MY MENTOR: AN ANDROID APPLICATION
FOR KNOWLEDGE SHARING AND SELF-LEARNING

BY

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This project titled **"My Mentor: An Android Application For Knowledge Sharing And Self Learning"** submitted by Raduan Ahamad, ID No: 191-15-12943, to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering (BSc) and approved as to its style and contents. The presentation has been held on *02/02/2023*.

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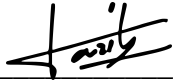**Associate Professor**
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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Md Azharul Islam Tazib, Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.
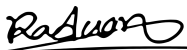
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Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

My Mentor is an application (native) based on the android platform. In the present world information is widely available, thus learning a new skill is easier than ever. But unstructured information often distracts the learner with too much information, which causes the learner to be overwhelmed and sometimes they end up failing to achieve their goal. And that is where this platform comes, It focuses on making the journey of a self learner easy by providing the necessary guidance when needed. The knowledge sharing platform will help learners to find a mentor who would instruct the learner, show a path that has already been experienced, mistakes that have already been made, so the learner doesn't have to repeat them. The platform also provides all the tools to establish forms of communication that a modern learner and an educator will require. The application also comes with features to regulate the users, their activities and the whole platform. Platform also enables a mentor to sell their courses or charge for their experience sharing. Social media based approach to spread knowledge will also allow to create communities for different domains of knowledge, then the tools will allow them to interact with these communities in a safe, secure and organized manner.

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CHAPTER 1

Introduction

1.1 Introduction

We are standing on the verge of the 4th industrial revolution. It will be about rapid development and changes in technologies. In the next competitive times it will take more skilled people to build our future. With the wide availability of information, gaining skill is more possible than ever. But still unemployment and lack of skill in available man power is an issue. The main reason is that even if the information is available, it doesn't make that learning process completely seamless. Unstructured information and too much availability of information makes the learning process confusing and the learners end up being overwhelmed. Sometimes people even quit pursuing their interests. Even if someone gains the skills and succeeds to meet their target, often it takes a lot of time because they have to find their way to success through trial and error. But shouldn't it be easy, less time consuming and fun for one to learn something as they already have their interest and passion in that particular field.

This project aims to solve one such issue that learners have been facing. The learners will have a platform where they can seek help for their specific problem and customized solution that will help them to overcome their specific obstacle that has been causing them to feel overwhelmed, losing focus and will save them time that they would have been figured out through mistakes and the valuable time will be used to learn further, allowing them to achieve more.

1.2 Motivation

In the world of automations jobs are constantly changing and becoming more challenging day by day. One must be up to date with the changing industry to be more professional and competent. Institutional learning is not enough, hence one has to be a self learner and constantly keep learning. History says it always takes 10,000 hours to master something. During that period of time one makes mistakes, finds their way of overcoming their problems. But in modern times we already have access to people's experiences. As all the mistakes have been made and a new learner doesn't have to repeat them. But where do

learners access these experiences in a structured way? That's what is the biggest motivation for the project. That a learner should be able to access structured learning and find customized solutions from experts who experienced these problems and their willingness to help a learner would take them far.

1.3 Objectives

There are thousands of people who have learned their crafts by themselves. People all around the world who run open source projects, NGO's and do charities. They are the example of society's volunteers. There are also so many web platforms where people get answers to their questions by people who are willing to help and explain their answers. The main objective of the project is to create a platform where such people who are capable and willing to help others and make them communicate to learners will be able to communicate with them effectively as well as in a structured way. The platform will also serve its purpose as a collection of tools to establish modern communication.

Another goal is to make a platform that can be used to monitor students and teacher communication. Such platforms are constantly needed as there are too many applications to maintain communication which creates a lot of ambiguity along with distractions, so a single platform that contains all kinds of tools to establish communication.

1.4 Expected Outcomes

The complete project will contain features that will allow a learner to join the platform with their virtual credentials such as email and mobile number. Both email and phone number verification will be available to ensure the security of the platform and will ensure secure communication between the users. The user will also get a guided tour of the platform through intuitive UI. After that the learner will be able to look for specific domain centrice mentors. The platform will mostly focus on different domains of IT technologies but it will be completely capable of sharing knowledge of non-technical domains as well. After that the learners will be able to communicate with their mentors of choice, following their activities. There will be different methods of communication such as: texting, video calling, file sharing, meeting with a huge number of people. Both the

learner and mentor will be able to create their own profile and upload data related to their progress. There will be different closed and open groups where multiple people can interact with each other. Certain mentors will be able to put their combined knowledge and experience on sale, there will be secured payment gateways as well. Security features like verification and authentication will be available as well. The admin panel will be able to monitor the activities and user based to regulate the safety of the platform.

1.5 Project Management and Finance

The project is a product based native android application which is Semi-Detached[1]. The core project management principles like feasibility study which includes operational, financial, technological along with project planning in accordance with SDLC have been followed.

Different Back End components of the project that required using many open source and premium SDK's, APIs, come with freemium plans like for example firebase's spark plan is free for hobbyist developers and small startups. But after exceeding a certain user number which is around 50,000-10000 the platform will start charging. But a platform with thousands of active users will be able to generate a few hundred dollars in review from different sources like the ad mob, revenue from users subscription model, using which these expenses can be paid off. Other expenses of the app and its components will be explained on the requirement analysis chapter of the report.

1.6 Report Layout

A simple overview and representation for easy navigation through the content of the whole project:

In **Chapter 1**, Introduction (Details about the project, its motivation and objective along with expected outcome).

In **Chapter 2**, Background (Project Background, Related Work in the Domain and Analysis Between Them, Scope of Problem, Challenges)

In **Chapter 3**, Requirement Specification (Requirement Specification)

In **Chapter 4**, Design Specification (Design Specification of Front and Back End and the UI/UX)

In **Chapter 5**, Implementation and Testing (Implementation of Design and DB)

In **Chapter 6**, Impact on Society (Impact on Society and Environment)

In **Chapter 7**, Conclusion and Future Scope (Conclusion and Scope for Further Development)

CHAPTER 2

Background

2.1 Introduction

Even a decade earlier there are not many different domains in professions but that is being changed, thanks to the present trend of automation which is changing existing jobs and continuously challenging the professionals. But in the present world most booming domains are the development of technologies for various fields of application that directly benefit the consumer end. One such profession is software development and engineering. It is said that Computer Science and IT is the second most [2] desirable and demanding major in the world among college going students. Thanks to its flexibility many existing professionals are considering a career change. Which makes this profession even more competitive. There are different roles in this profession which requires extensive knowledge and experience to fulfill these responsibilities. For example a software engineer needs in depth knowledge of Data Structures and Algorithms, System Designs concepts. Which can be learned from books like Introduction to Algorithms[3], System Designs[4]. For Network Engineers they need skills related to server side operating systems and networks. But only reading does not bring the ultimate skill set in one's journey towards their dream. They need constant support that are mostly regarding their specific path wise problems which need customized solutions from experts. Existing platforms have these gaps where information is not available in a structured manner and the available means of communication are not practical enough. This project aims to solve this particular problem and completely eradicate the gap for self learning.

2.2 Related Works

The 21st century is witness to never seen approaches to learning. Technological approaches like the use of AR [5], VR [6] are changing education. One such approach is the domain of EdTech [7]. It means the implementation of technologies in the classroom or outside of institutional learning to educate people. In the same domain there are many available platforms that focus on using tech to teach. Many platforms bring classrooms and university-like alternatives to online, like Coursera [8], LinkedIn Learning[9] are

available. But these platforms have courses that take months to complete and the cost of these courses can go up to thousands of dollars. Often they don't provide every single knowledge one needs to be employable, hence one need to pursue self learning. There are also platforms such as: Quroa [10], Stack Overflow [11], Chegg [12]. The MOOC (Massive Open Online Courses) platform unites teachers from top institutions that are best in academia and students from different countries can learn from them without having to relocate. These platforms also have benefits like scholarships and aids for students from developing nations.

Platforms like Quora work in a Question-Answer pattern, where students or people from different backgrounds with different interests can ask questions and available users with knowledge about that topic will answer the questions. Platforms like Stack Overflow, which is also Question-Answer based and aims mostly for professional programmers and enthusiastic learners. But this site is a part of many similar platforms of the Stack Exchange Network. Similar sites to the Stack Overflow are Math, Physics, English and many more, all the are part of the Stack Exchange Network. Similarly chegg also provides similar features that helps students with their homeworks. Experts from different fields help them with their queries and the solved results may become open or can be accessed by buying their subscription.

All these above services are very similar to My Mentor and carry similar missions but with different approaches. The sole purpose of the project is to reduce the gap and take these approaches one step further to ensure better learning for the learners who prefer self learning.

