

An Android Based Video Calling Application

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Abstract

We develop this project to call on a video to another person which is staying far away in the distance with the help of this app we can talk to each other the person who is a far from at the corner of the world in this app we can see a picture of a person which we are talking with and talk with them through audio this helps to convey a message or thoughts or voices to reach another person with the help of video calling app it is very difficult to meet the person which is stay in Far Away distances with the video calling we can feel like a person is standing next to me for sitting next to me Thanks to the increase in face-to-face interaction with video communications, we hold much stronger & trusting relationships with each of our customers. We get to know each other as a person, not just a voice, and in turn builds the long-term relationships that are vital to everyone involved. Video conferencing boosts productivity, saves time, reduces travel expenses, and overall promotes collaboration. The advantage of video conferencing is the ability to facilitate all of those benefits without requiring constant travel for face-to-face communication Purpose. The main purpose of video conferencing is to enable face-to-face communication between two or more people in different locations. It is a popular alternative to phone conferencing for businesses and provides individual users with an inexpensive means of communication with distant friends and family.

Keywords: Video Call (VC), Distance Learning.

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I. INTRODUCTION

Audio and video calling have been used for many years by both business and education. Until recently, however, these types of conferencing required expensive and elaborate microwave, satellite, telephone, and/or data links. Distance learning classrooms and video calling rooms for business are still very expensive to set up and to operate if they provide full-duplex audio and video in addition to data conferencing. In the last few years, however, desktop audio and video calling have become a reality. Small microphones and cameras plugged into computers allow users to send audio video across the Internet. Instead of "chatting" in text about a document they are creating with a shared application, users can really talk to each other. For the past decade, video calling (VC) has become more popular and more reliable as a tool to bridge the distance gap when travel is not an option, impractical or undesired. Video calling uses audio and video telecommunications to bring people at different sites together. Understanding what are required for video calling and its application has become one of the major researched topics by various learning institutions and businessmen. In this paper, an introduction to video Calling is presented with the emphasis on its application in distance learning. This app is used as a Social Media Platform. This app has been developed using Android Studio. The Main priority was to create a Video Calling application that can provide user with an uninterrupted Video Conversation Experience

1.1.1 Overview

Voice and video calling are popular and great free online methods of communication for work or personal reasons. This is greatly related to the increase in internet bandwidth availability and its low costs. Both voice and video calls are seen as important tools of communication for small businesses and youth. Around 84% of internet users in the region said that they use voice or video calling apps.

Take a glance at the most used voice/video applications in the Arab world:

- ❖ WhatsApp messenger is ranked as the most used application for video & voice calls in the Arab world with a rate of 72.3%.
- ❖ Facebook messenger is ranked as the second most used application for voice & video calls with a rate of 64.9%.
- ❖ Skype voice & video calls come at next with a rate of 37.4%.

