

# LAB REPORT



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# Chapter 1

## Introduction

### 1.1 Purpose

Our project Pathbondhu, an online platform is designed to connect tutors and guardians in more efficient and convenient way. With comprehensive set of features, we aim to bridge the gap between tutors and guardians. We know many qualified teachers don't get the proper tuition as well as many guardians don't get the qualified tutor as their requirement. We understand these difficulties and have developed our Online Tutoring Platform to overcome these obstacles.

### 1.2 Intended Audience

The intended audience of this platform are development team, quality assurance team, documentation team, legal team, and other stakeholders.

### 1.3 Intended Use

The document will be used by the developing team according to the need. Quality assurance team will generate test plans based on the described external behaviour of the product. Documentation team will use the SRS to understand what the software product is supposed to do. The legal team will use the SRS to understand the structure of the product for reviewing security and other legal issues of the product. This SRS will provide an insight of the product to the intended audiences.

### 1.4 Product Scope

For tutor, our platform empowers tutors by offering them a registration and updating process where they can showcase their skills, qualifications, and preferred tutoring locations. With just a few clicks, tutors can create a comprehensive profile that highlights their expertise and attracts potential guardians seeking their services. Besides they can search the available tuition based on their preference easily apply for the preferable tuition offers.

For guardians, our platform provides a user-friendly registration system that allows them to share their requirements and preferences for a tutor. Through our user-friendly search functionality, guardians can easily find tutors based on subjects, qualifications, locations, and availability.

## 1.5 Risk Definition

The performance of our project depends on computing power Server .If the server gets slow down then the system may be collapsed. To solve this problem we will use several backup servers.

## Chapter 2

# Overall Description

### 2.1 Operating Environment

This section provides an overview of the operational environment in which the system will be deployed and run. It outlines the hardware, software, networking, and other components required to ensure the reliable and secure functioning of the web application.

#### 2.1.1 Hardware Requirements

- Virtual Machines : Running of cloud infrastructure.
- Load Balancer : Distributing incoming traffic across multiple VMs to ensure optimal resource utilization and high availability.

#### 2.1.2 Software Requirements

- Front end : HTML, CSS and React framework will be used for development purposes.
- Database : MySQL relational database to store and manage application data.
- Web Server: Nginx will be used to serve static files and handle incoming HTTP requests.

#### 2.1.3 Operating System

The servers will run on the Linux operating system, specifically Ubuntu Server 20.04 LTS. This choice provides a stable and well-supported environment for hosting the web application.

### 2.2 User Classes and Characteristics

#### 2.2.1 Tutor

- Characteristics
  - Professional educators or experts in specific subjects.
  - Active members in the educational community.

- Roles
  - Update Profile: Regularly update their profile information to ensure accuracy.
  - Search for Tuition: Look for suitable tuition assignments based on subjects and locations.
  - Pay Service Fee: Complete service fee payments through integrated payment gateway.
  - Request for Tuition: Apply for tuition assignments that match their expertise and availability.
  - Cancel Tuition Request: Withdraw from a tuition request if needed.
  - Rate and Review Tuition: Provide feedback on their tuition experience.

### 2.2.2 Guardian

- Characteristics
  - Parents or individuals seeking tutoring services.
- Roles
  - Search for Tutors: Seek tutors that fulfill specific requirements.
  - Request for Tutors: Create requests for tutors with particular qualifications.
  - View Interested Tutors: Access the list of tutors interested in their tuition offers.
  - Cancel Tuition Request: Withdraw tuition requests as needed.
  - Rate and Review Tutors: Provide feedback on the performance of selected tutors.

### 2.2.3 Admin

- Characteristics
  - Platform administrators responsible for system management.
  - Monitor and ensure platform integrity.
- Roles
  - Verify Tutors: Validate tutor profiles to prevent fraud registrations.
  - Review Applications: Assess tutor applications for qualifications and authenticity.
  - Cancel Requests: Cancel applications or requests based on responses from tutors and guardians.
  - Remove Users: Remove users based on reported incidents or provided information.
  - Post Tuition: Post tuitions on behalf of guardians to improve their tutor finding process.

## 2.3 Constraints

This section outlines the various constraints that need to be considered during the development and operation of the system. These constraints define limitations or requirements that influence the design, functionality, and deployment of the application.

### 2.3.1 Technical constraints

The system must be compatible with the latest versions of commonly used web browsers such as Google Chrome, Microsoft Edge, Safari.

### **2.3.2 Budget constraints**

The development of the system must adhere to the allocated budget of BDT X. This budget includes expenses related to software licenses, development tools, and personnel costs.

### **2.3.3 Resource constraints**

The system will be hosted on a cloud-based server with allocated resources of X CPU cores, Y GB of RAM, and Z GB of storage. The development team must optimize code and configurations to ensure efficient resource utilization within these limits.

## **2.4 Assumptions**

### **2.4.1 Stable Internet Connection**

It is assumed that users accessing the system will have a stable internet connection with reasonable bandwidth.

### **2.4.2 Responsive Design**

It is assumed that the system will incorporate responsive design principles to ensure proper rendering and usability across various screen sizes and devices, including desktops, tablets, and smartphones.

### **2.4.3 Third-Party API Availability**

It is assumed that the external APIs (e.g. Bkash) used for data integration will be available and operational during the application's usage. Contingency plans will be devised in case of API unavailability or changes that impact integration.



## Chapter 3

# Requirements

### 3.1 Functional Requirements

- As a tutor, I want to update my profile so that everyone can get my updated information.
  - After updating the full profile, tutor submits it for verification.
  - Admin reviews profile update by verifying the documents submitted.
    - \* If updated information is consistent with submitted documents, admin accepts profile update request. The profile gets updated.
    - \* If updated information is not consistent with submitted documents, admin rejects the profile the profile update request.
  - If there's a failure due to lost server connection, display message "Server connection lost"
- As a tutor, I want to search for tuition so that I can get the desired tuition based on subjects, location and other criteria.
  - Tuition offers are displayed based on selected criteria.
  - If selected criteria do not match with any existing tuition offers, display message "No tuition available".
  - If selected criteria match 80% with any other tuition offer, the system shows that tuition offer to the tutor.
  - If the criteria match is less than 80%, prompt the tutor to modify the selected criteria.
- As a tutor, I want to pay service fee.
  - Tuition offer is confirmed for the tutor.
  - Tutor pays the service fee by bKash, Rocket or Nagad.
  - If payment is successful, display message "Payment successful". And provide tutor with the contact address of the guardian.
  - If payment is not successful, display message "Payment is not successful. Try again later".
- As a tutor, I want to request for tuition so that I can get a tuition according to my choice.
  - Tuition offer requirements must match with the tutor.
  - If request is successful, display message "Successfully applied".
  - If the request is not successful, display message "Profile is not up-to-date".
  - If the applied tuition has been assigned to another tutor or tuition offer has been deleted, display message "Sorry, tuition is not available".

