

Online Quran Teaching Academy

(Web App & Mobile App)

Submitted by

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Session (2017-21)

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Final Approval

It is certified that we have read the report entitled “**Online Quran Teaching Academy**” submitted by **Muhammad Adnan** and it is our judgment that this report is of sufficient standard to warrant its acceptance by Department of Information Technology, Bahauddin Zakariya University Multan, Sub Campus Lodhran for the partial fulfillment of the requirement for the Bachelor of Science in Information Technology.

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Dedication

To our parents, teachers and all of the people who prayed for us. A special feeling of gratitude to my loving parents; I also dedicate this dissertation to my friends and family who have supported me throughout the process.

Acknowledgments:

With the blessings of Almighty Allah and prayers of our parents I have made this attempt to achieve the goal that was set for me to complete the Bachelor degree. Although the project was complex and complicated, I put my maximum effort to fulfill the goal.

I deeply indebted to our teachers and special gratitude to our final year project supervisor,

Mr. Kamran Qadir whose guidance, suggestion and encouragement remained a continuous source of inspiration for us throughout the entire course of project.

I wish to seize this opportunity to thanks all our friends, who very patiently guided us through all the stages of the project with regard to system support. Finally a special thanks to our parents, friends and our family for their prayers, unending support and encouragement during the course of a long and tedious struggle to accomplish the work in time.

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Abstarct

Online Quran Teaching Academy is complete system of Teaching Quran Online Worldwide. It can be used any organization or by a single person to Learn or Teach Quran Online on a single, simple and reliable platform either using website app and using mobile app without using of Skype and Zoom etc.

This system is consisted of Record management and Real time messages feature. Online Quran teaching academy is a web app and mobile app system in which people from all over the world can find teachers to learn Quran and other Islamic courses. On the other-hand teachers can also find students to teach them and earn some money in this way.

Online Quran teaching academy manage the records of registered students and teachers. There is a real time messages feature in Online Quran teaching academy for the purpose of communication between students and teachers to find the perfect match for them.

Project Brief

PROJECT NAME:

Online Quran Teaching Academy (Web App & Mobile App)

UNDERTAKEN BY:

Muhammad Adnan

SUPERVISED BY:

Mr. Kamran Qadir

STARTING DATE:

July 25, 2021

COMPLETION DATE:

March 20, 2022

COMPUTER USED:

MacBook Pro 13" 2019, 8GB, 256GB

OPERATING SYSTEM:

Mac OS, Monterey

SOURCE LANGUAGE(S):

ReactJS, Node, Express

DBMS USED:

MongoDB

TOOLS/PACKAGES:

Postman, MongoDB Compass, VS Code

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Chapter 1

Introduction

1.1 Problem Statement:

From the numbers of years, the trend about the learning and teaching of Quran Online via Skype, Zoom, and Viber etc, is increasing day by day.

Especially in covid-19 era this trend increasing with the huge number of teachers and students from worldwide.

Teachers started searching students on different platforms like Facebook, Instagram etc. And students also have difficulty to find a good and authorized teacher.

Now a days, the trend of home tutors is present, that teacher have to go at the home of different students to teach them.

And students are also bound to the home to wait for the tutors to come and teach them Quran. The other disadvantage of the classis system is that tutor and student are bound to the physical place, they can't enjoy the life by visiting places in the world.

Online Quran teaching academy is a system in which people from all over the world can find teachers to learn Quran and other Islamic courses. On the other-hand teachers can also find students to teach them and earn some money in this way.

Online Quran teaching academy manage the records of registered students and teachers.

There is a real time messages feature in Online Quran teaching academy for the purpose of communication between students and teachers to find the perfect match for them.

1.2 Need of Project

Online Quran teaching academy is built to overcome the real-world problem that is to find students to teach them and earn some living and to find teachers to learn about Quran and other Islamic things by sitting at the home and taking the benefit of new online world.

I have thought about this system that I can replace the classic teaching system to advance online and modern online teaching system. In this modern online teaching system, teachers and students are not bound to the physical place and they can take classes by sitting anywhere by using the internet and our Online Quran Teaching system.

Teachers and students can enjoy the life and with enjoying life they can continue their learning.

1.3 Scope of the Project

The aim of online Quran teaching academy is to provide a unique and one only system to find, learn, and teach by using the single platform.

This system provides a secure a proper way to register, find and go further in a secure way.

The scope of the system is:

- Record teacher's data
- Record student data
- Find students

- Find teachers
- Real time communication

1.4 Objectives of the Project:

The main objective of the online Quran teaching academy is to provide a single platform to students and teachers who want to learn and teach Quran online by sitting at home.

To provide a secure environment this system also manages the records of students and teachers by registering process.

Quran teachers can now earn their livings by teaching Quran online. Other benefit of the system is that by using this system teacher don't have to go anywhere at physical location to teach students and earn money.

For Students this is also a great opportunity that the students now learn things by sitting at their home and at their desired time.

Chapter 2

System Requirement Analysis

2.1 System Requirement Analysis:

The most important thing in designing and developing a system is to understand the existing system, its problems and limitations. A good understanding of the system enables developer to identify the correct problem or limitation and suggested realistic solutions for the problems.

We must thoroughly understand the problem of the existing system and determine how the computer can be used to make its operation more effective. The main responsibility of conducting system analysis, to learn relevant facts about working of the existing system, to make our new system more advanced and accurate.

It is responsibility of designer and developer to analyze it and assemble recommendations for the system. Therefore the study of the working of the system and limitations of the existing system is an important task before the design and development phase.

2.2 Functional Requirement

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 the stakeholders. Generally, functional requirements describe system behavior under specific conditions.

These are below some of the functional requirements of the Online Quran teaching system:

- Register User
- Login User
- Search User
- Message User
- Receive Message
- User can Check Profile
- Show Static Content
- Show Content Dynamically
- Real Time messages

2.3 Non-Functional Requirement

Nonfunctional requirements, not related to the system functionality, rather define how the system should perform.

Some examples are:

The website pages should load in 3 seconds with the total number of simultaneous users <5 thousand.

The system should be able to handle 1 million plus users without performance deterioration.

The system should work on the fast internet.

Message function of this system didn't work offline.

2.4 Domain Requirement

Domain requirements are the requirements which are characteristic of a particular category or domain of projects. The basic functions that a system of a specific domain must necessarily exhibit come under this category.

Domain requirement of this system is that it uses universal messaging feature method called Socket.io for real time messages.

For Static and dynamic content, it uses the ReactJS.

2.5 Analysis of the Existing System:

The analysis is preliminary concerned with studying of current system which is in use. People are using third party software like skype and zoom to take and classes.

2.5.1 Understanding the System:

The most important thing for a successful system development is a proper understanding of existing running system. By using skype and zoom people faces many problems.

So I have decided to make a single platform for all the required things need to teach and learn.

2.5.2 Understanding Involvement:

The most successful systems or projects are those in which user plays an important, active and vital role. The user's knowledge about existing system is useful for the better system. Although the people are taking classes via zoom and skype, but they are not much comfortable with these because someone's thing about privacy issue and some have problem using these systems.

2.6 Data Gathering:

In data gathering technique we collect the data related to our project and on the behalf of this data we decide which method is suitable to make our project work efficiently.

The technique or method which is used to gather information required persons with sensitivity, common sense and knowledge of what and when to gather and what channel to use in securing the information.

Two common data gathering methods are

- interviews
- questionnaires.

In interview two or more people can meet to share their opinions and different purposes. Questionnaires is also a very popular and effective method to gather data about our problems.

2.7 Data Analysis:

After collecting the data from peoples or users by doing questioning or by interviews we do data analysis (DA). DA is a practice of science for examining the raw data to get organized so that useful information can be extracted from it.

The process of organizing and thinking about data is a key to understanding what the data contain and what not contain. Data analysis is the process of systematically applying statistical and/ or logical techniques to describe and illustrate, condense and recap, and evaluate data.

The collected data serves as foundation for the documentation of the system analysis phase.

2.8 New System Requirements:

The purpose of gathering and analyzing the data is to establish the system requirements because the development and design of the new system will be based on these collected requirements.

Requirement analysis provides the software developer and designer with a model of:

- System GUI
- System Function
- System Behavior

2.9 Description of present system

Existing system of online Quran teaching is carried out via third party software like skype and zoom etc. People find each other via different platform including Facebook, Instagram and LinkedIn etc.

2.9.1 Limitations of present system

There is no special system of teaching Quran online, so people are using third party software for communication and calling to teach and learn each other.

2.9.2 Proposed system

The proposed system is a full system for finding peoples and communicate each other to do further actions.

2.9.3 Existing System of Online Quran Teaching System

The system designer must understand the existing system before he does anything to improve this existing system. The phase of understanding includes the study of getting knowledge about each and every work done in already existing system. I gather data from different prospective first of all then I have understand the whole process of the system

- How it works?
- What type of entities are acting in the system?
- What are their functions to perform?
- The limits?

I have prepared a questioner including different type of questions in it. Which help me to know actual requirements of the proposed system.

2.9.4 Drawbacks of Existing System

Drawbacks, problem or weaknesses that are in other word undesirable conditions, and situations which prevent the system to overcome the complete goal of a system.

Some of the major drawbacks are as follows:

- Slow , tedious , time consuming
- Lack of security
- Information redundancy
- Reliability
- Visual Appearance

2.9.5 Advantages of Proposed system

Advantages of proposed system is that teacher can register their self in the system and find registered students to teach them.

Ans Student can also register their self to find tutors and learn from them.

2.9.6 Comparison

Now a days people using third party software and tools for to communicate each other. And in my proposed system people use only my system to find each other on that platform and communicate each other.

2.10 Feasibility Study

A feasibility study is a test report of a proposed system. It identifies the proposed system workability, impact on the organization, ability to meet user needs, and effective use of system resources. System feasibility is accessed in three principal ways:

- Technical
- Economical
- Operational

2.10.1 Technical Feasibility

We need the project to be feasible in the way the technical resources should be present.

For example, there should be proper hardware and software and the persons who can operate the system. A system request is technical feasible if the organization can obtain the equipment and personnel to develop and operate the system.

Technical feasibility is frequently the most difficult area because objective and performance of system also depends upon it. It is essential that the process of analysis must be conducted in parallel with the assessment of technical feasibility.

2.10.2 Economic Feasibility

The economic feasibility assessment is to determine cost benefit analysis. It helps project planners determine the positive economic benefits to the organization that the proposed system will provide and helps quantify them. It is generally the bottom line consideration for most systems.

2.10.3 Operational Feasibility

A system must have a user friendly environment. An operational feasible system is one that will be used effectively after it has been developed. If user has difficulty with new system, then it will not produce the expected benefit. User friendly interface make it easier for the user. The proposed system will be user friendly and menu driven and end user will operate the system efficiently after training. After gathering all information and telling the management what would be required to operate this database, the management has decided to work more on the project and develop a good project. We need a skilled person to operate the system.

Chapter 3

System Design

3.1 Introduction to System Design

“A **System** is a collection of elements or components that are organized for a common purpose to carry out specific activity to perform a duty or solve a problem”. Systems design is the process or art of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements.

3.2 Design objectives of the Proposed System

Before designing any computer-based system, it is essential and helpful to establish the objectives that the computer based system should satisfy. So that we have argue to build a new system and if objectives of proposed system are clear it gives help us in designing this system.

I made the following objectives of the purposed online Quran teaching system.

- Efficiency
- Simplicity
- Best appearance

The proposed system should be efficient and faster than the existing system.

• **Data Security**

It refers to protection from any accidental loss or loss of data. The data required for decision making is very important and valuable. Therefore, the reliability of the system may be secured by giving Teachers and Students password and individual email address so in this way they can see their own data and update or delete just their own record and not able to disturb others data/record.

• **Accuracy**

The system will provide accurate information, because in this system standardized algorithms and efficient techniques and advance tools have been used to handle this project database and whole project.

• **Flexibility**

The system allows for changes and its layout and new fields and features can easily be added. It can be change according to future requirements.

• **User Friendly**

Student and Teachers can easily register, login and use the service via easy GUI of the online Quran teaching system. This makes the system user friendly.

- **Reliability**

The new system is more reliable than existing system, due to its accuracy and security so that timely decision may be possible.

- **Performance**

The proposed system should reduce the time and efforts required to retrieve information. It should have the capability to answer various queries instantly and efficiently.

3.3 The Applied Approach

There are different types of applied approaches in software development. One such approach/process we used in our system Development is "Incremental Model". The development process based on the **Incremental model** is split into several iterations ("Lego-style" modular software design is required!). New software modules are added in each iteration with no or little change in earlier added modules. The development process can go either sequentially or in parallel. Parallel development adds to the speed of delivery, while many repeated cycles of sequential development can make the project long and costly.

The phases in Incremental Model model are:

- Planning
- Requirement Analysis
- System & Software Design
- Detail design
- Development
- Testing
- Delivery
- Maintenance

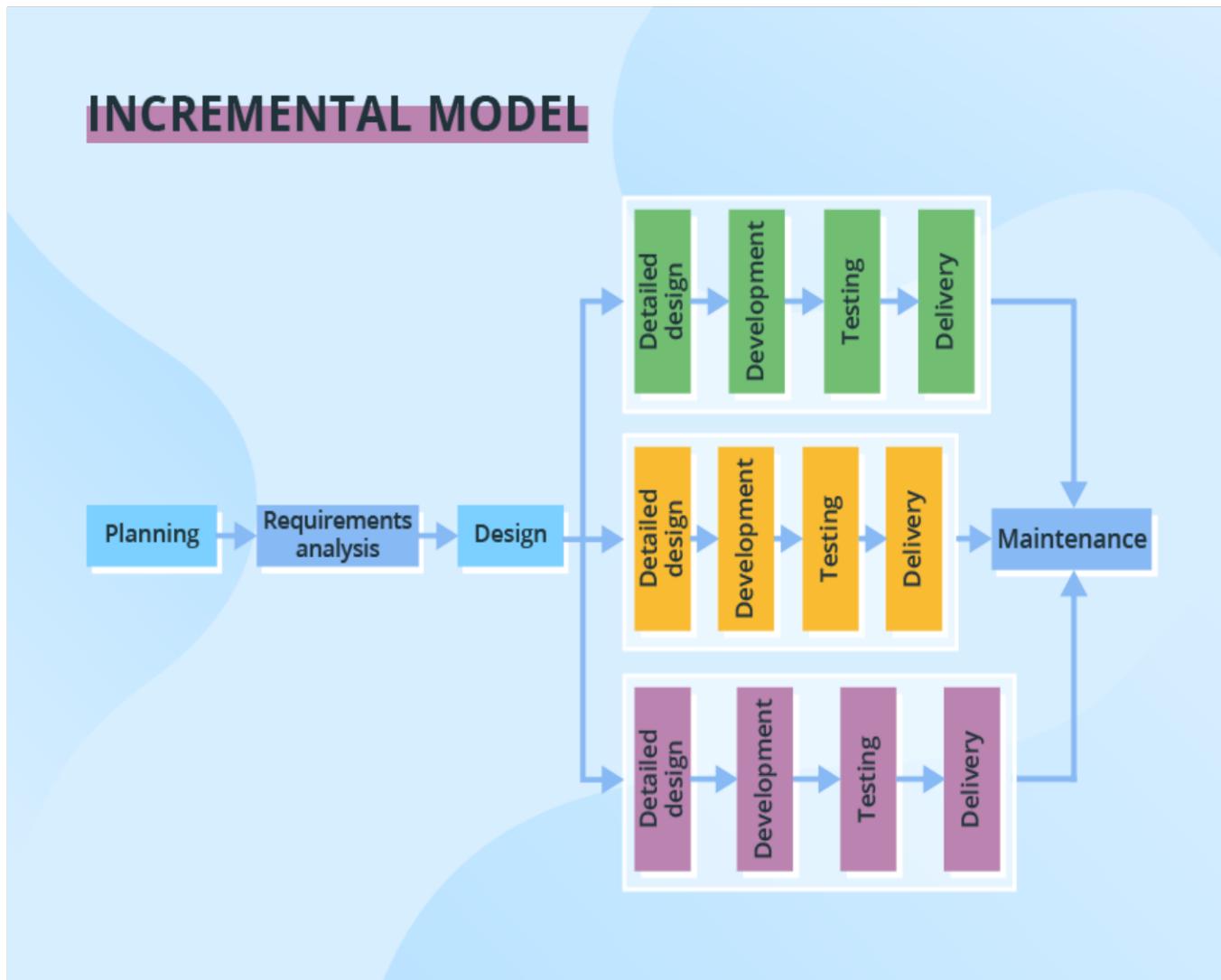


Fig: 3.3 Incremental Model

3.3.1 Requirement Analysis & Definition:

All possible requirements of the system to be developed are captured in this phase. Requirements are set of functionalities and constraints that the end-user (who will be using the system) expects from the system.

The requirements are gathered from the end-user by consultation, these requirements are analyzed for their validity and the possibility of incorporating the requirements in the system to be development is also studied. Finally, a Requirement Specification document is created which serves the purpose of guideline for the next phase of the model.

3.3.2 System Design:

Before starting for actual coding, it is highly important to understand what we are going to create and what it should look like? The requirement specifications from first phase are studied in this phase and system design is prepared.

System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture. The system design specifications serve as input for the next phase of the model.

We can see these system design components:

- UML Diagrams
- Database Design
- UX/UI Design

3.4 UML Diagrams

UML is a standard language for specifying, visualizing, constructing, and documenting the artifacts of software systems.

- UML stands for Unified Modeling Language
- UML is different from the other common programming languages like C++, Java, and COBOL
- UML is a pictorial language used to make software blue prints

So UML can be described as a general purpose visual modeling language to visualize, specify, construct and document software system. Although UML is generally used to model software systems but it is not limited within this boundary. It is also used to model non software systems as well like process flow in a manufacturing unit etc.

UML is not a programming language but tools can be used to generate code in various languages using UML diagrams. UML has a direct relation with object oriented analysis and design. After some standardization UML is become an OMG (Object Management Group) standard.

Following diagrams are covered:

- Use case diagram
- Class diagram
- Sequence diagram
- State machine diagram
- Activity diagram
- Component diagram

3.4.1 Use Case Diagrams

To model a system the most important aspect is to capture the dynamic behavior. To clarify a bit in details, dynamic behavior means the behavior of the system when it is running or operating.

So only static behaviour is not sufficient to model a system rather dynamic behaviour is more important than static behaviour. In UML there are five diagrams available to model dynamic nature and use case diagram is one of them.

Now as we have to discuss that the use case diagram is dynamic in nature there should be some internal or external factors for making the interaction.

These internal and external agents are known as actors. So use case diagrams are consists of actors, use cases and their relationships. The diagram is used to model the system/subsystem of an application. A single use case diagram captures a particular functionality of a system.

So to model the entire system numbers of use case diagrams are used.

Graphical Notation

The basic components of Use Case diagrams are the Actor, the Association, and Use Case.

Actor



An Actor, as mentioned, is a user of the system, and is depicted using a stick figure. The role of the user is written beneath the icon. Actors are not limited to humans. If a system communicates with another application, and expects input or delivers output, then that application can also be considered an actor.

Use Case



A Use Case is functionality provided by the system, typically described as verb + object (e.g. Register Car, Delete User). Use Cases are depicted with an ellipse. The name of the use case is written within the ellipse.

Association



Associations are used to link Actors with Use Cases, and indicate that an Actor participates in the Use Case in some form. Associations are depicted by a line connecting the Actor and the Use Case.

Relationships

Relationship among the use case and actor, Illustrate relationships between an actor and a use case with a simple line. For relationships among use cases, use arrows labeled either "uses" or "extends." A "uses" relationship indicates that one use case is needed by another in order to perform a task. An "extends" relationship indicates alternative options under a certain use case.