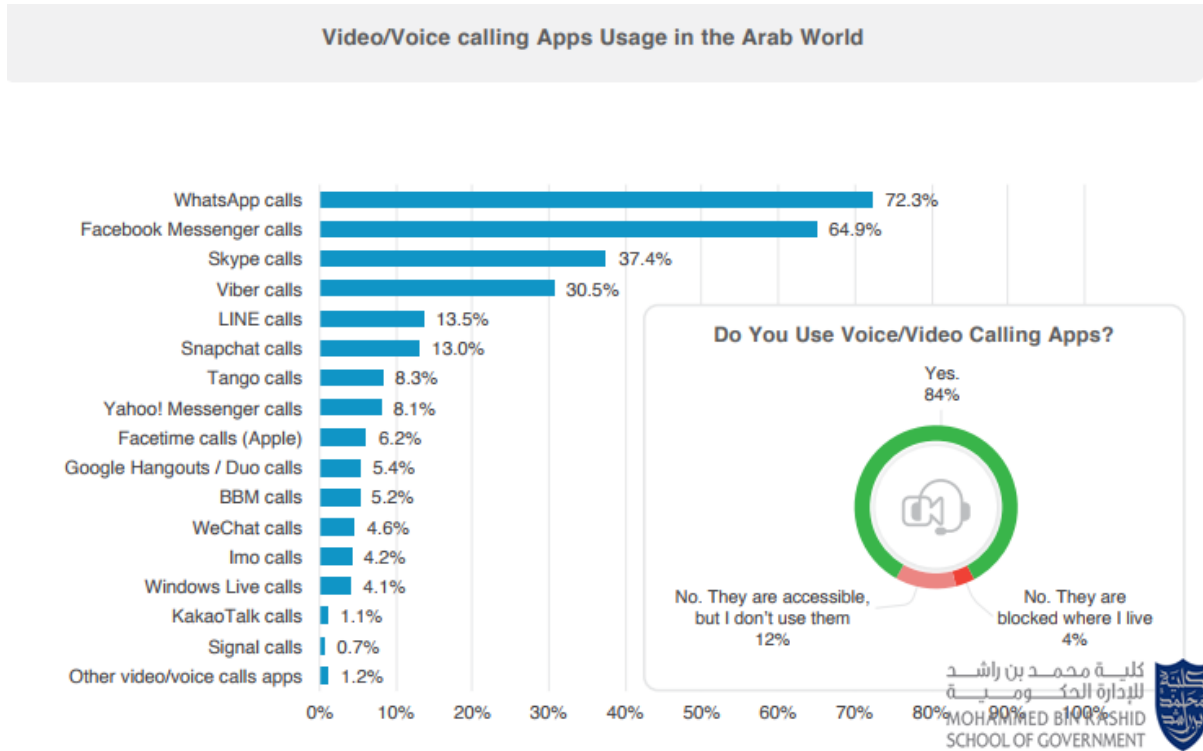


Fig. 1 – video/voice calling apps usage in the Arab World

Demand for video calling apps has skyrocketed in the current, as we are confining ourselves to self-isolation, or fearful of visiting each other in the case of spreading COVID-19. More and more of us are turning to online platforms to stay connected. What's the best video calling app to match these circumstances? Read on to find out.

7 Benefits of Video Calling

video calling apps allows you to hold meetings with many people in many locations. It is distinct from simple video calling, which involves fewer callers and features, and has varying price and usage limitations. In the past, video calling or conferencing required complicated and expensive equipment and expertise. Today, anyone with a phone can host or participate in a video conference. All you need is an internet connection and a conferencing platform like Skype, Zoom, or GoToMeeting.



Fig. 2 – video Calling Meetings

Video calling has become more accessible because of Voice over IP technology, which carries video, audio, and other data packets over IP networks.

Video calling has a higher bandwidth requirement than a simple video call. A typical session with decent quality video is around 1 Mbps for each participant. If HD video quality is important to you, consider this a minimum value.

Here are seven benefits of video conferencing.

Fig. 3 – No Need to Travel



It costs time and money to travel to meet people. With video calling, you can organize and hold a meeting with participants from all over the world. They only need the necessary equipment and to be present in front of the screen at the chosen time. The pre-meeting organization can be done via email, instant messaging, or various service platforms.

Fig. 4 – Bind Your Mobile Workers



If you have a mobile workforce with employees scattered around the country, video calling allows them to connect to your office on any computer or mobile device. You can leverage this existing mobile infrastructure to conduct video conferencing meetings with your workforce. The visual nature of video conferencing also allows you to check the activities and whereabouts of your employees.



Fig. 5 - It Aids Telecommuting

Video calling is an essential tool for teleworking or telecommuting—working away from the office, often at home. If your business has several workers who work from home, one way to curb the lack of interaction is through video calling. It also allows you to maintain the kind of downward instruction and upward reporting you get in an office.



Fig. 6 - Organize Meetings Independent of Time

Now that meetings online are free from travel expenses and location restrictions, they can be organized more often. You can meet people around the world every day or even several times a day. Meetings can be short notice. Participants no longer have excuses related to location and travel. This allows your business to move quickly, keeping tabs on all points of interest.



Fig. 7 - Humanize Your Conversation

Compare video call with phone or email. When everyone on a call can see everyone else's face, you can rely on the kinds of facial cues, body language, and hand gestures familiar to face-to-face conversations. Seeing someone while talking to them changes the nature of the conversation, be it a business or personal relationship.



Fig. 8 - Show Things

Seeing is believing, and showing is convincing. Through video calling, you can write on a board and show it to everyone, demonstrate your latest product, introduce a new recruit, share your screen or display a presentation. Oftentimes, these visual assets may not be available even at in-person meetings.

Fig. 9 - Learn and Teach Online



If you are a teacher or trainer, your market may be far from where you are physically located. Video calling is a great way to acquire and share knowledge with the rest of the world. While it's not the same as being physically present, online interaction is often more than enough. You will be able to use multimedia tools like interactive whiteboards, as well as online collaboration tools.

1.1.2 Purpose

The main purpose of video Calling app is to enable face-to-face communication between two or more people in different locations. We develop this project to call on a video to another person which is staying far away in the distance with the help of this app we can talk to each other the person who is a far from at the corner of the world in this app we can see a picture of a person which we are talking with and talk with them through audio this helps to convey a message or thoughts or voices to reach another person with the help of video calling app it is very difficult to meet the person which is stay in Far Away distances with the video calling we can feel like a person is standing next to me for sitting next to me Thanks to the increase in face-to-face interaction with video communications, we hold much stronger & trusting relationships with each of our customers

1.1.3 Objective

- ❖ Video calling can be a nicer way of chatting with others than just a Phone call.
- ❖ It let's you see the person you're talking to even if that person is far away from you.
- ❖ It connects people all over the world.