- As a tutor, I want to cancel tuition request so that I can do other work.
  - Tuition request of the tutor is cancelled successfully.
  - If the cancellation is done within 7 days of confirming the service fee payment, the fee will be refunded.
  - If there is a failure due to lost server connection, display message “Server connection is lost”.
- As a tutor, I want to rate and review my tuition experience.
  - The feedback will be taken without any error and tutor will be redirected to home page.
  - If any case of unusual review spamming is detected, the rating will be rejected
  - If the review system is unavailable then the tutor will be informed with the message “Review system is temporarily unavailable. Try again later”.
- As a guardian, I want to create tuition so that I can get my desired tutor.
  - The guardian will create a tuition manually by filling up a form with required information.
    - \* If all the required fields of information are filled up, the form can be submitted and the guardian will be redirected to home page.
    - \* If some information is missing, a message will be displayed “Please fill out all required fields”.
  - The admin will review the submitted form.
    - \* If all information is relevant, the request will be posted in the platform.
    - \* If there is any irrelevant information, the request will be rejected and the guardian will be informed about it through notification and email.
- As a guardian, I want to view the number of tutors who are interested in my tuition offer.
  - The guardian will go to their tuition offer section
    - \* If there is one or more tuition offers in the tuition offer section, then the guardian can choose a tuition offer they posted to see the number of interested tutors.
    - \* If there is no tuition offer there, display message “No tuition offers at this moment”.
    - \* If there is no tutor who applied for the tuition, display message "No tutor at this moment".
- As a guardian, I want to request a tutor from the available tutors’ list so that I can choose a tutor.
  - A notification and email will be send to the chosen tutor.
- As a guardian, I want to cancel a tuition request.
  - Tuition request is cancelled successfully.
  - If the cancellation is done while a tutor has accepted the tuition and paid service fee, the fee will be refunded.
  - If there is a failure due to lost server connection, display message “Server connection is lost”.
- As a guardian, I want to rate and review a tutor based on his/her performance.
  - The guardian will be able to rate the tutor and the rating will be posted on the tutor’s public profile.
  - If any case of unusual review-spamming is detected, the rating will be rejected.
  - If the review system is unavailable then display message "Review system is temporarily unavailable. Try again later".
- As an admin, I want to verify a tutor’s profile so that I can prevent fraud tutors from registering.
  - An admin will verify the profile information of a tutor and if the NID, Student ID and educational credentials are correct, the tutor will be verified.

- If the NID, Student ID or educational credentials are incorrect, the tutor will be asked to give correct information.
- As an admin, I want to review applications so that I can verify the tutor's qualifications.
  - If the information provided by the tutor matches guardian requirements and the profile of the teacher is up-to-date, the admin will approve it and send a message saying, "Your application is approved."
  - The admin will reject the application if the tutor's qualifications do not match the guardian's requirements and send a message saying, "Your application is not approved. Please apply according to your qualifications and update your profile properly."
- As an admin, I want to cancel requests based on the responses of tutors and guardians.
  - The admin will review the tuition cancellation request-
    - \* If the tutor hasn't paid the service fee yet and wants to cancel the tuition, the admin will review the cancellation request. If the request is valid, the admin will approve it and send a message "Your application is canceled" and send a message to the guardian "The tutor cancels the offer".
    - \* If the tutor pays the service fee and wants to cancel the tuition within seven days of confirming the service fee, The admin will approve it and refund the fees.
  - The admin will review the tutor cancellation request-
    - \* If the guardian wants to cancel the tuition request that is requested by any tutor, The admin will approve the cancellation request and send messages to the tutor, "Your requested tuition is not available" and send a message to the guardian-"Your tuition request is canceled". If the tutor has already paid the service fees, the admin will refund the fees.
- As an admin, I want to remove a user based on the provided information or reported incidents so that I can prevent fraud.
  - The admin will review the report and remove the users if the reported incident violated the rules and guidelines, and send an email to the users saying, "You are removed from the system."
- As an admin, I want to post tuition on behalf of guardian's requirements so that guardians can easily find the desired tutors.
  - If any guardian is not aware of the system of posting tuition requests, they can contact the admin via phone, The admin will record all the information, post it, and send a message to the guardian-"Successfully posted."
  - Display the message "Please fill up all the points" if the admin has not enough information to post the tuition request.

## 3.2 Non Functional Requirements

- The response time of the system must be less than 1 second.
- System must be able to handle a minimum 1000 concurrent users.
- OTP (One Time Password) must be used for verification. The authentication time period should be 30 seconds.
- System must impose minimum password lengths following a standard password strategy
- System must be available 24hrs a day. For maintenance purposes, it will be offline from 3:01 am to 3:30 am.
- System must have a data backup mechanism.

- System must be responsive for all device and platforms.
- Search function must show results within 200ms.
- System must have an optimized website to improve its visibility and search engine rankings, increasing the chances of attracting users.
- System must have a secure online based payment system.
- System must provide graphic rating scale (star) and question-answer to complete review

