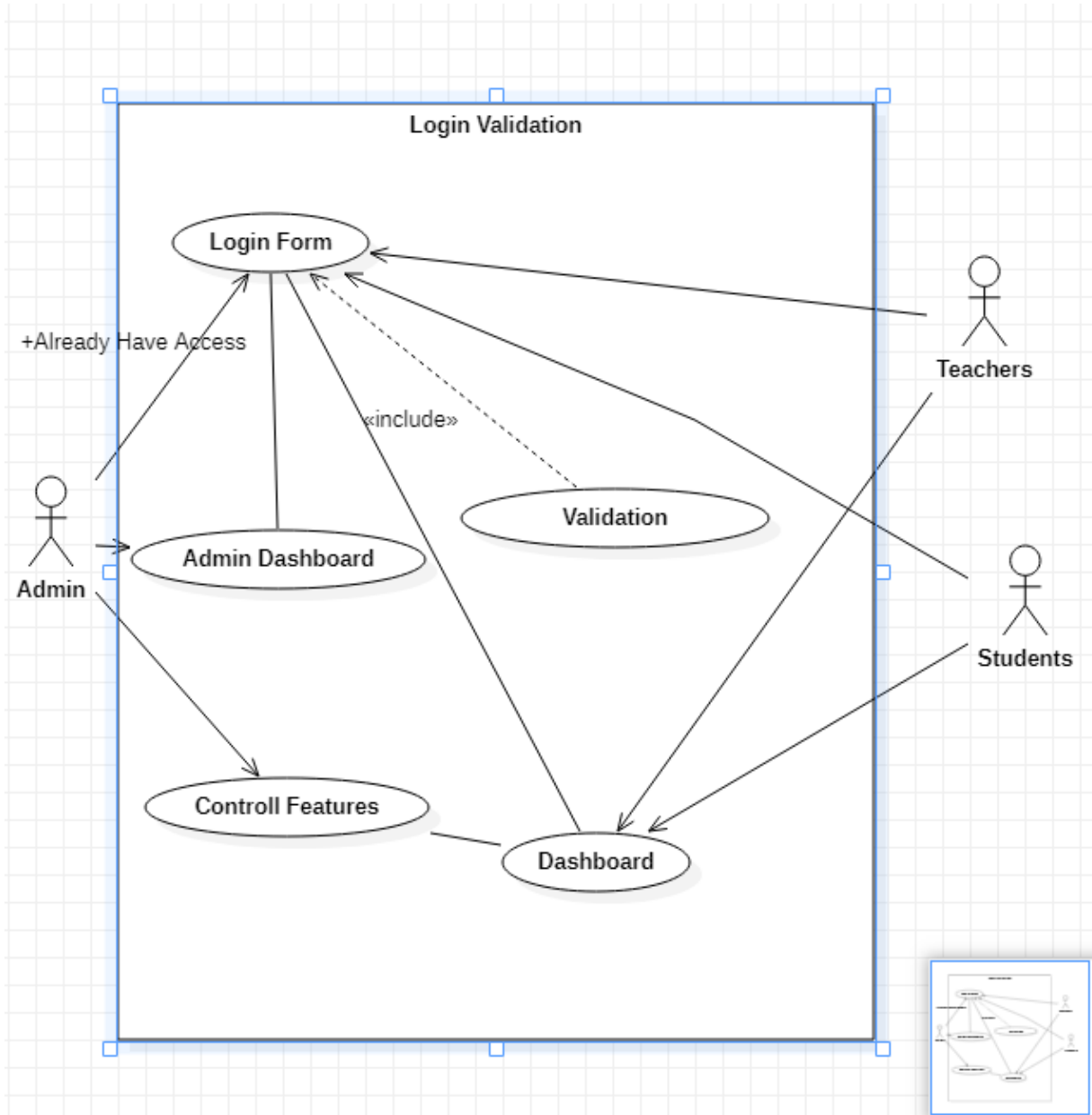
3.1 Functional Requirements

3.1.2 **Module 1 complete CRUD: LOGIN (All)**

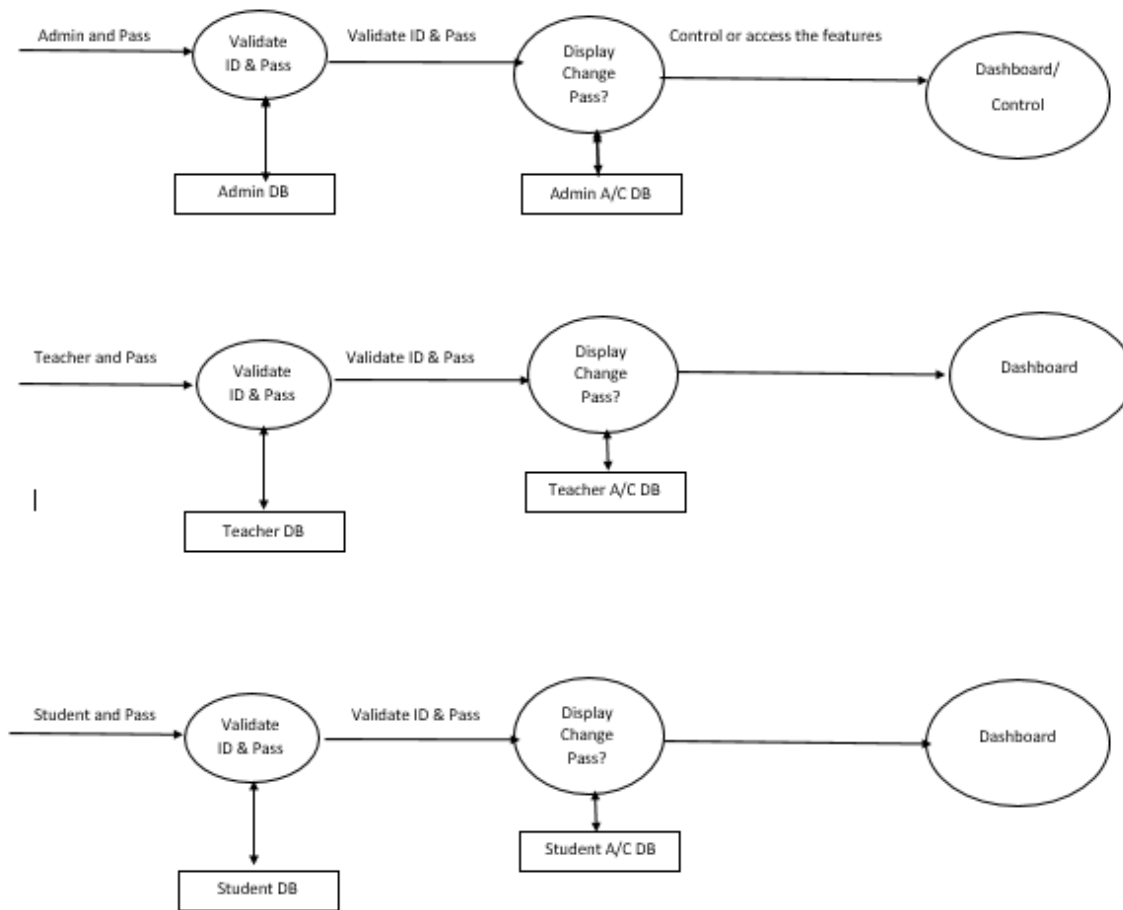
- a) **Description:** This function ensures that only authorized users gain access to the SMS databases. An authorized user is a user who has an account on the system. Users include Teachers, Students, and MPA officials. The user must type a valid username and password to gain access.
- b) **Usage Scenario/ Use case Description/ Specification:**

| | |
|-----------------------|---|
| Description | Allows access to online SMS |
| Inputs | Username, password |
| Source | 1. User inputs username and password 2. Press Login Button |
| Alternate case | |
| Outputs | Successful login; unsuccessful login |
| Destination | None |
| Precondition | Authorized User |
| Post Condition | No change to Passenger Accounts Database |
| Side Effects | Failures and successful logins are sent to Reservation Database |

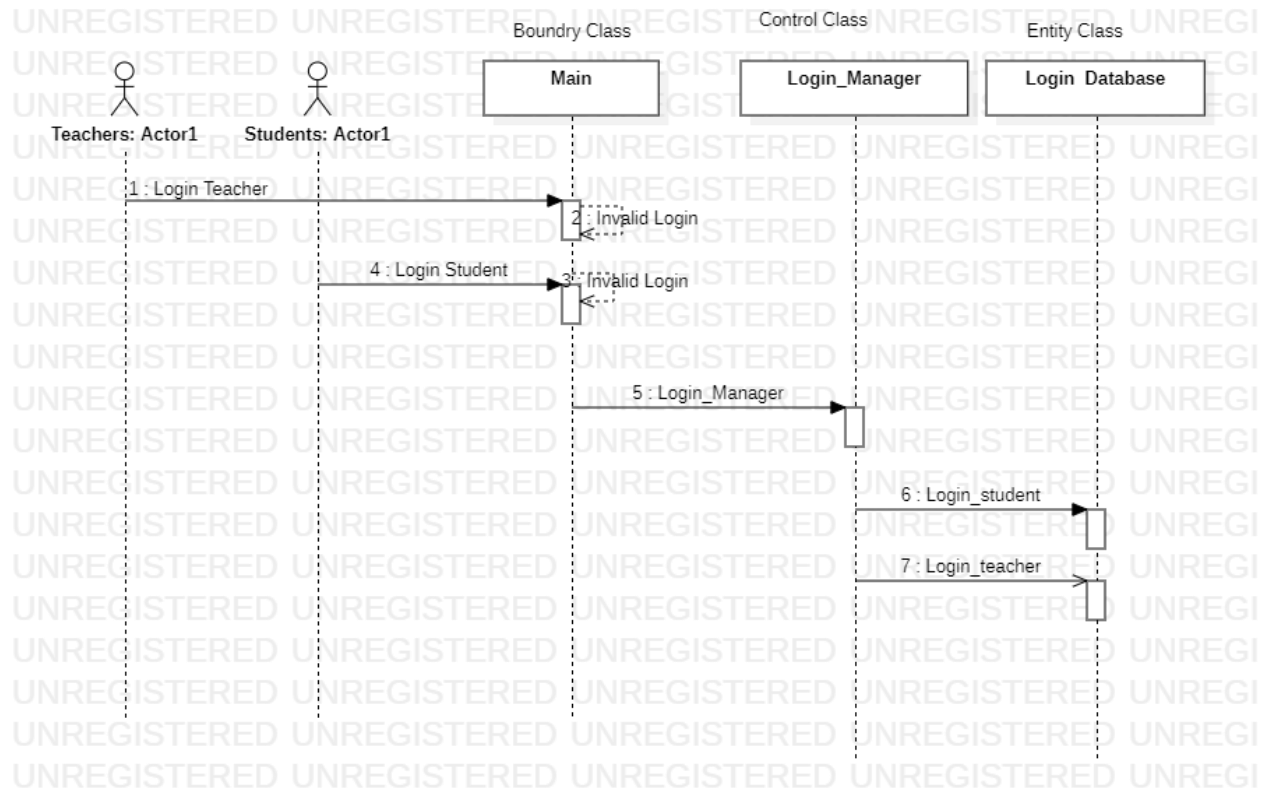
c) Detailed Use case Diagram for Login:



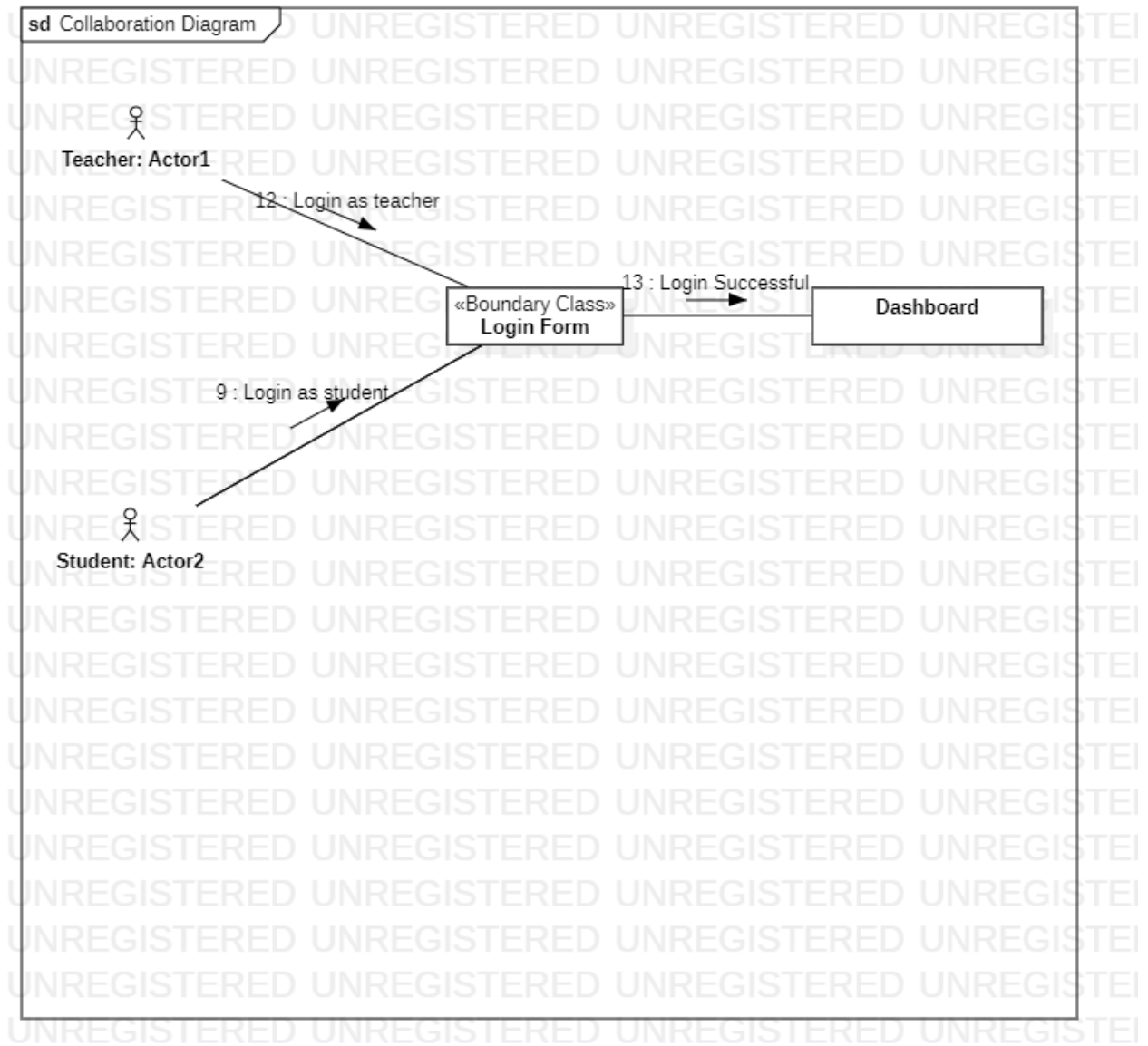
d) Flow of Event or Data Flow Diagram for Login:



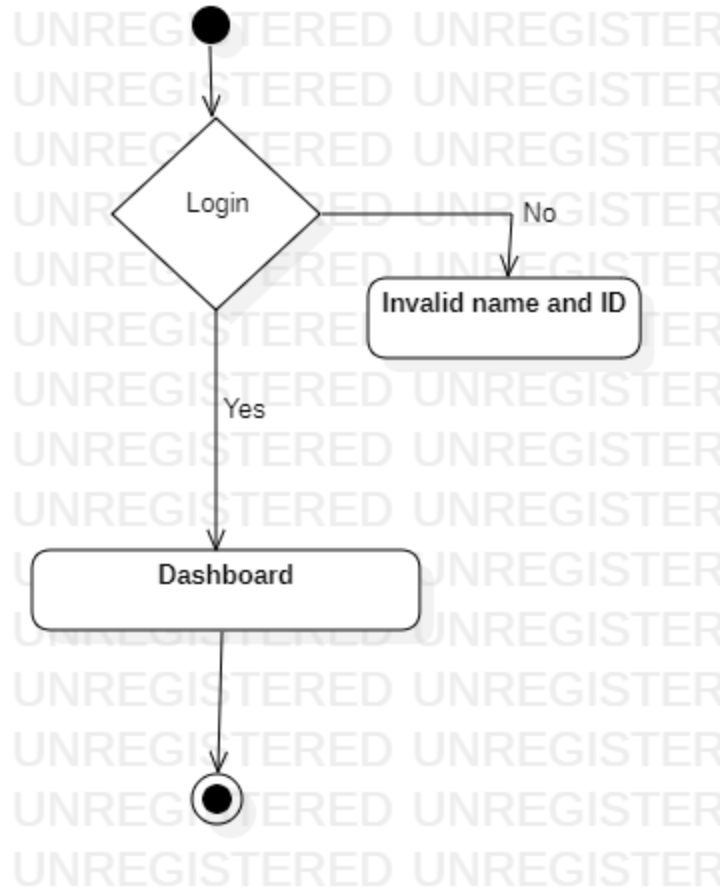
e) *Sequence Diagram for Login:*



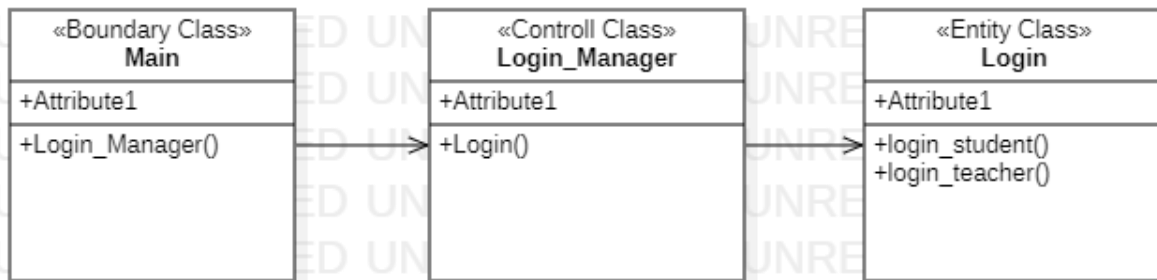
f) Collaboration Diagram for Login:



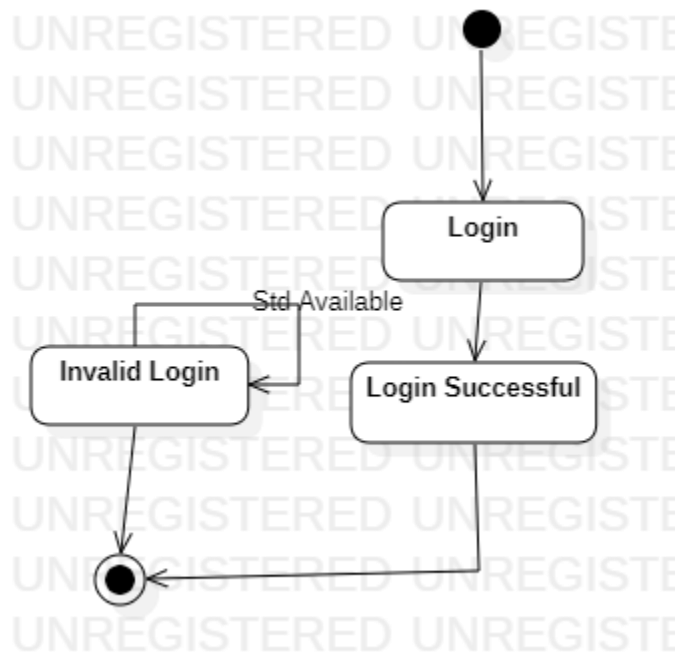
g) Activity Diagram for Login:



h) Class Diagram for Login:



i) State Chart Diagram for Login:

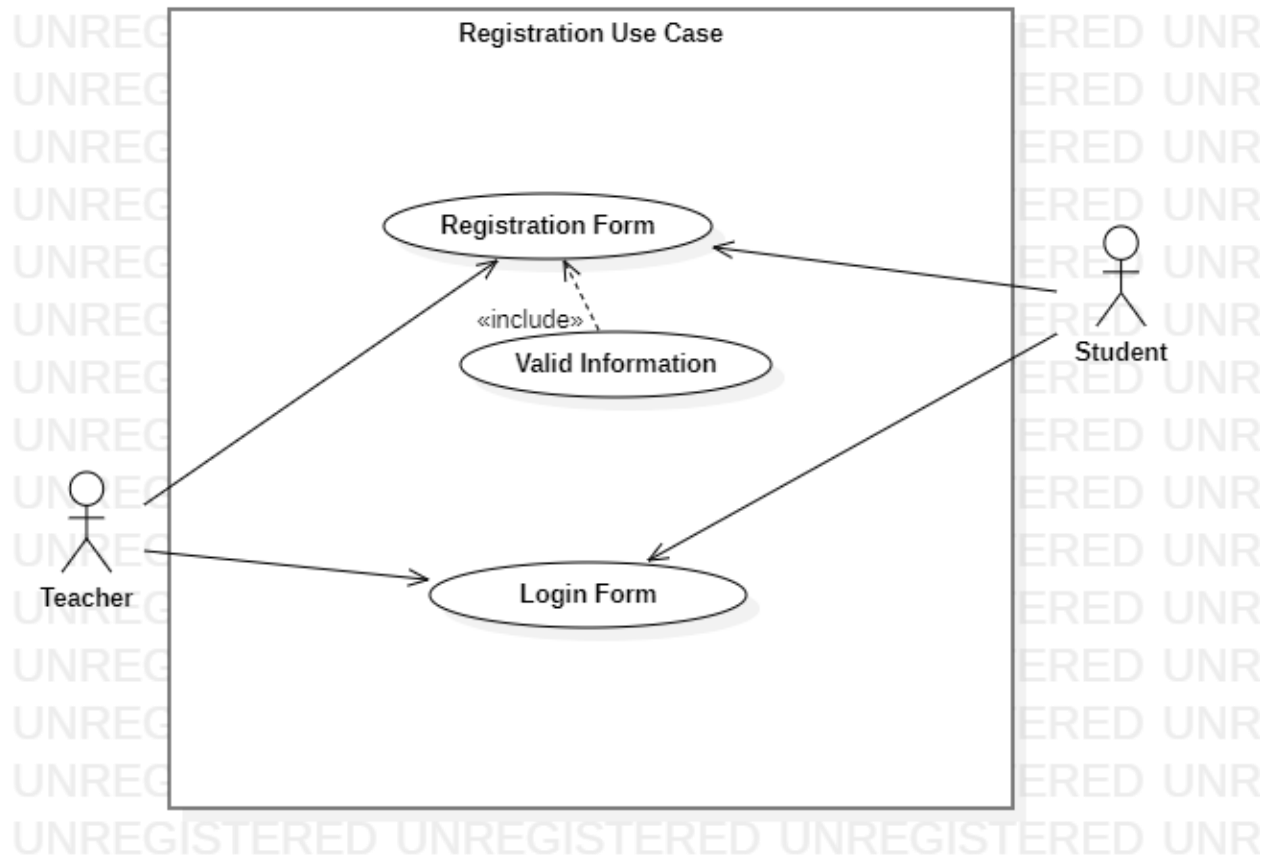


3.1.3 Module 2 complete CRUD: Registration Function (62606)

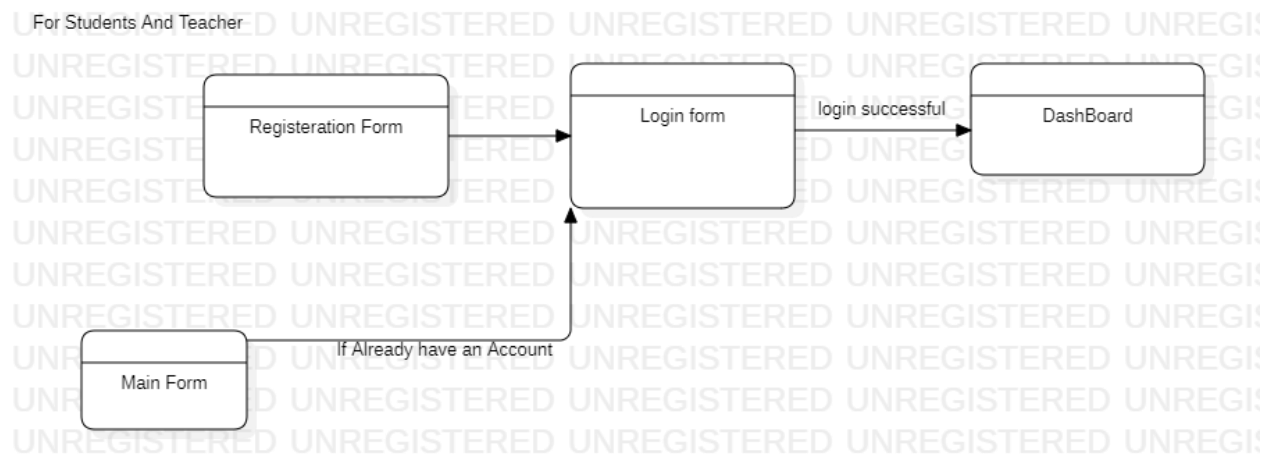
- a) **Description:** This function allows the users to register themselves by making account. If the user already have an account, then simply he/she just login to their account. Teacher and Student easily make their accounts by given id to login to their account and check their schedule.
- b) **Usage Scenario/ Use case Description/ Specification:**

| | |
|-----------------------|---|
| Description | Register account |
| Inputs | Username, password, email, address, contact etc. |
| Source | 1. User Add their details 2. Press Button Register |
| Alternate Case | |
| Outputs | Successfully Registered |
| Destination | Computer screen Registration database Teacher and Student Data Base |
| Precondition | Valid information; Password with unique character |
| Post Condition | Account Registered and login |
| | |
| Side Effects | |

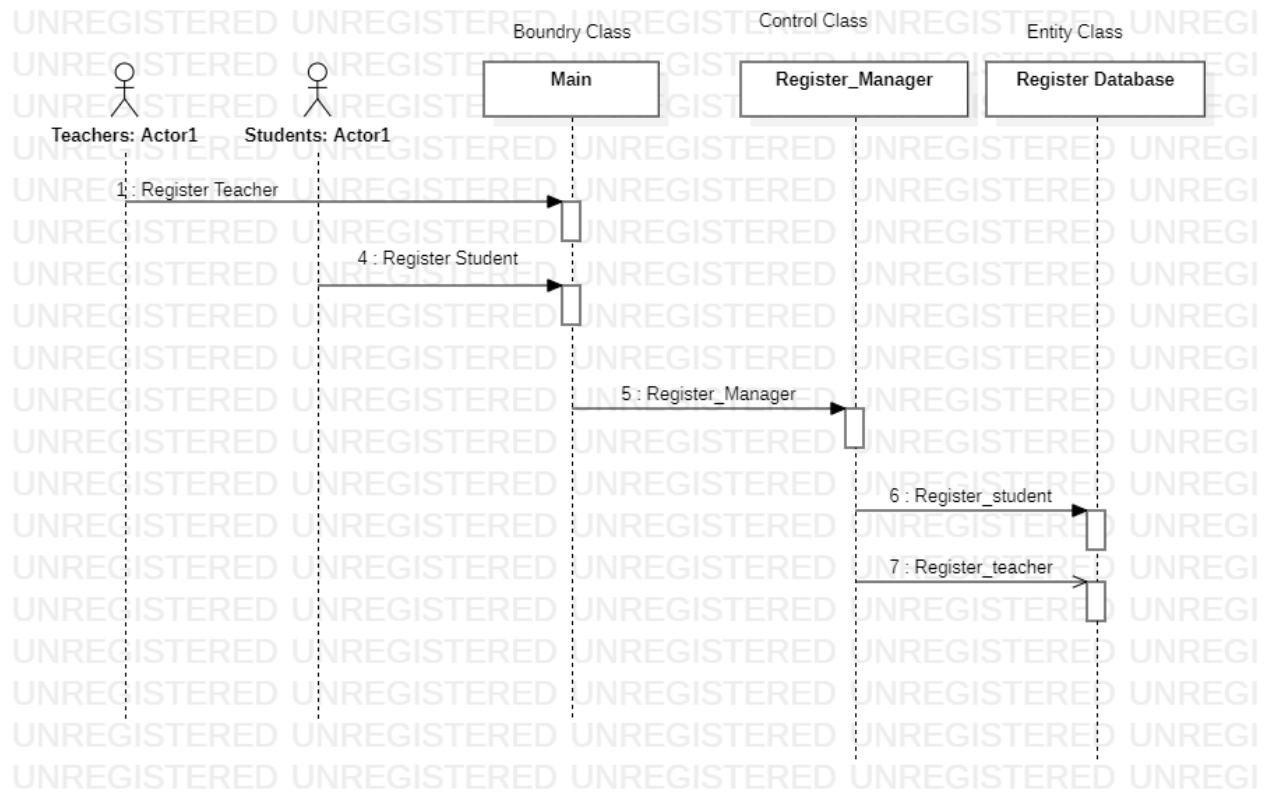
c) Use case Diagram for Registration:



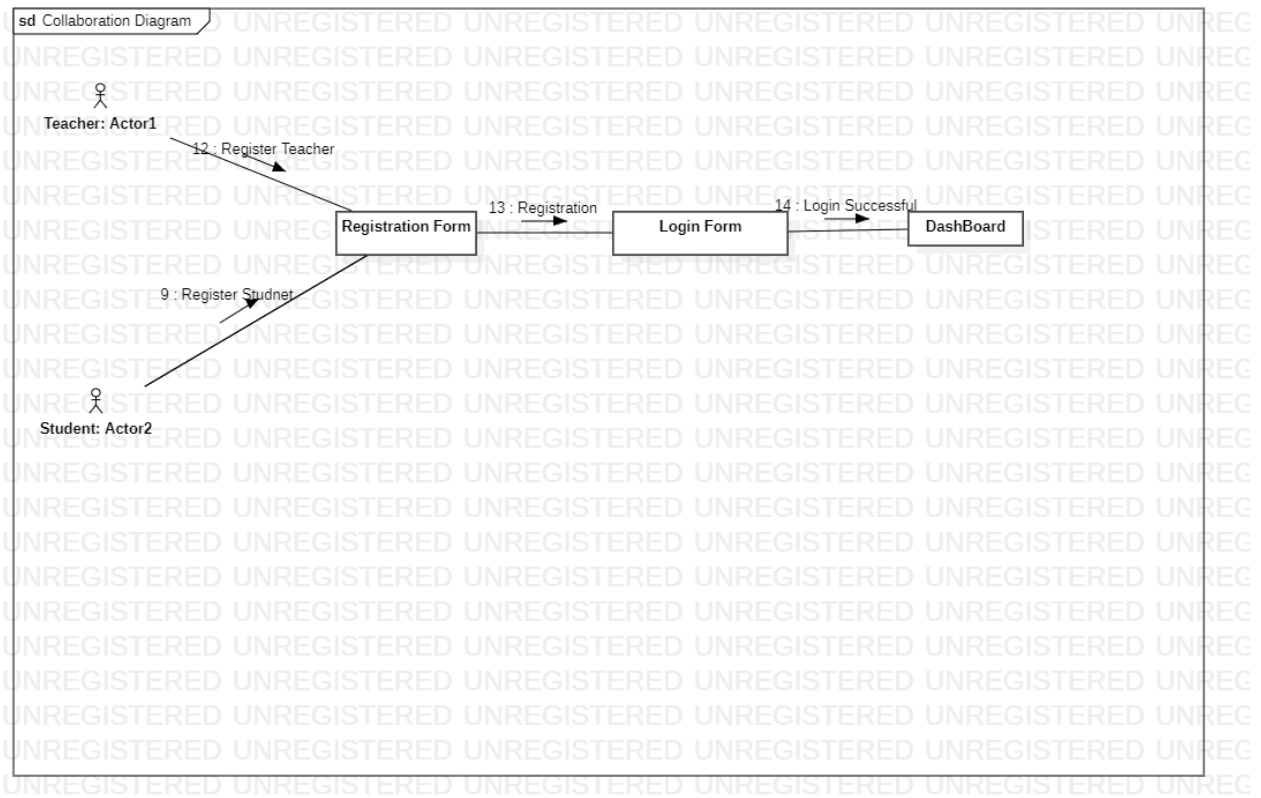
d) Flow of Event or Data Flow Diagram for Registration:



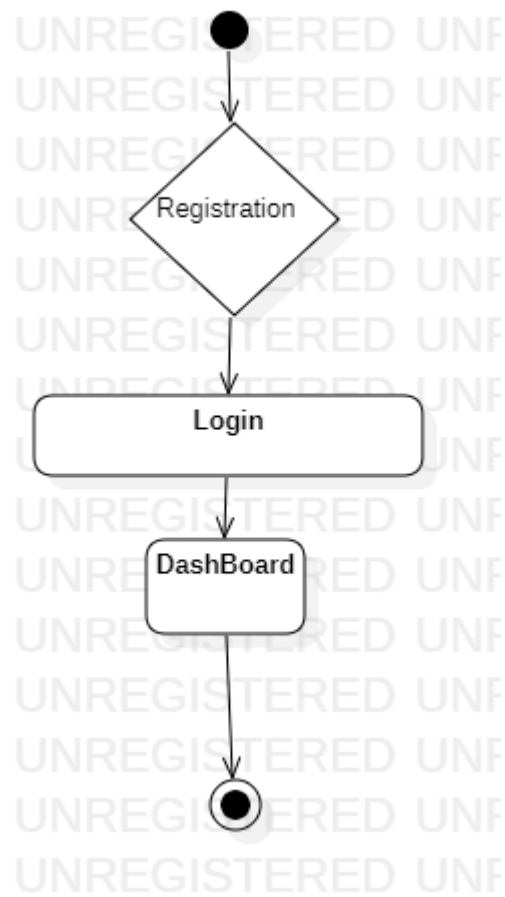
e) *Sequence Diagram:*



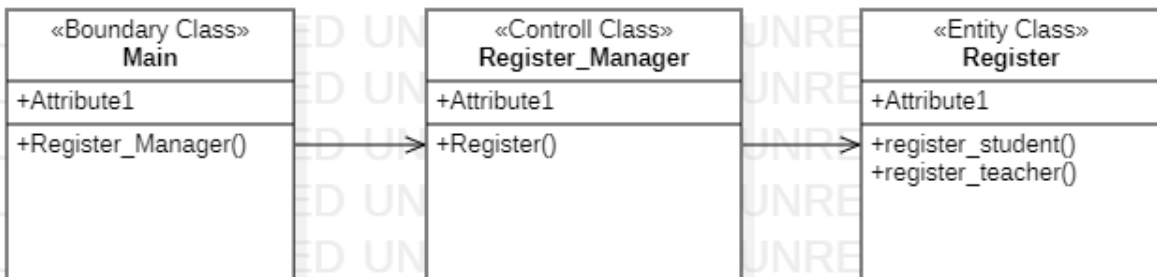
f) Collaboration Diagram:



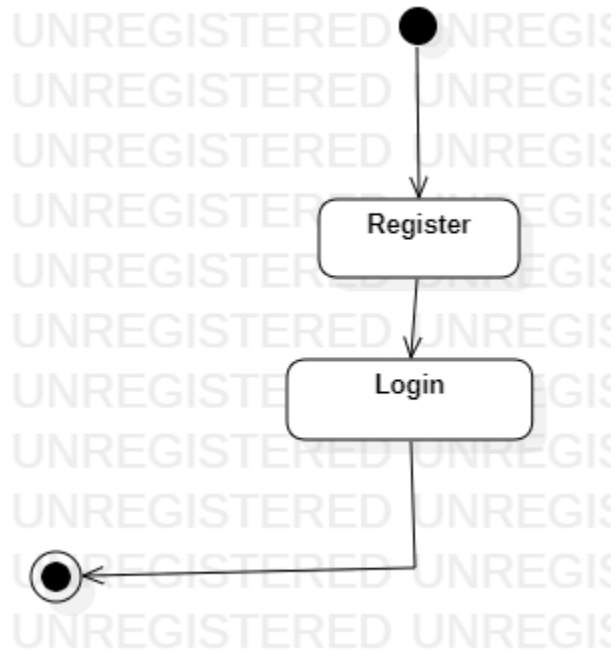
g) Activity Diagram:



h) Class Diagram:



i) State Chart Diagram:

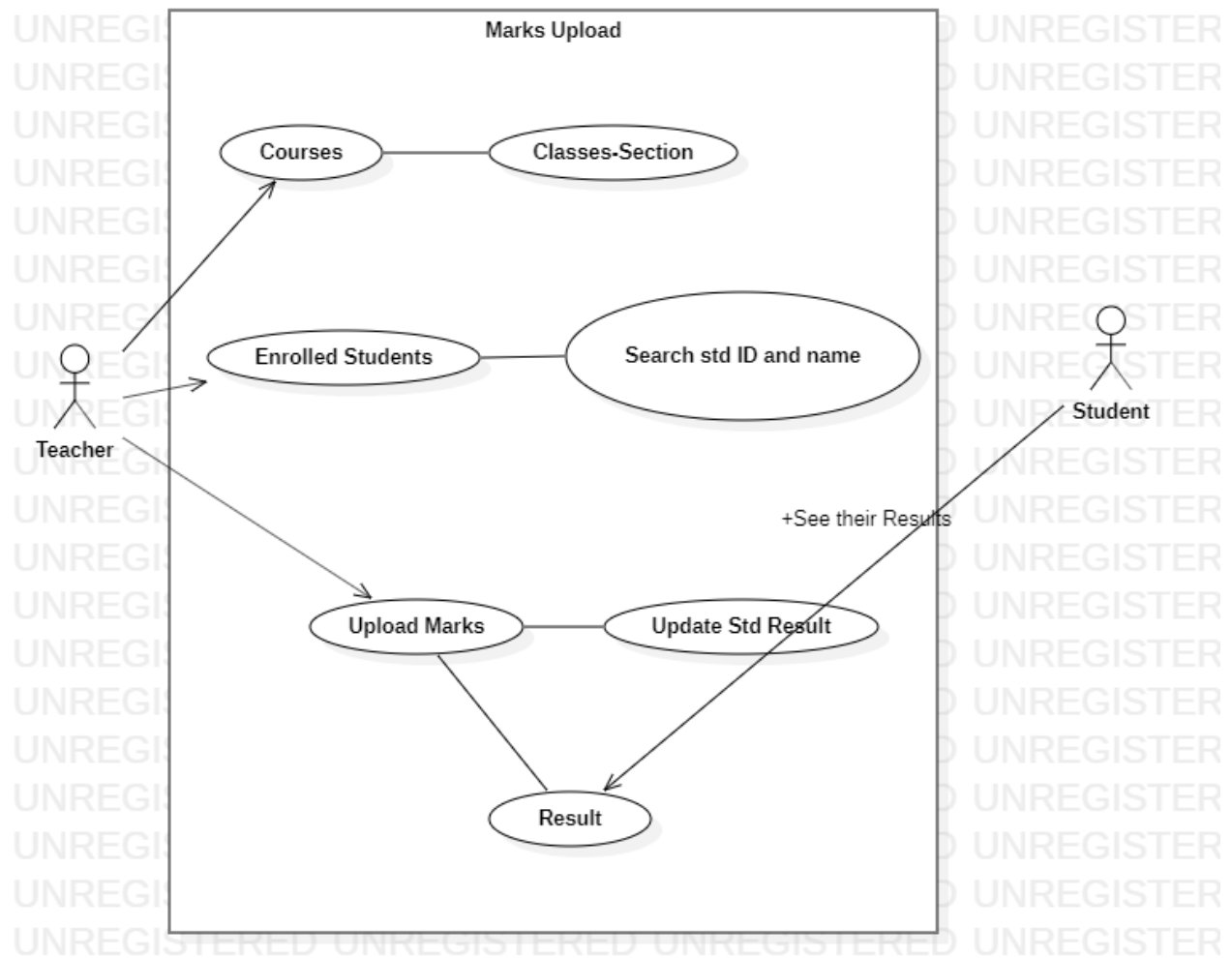


3.1.4 **Module 3 complete CRUD: Marks-Students Function (64413 - GL)**

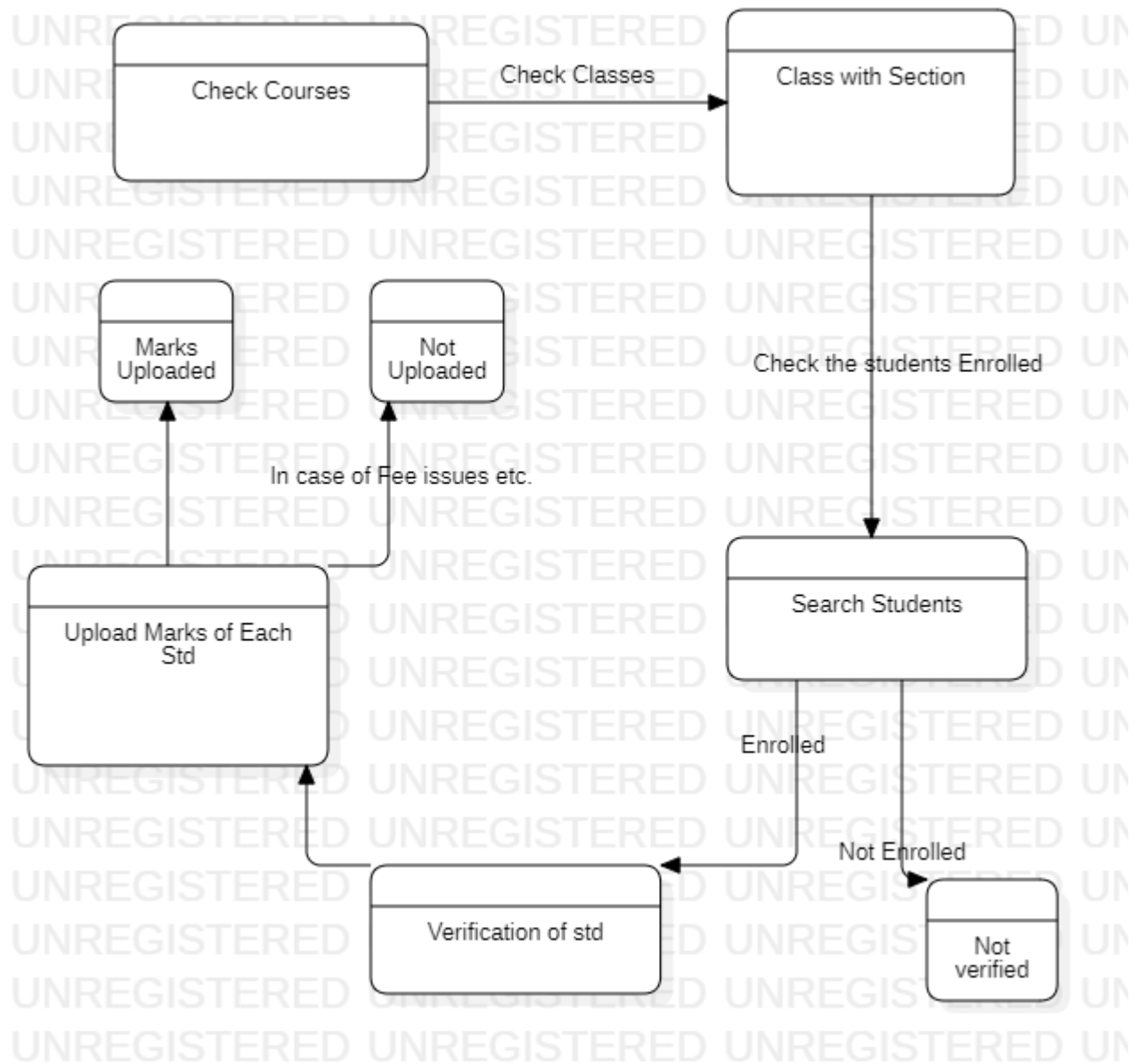
- a) **Description:** This function comes under Teacher's module where he or she will upload the marks of students related to their subjects. Also they have rights to update or upload the marks and write remarks as well.
- b) **Usage Scenario/ Use case Description/ Specification:**

| | |
|-----------------------|--|
| Description | Allows access to upload Marks of Students |
| Inputs | Student ID, name |
| Source | 3. User inputs Student name and ID 4. Press Upload Marks Button |
| Alternate case | |
| Outputs | Successfully uploaded; unsuccessful uploaded |
| Destination | None |
| Précondition | Authorized Teacher |
| Post Condition | No change to Teacher Account Database |
| Side Effects | Failures and successful marks upload are sent to Student Database |

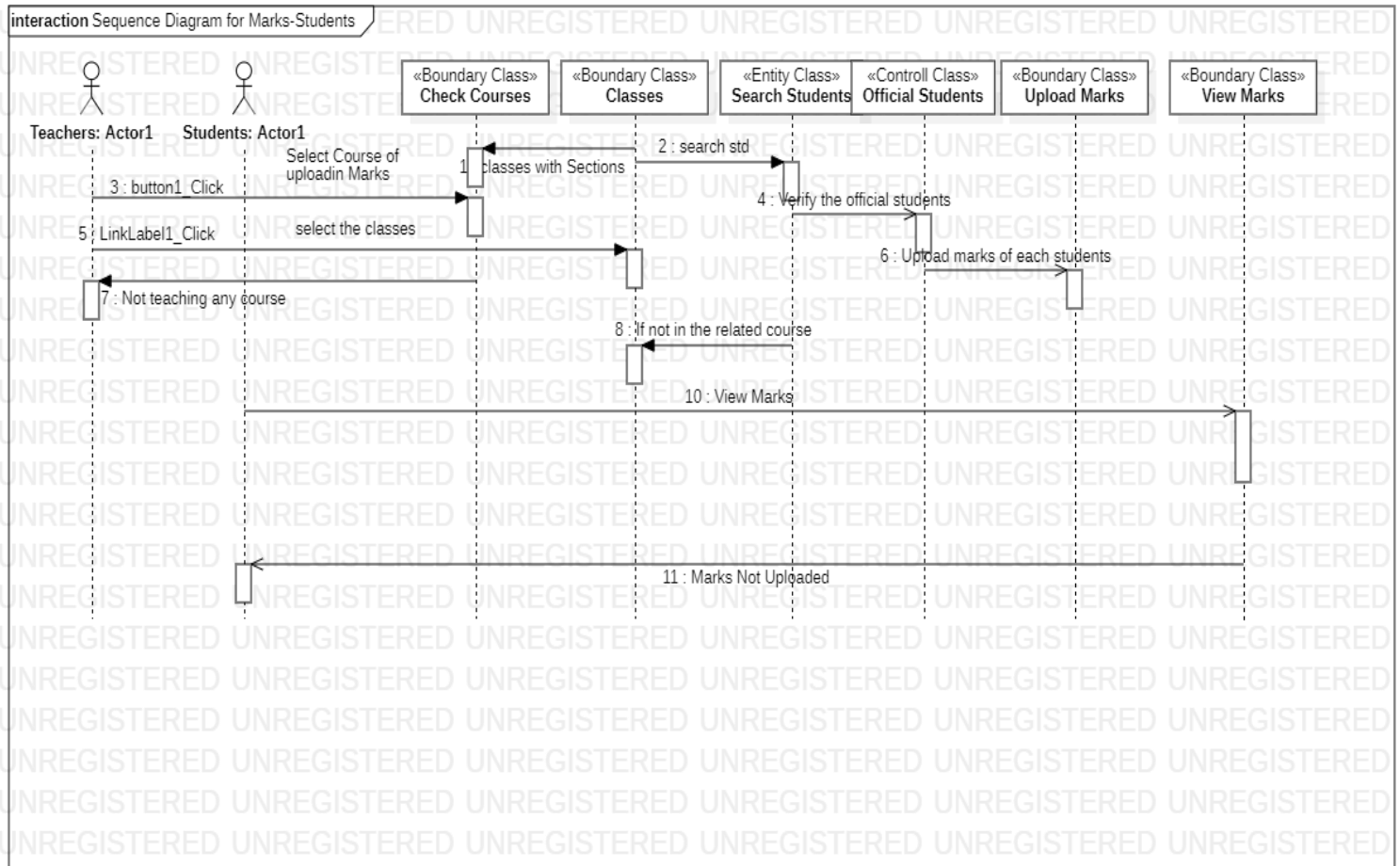
c) Use case Diagram for marks-students:



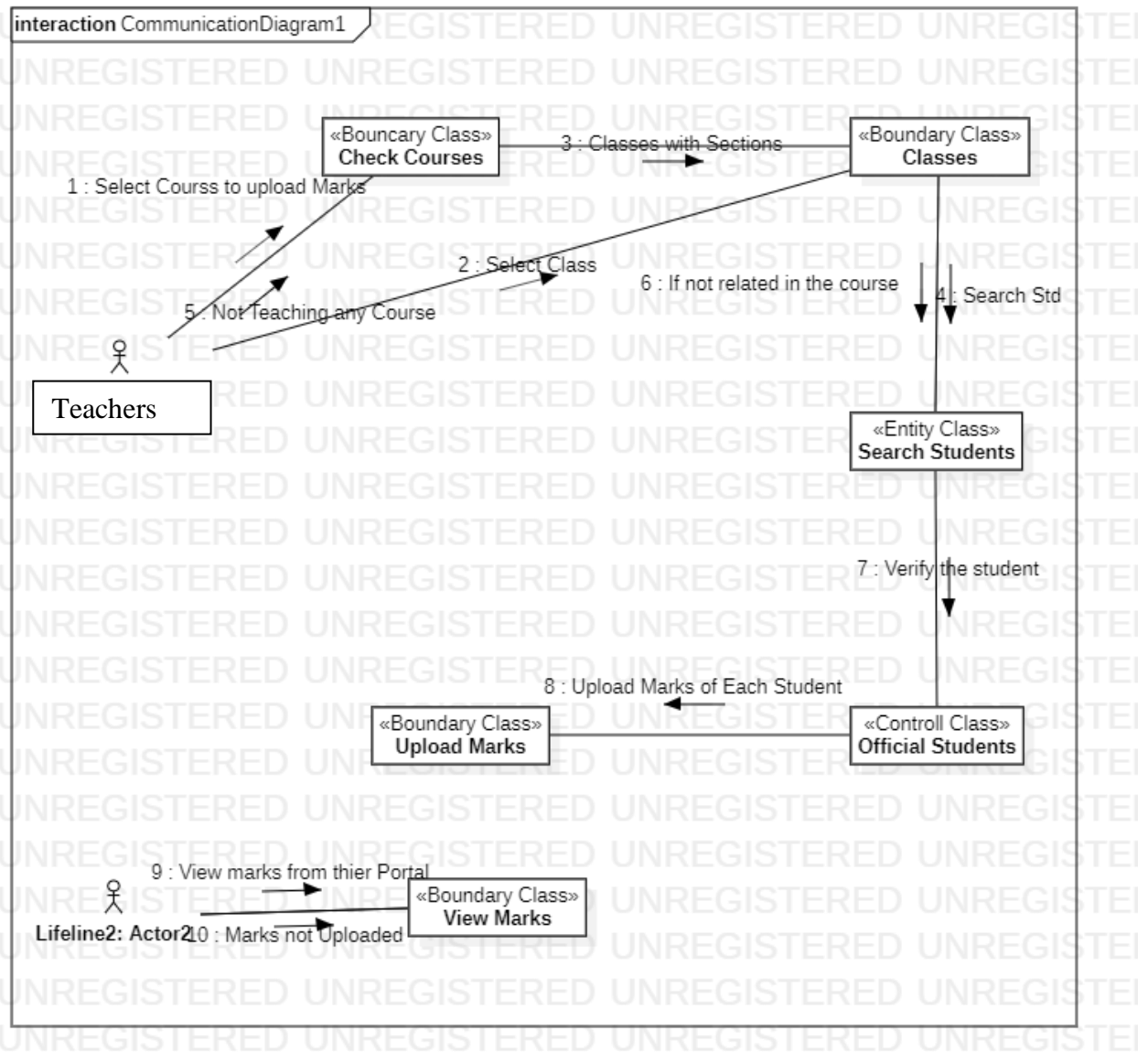
d) Flow of Event or Data Flow Diagram for marks-students:



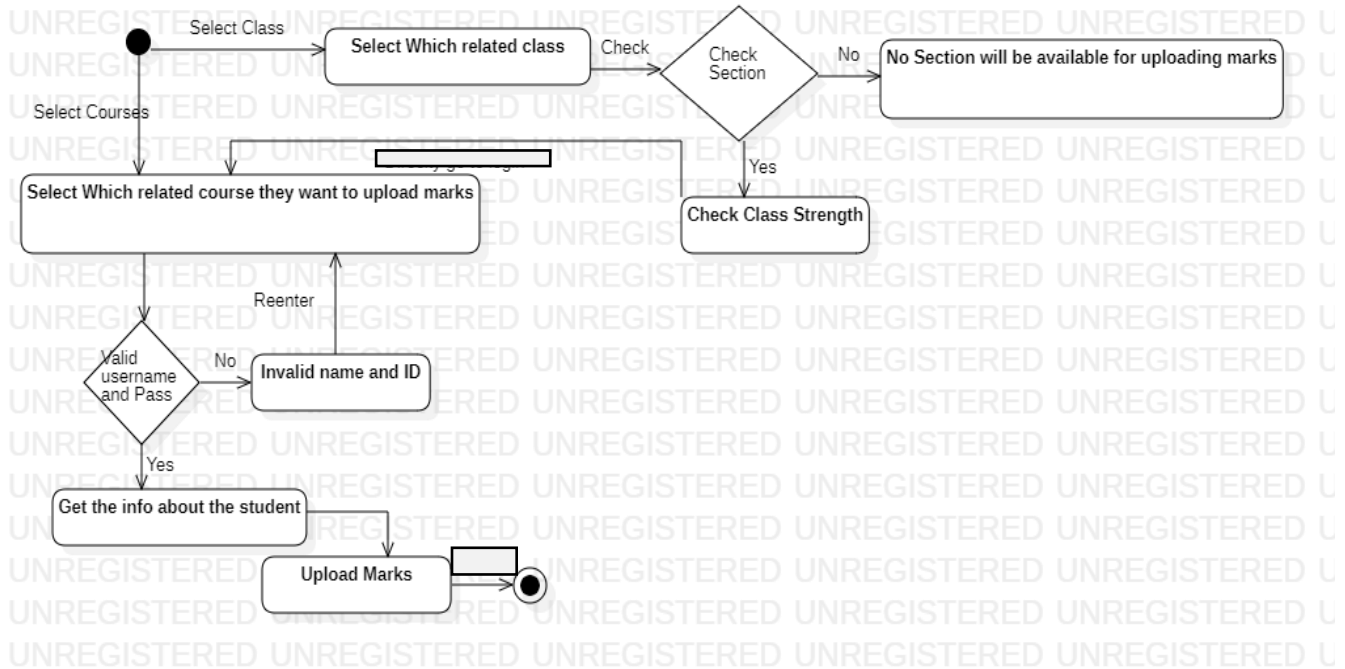
e) Sequence Diagram for marks-students:



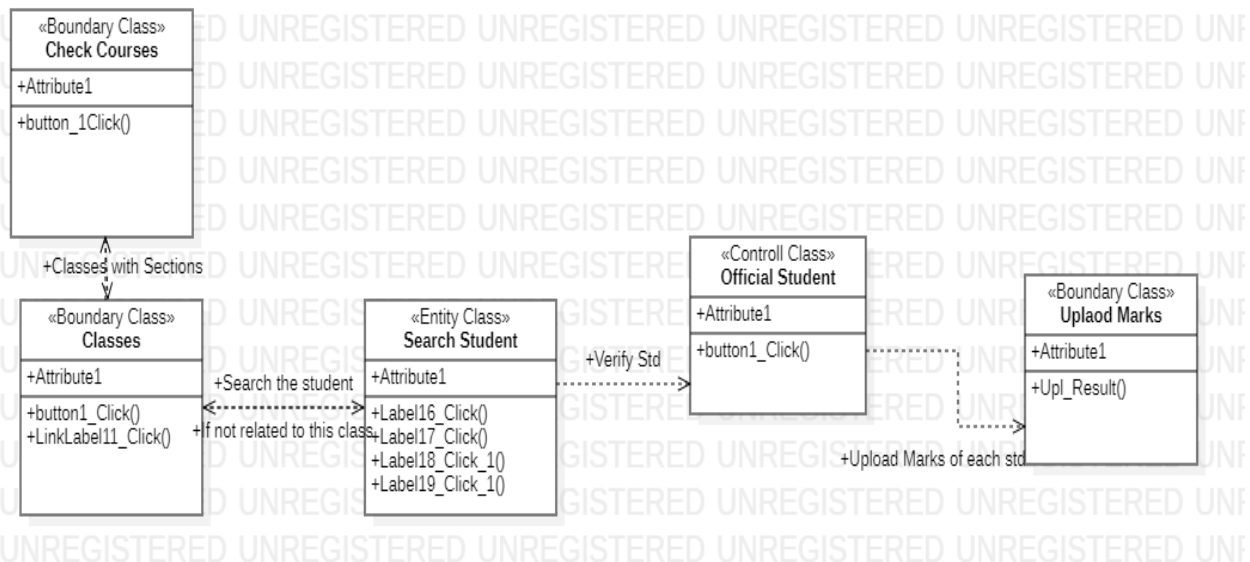
f) Collaboration Diagram for marks-students:



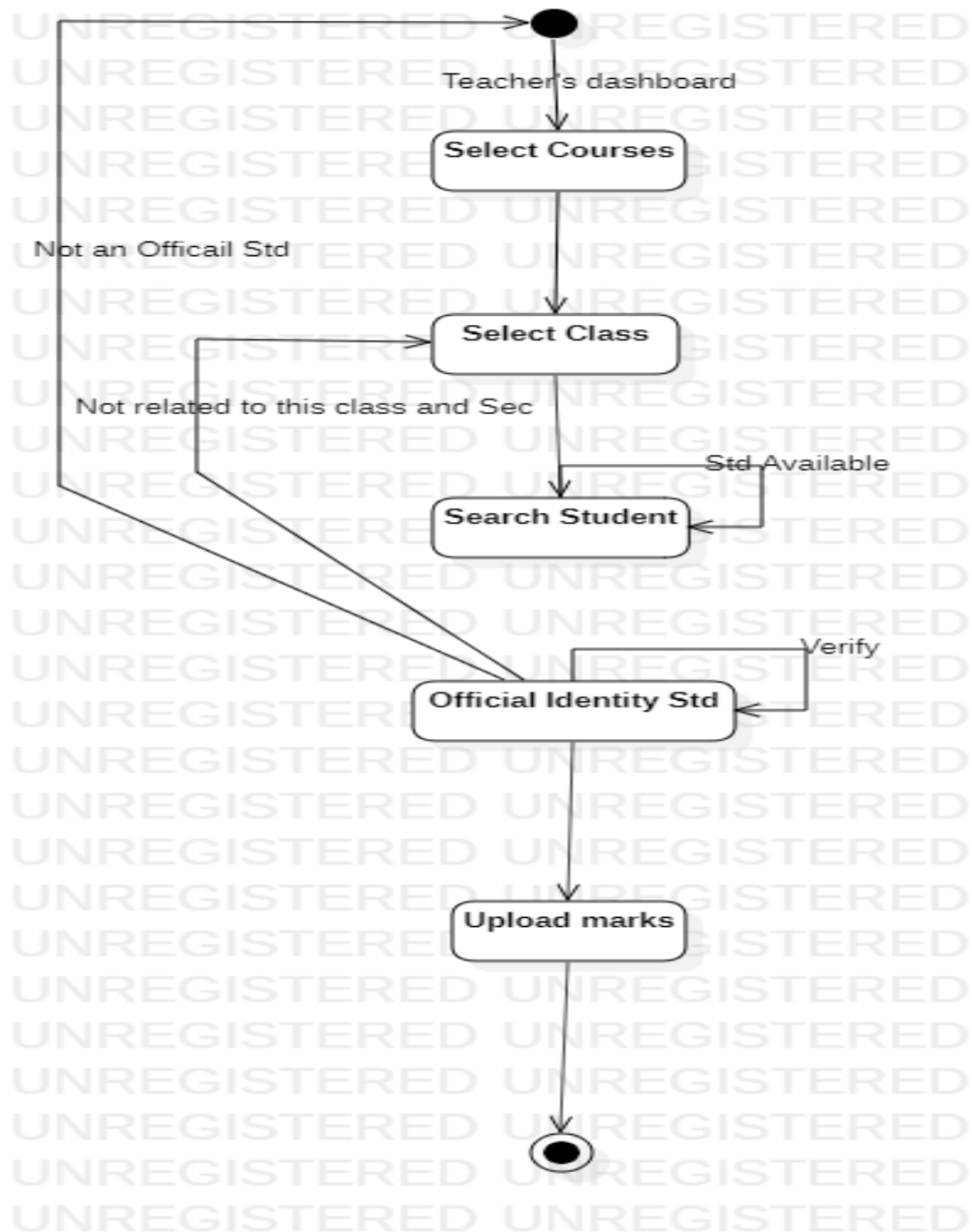
g) Activity Diagram for marks-students:



h) Class Diagram for marks-students:



i) State Chart Diagram for marks-students:



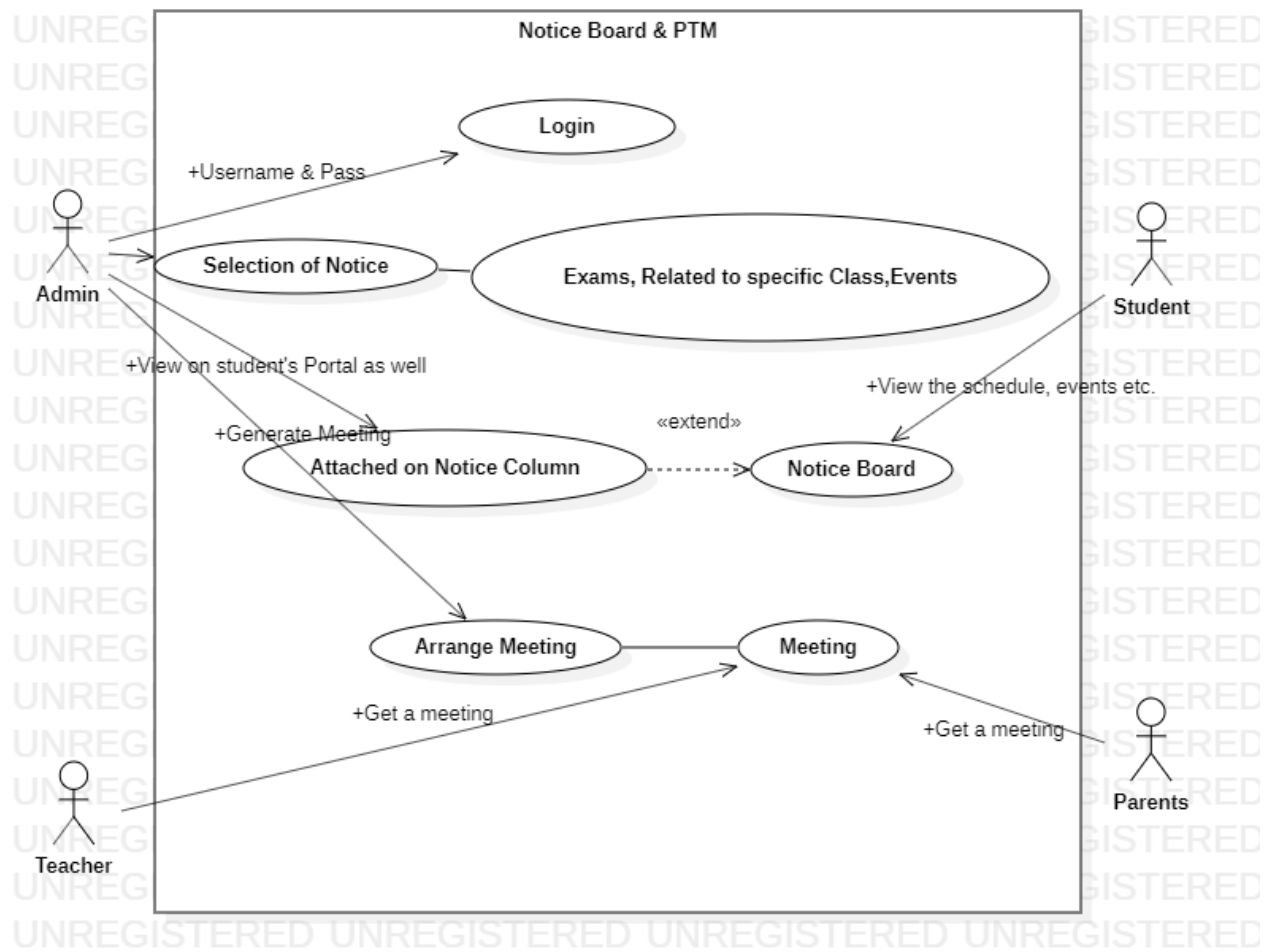
3.1.5 **Module 4 complete CRUD Notice & PTM Function (64335)**

a) *Description:* This function ensures that from the administration department, they put a notice on the notice board or notice column where students and teachers aware from the important notices related to class timings, exams, and etc. Also we have PTM where teachers parents can communicate each other and aware of student's performance.

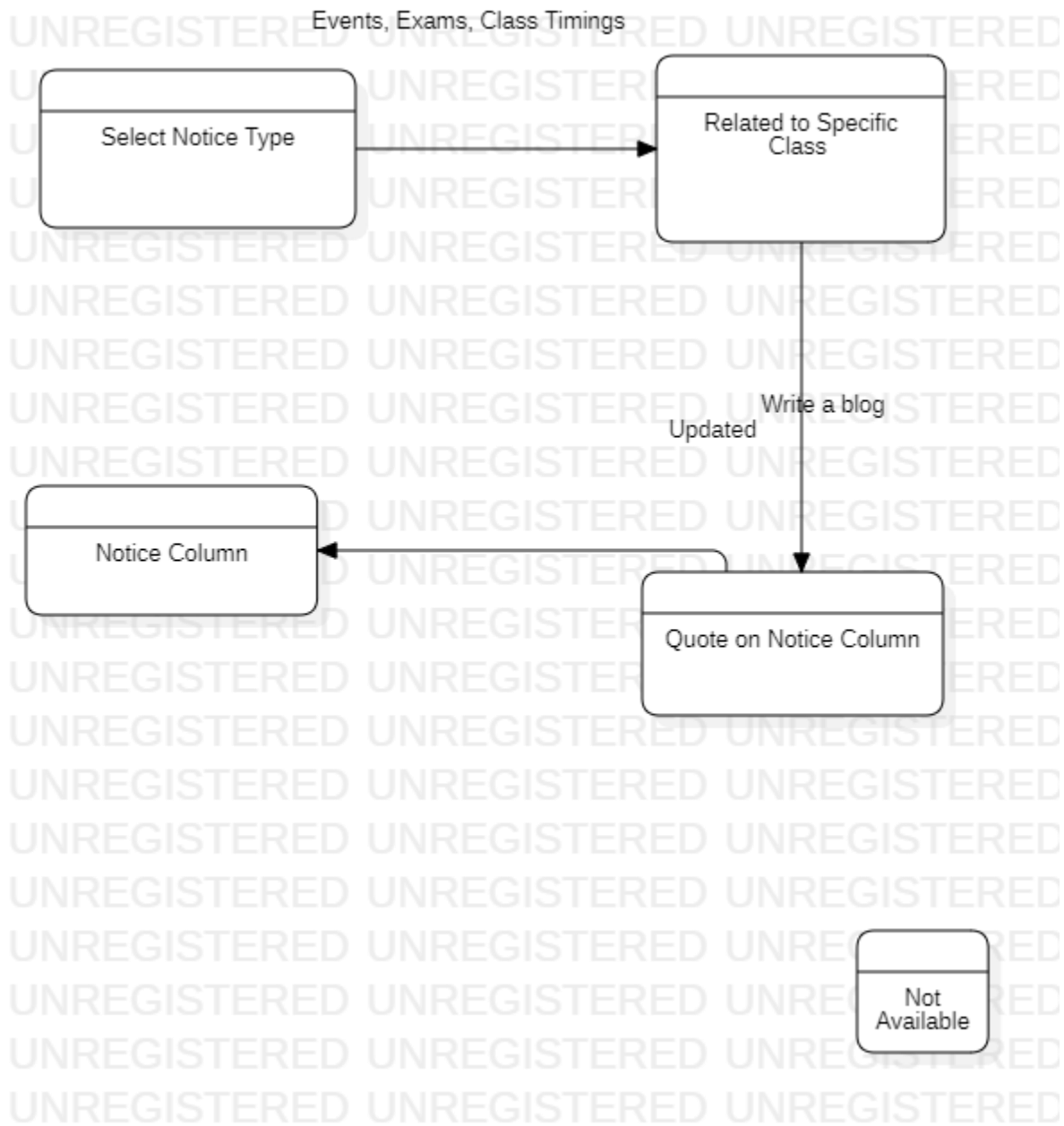
b) *Usage Scenario/ Use case Description/ Specification:*

| | |
|-----------------------|---|
| Description | Allows access to Manage the exams schedule, timings, and etc. on the notice board column. |
| Inputs | Select related to Class notice, Select Exam Schedule notice. |
| Source | 5. Admin add Events, Exams dates etc. 6. Update Notice Board. |
| Alternate case | |
| Outputs | Successfully to update notice column; unsuccessful to update notice column |
| Destination | None |
| Précondition | Authorized Administration |
| Post Condition | No change to Teacher Account Database |
| Side Effects | |

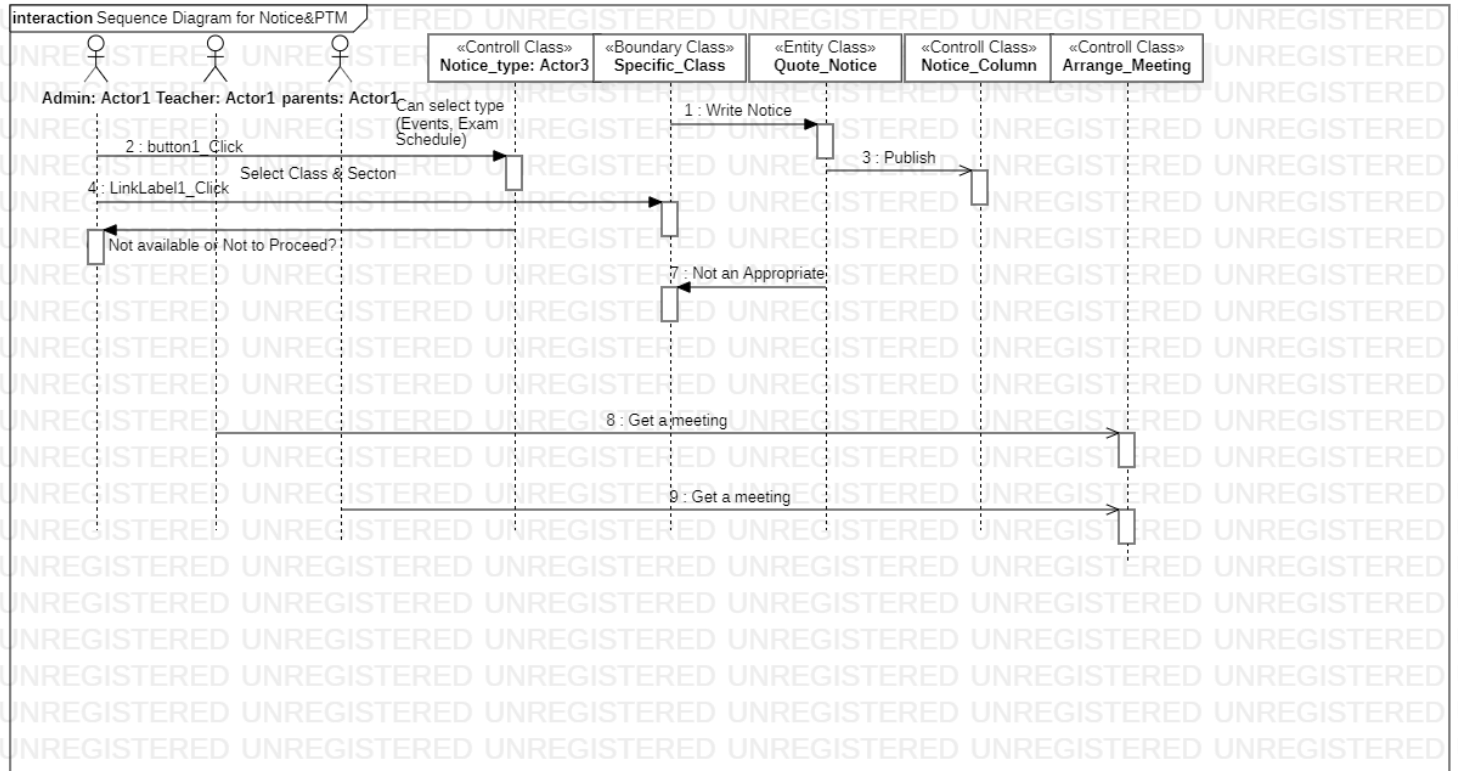
c) Detailed Use case Diagram for Notice Board & PTM:



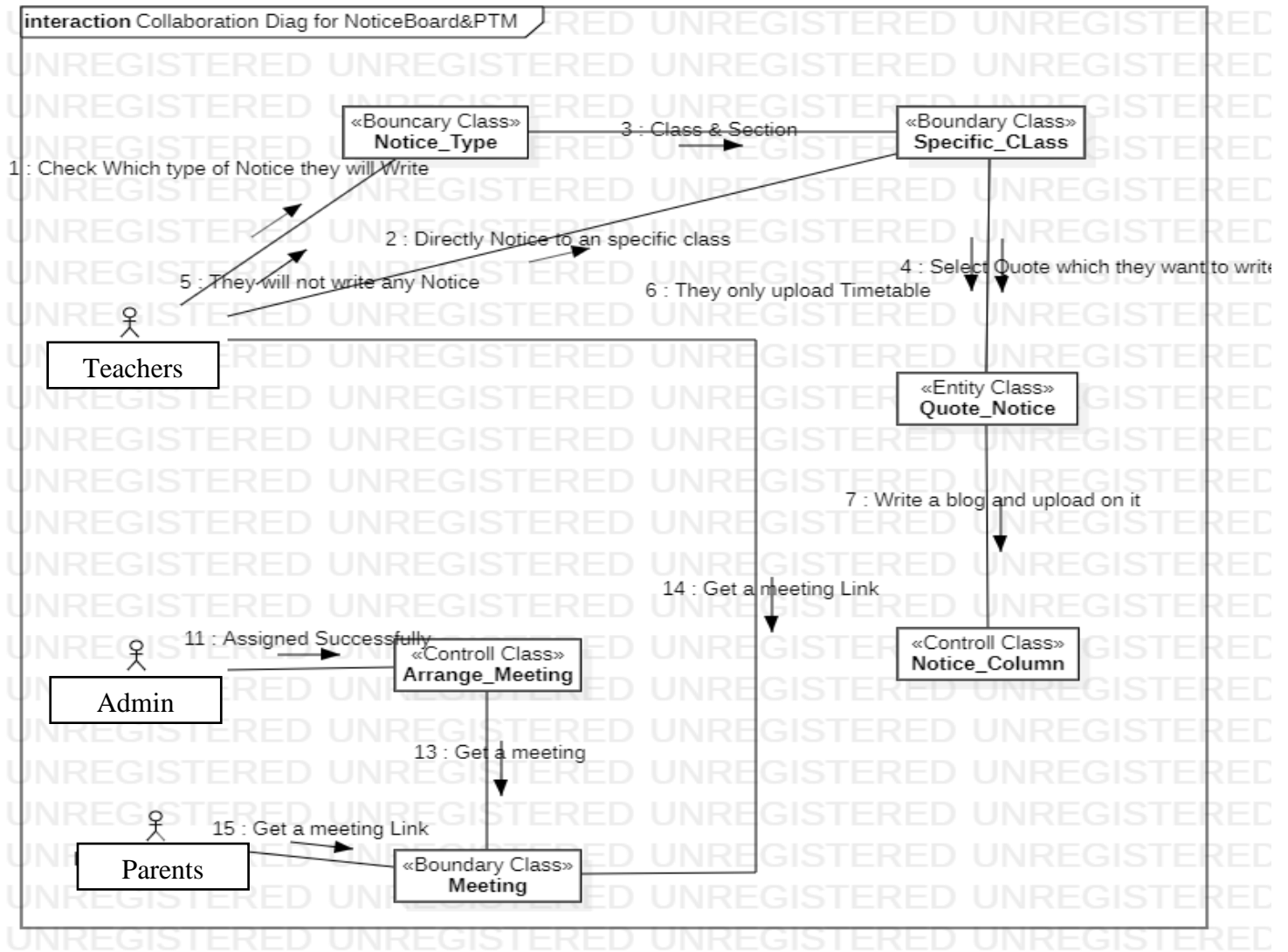
d) Flow of Event or Data Flow Diagram for Notice Board & PTM:



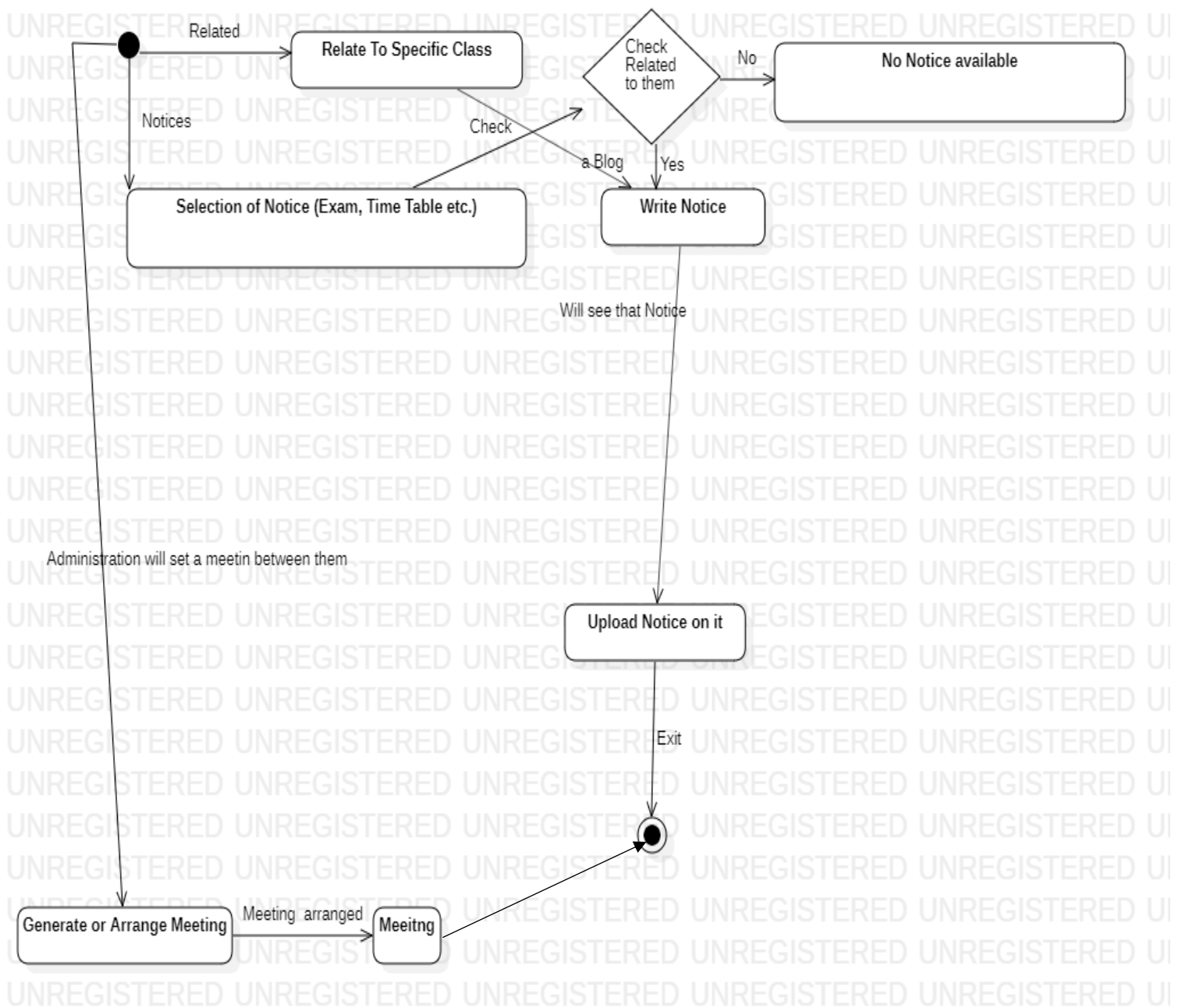
e) *Sequence Diagram for Notice Board & PTM:*



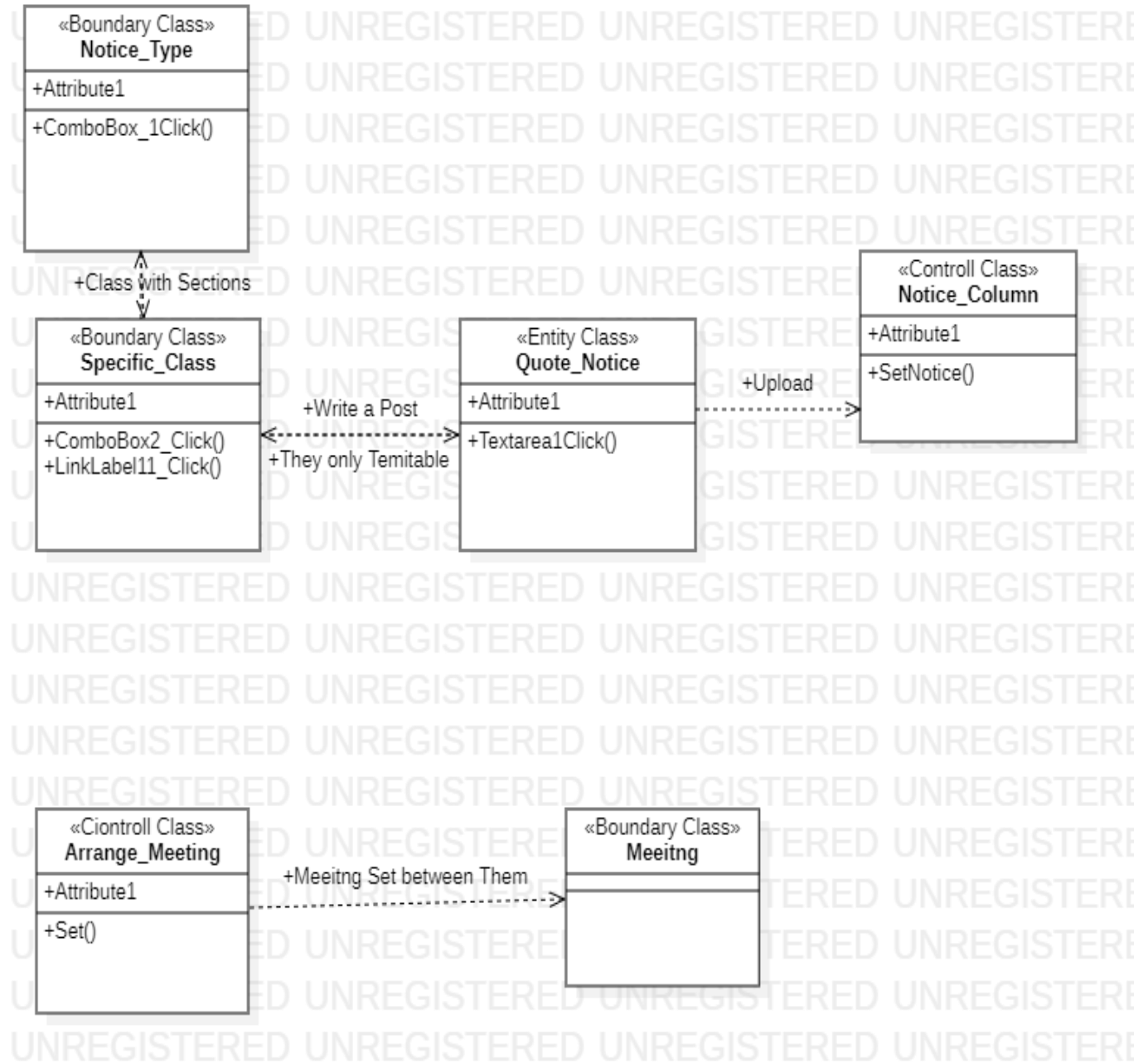
f) Collaboration Diagram for Notice Board & PTM:



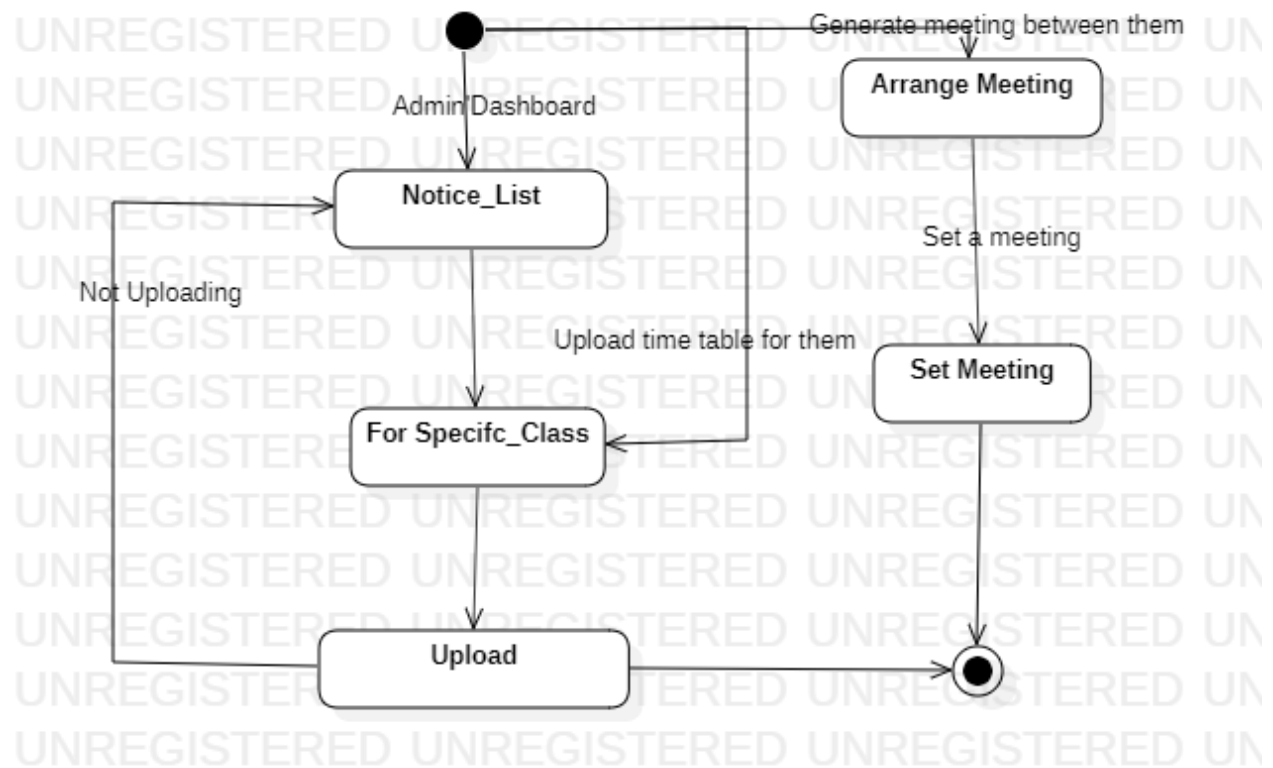
g) Activity Diagram for Notice Board & PTM:



h) Class Diagram for Notice Board & PTM:



i) State Chart Diagram for Notice Board & PTM:



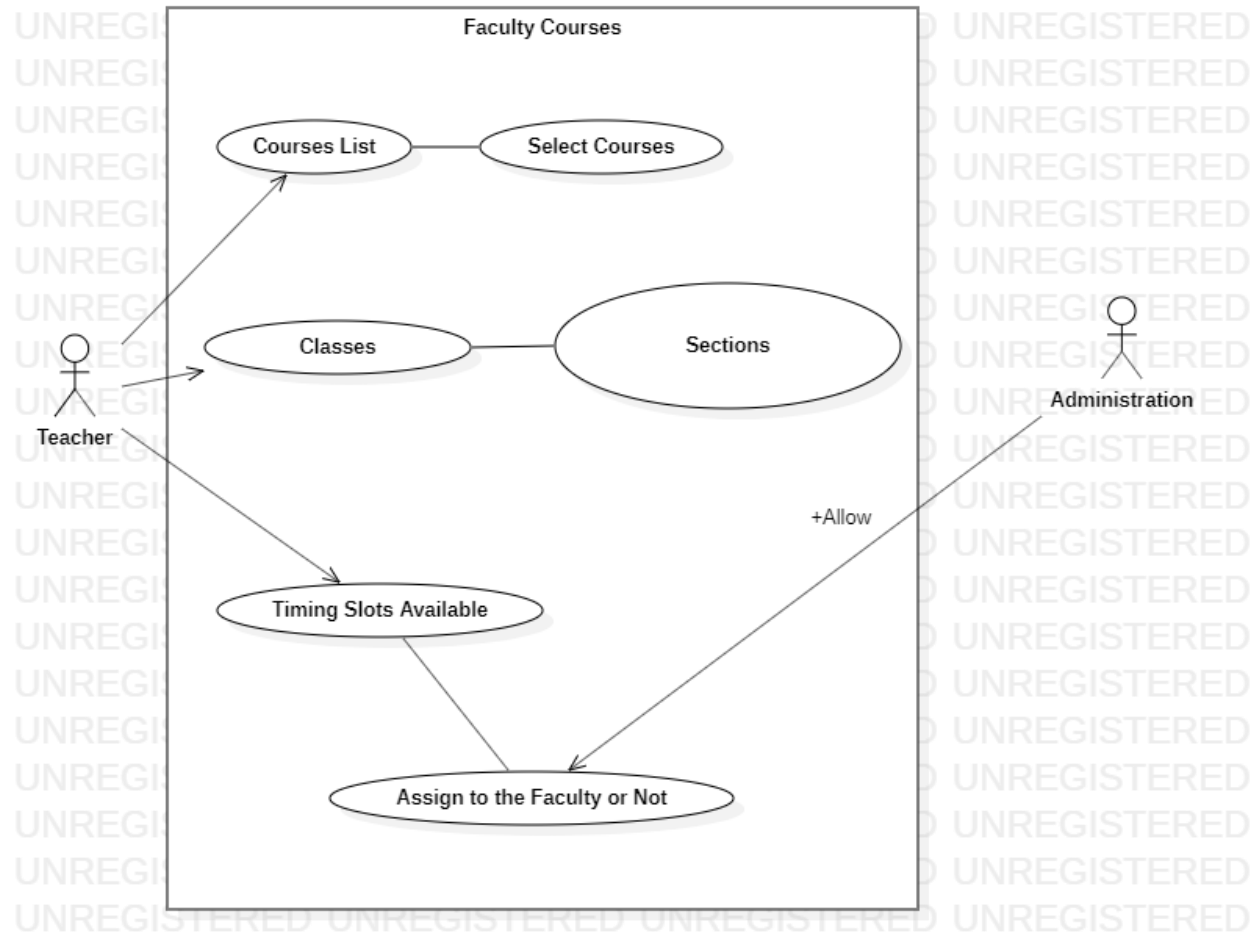
3.1.6 **Module 5 complete CRUD Faculty Courses Function (62749)**

a) Description: This function ensures that only authorized users gain access to the SMS databases. An authorized user is a user who has an account on the system. Users include Teachers, Students, and MPA officials. The user must type a valid username and password to gain access. Only Admin and Teachers can change the Time table and Student can see their classes Schedule.