System Boundary Boxes (optional)

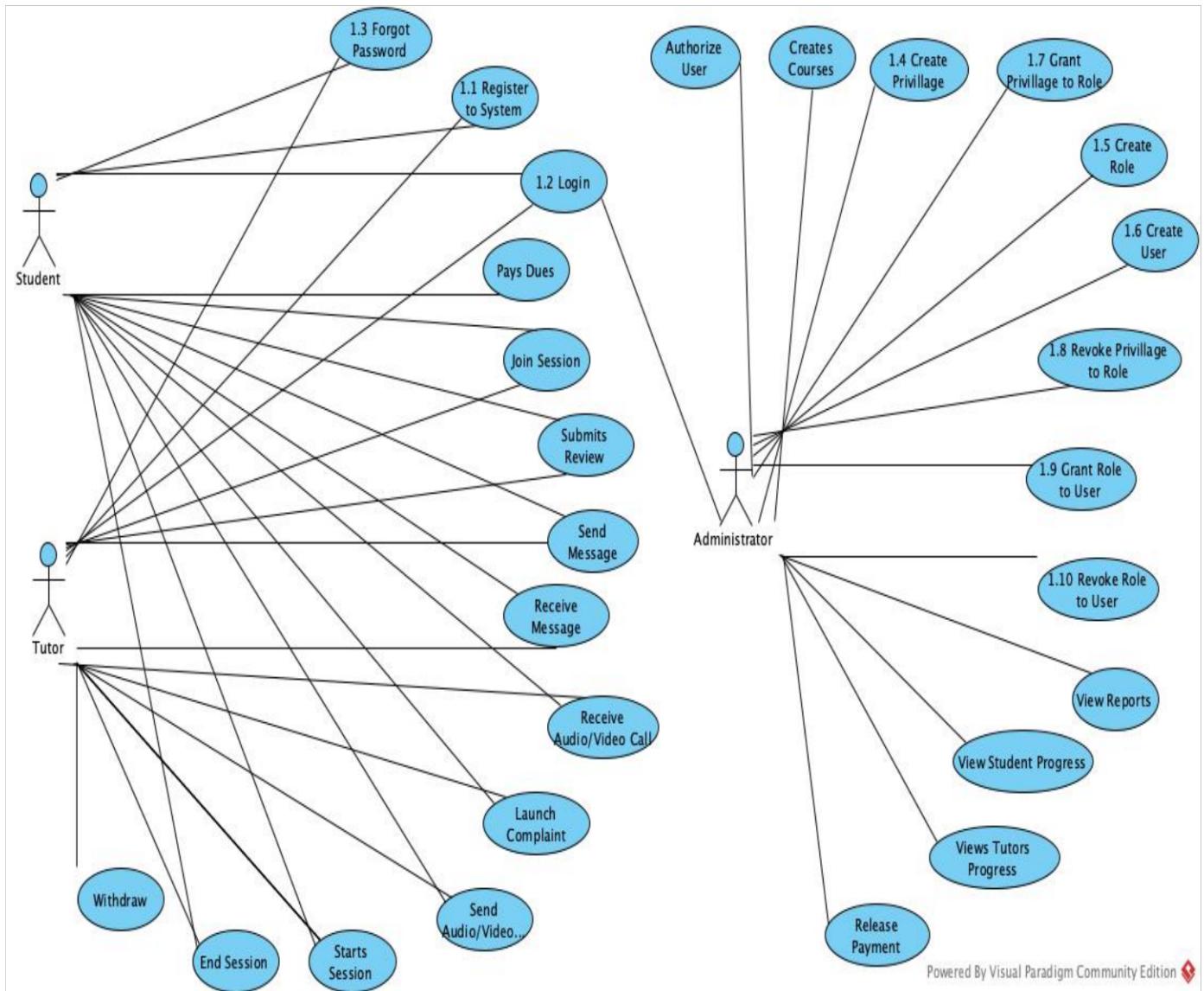
A rectangle can be drawn around the use case, called the system boundary box, to indicate the scope of the system. Anything within the box functionality that is in scope and anything outside the box is not.

System boundary boxes are rarely used. Packages (optional) are UML contracts that enable you to organize model element into groups.

Packages are depicted as file folders and can be used on any of the UML diagrams including both use case diagrams and class diagrams.

Packages are used only when diagrams become unwieldy, which generally implies they cannot be printed on a single page to organize a large diagram into smaller ones.



**Fig:3.4.1 Complete Use Case**

Use Case Description of Whole/General Use Cases:

Use Case ID	G.1
Use Case Name	General, Login
Use Case Description	This feature will be part of the security sub-system. This is the feature necessary for users that want to use the system. User must be login to system to use that.
Inputs	Username and Password
Outputs	User is logged in successfully.
Normal Flow	<p>User opens the system and a login screen is shown to the user. He / She enters user name and password and clicks on Login button</p> <p>If correct user name and password are entered, user will be logged into the system with welcome message on screen.</p>
Alternate Flow	<ol style="list-style-type: none"> 1. If User leaves user name field or password field as blank or empty, an error message will be shown that please enter username or password 2. If user enters wrong user name or password, system will show error message that please enter correct username and password
Pre-Conditions	User must be registered
Post Conditions	User last login time be saved into the system
Priority	Normal

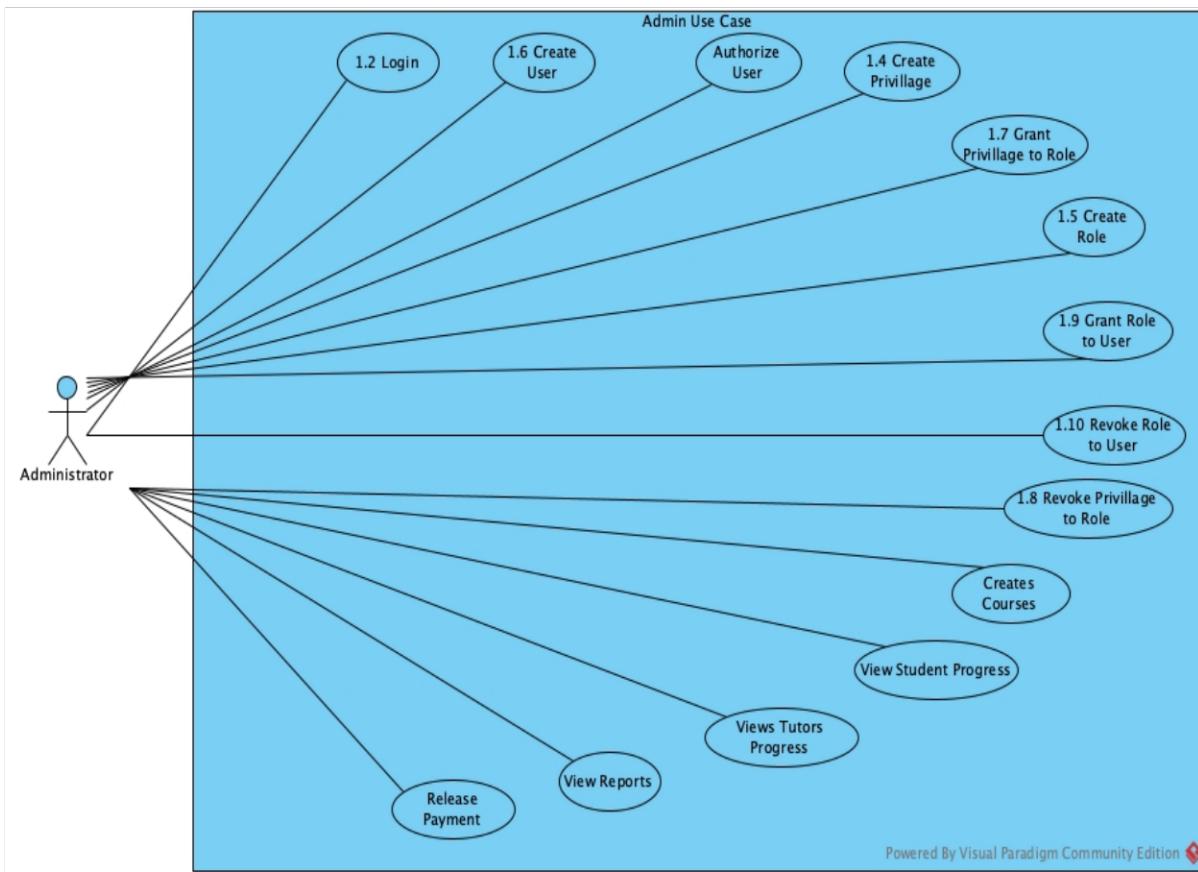


Fig:3.4.2 Admin Use Case Diagram

Use Case Description of Admin:

Use Case ID	A.1
Use Case Name	Admin
Use Case Description	Create privileges, grant privileges, revoke privileges, create rules, assign rules, check reports, create user, delete user
Inputs	Admin Username and Password
Outputs	Log in successfully.
Normal Flow	User opens the system and a login screen is shown to the user. Admin enters user name and password and clicks on Login button If correct user name and password are entered, user will be logged into the system with welcome message on screen.
Alternate Flow	<ol style="list-style-type: none"> 1. If Admin leaves user name field or password field as blank or empty, an error message will be shown that please enter username or password 2. If user enters wrong user name or password, system will show error message that please enter correct username and password
Pre-Conditions	Admin must be registered
Post Conditions	Admin last login time be saved into the system
Priority	High

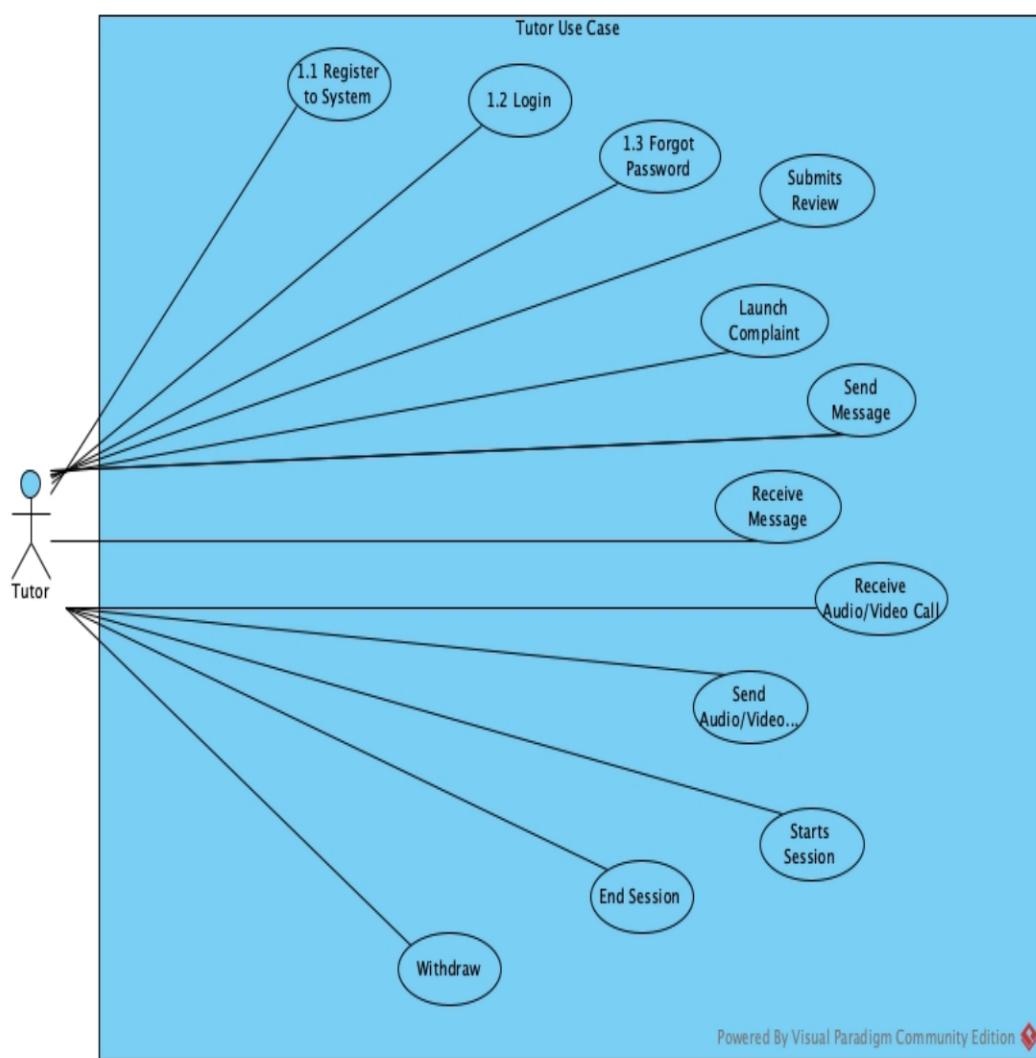


Fig:3.4.3 Use Case Diagram of Tutor

Use Case description of Tutor

Use Case ID	T.1
Use Case Name	Tutor
Use Case Description	Register, Login, Find Student, Send Chat, Receive Chat
Inputs	Username and Password
Outputs	Log in successfully.
Normal Flow	Tutor opens the system and a login screen is shown to the user. Tutor enters user name and password and clicks on Login button. If correct user name and password are entered, user will be logged into the system with welcome message on screen.
Alternate Flow	<ol style="list-style-type: none"> 1. If User leaves user name field or password field as blank or empty, an error message will be shown that please enter username or password 2. If user enters wrong user name or password, system will show error message that please enter correct username and password
Pre-Conditions	Tutor must be registered
Post Conditions	Tutor last login time be saved into the system
Priority	Normal

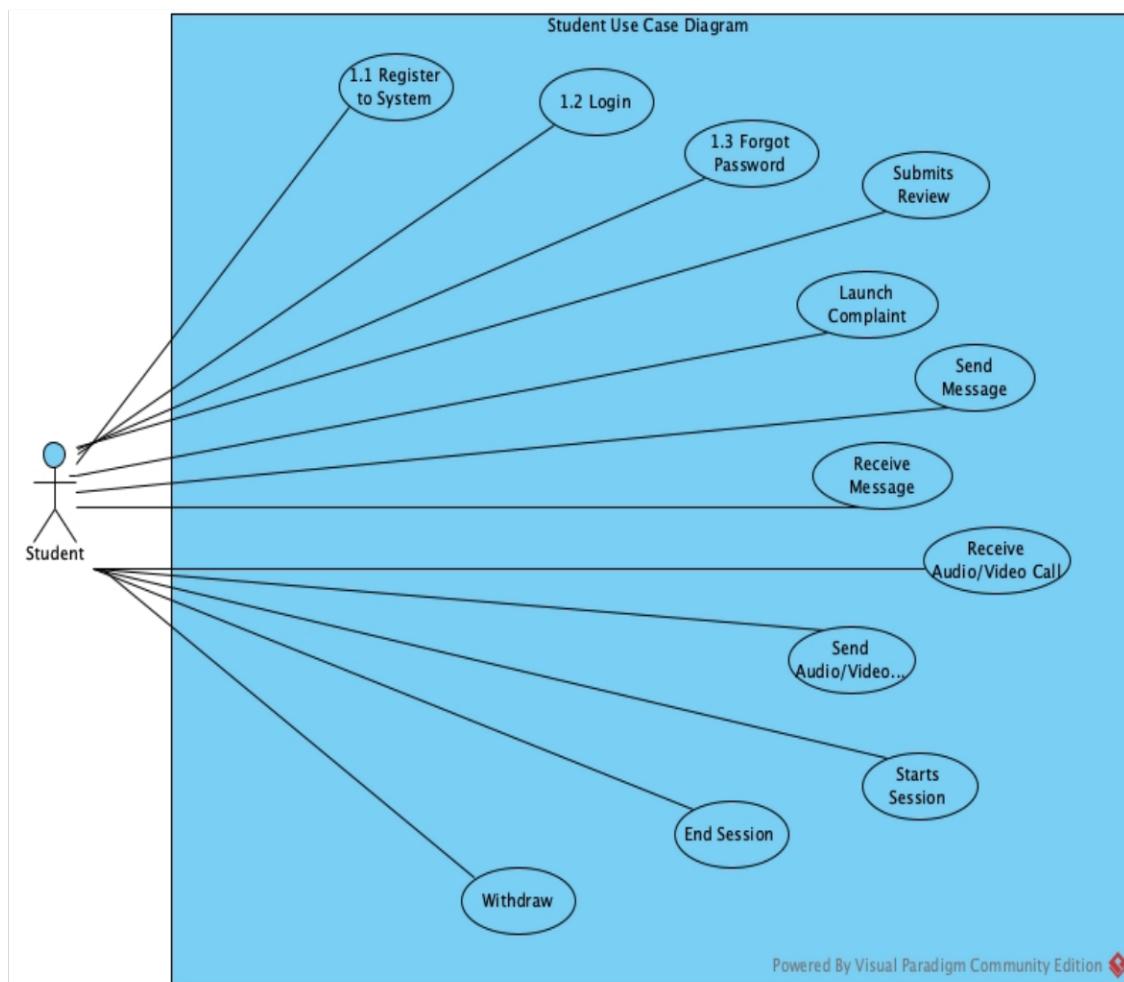


Fig:3.4.4 Use Case Diagram of Student

Use Case Description of Student

Use Case ID	S.1
Use Case Name	Student
Use Case Description	Register, Login, Find Student, Send Chat, Receive Chat
Inputs	Username and Password
Outputs	Log in successfully.
Normal Flow	Student opens the system and a login screen is shown to the user. Student enters user name and password and clicks on Login button If correct user name and password are entered, user will be logged into the system with welcome message on screen.
Alternate Flow	<ol style="list-style-type: none"> 1. If User leaves user name field or password field as blank or empty, an error message will be shown that please enter username or password 2. If user enters wrong user name or password, system will show error message that please enter correct username and password
Pre-Conditions	Student must be registered
Post Conditions	Student last login time be saved into the system
Priority	Normal

3.4.2 Sequence Diagrams:

Sequence diagrams are used to show the flow of functionality through a use case. Actors and objects are shown at the top of the diagram. Each arrow represents a message passed between actor and object to or object and object to perform the needed functionality .it depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the object needed to carry out the functionality of scenario.

Sequence diagrams describe interaction among class in terms of an exchange of messages over time.

Basic Sequence Diagram Symbols and Notations class roles

Class roles describe the way an object will behave in context. Use the UML object symbol to illustrate class roles, but don't list object attributes.

- **Actor**
- **Lifeline**
- **Activation**
- **Message**
- **Loops**

Actors can also communicate with objects, so they too can be listed as a column. An Actor is modeled using the ubiquitous symbol, the stick figure.

The Lifeline identifies the existence of the object over time. The notation for a Lifeline is a vertical dotted line extending from an object.

Activations, modeled as rectangular boxes on the lifeline, indicate when the object is performing an action.

Messages, modeled as horizontal arrows between Activations, indicate the communications between Objects.

A repetition or loop within a sequence diagram is depicted as a rectangle .Place the condition for exiting the loop at the bottom left corner in square brackets.

