

# Alumni-Student Interactive Messaging

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## Abstract:

Communication over the Internet is becoming vital these days. Online communication allows users to communicate with other people in a fast and convenient way. An online communication application must be able to share texts, images, or any other files faster with minimal or no lag. One platform that offers real-time database and cloud services to help developers create these applications is Firebase. Instant messaging can be thought of as a communication platform. Compared to other platforms like iOS, Android offers a superior framework for the creation of diverse instant messaging apps. This paper's major goal is to introduce a software tool that enables real-time contact between students, alumni, and, in some situations, teachers. Developed on Android, the system will allow users to communicate with other users through text or audio or video, or PDF messages using the Internet. The smartphones must be connected via the internet to receive or send messages. This app is based on Android with a backend provided by Google Firebase.

**KEYWORDS:** Alumni, Doubt Resolution, Real Time messaging, Firebase, Android

## 1. INTRODUCTION

In the world, communication plays a vital role. folks communicate with one another through numerous applications or media. Initially, folks communicated with alternative one another through letters or other sources, as these media may take an extended time to deliver content. Cell phones are another means of communication; however, the drawback is that any restricted or little message must be sent to a different phone call and it is not a perfect method. Developers are then sought-after to implement text communication that might alter an immediate communication service. In 1984, the SMS conception was developed within the Franco-German in collaboration with Friedhelm Hillebrand and Bernard Ghillebaert. The limitation of SMS was the restricted size of 128 bytes, with the increase of smartphones within the decade once several electronic messaging applications were developed. Some are Bluetooth primarily based and a few are net based like WhatsApp and WeChat. This software permits the utilization of applications on mobile devices. As developed by Google, Android users will develop mobile apps that are installed through app stores like the Play Store. Firebase is a NoSQL DB that uses sockets to permit users to store and retrieve data from the DB. Android version ought to be more than 2.3, as this prerequisite for firebase. Firebase provides different varieties of services, such as:

- **Firestore:** Firestore is a NoSQL database that uses sockets to permit users to store and retrieve data from the DB. Android version ought to be more than 2.3, as this prerequisite for firebase. Firebase provides different varieties of services, such as:

- **Firestore:** Building the infrastructure for storing data like video, text, and photographs would be challenging and expensive for a new developer, therefore firebase offers the platform for cloud storage.
- **Real-time database:** It is a cloud-hosted NoSQL database. This DB is used as we want minimal to no lag, as we are developing an instant messaging service and we are not using one type of DB as the pricing for this type of DB is more
- **Firestore:** It is a service from Google and is a scalable, adaptable database for server, web, and mobile applications. It supports offline caching for mobile so we can view older messages independent of network delay or Internet connectivity, and it keeps the data synchronised across client apps. Cloud Firestore provides a connection with Cloud Functions as well as other Firebase and Google Cloud technologies.
- **Crashlytics:** When some unexpected crashes occur in any application it may be difficult to conclude why the application crashed. Firebase provides a crash reporting service to deal with these crashes.

The main object of this research paper is concerned with a software application for the establishment of real-time communication services between alumni, students, and teachers. Chat applications have many-to-many types of communication systems where the users will able

to exchange messages among themselves. Users can create the chatroom according to their requirements or can also join the existing chatroom. With this functionality, a college student who is clueless about the subject or their career can gain clarity and will start working towards reaching their full potential.

## 2. Literature Survey

- Application of Firebase in Android App Development:-

You can use Firebase Cloud Messaging, a notification server with an online console, to send notifications to target audiences based on Firebase Analytics data. Using NoSQL, Firestore's Realtime Database stores and syncs real-time data between users and devices. Additionally, Firebase Cloud Storage makes it simpler to organise and store user-generated content like images, audio, and video. Using Cloud Tasks, you may evaluate your apps at any stage of their lifecycle without evaluating the active servers. With useful tools and simple procedures, hosting and verification are easily managed with Firebase. Using the ready-to-use Firebase ML Kit APIs, the machine-learning capabilities of the operating system have been carefully improved. The best aspect is that you can still bring creativity to complex software even with limited machine-learning knowledge and experience.

