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Department of Computer Science & Engineering

Term Project

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Section 1

1. Introduction

Project Name: Tutor's Club

Project Introduction: Finding a good tutor can be difficult in some cases, "Tutor's Club" is a mobile based application that will help its users to find a tutor or tuition near them. University or

school students can use this app to start teaching or learning both online or on physical platforms. People who have teaching skills can help those who are keen to learn using this application. This application will help its users to find their desired tutor or tuition interactively.

2. Project Goal and Objectives

The goal of this project is to build an application for the stakeholders to find tuition or tutor according to their preferences easily and collectively.

The objectives are as follows:

- Users of this application will be able to hire a tutor or get a tuition for both physical and online sessions.
- Can be used anywhere and anytime as it is a mobile application.
- User interface will be detailed and organized for a better user experience.
- Very secured and reliable system.
- Attention will be given to reviews and get better with every update.

3. History leading to project request

Tuition helps students to earn and also improves their basic knowledge. It is an amazing earning platform for students who have no other choice but to depend on themselves for financial support.

A home tutor provides guidance, helps students to understand a topic and grasp knowledge easily. Students are given extra care and time which helps to boost their self-confidence as well as their grades.

Day by day, home or online tuition is becoming more and more popular but sometimes it becomes tough to get tuition with a desirable salary in a preferred location. There are many

agencies and Facebook groups which offer tuition but they are not always trustworthy. In most cases, the tutor has to give 50% of their first month salaries to the agencies as per contract. A mobile application will be an easy solution for both parties as it's more effective and less time consuming. The option of having both online and physical learning sessions will make things easier for both teacher and student. "Tutor's Club" can be an interactive platform for the users and will find them with the best match by establishing mutual understanding and communication. This app can also avoid media business in the tuition system. Using this app anyone can create a profile and apply to their preferable tuition.

4. Identify Problem, Solutions & Opportunities

Problems :

- Standard manual search for a suitable tutor or tuition fulfilling all requirements is a major time consuming process.
- People who are looking for a tuition do not find the tuition in their desired location
- University students who are experienced and capable of teaching can't manage to find tuition because of their lack of contact and some can't travel far for tuition.
- Sometimes students face problems in a specific topic of a subject and needs help on that particular topic.
- Lack of communication and understanding between both parties while confirming a tutor or tuition can sometimes be a problem.
- Not all sources can be trusted and there is always a chance of getting scammed.

Solution: :

- While registering, this app will take all necessary information and requirements from a user and will immediately find them with the best match
- The user will only be provided with the best matches within the location they select while registering.

- This app will provide a different section for online teaching which will enable students to find desired tuition anywhere within this country without leaving home.
- This app will let the user select specific topics as well as subjects while searching for a teacher and shows the best matches.
- This app will have a chat section where both parties can communicate for mutual understanding. They may also request a demo interview for both online and physical sessions before actually confirming.
- While registering, users will have to scan their NID/Passport or educational ID card which will be used to verify them and will be stored in the app database as evidence of their identity as a security measure for both parties.

Opportunities:

The aim of this project is to make the process of finding tuition less time consuming, accessible and affordable for its users. Hiring a teacher from this app is highly secured because of Tutor's Club's verification process and so there is less chance of getting scammed. Also, this app will be making necessary updates according to the reviews from users.

Section: 2

5. Product Description:

a. Product Summary:

As this application will be for mobile phones It will have both client and server sides. The app will take necessary input details from the user on the client-side and send it to be stored in the server. As a user's information will be getting stored in the server, users will be able to access their information from any device anywhere.

There will be a separate option for registering as a tutor and registering as a student. To complete the registration user will have to input all necessary information in the signup form. Users will also have to scan their ID's through their phone cameras as a verification process. After the registration is done, a profile will be created for the user where they can view their activities, also they can modify and update their personal information if needed.

After requesting a tutor or tuition there will appear a list of profiles of the registered tutors or tuition requests. Users will be able to see their detailed information and can contact them through chatting on the app before they confirm. For online sessions, users can also request mock or trial classes so that they can decide accordingly. After using our service users can give us reviews about the tutor or the app itself. The rating and comments given by the users about the tutor will be available on the tutor's profile. The feedback will be used for further updates.

b. Product Stakeholders:

The stakeholders of this application are

- User (Student/Parent, Tutor)
- Application developers
- Admin

6. System Context Level Data Flow Diagram

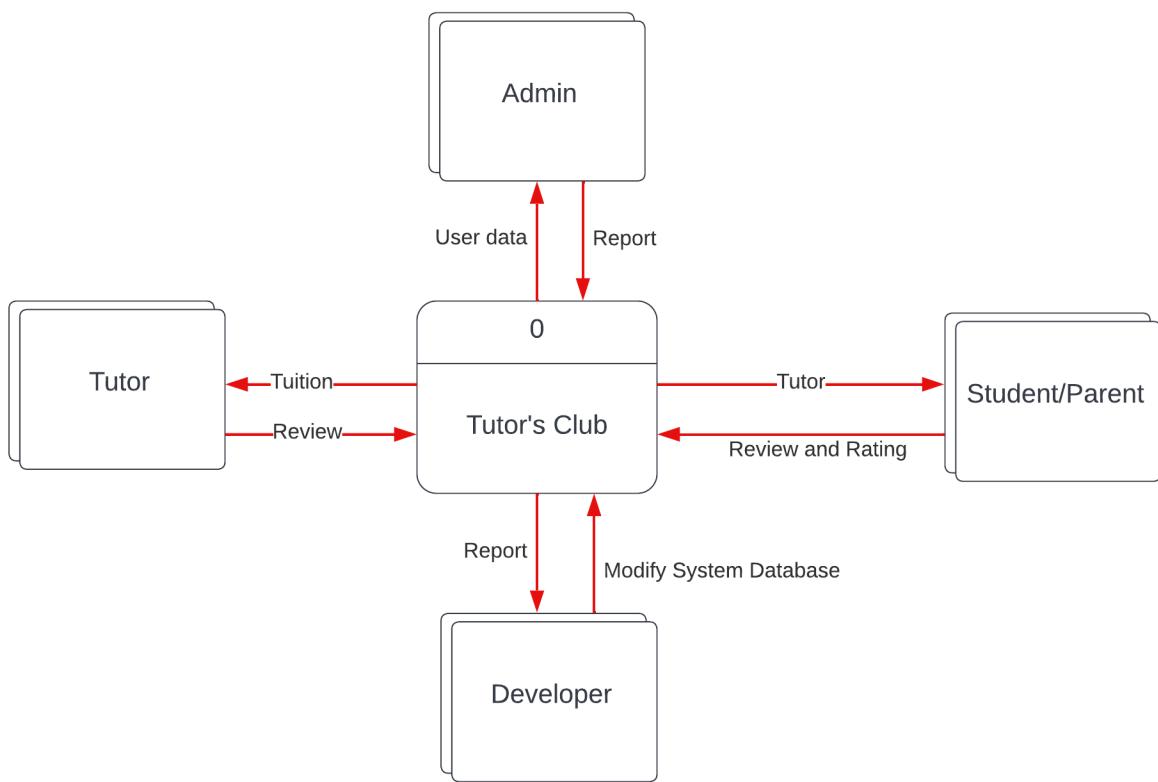


Fig : Context level Data Flow Diagram

7. Hardware components:

1) Any Operating system with 128 MB of RAM

2) 256 MB of free Hard-drive space

Hardware architectures:

1) IOS (iOS 11.0 Tigris and higher)

2) Android (“Nougat 7.0” and higher)

Frontend:

- Smartphone
- Internet connection capable of smooth browsing experience
- A Web Browser or an Android or iOS app.

Backend:

- Servers capable of handling 1000 users concurrently hosted by a cloud service provider.
- At least 100MB of storage allocated per user.
- A relational database - MySQL.

- A language like Python that is capable of handling thousands of requests every second.

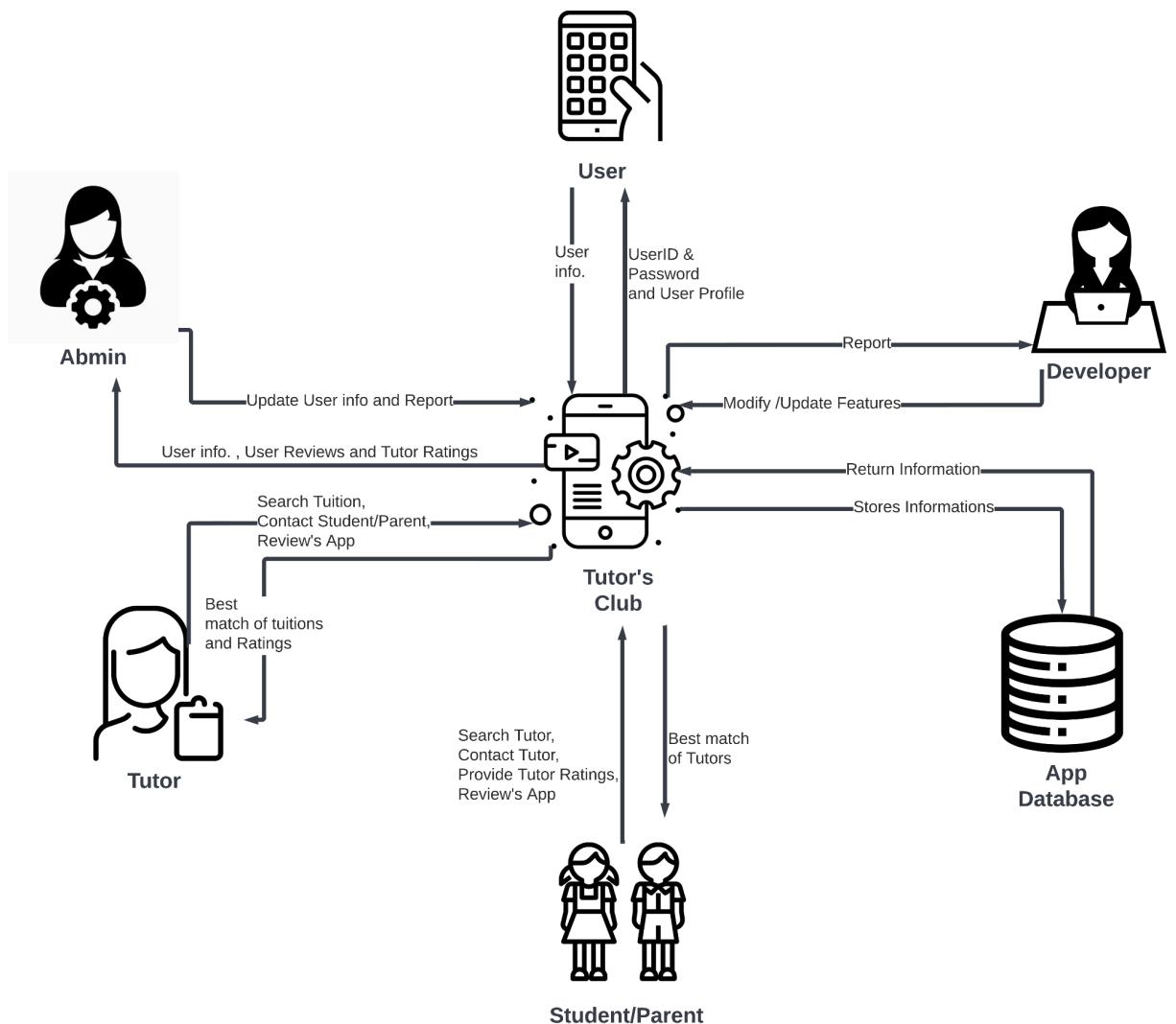


Fig: Rich Picture of Tutor's Club

8. Key Technical Features of Software

- Java Script will be the main frontend language
- Creates user profiles for registered users (Parent/Student,Tutor)
- Take detailed information while registering to find the best match
- Has options for both online and offline tuition/tutor.
- Well categorized search options.
- In-built chat-box for communication.
- Less chance of data-loss as all information is saved in the database.

Section 3:

9. Information Gathering methods (At least three methods)

Tutor's Club' is a mobile application which helps its users to find tutor or tuition. Requirement analysis is crucial for the success or failure of the app, it help us to determine the actual needs of the users to discover and analyze user needs several techniques can be employed to gather information. I will use the following three information gathering techniques for my project.

a) Interviewing:

It is used for collecting detailed information from the interviewees, including their insights and opinions. It is the most effective technique as it allows direct interaction. This application mainly focuses on students and teachers. We interviewed some university and college student which helped us to understand their views and opinions about our app. For interviewing both open-ended and closed-ended questions were asked. While closed questions helped to conclude the session quickly by gathering relevant information, through the open-ended questions, we got to know their point of view and insights of the difficulties they had to face while searching for a tutor or proper tuition job

Here are some questions we asked during interview session:

Student:

1. Where are you currently studying?
2. Do you take extra tuition besides your school/college/university?
3. Does it get difficult for you to understand lectures in a class full of students?