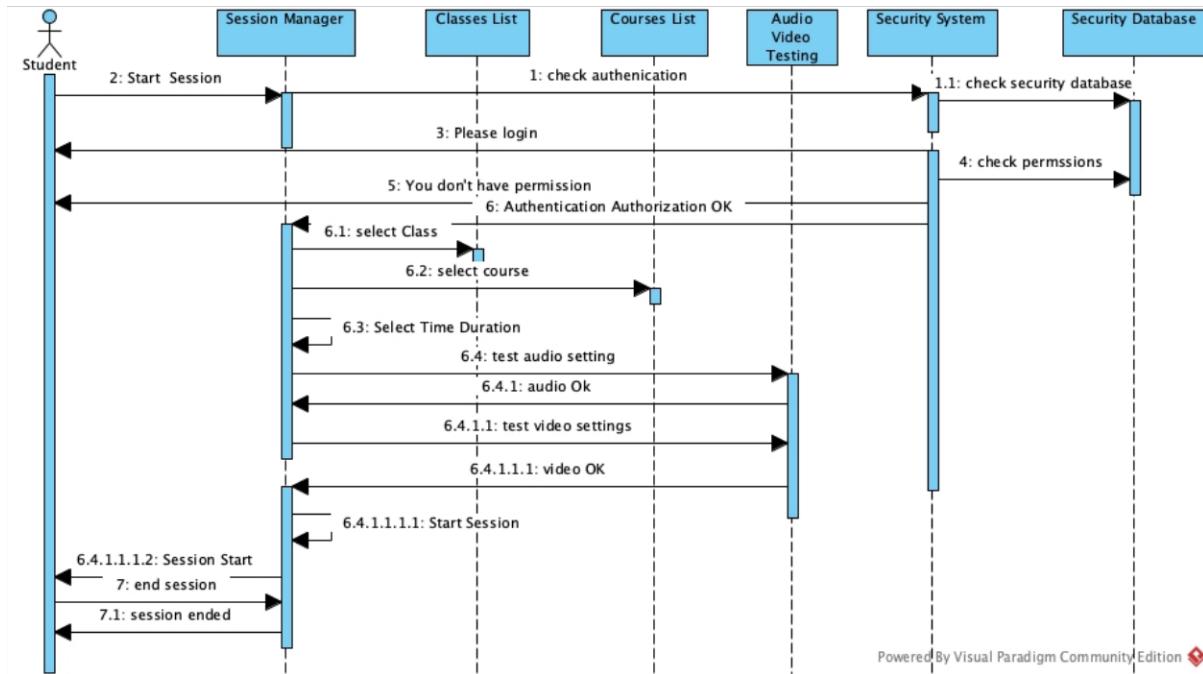


Fig:3.4.5 Sequence Diagram of Student

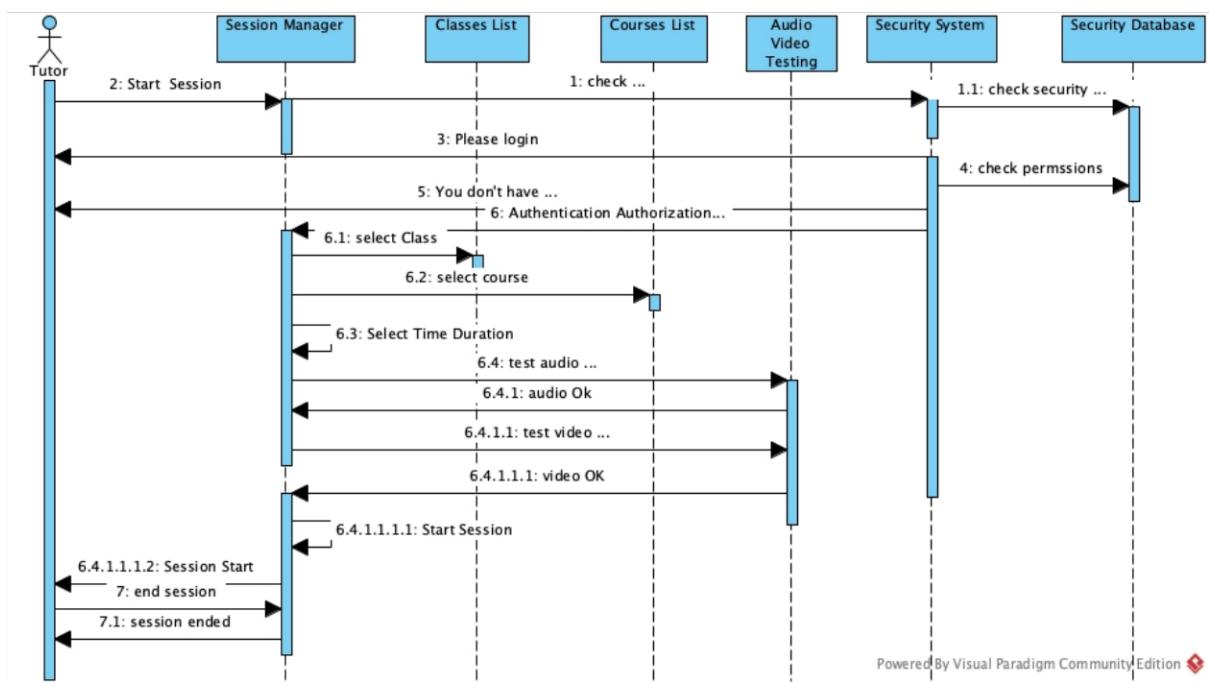


Fig:3.4.6 Sequence Diagram of Tutor

3.4.3 State Diagram:

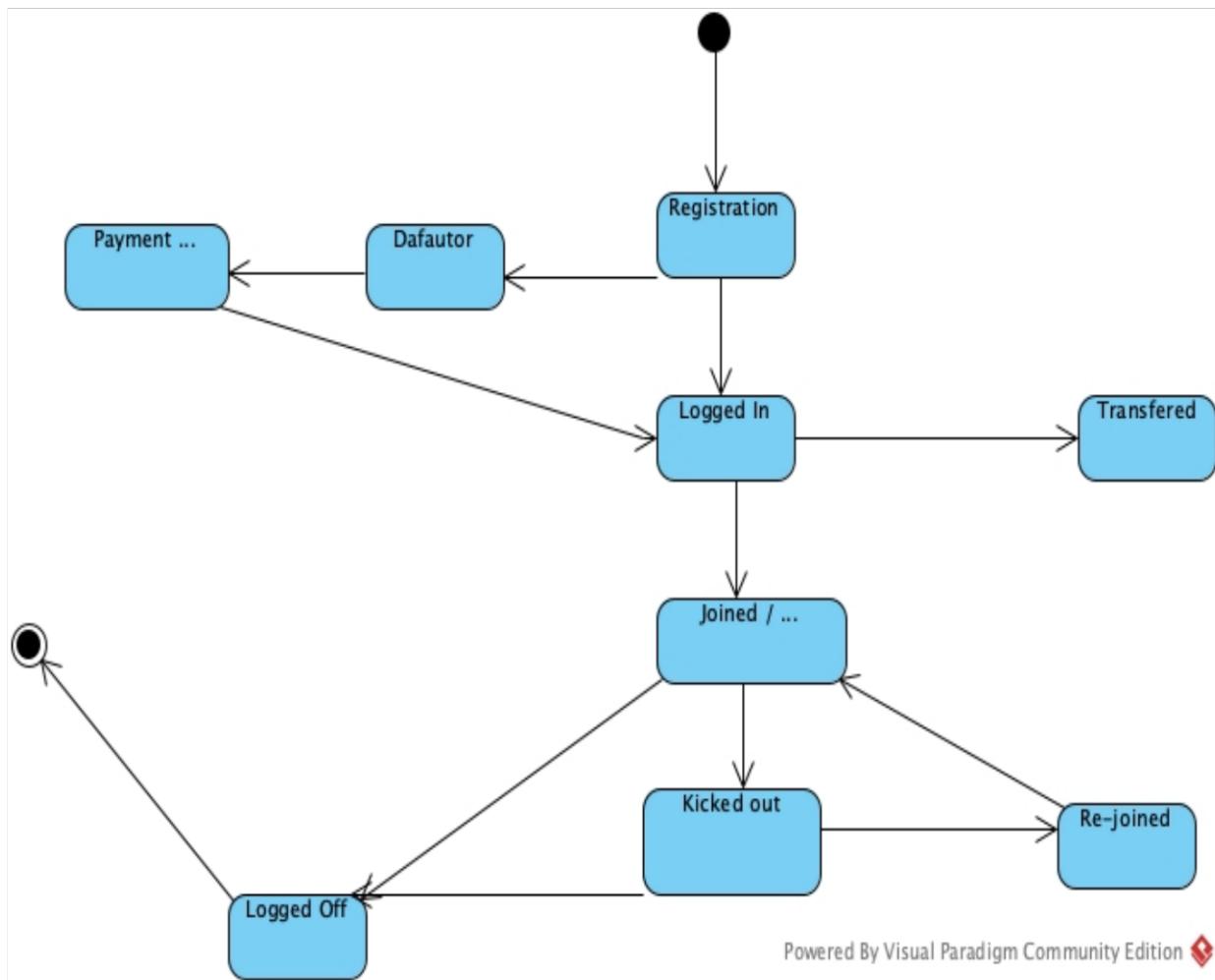
The name of the diagram itself clarifies the purpose of the diagram and other details. It describes different states of a component in a system. The states are specific to a component/object of a system.

A State chart diagram describes a state machine. Now to clarify it state machine can be defined as a machine which defines different states of an object and these states are controlled by external or internal events. Activity diagram explained in next, is a special kind of a state chart diagram. As State chart diagram defines states it is used to model lifetime of an object.

States are represented as a rounded rectangle with the name of the state shown. Optionally you can include an activity that represented a longer running task during that state. Connecting states together are transitions. These represented the events that cause the object to change from one state to another.

The guard clause of the label is again mutually exclusive and must resolve itself to be either true or false. Actions represent tasks that run causing the transitions actions are different from activates in that action cannot be interrupted, while an activity can be interrupted by an incoming event. Both ultimately represent an operation on the object being studied.

For example an operation that sets an attribute would be considered an action, while a long calculation might be an activity. The specific separation between the two depends on the object and the system being studied. Like activity diagrams state diagrams, state diagram have one start and one end format which the state transitions start and end respectively.

**Fig:3.4.7 State Diagram**

3.4.4 Activity diagrams:

Activity diagram is another important diagram in UML to describe dynamic aspects of the system. Activity diagram is basically a flow chart to represent the flow from one activity to another activity.

The activity can be described as an operation of the system. So the control flow is drawn from one operation to another. This flow can be sequential, branched or concurrent. Activity diagrams deals with all type of flow control by using different elements like fork, join etc.

Start: each activity diagram has non start (above) at which the sequence of actions begins.

End: each activity diagrams has one finish at which the sequence of actions ends

Activity: are connected together by transition. Transitions are directed arrows flowing from the previous activity to the next activity. They are optionally accompanied by a textual label of the form:

Label

The **guard** is a conditional expression that when true indicates that transition is taken. The label is also optional and freeform.

To show conditional behavior uses a branch and a merge. The top diamond is a branch and has only one transaction flowing into it and any number of mutually exclusive transitions

flowing out. That is the guards on the outgoing transitions must resolve themselves so that only one is followed. The merge is used to end the conditional behavior .there can be any number of incoming and only one outgoing ,transition.

To show parallel behavior uses a fork and a join. The fork has one transition entering and any number of transition exiting .all of which will be taken. The join represents the end of the parallel behavior and has any number of transitions entering an only one leaving.

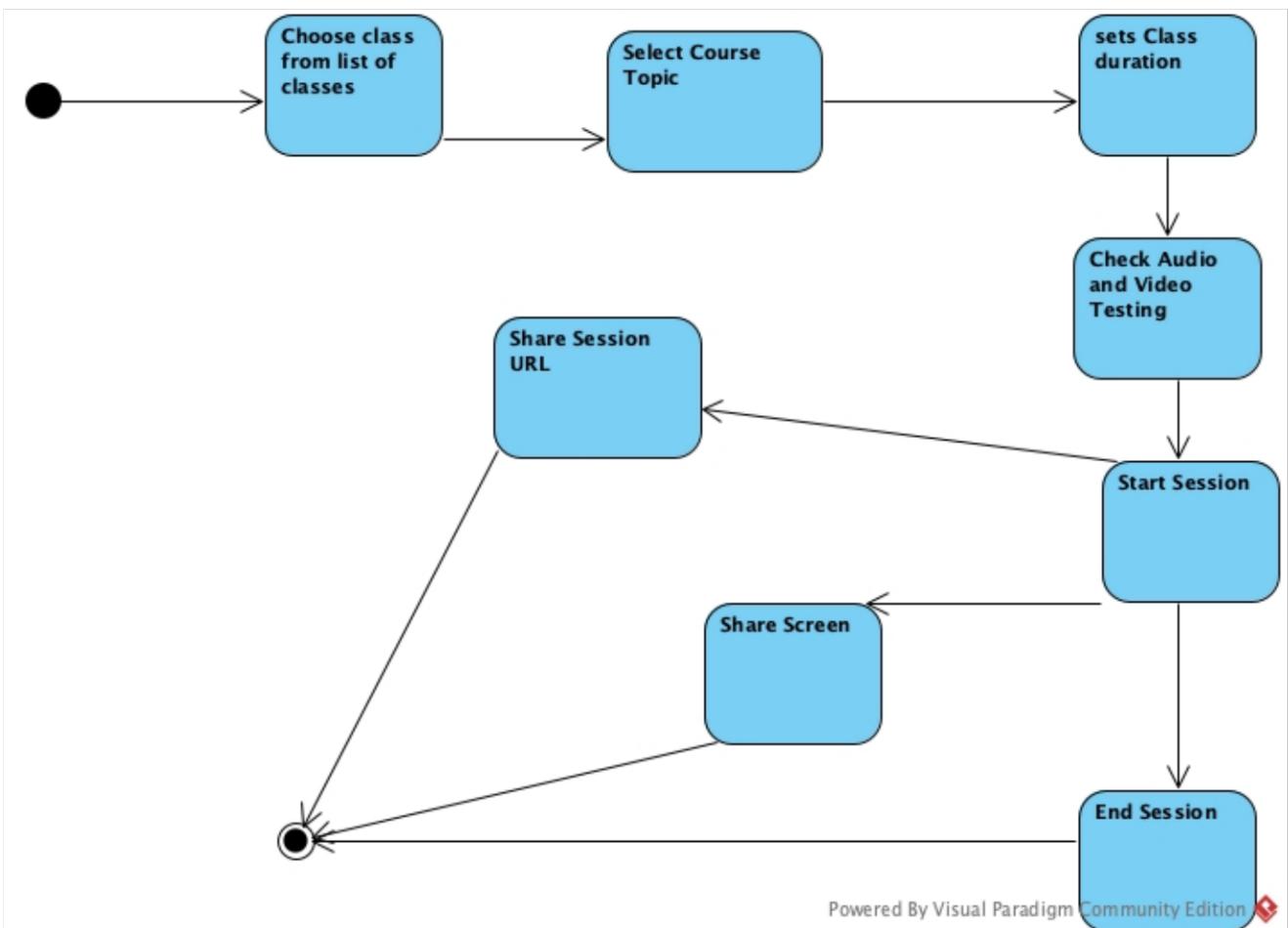


Fig:3.4.8 Activity Diagram

3.4.5 Component Diagram

In Unified Modeling Language, a component diagram depicts how components are wired together to form larger components or software systems. They are used to illustrate the structure of arbitrarily complex systems.

A component diagram, also known as a UML component diagram, describes the organization and wiring of the physical components in a system. Component diagrams are often drawn to help model implementation details and double-check that every aspect of the system's required functions is covered by planned development.

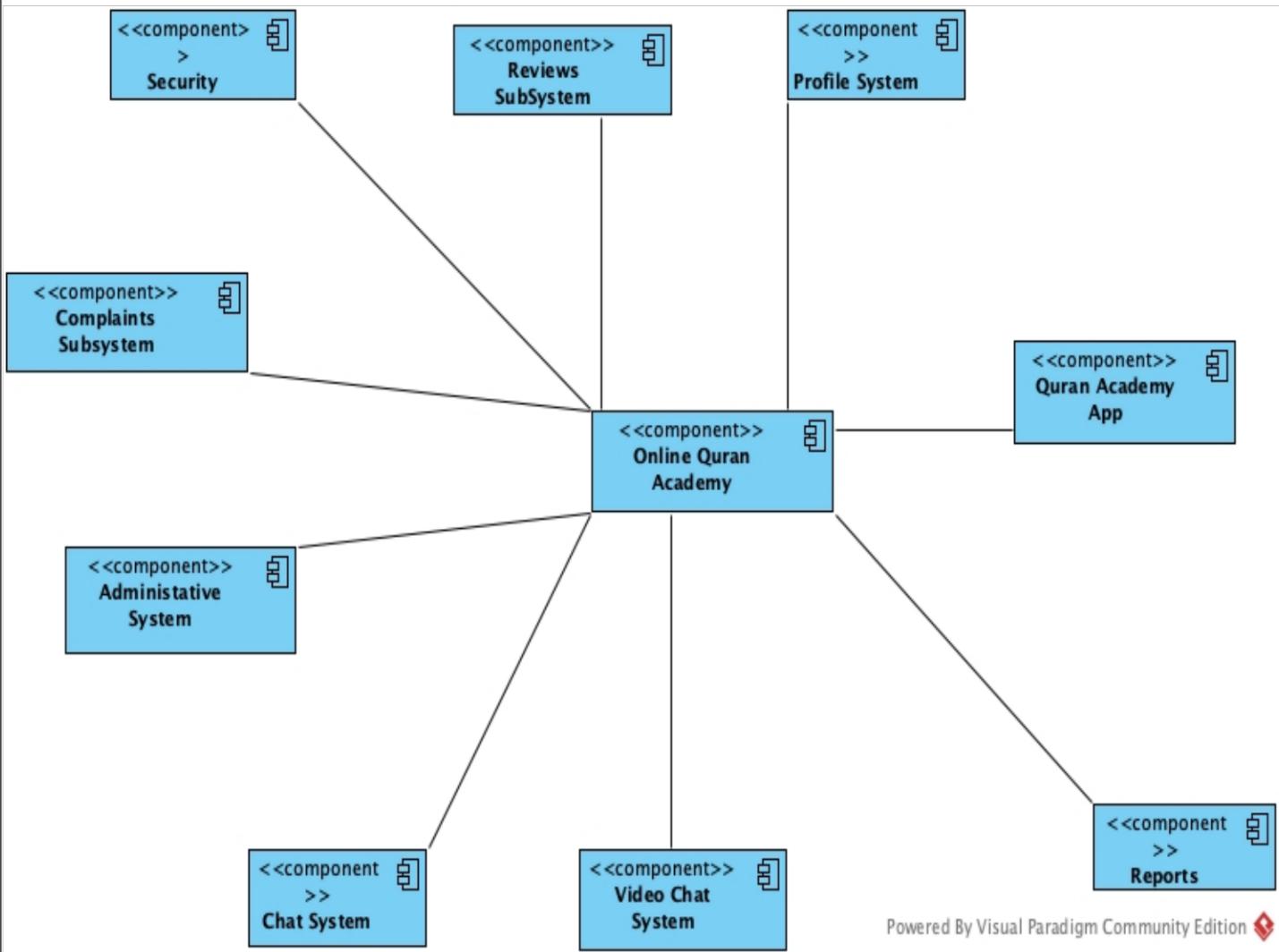


Fig:3.8.9 Component Diagram

3.4.6 Class Diagram

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

Class diagrams are the main building block in object-oriented modeling. They are used to show the different objects in a system, their attributes, their operations and the relationships among them. In the example, a class called “loan account” is depicted.

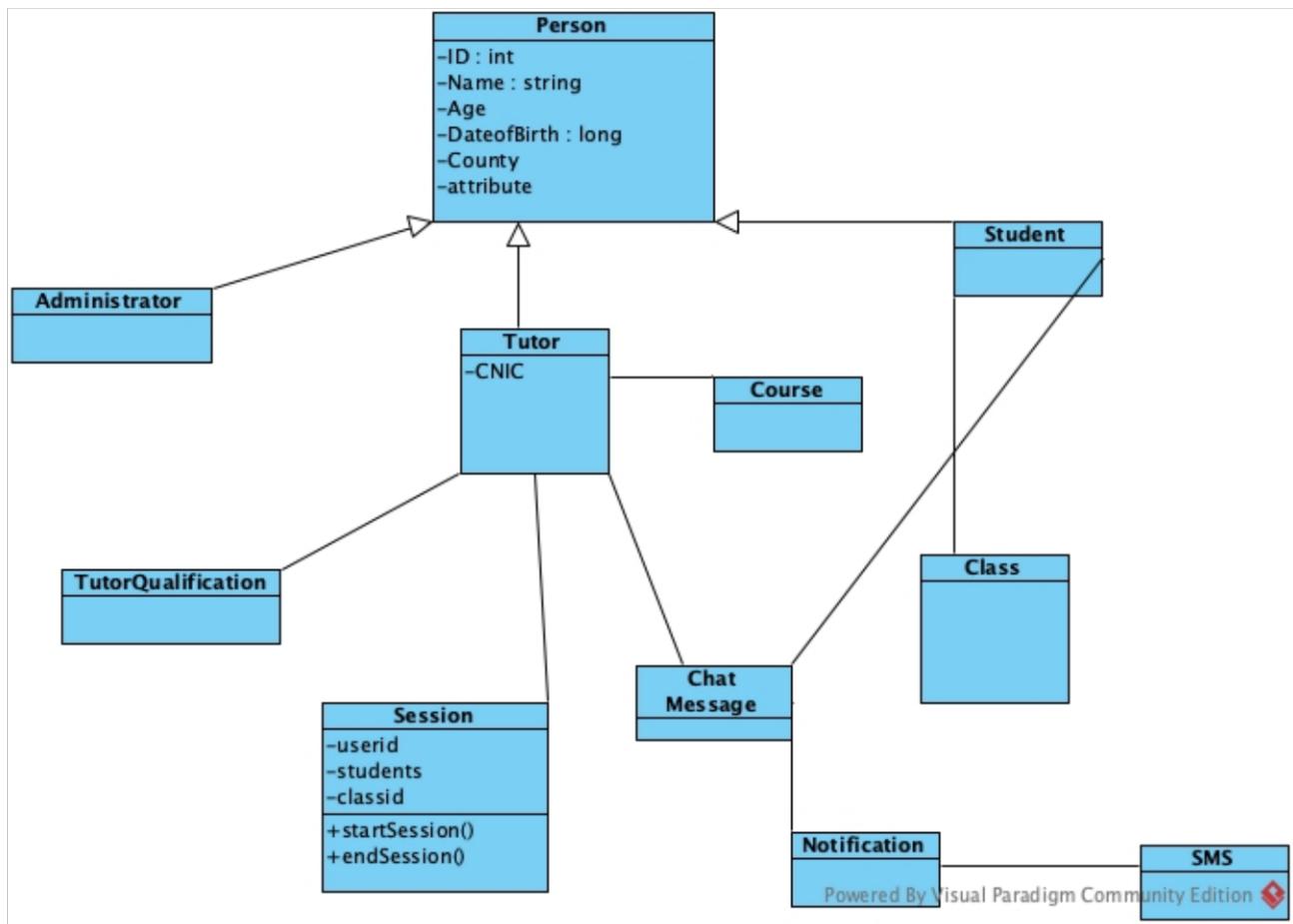


Fig:3.4.10 Class Diagram

3.5 Database Design

Database is a high performance fault tolerance database management system. The modern database is called mongoDB database. Its popularity is due to ease of use, flexibility and capability.

Database is the main and major thing of every system and software either it will be web app, desktop app or a mobile app. It's because the database is the primary key in which users data will be saved.

So, in this project I have used mongoDB database system which is based on raw data and work in the form of clusters and atlases.

MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License.

Advantages

MongoDB offers many advantages over traditional relational databases:

- Full cloud-based application data platform.
- Flexible document schemas.
- Widely supported and code-native data access.
- Change-friendly design.
- Powerful querying and analytics.
- Easy horizontal scale-out with sharding.
- Simple installation.
- Cost-effective.