## Chapter 4

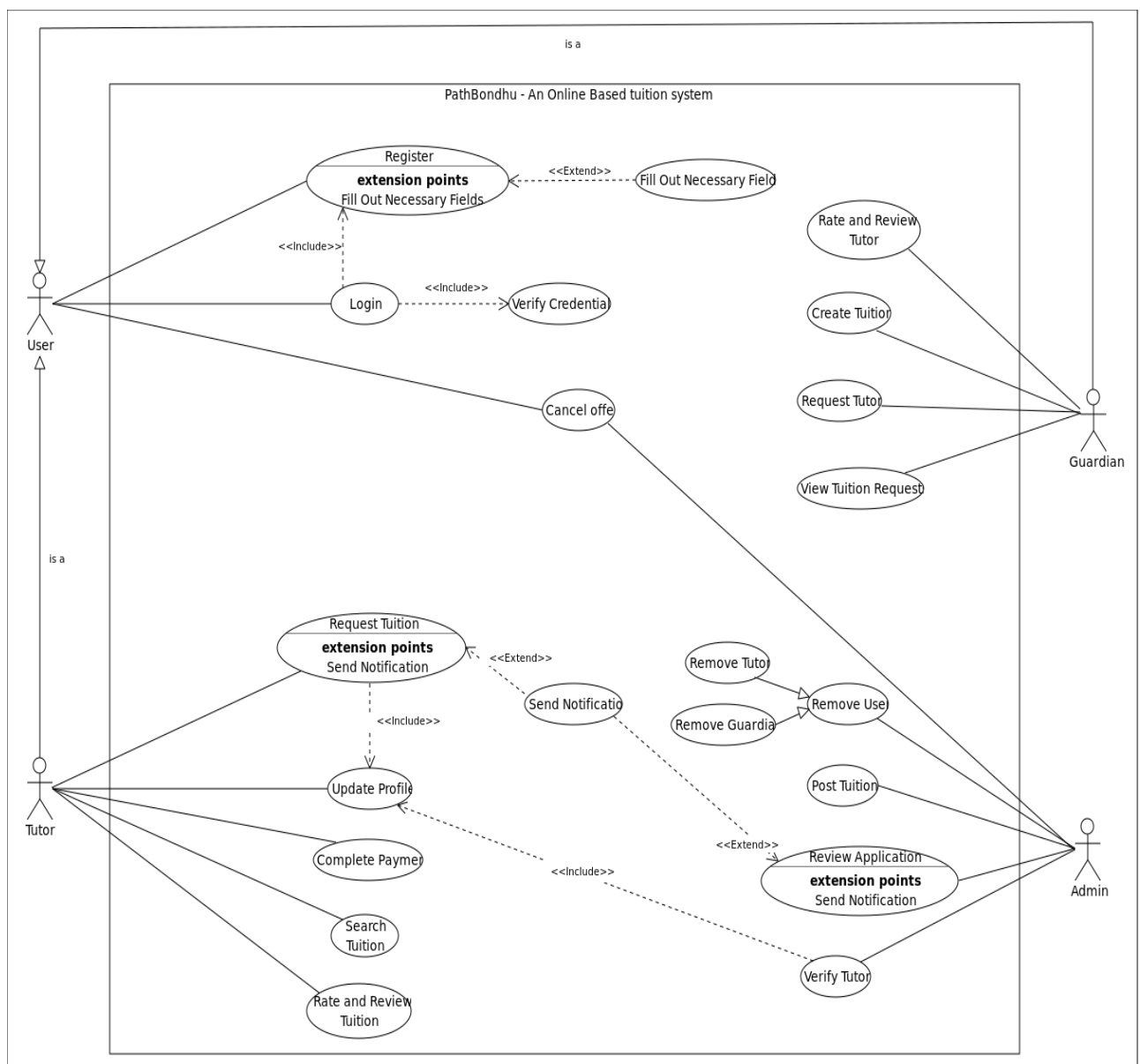
# User Stories

- **As a tutor, I want to search for tuition so that I can get the desired tuition based on subjects, location and other criteria.**
  - Tuition offers are displayed based on selected criteria.
  - If selected criteria do not match with any existing tuition offers, display message “No tuition available”.
  - If selected criteria match 80% with any other tuition offer, the system shows that tuition offer to the tutor.
  - If the criteria match is less than 80%, prompt the tutor to modify the selected criteria.
- **As a tutor, I want to pay service fee.**
  - Tuition offer is confirmed for the tutor.
  - Tutor pays the service fee by bKash, Rocket or Nagad.
  - If payment is successful, display message “Payment successful”. And provide tutor with the contact address of the guardian.
  - If payment is not successful, display message “Payment is not successful. Try again later”.
- **As a guardian, I want to rate and review a tutor based on his/her performance.**
  - The guardian will be able to rate the tutor and the rating will be posted on the tutor’s public profile.
  - If any case of unusual review-spamming is detected, the rating will be rejected.
  - If the review system is unavailable then display message "Review system is temporarily unavailable. Try again later".
- **As an admin, I want to cancel requests based on the responses of tutors and guardians.**
  - The admin will review the tuition cancellation request-
    - \* If the tutor hasn’t paid the service fee yet and wants to cancel the tuition, the admin will review the cancellation request. If the request is valid, the admin will approve it and send a message "Your application is canceled" and send a message to the guardian "The tutor cancels the offer".
    - \* If the tutor pays the service fee and wants to cancel the tuition within seven days of confirming the service fee, The admin will approve it and refund the fees.
  - The admin will review the tutor cancellation request-
    - \* If the guardian wants to cancel the tuition request that is requested by any tutor, The admin will approve the cancellation request and send messages to the tutor, “Your requested tuition is not available" and send a message to the guardian-"Your tuition request is canceled". If the tutor has already paid the service fees, the admin will refund the fees.

- **As an admin, I want to post tuition on behalf of guardian's requirements so that guardians can easily find the desired tutors.**
  - If any guardian is not aware of the system of posting tuition requests, they can contact the admin via phone, The admin will record all the information, post it, and send a message to the guardian- "Successfully posted."
  - Display the message "Please fill up all the points" if the admin has not enough information to post the tuition request.

## Chapter 5

# Use Case Diagram



## Chapter 6

# Use Case Specifications

**Use Case ID:** UC1

**Use Case Name:** Registration

**Actors:** Tutor, Guardian

**Description:**

1. Input name, contact details, email, password and any other required information.
2. The system sends a confirmation message or notification to the user, acknowledging successful registration.

**Exception:**

1. Page not found.
2. No database connection.

**Preconditions:**

1. The user accesses the registration form provided by the system.
2. The system is operational.

**Postconditions:**

1. Successful registration: The user is successfully registered in the system
2. Unsuccessful registration: If the user does not fill in all the required fields and write password correctly, the system displays an error message.

**Use Case ID:** UC2

**Use Case Name:** Log in

**Actors:** Tutor, Guardian, Admin

**Description:**

1. User enters their contact number/email and password.
2. The system validates the contact number/email and password.
3. Remember password

**Exception:**

1. Page not found.
2. No database connection.

**Preconditions:**

1. The user accesses the login page provided by the system.
2. The system is operational.

**Postconditions:**

**Successful login:** The user is successfully logging into the system and accessing to their respective dashboard.

**Unsuccessful login:** The user stays on the login page.



**Use Case ID:** UC3**Use Case Name:** Request Tuition**Actor:** Tutor

**Description:** 1. The tutor navigates to the "Job Board" section in their dashboard.  
 2. The tutor selects the desired criteria for the tuition assignment, such as subject, class, location, time preferred schedule, salary and any specific requirements.  
 3. The tutor filters the appropriate tuition and submits the request.

**Exception:** 1.No available tuition**Precondition:**

- 1.The tutor is logged into the system.
2. The tutor profile is complete and up-to-date.

**Postcondition:**

- 1.Successfully submitted the tuition request.
- 2.If the submission is not successful then the system notifies the tutor "Profile is not up-to-date".

**Use Case ID:** UC4**Use Case Name:** Create Tuition**Actor:** Guardian**Description:**

- 1.The guardian accesses the create tuition section in his/her dashboard.
- 2.The guardian fills out the create tuition form, providing details such as subject, preferred location, desired qualifications, and any additional requirements.

**Exception:**

- 1.Page not found.
- 2.No database connection.

**Precondition:**

- 1.The guardian is logged in the system

**Postcondition:**

- 1.Successfully submitted the form.
2. If some information is missing, a message will be displayed "Please fill out all required fields".

**Use Case ID:** UC5**Use Case Name:** Search Tuition**Actor:** Tutor**Description:**

- 1.Tutor can search the available tuition according to their criteria like subject, location, qualification, salary, tuition experience, subject etc.
- 2.They can use search and filter option.
- 4.If more than 805.If criteria like preferred location is not matched with any tuition then the system suggests the tuition of nearest location.

**Exception:**

- 1.No result found

**Precondition:**

1. The tutor is logged into the system.
- 2.The system is operational.

**Postcondition:**

1. Tutor views the search result based on their specification.
2. If there is no matched, Display message "Tuition not available"

**Use Case ID:** UC6

**Use Case Name:** View Tuition Request

**Actor:** Guardian

**Description:**

1. Navigates the tuition offer section and selects a tuition to view the tuition requests by tutors.

2. Display the tutor profile who requested for the tuition.

**Exception:**

No tutor found.