II. PLATFORM AND TECHNOLOGY USED

2.1 Android



Fig. 10 - Android Architecture

Android architecture includes a variety of components to meet the demands of any Android device. Android software includes an open-source Linux Kernel with a suite of C/C++ libraries that are accessed via application framework services. Among all the components, the Linux Kernel delivers the primary functionality

of the operating system to smartphones, while the Dalvik Virtual Machine (DVM) offers a basis for executing an Android application.

1. Linux Kernel

Linux 3.6 is near the bottom of the layers, with around 115 fixes. This offers a degree of abstraction between the device hardware and includes all of the necessary hardware drivers such as camera, keyboard, display, and so on. Furthermore, the kernel handles all of the things that Linux excels at, such as networking and a huge number of device drivers, which make connecting to peripheral hardware a breeze.

2. Libraries

On top of the Linux kernel, there is a set of libraries that includes the open-source Web browser engine WebKit, the well-known library libc, the SQLite database, which is a useful repository for storage and sharing of application data, libraries to play and record audio and video, SSL libraries responsible for Internet security, and so on.

3. Android Runtime

This is the third component of the architecture, and it is accessible from the bottom of the second stratum. This section contains a critical component known as the Dalvik Virtual Machine, which is a kind of Java Virtual Machine specifically created and optimized for Android. The Dalvik virtual machine makes advantage of Linux fundamental characteristics such as memory management and multi-threading, which are inherent in the Java programming language. Every Android application may operate in its own process, with its own instance of the Dalvik virtual computer, thanks to the Dalvik VM. The Android runtime also includes a set of fundamental libraries that allow Android application developers to create Android apps in the standard Java programming language.

4. Application Framework

In the form of Java classes, the Application Framework layer provides various higher-level services to applications. These services may be used by application developers in their apps.

The following major services are included in the Android framework:

a) Activity Manager

The Activity Manager manages the whole application lifecycle and activity stack.

b) Content Provider

Content Providers enable apps to publish and share data with one another.

c) Resource Manager

Access to non-code embedded resources like as strings, colour settings, and user interface layouts is provided through the Resource Manager.

d) Notification Manager

Notifications Manager enables programmers to show the user alerts and notifications.

e) View System

A view system is an extendable set of views that is used to develop application user interfaces.

5. Applications

The top layer of Android architecture is applications. Pre-installed programmers like as home, contacts, camera, gallery, and so on, as well as third-party applications downloaded from the play store such as chat apps, games, and so on, will be put solely on this layer. It uses the classes and services supplied by the application framework to execute within the Android run time.