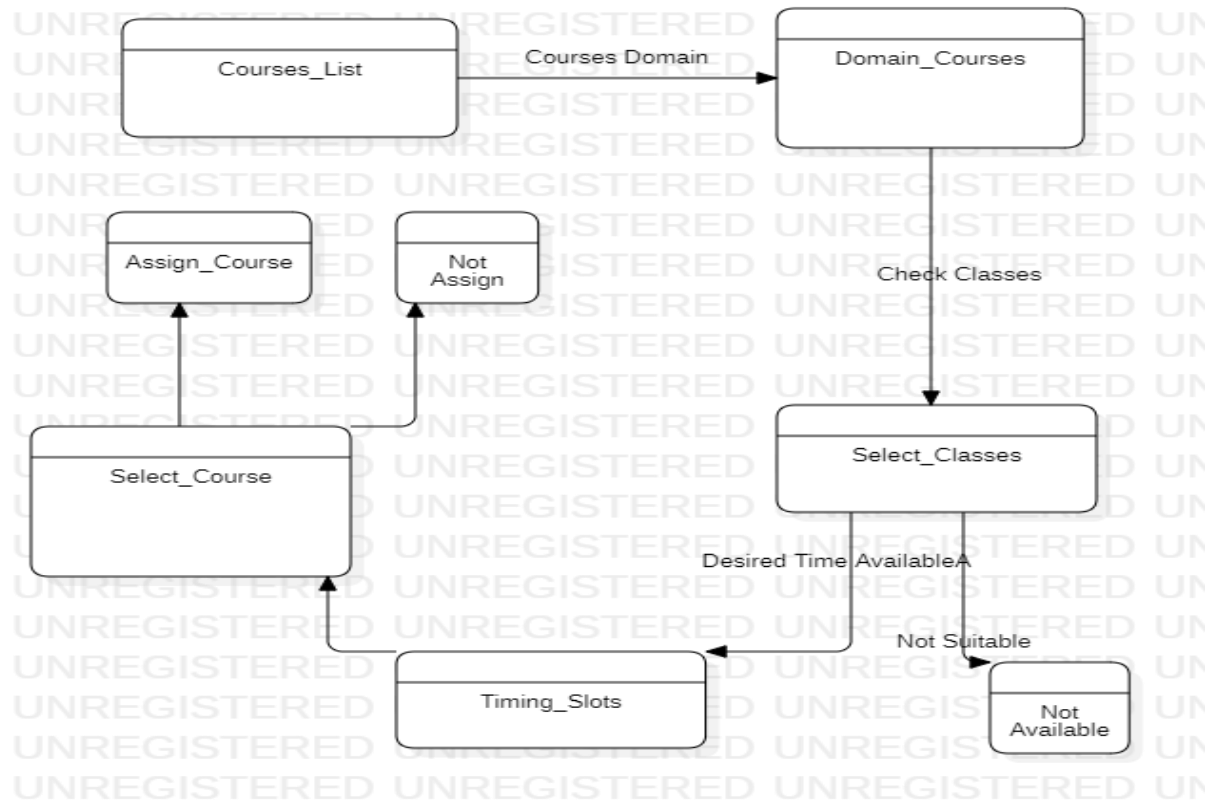
b) Usage Scenario/ Use case Description/ Specification:

| | |
|-----------------------|--|
| Description | Allows access to Manage or select courses for Teachers to the related classes. |
| Inputs | Select Course, Select Class, Select Sections. |
| Source | 7. Admin add Subjects and their time 8. Update Courses List. |
| Alternate case | |
| Outputs | Successfully Assign; unsuccessful Assigning |
| Destination | None |
| Précondition | Authorized Teachers |
| Post Condition | No change to Teacher Account Database |
| Side Effects | |

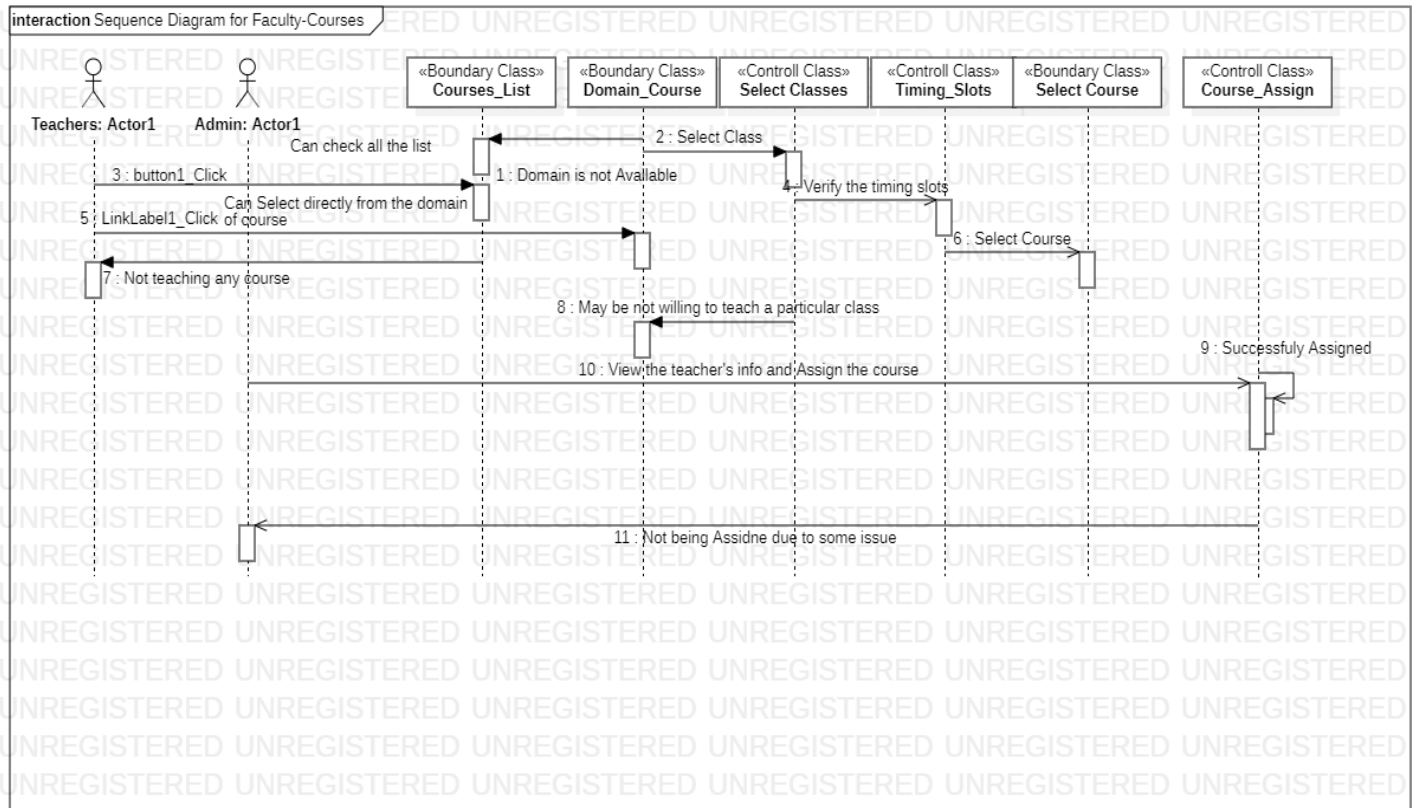
c) Detailed Use case Diagram for Faculty Courses:



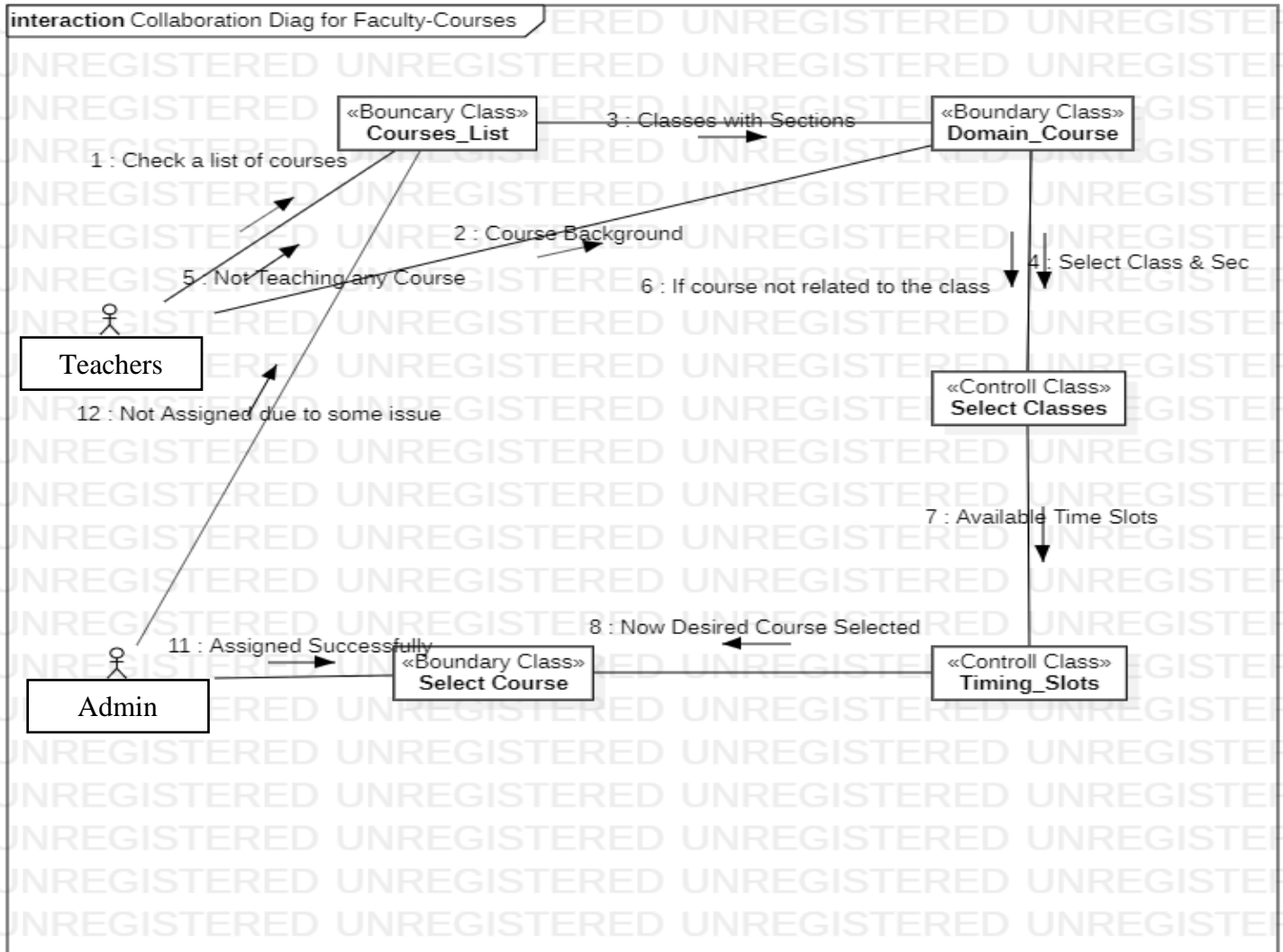
d) Flow of Event or Data Flow Diagram for Faculty Courses:



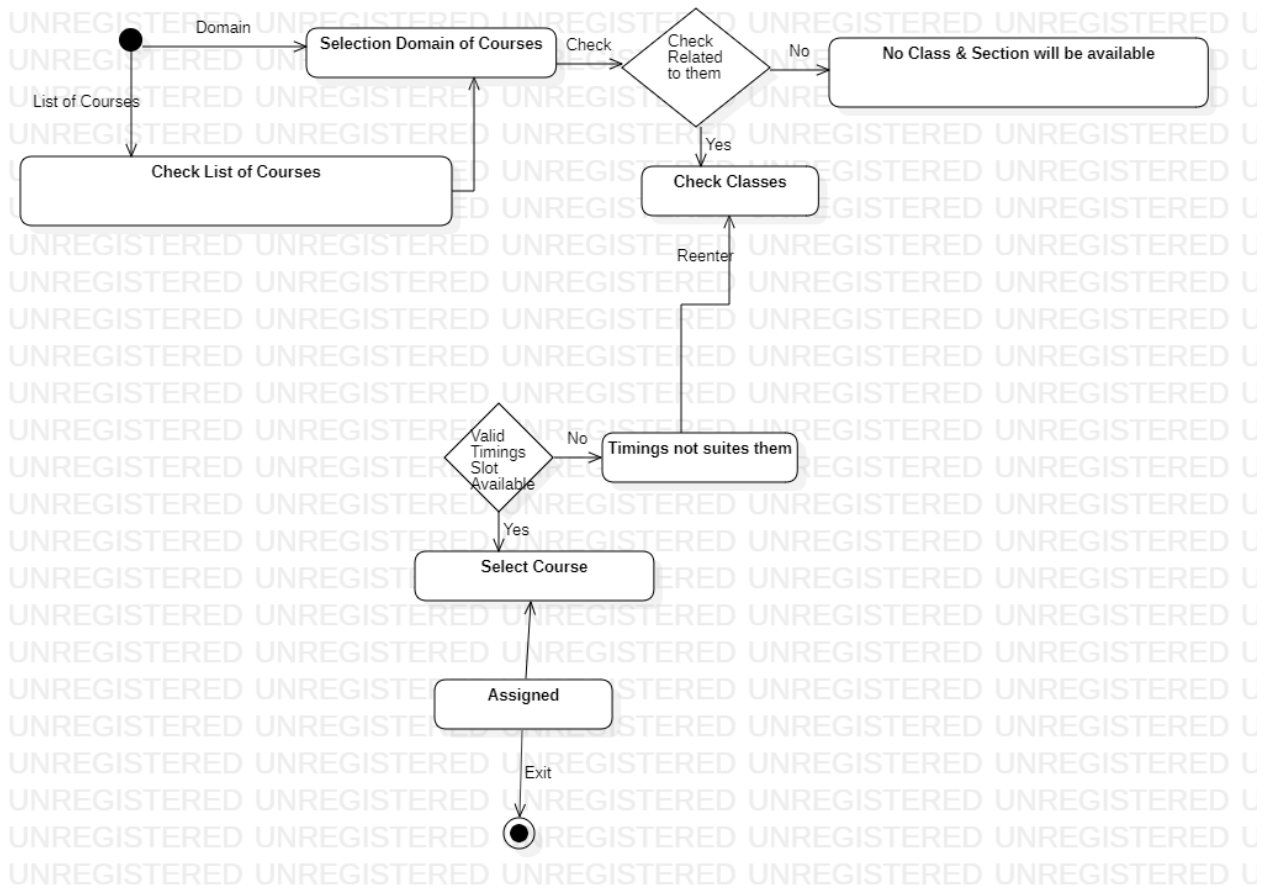
e) Sequence Diagram for Time Table:



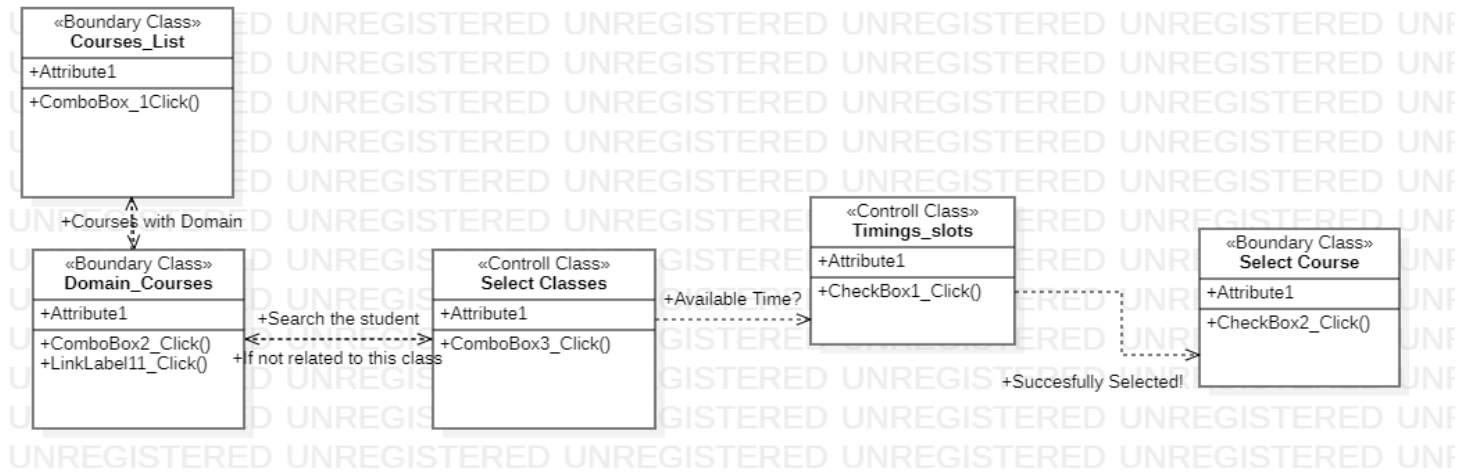
f) Collaboration Diagram for Faculty Course:



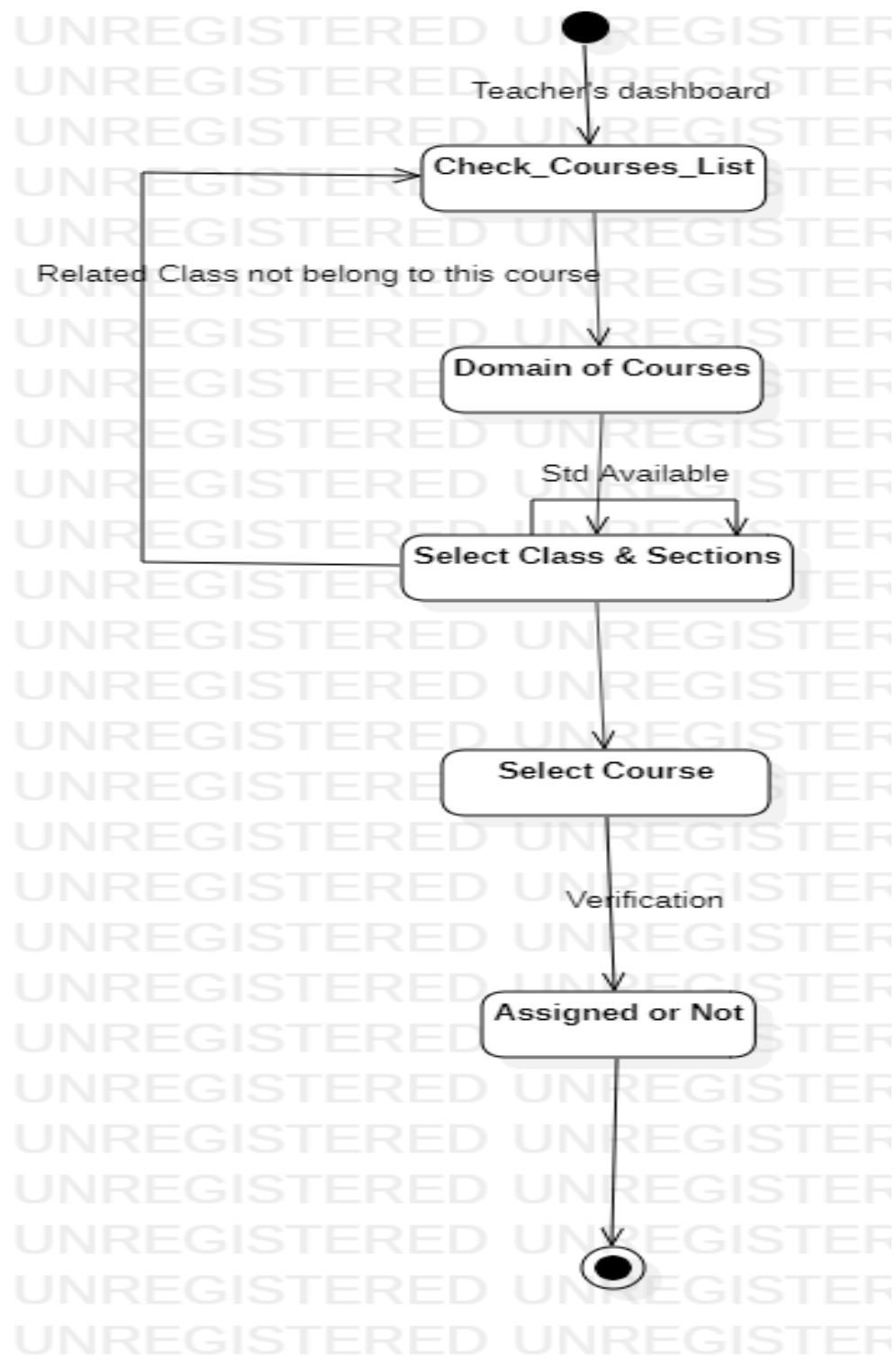
g) Activity Diagram for Faculty Courses:



h) Class Diagram for Faculty Courses:



i) State Chart Diagram for Faculty Courses:



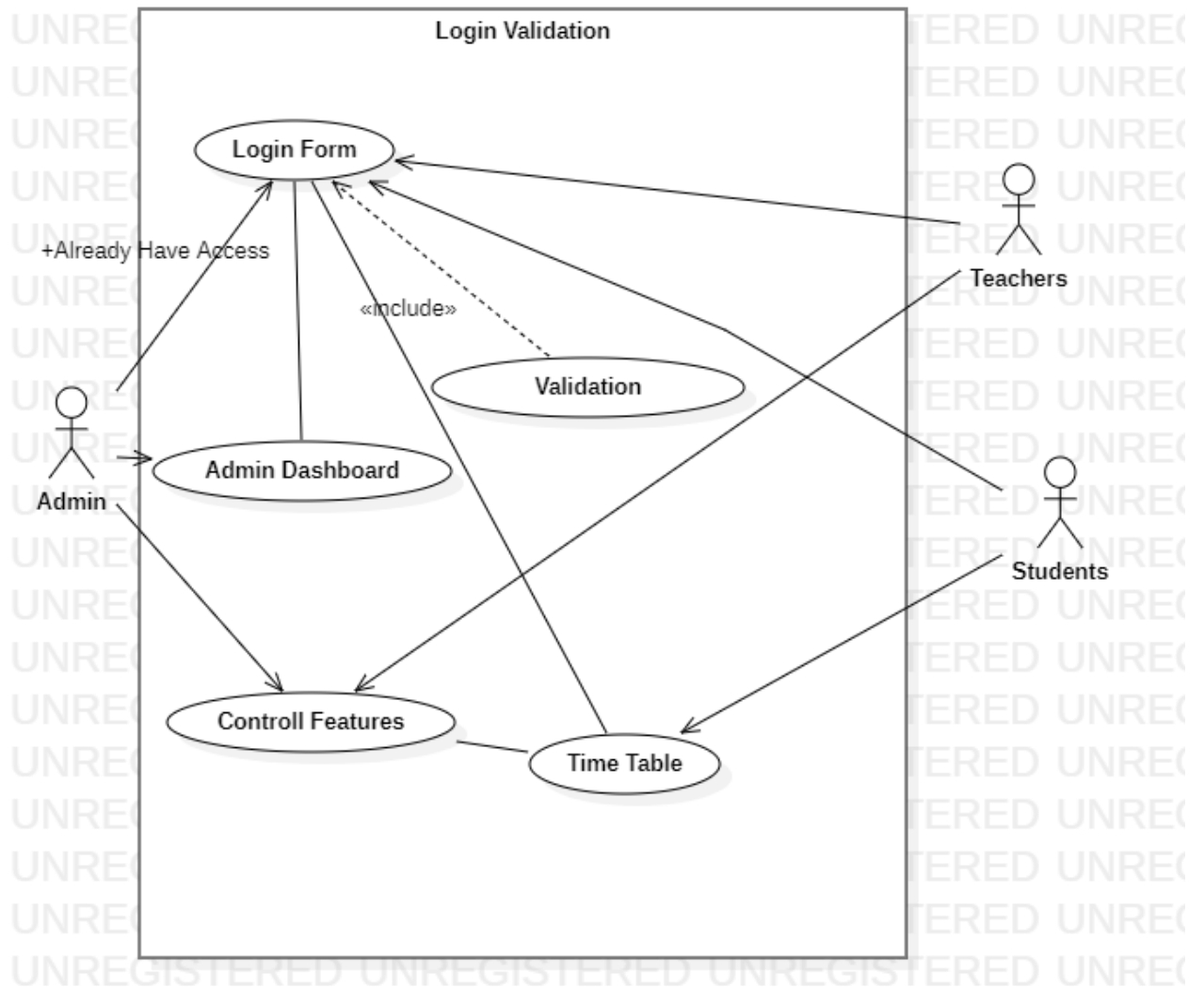
3.1.7 **Module 6 complete CRUD Time Table Function (62822)**

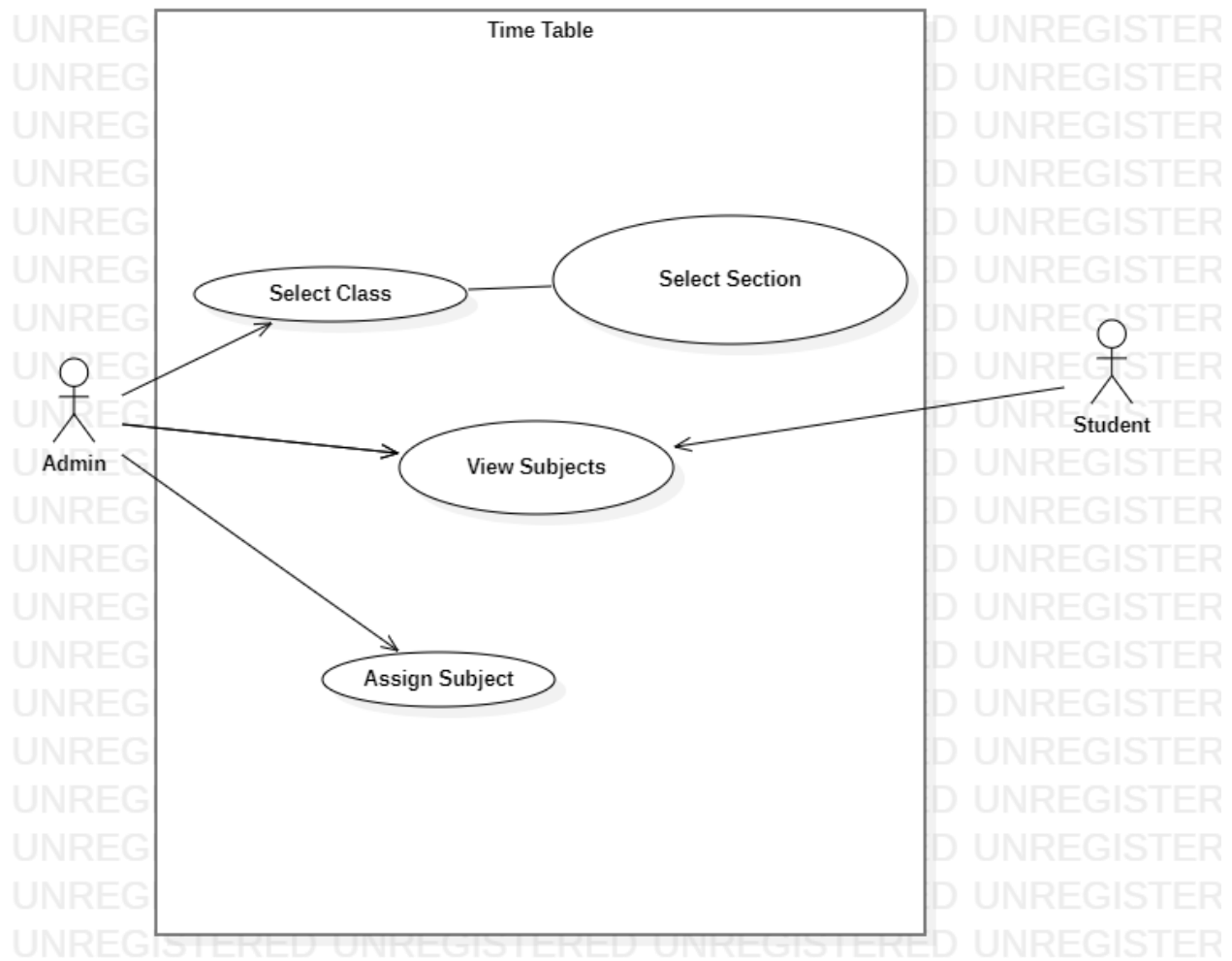
a) **Description:** This function ensures that only authorized users gain access to the SMS databases. An authorized user is a user who has an account on the system. Users include Teachers, Students, and MPA officials. The user must type a valid username and password to gain access. Only Admin and Teachers can change the Time table and Student can see their classes Schedule.

b) **Usage Scenario/ Use case Description/ Specification:**

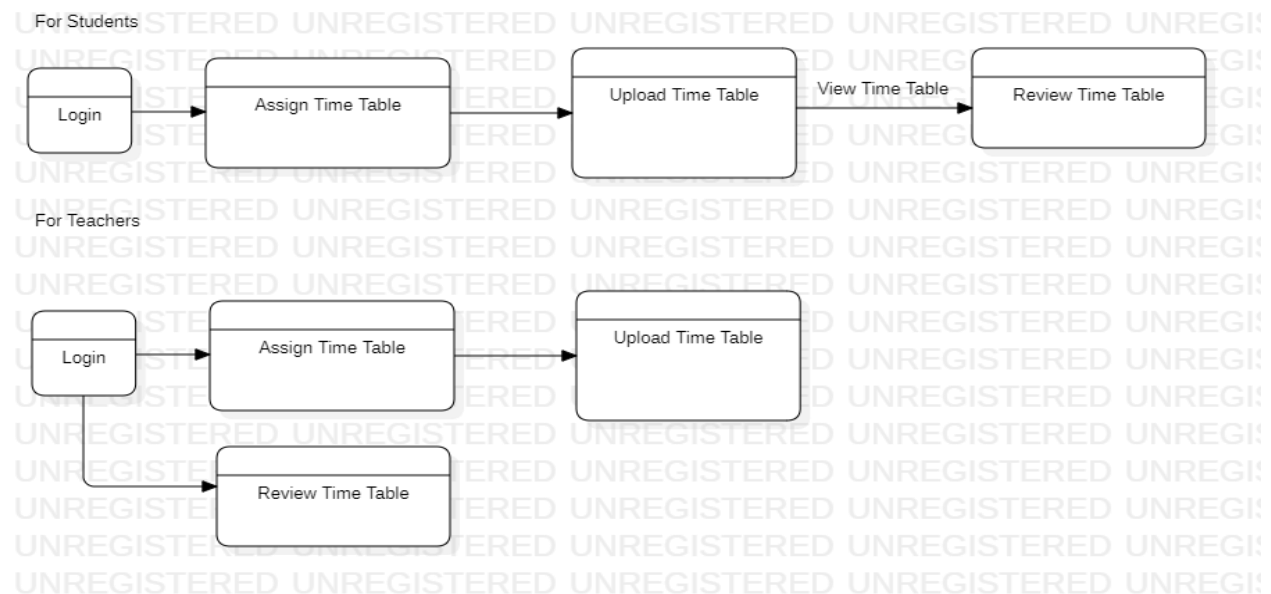
| | |
|-----------------------|--|
| Description | Allows access to Manage Time Table for Teachers and Students Classes |
| Inputs | Select Class, Select Section |
| Source | 9. Admin add Subjects and their time 10. Update Time table |
| Alternate case | |
| Outputs | Successfully uploaded; unsuccessful uploaded |
| Destination | None |
| Précondition | Authorized Teacher, Students |
| Post Condition | No change to Teacher or Students Account Database |
| Side Effects | |

c) Detailed Use case Diagram for Timetable:



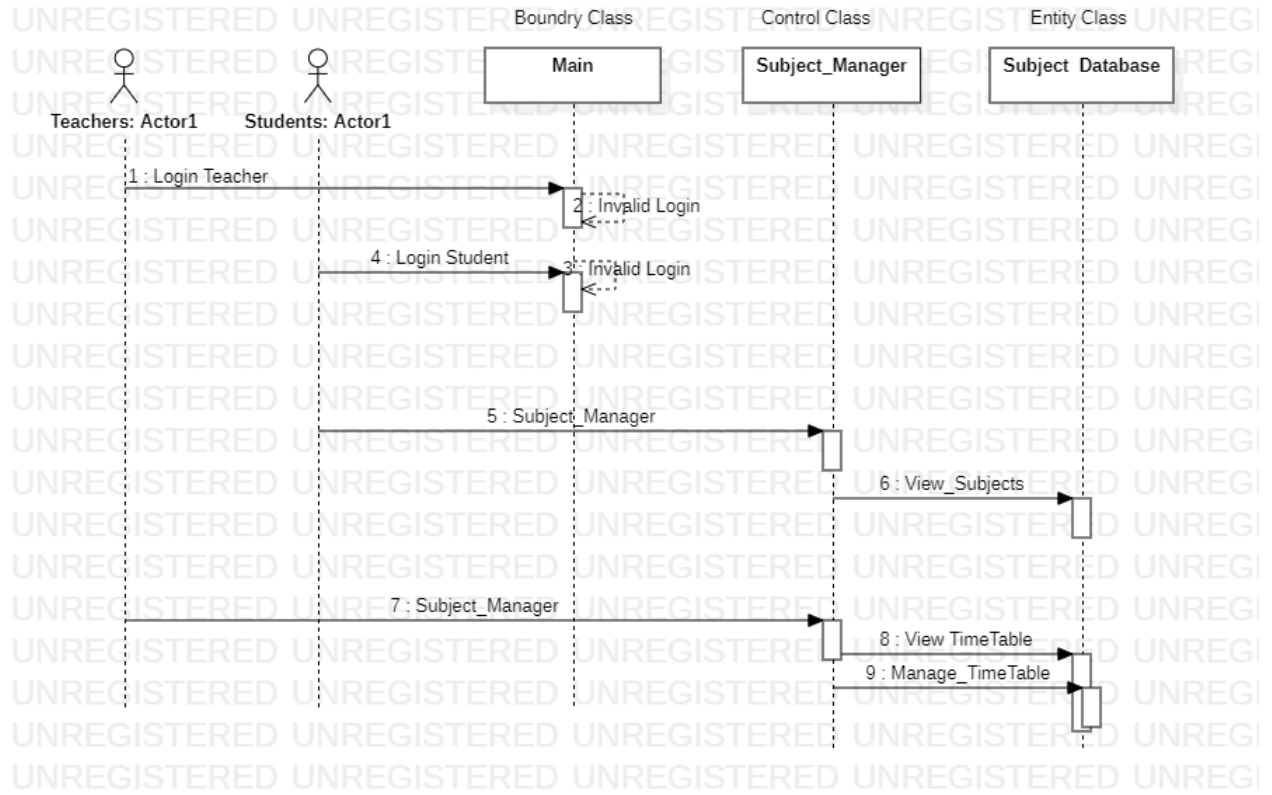


d) Flow of Event or Data Flow Diagram for Time Table:

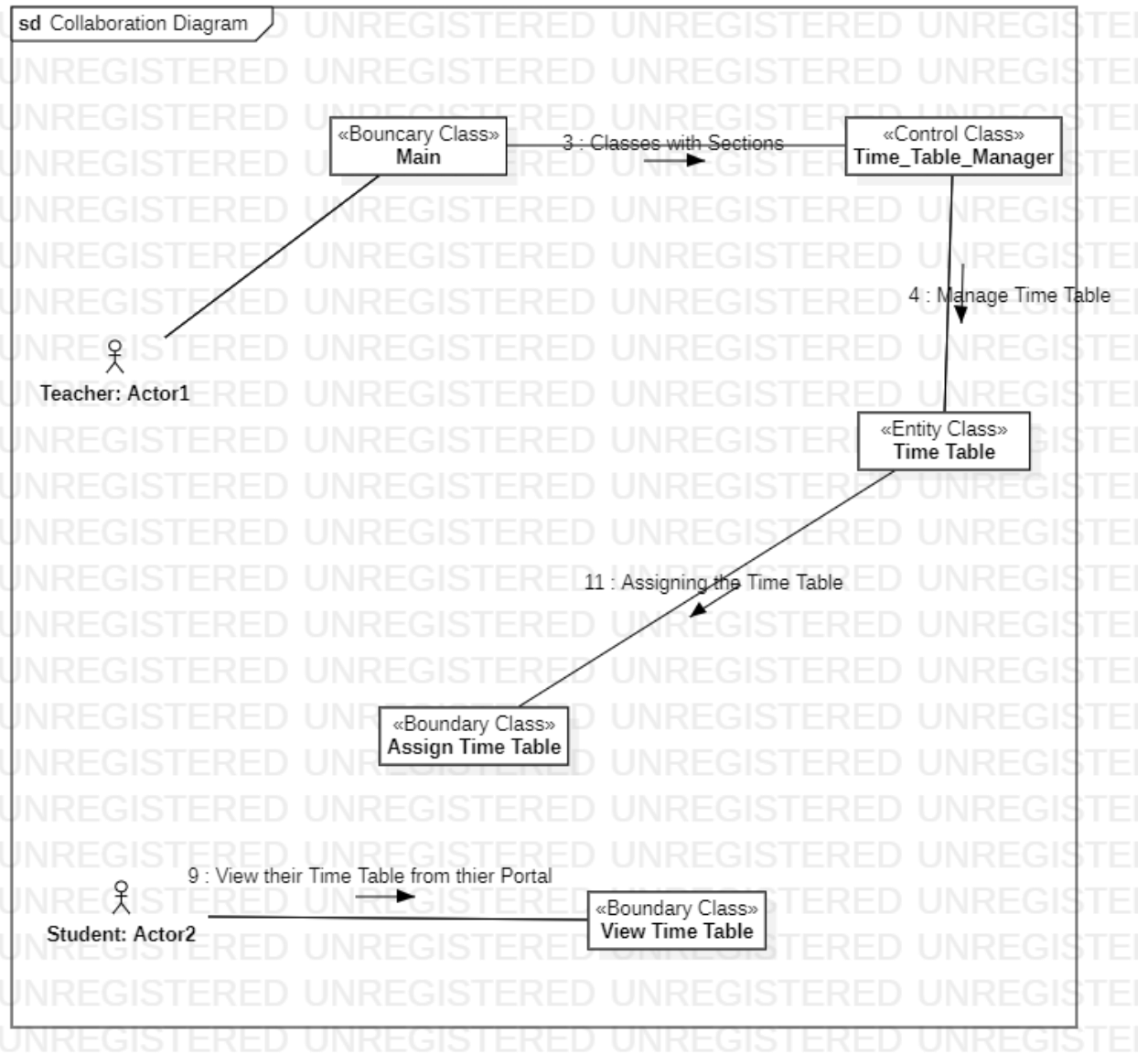


e)