**Precondition:**

1. The guardian is logged into the system.

2. The system is operational.

**Postcondition:**

1. Guardian views the list of tutors who are applied for the tuition.

2. If there is no application there, Display message “No tutor at this moment”.

**Use Case ID:** UC7

**Use Case Name:** Request Tutor

**Actor:** Guardian

**Description:**

1. Navigates the tuition offer section and selects a tuition to view the tuition requests by tutors.

2. Guardian sends request to the best option according to his/her choice from the list of tutors who are applied for the tuition.

**Exception:**

No tutor found.

**Precondition:**

1. The guardian is logged into the system.

2. The system is operational.

**Postcondition:**

1. Status of the tuition updates.

**Use Case ID:** UC8

**Use Case Name:** Update Profile

**Actor:** Tutor

**Description:**

1. Navigates update profile section.

2. Update personal information, tuition experience and information, academic information

3. Provide important credentials like national id card, institutional id card, birth certificate, SSC/HSC certificates etc.

4. Saves the change.

**Exception:**

1. No database connection

**Precondition:**

1. The tutor is logged into the system

2. The system is operational

**Postcondition:**

1. Tutor can view the overall information percentage of the profile. Higher the percentage, higher the possibility of getting tuition.

**Use Case ID:** UC9

**Use Case Name:** Complete Payment

**Actor:** Tutor

**Description:**

1. Navigates payment section.
2. Displays the details of the pending payment to the system for their tuition.
3. Selects preferred payment method (Online payment eg. Bkash, Nagad, Rocket)
4. Confirms the payment by clicking "Complete Payment" option.
5. System updates the payment status.

**Exception:**

1. Payment failed.
2. No database connection

**Precondition:**

1. The tutor is logged into the system.
2. The tutor has a pending payment for their service fee.
3. The system is operational.

**Postcondition:**

1. **Successful Payment:** Provides the notification and update profile status
2. **Unsuccessful Payment:** Stay on the same page

**Use Case ID:** UC10

**Use Case Name:** Rate and Review Tuition

**Actor:** Tutor

**Description:**

1. Tutor selects Rating and Review option
2. Tutor provides a rating using graphic rating scale(star) to rate the tuition.
3. System displays the question about student co-operation, guardian behavior, payment on time and the tutor provide a rating using multiple options "Bad", "Good", "Very good".
4. Tutor gives comment about the tuition.

**Exception:**

1. No rating or review provided.

**Precondition:**

1. The tutor is logged into the system.
2. The system is operational.

**Postcondition:**

1. The rating and review are successfully submitted for the tuition.
2. If the review system is unavailable then display message "Review system is temporarily unavailable. Try again later".

**Use Case ID: UC11****Use Case Name:** Rate and Review Tutor**Actor:** Guardian**Description:**

1. Guardian selects Rating and Review option
2. Guardian provides a rating using graphic rating scale(star) to rate the tuition.
3. System displays the question about student teaching skill, professionalism, punctuality, student performance and the guardian provides a rating using multiple options "Bad", "Good", "Very good".
4. Guardian gives comment about the tutor.

**Exception:**

1. No rating or review provided.

**Precondition:**

1. The guardian is logged into the system.
2. The system is operational.

**Postcondition:**

1. The rating and review are successfully submitted for the tutor.
2. If the review system is unavailable then display message "Review system is temporarily unavailable. Try again later".

**Use Case ID: UC12****Use Case Name:** Cancel Offer**Actor:** Tutor/Guardian/Admin**Description:**

1. Tutor navigates "My tuition" section and cancel the specific tuition.
2. Guardian navigates "Available tutor" section and cancel the specific tutor.
3. Admin can cancel the offer if he gets any response from the guardian and tutor.

**Exception:**

1. No available tuition or tutor

**Precondition:**

1. The tutor/the guardian/the admin is logged into the system
2. The tutor/the guardian has made an offer or accepted an offer for a tuition assignment.
3. The system is operational.

**Postcondition:**

1. Successfully canceled the tuition or tutor.

**Use Case ID:** UC13**Use Case Name:** Verify Tutor**Actor:** Admin**Description:**

- 1.Admin accesses the pending verification request section in their admin panel.
2. System displays a list of tutor profiles awaiting verification.
- 3.Admin cross check the provided information with all the credentials and other supported documents.
- 4.If the profile is ok then the admin marks it as verified.
- 5.The system updates the status of tutor profile as verified.

**Exception:**

- 1.Insufficient information.
- 2.Wrong and false information.

**Precondition:**

- 1.The admin is logged into the system.
- 2.The tutor has submitted their profile information for verification.
- 3.The system is operational.

**Postcondition:**

- 1.Successfully verified
- 2.Verification rejected

**Use Case ID:** UC14**Use Case Name:** Post Tuition**Actor:** Admin**Description:**

- 1.Accesses the “Post tuition” section in their admin panel.
- 2.Provide all the information to the form according to the requirement of the guardian.
- 3.Submits the tuition request.

**Exception:**

- 1.Incomplete or invalid information.
- 2.Technical error.

**Precondition:**

- 1.The admin is logged into the system.
- 2.A guardian has requested the admin to post a tuition assignment on their behalf.
- 3.The system is operational.

**Postcondition:**

- 1.Successfully submitted the tuition post.

**Use Case ID:** UC15

**Use Case Name:** Remove User

**Actor:** Admin

**Description:**

1. Identifies the tutor or guardian to be removed based on the provided information or reported incidents.
2. Verifies the validity of the reasons for removal.
3. Select Remove option.

**Exception:**

1. Legal consideration.
2. Technical error

**Precondition:**

1. The admin is logged into the system.
2. A tutor or guardian has been identified for removal due to policy violations, misconduct, or other reasons.
3. The system is operational.

**Postcondition:**

1. successfully removed from the system.

**Use Case ID:** UC16

**Use Case Name:** Review Application

**Actor:** Admin

**Description:**

1. The admin accesses the tutor application review section.
2. Examines the tutor's qualifications and compares them with guardian requirements.
3. If the tutor's qualifications match the guardian requirements and the profile is up-to-date, The admin approves the application and sends a message to the tutor: "Your application is approved."
4. If the tutor's qualifications do not match the guardian requirements or the profile is not up-to-date, the admin rejects the application and sends a message to the tutor: "Your application is not approved. Please apply according to your qualifications and update your profile properly."