2.3 Comparative Analysis

Earlier the gaps between available platforms and solutions has been discussed. They are more likely to create even more confusion between learners, the platforms that actually provide solutions have their limitations. Such as Stack Overflow where we often get the solutions but the methods to communicate creates a lot of ambiguity. Other platforms solely focus on solving problems regarding technical issues that professionals face on

their daily to daily basis specifically while playing their job roles. On the other hand My Mentor completely focused on solving problems that a self learner faces. For example a university student who may have joined some engineering department. It often takes the first year of university to figure out what actually will be preferred as a career after graduation. After that learning a skill that interests them along with their existing traits. Even if they decide all these by themselves without wasting time, getting started and reaching a competent level will take them a lot of time. Let's say a student aimed to become a developer, he googles and immediately he becomes overwhelmed by questions like what kind of development field to pursue (Mobile, Web, Desktop), after that what kind of stack? Is it native or hybrid? What languages should they learn? What library and Frameworks should they learn first. Sorting out all these confusion and finally learning to create skill sets takes a lot of time and effort. And the learner ends up achieving less.

But a platform like My Mentor will provide them the necessary guidance and tools to solve problems and maintain communication. On a regular day users use different apps to video chat, share files, video conferencing, sharing works and taking feedbacks. All these different tools create even more ambiguity. My Mentor also focuses to solve these problems by combining all these necessary tools that a modern learner will require.

2.4 Scope of the Problem

The scope of this project specifically focuses on students and enthusiastic learners who passionately and actively learn to develop an existing skill or some new skill that requires special attention. They will be able to find guidance and solutions that show them a direction toward which they will continue learning but not anything regarding a technical problem or help to solve a homework or assignment. Project scope also focuses on building a platform where students and mentors can communicate with each other. All types of communication such as texting, video call, video conferencing, sharing contents with larger groups, streaming from the internet, all these features would have been available by using different tools and applications. But the application will contain all these tools. This will make focusing and communication much easier. There will also be features like a marketplace, where a mentor can charge and sell their experience. In

online market places there are consultants who provide consultancy on a particular niche the platform will be appropriate for them as well.

2.5 Challenges

The application is a Semi-Detached type of project as it has a certain level of complexity along with proper guidance required by experienced people. Even if they are overcomed one of the biggest challenges will be that after creating the project, onboarding the correct user base and most importantly the correct mentors. Successful platforms like Quora and Chegg have problems like validating correct answers as well as facts. There could be misleading information which can seriously affect the learning process and further decision of a learner.

This challenge can be solved by creating awareness about the right and wrong kind of users who will be volunteering for help to the learners. Learners should ask for help from mentors who have completed and valid profiles. There also could be a machine test which will test a particular mentor's knowledge of their related field. Most importantly, logically thinking before considering a mentor's advice and help would be most appropriate. This way the learner will be able to differentiate between good and bad advice from mentors.

CHAPTER 3

Requirement Specification

3.1 Business Process Modeling

A Business has its process, services and activities. All the logical sequence of any business's events which results in them successfully providing their services and continuing with their mission are their business processes. However a business process modeling diagram is a depiction of all the sequence of events, one after another which explains the execution process of a business. The following is the business process modeling diagram of My Mentor application:
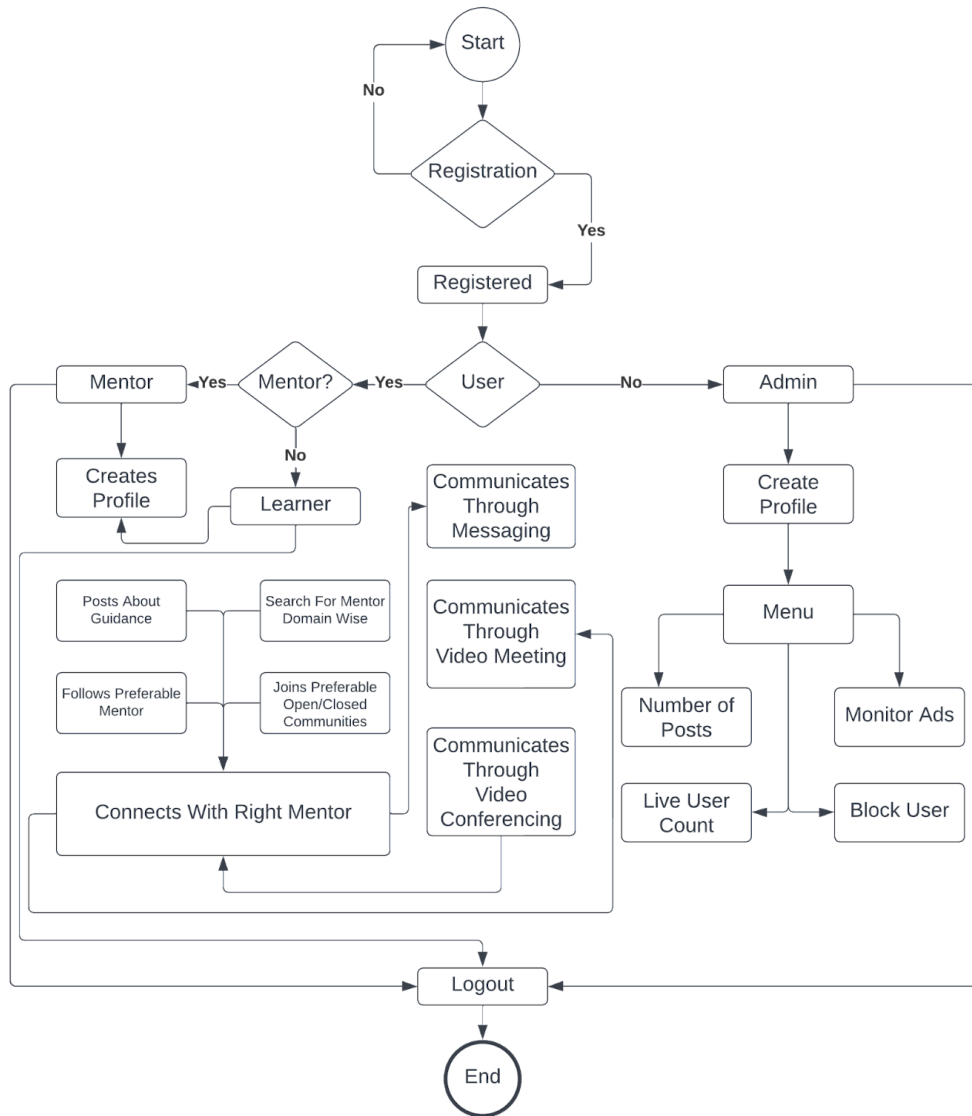
Figure 3.1: Business Process Model Diagram of My Mentor

3.2 Requirement Collection and Analysis

One of the most important stages of the Software Development Life Cycle is Requirement Analysis. This ensures the feasibility of any project. My project is based on the android platform. There are a whole lot of things to research and consider before developing the project.As our main user base will be the self learners of different ages and professions with different backgrounds, we are considering thoroughly all the requirements of them. The most important functional requirements for the project are:

- The process of registration and verification is crucial.
- Login with mail and phone number.
- Authentication handling.
- Personal information to use the platform.
- Ensuring the security of shared personal information.
- Feature for posting and requesting help on a particular domain.
- Ways to interact with the posts through commenting and expressions.
- Availability of modern communication methods for users.
- Reward mechanism for gamifying helping process.
- Users should be able to follow each other.
- Searching options for existing users and posts on the platform.
- Ensuring the safety of the platform.

Technologies and tools required for development of the platform:

- IDE: Android Studio.
- Programming Languages: Java and XML.
- Database: Firebase Database and Firebase Storage.
- SDK: Agora for video meeting features.
- Adobe XD for UI design.
- Android devices for application testing.