The screenshot shows the MongoDB Atlas interface for the 'quran-tutor-mern' database deployment. The left sidebar includes sections for Deployment, Database (selected), Data Lake, Data Services (Triggers, Data API PREVIEW), Security (Quickstart, Database Access, Network Access, Advanced), and New On Atlas (3). The main content area displays the 'Database Deployments' page for 'ADNAN'S ORG - 2021-12-01 > QURAN-TUTOR-MERN'. It features a search bar, a 'Create' button, and tabs for Cluster (selected), Connect, View Monitoring, Browse Collections, and more. Key metrics shown include R 0, W 0, Connections (4.0), In 40.3 B/s, Out 319.4 B/s, Data Size (155.3 KB / 512.0 MB), and a chart showing network traffic over time. Below the metrics is a table with cluster details: VERSION (5.0.6), REGION (AWS / Mumbai (ap-south-1)), CLUSTER TIER (M0 Sandbox (General)), TYPE (Replica Set - 3 nodes), BACKUPS (Inactive), LINKED REALM APP (None Linked), and ATLAS SEARCH (Create Index). A 'System Status: All Good' message is at the bottom.

Fig:3.5.1 MongoDB Atlas View

3.5.1 Tables or Atlas or clusters:

In mongoDB database, the term used atlas/clusters on the place of classic databases tables. In mongoDB clusters and collections used at the name of tables to store data.

In this project we have created 3 table or clusters to store different type of information.

Below are the three type of clusters we have created.

- Users
- Chat
- messages

In these three different clusters I have saved the different information of users according to their uses.

The screenshot shows the MongoDB Atlas interface. On the left, there's a sidebar with sections for Deployment, Database (selected), Data Lake, Data Services (Triggers, Data API, PREVIEW), and Security (Quickstart, Database Access, Network Access, Advanced). The main area is titled 'Cluster0' and shows the 'quran-tutor-merndb' database. It displays 'DATABASES: 1' and 'COLLECTIONS: 3'. The collections listed are 'chats', 'messages', and 'users'. A table provides detailed statistics for each collection:

Collection Name	Documents	Documents Size	Documents Avg	Indexes	Index Size	Index Avg
chats	17	2.79KB	169B	1	36KB	36KB
messages	39	5.21KB	137B	1	36KB	36KB
users	13	3.35KB	264B	2	72KB	36KB

Fig:3.5.2 MongoDB Clusters or Chats, Messages and Users

3.5.1.1 Users Cluster and collections:

In the users cluster, user information will be saved when a user register into the system, it provide some attribute like name, email and password etc, so I have saved this info to users clusters on mongoDB database.

Users Cluster Description:

Column Name	Description
id	This column will save the unique id of every new user.
name	In this column user have to provide his name.
email	This column is for user email.
password	In this column user enter his secret password
confirm password	In this column user enter his secret password again to confirm he can memorize his secret password or he enter the correct password as he/she want/
pic	User can select his profile pic.

The screenshot shows the MongoDB Atlas interface. On the left, a sidebar menu includes options like DEPLOYMENT, Database (selected), DATA SERVICES, SECURITY, and Advanced. The main area displays the 'Collections' tab for the 'quran-tutor-mern' database, which contains one database and three collections: chats, messages, and users. The 'users' collection is selected, showing its storage size (38KB), total documents (13), and index size (72KB). A query results table shows 13 documents, with the first document's details expanded:

```
_id: ObjectId("61d9b554350bde16891c63ce")
pic: "https://icon-library.com/images/anonymous-avatar-icon/anonymous-avatar-.png"
name: "adnan5"
email: "adnan5@mail.com"
phone: 34549
work: "devpler"
password: "$2a$10$Q2kWxBo/6plfHLvvIw0GeOPHGoxjsn1xH.C3RkpByuJ6Tj4HOHe"
cpassword: "admin"
createdAt: 2022-01-08T16:01:24.229+00:00
updatedAt: 2022-01-08T16:01:24.229+00:00
__v: 0
```

Fig:3.5.3 Users cluster view and columns.

5.5.1.2 Chats clusters:

In this cluster of mongoDB database, every started or created chat data will be save. In this chat cluster different attributes are saved like chat name, and messages.

Chats clusters description:

Column Name	Description
Id	This column will save a unique id of chat created
name	This column save the name of chat created, in array format.
Created time	This column save the time at which the chat is created or started.

The screenshot shows the MongoDB Atlas interface. On the left, a sidebar navigation includes 'DEPLOYMENT', 'Database' (selected), 'DATA SERVICES', 'Data API (PREVIEW)', and 'SECURITY'. The main area displays 'quran-tutor-merndb.chats' with 17 documents. A query result table shows two documents:

_id	isGroupChat	users	chatName	createdAt	updatedAt
ObjectId("61e82305a6eedc2587cd8372")	false	[redacted]	"sender"	2022-01-19T14:41:09.390+00:00	2022-01-19T14:41:09.390+00:00
ObjectId("61ebac968505590632ea6f02")	false	[redacted]	[redacted]	[redacted]	[redacted]

Fig:3.5.4 chats cluster view

3.5.1.3 Message cluster:

In the message cluster, the data about messages which users send to each other will be saved on the form of JSON format. Because the mongoDB database deal the data in the form of JSON template or format.

Description of Messages Cluster:

Column Name	Description
Id	Save unique id of message
readBY	Save data about the receiver of messages
Sender	Save data about the message sender.
Content	Save the content of message to be send or received.
Chatid	Save chat id associated with these messages.
Time	Save time of messages send and received.

The screenshot shows the MongoDB Atlas interface. On the left, a sidebar menu includes sections for DEPLOYMENT, Database (selected), DATA SERVICES, and SECURITY. The Database section shows 'quran-tutor-merndb' with three collections: chats, messages (selected), and users. The main panel displays the 'quran-tutor-merndb.messages' collection. It shows storage details: STORAGE SIZE: 36KB, TOTAL DOCUMENTS: 39, INDEXES TOTAL SIZE: 36KB. Below this, there are tabs for Find, Indexes, Schema Anti-Patterns, Aggregation, and Search Indexes. A 'FILTER' button is present with the query '{ field: 'value' }'. At the bottom, it says 'QUERY RESULTS 1-20 OF MANY' and shows a snippet of a document:

```
_id: ObjectId("61ebad3f8505590632ea6f05")
> readyBy: Array
  sender: ObjectId("61ebad018505590632ea6f03")
  content: "hi"
  chat: ObjectId("61ebad3a8505590632ea6f04")
  createdAt: 2022-01-22T07:07:43.142+00:00
  updatedAt: 2022-01-22T07:07:43.142+00:00
  __v: 0
```

Navigation buttons for 'PREVIOUS' and 'NEXT' are at the bottom, along with a '1-20 of many results' indicator and a message icon.

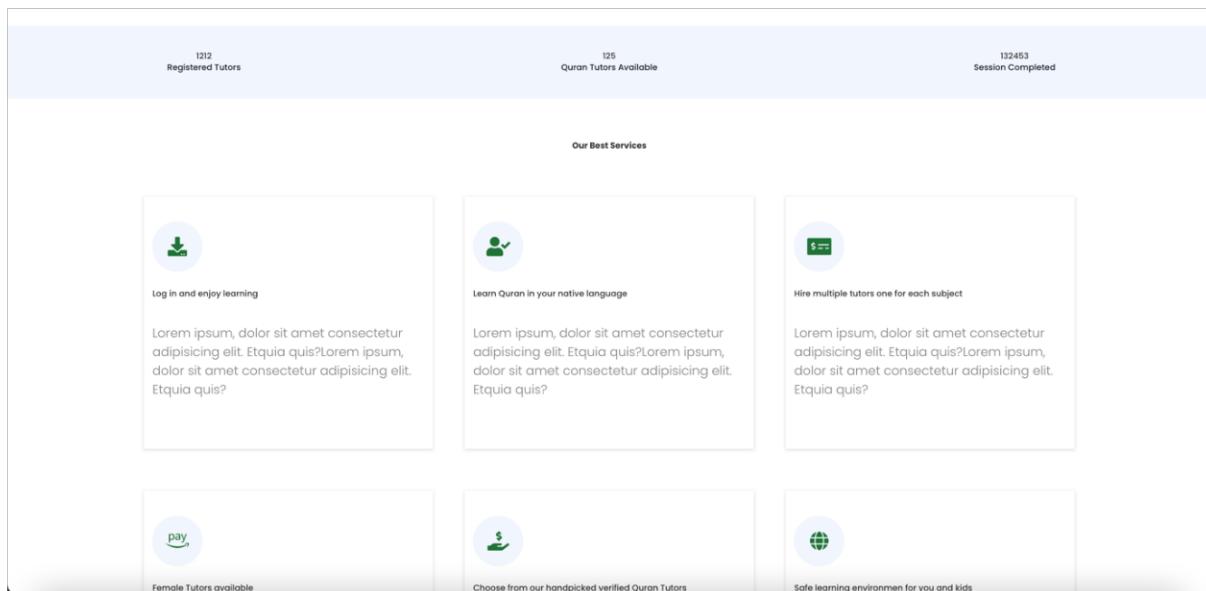
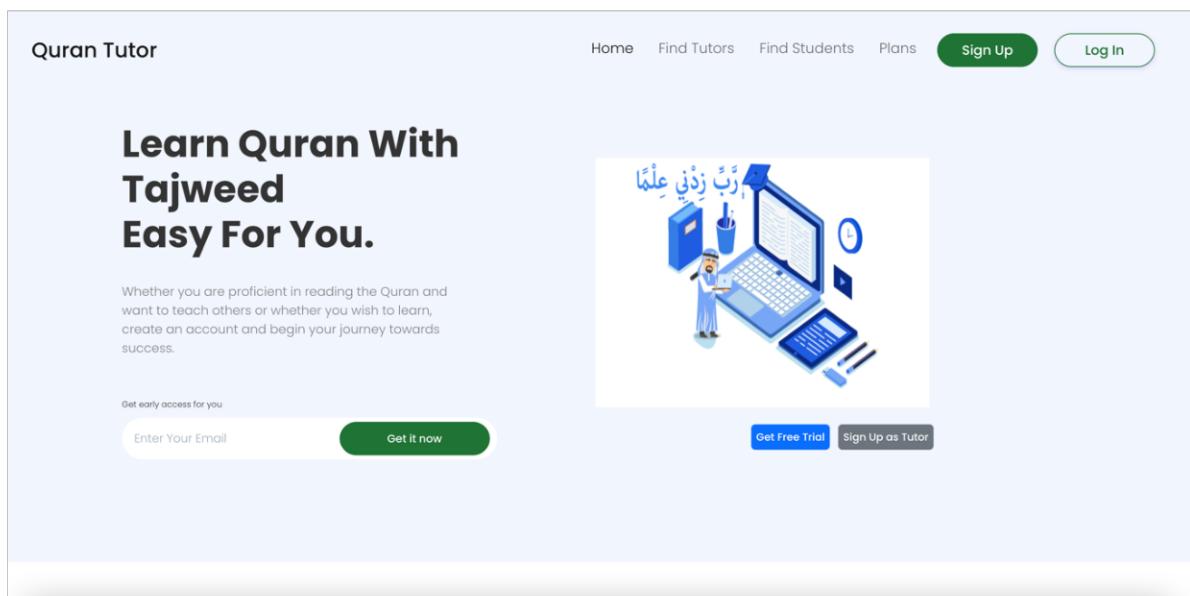
Fig:3.5.4 Messages cluster view

3.6 UX/UI Design of Web App

I have used the ReactJS and its material UI library called Chakra UI to design the User interface and user experience of the system. I have used bootstrap 5 for design responsive on different resolution devices.

Below is the whole screenshot of my design systems.

3.6.1 Home Screen UI



About Quran Tutor
A Brief Summary
Do you want to read the Quran with proper pronunciation (Tajweed)? Would you like your child to memorize the Quran (Hifz) but don't know where to start? At Qutor, we make it our mission to develop innovative tools to help you achieve these goals. Whether you are proficient in reading the Quran and want to teach others or whether you wish to learn, create an account and begin your journey towards success.

[About Us](#)

QURAN TUTOR APP

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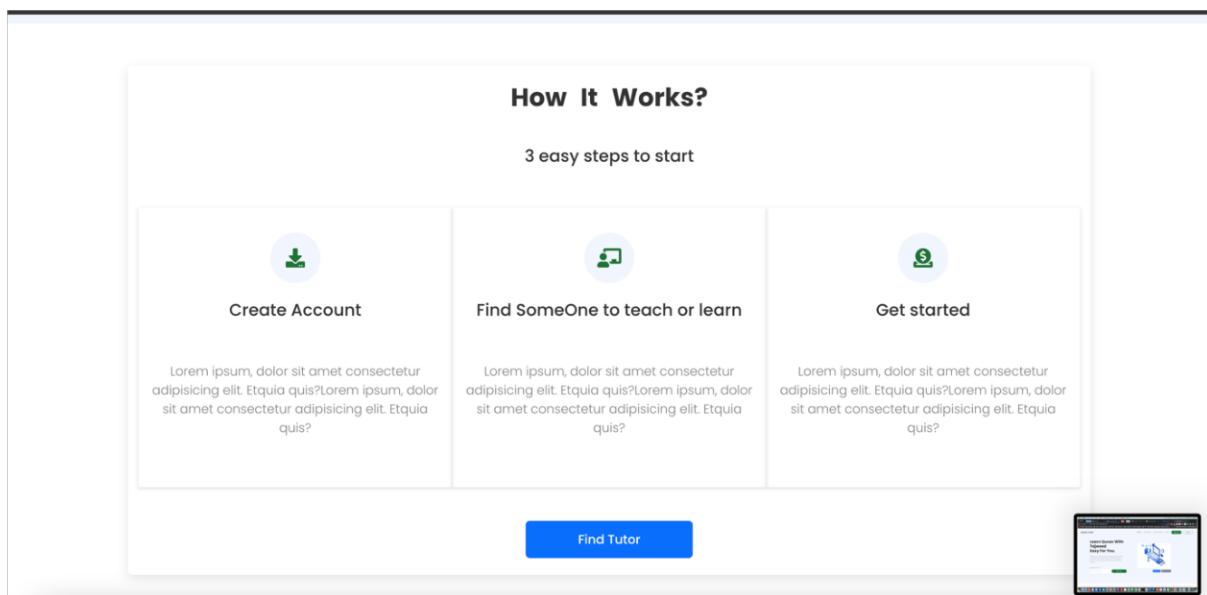
QURAN TUTOR APP

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How to use the App?

- Download**
Download app on your mobile. Our app is available for both iOS and Android.
- Register / Sign In**
If you are new to Quran Tutor, then first register yourself, and sign in to explore more things.
- Find SomeOne**
If you are student then find a tutor to start learning. If you're a Tutor, then find some students who want to learn.
- Payment**
We provide secure payment method to transfer payments.

[Download App](#)



Quran Tutor

Home Find Tutors Find Students Plans **Sign Up** **Log In**

All Tutors
Choose your desired tutor on the base of criteria you want.

TUTOR 1 This is a summary, can be any length Very short, can be any description Message	TUTOR 2 Another summary, make sure that this is very responsive Billy Bob Bob Bob likes Markiplier gameplay videos Message
--	---

Register as a Tutor



Build Your Profile

Build your Quran Tutor profile and choose the Quran courses you want to teach, like online Tajweed, Hifz memorization and Arabic Language course.



Find Students

You can message Quran students and they can message you. If you are a good match, set up your first Quran lesson and start teaching your online Quran classes



Teach and earn

Set your hourly rate and every minute you spend teaching Quran classes gets logged so you know how much to bill each student. Students pay you directly

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[Contact Us](#)

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[Usefull Links](#)
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Quran Tutor

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[Plans](#)
Sign Up
Log In

Find Students here

A Brief Summary

Do you want to read the Quran with proper pronunciation (Tajweed)? Would you like your child to memorize the Quran (Hifz) but don't know where to start? At Qutor, we make it our mission to develop innovative tools to help you achieve these goals. Whether you are proficient in reading the Quran and want to teach others or whether you wish to learn, create an account and begin your journey towards success.



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Read Qaida

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 Download on the App Store

 GET IT ON Google Play

Build your Quran Tutor profile and choose the Quran courses you want to teach, like online Tajweed, Hifz memorization and Arabic Language course.

You can message Quran students and they can message you. If you are a good match, set up your first Quran lesson and start teaching your online Quran classes.

Set your hourly rate and every minute you spend teaching Quran classes gets logged so you know how much to bill each student. Students pay you directly.

Sign Up As Tutor

3.6.2 Sign Up Page

Quran Tutor

Home Find Tutors Find Students Plans **Sign Up** Log In

Register to get started

Name *

Email Address *

Password *

Confirm Password *

Upload your Picture
 No file chosen

Sign Up

3.6.3 Login Page

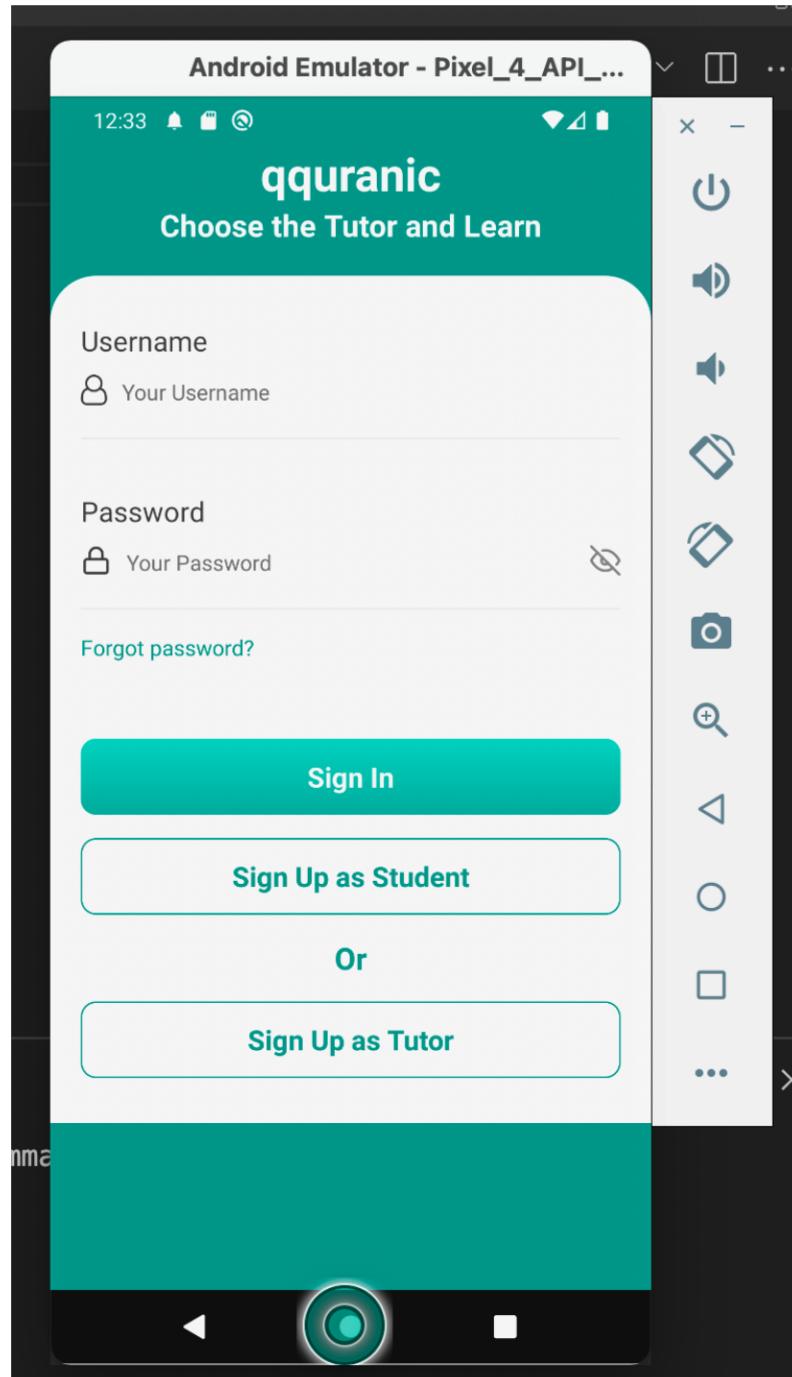
The screenshot shows the login page for the Quran Tutor website. At the top, there is a navigation bar with links for Home, Find Tutors, Find Students, Plans, a Sign Up button, and a Log In button. Below the navigation bar, the main content area has a heading "Login to see more things". It contains two input fields: "Email Address *" and "Password *". Both fields have placeholder text ("Enter Your Email Address" and "Enter password") and a "Show" link. A blue "Login" button is positioned below the password field. At the bottom of the form is a red button labeled "Get Guest User Credentials". The footer of the page includes links for Company (About Us, Contact Us, FAQs, Prices and Plans, Services), Download App (IOS, Android, How to Use App?), Useful Links (Find Tutors, Find Students, Read Quran, Read Qaida), and social media links for Follow Us (Facebook, Instagram, YouTube, Twitter). It also features download links for the App Store and Google Play.