4. What kind of difficulties do you face while searching for a private tutor?
5. Would you prefer online tuitions?
6. What do you think of our app? How beneficial would it be to you?

Tutor:

1. Are you currently studying or doing jobs?
2. How far is your university/office from your home?
3. How long have you been teaching? How do you like it?
4. What difficulties do you face while searching for tuition?
5. Are tuition agencies helpful? What do you think about them?
6. Would you like to provide online tuition?
7. Do you think our app can help you find suitable tuition? How?

Activities Performed:

1. We read and understand the background information as much as possible, about the interviewees and the organization from the resources available.
2. Using the gathered background information, we established the objectives of the interview.
3. Then we decided the correct client stakeholders whom to interview. We included the key people at all levels who will be affected by the system in some manner.
4. We scheduled the time and location for the interview and informed all the participants about the objective, time and location well in advance.
5. After that we decide the types and the structure of the question we are going to ask. Mainly there are two types of questions open-ended and closed and three structures to arrange those questions: pyramid, funnel and diamond. We decide the one appropriate for us.
6. We built a list of interview questions and issues to be discussed.

7. During the interview we made a documentation of the facts and information gathered. We took the review of the interview, wrote it up with the interviewee and made corrections if needed.

8. We made an interview report and reviewed the report with the respondent.

b) Questionnaire :

Surveying through the questionnaire is the method for gathering information from a large number of users in a short amount of time. A questionnaire allows the subject time to think about their answer and time to recall previous events or thoughts. We have designed the questionnaire based on what we discovered in the interview. Through the use of questionnaires, we were seeking to quantify what was found in interviews. It saved our time as we did not interview each stakeholder individually. Rather than a digital google form was created and was shared into several groups where students and teachers have an active presence. Also, the questionnaire was shared with some people personally by email.

Just like interview questions, the question format for surveying was also a blend of both open-ended and closed questions. The questions and their fixed option for answers helped us to collect information quickly, eliminating the need for the interviewee/people to have to spend much time thinking and finding the words needed for answering the question. This is particularly helpful when the stakeholders are spread in a larger area and the number of participants involved is very high. Some short questions were also included, which allowed the participants to write down their opinions under the questions.

Participant's responses to the closed-ended question were specific, which helped us to analyze them quickly with ease. By using this method, we got relevant data. The positive responses were from those who were interested in using this app. We also got some negative and neutral responses. But mostly, they were in favor of our application.

Open-ended questions helped participants to share valuable information and the experiences they faced in day-to-day life, when asked. This helped us to obtain detailed information about their problems.

Activities Performed:

- 1.** First of all, we decide what type of information we require, what are the things we need to know from the respondent in order to meet the survey's objectives.
- 2.** After that we have chosen our target respondents. We included all the people who will be affected by the system in some manner.

3. Then we decide the type of the questions if they are going to be open-ended or closed and develop the questions.
4. While making questionnaires the order of the questions is also important. We have ordered the questions in such a way so that the most important and less controversial questions place first, and cluster items of similar content remain together.
5. We have chosen a method for reaching the questionnaires to the target respondents and administer the questionnaire.

c) **Joint Application design (JAD):**

Joint Application Design is another information gathering method that can replace a series of one-to-one interviews with the user community and allows the analyst to accomplish requirements analysis and design the user interface with the users in a group setting. Joint application design is very effective in specifying requirements, because of the users' involvement in the process. This involvement allows the user to suggest their own opinion and thoughts about the design. The user may change some of their requirements and suggest new ones.

Activities Performed:

We arranged JAD sessions with some of the students' families along with some experienced tutors who are also students. We presented users with the interface and how the software will work. We showed them a patched-up prototype of our application to make them understand what they will be able to do with 'Tutor's Club'. The participants took this initiative very positively and suggested some features which helped us upgrade the design of the application. We were open to any suggestions and took review from the participants until all their requirements matched with our plan.

10. Major functionalities offered by the system

- 1) Anyone with internet connection and an android phone can use this app
- 2) Can easily find suitable tutors/tuition.
- 3) Easily accessible features will make the user experience better.
- 4) Students can communicate with the tutor directly by chatting.
- 5) All the provided data by the user will be stored in the application database.
- 6) Admin of the app can Sign Up, Login, ban users and submit a leave application

11. Use Case Diagram

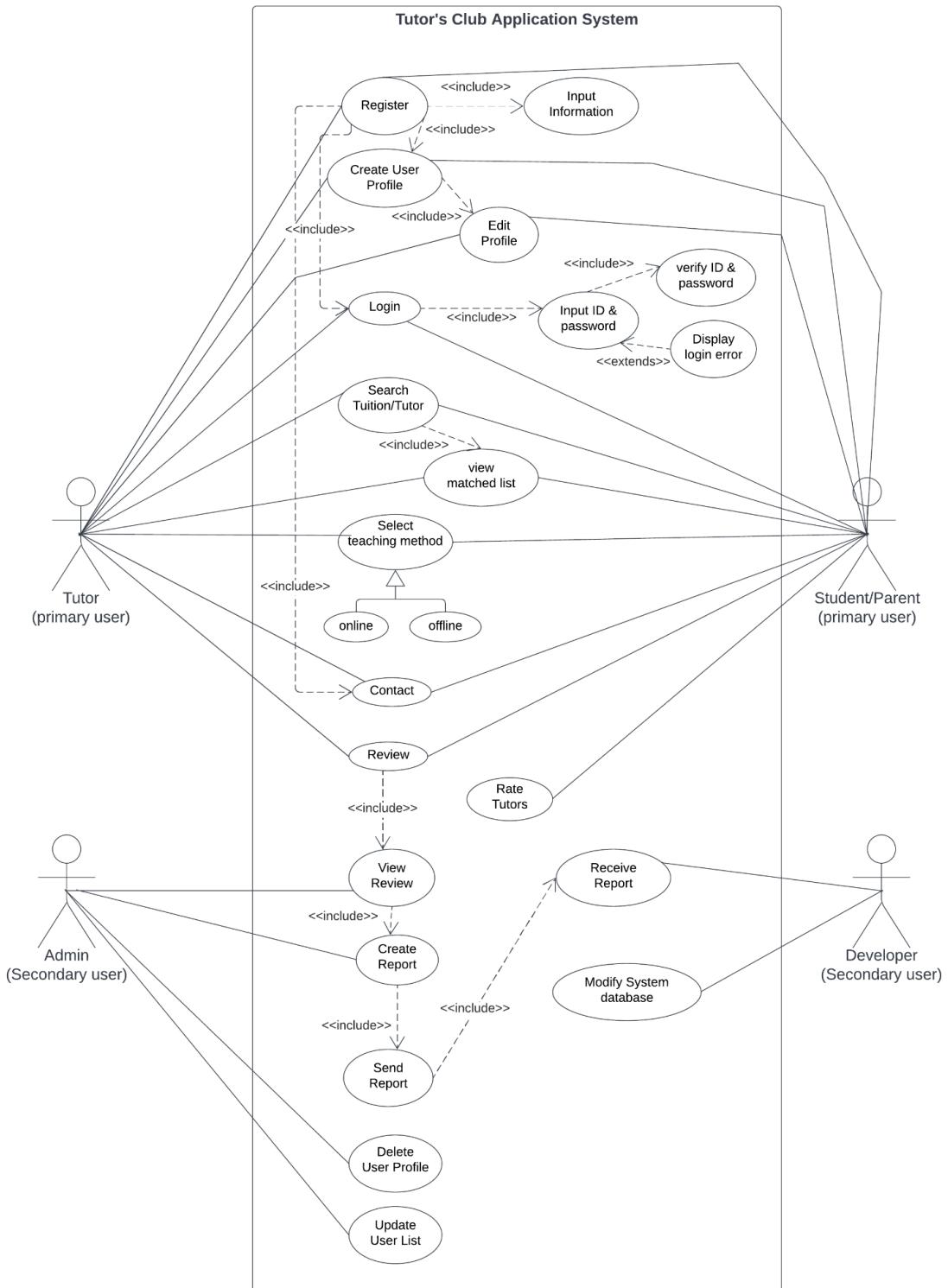


Fig: Use case diagram of Tutor's Club.

12. Normal Scenarios (At least 2)

Scenario 1:

Use Case Name: View Matched List	Unique ID: SA-00001
Actor(s): User (Student/Parent, Tutor)	
Stakeholders: Student/Parent, Tutor, Admin	
Description: View matched tutor or tuition list.	
Triggering Event: User attempts to view the matched list in the app by clicking on the button.	
Trigger type: External	
Steps Performed:	Information Required for Steps:
1. login and click on the Search Tutor/Tuition option.	1. Search tuition interface
2. Requirement Form appears	2. Requirement Form
3. Inputs required information on the form	3. Options on form
4. Click the submit button.	4. Search tuition page
5. Displays Matched List	5.. Matched List page
Pre-condition: User needs to have an internet connection and have ideas about the features of the app.	
Post-condition: Users have to carefully input all required information while Searching.	

Assumption: User has credentials to access the internet and download the app to find a tutor on tuition .

Success Guarantee: User has Views the matched list successfully

Minimum Guarantee: User was able to input requirements.

Requirements Met: User provides information and was able to view list successfully.

Scenario 2:

Use Case Name: Review Process	Unique ID: SA-00002
Actor(s): User (Tutor/Parent)	
Stakeholders: Tutor, Parent	
Description: User logins to the app and provide review and save details	
Triggering Event: Write review by clicking on the review and save option.	
Trigger type: External	
Steps Performed:	Information Required for Steps:
1. User Logins to the app using valid ID and password	1. Login page
2. Select the review option which appears on the device screen.	2. Review page

3. input new review	4. Review form
4. Clicks save and view given review	5. Review Page
Pre-condition: User needs to be Registered to the app.	
Post-Condition: Input information before saving	
Assumptions: User Can login to the app via ID and provide review	
Success Guarantee: Users were able to login to the app and provide review	
Minimum Guarantee: User was able to login	
Requirements Met: User was able to login and provide review and save details	

13. Alternate Scenarios (At least 2)

Scenario 1:

Use Case Name: View Matched list	Unique ID: SA-00324
Actor(s): User (Student/Parent, Tutor)	
Stakeholders: Student/Parent, Tutor, Admin	
Description: This use case describes how the user fails to view the matched list.	
Triggering Event: User wants to view matched list by clicking button	

Trigger type: External

Steps Performed:	Information Required for Steps:
1. Login to the app	1. login page
2. Search for tuition/tutor	2. Search tuition/tutor interface
3. Invalid requirement provided by the user . For example- invalid location	3. Requirement form
4. Warning Text pops up	4. Warning text
5. User again inputs with valid requirements	5. Requirement form
6. Display best match found	6. Matched list page

Pre-condition: User needs an idea about the app and downloads the app into the device.

Post-condition: Users have to carefully input required information to view list

Assumption: Invalid information was provided

Success Guarantee: User was able to view list

Minimum Guarantee: User was able to login to the app.

Requirements Met: Successfully view best match list found

Scenario 2:

Use Case Name: Review	Unique ID: SA-67038
Actor(s): User Tutor/Parent	
Stakeholders: Tutor/Parent	
Description: This use case describes how the user fails to provide review and save information.	
Triggering Event: Provide review. By clicking on the review and save option.	
Trigger type: External	
Steps Performed:	Information Required for Steps:
1. User Logins to the app	1. Login page
2. Click on the Review option	5. Review page
3. Forgets to save data	6. Review form
4. Warning text appears on screen	7. Warning text
5. Tries again by inputting all the information and saves data	8. Review form
6. Successfully Provide review and saved data	9. Needs to provide data and save details
Pre-condition: User needs to be registered to the app..	

Post-condition: Input the information before saving.

Assumption: invalid data provided

Success Guarantee: Users were able to login to the app and provide review.

Minimum Guarantee: User was able to login to the app.

Requirements Met: Successfully provide review and save data

14. Functional Requirements

Functional requirements are product features or functions that developers must implement to enable users to accomplish their tasks. So, it's important to make them clear both for the development team and for the stakeholder . The functional requirements of our application are:

1. Users will be able to access the application via multiple devices.
2. Users will be able to register as a tutor or student.
3. Students and tutors will have different user interfaces.
4. Users will be able to give their preferred location for better results.
5. Users will be able to both input and select required data.
6. All information will be stored in the app database.
7. All stored information will be secured and cannot be tempered with.
8. A user profile will be created for all registered users.
9. Users will be able to edit profiles anytime.
10. User's edited information will be automatically updated and stored.
11. Updated data of the tutors' availability will be shown.
12. Option for both online and offline tutoring will be available.