2.2 Android Studio

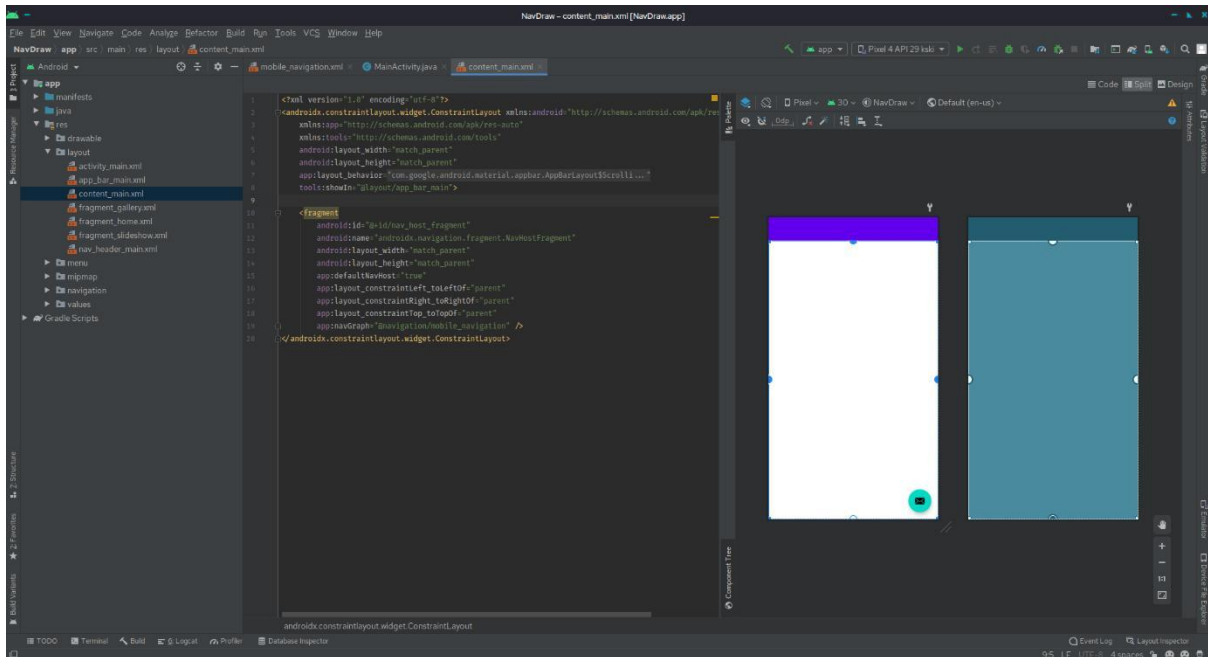


Fig. 11- Android Studio 2021.1.1 running on Windows

2.3 Java



Fig. 12 – Java Version 8

Java is a programming language as well as an operating system. Java is a high-level programming language that is powerful, object-oriented, and secure. Java was created in 1995 by Sun Microsystems (which is now an Oracle company). James Gosling is often regarded as the "Father of Java." It was called Oak before Java. Because Oak was already a registered firm, James Gosling and his team renamed it Java.

It is a programming language that may be used for a variety of purposes designed to allow programmers to write once and run anywhere (WORA), which means that generated Java without the requirement for recompilation, code can execute on any platform that supports Java. Java programmes are often converted into bytecode capable of running on any Java virtual machine (JVM), independent of computer architecture. Java's

syntax is comparable to those of C and C++, although it has fewer low-level features than any of them. The Java runtime provides dynamic features (such as reflection and runtime code change) that traditional compiled languages do not. J2EE offered technology and APIs for corporate applications that normally operate on servers, whereas J2ME had APIs tailored for mobile apps. J2SE was the moniker given to the desktop version.

2.4 SQLite Database

SQLite is a library that runs in the background enables a serverless, transactional SQL database engine with zero setup. It is a zero-configuration database, which means that, like other databases, you do not need to setup it on your system. SQLite engine is not a stand-alone process like other databases; it may be linked statically or dynamically with your application depending on your needs. SQLite directly accesses its storage files. SQLite supports bindings for a wide range of computer languages. It follows PostgreSQL syntax in general but does not impose type checking. This implies that, for example, a string can be inserted into a column specified as an integer. Prior to each release, SQLite does automatic regression testing. SQLite versions have had 100 percent branch test coverage, one of the components of code coverage, since the August 10, 2009 release of SQLite 3.6.17. The testing and test equipment are both free and commercial.

SQLite is incredibly tiny and light weight, taking up less than 400KiB when fully configured and less than 250KiB when optional features are disabled. SQLite is self-contained, which means it does not require any external dependencies. SQLite transactions are completely ACID-compliant, which allows for secure access from different processes or threads. SQLite is developed in ANSI-C and has a basic and straightforward API. SQLite's release includes a standalone command-line tool. It is capable of creating a database, defining tables, inserting and changing rows, running queries, and managing a SQLite database file. It also functions as a model for developing SQLite-based apps.

III.LITERATURE REVIEW

With the growth of new communication technologies, the power of social media has gained more importance. The social media is crucial in defining what we think about how we look at things and our social place and to discuss about the various issues in the society. Social media has been considerably influencing the various aspects of society like cultural, spiritual, social, economic, political and religious as well as influencing a personal level of thinking, feeling and reacting to particular issues. Social Media in a way disseminates information and had created the need for marketers to be present online to market their products. Social media plays both positive and negative role in marketing. In this article an extensive review of literature has been carried on to analyse and to get a good understanding on the impact of social media and its role in marketing. Literature review has been done from various books, journals, published papers etc. These studies have been reviewed and presented in the following manner. Literature review has been collected from both within India and outside India.

Cloud-based instant messaging and voice over IP service Telegram announced it had reached 400 million users this week, just a few months later after it surpassed the 300 million milestone, according to a press release published by the company.

The social media also launched a €400K, or \$432K, contest for creators of education tests and made a peculiar promise: To take and fix the "secure or usable" problem in group video calls during 2020.