- Review and Study of Android Based Instant Messaging Application Using Firebase:-

Internet-based communication is becoming increasingly important today. Online communication enables users to communicate with others quickly and conveniently. Due to this, the online communication tool must allow users to send texts, photos, and other files quickly and without any or little delay. One of the platforms that offer a real-time database and cloud services to help developers create these applications quickly and easily is Firebase. One method of maintaining communication is instant messaging. Compared to other platforms like iOS, Android offers a superior environment for the creation of numerous instant messaging applications. This paper's major goal is to introduce a software application for starting a real-time conversation between operators and users. The android-based system will let users text each other while using the internet to communicate with other users. Both devices must be online for the system to function. This program is based on Android, and Google Firebase provides the backend.

- ML Kit in Firebase for App Development:-

A technique for text recognition was put forth by Shashank et al.

Along with the related work done on image-to-text recognition, the applications of text recognition are reviewed. This system's experimental findings are also highlighted. It also includes a brief introduction to optical character recognition and a discussion of OCR's difficulties.

Artificial intelligence, optical character recognition, and object identification are a few examples of real-world contexts in which Ajay et al described text detection applications. The text detection process's information is discussed. The challenges posed by the various environments in which the image is captured are mentioned. The presentation of a system for text detection and classification is described.

- Android application development for push notification feature based on Google Cloud Messaging:-

The push notification process is divided into three domains: worker, server, and initiator. The worker is made up of an interface called Retrofit and a message builder named GSON. The Retrofit interface is a REST (representational state transfer) client method where the data stream flows inbound and outbound asynchronously between entities and understands each other. GSON is a Google-initiated Java library used to convert Java objects into JSON (JavaScript Object Notation) representation on the android environment. In the role of a server, Firebase Cloud Messaging (FCM) offers the environment required for the application to construct, target, and transmit push notifications consistently and for no cost. With the help of cloud monitoring, the FCM includes application analytics that helps developers comprehend how deployed applications behave and operate. A collection of use cases that represent the application workflow makes up the initiator.

## 3. Problem Statement

Every year in an engineering college, a batch passes out, steps out into the corporate world, and learns a lot. Also, some alumni become successful and achieve a lot of things. In most of these colleges, the alumni network is solid but in certain colleges, the alumni network is not established to a great extent. As we go along with our study, we encountered such problems at multiple colleges which can be fixed using the alumni chat app:

1. Able to keep a complete database of Alumni, including various interactions along with classifications and categorization.
2. Keep track of current employment and career developments of alumni.
3. Plan and execute Alumni Meets and events.

4. Engage alumni for the development of current students.
5. Highlight achievers in the alumni group.
6. Communicate with any group or entire alumni using text, photos, videos, and audio.
7. A mobile App for each alumni member.
8. Sharing of Job and career opportunities by Alumni in a group.

## 4. PROPOSED DESIGN SYSTEM

### 4.1. Authentication/Login

In a chat app, the first screen usually is the login screen. For this application login data is stored in Firebase Firestore and contains various data like the name, skills, device token (for notifications) and profile image URL.