13. Proper tuition/tutor will be suggested as per the given information of user.
14. Will encrypt all user data and host it in the cloud for data security.
15. Only registered users will be able to contact other users.
16. Will verify the identity of the users by email verification while registering.
17. Users will get verification code in their email or phone number.
18. Users will be able to reset passwords through request.
19. Users will be able to rate the tutor.
20. Users will be able to rate and give feedback about the application.
21. Admins will be able to send reports to the developer team.
22. Admins will be notified about any feedback from the users.

15. Non-Functional Requirements (At least 5)

A non-functional requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors. They are contrasted with functional requirements that define specific behavior or functions. The non-functional requirements of our application are:

Category	Nonfunctional Requirements
Implementation	<ol style="list-style-type: none"> 1. The system should be user friendly and intuitive. 2. All users should be able to access in the system with internet connection
Reliability	<ol style="list-style-type: none"> 1. The system will remain reliable with a large number of users.

Usability	<ol style="list-style-type: none"> 1. Users shall be able to use all the system functions 2. Users shall be able to interact with each other
Performance	<p>Viewing a matched list will be fast and efficient, despite many users accessing the app at once.</p>
Ease of Use	<ol style="list-style-type: none"> 1. The software needs to be updated regularly to minimize the number of bugs. 2. Should ensure users' privacy and will provide security. 3. Make user interaction easy and obvious so that non proficient users can use the system with ease 4. The hardware needs to be powerful to be able to process all the data. 5. The system needs to be built in a way so that it can be easily maintained, updated or modified to add more features in the future. 6. The system needs to be monitored, maintained regularly to ensure robustness, and to eliminate any security threats.

Section 4:

16. Entity Relationship Diagram

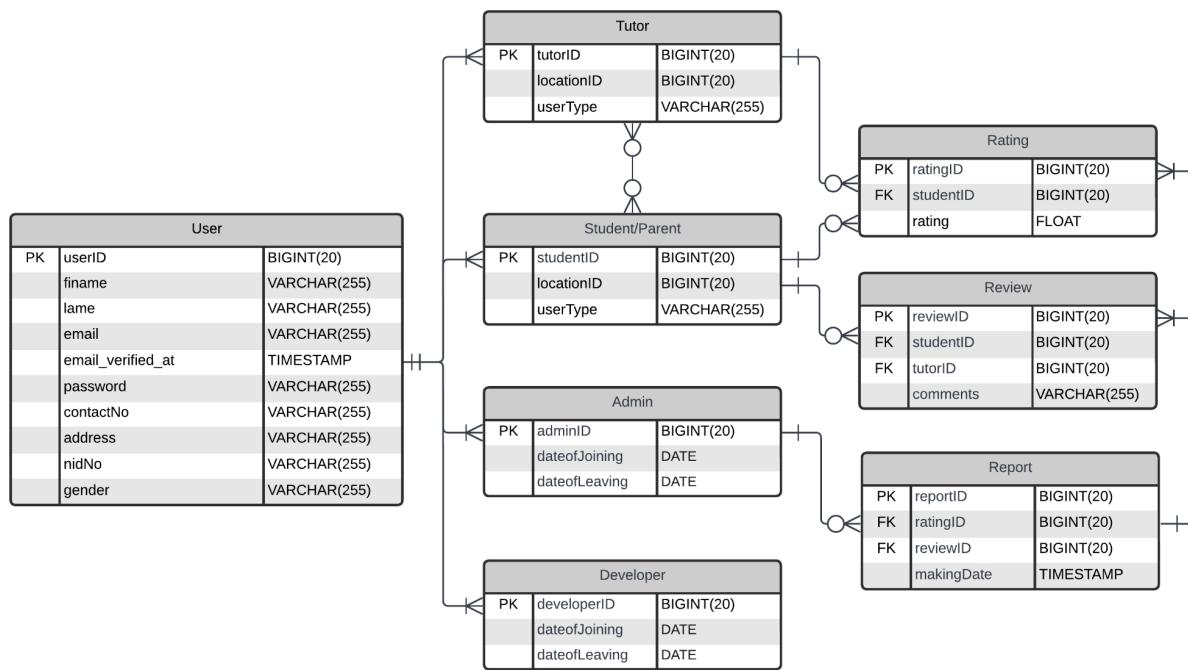


Fig: ER-diagram of Tutor's Club.

17. Logical Data Flow diagram

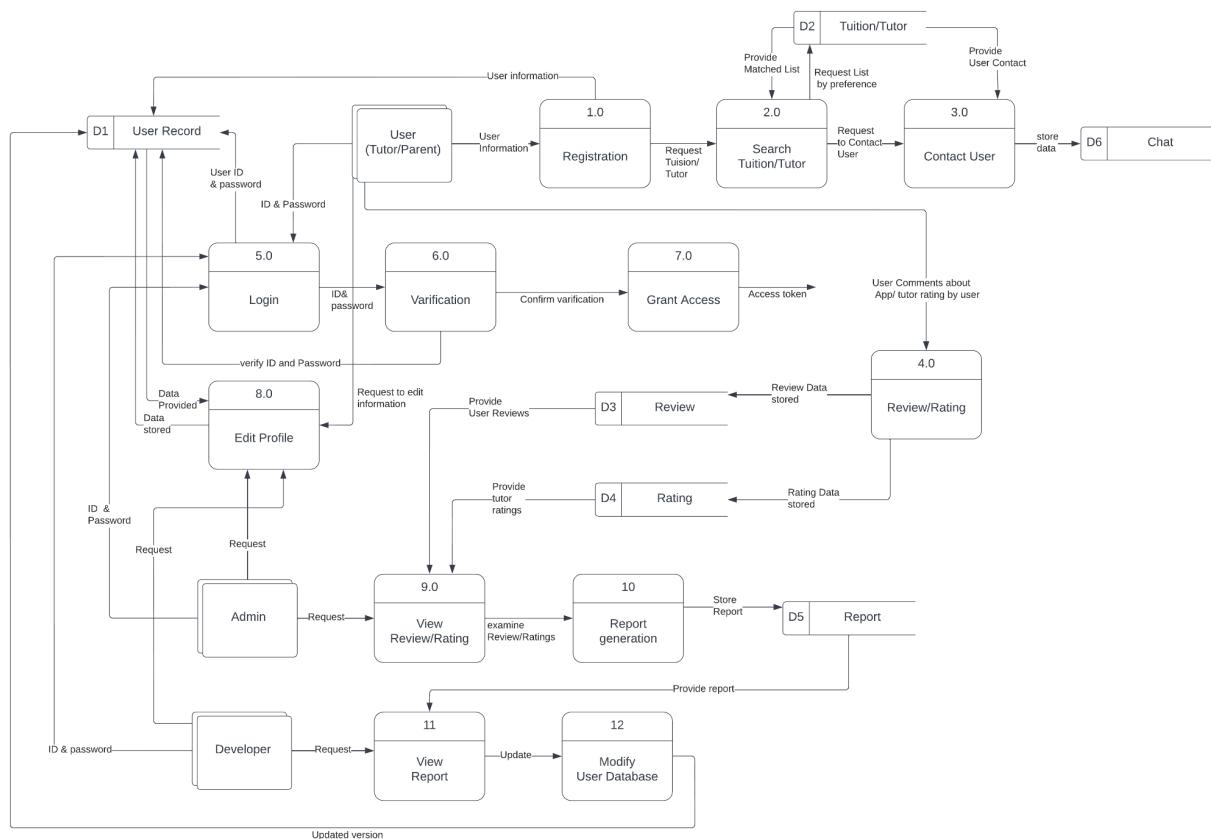


Fig1: Logical Data Flow diagram of Whole system

Logical Data Flow Diagram of Subsystems:

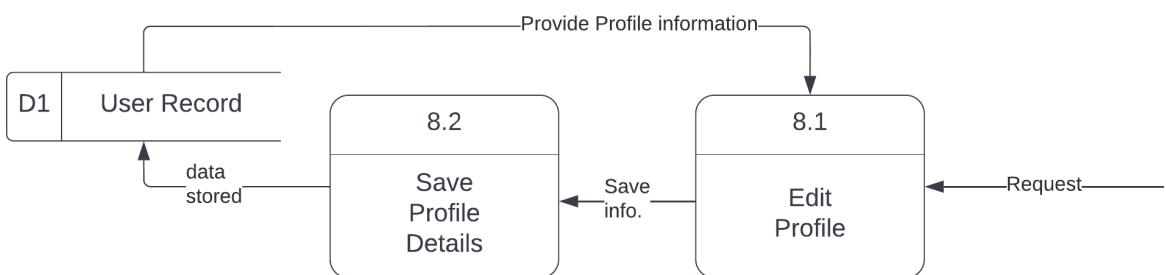


Fig1.1: Logical Data flow diagram of Edit Profile Process.

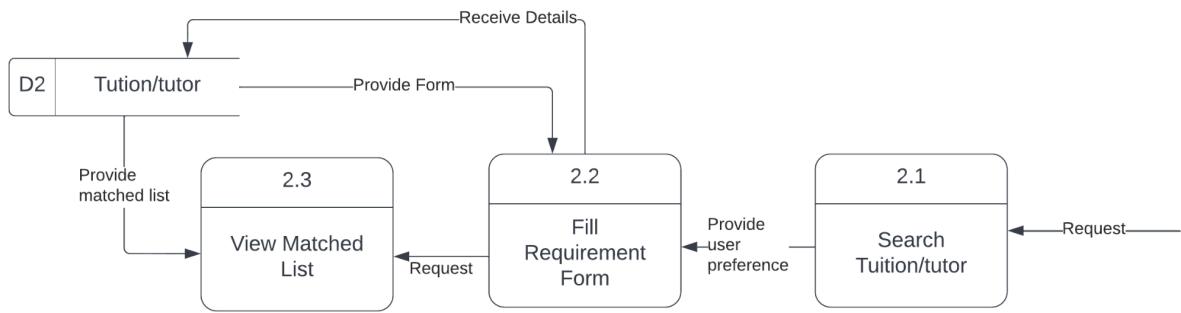


Fig1.2: Logical Data Flow diagram of View Matched List process.