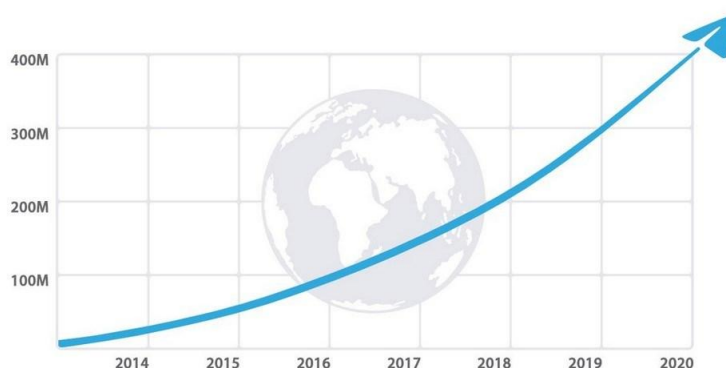


Fig. 13 – Telegram Rate 2014 and April 2020

Telegram rate of new users grow between 2014 and April 2020.

According to experts, much of the acceleration of the growth rate comes from the COVID-19 pandemic and also that Telegram often sees a surge in its user base when WhatsApp or another popular instant messaging platform faces an outage.

Regarding the current pandemic and new behaviors due to healthy and social distancing, remember than online and cloud based services are experiencing a massive surge in usage as we previously reported in ExpertInvestor with the 775% spike in Microsoft cloud demand in March.

1.5 Million New Users Every Day

Founder and CEO of Telegram Pavel Durov highlighted that "every day at least 1.5 million new users sign up for Telegram," as people remain choosing "freedom and quality" over restrictions and mediocrity" in an apparent reference against other social media engines such as WhatsApp and Messenger.

Durov says:

When we started Telegram 7 years ago, we assumed that people will always choose freedom and quality over restrictions and mediocrity. As the gap in popularity between Telegram and its older competitors narrows, we find more and more validity in that original assumption. Thank you for being smart and free!

Founded seven years ago, Telegram is now the most downloaded social media application in over 20 countries. Its desktop version is gaining more and more popularity as the desktop app does not require the phone to be connected to the internet to work.

Telegram Launches a €400 Contest For Creators of Education Tests

As a measure to help self-isolated, socially distanced, and quarantined students around the world, Telegram has decided to enhance online education funnily and interactively by creating a database of education tests.

Today, the social media also launched a €400K crowd-sourcing initiative for education tests and content for all subjects and levels that will distribute the money among creators. The company asks for innovation, out-of-the-box thinking, and savviness, and the only condition is to respect intellectual property rights. The deadline is May 15.

Create and publish an original educational test on any subject at any difficulty level, in any language. Feel free to choose anything from basic Medieval European History in English to Mikrobiologie für Experten auf Deutsch – and add any media you require to your questions, but make sure all intellectual property rights are respected.

As a part of the plan, Telegram improved its Quiz Mode engine with the addition of QuizBot and educational features. People can now add explanations to answers, helping users learn from their mistakes, or providing them with more context.

IV. OUTPUT OF OUR APPLICATION

Fig. 14 - Look for our app icon

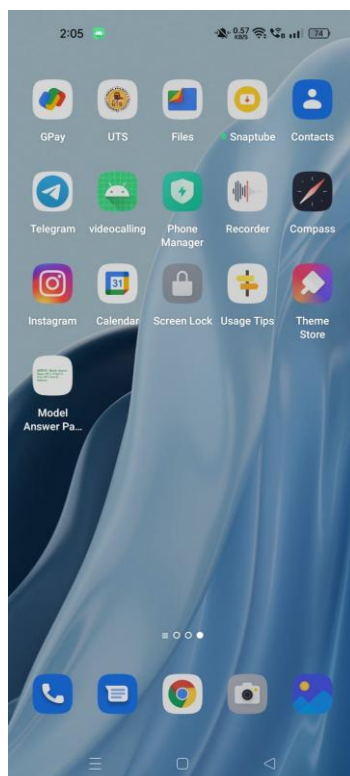
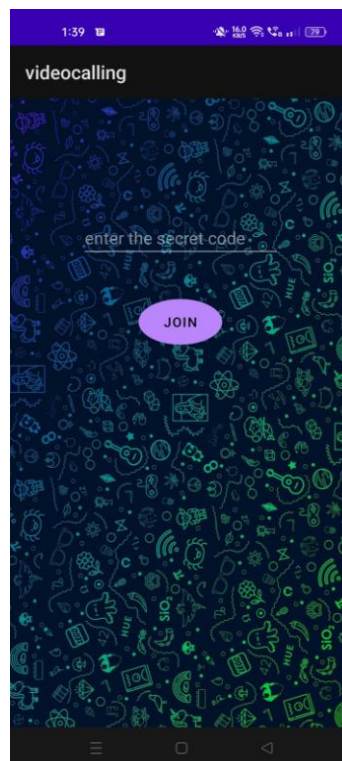