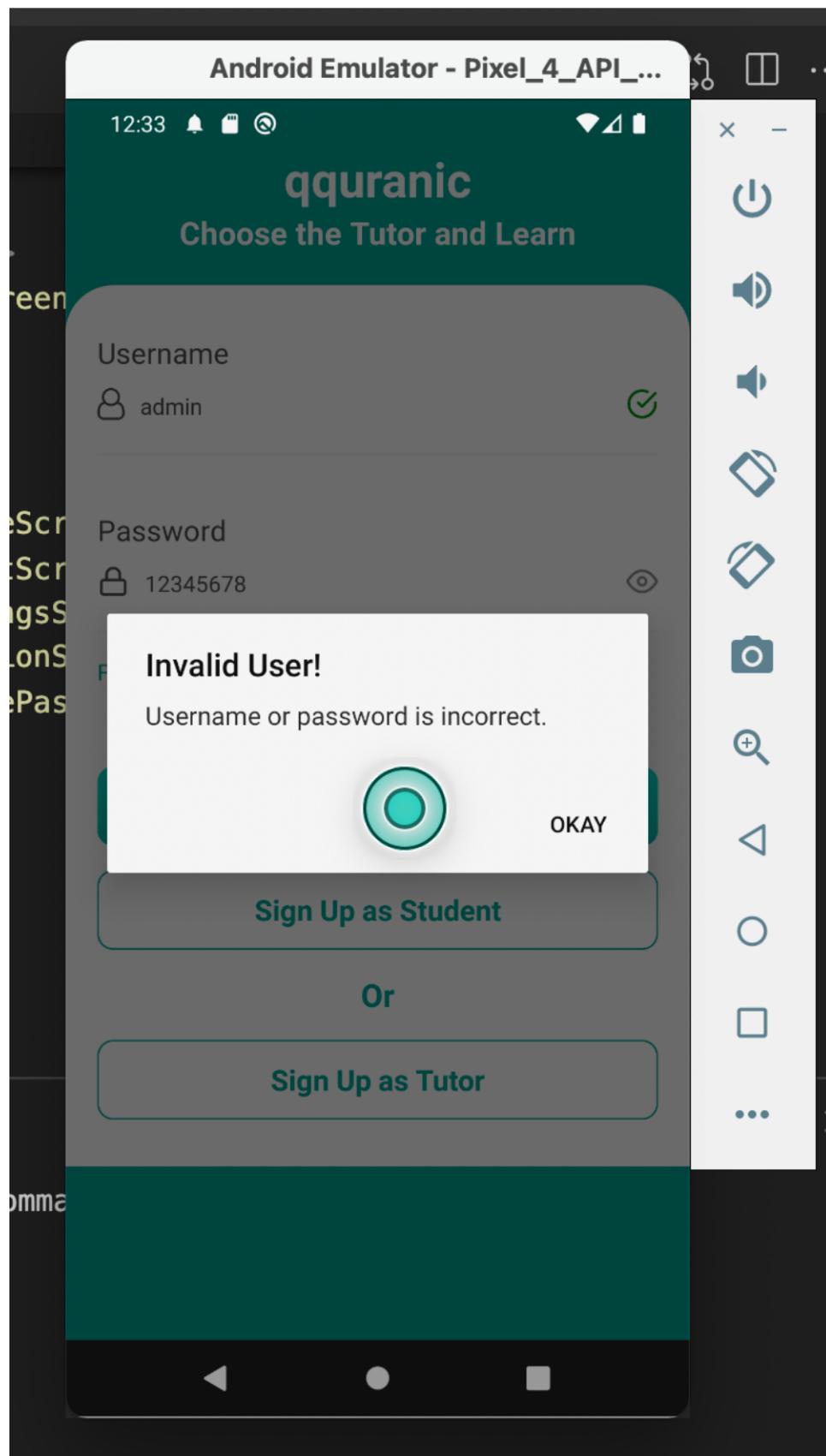
3.6.4 Messages or Chat Page

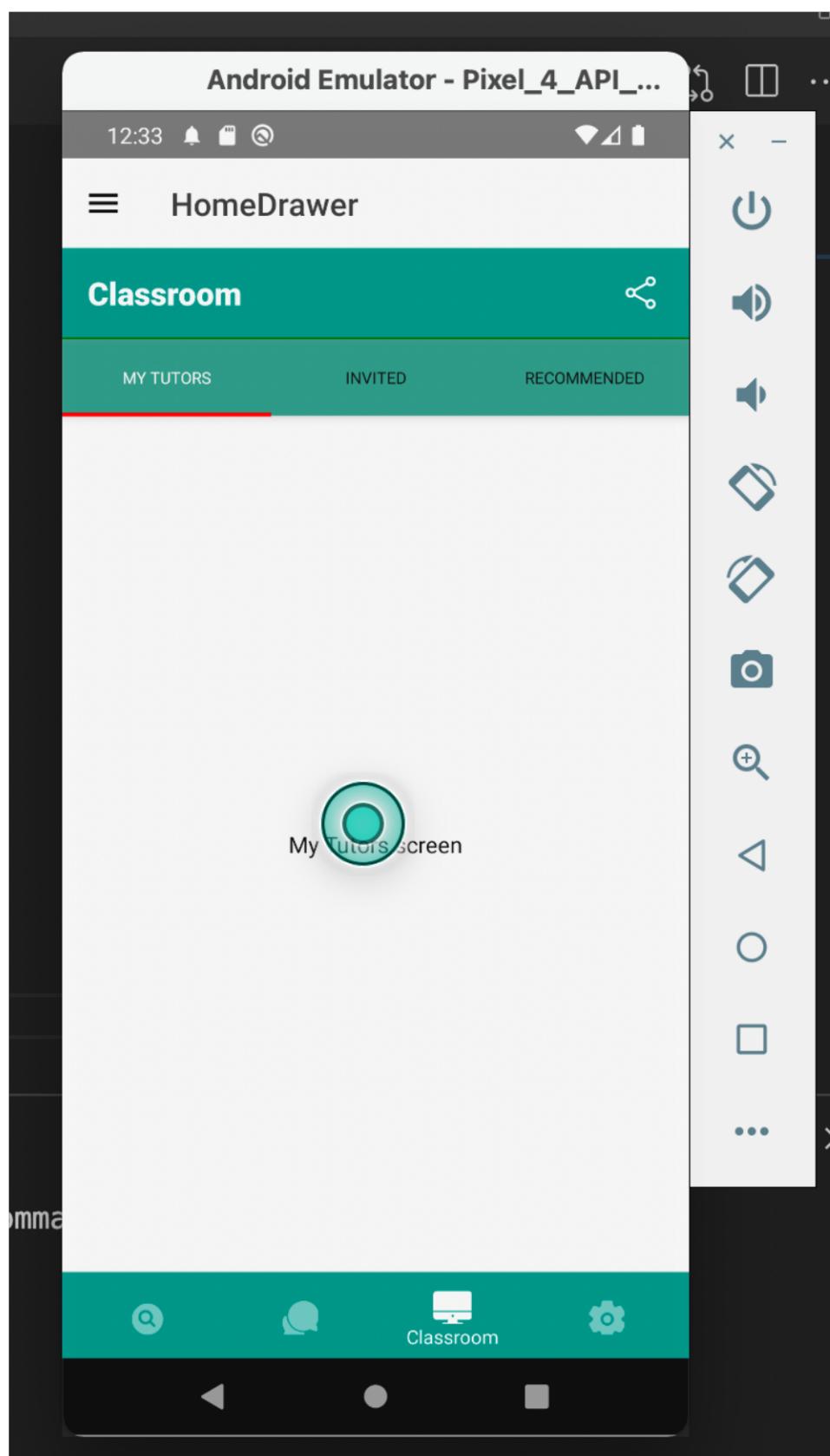
The screenshot shows the messages or chat page. At the top, there is a search bar labeled "Search User" and a "Real Time Messages" section. The main area is divided into two panels: "My Chats" on the left and a specific chat with "usman" on the right. The "My Chats" panel shows a list of recent conversations, with the top one for "usman" showing messages like "hi", "hi", "hi", and "jgh". The "usman" chat panel shows a message input field at the bottom with the placeholder "Enter a message..".

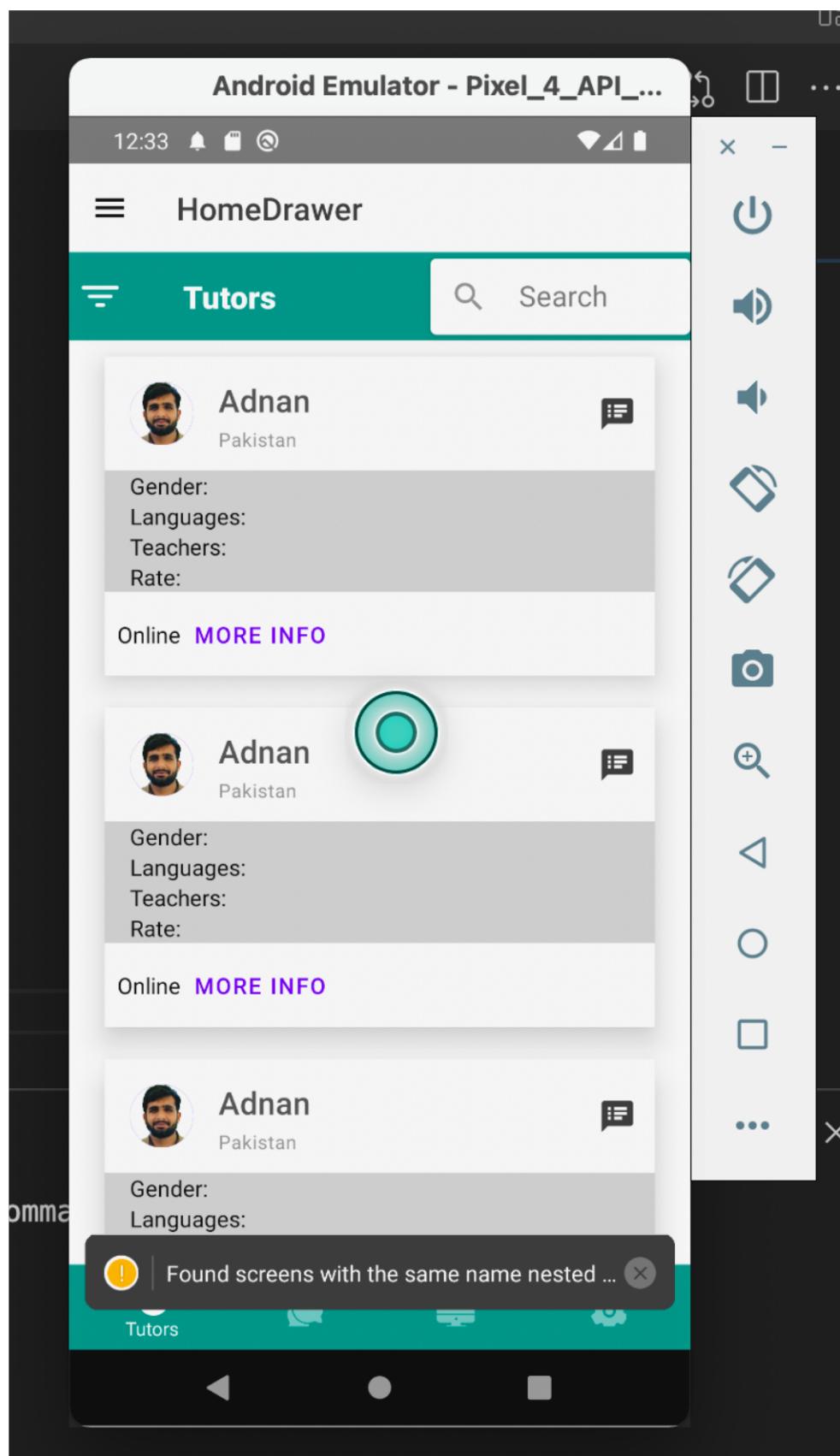
3.7 UX/UI Design of Mobile App

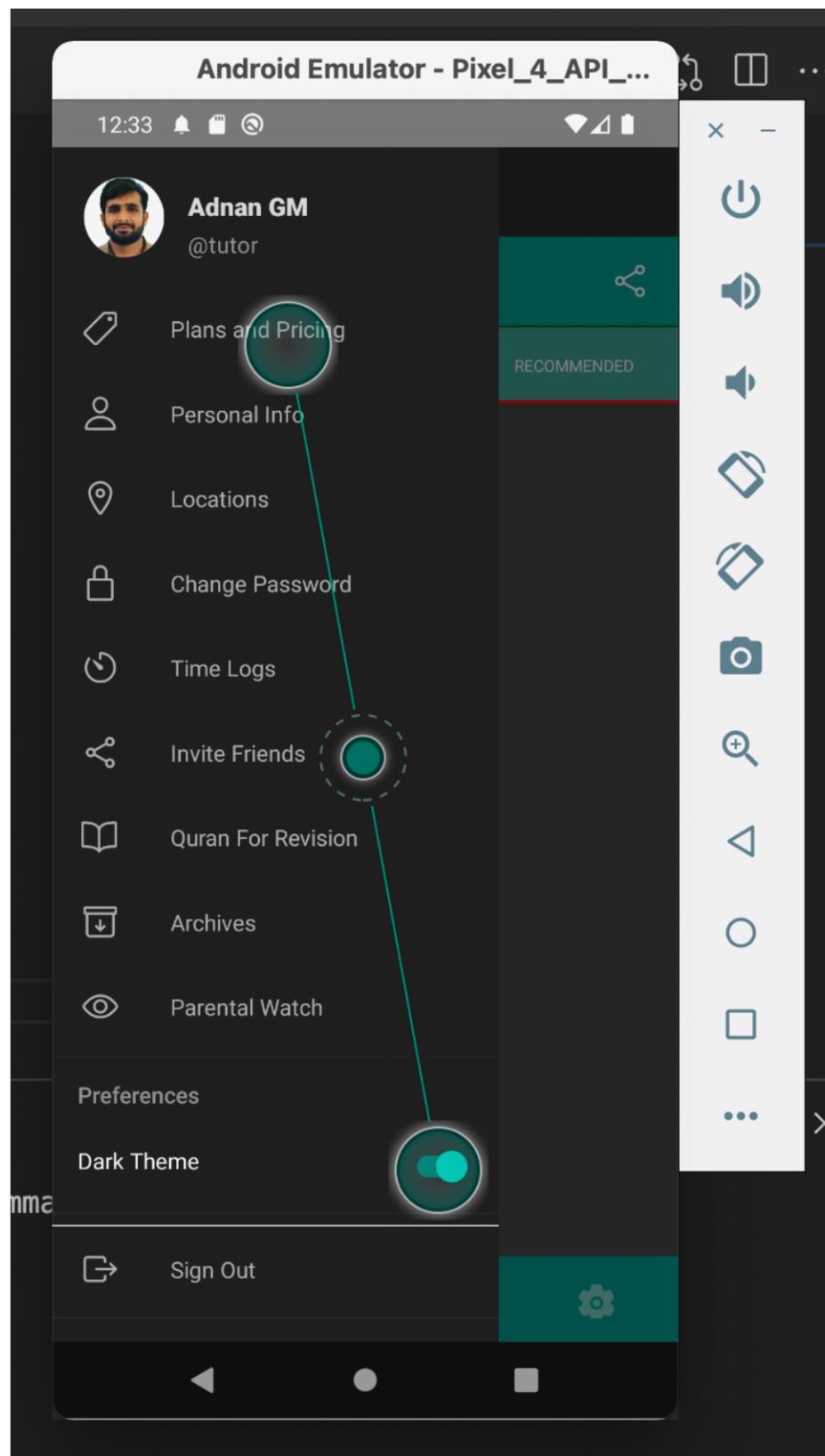
Below are the screenshots of mobile app running.











Chapter 4

Implementation

4.1 Implementation

In this chapter, we mainly handle with the things we have used to made the project or our proposed system. This is main and primary chapter in contest of fyp report or documentation. Because this is the chapter in which a project developer have to provide details about the tool, technologies and language he/she had used to make the thinkable thing into the reality. Below are some of the useful information about the system I have made.

4.2 Technology Used in Web App:

- MERN Stack
 - MongoDB
 - Express
 - ReactJS
 - NodeJS

Why I have used MERN Stack technology for this system development? What are the benefit of this technology? Let we answer some these types of questions.

4.3 What is MERN Stack Technology:

MERN stands for MongoDB, Express, React, Node, after the four key technologies that make up the stack.

MongoDB - document database

Express(.js) - Node.js web framework

React(.js) - a client-side JavaScript framework

Node(.js) - the premier JavaScript web server

Express and Node make up the middle (application) tier. Express.js is a server-side web framework, and Node.js the popular and powerful JavaScript server platform. Regardless of which variant you choose, ME(RVA)N is the ideal approach to working with JavaScript and JSON, all the way through.

4.4 How does the MERN stack work?

The MERN architecture allows you to easily construct a 3-tier architecture (frontend, backend, database) entirely using JavaScript and JSON.

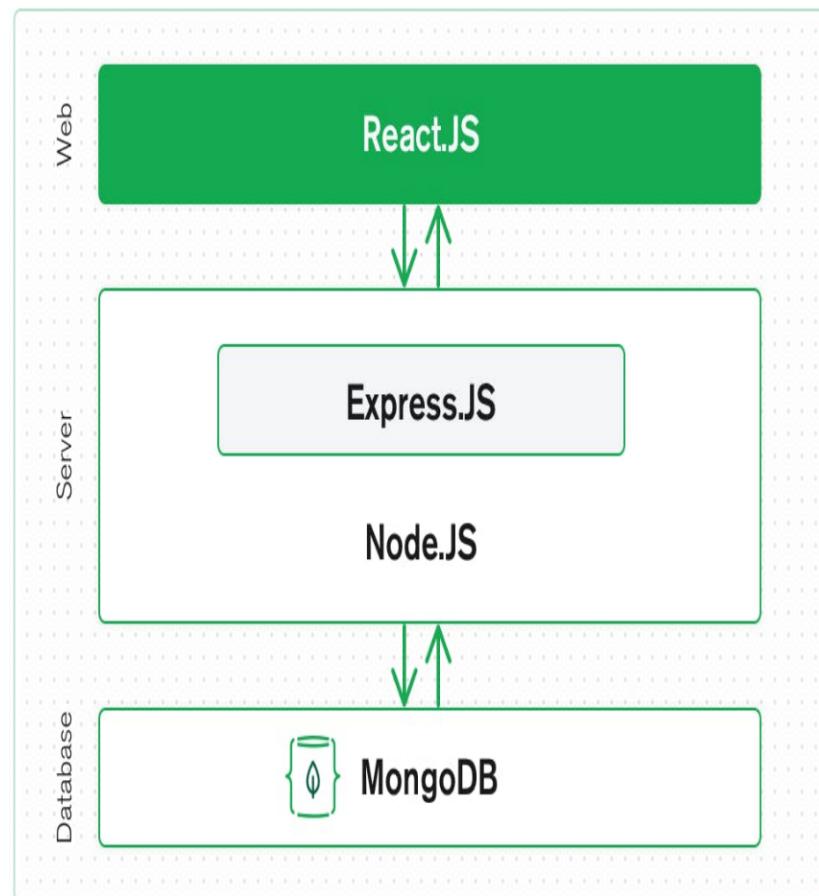


Fig: MERN Stack 3-tier structure

4.5 Technology Used in Mobile App

- React native
 - Hybrid Mobile Apps
 - Material UI
 - ReactJS

4.6 What is React Native?

React Native is a JavaScript framework for writing real, natively rendering mobile applications for iOS and Android. It's based on React, Facebook's JavaScript library for building user interfaces, but instead of targeting the browser, it targets mobile platforms. In other words: web developers can now write mobile applications that look and feel truly "native," all from the comfort of a JavaScript library that we already know and love. Plus, because most of the code you write can be shared between platforms, React Native makes it easy to simultaneously develop for both Android and iOS.

Similar to React for the Web, React Native applications are written using a mixture of JavaScript and XML-esque markup, known as JSX. Then, under the hood, the React Native "bridge" invokes the native rendering APIs in Objective-C (for iOS) or Java (for Android). Thus, your application will render using real mobile UI components, *not* webviews, and will look and feel like any other mobile application. React Native also exposes JavaScript interfaces for platform APIs, so your React Native apps can access platform features like the phone camera, or the user's location.

React Native currently supports both iOS and Android, and has the potential to expand to future platforms as well. In this book, we'll cover both iOS and Android. The vast majority of the code we write will be cross-platform. And yes: you can really use React Native to build production-ready mobile applications! Some anecdotal evidence: [Facebook](#), [Palantir](#), and [TaskRabbit](#) are already using it in production for user-facing applications.

4.7 Advantages of React Native

The fact that React Native actually renders using its host platform's standard rendering APIs enables it to stand out from most existing methods of cross-platform application development, like Cordova or Ionic. Existing methods of writing mobile applications using combinations of JavaScript, HTML, and CSS typically render using webviews. While this approach can work, it also comes with drawbacks, especially around performance. Additionally, they do not usually have access to the host platform's set of native UI elements. When these frameworks do try to mimic native UI elements, the results usually "feel" just a little off; reverse-engineering all the fine details of things like animations takes an enormous amount of effort, and they can quickly become out of date.

In contrast, React Native actually translates your markup to real, native UI elements, leveraging existing means of rendering views on whatever platform you are working with. Additionally, React works separately from the main UI thread, so your application can maintain high performance without sacrificing capability. The update cycle in React Native is the same as in React: when props or state change, React Native re-renders the views. The major difference between React Native and React in the browser is that React Native does this by leveraging the UI libraries of its host platform, rather than using HTML and CSS markup.

For developers accustomed to working on the Web with React, this means you can write mobile apps with the performance and look and feel of a native application, while using familiar tools. React Native also represents an improvement over normal mobile development in two other areas: the developer experience and cross-platform development potential.

4.8 Front End Design React.js

The top tier of the MERN stack is React.js, the declarative JavaScript framework for creating dynamic client-side applications in HTML. React lets you build up complex interfaces through simple Components, connect them to data on your backend server, and render them as HTML.

React's strong suit is handling stateful, data-driven interfaces with minimal code and minimal pain, and it has all the bells and whistles you'd expect from a modern web framework: great support for forms, error handling, events, lists, and more.

4.9 Back End Express.js and Node.js Server Tier

The next level down is the Express.js server-side framework, running inside a Node.js server. Express.js bills itself as a “fast, unopinionated, minimalist web framework for Node.js,” and that is indeed exactly what it is. Express.js has powerful models for URL routing (matching an incoming URL with a server function), and handling HTTP requests and responses.

By making XML HTTP Requests (XHRs) or GETs or POSTs from your React.js front-end, you can connect to Express.js functions that power your application. Those functions in turn use MongoDB's Node.js drivers, either via callbacks for using Promises, to access and update data in your MongoDB database.

4.10 Database Tier MongoDB

If my application stores any data (user profiles, content, comments, uploads, events, etc.), then am going to want a database that's just as easy to work with as React, Express, and Node.

That's where MongoDB comes in: JSON documents created in your React.js front end can be sent to the Express.js server, where they can be processed and (assuming they're valid) stored directly in MongoDB for later retrieval. Again, if I am building in the cloud, i'll want to look at Atlas.

4.11 Is MERN a full-stack solution?

Yes, MERN is a full-stack, following the traditional 3-tier architectural pattern, including the front-end display tier (React.js), application tier (Express.js and Node.js), and database tier (MongoDB). I can any type of system by using this fast, secure and reliable technology.

4.12 Why I have chosen the MERN stack?

Let's start with MongoDB, the document database at the root of the MERN stack. MongoDB was designed to store JSON data natively (it technically uses a binary version of JSON called BSON), and everything from its command line interface to its query language (MQL, or MongoDB Query Language) is built on JSON and JavaScript.

MongoDB works extremely well with Node.js, and makes storing, manipulating, and representing JSON data at every tier of your application incredibly easy. For cloud-native

applications, MongoDB Atlas makes it even easier, by giving you an auto-scaling MongoDB cluster on the cloud provider of your choice, as easy as a few button clicks.

Express.js (running on Node.js) and React.js make the JavaScript/JSON application MERN full stack, well, full. Express.js is a server-side application framework that wraps HTTP requests and responses, and makes it easy to map URLs to server-side functions. React.js is a frontend JavaScript framework for building interactive user interfaces in HTML, and communicating with a remote server.

The combination means that JSON data flows naturally from front to back, making it fast to build on and reasonably simple to debug. Plus, you only have to know one programming language, and the JSON document structure, to understand the whole system.

4.13 Security and Encryption

Whether I am creating an application or website i need a login or registration system at some point. At that point passwords are critical i need a secure way to store passwords. **bcryptjs** lets me hash users passwords means it convert users password to a random string.

I have used bcryptjs encryption technique to encrypt the user password. This thing will increase the security of my system and increase the trust of users. This uses hashing technique to encrypt things in my system. The major concern of bcryptjs in my system is to encrypt the user password at the time of registration either it is student, or a tutor.

In the below screenshot, mongoDB cluster includes users data showing the password as a random keys, and below the password column show simple entered password.

```
_id: ObjectId("61d9b554350bde16891c63ce")
pic: "https://icon-library.com/images/anonymous-avatar-icon/anonymous-avatar...""
name: "adnan5"
email: "adnan5@mail.com"
phone: 345454
work: "devpler"
password: "$2a$10$Q2kWxBo/6pLfhLvvIw0Ge0PHGoxjsn1xH.C3RrkpByuJ6Tj4HOPhe"
cpassword: "admin"
createdAt: 2022-01-08T16:01:24.229+00:00
updatedAt: 2022-01-08T16:01:24.229+00:00
__v: 0
```

4.14 Tools Used in Web App

- Visual Studio Code
- Chrome
- MongoDB Compass
- MacOS Terminal

What is Visual Studio Code?

Visual Studio Code is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

What is Chrome?

Google Chrome is a cross-platform web browser developed by Google. It was first released in 2008 for Microsoft Windows, built with free software components from Apple WebKit and Mozilla Firefox. It was later ported to Linux, macOS, iOS, and Android, where it is the default browser.

What is MongoDB Compass?

MongoDB Compass is a powerful GUI for querying, aggregating, and analyzing your MongoDB data in a visual environment. Compass is free to use and source available, and can be run on macOS, Windows, and Linux.

What is terminal in MacOS Terminal?

Terminal is the terminal emulator included in the macOS operating system by Apple. Terminal originated in NeXTSTEP and OPENSTEP, the predecessor operating systems of macOS.

4.15 Features of Online Quran Teaching Web App:

- Register Tutor
- Register Student
- Save the registration record in Database
- Find Tutor to start learning
- Find Student to start teaching
- Real time chat system, in which student can message with tutor and tutor can message to student.
- Very Fast and Dynamic Web App
- Profile Section
- Show some static content

4.16 Tools Used in Mobile App

- Visual Studio Code
- Android Studio
- Android Emulator
- MacOS Terminal

What is Visual Studio Code?

Visual Studio Code is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

What is Android Studio?

Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development.

What is Android Emulator?

The Android Emulator simulates Android devices on your computer so that you can test your application on a variety of devices and Android API levels without needing to have each physical device. The emulator provides almost all of the capabilities of a real Android device.

What is terminal in MacOS Terminal?

Terminal is the terminal emulator included in the macOS operating system by Apple. Terminal originated in NeXTSTEP and OPENSTEP, the predecessor operating systems of macOS.

4.17 Features of Online Quran Teaching Mobile App:

- Register Tutor
- Register Student
- Save the registration record in Database
- Find Tutor to start learning
- Find Student to start teaching
- Real time chat system
- Very Fast and Dynamic Web App
- Profile Section
- Show some static content
- Hybrid Mobile App using latest technology called React-Native
- Run on Android Platform
- Also Building for iOS Platform

Chapter 5

Testing

5.1 Introduction to Testing:

The goal of utilizing numerous testing methodologies in your development process is to make sure your software can successfully operate in multiple environments and across different platforms.

5.2 Types of System Testing

These can typically be broken down between functional and non-functional testing.

Functional testing involves testing the application against the business requirements. It incorporates all test types designed to guarantee each part of a piece of software behaves as expected by using use cases provided by the design team or business analyst. These testing methods are usually conducted in order and include:

- Unit testing
- Integration testing
- System testing
- Acceptance testing

Non-functional testing methods incorporate all test types focused on the operational aspects of a piece of software. These include:

- Performance testing
- Security testing
- Usability testing
- Compatibility testing

The key to releasing high quality software that can be easily adopted by your end users is to build a robust testing framework that implements both functional and non-functional software testing methodologies.

As specified above, the system is first divided in units which are developed and tested for their functionalities.

These units are integrated into a complete system during Integration phase and tested to check if all modules/units coordinate between each other and the system as a whole behaves as per the specifications.

After successfully testing the software, it is delivered to the customer.

5.3 Functional System Testing

Below are the Functional system testing techniques. I have checked the system by providing the right and wrong input to the system to check its behavior. For example, I have given a name on the field of email, so it gives an error to must enter an email template including @anything.com. And I have provided a wring password of registered user to check whether it give access to user which enter wrong password, then my system say's enter the right email and password.

And when login into the system the menu changes according to the user profile. System shows a message menu after login, but before login there is no menu shown to user.

5.3.1 Unit testing

Unit testing is the first level of testing and is often performed by the developers themselves. It is the process of ensuring individual components of a piece of software at the code level are functional and work as they were designed to. Developers in a test-driven environment will typically write and run the tests prior to the software or feature being passed over to the test team. Unit testing can be conducted manually, but automating the process will speed up delivery cycles and expand test coverage. Unit testing will also make debugging easier because finding issues earlier means they take less time to fix than if they were discovered later in the testing process.

I have tested every unit of my online Quran teaching system and I didn't find any other error except some glitches in messages feature any time.

My system has some major units like register, login and messaging.

5.3.2 Integration testing

Integration testing is the phase in software testing in which individual software modules are combined and tested as a group. Integration testing is conducted to evaluate the compliance of a system or component with specified functional requirements. It occurs after unit testing and before system testing.

I have grouped the units of systems and tested as a group and they are working well as they are performing as a single unit.

5.3.3 System testing

System testing is a black box testing method used to evaluate the completed and integrated system, as a whole, to ensure it meets specified requirements. The functionality of the software is tested from end-to-end and is typically conducted by a separate testing team than the development team before the product is pushed into production.

The system testing is good as I have checked.

5.3.4 Acceptance testing

Acceptance testing is the last phase of functional testing and is used to assess whether or not the final piece of software is ready for delivery. It involves ensuring that the product is in compliance with all of the original business criteria and that it meets the end user's needs. This requires the product be tested both internally and externally, meaning you'll need to get it into the hands of your end users for beta testing along with those of your QA team. Beta testing is key to getting real feedback from potential customers and can address any final usability concerns.

I have shared the system with my friends to check its functionality and error if any found, the feedback about system is positive.

5.4 Non-functional system techniques

Below are some of the non-functional system techniques I have done.

5.4.1 Performance testing

Performance testing is a non-functional testing technique used to determine how an application will behave under various conditions. The goal is to test its responsiveness and stability in real user situations. I have tested the Performance by broken down into four types:

- **Load testing** is the process of putting increasing amounts of simulated demand on your software, application, or website to verify whether or not it can handle what it's designed to handle.
- **Stress testing** takes this a step further and is used to gauge how your software will respond at or beyond its peak load. The goal of stress testing is to overload the application on purpose until it breaks by applying both realistic and unrealistic load scenarios. With stress testing, you'll be able to find the failure point of your piece of software.
- **Endurance testing**, also known as soak testing, is used to analyze the behavior of an application under a specific amount of simulated load over longer amounts of time. The goal is to understand how your system will behave under sustained use, making it a longer process than load or stress testing (which are designed to end after a few hours). A critical piece of endurance testing is that it helps uncover memory leaks.
- **Spike testing** is a type of load test used to determine how your software will respond to substantially larger bursts of concurrent user or system activity over varying amounts of time. Ideally, this will help you understand what will happen when the load is suddenly and drastically increased.

5.4.2 Security Testing

With the rise of cloud-based testing platforms and cyber attacks, there is a growing concern and need for the security of data being used and stored in software. Security testing is a non-functional software testing technique used to determine if the information and data in a system is protected. The goal is to purposefully find loopholes and security risks in the system that could result in unauthorized access to or the loss of information by probing the application for weaknesses. There are multiple types of this testing method, each of which aimed at verifying six basic principles of security:

1. Integrity
2. Confidentiality
3. Authentication
4. Authorization
5. Availability
6. Non-repudiation

I have used the password encryption method to encrypt the password of users. By using this encryption method, I have encrypted the password of user at the registration time.

And when user want to login, the encrypted password will be decrypted and its matched with the decrypted password to verify the login details to enter the user into the system.

5.4.3 Usability Testing

Usability testing is a testing method that measures an application's ease-of-use from the end-user perspective and is often performed during the system or acceptance testing stages. The goal is to determine whether or not the visible design and aesthetics of an application meet the intended workflow for various processes, such as logging into an application. Usability testing is a great way for teams to review separate functions, or the system as a whole, is intuitive to use.

I have checked the system different responsive view point to check the usability of system I have designed, so my system can used on every resolution device.

5.4.4 Compatibility Testing

Compatibility testing is used to gauge how an application or piece of software will work in different environments. It is used to check that your product is compatible with multiple operating systems, platforms, browsers, or resolution configurations. The goal is to ensure that your software's functionality is consistently supported across any environment you expect your end users to be using.

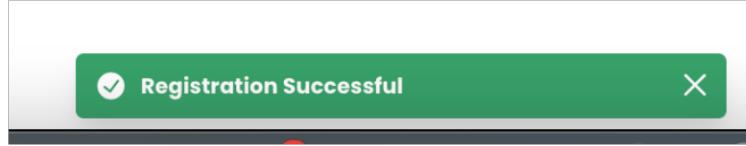
I have checked my system compatibility on different types of operating system and also on different types of browsers to run it accurately. Because this is a web app, so it must be run able on every browser.

I have checked my system on MacOS, Windows and Linux operating system and its working fine.

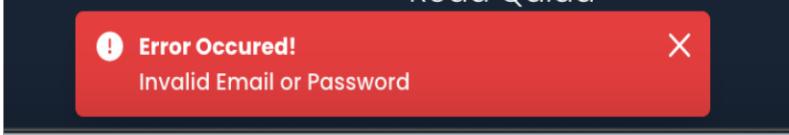
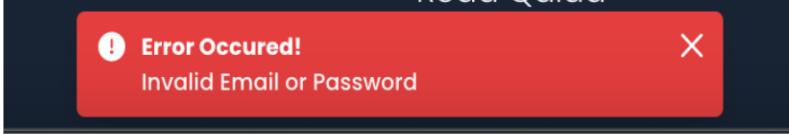
Also checked it on Chrome, Firefox, Safari and Edge browser and its working fine.

5.5 Test Cases Web App

5.5.1 Test Scenario for Registration:

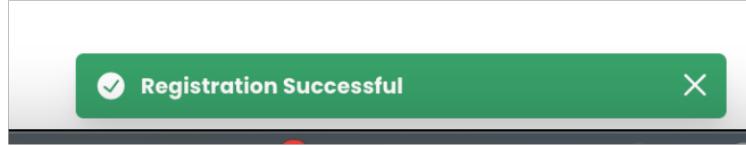
Test Case ID	T.1.0	Status
User Case Name	UC- 1.0 User Register Logic	
Test Scenario 1 With proper input	<p>Inputs: Name:abc Email: abc123 Password: 123abc Confirm Password: 123abc Output: Success message is shown</p> 	✓
Test Scenario 2 With correct inputs	<p>Inputs: Name:abc Email: abc123 Password: abc Confirm Password: 123abc Output: This error message is shown</p> 	✗

5.5.2 Test Scenario for Login

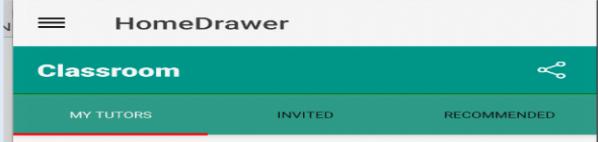
Test Case ID	T.1.0	Status
User Case Name	UC- 1.0 User Logic	
Test Scenario 1 With wrong input of both email and password	<p>Inputs: Email: abc123@mail.com Password: 123abc Output: This error message is shown</p> 	✗
Test Scenario 2 With correct inputs	<p>Inputs: Email: admin@mail.com Password: admin Output: Success message is shown</p> 	✓
Test Scenario 3 With wrong input of password only	<p>Inputs: Email: admin@mail.com Password: 12345 Output: This error message is shown</p> 	✗

5.6 Test Cases Mobile App

5.5.1 Test Scenario for Registration:

Test Case ID	T.1.0	Status
User Case Name	UC- 1.0 User Register Logic	
Test Scenario 1 With proper input	<p>Inputs:</p> <p>Name:abc</p> <p>Email: abc123</p> <p>Password: 123abc</p> <p>Confirm Password: 123abc</p> <p>Output:</p> <p>Success message is shown</p> 	✓
Test Scenario 2 With correct inputs	<p>Inputs:</p> <p>Name:abc</p> <p>Email: abc123</p> <p>Password: abc</p> <p>Confirm Password: 123abc</p> <p>Output:</p> <p>This error message is shown</p> 	✗

5.5.2 Test Scenario for Login

Test Case ID	T.1.0	Status
User Case Name	UC- 1.0 User Logic	
Test Scenario 1 With wrong input of both email and password	<p>Inputs: Email: abc123@mail.com Password: 123abc Output: This error message is shown</p> 	X
Test Scenario 2 With correct inputs	<p>Inputs: Email: admin@mail.com Password: admin Output: HomeScreen is shown</p> 	✓
Test Scenario 3 With wrong input of password only	<p>Inputs: Email: admin@mail.com Password: 12345 Output: This error message is shown</p> 	X

Chapter 6

User Guide

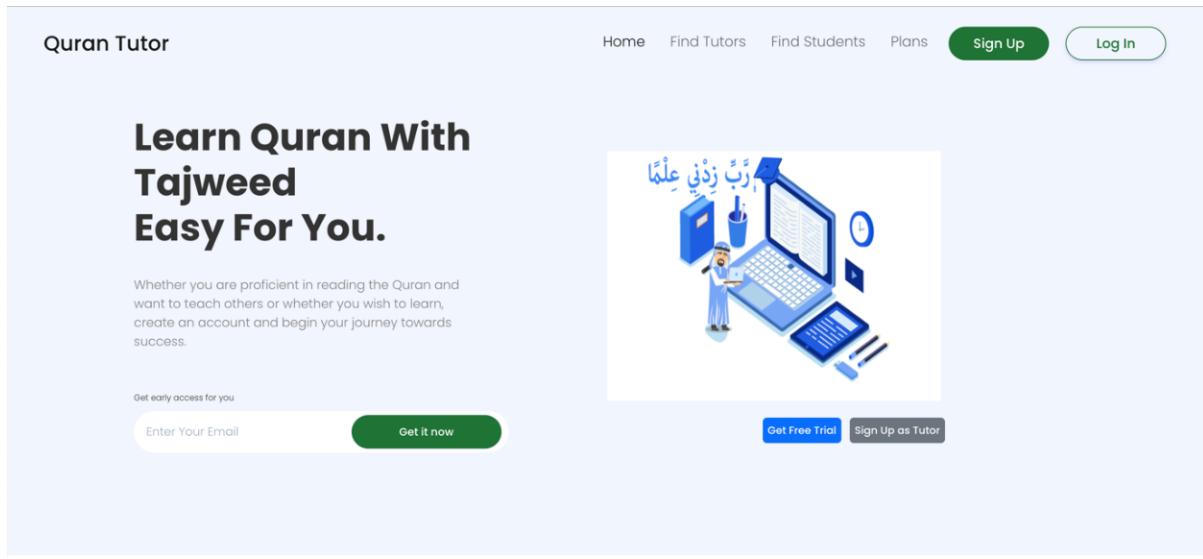
6.1 User Guide for Web App

In this, we explore the different user guide to the system. There some guide for the new user who is going to use our system at very first time.

6.2 Guide for Tutor:

For the tutor, he/she must be had to be registered in our system to use our best Online Quran Teaching System. To register as a tutor yourself, go to the website, click on sign up button from the menu, fill out the sign-up form accurately and click on sign up button to be registered. After successful registration, you can login into the system.to login, go to the login page from menu.

Homepage



6.2.1 Register Page for Tutor:

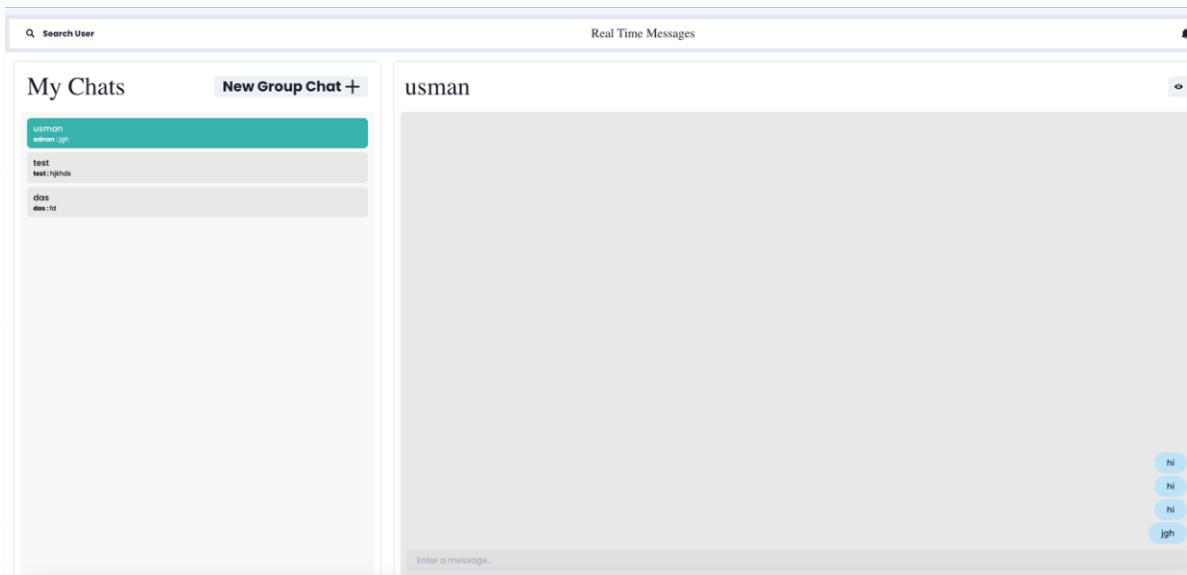
The screenshot shows the Quran Tutor website's registration page. At the top, there is a navigation bar with links for Home, Find Tutors, Find Students, Plans, a green "Sign Up" button, and a green "Log In" button. Below the navigation bar, the main content area has a heading "Register to get started". It contains several input fields: "Name *", "Email Address *", "Password *", "Confirm Password *", and "Upload your Picture". Each input field has a placeholder text and a "Show" link. A "Choose file" button with "No file chosen" is also present. At the bottom of the form is a blue "Sign Up" button.

6.2.1 Login Page for Tutor:

The screenshot shows the Quran Tutor website's login page. At the top, there is a navigation bar with links for Home, Find Tutors, Find Students, Plans, a green "Sign Up" button, and a green "Log In" button. Below the navigation bar, the main content area has a heading "Login to see more things". It contains two input fields: "Email Address *" and "Password *". Each input field has a placeholder text and a "Show" link. Below these fields are two buttons: a blue "Login" button and a red "Get Guest User Credentials" button. At the bottom of the page, there is a dark footer section containing links for Company, Download App, Useful Links, and Follow Us. The "Download App" section includes links for iOS, Android, and How to Use App?. The "Useful Links" section includes Find Tutors, Find Students, Read Quran, and Read Qaida. The "Follow Us" section includes links for Facebook, Instagram, YouTube, and Twitter. There are also download links for the App Store and Google Play.

6.2.3 Message Page for Tutor:

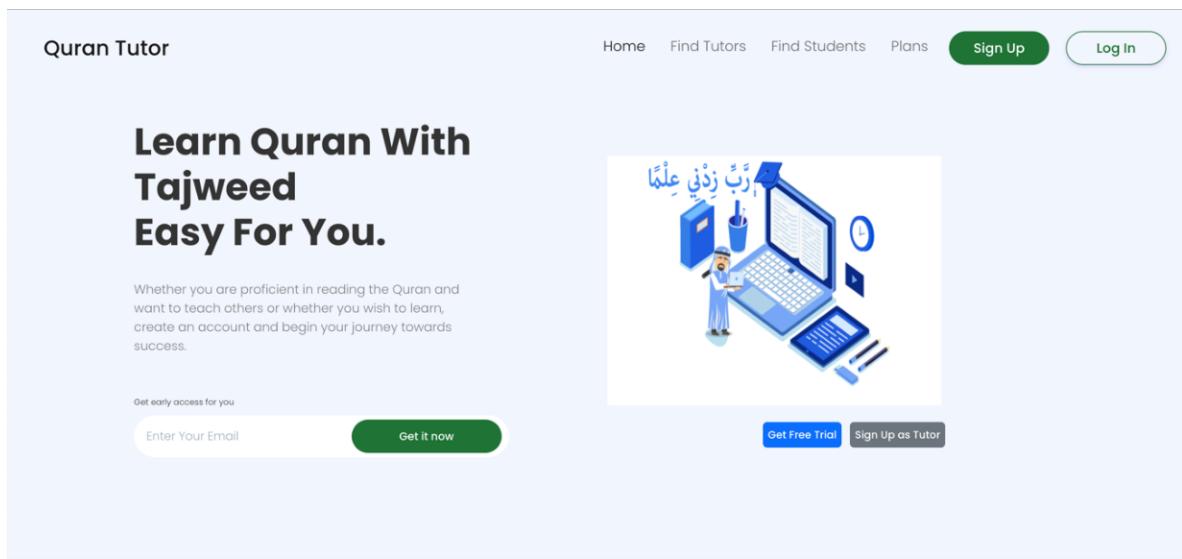
At this page, tutor can search for students from the upper right corner search box. Type a name and click on go button to search for any named student, after that tutor can see a list of registered students of that search name, select one of them and click on it to message him and see his further details.



6.3 Guide for Student:

For the student, he/she must be had to be registered in our system to use our best Online Quran Teaching System. To register as a student yourself, go to the website, click on sign up button from the menu, fill out the sign-up form accurately and click on sign up button to be registered. After successful registration, you can login into the system. to login, go to the login page from menu.

Homepage



6.3.1 Register Page for Student:

The screenshot shows the registration page for a student. At the top, there is a navigation bar with links for Home, Find Tutors, Find Students, Plans, a Sign Up button, and a Log In button. The main title "Register to get started" is centered above a form. The form contains fields for Name, Email Address, Password, Confirm Password, and Upload your Picture. A "Sign Up" button is located at the bottom of the form.

Name *	<input type="text" value="Enter Your Name"/>
Email Address *	<input type="text" value="Enter Your Email Address"/>
Password *	<input type="password" value="Enter Password"/> <input type="button" value="Show"/>
Confirm Password *	<input type="password" value="Confirm password"/> <input type="button" value="Show"/>
Upload your Picture	<input type="file" value="Choose file"/> No file chosen
<input type="button" value="Sign Up"/>	

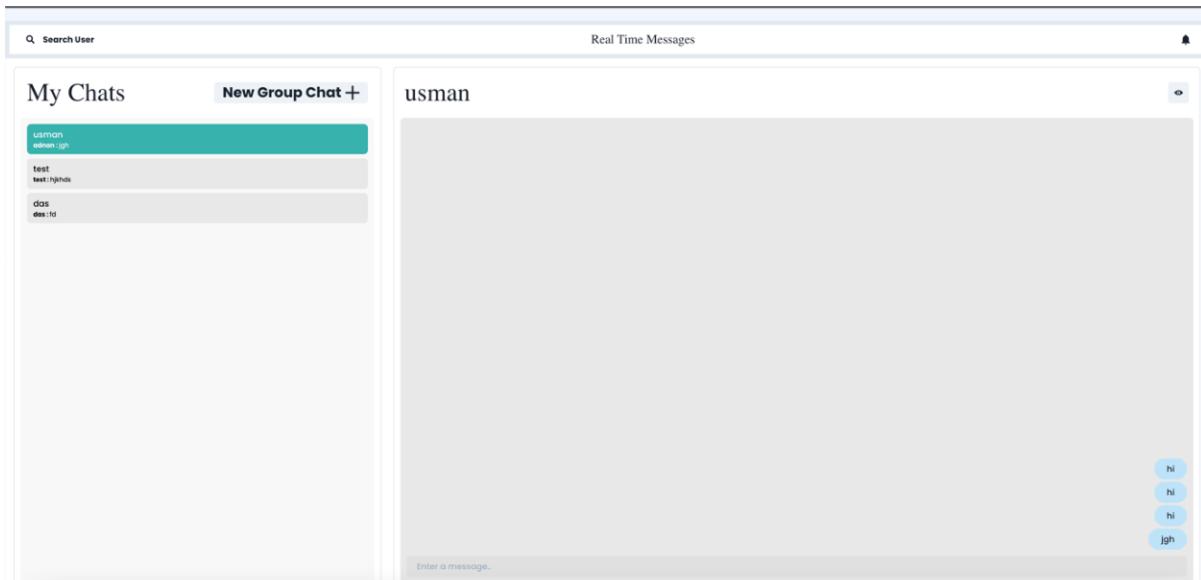
6.3.2 Login Page for Student:

The screenshot shows the login page for a student. At the top, there is a navigation bar with links for Home, Find Tutors, Find Students, Plans, a Sign Up button, and a Log In button. The main title "Login to see more things" is centered above a form. The form contains fields for Email Address and Password. A "Login" button is located at the bottom of the form, and a red "Get Guest User Credentials" button is positioned below it.

Email Address *	<input type="text" value="Enter Your Email Address"/>
Password *	<input type="password" value="Enter password"/> <input type="button" value="Show"/>
<input type="button" value="Login"/>	
<input type="button" value="Get Guest User Credentials"/>	

6.3.3 Message Page for Student:

At this page, tutor can search for tutor from the upper right corner search box. Type a name and click on go button to search for any named tutor, after that tutor can see a list of registered tutor of that search name, select one of them and click on it to message him and see his further details.



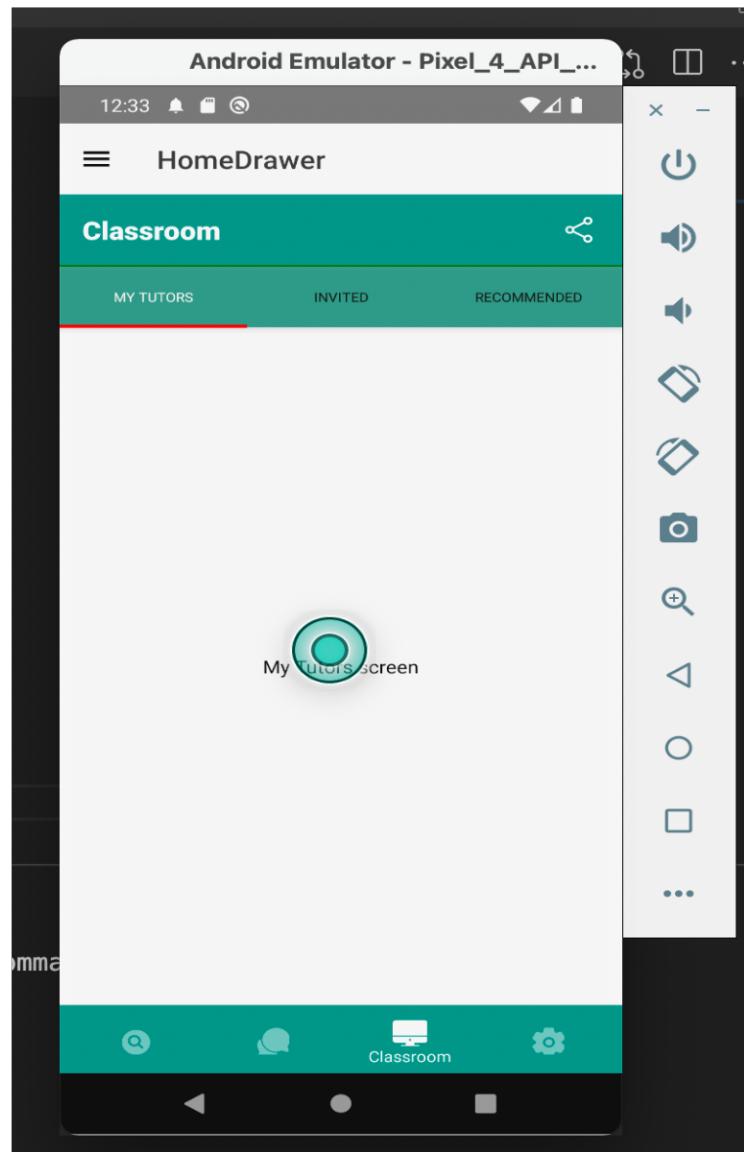
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In this, we explore the different user guide to the system. There some guide for the new user who is going to use our system at very first time.

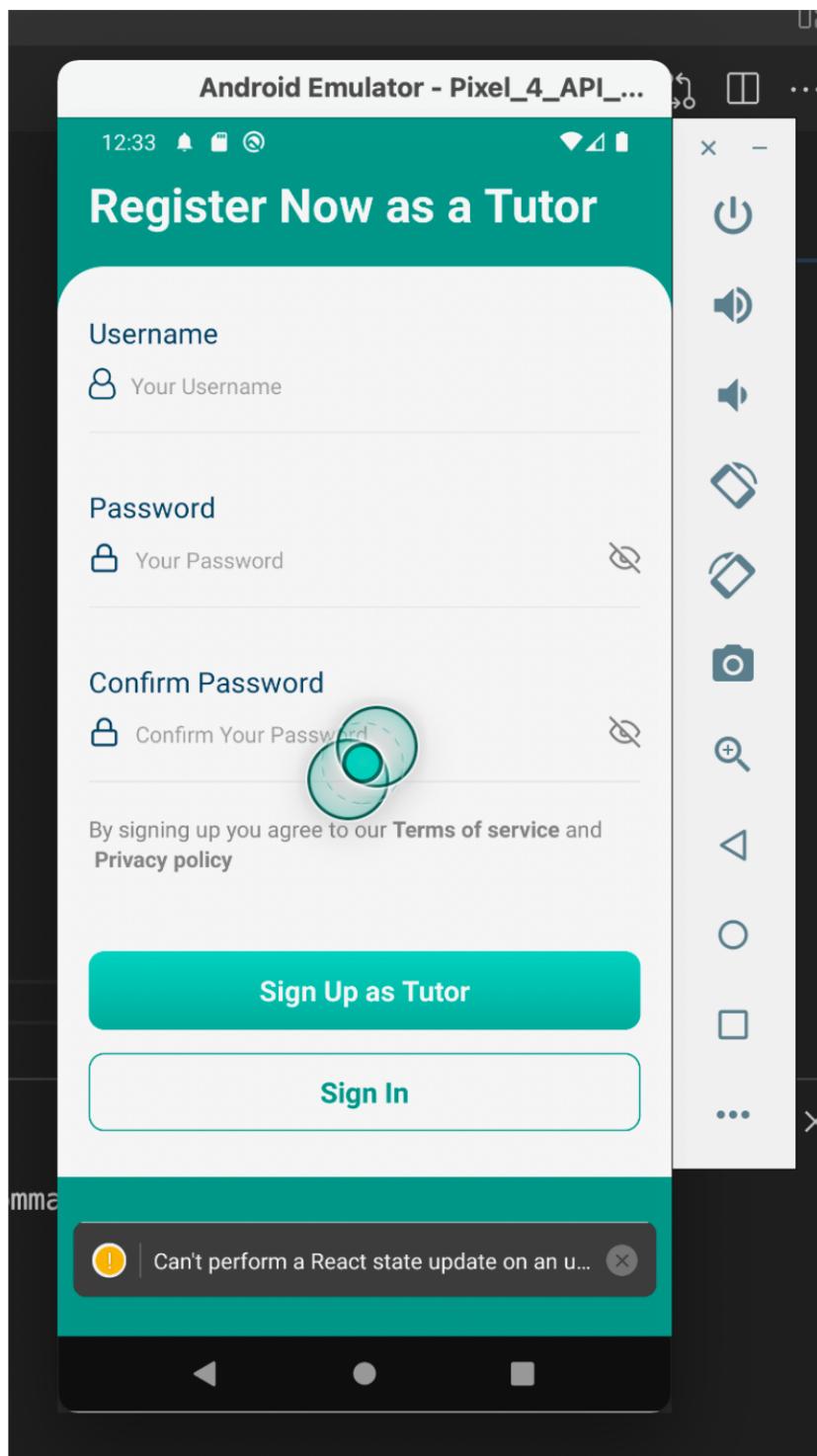
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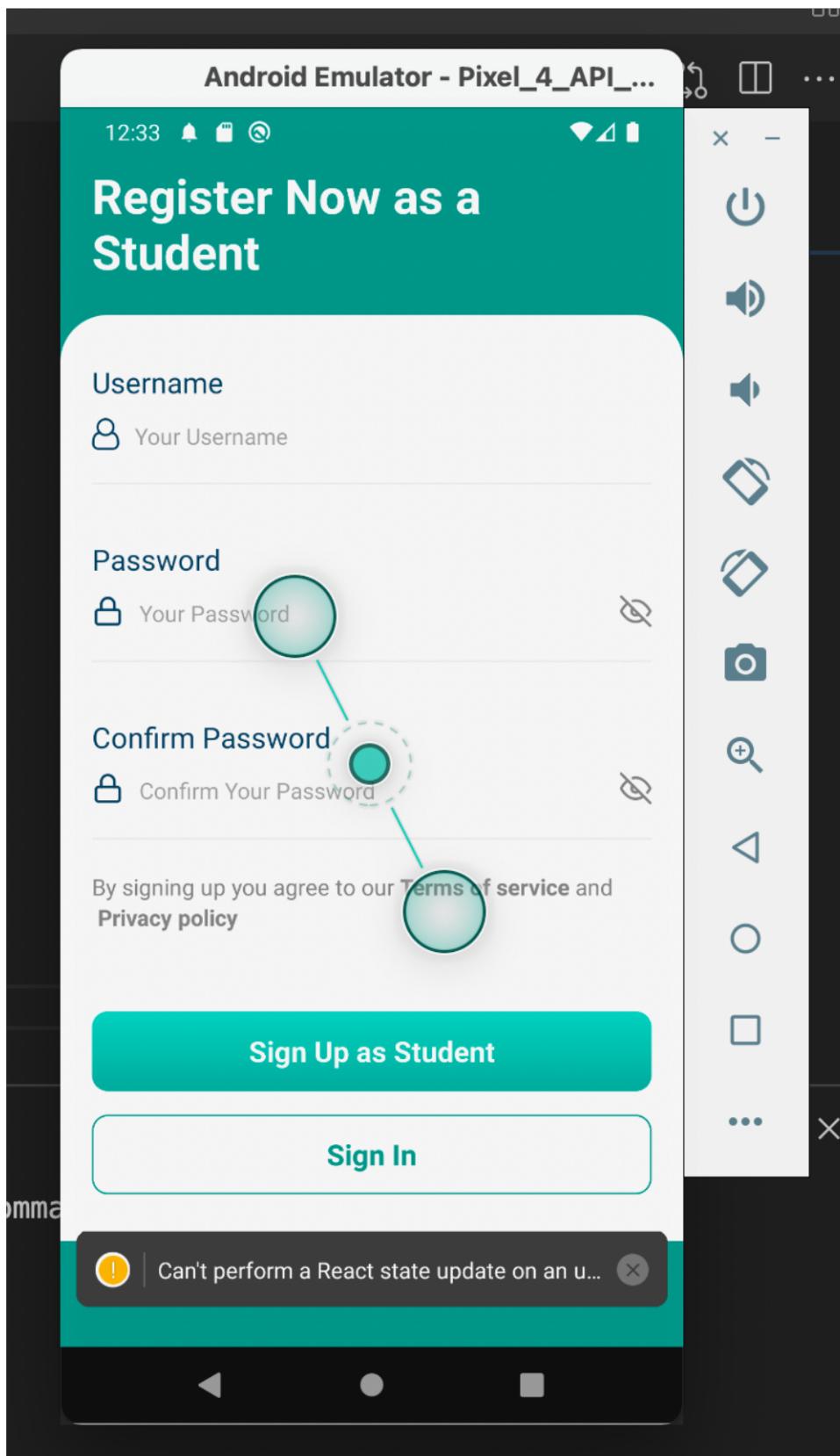
Homepage



6.5.1 Register Page for Tutor:

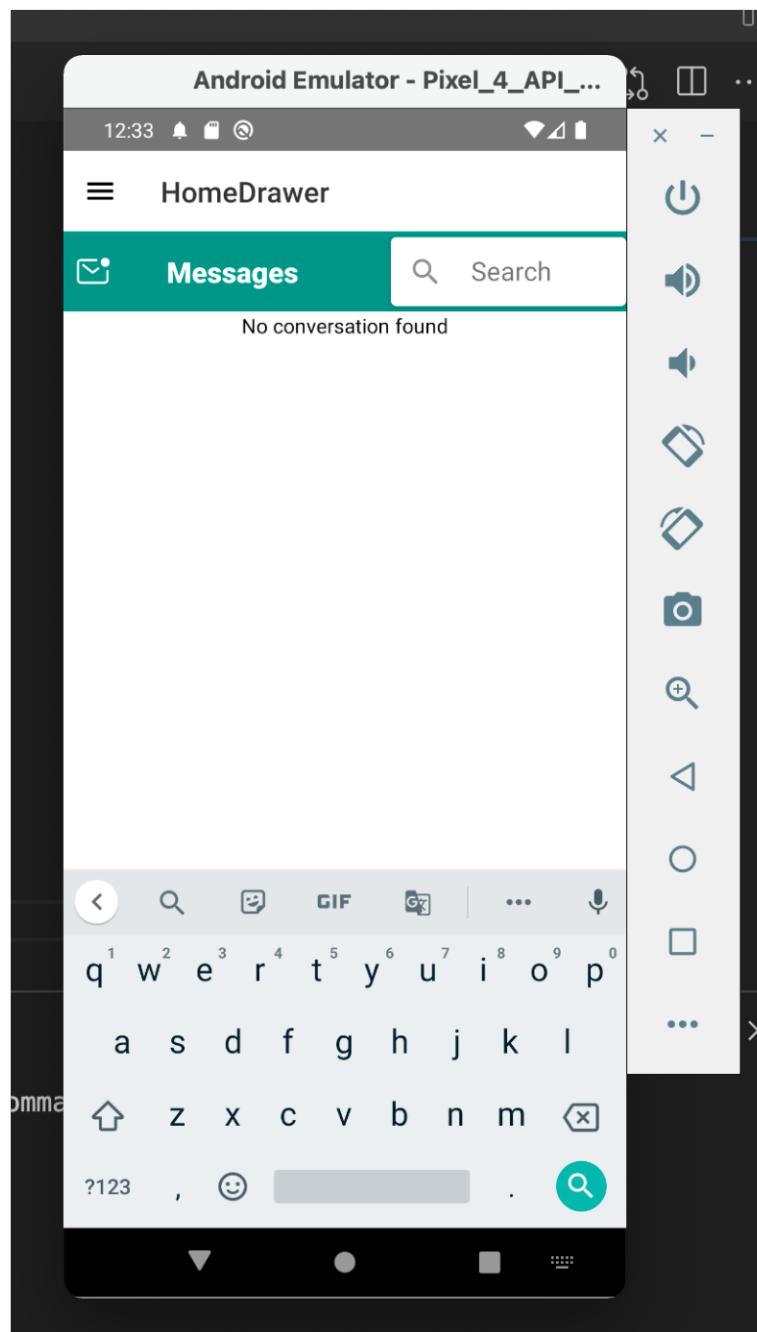


6.5.2 Register Page for Student:



6.5.3 Message Page:

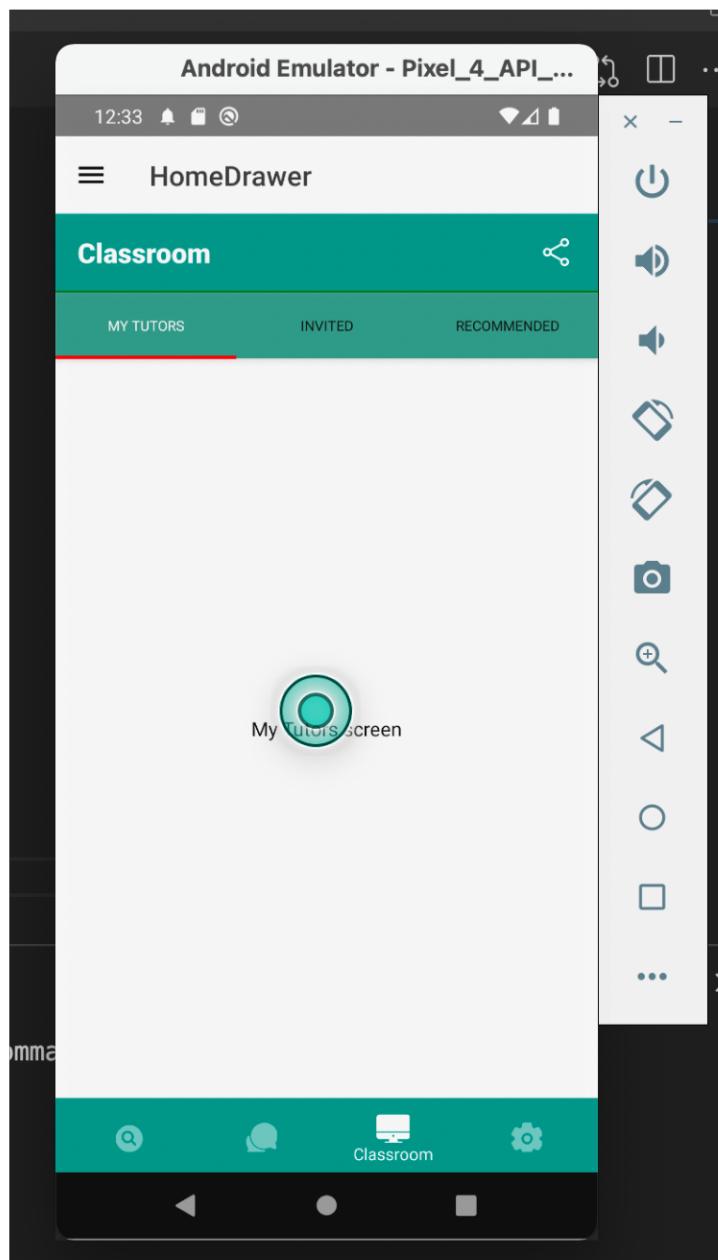
At this page, tutor and student can search for each other from the upper right corner search box. Type a name and click on go button to search for any named student tutor, after that tutor/student can see a list of registered students of that search name, select one of them and click on it to message him and see his further details.



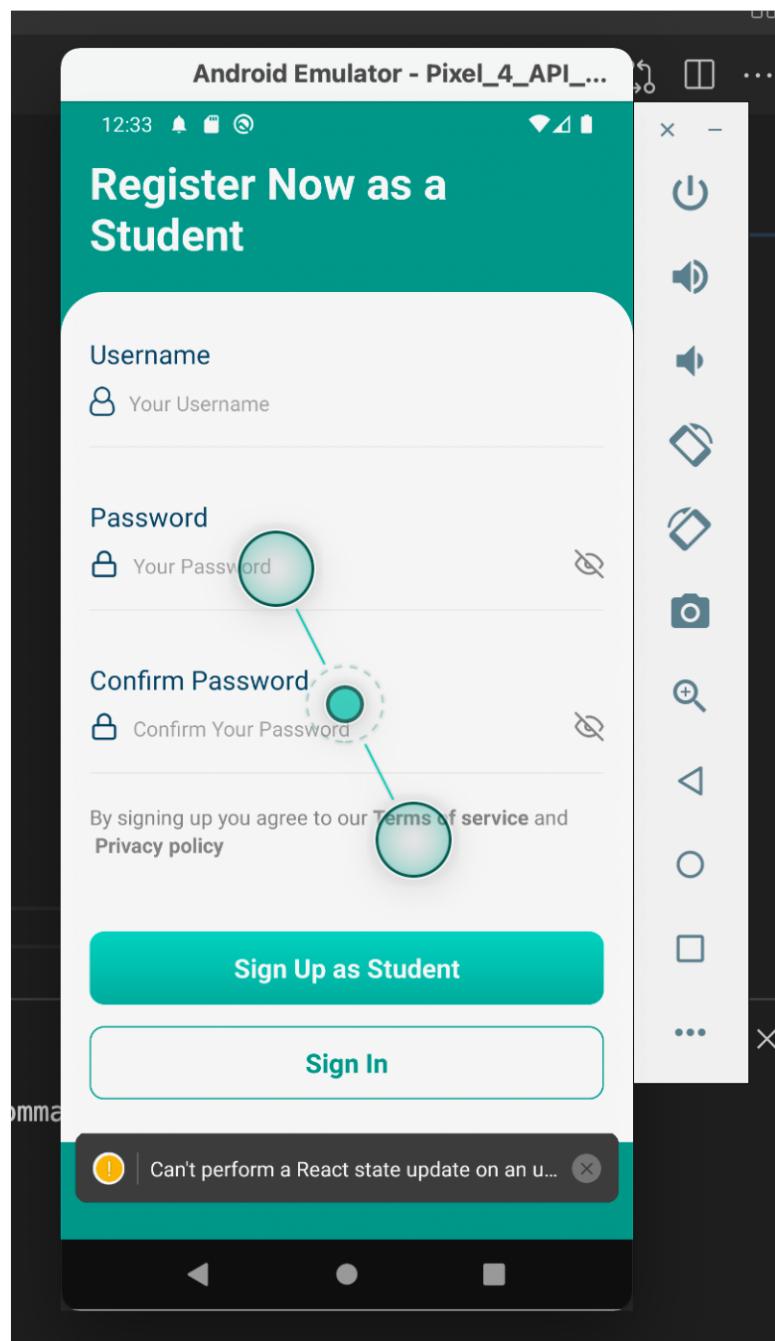
6.6 Guide for Student:

For the student, he/she must be had to be registered in our system to use our best Online Quran Teaching System. To register as a student yourself, go to the website, click on sign up button from the menu, fill out the sign-up form accurately and click on sign up button to be registered. After successful registration, you can login into the system. to login, go to the login page from menu.

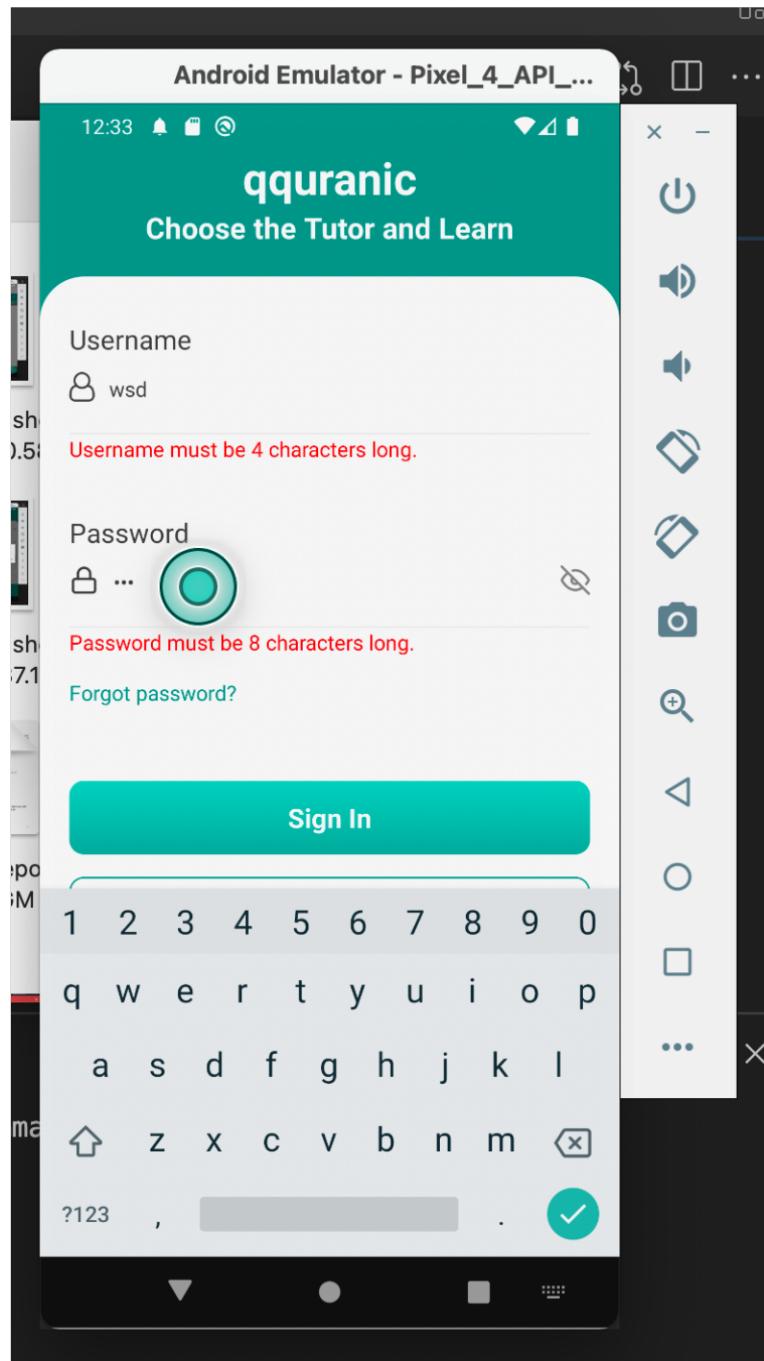
Homepage



6.6.1 Register Page for Student:

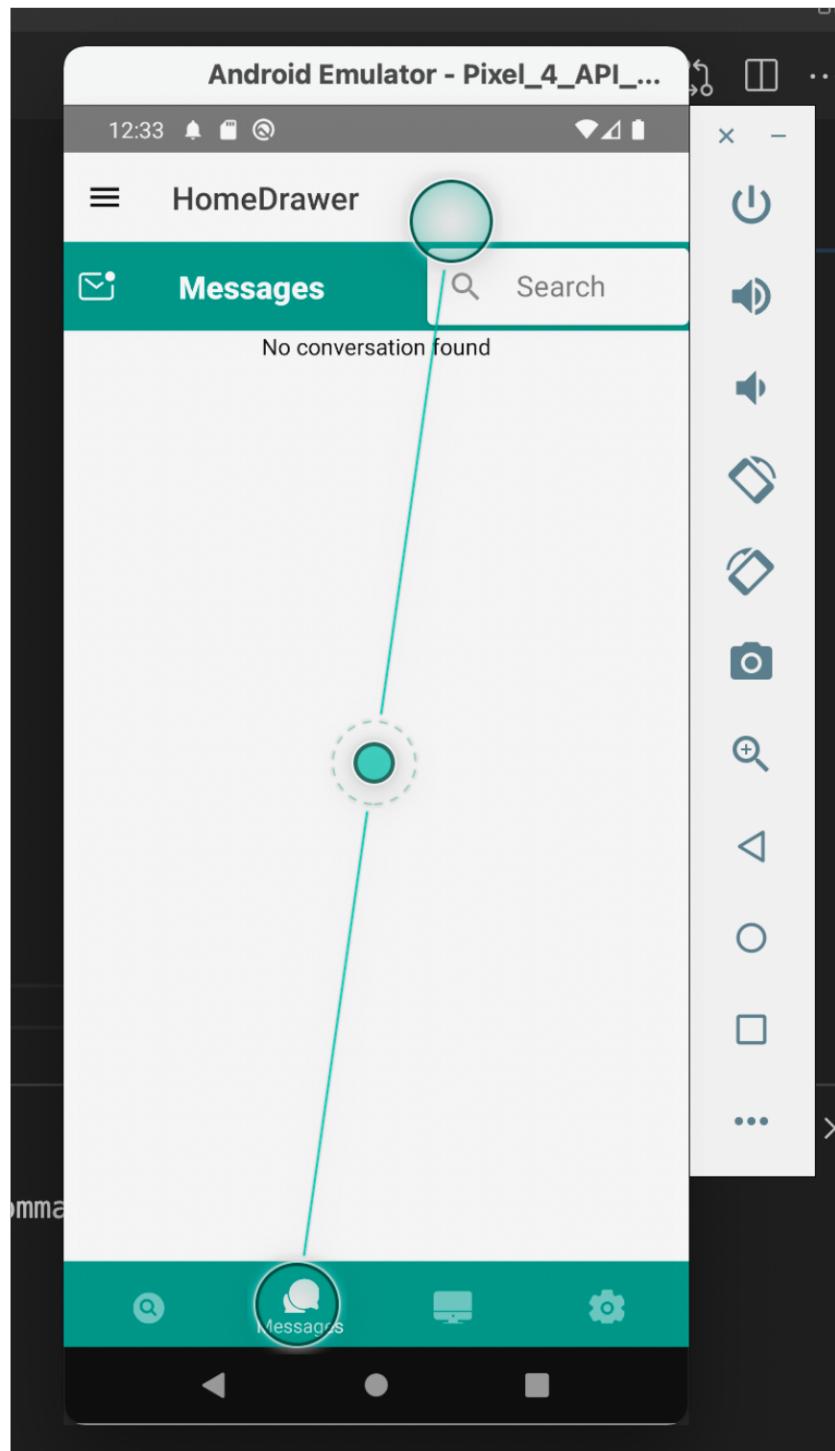


6.6.2 Login Page for Student:

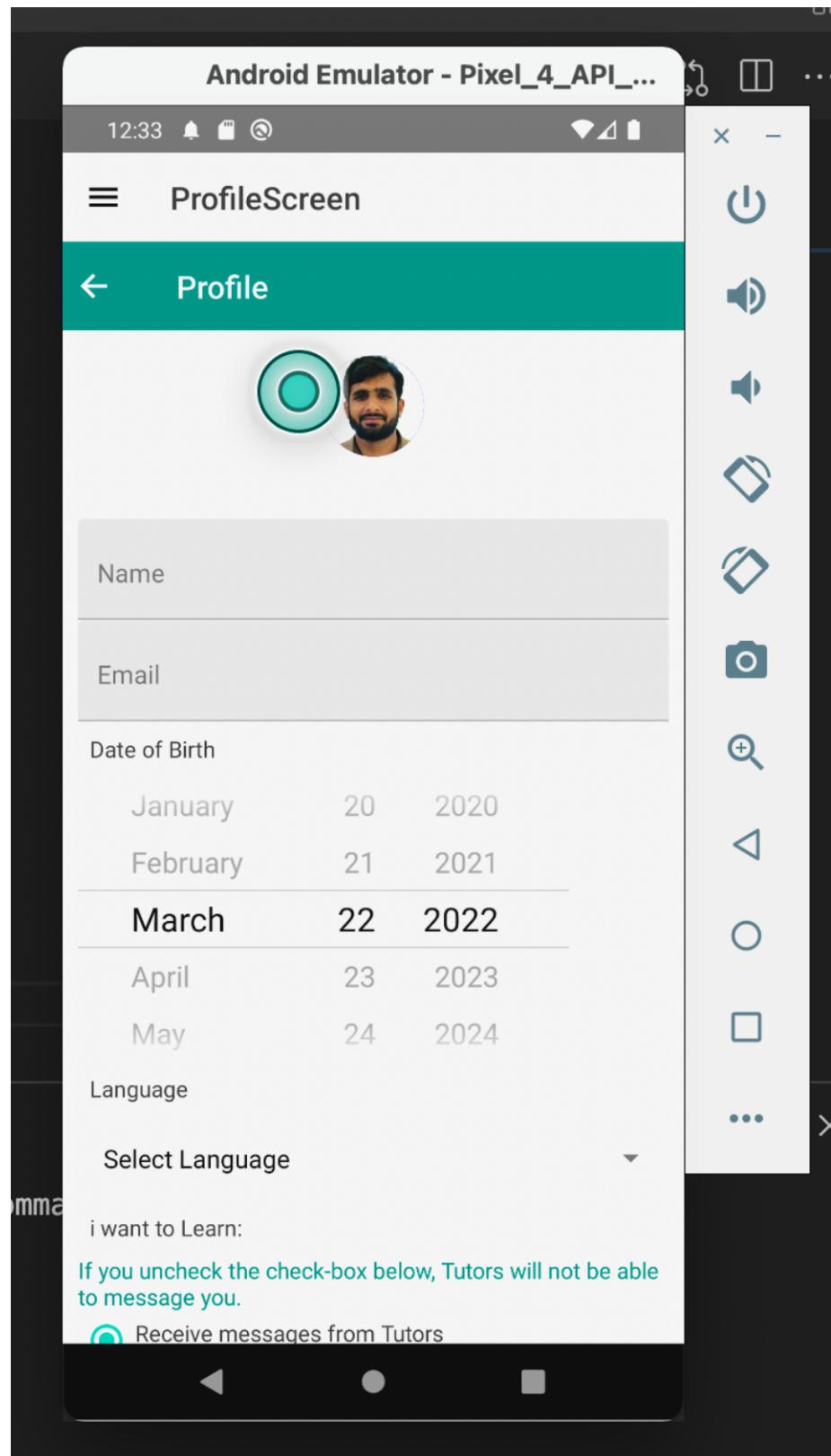


6.6.3 Message Page for Student:

At this page, tutor can search for tutor from the upper right corner search box. Type a name and click on go button to search for any named tutor, after that tutor can see a list of registered tutor of that search name, select one of them and click on it to message him and see his further details.



6.6.7 Profile Page:



Chapter 7

Conclusion

7.1 Conclusion

Online Quran teaching system is a complete solution for those people who want to teach and learn Quran online by sitting at their home. This will overcome the problem the people are facing by using the zoom, skype and WhatsApp for taking online Quran classes. Online Quran teaching system provide a one and only one system for a complete package of online Quran classes, because it has online registration and messaging feature. By using this system Quran teaching tutor and Quran learning student can find each other, communicate their self, and choose the right person to learn and teach on both of the Web App and Mobile App.

7.2 Future Works

In future we are working on this project to also include audio and video calling function in web app and also on mobile app to make a perfect and professional system and only one solution for Online Quran teaching system.

I am also trying to improve the UX/UI of both the web app and mobile app to improve the user experience and made th mobile app and web app simple as possible.

7.2 References

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- <https://nodejs.org/>
- <https://chakra-ui.com/>
- <https://socket.io/>
- <https://react-bootstrap.github.io/>
- <https://www.npmjs.com/>
- <https://www.npmjs.com/package/axios>
- <https://reactjs.org/docs/react-dom.html>
- <https://www.npmjs.com/package/bcryptjs>
- <https://www.npmjs.com/package/cookie-parser>
- <https://expressjs.com/en/resources/middleware/cors.html>
- <https://www.npmjs.com/package/dotenv>
- <https://jwt.io/>

- <https://mongoosejs.com/>
- <https://www.npmjs.com/package/nodemon>
- <https://www.heroku.com/>
- <https://reactnative.dev/>
- <https://www.npmjs.com/package/react-native-date-picker>
- <https://www.npmjs.com/package/react-native-gesture-handler>
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- <https://oblador.github.io/react-native-vector-icons/>
- <https://fontawesome.com/v5/docs/web/use-with/react-native>
- <https://reactnativepaper.com/>

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Who made this document:

Muhammad Adnan, Roll# LDBTT-17-81, BZU Lodhran Campus

Contact:

Email me at: mohammadadnangm@gmail.com

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Font-Size use of paragraph:

12pt

Paragraph Style:

Justify

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H1, H2, H3

Font-Size used for headings:

14pt – 16pt

Page Shadow Used,

Page Sections Used,

Page Number Used