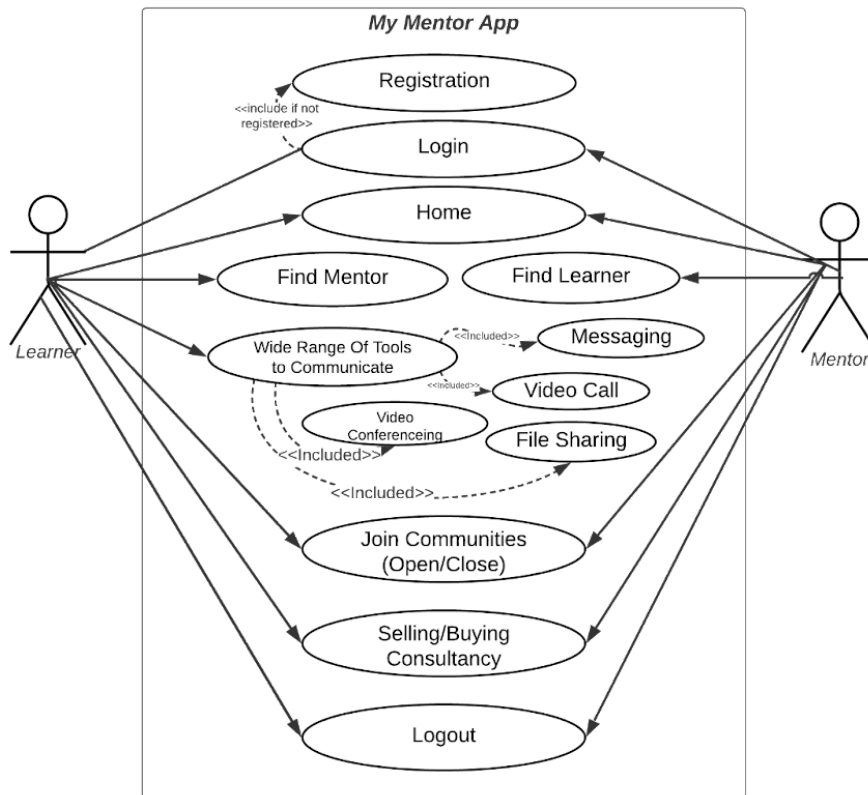## 3.3 Use Case Modeling and Description

Figure 3.2: Use Case of My Mentor

Description of Use Case:

Table 3.1: Use case description for Authentication

Use Case 1	Login.
Actor	User.
Secondary Actor	Application.
Pre-Condition	Completion of account registration.
Scenario	Provide email and password through edit-text.
Post-Condition	1. Proceed to profile creation. 2. Completion of learner/Mentor profile.

Table 3.2: Use case description for Authentication

Use Case 2	Finding Mentor/Learner
Actor	User.
Secondary Actor	Application.
Pre-Condition	1. Completion of account registration 2. Completion of profile.
Scenario	Searching and posting about consultancy.
Post-Condition	1. Going to their profile 2. Starts following. 4. Able to interact. 3. Start communicating.

Table 3.3: Use case description for Authentication

Use Case 3	Communication..
Actor	User.
Secondary Actor	Application.
Pre-Condition	1. Completion of account registration 2. Completion of profile. 3. Connecting by posting-searching and following.
Scenario	Communicating using different ways of the application.
Post-Condition	1. Messaging. 2. Audio/Video calling. 3. Arranging meetings. 4. File sharing.

As we know use cases define the scenario where the software system will be used and who will be interacting and responding. The successful interaction of them ensures the success of the system. The above mentioned use cases are few of the core features of the system My Mentor. These use cases, along with intuitive user interfaces and fast, responsive applications will ensure the proper functioning of the features. Most of these above mentioned use cases will be implemented by the back end of the application.

3.4 Logical Data Model

Data could be stored in a relational database, NoSQL database, through XML tags or in many forms. A logical data model is a visual representation of how data and attributes are managed and interacted with throughout the application to successfully develop it. In this particular project three important things were required. Object oriented programming languages which will be able to work with real world data, a database to hold NoSQL data and a storage to store rich files like images and videos. Also needed frontend language by using which the front end will be created and the user will interact with to provide the data. In this project I used Java as the object oriented programming language, Firebase database and storage to store the data and XML to take input from the front end. Below is the logical data model of My Mentor:
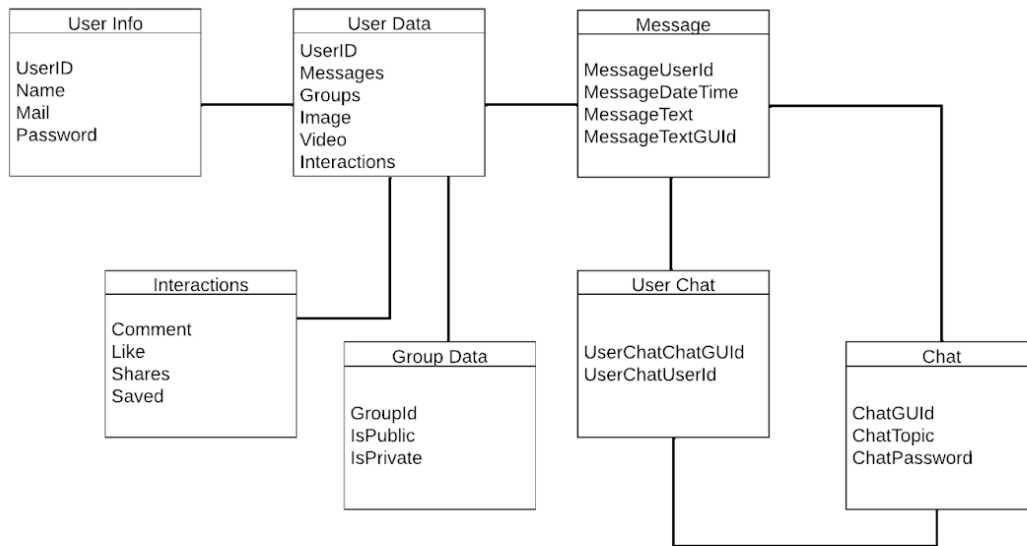
Figure 3.3: Logical Data Model of My Mentor

3.5 Design Requirement

Design is one of the most important parts of the project. Before developing the front end we must collect all the necessary design requirements. For our particular project where use will mostly interact with the front end of our application which makes the design even more important. The most important design requirement for My Mentor are:

- Easily navigable UI about the various registration processes.
- After onboarding the platform there should be an interactive tour of the tools available.
- Users should be able to differentiate between types of open and closed groups of different domains.
- There should be support for multiple types of language and switching between them should be easy.
- Users may change their profile information over time, so that process should be less complicated.
- The settings of the application should be designed in a manner that non-technical users can understand.
- In the course marketplace, users should be able to see enough details so that they can consider before buying.
- Color code should not be flashy so that it doesn't trigger people with special needs.
- One of the main purposes of the application is to reduce distraction for the users so the design should represent that.
- The design of scheduling video calls, video streaming, making podcasts should be easy and navigable.

Our aim while designing the application was to make it less distracting and learners of all backgrounds and age should be able to navigate with ease.

Chapter 4
Design Specification

4.1 Front-end Design

There are different components of an application. Out of which one of the core ones is the front-end. No matter whatever is happening in the background the front-end is the part that is visible to the user. An appealing user interface controls a lot of things, for example the interaction time, user experience, usability of the features. Upon researching the design of the front end I have gathered requirements and based on which the UI and front-end was designed. The following figures are few of the core front-end design of My Mentor application:
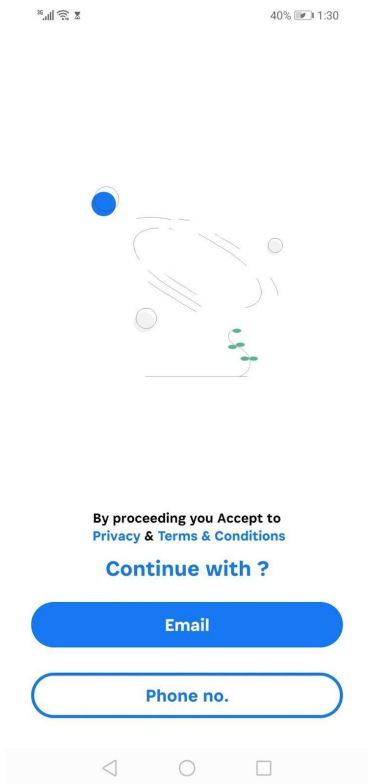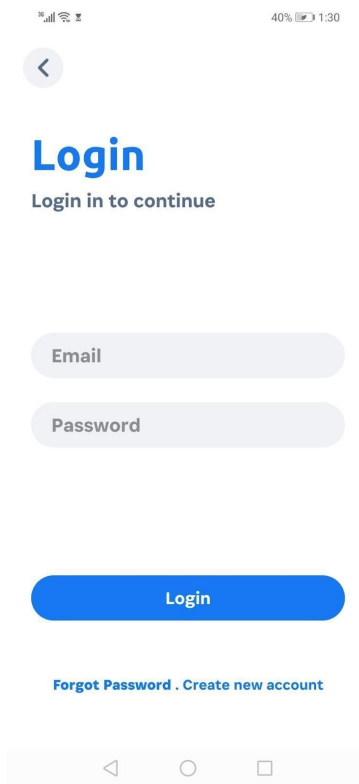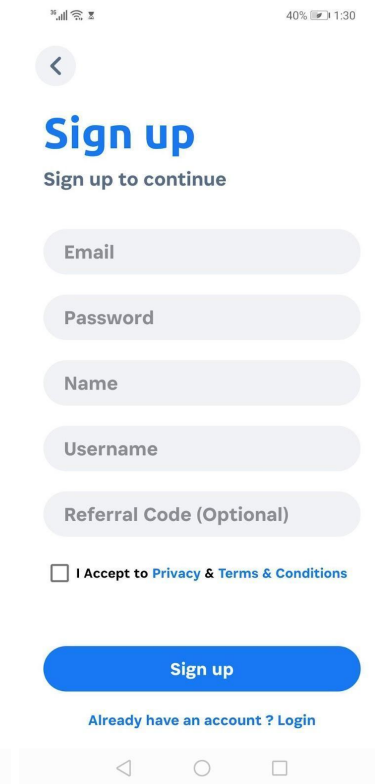
| Figure 4.1 | Figure 4.2 | Figure 4.3 |