**Exception:**

1. Technical error

**Precondition:**

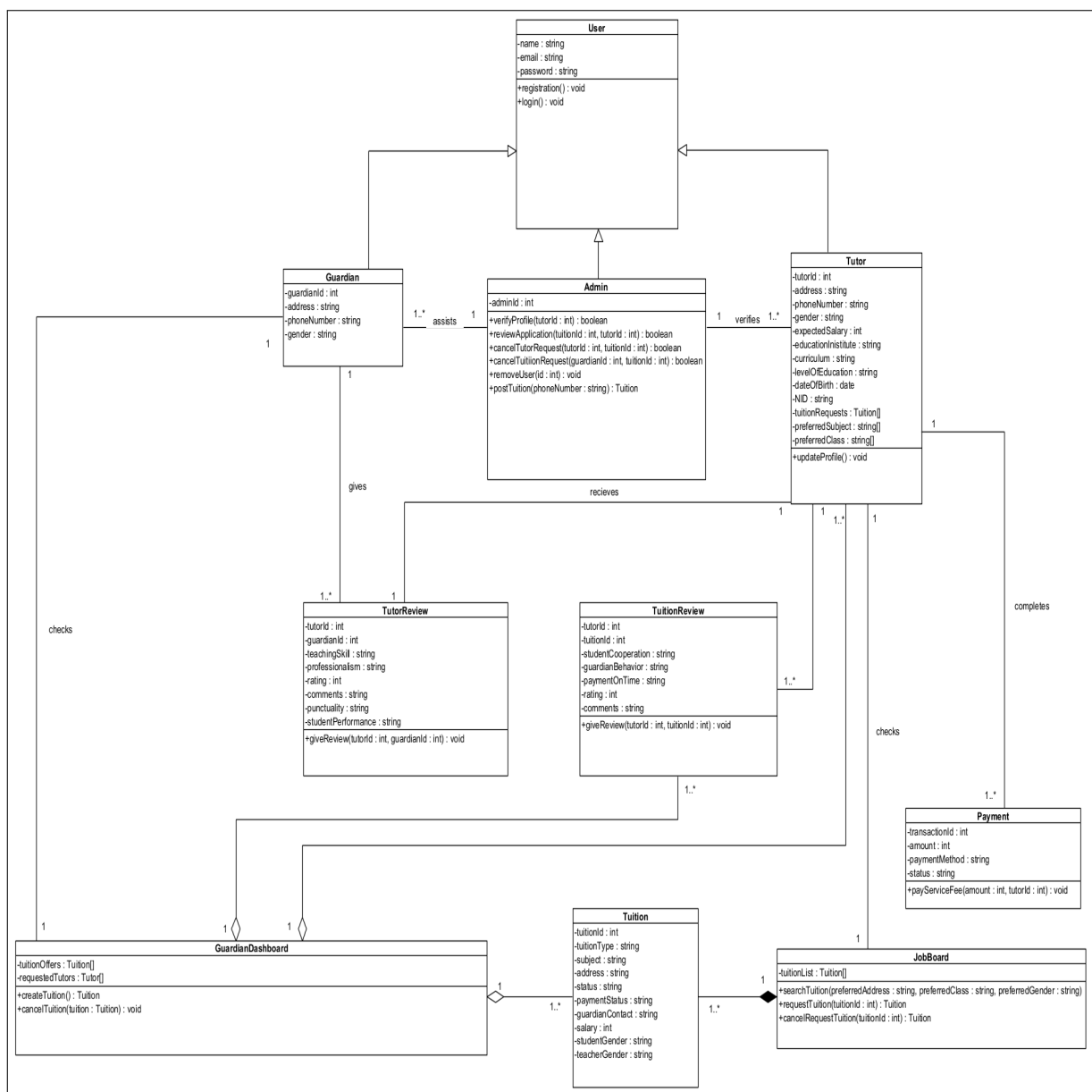
1. The admin is logged into the system.
2. There are tutor applications to be reviewed
3. The system is operational.