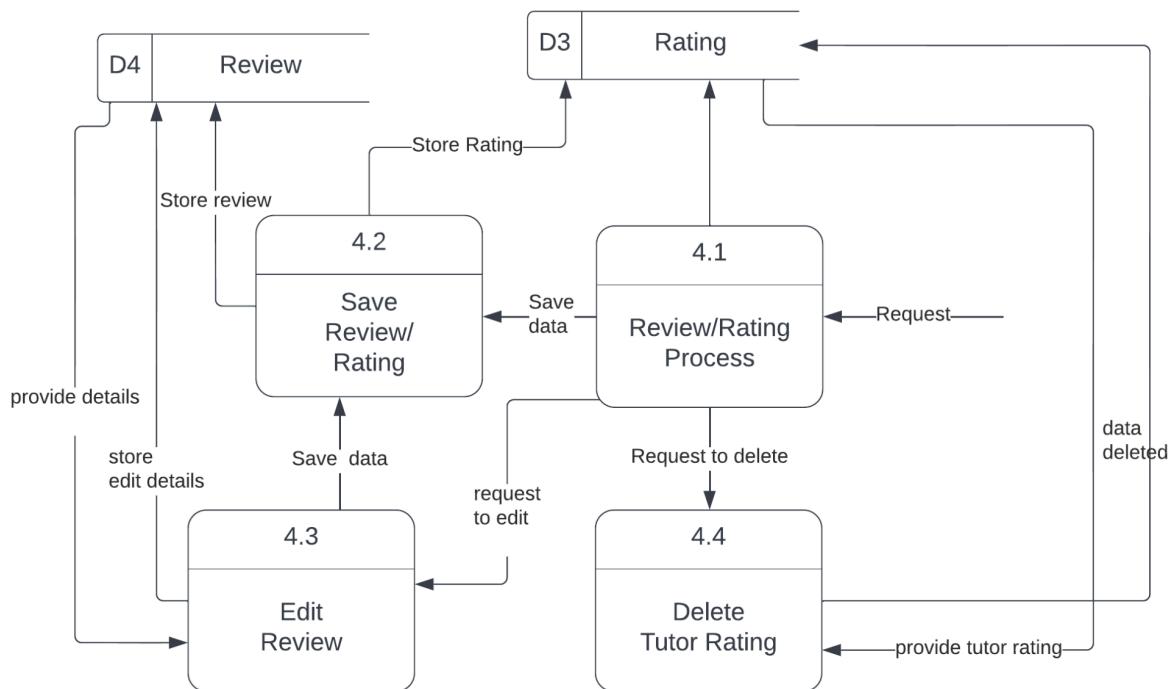


Fig1.3: Logical Data Flow diagram of Review Process

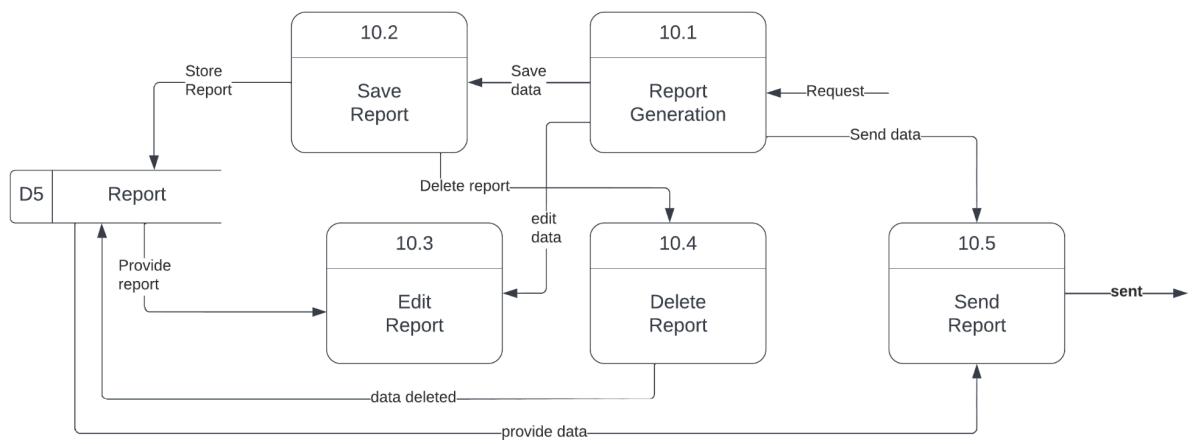


Fig1.4: Logical Data Flow diagram of Report Process

18. Physical Data Flow diagram

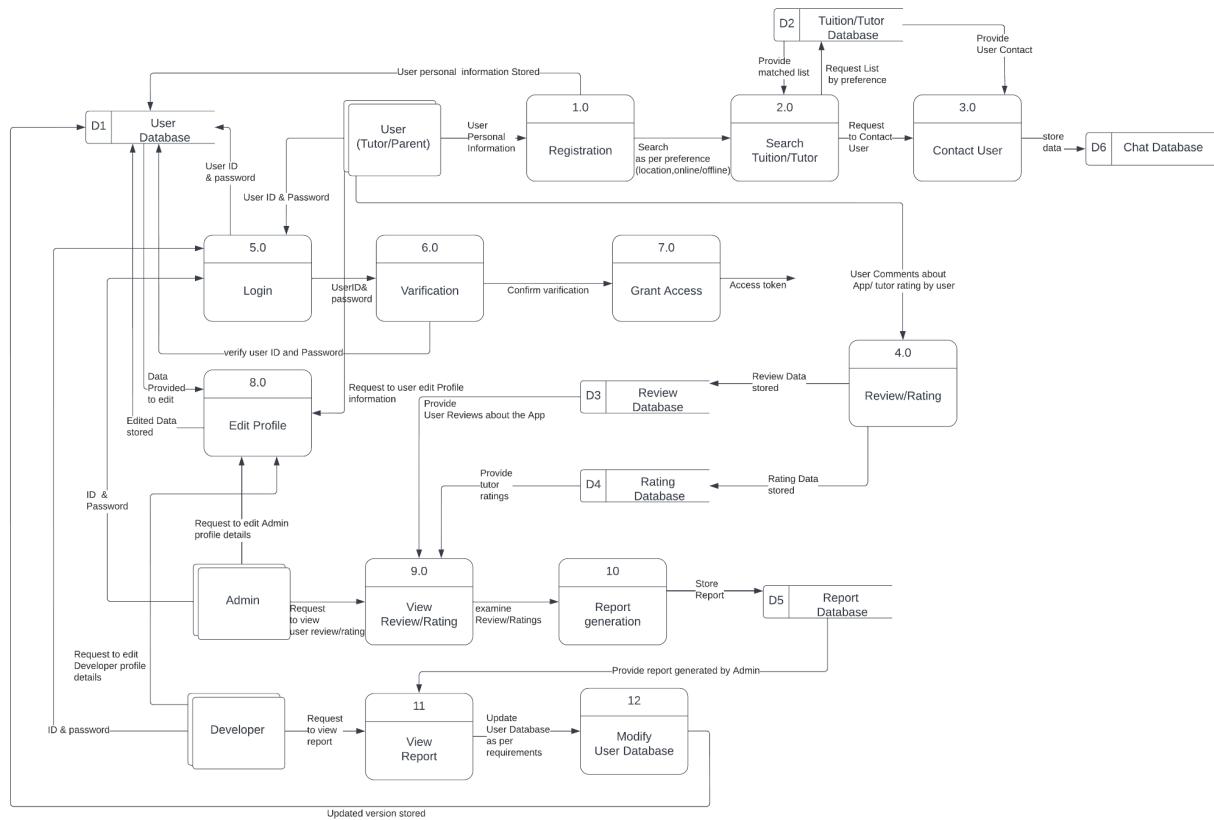


Fig2: Physical Data Flow diagram of Whole system

Physical Data Flow Diagram Of Subsystems:

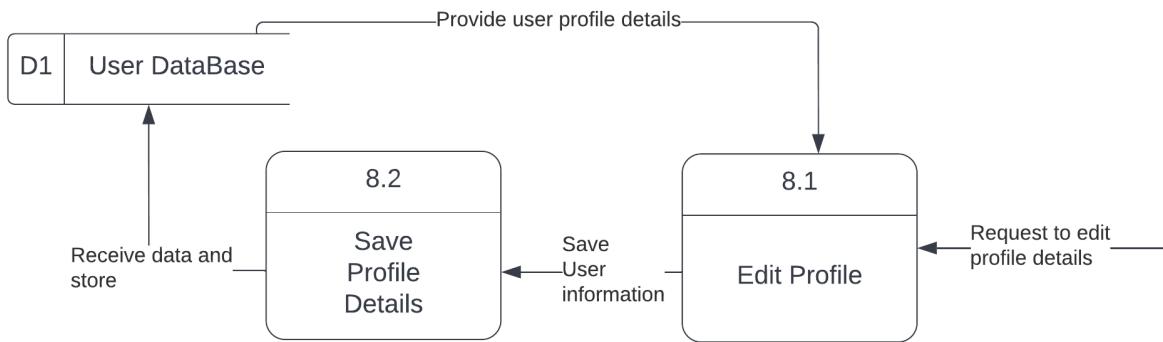


Fig1.1: Physical Data Flow diagram of Edit Profile Process

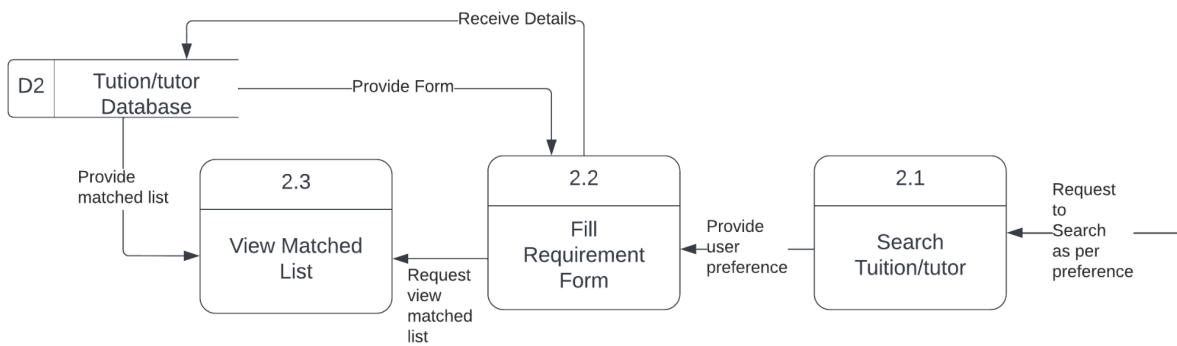


Fig1.2: Physical Data Flow diagram of View matched List Process

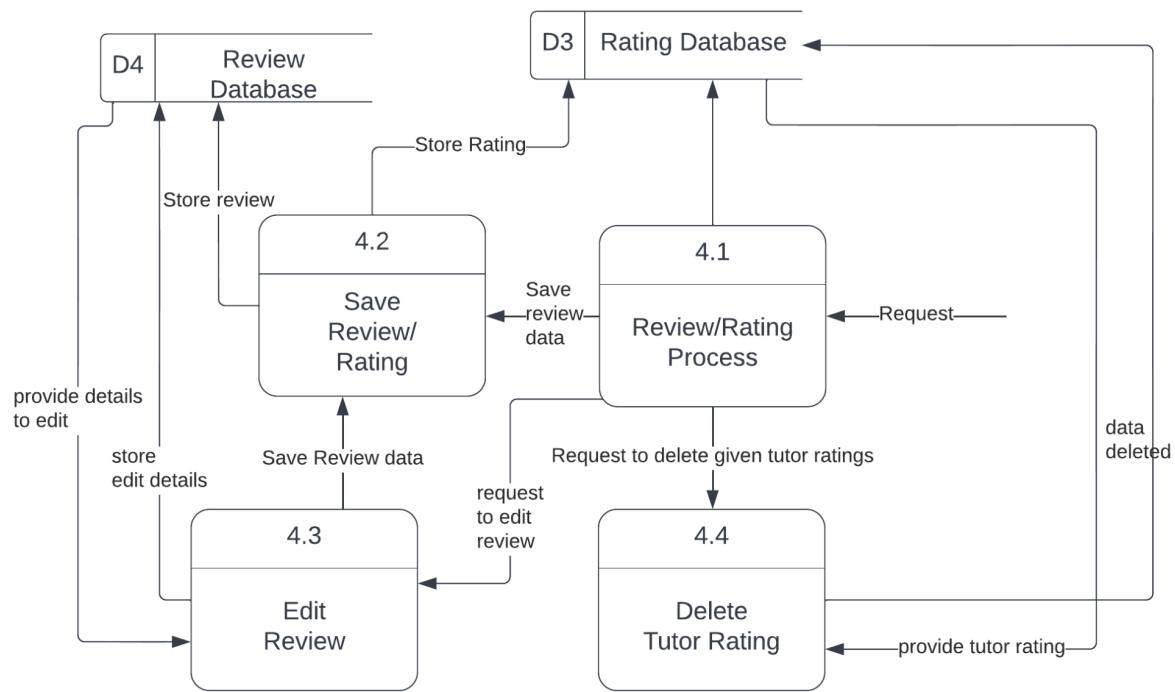


Fig1.3: Physical Data Flow diagram of Review Process

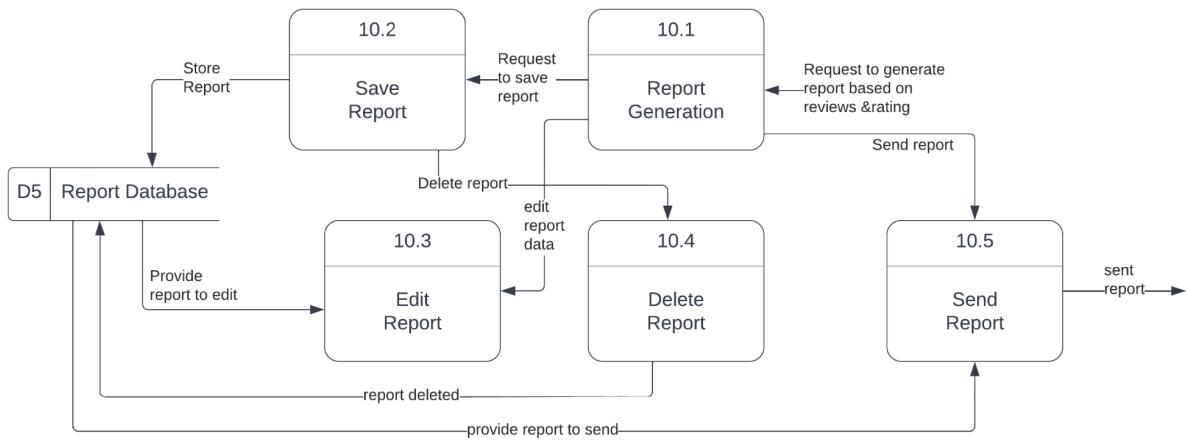


Fig1.4: Physical Data Flow diagram of Report Process

19. Activity diagrams

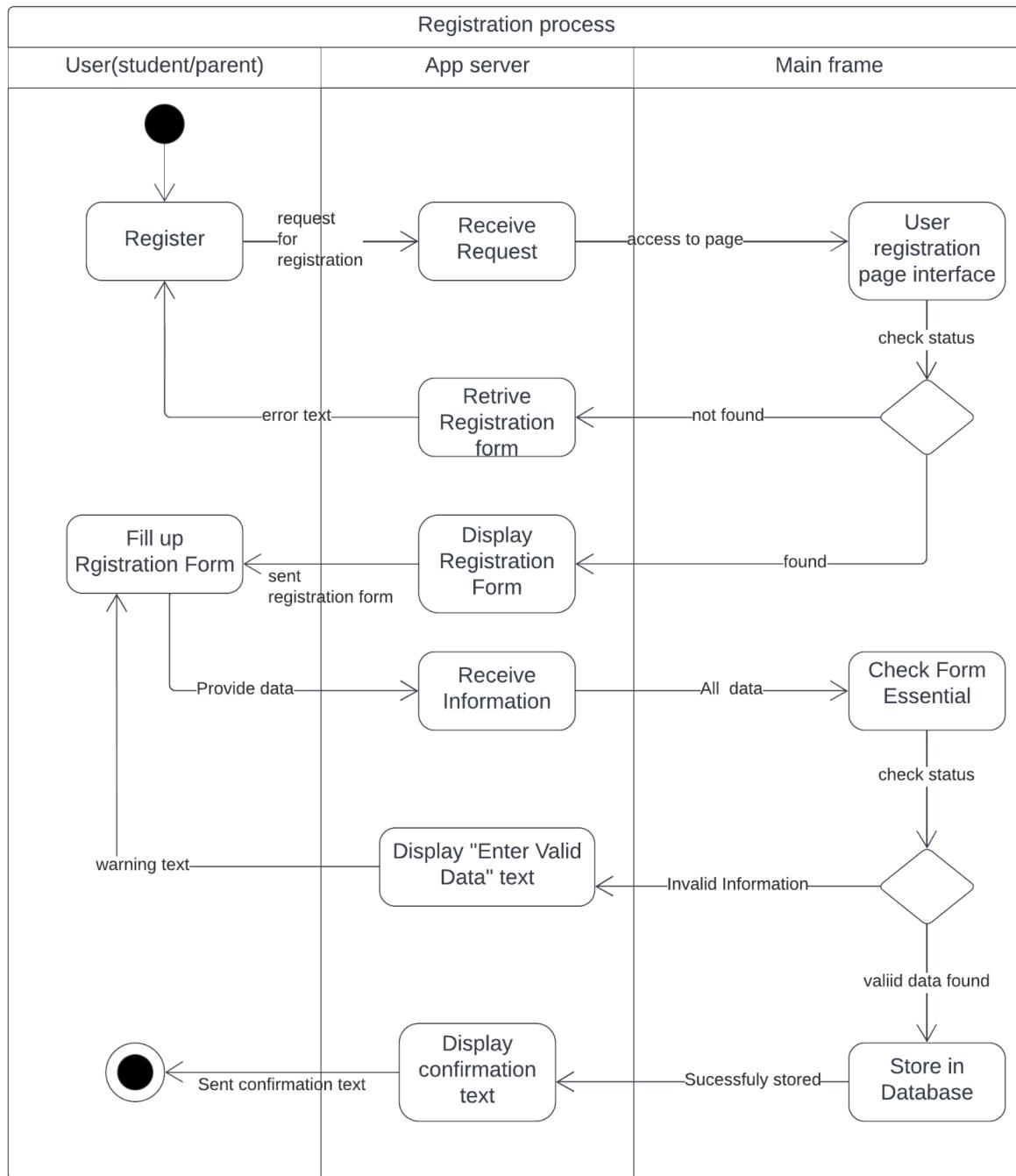


Fig: Activity diagram for Registration process.

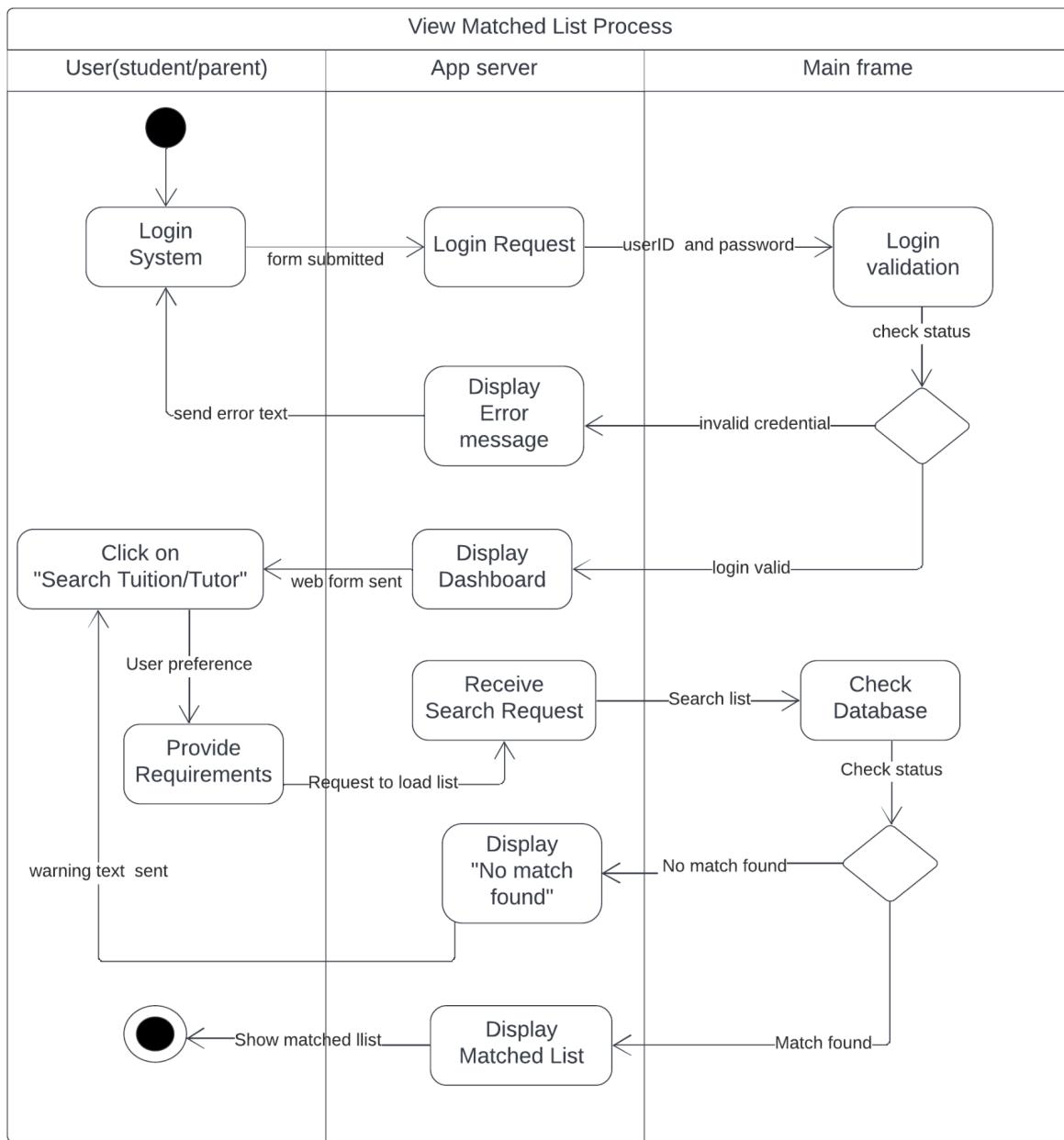


Fig: Activity diagram for View Matched List process

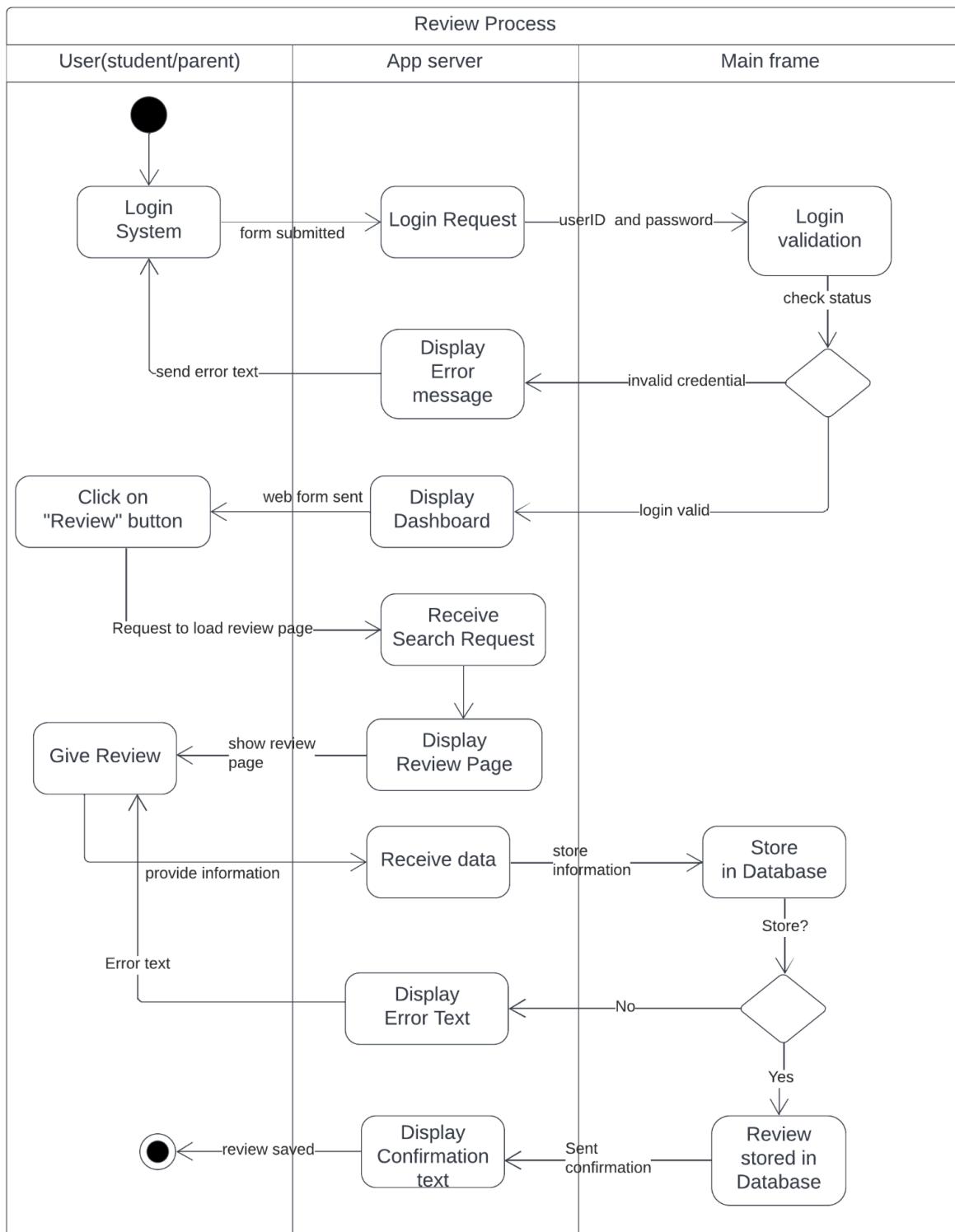


Fig: Activity diagram for Review process.