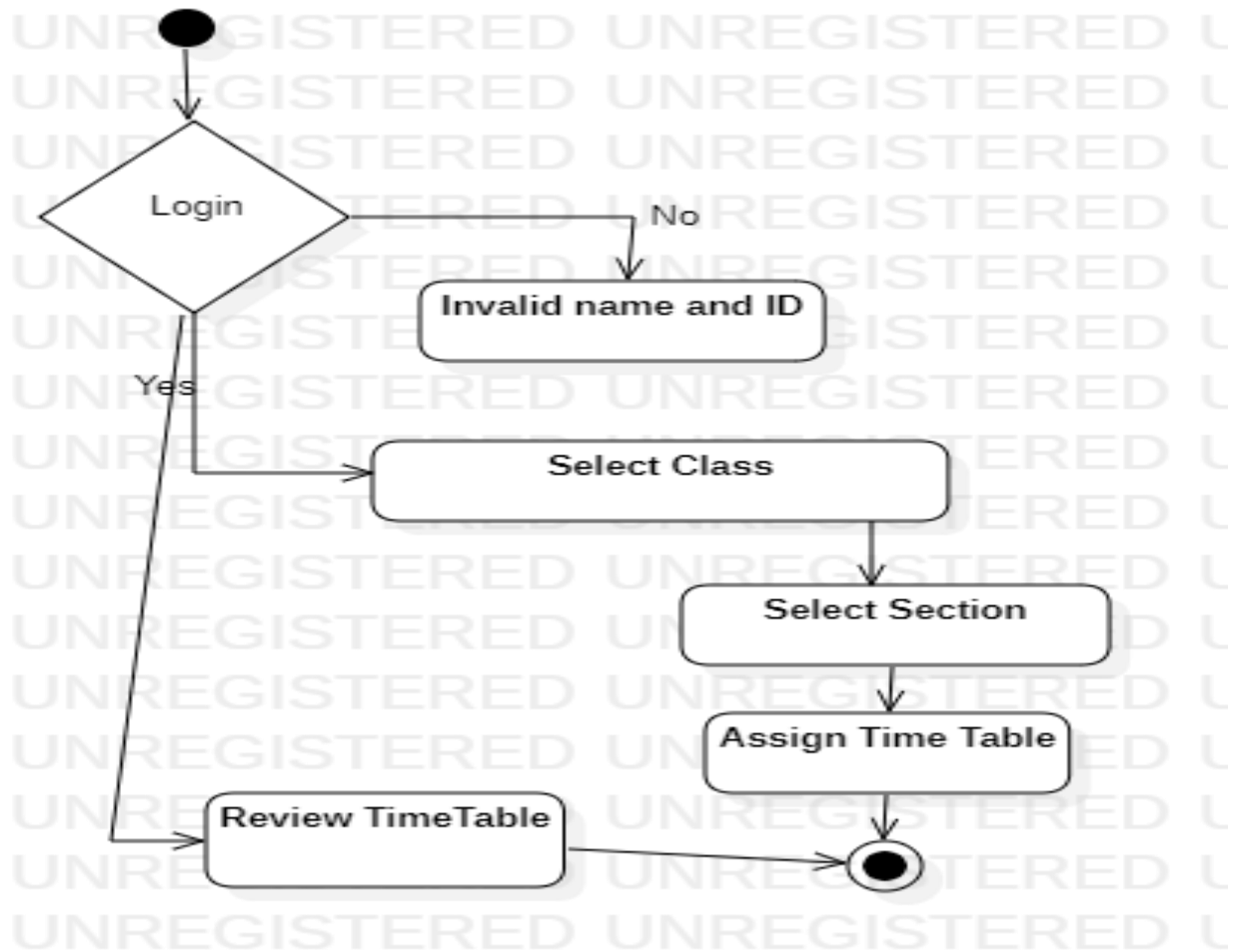
Sequence Diagram for Time Table:



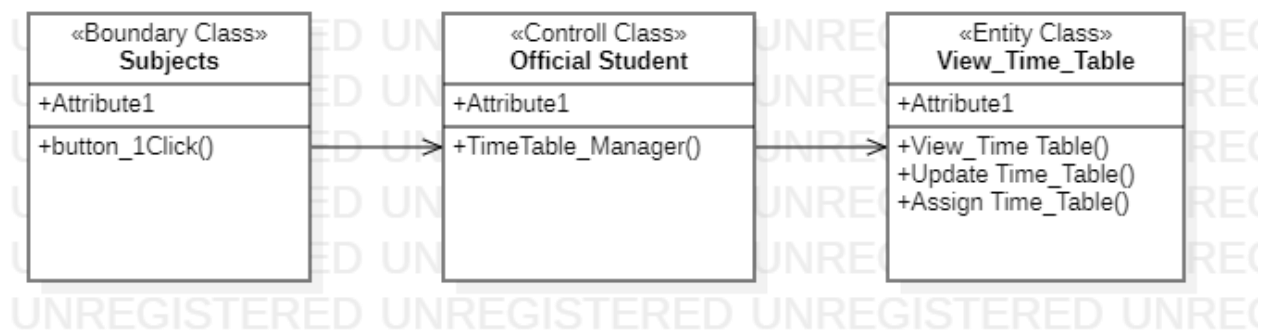
f) Collaboration Diagram for Time Table:



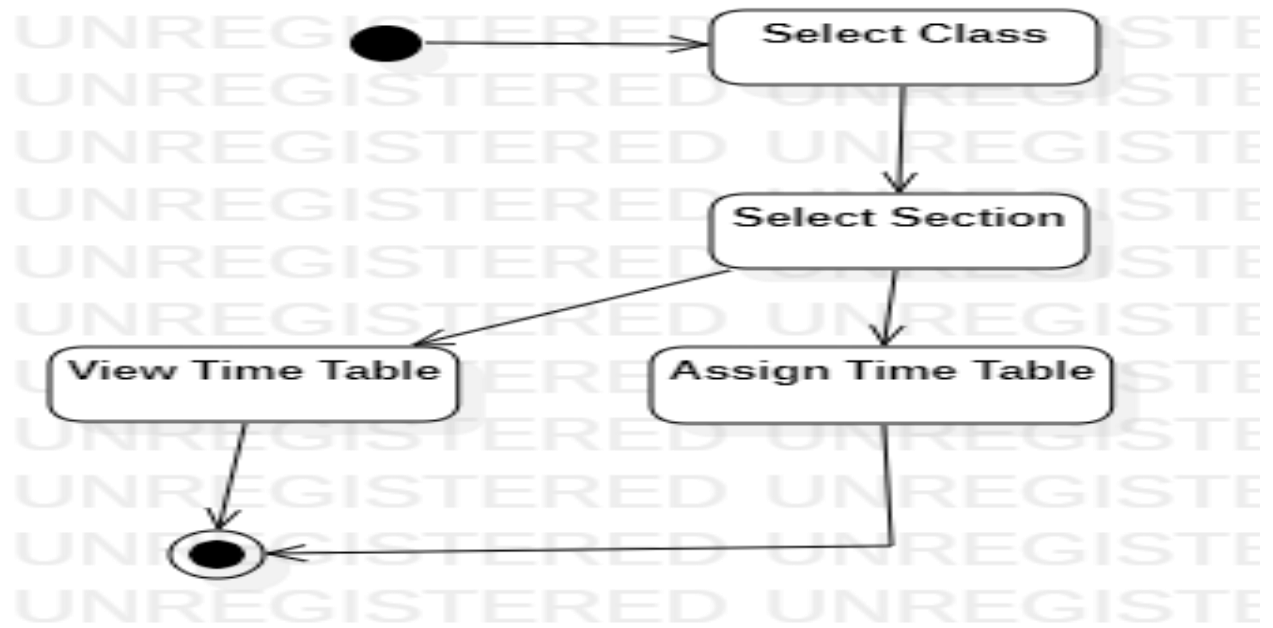
g) Activity Diagram for Time Table:



h) Class Diagram for Time Table:



i) State Chart Diagram for Time Table:



3.2. External Interface Requirements

3.2.1 User Interfaces

The user interfaces are divided into three major components. One part includes the student accessing the system using a cell phone. The second portion involves the teachers accessing the system using a cell phone or at a particular location specifically designed to access the system. The third portion involves the administration to access through remotely. For instance, the admin for the MPA access the management system from anywhere internet is available or MPA office.

This is a brief description. However, a more detailed demonstration is done in the prototype. The purpose of this interaction is to illustrate the overall view of the SMS.

Selecting one of these functions will take the Teachers and students to a different user interface. For instance, choosing SelectClass they want to teach will display the following web page. The title of this page is consistent with the function selected, and since the SelectClass was selected, the title displays Ticket Reservation. The purpose of this is to allow the Teachers know what part of the system they are accessing. Furthermore, the Teachers can select any of the four functions.

The Student can select any of the four functionalities. For the sake of this demonstration, if the Student clicks on the ViewResult () function the diagram below is displayed. Once again the title is the same as the main function and a subtitle indicates the second function selected. In addition, the Student can fill up the following information. The View buttons allow the Student to navigate through the interfaces. For instance, the back button will take the Student to the above page, and the clear button will clear the form of any selection he/she made before. The Display Available displays the available Result and Grade.

3.2.2 Hardware Interfaces

The SMS includes two major hardware components: cellular phones and regular PC's. The cell phones require WAP (wireless application protocol) network protocol, which is already programmed in the latest phones.

The second component involves the regular PC's, which communicate with the server. The server then communicates with the database. The protocol involved between the PC's and the server is the HTTP protocol, which allows communication between the PC's and the Server. The remote PC's, such as someone accessing the SMS from home using the Internet, are able access the information through the CGI. The requests come in through the HTTP protocol, and using an ODBC the database results are returned and processed using Perl to give an HTML web page. The format of the output is displayed as web pages.

3.2.3 Software Interfaces

An Oracle DBMS will be used to manage the database and any changes made to it. Furthermore, the DBMS will make regular backups of the database and generate reports regularly so that they can be accessed by the MPA. The Apache server between the client and the database will handle all communication, and the server will run on a Linux operating system. Furthermore, the HTML pages must be implemented such that they can be displayed on two common browsers: Netscape and Internet Explorer.

Information about the products used for the SMS:

- (1) Name: Oracle
- (2) Mnemonic: Oracle
- (3) Version Number: ?
- (4) Source: Oracle

- (1) Name: Linux
- (2) Mnemonic: Linux
- (3) Version Number: 6.2
- (4) Source: Unix

- (1) Name: Internet Explorer
- (2) Mnemonic: IE
- (3) Version Number: 5.00
- (4) Source: Microsoft

- (1) Name: Apache
- (2) Mnemonic: Apache
- (3) Version Number: 1.3.14
- (4) Source: Apache Software Foundation

3.3 Performance Requirements

The following sections list the performance requirements for the system.

3.3.1 User Requirements

| User Requirements | Description of Requirement For Design Environment |
|------------------------------------|--|
| Location(s) and Number(s) of Users | |
| Expected Growth in Number of Users | |
| After 1 Year | 50% |
| After 2 Years | TBD |
| After 3 Years | TBD |
| User Expectation | |
| Interactivity | User expect that it provides a very easy to use graphical user interface |
| Reliability | For some applications, reliability must be 100% during the application session |
| Adaptability | Network must adapt to user additions, deletions and changes |
| Security | Encryption software would be used for Credit Card transactions |
| Cost / Funding | |

3.3.2 Application Requirements

Since no specified service is indicated, then we have listed the applications as best – efforts. This may change as we learn more about the application.

The communication package is determined to be bursty in nature, with small data sizes and frequent transmissions. We can consider this application to be interactive-burst, while the database transaction-processing application is described by the MPA as transferring large amounts of data (initial estimates are 1 MB/transaction), we have listed this application as interactive-bulk.

| Categorizing Applications | Best-Efforts | Application Locations |
|---------------------------------|--------------|-----------------------|
| Communication | 100 Kb/s | Guangzhou and Nanjing |
| Database Access | 400 Kb/s | All Locations |
| Database Transaction processing | 1.5 Mb/s | All Locations |

3.3.3 Host Requirements

| | Type of Host or Equipment | Numbers and Locations |
|--------|---------------------------------|--|
| Host A | PC | Guangzhou (10), Nanjing(7), Shanghai(10) |
| Host B | Database Server | Shanghai |
| Host C | Application Server | Nanjing |

3.4.1 Standards Compliance

There are no design constraints that can be imposed by other standards limitations.

3.4.2 Software Limitations

- must be able to run Internet Explorer or Netscape Communicator web browsers to access the system.
- must have cell-phone web based capability to access the system from a mobile phone.

3.4.3 Hardware Limitations

- Input/Output: One or two-button mouse, keyboard, cell-phone, or touch screen required.
- Network card required at thin-client terminals to make communication with server possible.

3.5 Quality Characteristics

There are a number of quality characteristics that apply to the SMS software system.

3.5.1 Portability

The SMS system will be developed using MVC and .NET so that it can be accessed from any type of system using just a regular web browser. It will also be available to users that have web access on their cellular phones. The system will be tested on all types of hardware before being released to ensure that it is compliant with this requirement.

3.5.2 Reliability

The system should be capable of processing a given number of reservations within a given time frame with no errors and the system should be available and operational all the time. During the development of the prototype for the one School, the system will be tested in its actual environment to ensure that it can handle the load of management that occur during a regular workday.

3.5.3 Usability

The SMS system will be developed so that it is an easy to use system that requires the least amount of user input possible. Every input will be validated. The user should only have general computer use knowledge. Error messages will be displayed if the user enters an invalid value or tries to access a function without the required permissions. An easy and well-structured user manual will be provided to the MPA and the system will include descriptive help for all operations allowed.

3.5.4 Correctness

The SMS system will be considered correct when the MPA approves the prototype presented and agrees that all the functions they require are implemented as stated in the Software Requirements Specification.

3.5.5 Flexibility

The SMS system should be developed in such a way that it is easily customizable. If new functions are required by MPA, there will be little effort required to update the system to support new cities or new transactions.

3.5.6 Security

The SMS system should not compromise the customer information at any time. The user information will never be sold to other parties and will be kept secure at all times. Users will be authenticated to ensure that no unauthorized users gain access to private information.

3.5.7 Maintainability

The SMS source code will be kept well structure and documented so that it is easier to maintain and extend the system. All changes to the system shall be documented.

3.6 Other Requirements

Certain requirements may, due to the nature of the software, the user organization, etc., be placed in separate categories such as those below.

3.6.1 Data Base

The Automate Railway Reservation System will have two main databases. One is the Reservation Database, and another is the Passenger Account Database. These database will be created with Oracle8i (Client/Server) version 8.1.6.0.0 Release 2. The following are the requirements for these databases that are to be developed as part of the product. They include:

Reservation Database

| | |
|--|---|
| Types of information | Schedule information for the trains, including date, time, departure city, destination city, ticket cost and ticket availability for a particular train |
| Frequency of use | Depends on the passenger demand, which may reach 25,000 per day during peak periods |
| Accessing capabilities | The database should allow access to at least 1,000 people at once; the users will have a general access to the information about the train schedule, and a secure access to the reports (available only to MPA officials) using a username and a password |
| Data element and file descriptions | To be determined |
| Relationship of data elements, records and files | To be determined |
| Static and dynamic organization | To be determined |
| Retention requirements for data | Train schedule information will be available as long as the train for a particular route is in use and at least one year after the train has been cancelled. The reports information will be available at least for 5 years |

Passenger Account Database

| | |
|----------------------|---|
| Types of information | Passenger account information including their name, address, phone numbers, last reservations, balance owed, credit card number (if they paid by a credit card) |
| Frequency of use | Depends on the passenger demand, which may reach 25,000 per day during peak periods |

| | |
|--|--|
| Accessing capabilities | The database should allow access to at least 500 people at once; the users will have a secure access to the database using a username and a password |
| Data element and file descriptions | To be determined |
| Relationship of data elements, records and files | To be determined |
| Static and dynamic organization | To be determined |
| Retention requirements for data | Passenger account will be available for as long as a passenger is using the account, and at least for 6 month since the passenger logged on last time. |

3.6.2 Operations

The normal operations required by the user can be viewed as the following:

User-initiated Operations:

These operations include the login operation, which is initiated by the users. Also, the process of becoming a new user is in this category. Building, changing, and viewing itineraries, as well as paying for the itinerary are all initiated by the users. The user initiates the report generation activity, as well as changing train schedules.

Interactive Operations and Unattended Operations:

The users initiate all the operations mentioned above, and almost all of them are somehow interactive. Displaying the train schedule is non-interactive. The report display is a non-interactive operation, although selecting the desired reports will require user input.

Data Processing Support Functions:

The user account data is used to create new accounts, as well as to validate user id's during login functions. For building itineraries, user input, user account data, and train schedule data are used, and processed. User data along with final results of user interaction (whether the user purchased a trip, number of tickets bought, etc.) are collected, and used for report generation purposes. Administrative users' inputs are collected in order to modify and present schedules.

Backup and Recovery Operations:

Both databases used (passenger account database and reservations database) are production databases. The main operation used for the backup and recovery is Oracle's built-in cold backup, which is also known as the "archive mode". Depending on the customer's needs and budget, additional redundancy can be added using systems like RAID 5 and tape backup.

3.6.3 Site Adaptation Requirements

There are no site adaptation requirements for this project.

4. Supporting Information.

There is no supporting information required for it.