Fig. 15- Screen For join



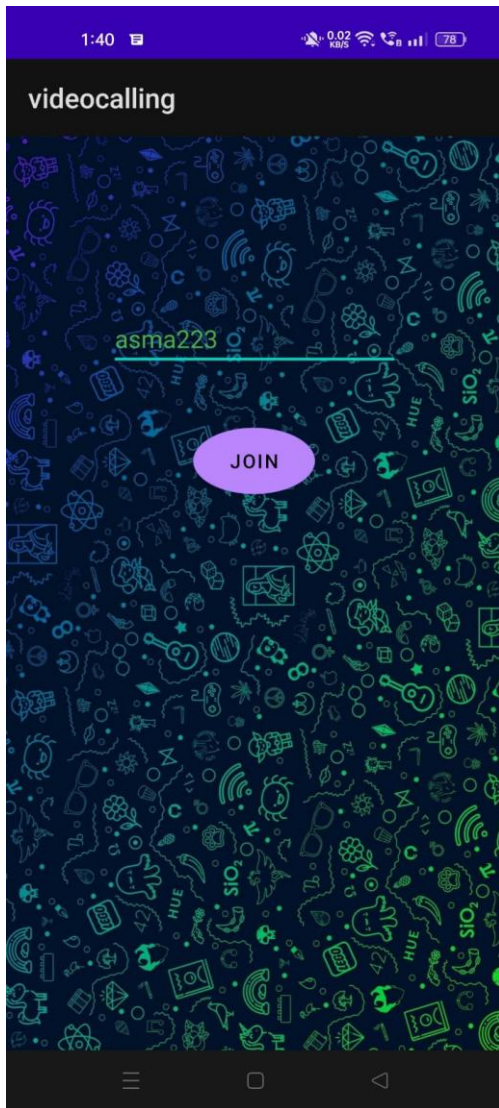


Fig. 16 - Enter any Secret Code

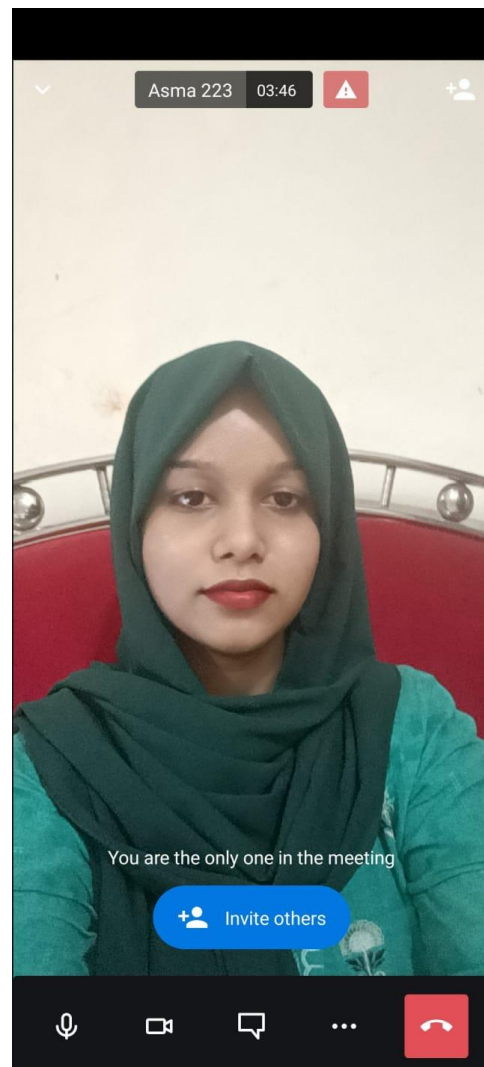


Fig. 17 - You have joined, now you invite other people in the video call



Fig. 18 - Other people have joined here

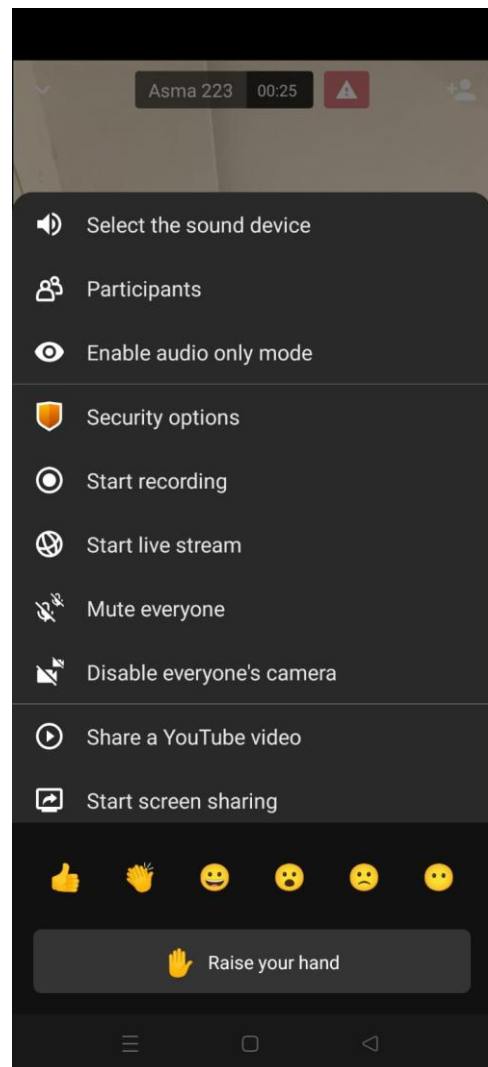


Fig. 19 - These are all the features of our video calling app

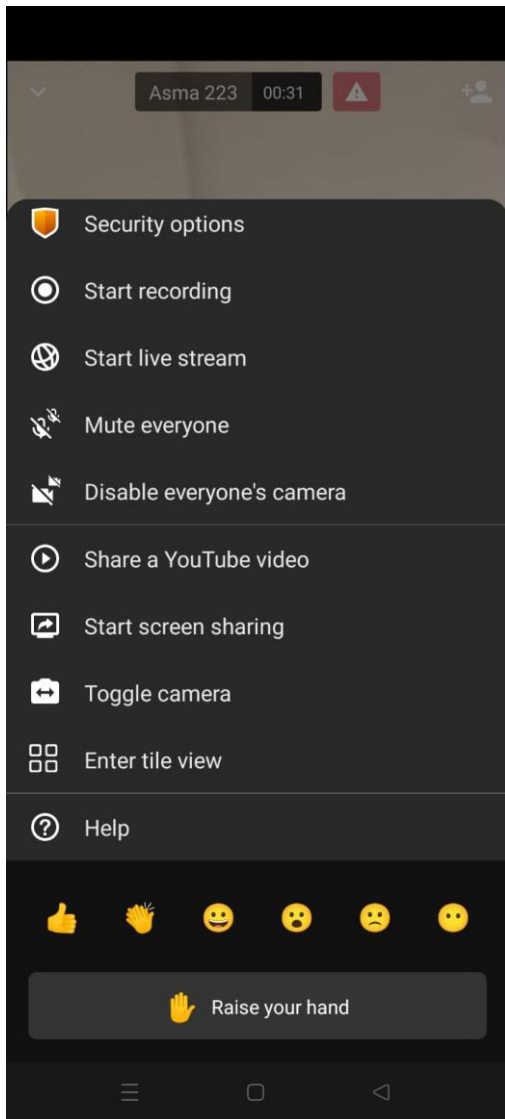


Fig. 20 - Features

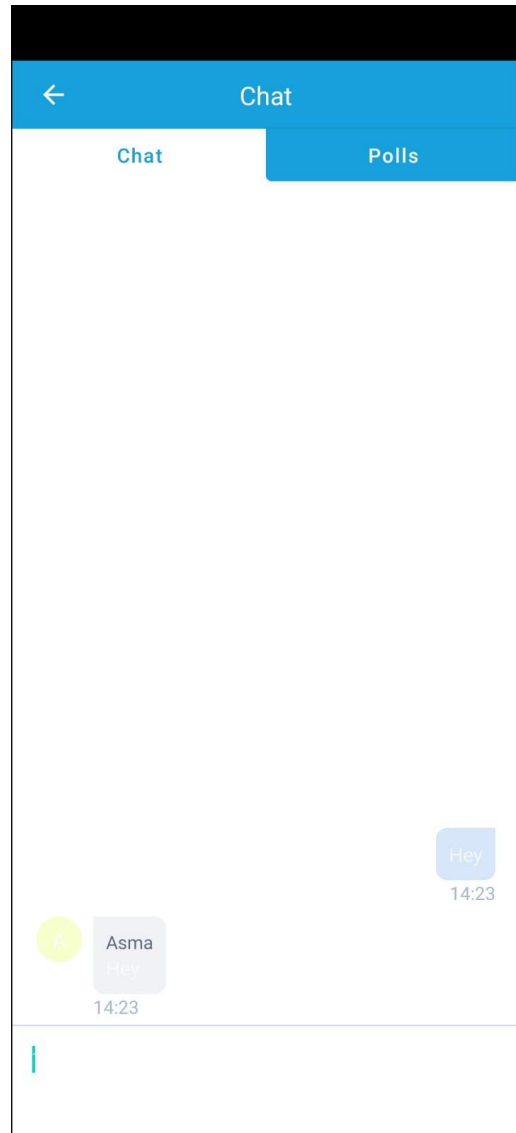


Fig. 21 - Our video calling app also has chat feature

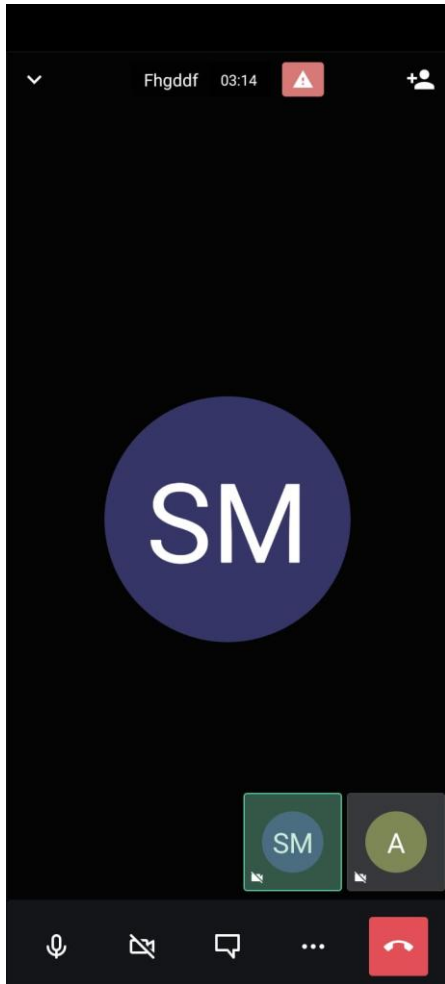


Fig. 22 - This is a unique feature in our video calling that you can turn off the camera of all the participants at the same time.

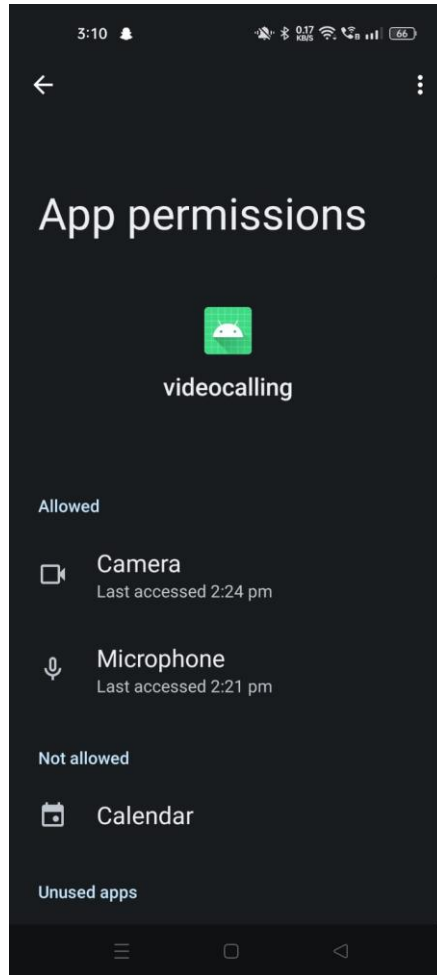


Fig.23 - App permission required for our application

V. CONCLUSION

The development of the project Android Video Calling Application has been wonderful learning experience for us as it took us through various phases of project development and application development in the world of software engineering. The thrill of tackling the problems involved and dealing with various bugs and logic issues gave us the feel developer industry. We gained a lot of knowledge about the working, structure and uses of API's, Android Studio, client and server, android OS and several hardware component and various technologies and platforms. The main purpose of video conferencing is to enable face-to-face communication between two or more people in different locations. It is a popular alternative to phone conferencing for businesses and provides individual users with an inexpensive means of communication with distant friends and family.

VI. FUTURE SCOPE

Although we tried to cover almost all of the aspects during our developmental phase, however we were forced to leave some aspects because of lack of time as well as monetary and other reasons.

Just like in the field of software development where there are always some shortcomings and room for improvement Video calling application can be used for live streaming platform. Application can also provide internet free voice call with walkie talkie technology used in Mobile Video calling streaming market is \$11 billion dollars technology increase we were hoping to develop hologram video calling platform and make our application more secure and safe for user Our application also have potential to become live streaming platform so number creator can earn money by live streaming Our application can also turn into social media application where people can upload video and show their creativity, our application can partner with numerous company and advertise their products on our application. That's how our application have potential to become successful and make our organization successful tech company

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