Advanced Chat Application

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Abstract— In today's world, the use of chat applications has become an essential aspect of communication. The aim of this project is to develop an advanced chat application that provides efficient, reliable, and secure messaging services. The application will be developed using Java at the backend and Android Studio at the frontend. The chat application will provide features such as instant messaging, group chat, voice and video calling, file sharing, and message encryption. The application will also have a user-friendly interface, making it easy for users to navigate and interact with the platform. The application will be designed with the latest technologies and will incorporate various security measures to ensure that users' data is protected. The application will be scalable, allowing for the addition of more features and functionalities in the future. Overall, the advanced chat application will provide users with a seamless and enjoyable messaging experience while maintaining the highest level of security and privacy.

I. INTRODUCTION

Chat applications have become an integral part of communication in today's world. With the increasing use of smartphones and the internet, people have moved away from traditional communication methods, such as emails and phone calls, and have adopted messaging applications. The availability of advanced features, such as instant messaging, group chat, voice and video calling, and file sharing, has made chat applications a popular choice for communication.

This project aims to develop an advanced chat application that will provide users with a seamless messaging experience while maintaining the highest level of security and privacy. The application will be developed using Java at the backend and Android Studio at the frontend, leveraging the power of these technologies to build a robust and scalable platform.

The application will provide users with various features such as instant messaging, group chat, voice and video calling, file sharing, and message encryption. The user interface will be designed to be intuitive and user-friendly, making it easy for users to navigate and interact with the platform.

Security is a crucial aspect of any chat application, and this project will prioritize ensuring that users' data is protected. The application will incorporate various security measures to prevent unauthorized access and protect users' information.

Overall, the advanced chat application will provide users with a reliable, efficient, and secure messaging experience, meeting the needs of modern communication in today's world. The chatting application has huge impact on day-to-day life. There are numerous chatting application available in this world. Each application has different additional features varying from other applications. These application organizations compete with each other and add some competing features during each release. They have reached people much and have an impact on people's life. People find a better application from an available internet application which they feel much reliable and secure. Some of the available charting applications that are available in these days are WhatsApp, Facebook, Instagram, Hike, etc.. The above-mentioned applications have billion users all over the world. Those companies are one of the top companies in the world. They have higher revenue per year and have many employees for their organizations developing additional features to compete with other organizations during each release. These applications have different features and follows different ways to ensure security of their user data. s. The basic chatting system should involve both sending and receiving processes simultaneously. In this application both sending and receiving messages simultaneously happens through java concept.

II. OBJECTIVE OF APPLICATIONS

- Provide users with a reliable and efficient messaging experience - The application will provide users with a seamless messaging experience, ensuring that messages are delivered promptly and reliably.
- Develop a user-friendly interface - The application will have a user-friendly interface that is easy to navigate, making it simple for users to send and receive messages, make voice and video calls, and access other features.
- Provide advanced features - The application will provide users with advanced features such as group chat, voice and video calling, and file sharing.
- Ensure high-level security - The application will incorporate various security measures to ensure that users' data is protected, including message encryption, password protection, and user authentication.
- Develop a scalable platform - The application will be designed to be scalable, allowing for the addition of more features and functionalities in the future.
- Optimize performance - The application will be optimized for performance to ensure that it runs smoothly and efficiently, even on low-end devices.
- Provide a customized user experience - The application will allow users to customize their profiles and settings, making the messaging experience personalized.

- Support multiple platforms - The application will be designed to support multiple platforms, including Android, iOS, and web, providing users with access to the application from a range of devices.
- Allow for seamless integration with other applications - The application will allow for seamless integration with other applications, such as social media platforms, making it easier for users to share information and communicate with others.