**Postcondition:**

1. Application is approved or rejected.

## Chapter 7

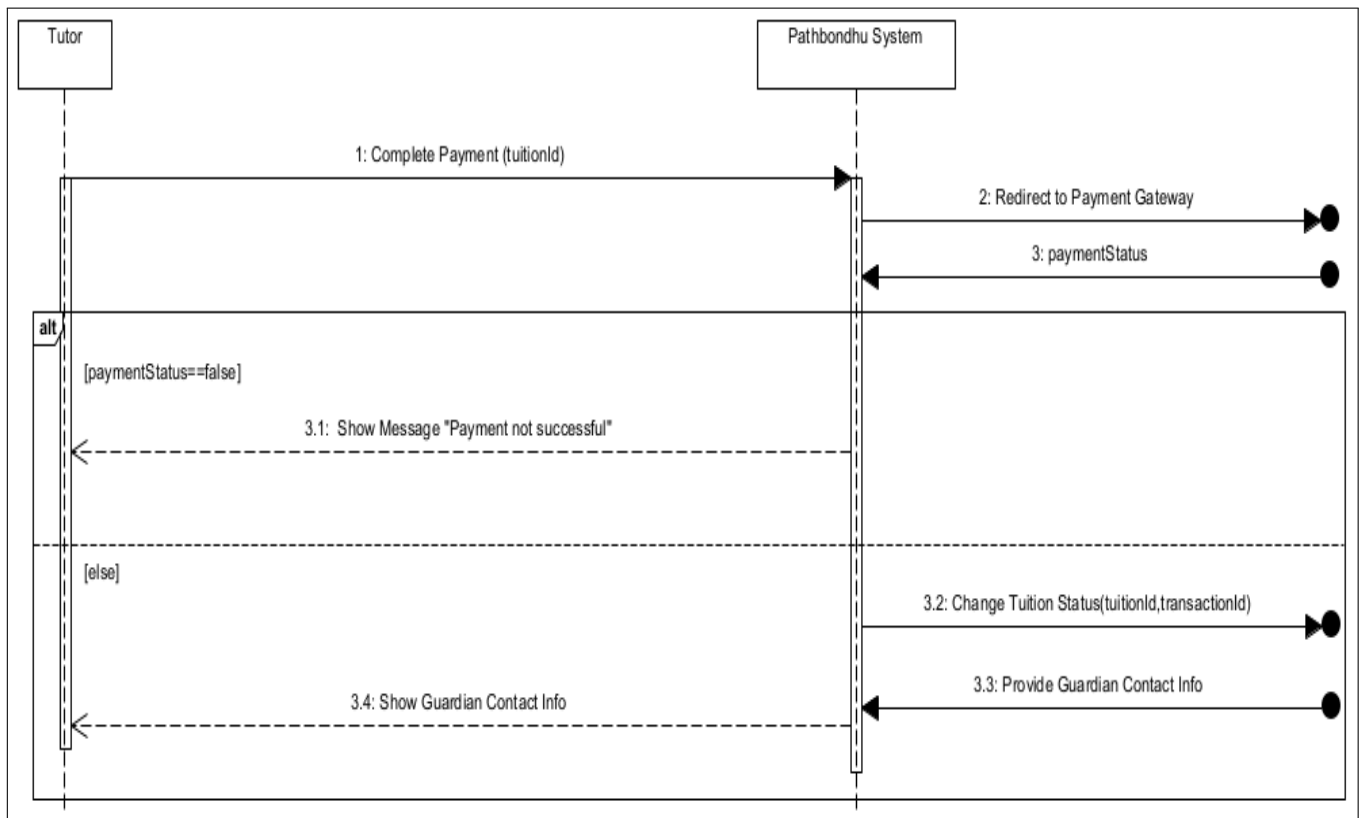
# Class Diagram



## Chapter 8

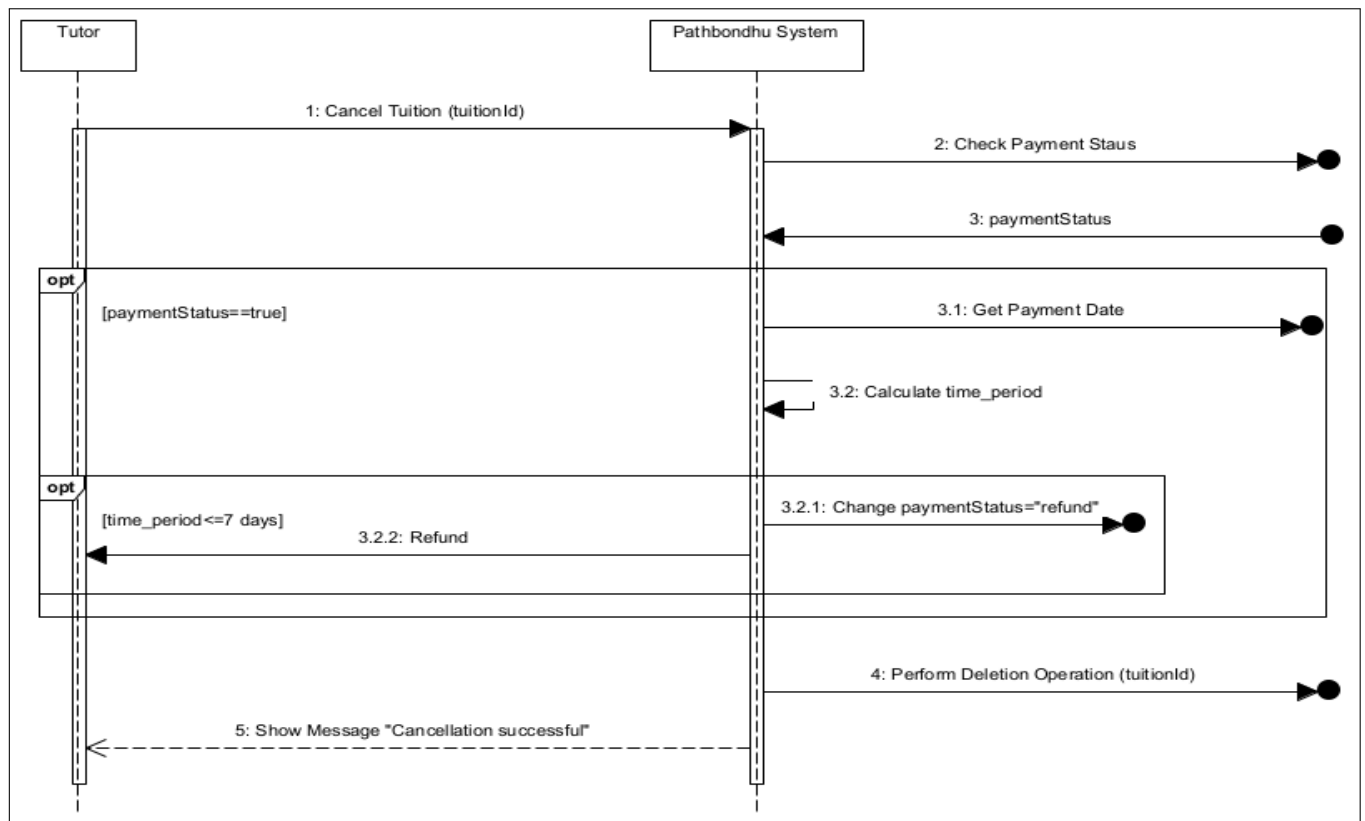
# Sequence Diagram

### 8.1 Complete Payment