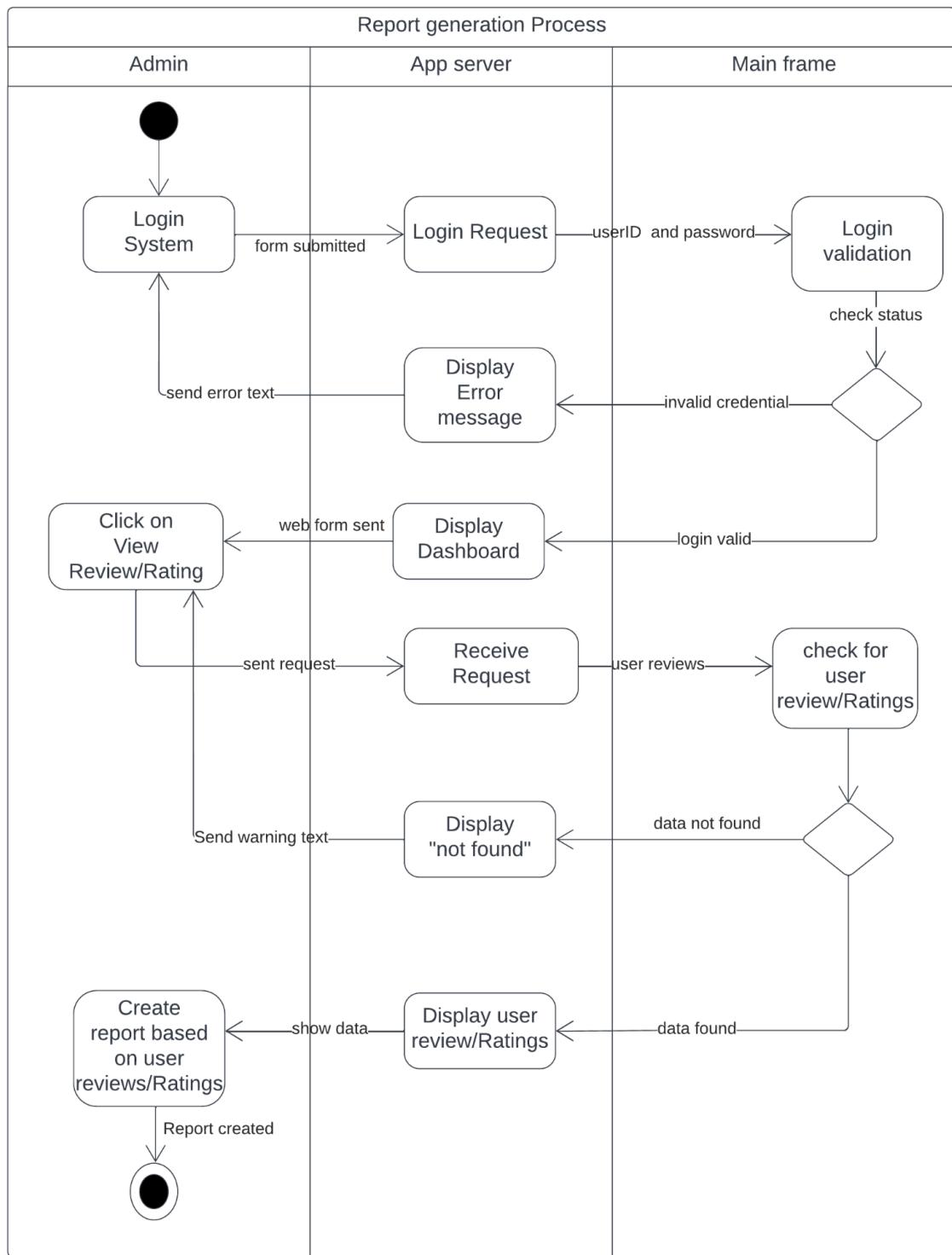


Fig: Activity diagram for Report Generation process.

20. Sequence diagrams

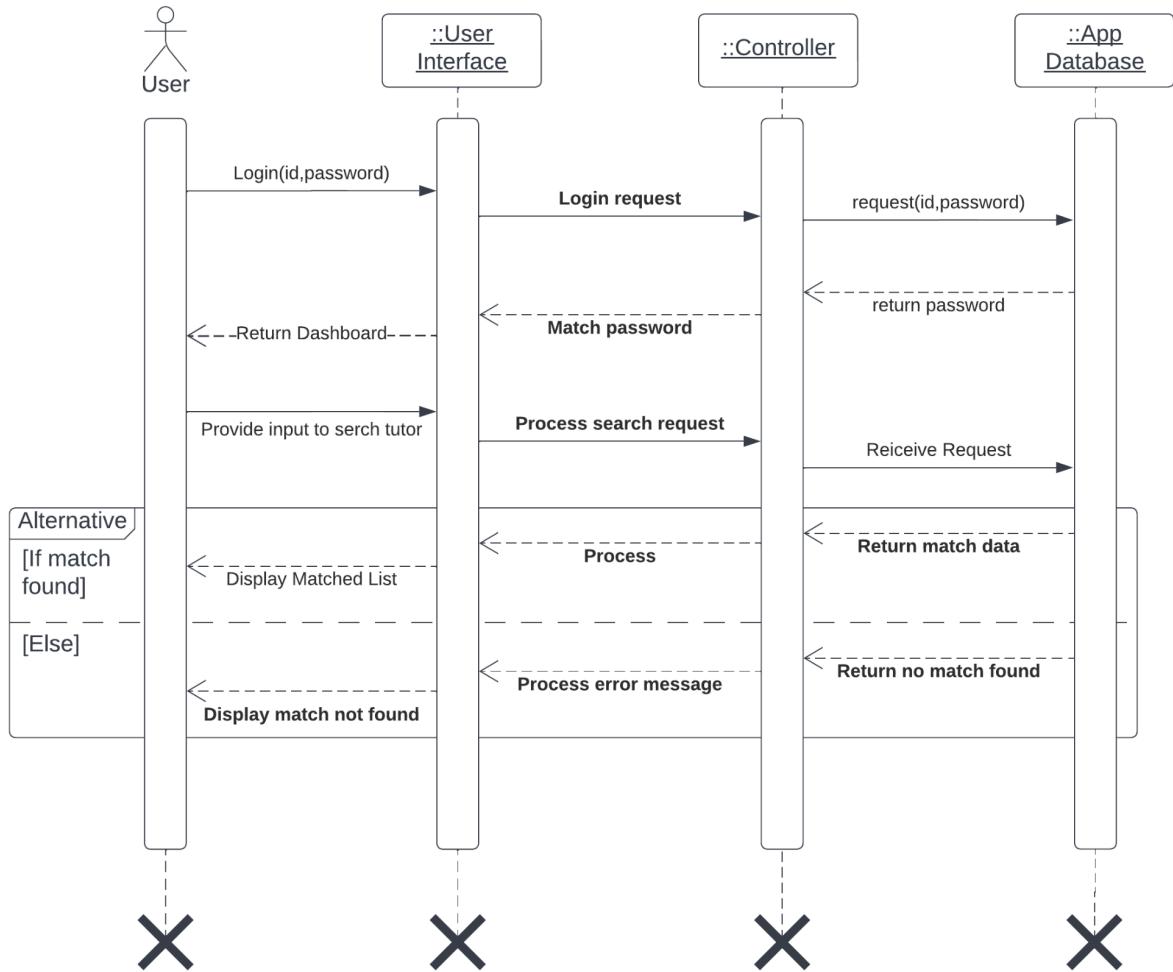


Fig: Sequence Diagram of “View matched list” Process.

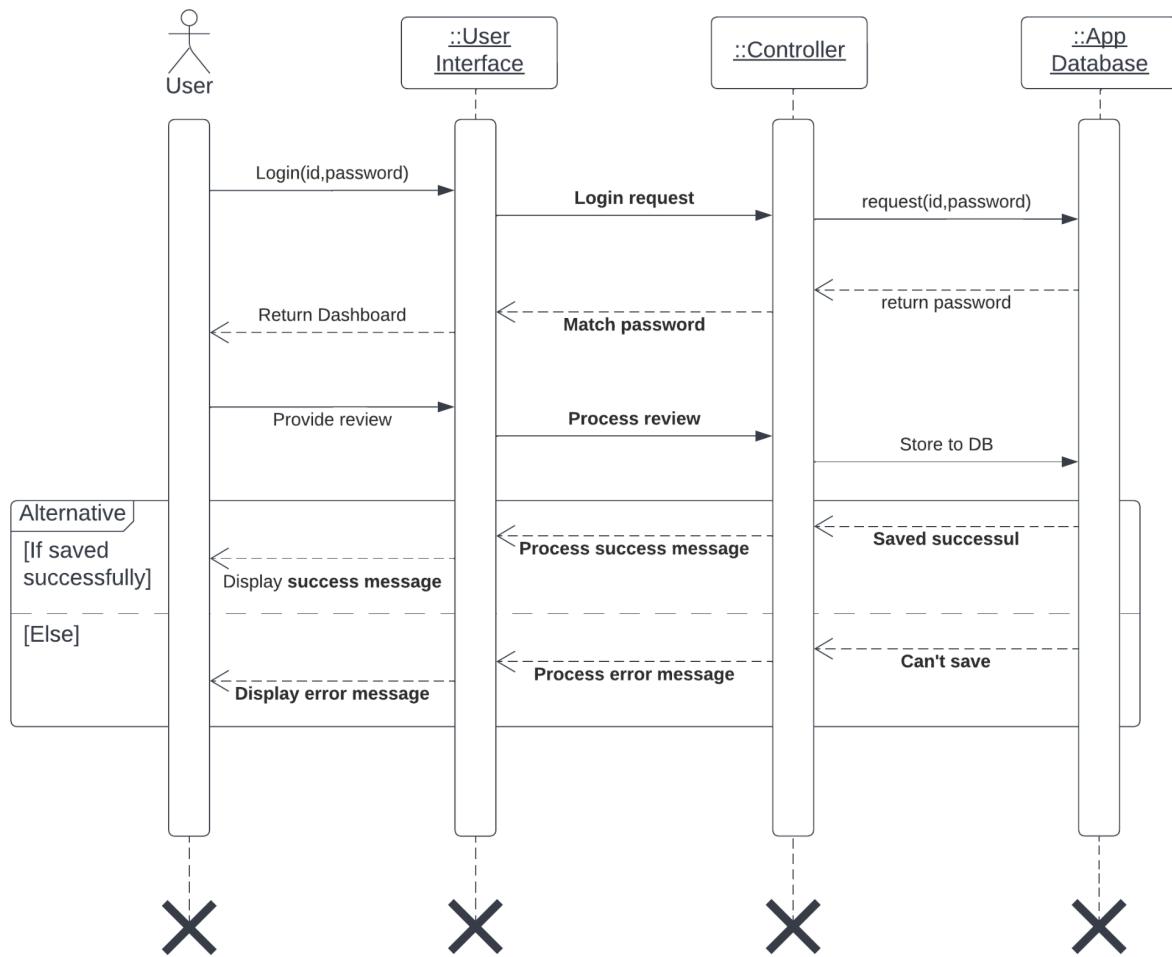


Fig: Sequence Diagram of “Review” Process.

21. Communication diagrams

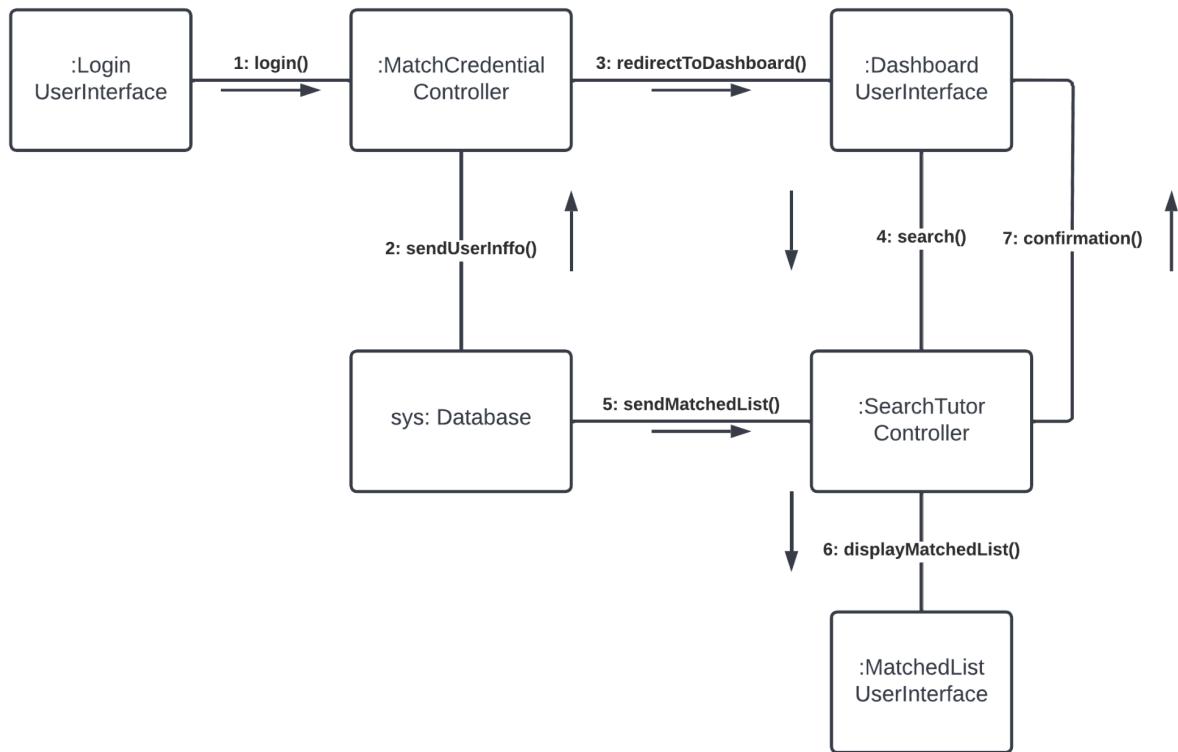


Fig: Communication Diagram of “View matched list” Process.