III. TECHNOLOGY USED

A. Google Firebase

We are using Firebase as a server for the chats to get synced. The server side of Firebase Cloud Messaging consists of two components: The FCM backend provided by Google. Your app server or other trusted server environment where your server logic runs, such as Cloud Functions for Firebase or other cloud environments managed by Google. Your app server or trusted server environment sends message requests to the FCM backend, which then routes messages to client apps running on users devices.
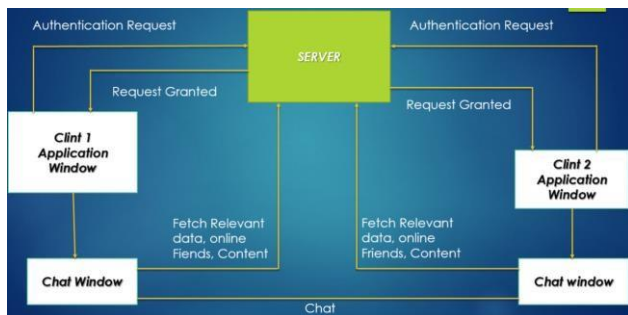
Fig 1. Block Diagram of the System

B. Android Studio

Android Studio is the official integrated development environment (IDE) for Android application development. It is purpose-built for Android to accelerate your development and help you build the highest-quality apps for every Android device. Android Studio offers build automation, dependency management, and customizable build configurations. You can configure your project to include local and hosted libraries, define build variants that contain different code and resources, and apply various code shrinking and app signing configurations.

C. Java

Java is known for its platform independence, meaning that Java code can run on any platform that has a Java Virtual Machine (JVM) installed. Java has a wide range of applications, from developing web applications and mobile apps to creating enterprise-level software systems. Java is a strongly typed language, which means that the data types of variables must be explicitly declared and cannot be changed during runtime. Java has a vast standard library that provides a set of pre-built tools and functions to simplify development and reduce coding time.

IV. UI/UX

D. Sign up page

Fig 2. Sign up page

E. Login page

Fig 3. Login Page

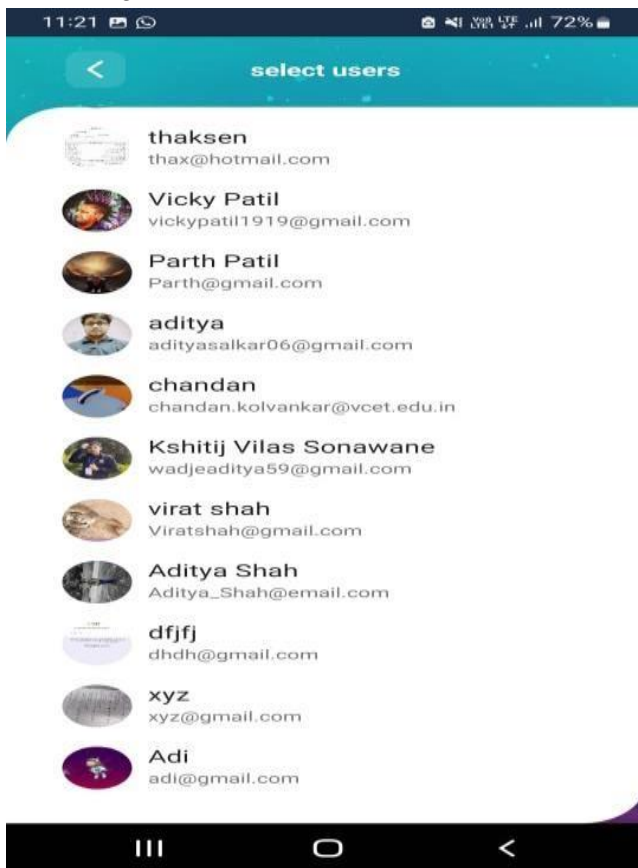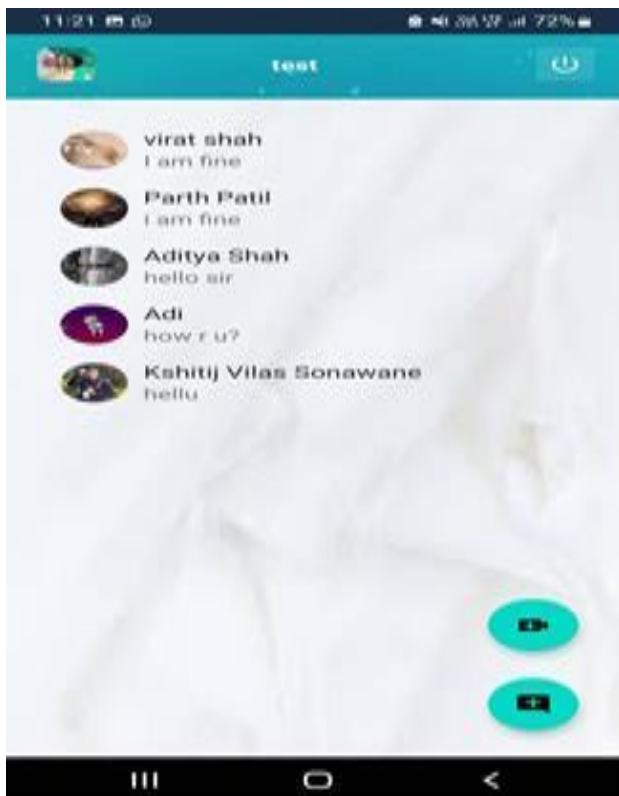## F. Starting New Chat