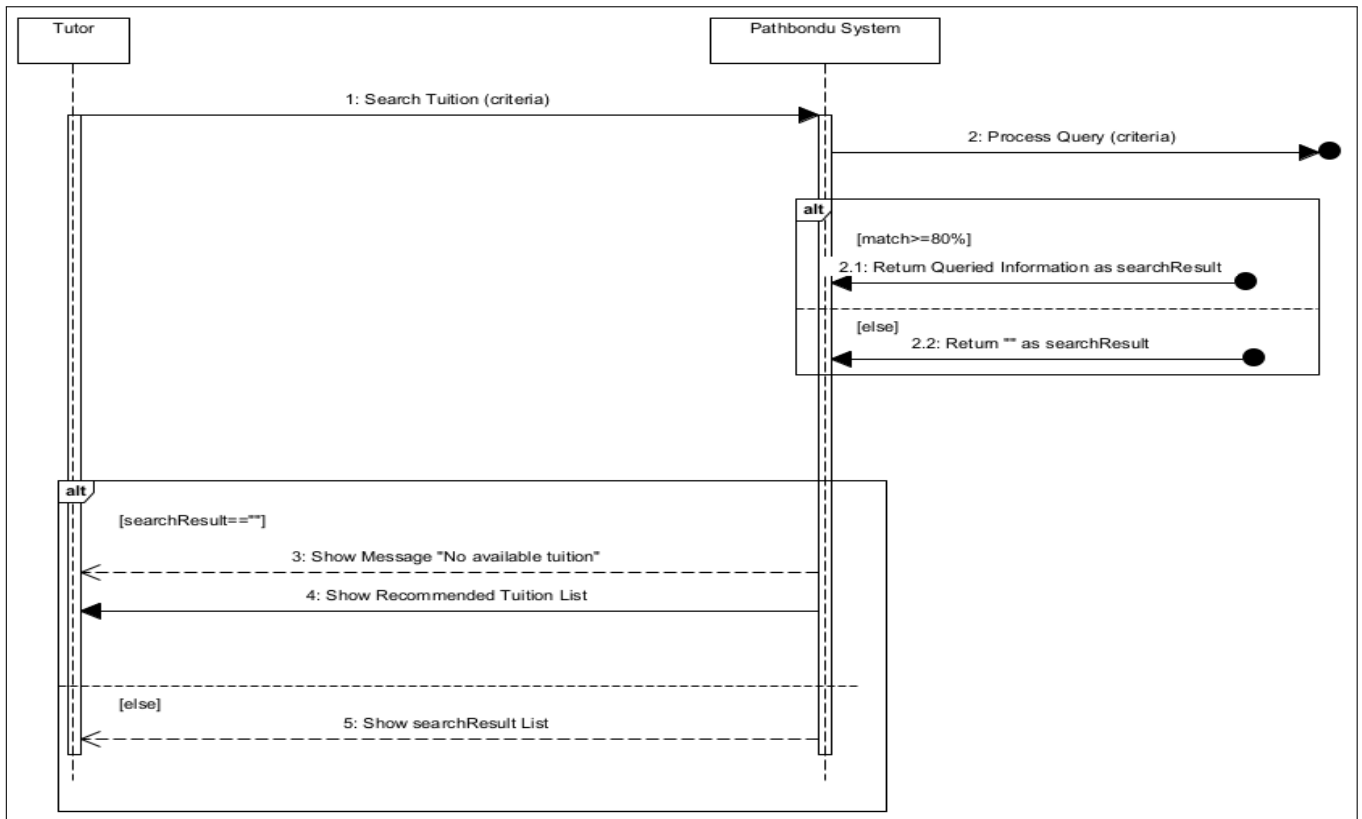




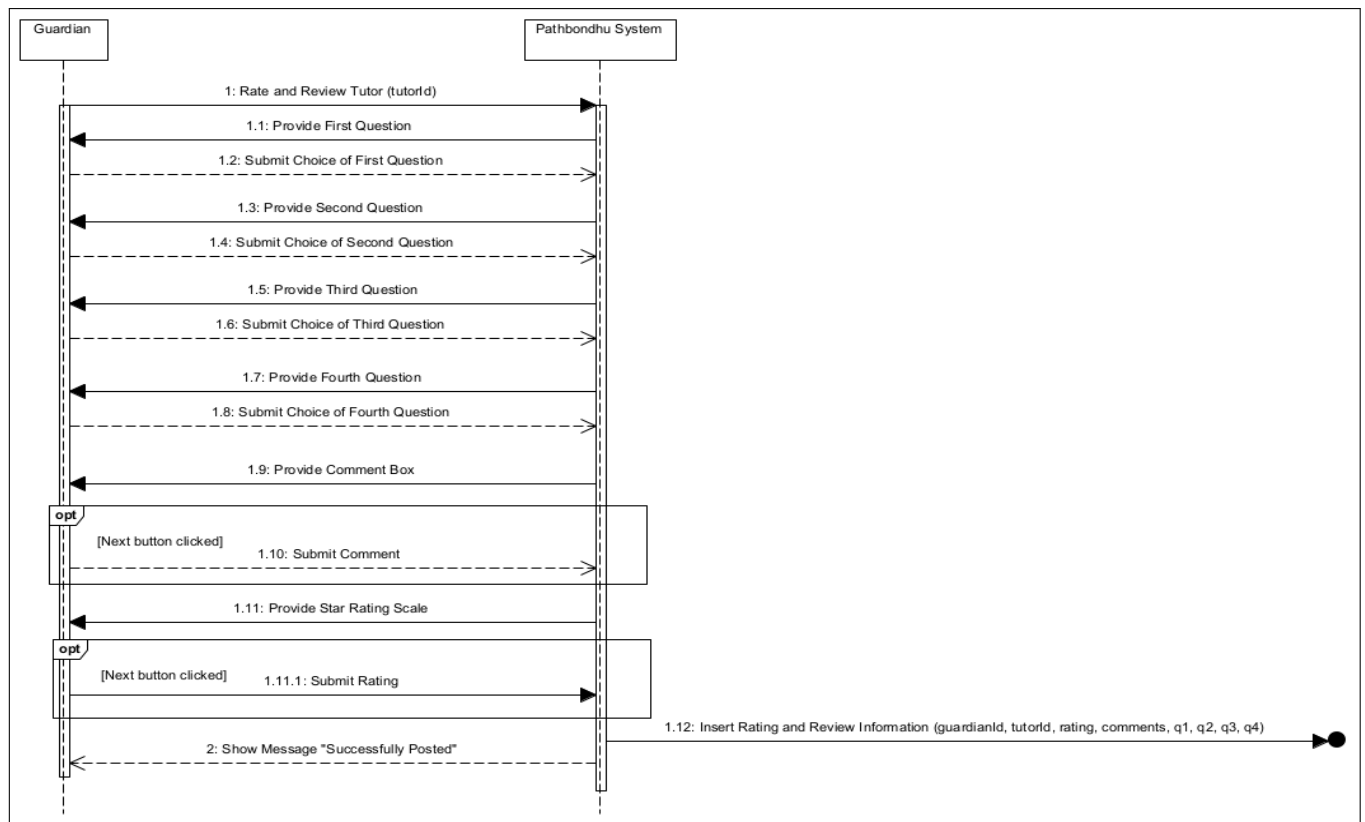
## 8.2 Cancel Tuition



### 8.3 Search Tuition



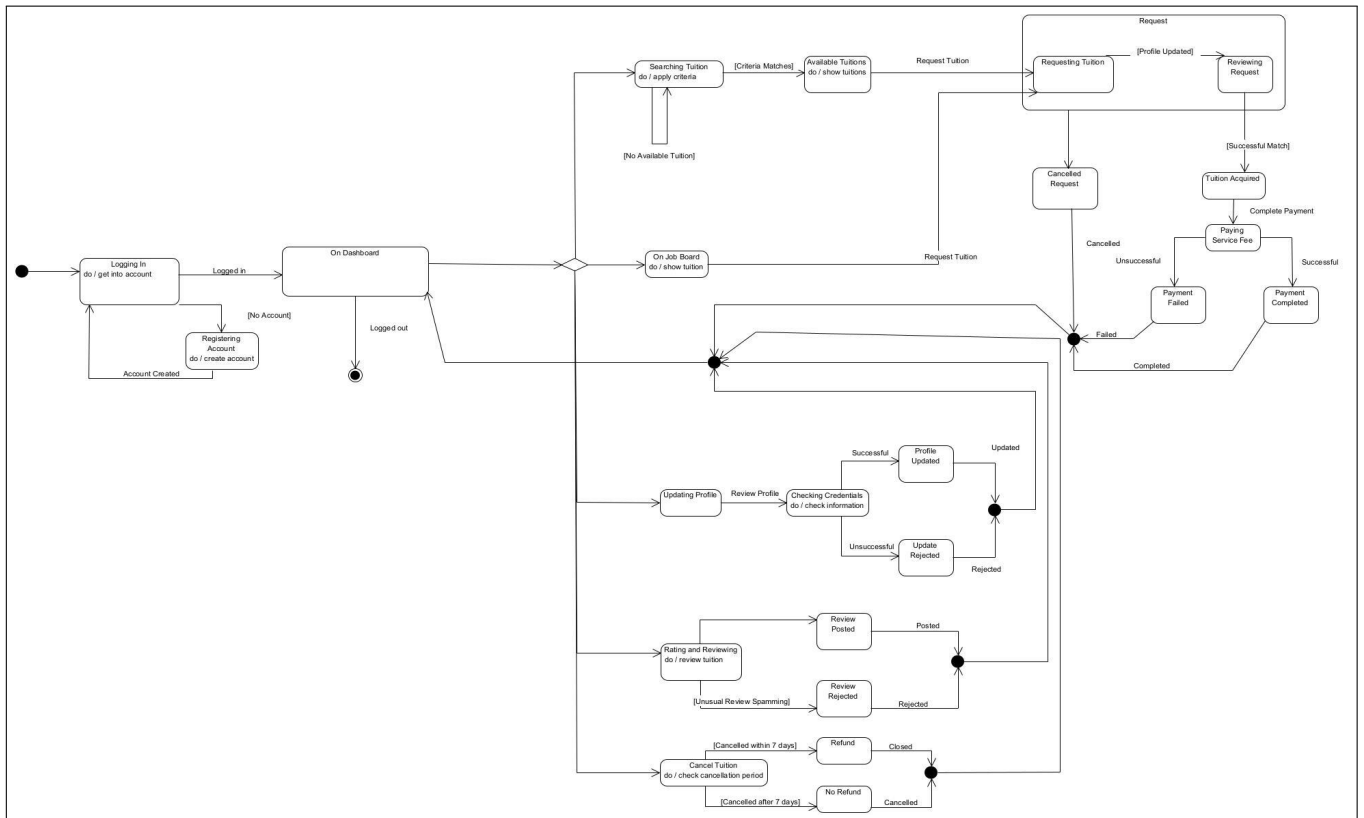
## 8.4 Rate and Review



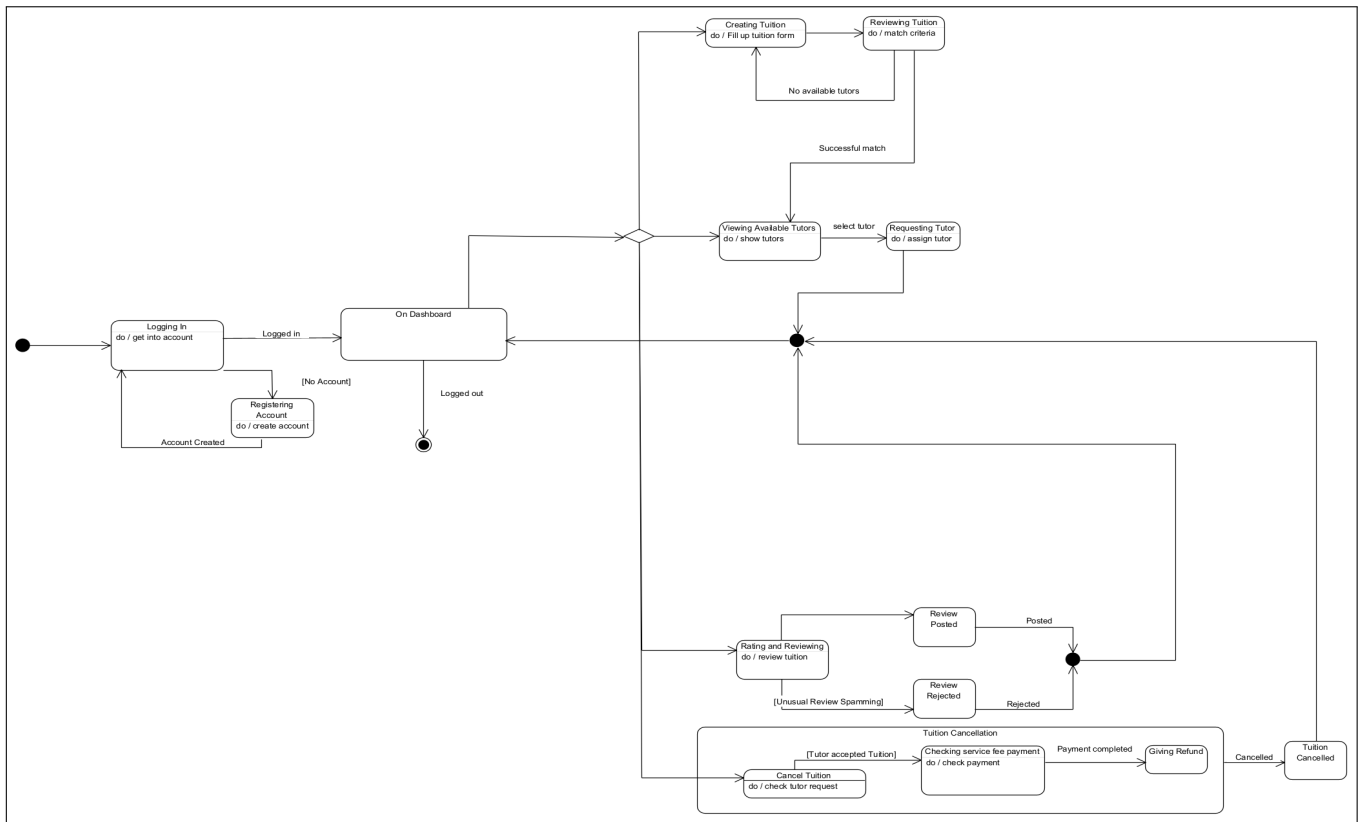