Upon launching the application the user will see the splash screen, which will give the app time to initialize different states, then the user will be greeted with options to login (Fig 4.2), signup (Fig 4.3) and if they are existing users who have forgot password then they will be redirecting to a new activity that will allow them to reset new password(Fig 4.4).
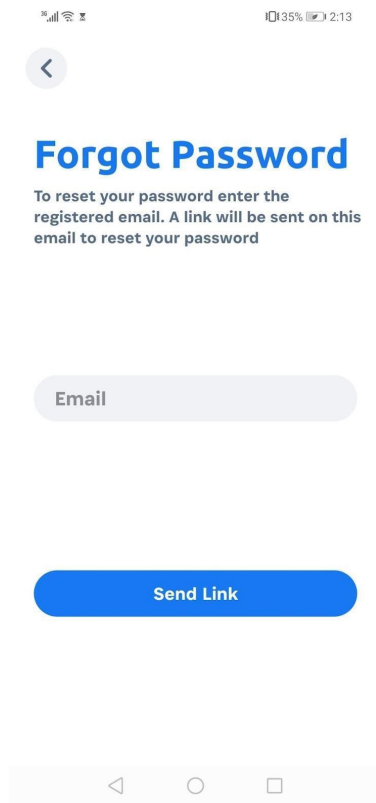
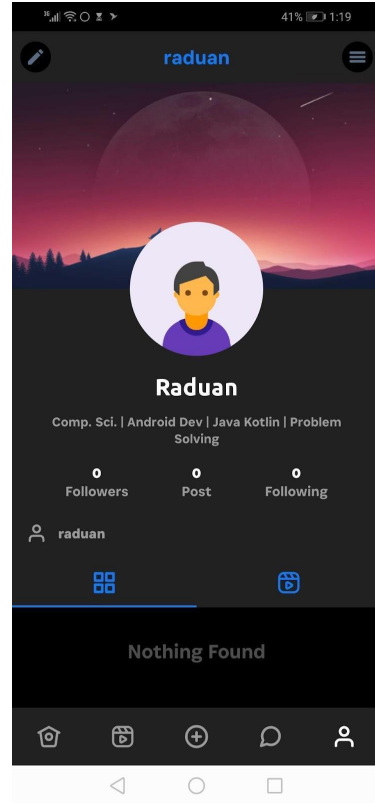Figure 4.4   Figure 4.5   Figure 4.6

After successfully registering, logging in, resetting password the user will be greeted to the home feed of the application (Fig 4.5). By clicking on the profile button they will be able to navigate to their personal account profile (Fig 4.6). Where they will be able to upload their personal information like photos, cover pages. One of the most important sections of this activity is the bio. There they can put related information that defines what are their interests, what is that they are pursuing, based on these they will be able to connect with fellow learners or a potential mentor who can consider helping him based on the information and his personal skills.
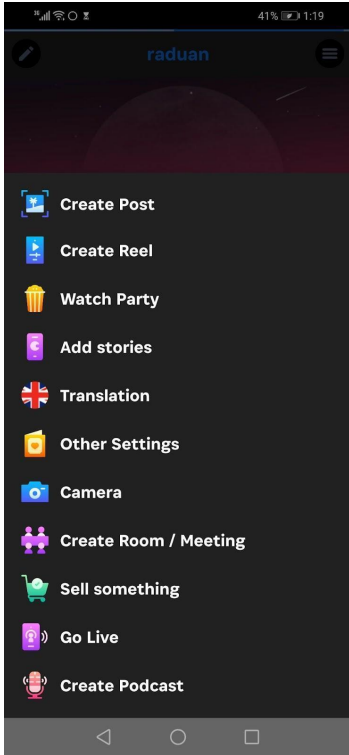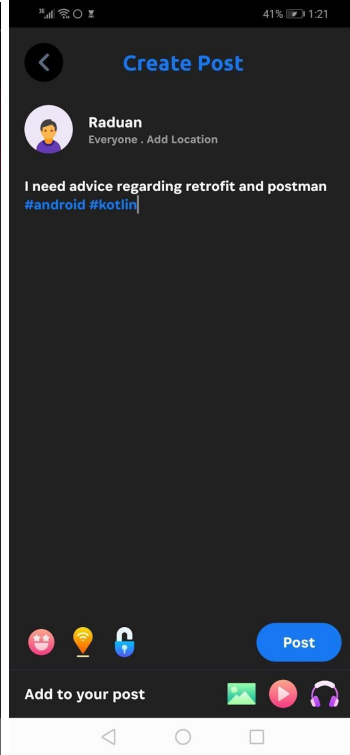
Figure 4.7   Figure 4.8   Figure 4.9
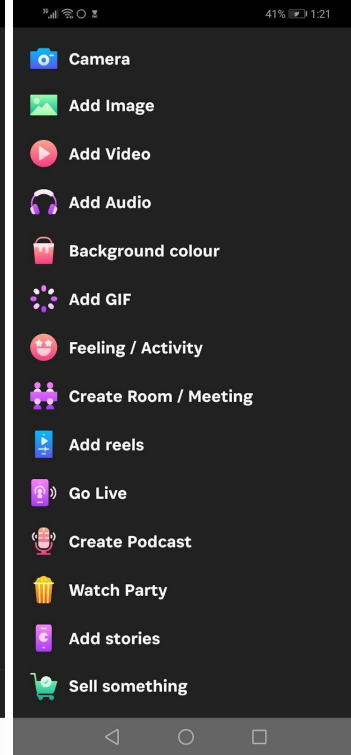

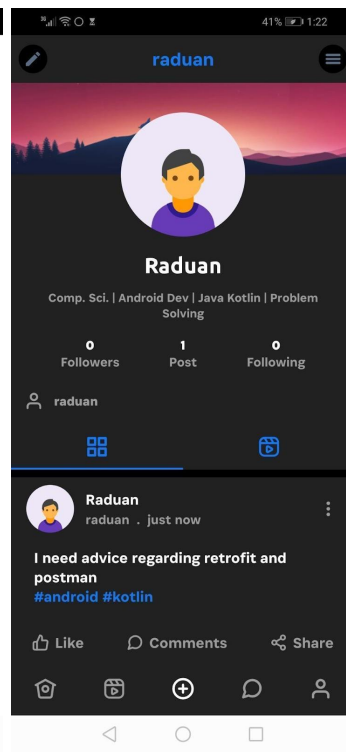Figure 4.10   Figure 4.11

One of the core features of the application is asking for help where it is reaching out to the potential mentor. Such a post may need a lot of information. An user may upload a recording, video, images, location, mention a hashtag. The app will have all these ways. By pressing the plus button (Fig 4.6) users will be able to create posts. These posts can be posted on their personal profile, in open or closed groups. Upon posting potential learners or mentors will be able to interact with each other and with the communities by posting comments and expressions (Fig 4.12). There will also be features to get notified about posts and interactions (Fig 4.13).
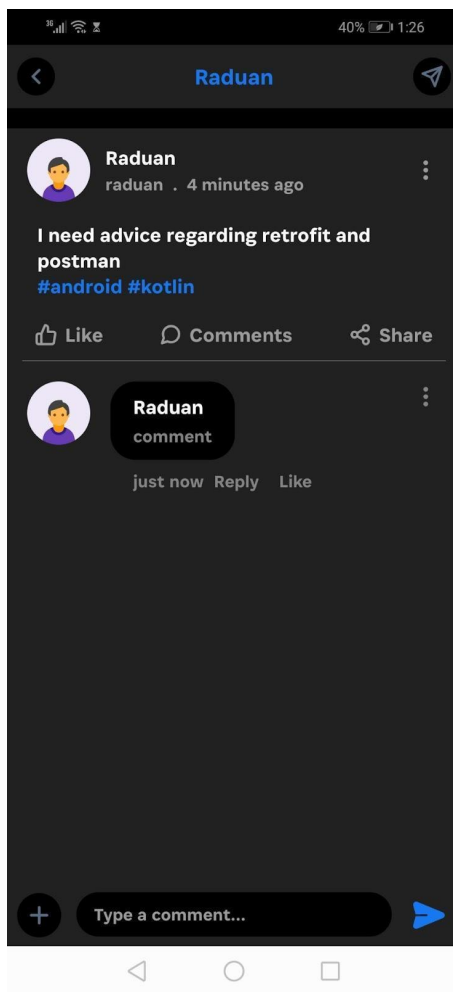