Fig 4. New Chat

G. Home Page

Fig 5. Home Screen

H. In-Chat Screen

Fig 6. Chat View

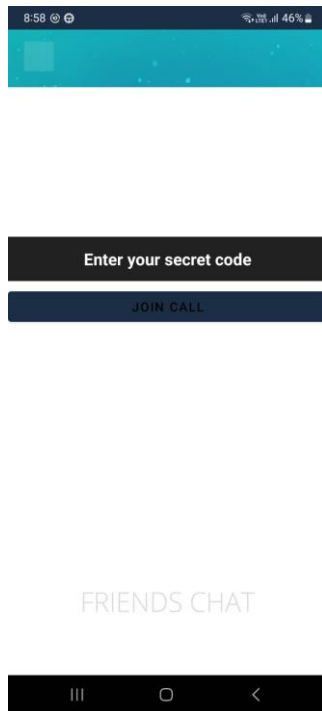Fig 7. Online View

I.   Video Call Set-up Screen

Fig 8. Video Call Set-up

CONCLUSION

THE ADVANCED CHAT APPLICATION PROJECT AIMS TO PROVIDE USERS WITH A RELIABLE, EFFICIENT, AND SECURE MESSAGING EXPERIENCE WHILE INCORPORATING ADVANCED FEATURES AND A USER-FRIENDLY INTERFACE. THE APPLICATION WILL BE DEVELOPED USING JAVA AT THE BACKEND AND ANDROID STUDIO AT THE FRONTEND, PROVIDING A SCALABLE PLATFORM THAT CAN BE EASILY CUSTOMIZED AND OPTIMIZED FOR PERFORMANCE.THE APPLICATION'S SECURITY MEASURES, INCLUDING MESSAGE ENCRYPTION, PASSWORD PROTECTION, AND USER AUTHENTICATION, WILL ENSURE THAT USERS' DATA IS PROTECTED. THE APPLICATION WILL ALSO BE DESIGNED TO SUPPORT MULTIPLE PLATFORMS, PROVIDING USERS WITH ACCESS TO THE APPLICATION FROM A RANGE OF DEVICES.OVERALL, THE ADVANCED CHAT APPLICATION PROJECT WILL MEET THE NEEDS OF MODERN COMMUNICATION BY PROVIDING USERS WITH A SEAMLESS MESSAGING EXPERIENCE, MEETING THE HIGHEST LEVEL OF SECURITY AND PRIVACY STANDARDS. THE APPLICATION WILL ALSO INCORPORATE VARIOUS FEATURES THAT MAKE IT EASY FOR USERS TO COMMUNICATE, SHARE FILES, AND MAKE VOICE AND VIDEO CALLS, MAKING IT A USEFUL AND PRACTICAL TOOL FOR INDIVIDUALS AND BUSINESSES ALIKE.

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