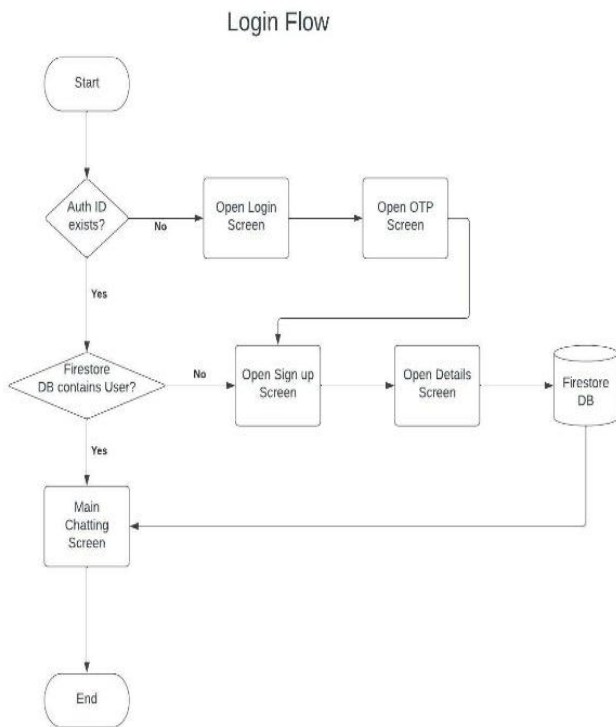


Figure 1: Flowchart of the login flow

```

company: "Microsoft"
country: "USA"
creator: false
deviceToken: "co9575mLQ4idsmjhgSjTyj:APA91bHSkV42KRZbZYS6j7DQ49nA01nADnWn4jNQwYQWMxTpN8X8-D0_2tAot2daOBZPxPp0w6"
imageUrl: "https://firebasestorage.googleapis.com/v0/b/malca-5f4a9.appspot.com/o/profile_pics%2FBMWRKeX86XalTFErOqJ3Ly0UiYp2?alt=media&token=b95ffd54-1a00-46d3-bfd4-ae47926a5de3"
name: "Testing"
onlineStatus: ""
rating: 5
rollNo: "02114803119"
skills: ["Java", "C++", "Python"]
status: ""
thumbImage: "https://firebasestorage.googleapis.com/v0/b/malca-5f4a9.appspot.com/o/profile_pics%2FBMWRKeX86XalTFErOqJ3Ly0UiYp2?alt=media&token=b95ffd54-1a00-46d3-bfd4-ae47926a5de3"
uid: "BMWRKeX86XalTFErOqJ3Ly0UiYp2"
upper_name: "TESTING"
  
```

Figure 2: Sample data of a single user in firebase firestore

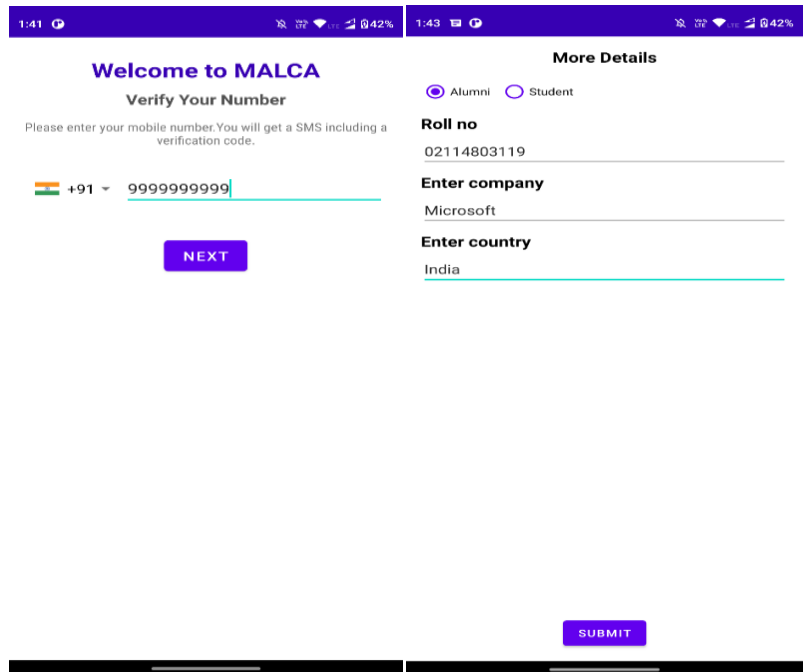


Figure 3: Screenshots of the login flow, where the first screen is for entering the mobile no. and the second is for entering student or alumni details

## 4.2. Chatting Feature

A chatting application requires a database that updates in real-time and requires triggers to be set up so that whenever the DB gets changes a trigger is sent to the Google FCM API and that FCM API redirects to the android class and renders a notification. Mostly a chatting application requires a NoSQL DB because it contains a hierarchical structure as we need to have the receiver UUID as the parent and the sender UUID as the child. The message information is present as a child of the sender's UUID. For this app, we have divided the message into two types text and multimedia. For the text, the string is stored directly in the Firebase Realtime DB and for the multimedia text we first store it in firebase storage which generates an URL, and that URL is stored as a string in the firebase realtime DB.

```

BMWRkx86NaITFeRqJ3Ly0iYp2wPyM7v1S1z0JzECRbq0iDrjaxSH3
├── -NJA98tUeHXnYkoNSait
│   ├── angle: 0
│   ├── duration: ""
│   ├── fileName: ""
│   ├── imageUrl: "https://firebasestorage.googleapis.com/v0/b/malca-5f4e9.appspot.com/o/profile_pics%2FwPyM7v1S1z0JzECRbq0iDrjaxSH3?alt=media&token=e4f..."
│   ├── liked: true
│   ├── msg: "Hi"
│   ├── msgId: "-NJA98tUeHXnYkoNSait"
│   ├── senderId: "wPyM7v1S1z0JzECRbq0iDrjaxSH3"
│   ├── senderName: "Animesh"
│   └── sentAt
│       └── status: 1
│           └── type: "TEXT"

```

Figure 5: Sample data of a single chat in firebase realtime DB

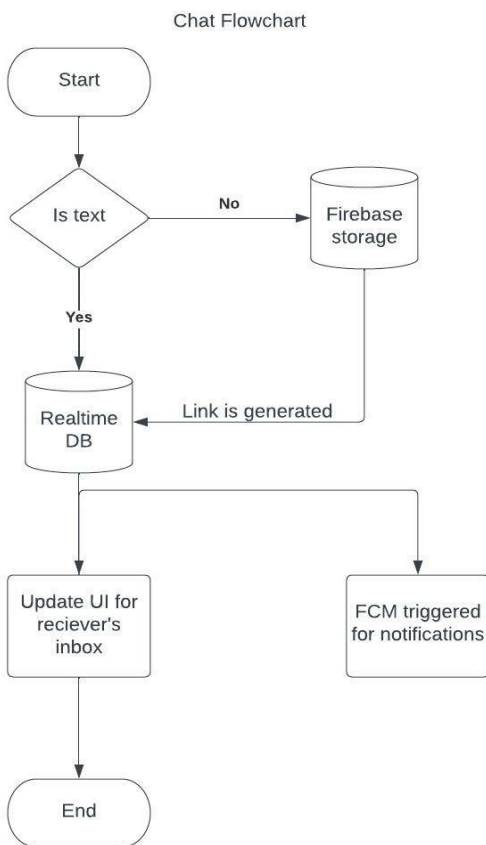


Figure 4: Flowchart for chatting feature

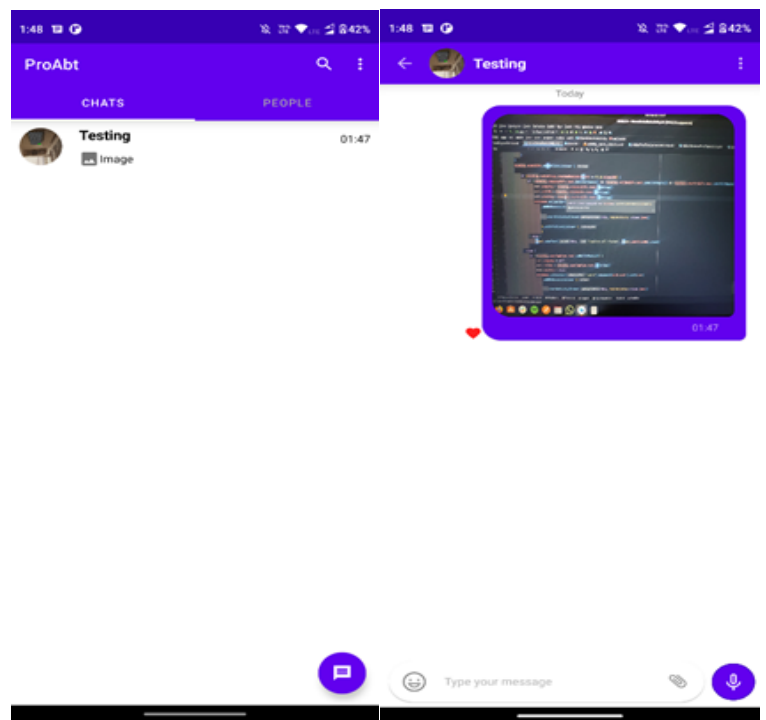


Figure 6: Screenshots of the chat screen, where the first screen is for all the users who have asked you doubts or vice versa and the second is for seeing the individual chat screen with a user

## 4.3. Ratings and filters

Each user can rate the other based on how well the user solves the doubts. This rating affects which position will the user be displayed on the list of the people screen. Also, Firebase realtime DB allows single as composite

queries that can be applied. In the app, we use both single as well as composite queries. We use single query to sort rating in a descending fashion and use compound query when we filter based on skills, company, and location along with sorting rating in descending fashion.

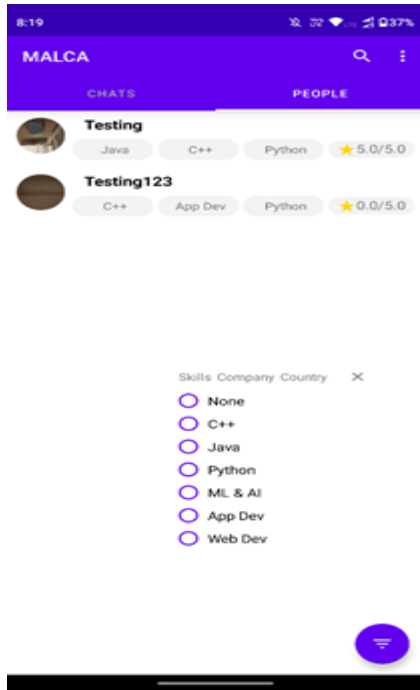


Figure 7: Screenshots of the rating and filter screen, in this screen the user can see the user info as well as the skills, ratings and can select a filter.

```

ratingUser
├── BMRKx86Ka1TFEr0qJ3Ly0U1Yp2
│   ├── avgRating: 5
│   └── totalPeople: 1
└── wPyW7ivS1z0JzECRbq0iDrjxSH3
    ├── avgRating: 5
    └── totalPeople: 1
    
```

Figure 8: Sample data of a user ratings in firebase realtime DB

## 5. Methodology

- Whenever a user will join the platform, he/she should have to enter their phone number, and if it is a new user, he/she will have to choose a photo, tech stack they excel in, name, etc.
- If there is a student, they must upload their id card while the app will extract the roll number through the id card using ML libraries all the details like the year

of their degree, and the branch will be automatically filled up and using the roll number we extracted we can confirm if they are enrolled in MAIT

- If there is an alumnus, they must upload their roll number, and all the details like the year of their passing out, the branch will be automatically filled up, and using the roll number we extracted we can confirm if they were enrolled in MAIT.
- When they log in/register they can find people using the tech stack of the companies they are working in.
- After successfully joining users can chat publicly.
- If the user, receives a message they will receive a notification using FCM.

## 6. Conclusion and Future Scope

The review of the previous studies revealed that an alumni-student interaction portal has improved the placement statistics and students started to improve in various other competitions like hackathons GSOC, and ICPC. According to a survey done in another research paper in their college, the first batch passed out in 2003 and since then, they have had over 10,000 alumni placed at esteemed organizations and few of them have opened their businesses or start-ups. And currently, there were close to 2000 students studying with no proper guidance and no place to solve their doubts. In conclusion to the research paper, it suggested that there must be an app that will help students get job opportunities and help students get their doubts solved. This will be helpful as most of the connections they are sent to LinkedIn are not accepted. In addition to this LinkedIn is not a platform for asking doubts, and stack overflow are not so personalized that everyone's doubts can be resolved. The final system that is proposed in this research paper will result in a real-time communication application that will provide students and alumni to communicate with each other with ease. The application will have a login page through which the student and alumnus can register and log in themselves. The home page of the application contains the previous messages if any. The user can be able to search for the other user and apply filters. Users can send and receive text messages. With these chat rooms, users can ask doubts as well as ask for career advice. Due to time constraints, there were certain features which were to be developed but could not be, those are:

- Faster uploads of multimedia files (like images, videos, audio, etc)

- Adding ML for identifying ID card and extracting roll numbers it
- Instead of asking for the location extract it from the GPS coordinates
- Adding tokens to gamify the doubt-solving process
- Making the filter section more exhaustive
- Minor bug fixes and app improvements

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