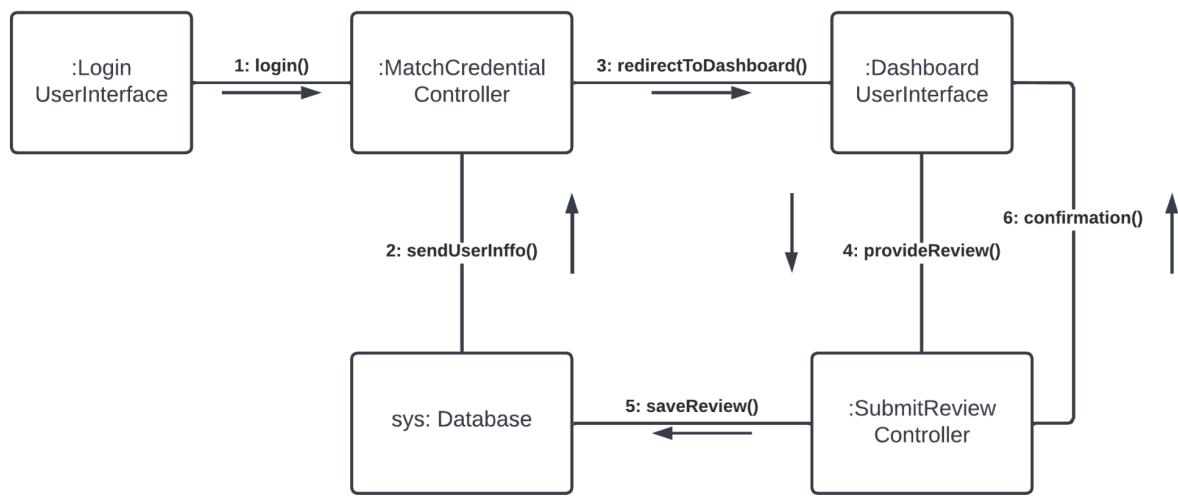


Fig: Communication Diagram of “Review” Process.

22. Class diagram

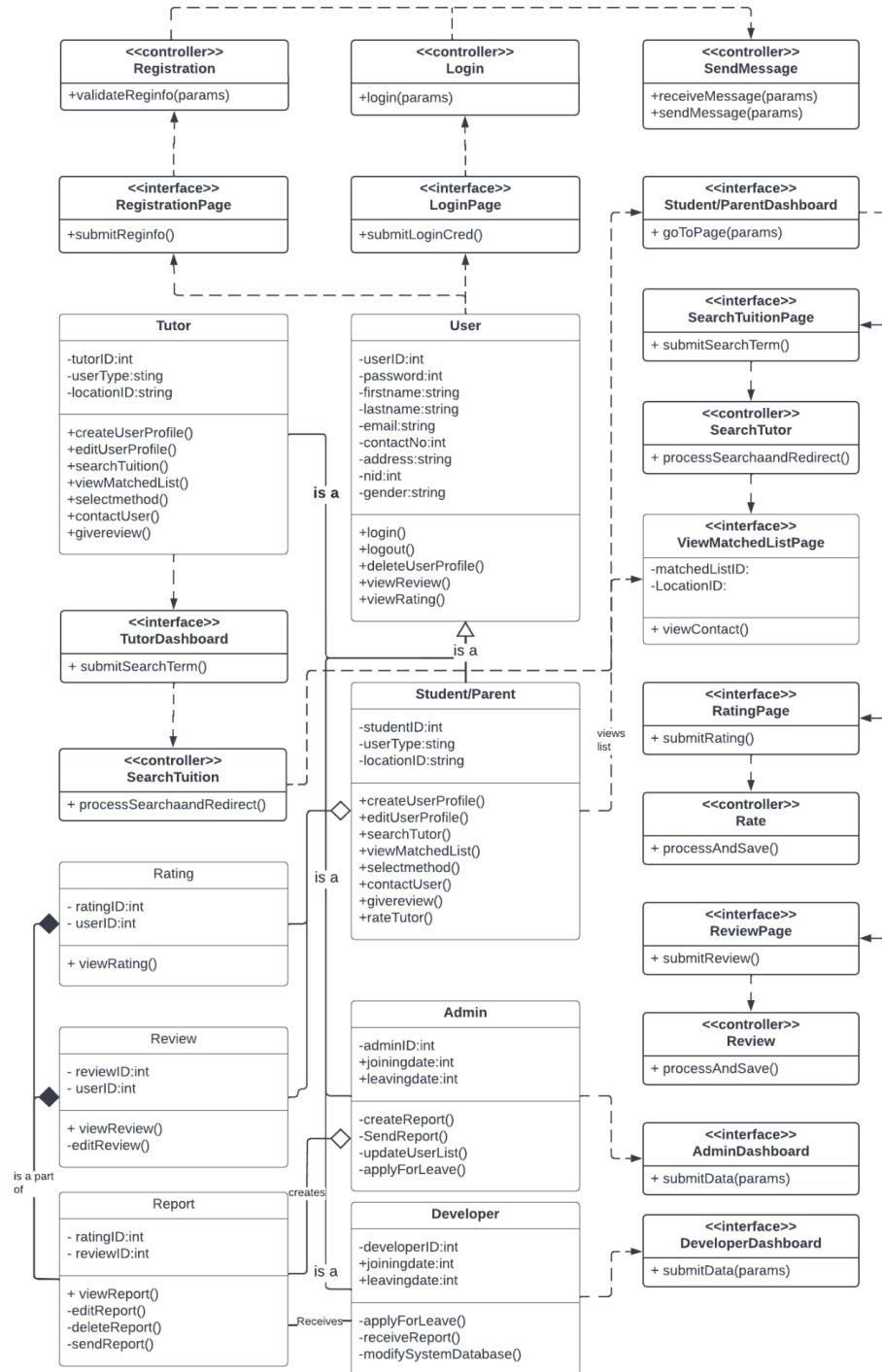


Fig: Class Diagram of Tutor's Club.

23. State-chart diagrams.

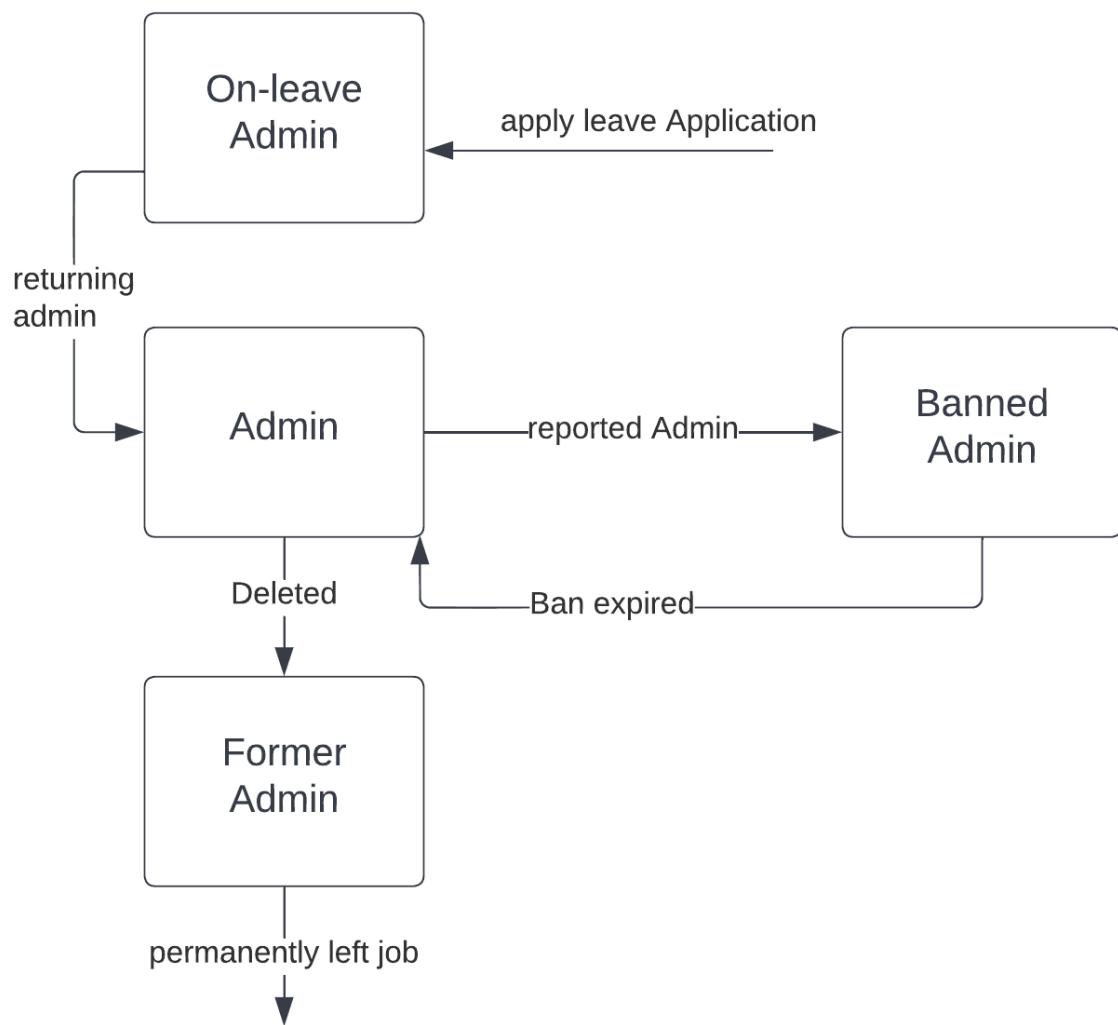


Fig: State Chart Diagram of Admin Class.

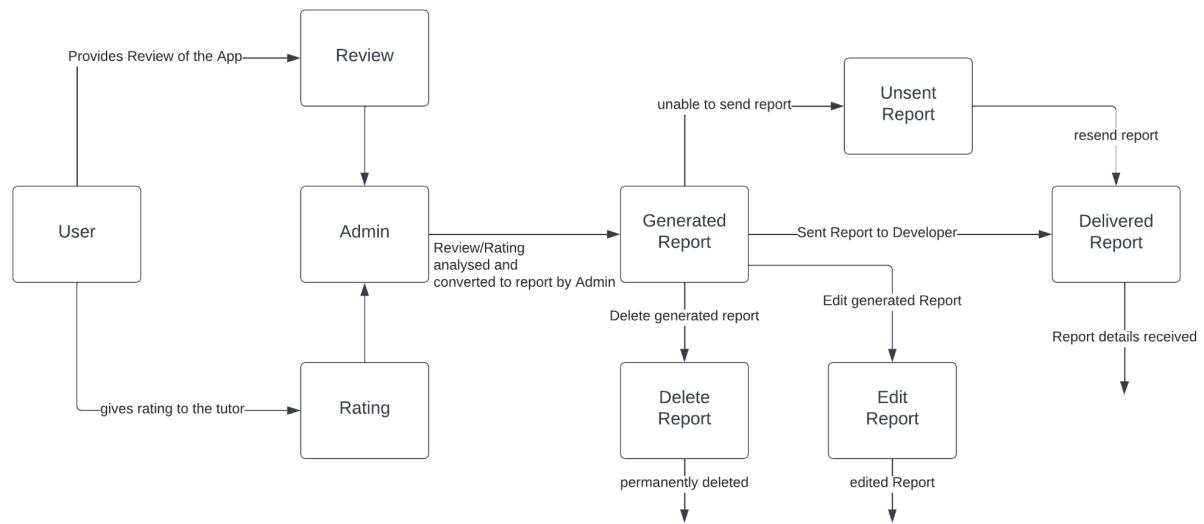


Fig: State Chart Diagram of Report Class.