## Chapter 9

# State Chart Diagram

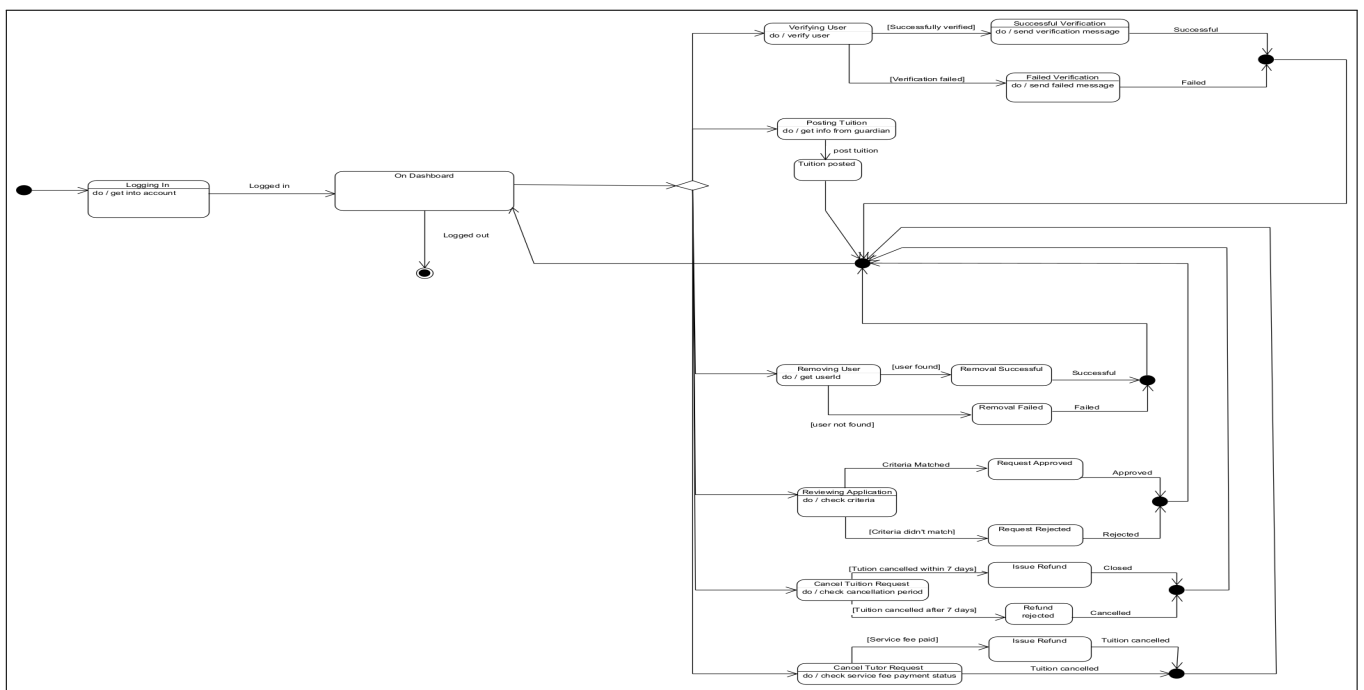
### 9.1 Tutor's state chart diagram



## 9.2 Guardian's state chart diagram



## 9.3 Admin's state chart diagram



## Chapter 10

# Database Schema