Figure 4.12   Figure 4.13
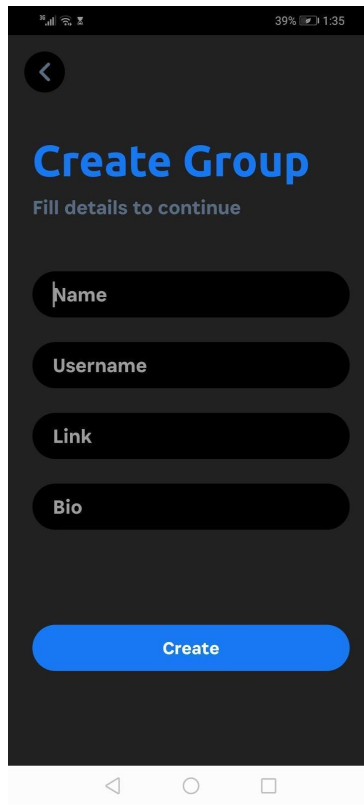
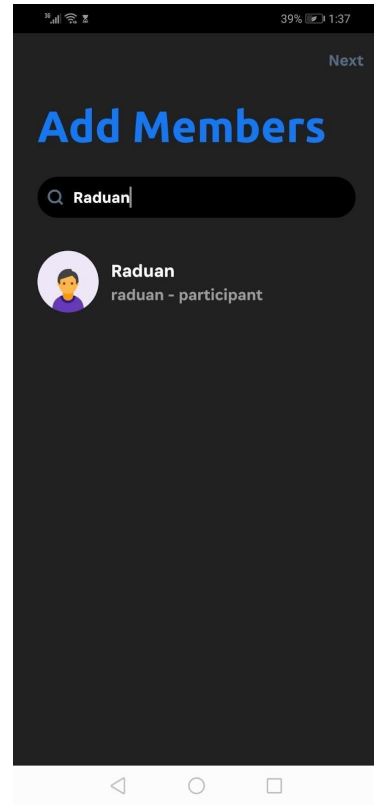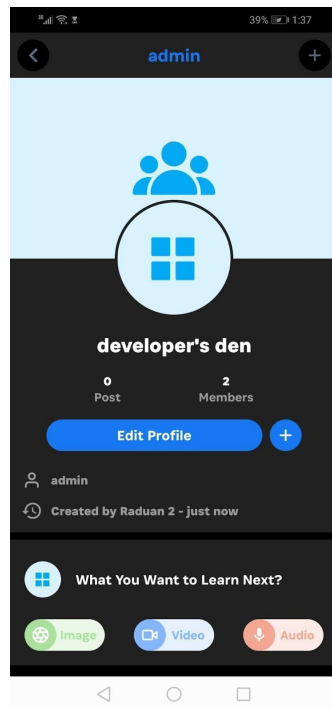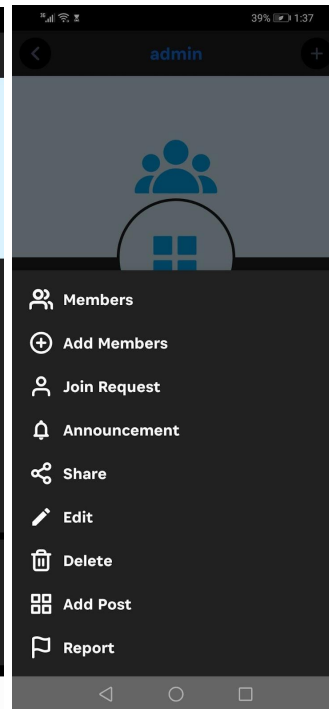Figure 4.14   Figure 4.15   Figure 4.16

Figure 4.17   Figure 4.18

Another core feature of the application is the communities. Humans are social beings and they can't live isolated. Especially when they are learning in a community it inspires us and sometimes that's what keeps us going toward achieving our goals. In My Mentor application we can create open and closed communities (Fig 4.17). Open communities are where anyone can participate and interact, whether closed communities (Fig 4.17) are limited to specific users and one can join only if an existing member adds them to the community. User's can also interact with each other through texting, audio-video calls (Fig 4.19). They can send and share a range of formats of file between them(Fig 4.20).
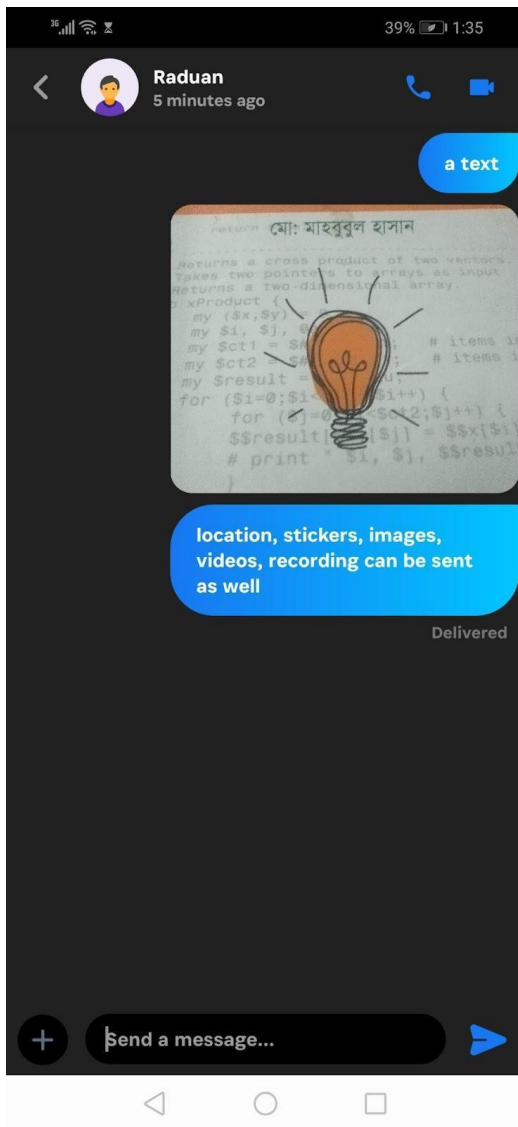

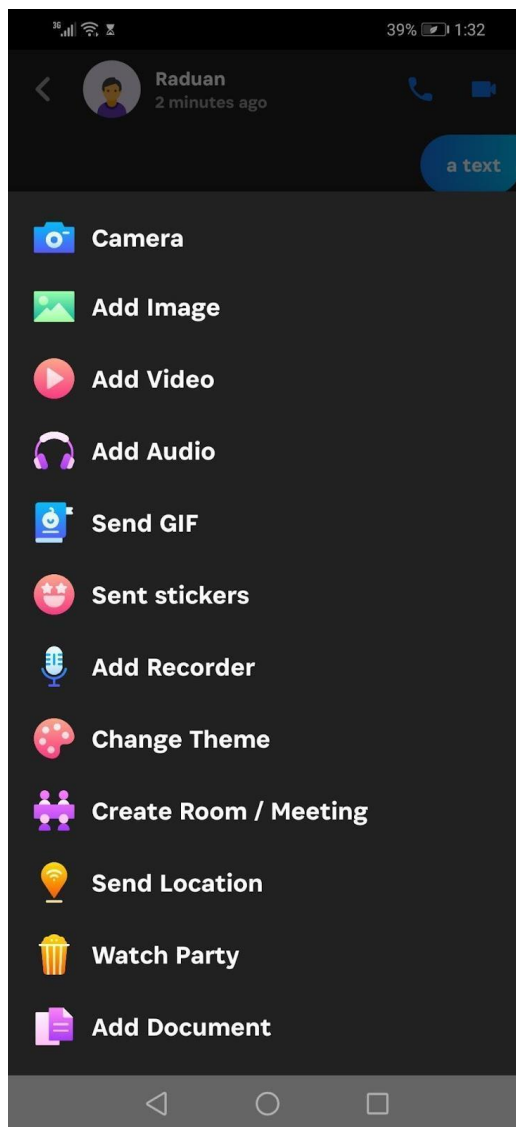Figure 4.19   Figure 4.20
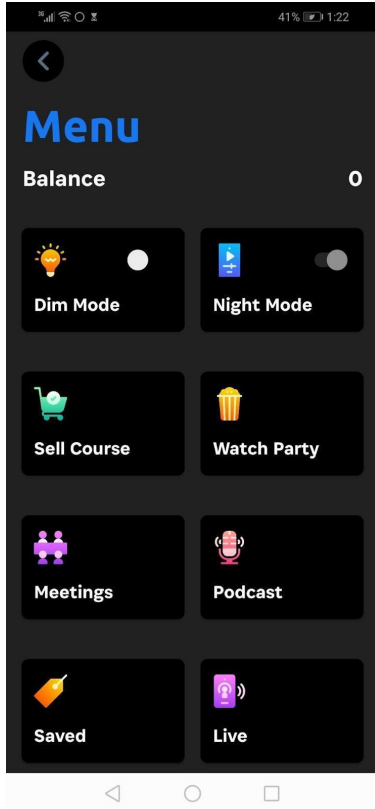
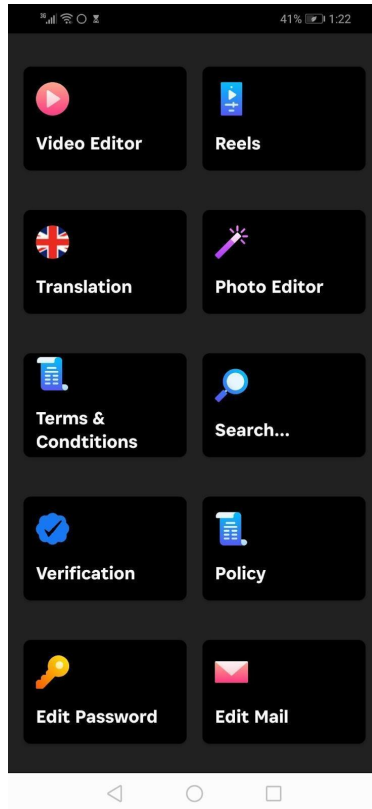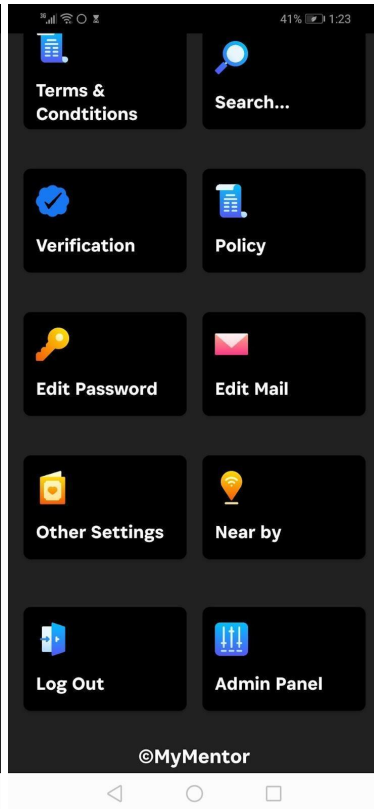Figure 4.21   Figure 4.22   Figure 4.23

In other platforms like Stack Overflow and Quora, even if anyone finds someone who is capable of helping there are not a lot of ways for them to communicate. Apart from that there are too many applications to communicate with a mentor. Platforms like Telegram, WhatsApp, Discord, Messenger, Google Meet, Zoom and many more. If one platform is good with file sharing then another platform is not, maybe another one is not good with streaming or hosting video conferences to large numbers of people. For these reasons one has to use many softwares. Which creates even more distractions and ambiguity. To solve that problem My Mentor has created a wide range of tools. From image-video editor to host meetings, podcasts,going live or streaming with a big number of people. All these can be one using one single platform which will reduce distractions and the learner will be able to communicate efficiently with their preferable mentors. Below figures describe how to create a meeting (Fig 4.24 and Fig 4.25). The application also supports different languages which will help a wide range of users to use the app with ease (Fig 4.27).
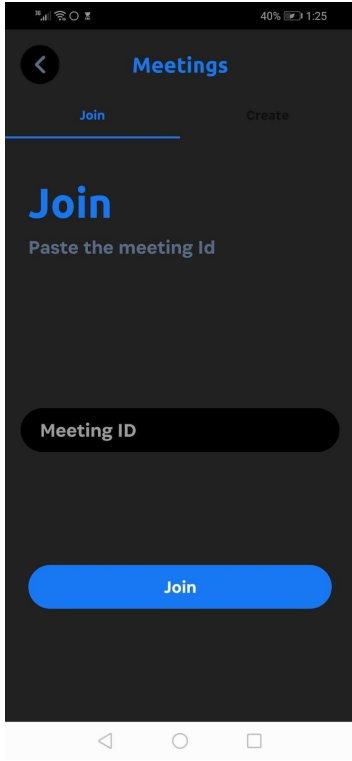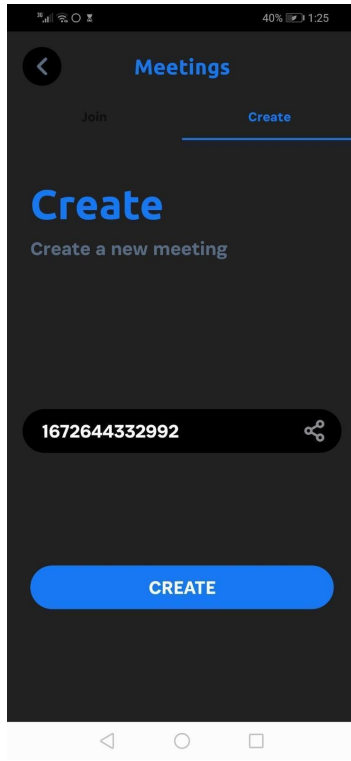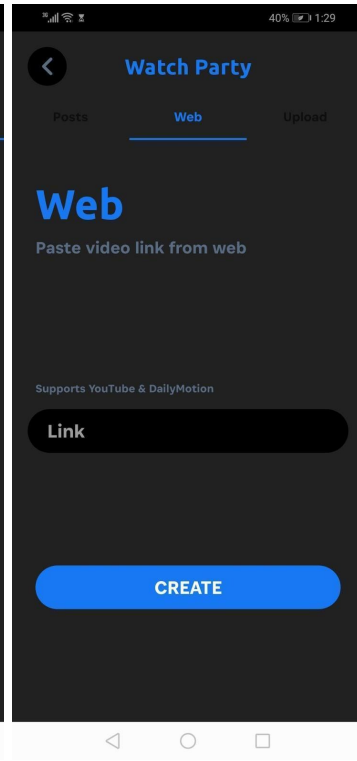
Figure 4.24

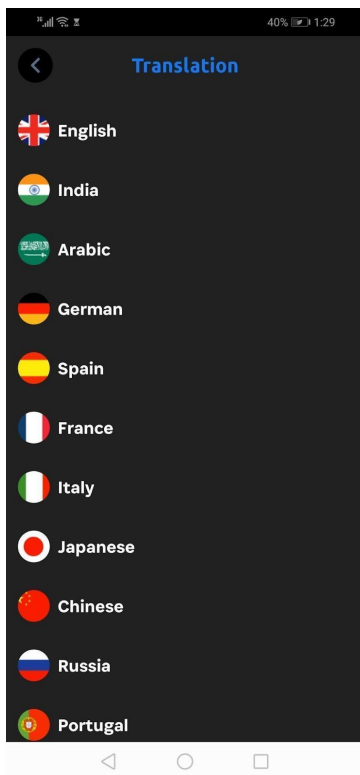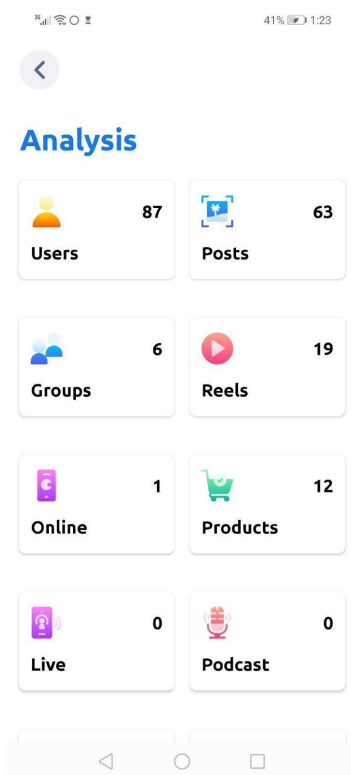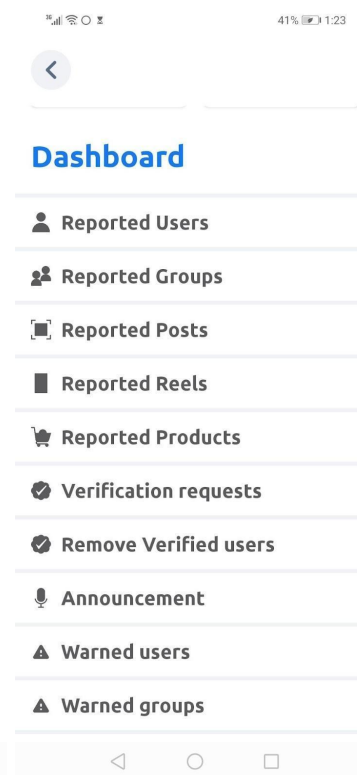Figure 4.25

Figure 4.26

Figure 4.27

Figure 4.28

Figure 4.29

The above figure shows (Fig 4.27) the translation feature of the application which is available in a wide number of languages. One other important feature of the app is the Admin Panel (Fig 4.28 and Fig 4.29). This gives the administrator all the options to regulate the platform. By using the panel a certain user, groups, posts, contents can be warned and deleted as well as the live number can be shown as well.

4.2 Back-end Design

The part that is hidden from the users, what holds the business logics and many more and only can be interacted by the programmers with access is the back-end, which also includes the server side as well. For My Mentor I needed a very strong back-end solution. which will be easy to implement and upscalable. Below descriptions explain about the crucial back-end components that have been used to develop the project.

Firebase

Firebase offers a wide range of products under the Firebase Suite. They have economical plans like Spark and Blaze. For these projects I will be using the Spark Plan. This allows many hobbyist programmers like me and small startups to use their products. After a certain amount of usage one has to take their premium plans.

Firebase Database

It is a NoSQL database which can store data in forms like JSON, Graph and many more. To store My Mentor application's date like chat data, user information Firebase Database is the ideal database to consider. The implementation is very easy where a developer doesn't have to reinvent the wheel. It saves a lot of development time to create and manage the backends and can be used to develop a better product.

Firebase Storage

For the project I needed solutions to store rich formats of file which will be generated by application. These data could be images and videos of big volume. And that is where firebase storage comes in. They offer very thorough documentation which makes the development process easier and saves time. It also comes with the Spark Plan.

Firebase Authentication

Security is a big risk for any application. While registering users on the platform an application needs different forms of authentication like registering with users existing social media accounts and credentials. Validating them and implementing all the backend is very hard and time consuming. Firebase Authentication provides cutting edge encryption and authentication which is widely used in the development industry. That's why it was my choice for user authentication.

Agora

This is a SDK which makes the implementation of backend to build features like audio call, video call, video streaming and many more. This SDK provides tools and prewritten libraries which makes the implementation much more easy and time efficient.

APIs

Application Programming Interface also known as API. It is used to communicate with a server or a computer. To develop this application I will need Google Maps API to use their location service. The APIs provides easy to implement interfaces

4.3 Interaction Design and User Experience (UX)

One of the important parts of the development process is a framework to develop better and impactful UI and UX. This is a part that makes a lot of difference in the user experience of any application. They are designed in a way which ensures successful and intuitive display of data that is not congesting. For our particular project I have ensured appealing interactions with the system's UI along with necessary ways for users to communicate with us if they faced any problems and could give suggestions to improve the system.

Throughout the project use of efficient and fast algorithms has been used. Which will make the system responsive and less laggy when huge amounts of data are provided. Android components like activity have been replaced with lighter activities known as fragments. These best practices in every stage will ensure the device's efficiency.

4.4 Implementation Requirements

To develop the project I have used the latest technologies and tools. These tools give many advantages while developing a project, saving time, effort. For front end implementation I have used XML and Java was the preferred programming language. Even though Kotlin can be used as well.

To develop any project a modern IDE is required. For android application development the official IDE is Android Studio which is an open source software. To develop it, the latest version (2021.3.1) of the IDE has been used. It comes with a wide range of tools to build, debug and test. Android projects require API level. For My Mentor it was API-29.

To run and test the application we can emulate a real device. Emulators are different from simulators. It mimics both hardware and software. To run and test the project many android emulators are out there to use but for the project a real device has been used rather than an emulator.

Below is a list of dependencies that have been used throughout the project which made the development process much easier.

```
211    implementation 'com.google.android.gms:play-services-location:19.0.1'
212
213    implementation 'com.android.volley:volley:1.2.1'
214
215    implementation 'com.google.code.gson:gson:2.8.9'
216    //noinspection GradleDependency,GradleDependency
217    implementation  'com.google.firebase:firebase-iid:21.1.0'
218
219    //noinspection GradleDependency
220    implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
221    //noinspection GradleDependency
222    implementation 'com.github.bumptech.glide:glide:4.12.0'
223                    No documentation found.                    :
224    androidTestImplementation 'junit:junit:4.13.2'
225    //noinspection GradleDependency
226    annotationProcessor 'com.github.bumptech.glide:compiler:4.12.0'
227
228    //noinspection GradleDependency
229    implementation 'com.google.android.gms:play-services-ads:19.8.0'
230    implementation("com.squareup.okhttp3:okhttp:5.0.0-alpha.2")
231    testImplementation("com.squareup.okhttp3:mockwebserver:4.9.1")
                    imglyConfig{}  >  modules{}
```

Figure 4.30: Dependency List

Chapter 5

Implementation and Testing

5.1 Implementation of Database

Databases are where data is stored. There are different types of databases, among which relational and non relational databases are the main two kinds. This project has use cases for both types of databases. By using different databases we can run certain queries on them which helps us to maintain, manipulate and define the data and the database. In my particular project I used Firebase Database and Firebase Storage. They are real time databases and come with features like offline synchronization and many more. Throughout the application it is constantly using a single instance of the database which is later being used to put, update and delete data depending on the interaction of the user. Our database has multiple entities and attributes. A database also has different types of relationships, out of which my application uses many to many as well as one to one relationships. Below diagram is a depiction of the relationship between entities.
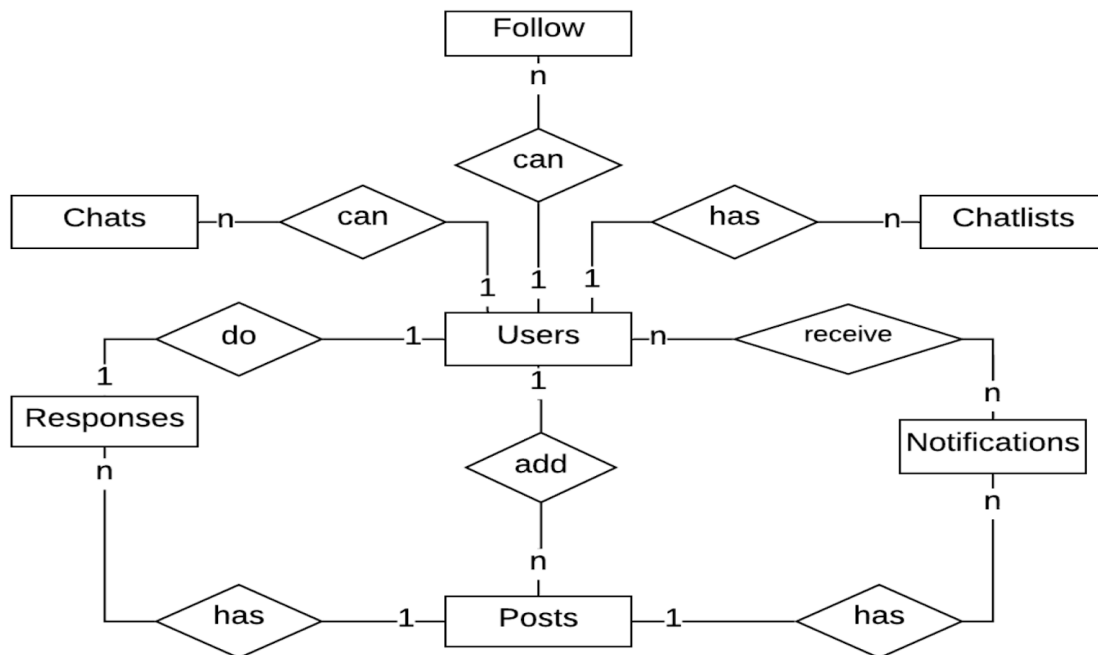

Figure 5.1: Entity Relationship Model Diagram
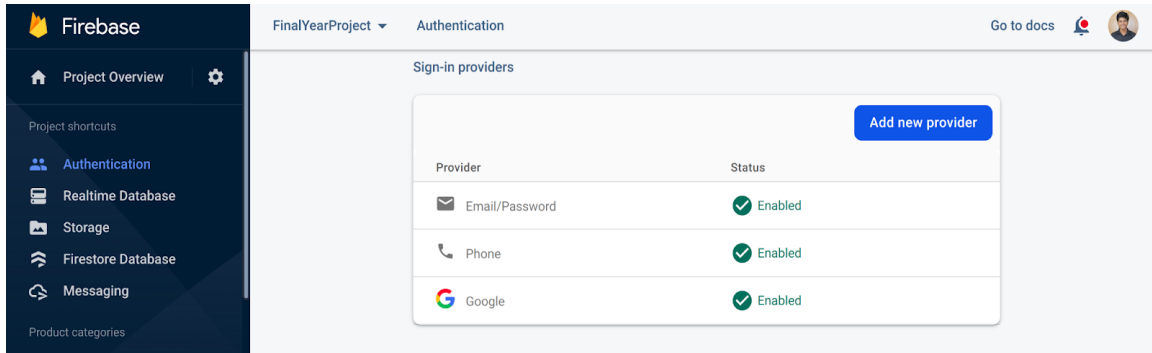
Figure 5.2: Firebase Console For Authentication Providers.

Figure 5.3: Firebase Console of Realtime Database's Data.

Firebase is the backend for the database of our project which has been discussed earlier. It provides a console on their website. Using the console Realtime Database, Storage, Authentication can be figured very easily. Different types of security rules are also available in the console, using them different kinds of rules can be applied on specific data paths.

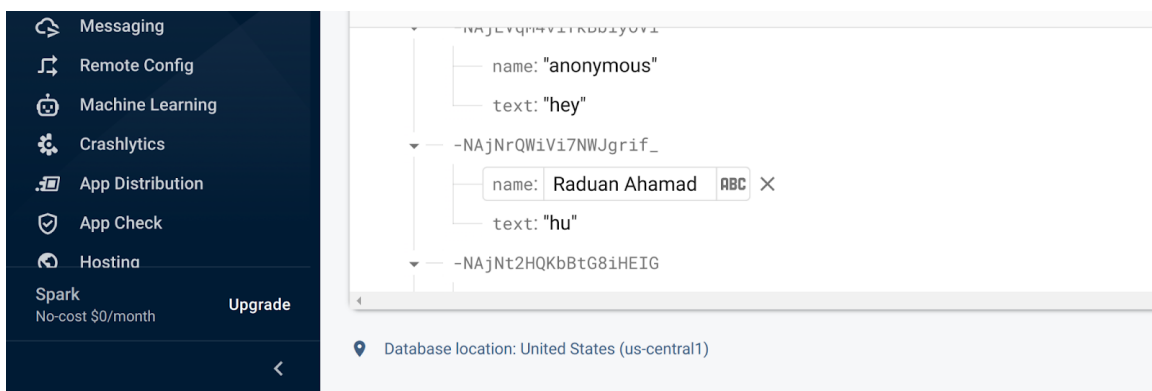## 5.2 Implementation of Front-end Design

The part users interact with is the front end. As it is visible to users and they don't know the behind logic, it is more likely that the project will be evaluated by the user based on appeal and user experience it gives to the user. Earlier all the requirements and specifications regarding the front end had been discussed. To implement the design XML has been used. In the present time there are even more Front-End designing libraries available. Out of which Material Design and Components are famous and widely used. It is available for android as well. Even though Jetpack Compose has been out there for quite some time, it is not widely used till now. That's why XML was considered. All the layouts that are more efficient and don't make the front end laggy, have been used.

5.3 Testing Implementation

One of the most crucial parts of any development process is the testing phase before deployment of the application. Testing done in different phases and different ways like black box and white box testing, unit testing, integration testing. In this project I have implemented testing. At first the project was done using an architecture pattern. Which allows us to differentiate between the business logics and other platform oriented logics and components. Which allows us to test independently. Apart from that manually testing using different devices was conducted as well. Apart from that testing using real life users has been conducted on platforms like UserTesting [13] and Respondent [14].

5.4 Test Results and Reports

Testing is done to know if a system will function properly or not in a real life situation. And to put those functions in maximum use, use cases are written while considering and covering all the practical scenarios which a system could face in its working life and try to find bugs in it. The below table contains test cases and their verdicts for My Mentor application.

TABLE 5.1: Table of Test Case And Result

	Case	Inupt	Outcome Expected	Actual Outcome	Result	Test Date
1	Splash Screen	Opened App Using Different Devices	Show Splash Screen Successfully	Opened Successfully	Passed	20 November 2022
2	Login	Providing Valid Credential	Logging In Successfully	Logged In Successfully	Passed	20 November 2022
3	User Name	Provided Existing Credential	Error	Showed Error	Passed	22 November 2022
4	Post Features	Posted Posts On Groups	Display Post On Home And Groups	Displayed On Home And Groups	Passed	22 November 2022
5	Texting	Texted Another User	Texting Will be Successful	Texting Was Successful	Passed	23 November 2022
6	Video Call	Called Another User	Calling Will be Successful	Calling Was Successful	Passed	23 November 2022
7	Searching	Searched Existing People	Result Will Appear	Related Results Appeared	Passed	23 November 2022

Chapter 6

Impact on Society, Environment and Sustainability

6.1 Impact on Society

Our primary motive and objective to develop this application was to create impact on the life of the learner. Making their process of learning easy, saving their time. I believe that the actual learning happens outside the institutional environment. Where people have to help each other and contribute to the community, only that will take us further in creating the world a better place and a world which is safe for everyone. I believe that my developed application will be able to successfully create an impact in people's life.

6.2 Impact on Environment

I think even though my developed application will be able to create a difference and impact on society, it will also create a negative impact on the environment. Currently one of the biggest problems on earth is carbon emissions. To use applications and technologies we need devices. These devices are manufactured in industries on a large grade which require a wide range of hardware and electronics. Manufacturing them and running them pollutes the environment this way or another. We hope to see in the foreseeable future that all the manufacturing and the production of goods, along with smartphones, in completely green and eco-friendly ways.

6.3 Ethical Aspects

I believe that thinking from the perspective of ethics, I have nothing to fear. As the whole project is an original creation and no intellectual property laws were regulated while developing it. All the assets that were used have been open for fair use.

6.4 Sustainability Plan

Android is a constantly changing technology and almost every month something new is introduced. To keep up with these changes a project must have a sustainability plan. It may include upgrading to a better architecture pattern. Right now MVVM [15] will make scalability, dependency injection and testing much more efficient. The language can also switch to Kotlin [16] which is easy with the help of a converter. Apart from that all the latest technology has been used which ensures that the application will sustain a longer period of time in the android world.

Chapter 7

Conclusion and Future Scope

7.1 Discussion and Conclusion

We have many existing platforms to help people with learning. But all of them have something which can be made better. I believe that my application will be able to make an impact and reduce the gaps that a learner faces and make the process of learning seamless. The social platforms are created in such a manner that the constant dopamine hit making people addicted towards them, people are suffering from short attention span. As there are enough distractions but when some choose to learn and change their life they should be able to do that, there should not be any confusion, the information they need should be structured and someone experienced should give it to them if needed. I took it on account and tried to build a solution. This project is the result of that. I believe and hope that this project will be able to make the difference that it is intended to do.

7.2 Scope for Further Developments

As we live in a world that evolves and constantly changes, there's always something that can be changed, made better and can be improved. And this project can be made even better as well. Features like adding a browser and text editor for programmers will give this application a sense of completion.

The language that was used in this project is Java. But Google and the android industry is moving to a Kotlin first approach. Converting this project into will be very easy as well because Kotlin comes with a converter that can convert Java into Kotlin with a few clicks. If that happens then there will be countless improvements that can be done to the project. For example Kotlin Coroutine can be used to handle threading, new technologies like KMM [17] can be used to create this project into a hybrid application which can run on both iOS and desktop computers. This will make the application available to a whole range of users.

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APPENDIX

Appendix A: Project Reflection

The development process of this application was started in Spring 2021. My main focus for building this application was to create a fast, responsive application with interactive user interface and an appealing user experience along with reducing the gap that I believe creates obstacles for self-learners while they are learning and trying to be resourceful, so that they can do better. Saving their time and helping them achieve more by providing the right guidance in time.

People will use devices and gadgets anyways. These are mere tools that should make their life easier, making them successful and not making them addicted to it. They are supposed to bring people closer, not keep them far. This is happening because developers and technologies are aimed to benefit businesses rather than those who these were made for.

I have given my best to create something that I stand for.

I believe and hope this application will bring the impacts that it is intended to do.

Final Report