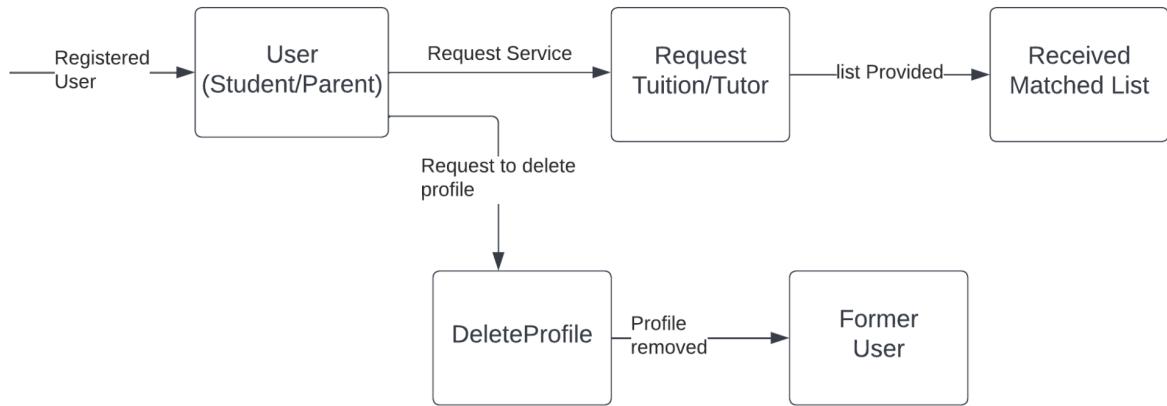


Fig: State Chart Diagram of User Class.

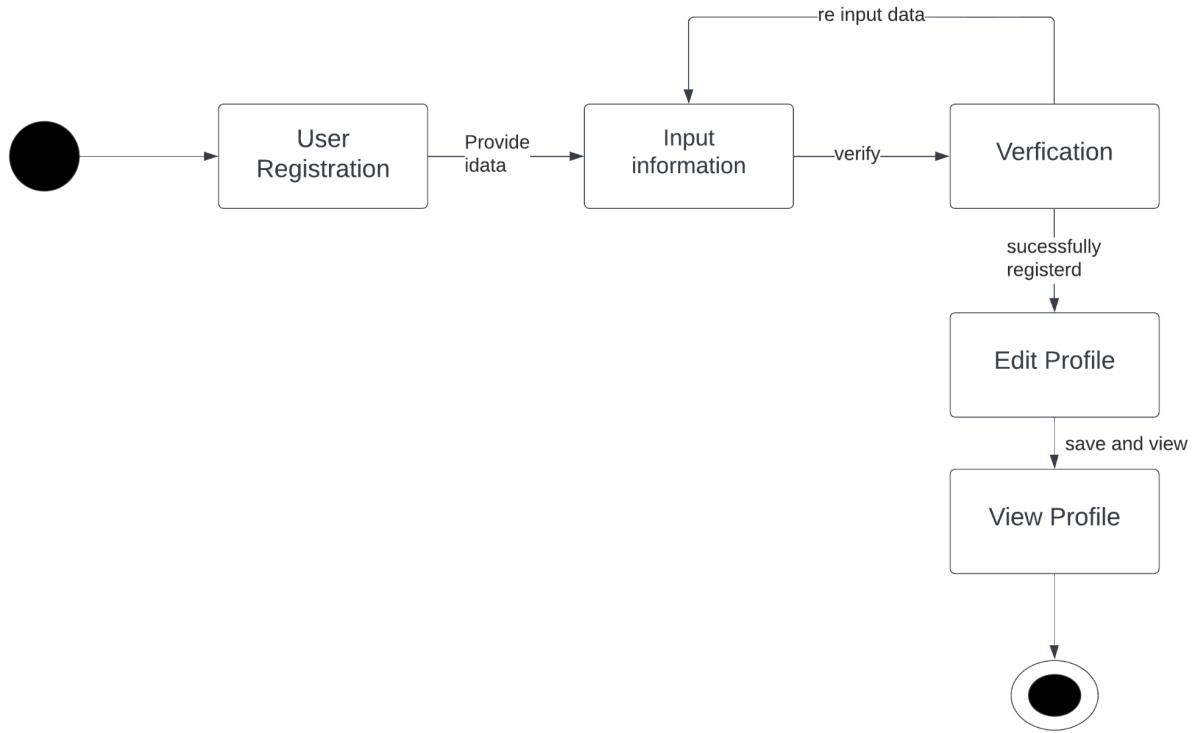


Fig: State Chart Diagram of Registration Process Activity.

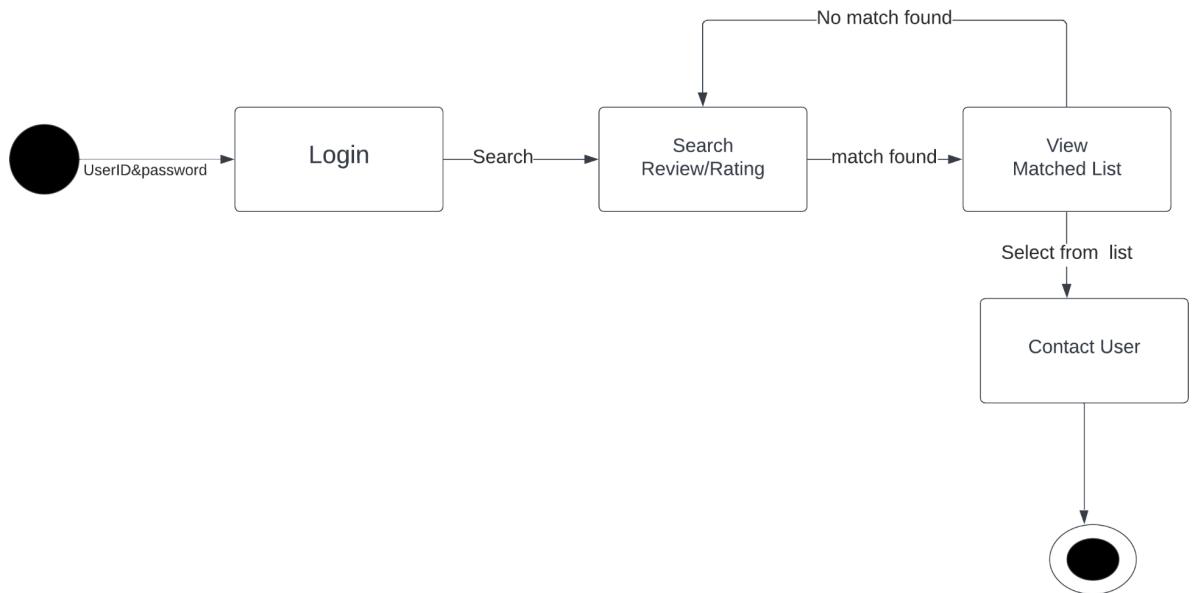


Fig: State Chart Diagram of View Matched List Process Activity

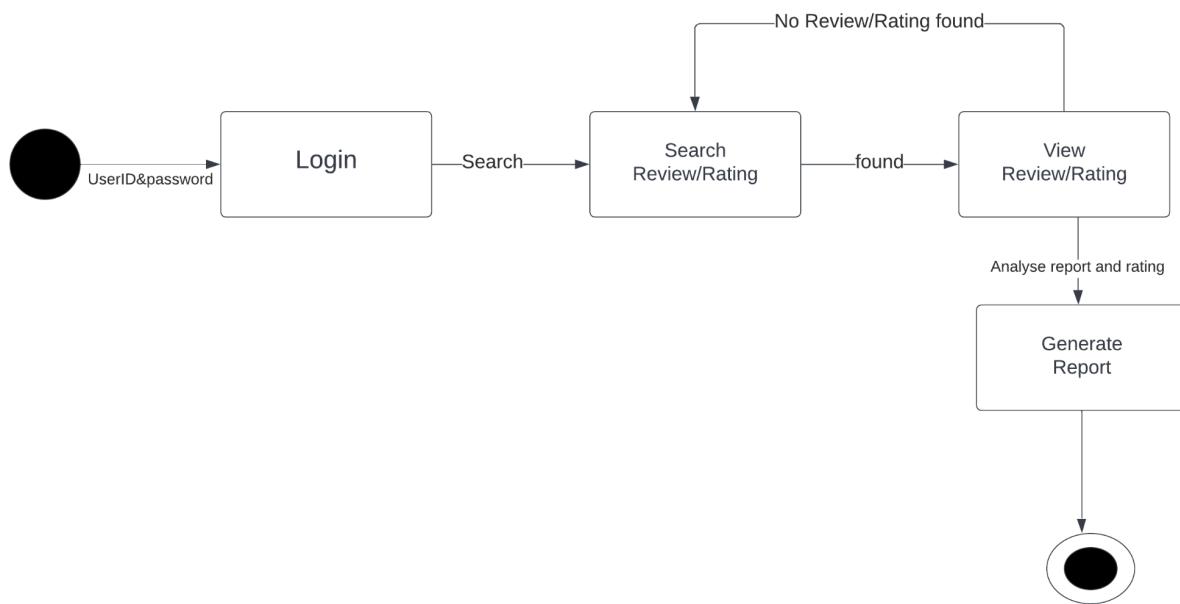


Fig: State Chart Diagram of Report Generating Process Activity.

24. CRUD matrix

Activity	Tutor	Student	Admin	Developer
Registration	C	C		
login	R	R	R	R
Edit profile	RU	RU	RU	RU
Delete profile	D	D		
Search Tutor/Tuition	C	C	U	
View Matched	R	R		

Activity	Tutor	Student	Admin	Developer
List				
Contact User	R	R		
Give Review	R	CR	R	
Rate Tutor	R	CR	R	
View Review	R	R	R	
Create Report			CR	
Update User list			U	
Send Report			CR	
Receive Report				R
Modify System Database				RU

Section 5:

25. Structure English pseudo code for the system

Registration Interface:

IF " Register" clicked THEN

 GET application form

 DISPLAY form

 IF user selected AS tutor THEN

 IF "next" clicked THEN

 GET questionnaire form

 DISPLAY form

 IF user clicks "submit" THEN

 IF user filled all information THEN

 IF user NOT exist THEN

 GET user input

 CREATE user account

 DISPLAY dashboard

 ELSE

 SEND error message to user

ENDIF

Search Tuition Interface:

DO WHILE user logged in

IF " Search Tuition" clicked THEN

GET requirement form

DISPLAY form

IF user clicks "submit" THEN

IF user clicks "view list" THEN

IF user filled all information THEN

GET user input

DISPLAY matched List

IF no match found THEN

DISPLAY ""no match found"

ENDIF

ELSE

SEND error message to user

ENDIF

Review Interface:

DO WHILE user logged in

```
IF " Review" clicked THEN  
    DISPLAY review form  
    IF user clicks "submit" THEN  
        GET user input  
        DISPLAY Review  
  
    ELSE  
        DISPLAY "no review found"  
    END IF
```

25. Prototype the user interface

Home Page of Tutor's Club:



Bashundhara

Hello!

Looking for a tutor?

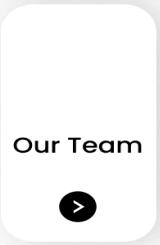
Search for tutor/tuition



Tutors



Available
Tututions



Our Team



Popular

[View all >](#)



Farishta Jahan Chowdhury
Teacher of The Month

Home

Feedback

Account

More

Create Profile Page (Registration Interface):

< Create Profile :

Personal Info:

Name [REDACTED]

Contact [REDACTED]

E-mail: [REDACTED]

Passport/NID No [REDACTED]

Education

SSC/O'Levels Institute [REDACTED]

CGPA [REDACTED]

HSC/A'Levels Institute [REDACTED]

CGPA [REDACTED]

Current Institute [REDACTED]

CGPA [REDACTED]

Preferred Location [REDACTED]

Preferred Subjects [REDACTED]

Method of Teaching [REDACTED]

Submit

Edit Profile Page:



Account Settings



Contact Number:

Old

New

E-mail:

Old

New

View Changes →

Name Nowrin Hossain

Location Dhanmondi

Contact Number 01892456311

Years of Experience 3 years

Save Changes

Contact Tutor Interface:



My soul intention is to start with explaining he topics first, followed by solving problems and practicing, as practice is what makes a man perfect!

Tahmid Hossain

ON OFF

AC

- 2 +

Rating

Book Appointment

View Matched Tutor List Page:

Tutor Profiles

Insiya Ahmed
Years of Experience: 3
Subjects: Maths and Science
Institue: IUB

Rakibul Hossain
Years of Experience: 1
Subjects: Maths and English
Institue: NSU

Rima Sharker
Years of Experience: N/A
Subjects: Bengali and Geography
Institue: DU

Ishmam Chowdhury
Years of Experience: 6
Subjects: Maths and Science
Institue: BUET

Urbana Khan
Years of Experience: 2
Subjects: Geography, English, and History
Institue: IUB

Review Page:

