Android TV App for Video Conferencing

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Abstract: Abstract: During the coronavirus (COVID-19) pandemic, many people work from home and hold meetings online from the past decade video conferencing become more popular. It is very efficient, distance learning and very effective now a days. We have lots of channels for video conferencing like Zoom, Ms teams, hangouts and Jitsi meet. This can be operated over the mobile phones our personal laptops. But we do not have any application by which we can use the video conferencing over the Android Tv directly. There are many steps by which we can broadcast our mobile or laptop screen over the Android Tv but there is no such application by which we can directly use the application directly on the Android Tv screen. In this Research paper, by using the API integration of the Jitsi meet or connectivity, Android Tv application can be created. From the last year, IT sector becomes more powerful because of the Work from Home Policies due to Pandemic Situation. All the work is going online, which is called distance video conferencing. For the effective learning we need a big screen, which would be very effective for distance learning. With the help of The Android Tv video conferencing application USER can learn the things quickly and without any trouble over the big screen. It will be very helpful for the students at Schools, Universities and for the employees of corporate world.

1 INTRODUCTION

Distance learning becomes more popular for holding the meetings over the different channels of Conferencing, innovation has arrived at a degree of steadiness, convenience and moderateness which allows its utilization in genuine instructing situations instead of exploration projects. In this research work, Android tv conferencing app is being made by using the Integration of Jitsi meet into the application. Now a days, video conferencing becomes very popular for distance learning and work from Home for the corporate world. The utilization of video is being hailed as the following development in electronic correspondence. Numerous organizations are creating frameworks to help such ideas as virtual groups, working from home, and remote conferencing. Video conferencing has as of late become progressively mainstream and scatter in the wake of quicker and less expensive web associations and better advances. Current independent video conferencing units give progressed video and sound quality due to more productive pressure and can work over typical broadband web associations. Developing preparing power and less expensive embellishments, like webcams, have additionally made it conceivable to partake in a video meeting utilizing committed programming on a ordinary Android TV with no costly unique equipment. With the financial plan extended to the limit, a few business premises and establishments are settling to the side their movement plans and going to web conferencing to set aside cash and time. Video meeting members use either VC framework, electronic application or on-premises programming to intuitively speak with collaborators, understudies and others in virtual gatherings or study halls.

This methodology is simpler, less expensive furthermore, considerably more advantageous to utilize while additionally giving simple access to record sharing and assortment of others communitarian administrations. With the blast of data transfer capacity, the assets are presently accessible to give more communication in the virtual

study hall by means of video conferencing. Utilizing the different innovations accessible for video conferencing, researcher can give a more intelligent distance learning experience by conveying continuous, bidirectional video, voice, and information correspondences to their distance understudies, instead of simply the standard electronic media. Video-based remotely coordinating is a type of remotely coordinating done through mediums that help video and sound correspondence. It is a live video association between individuals in separate areas with the end goal of correspondence or communication (Sami Andberg, 2008).

2 LITERATURE REVIEW

Video conferencing is a generally new instructing and learning advancement. Greenberg (2004) proposed that "videoconferencing-based distance schooling has been in the early appropriation stage for a very long time or more Here is where things were beginning to get muddled. Or then again so we thought (Sami Andberg, 2008). It is essential to comprehend the at the reason Jitsi could undoubtedly turn into a conferencing blender, was that the way toward blending sound is extremely straightforward. It is really a matter of adding numbers together. One necessity to give unique consideration to keeping these numbers inside an uncommon reach, or to not sending one's sound back to themselves (which regularly implies creating individual blends for each client) yet indeed, even in view of that, sound blending remains an interaction that is adequately lightweight to be dealt with by ware hardware.

The circumstance is very different for video. despite the fact that it has required some investment to come to that end result. If we somehow managed to deal with video conferencing the manner in which we by and large handle sound, at that point we would need to blend video content. The idea of video blending is that of creating composite images. As such, if clients A, B, C, and D were to take an interest in a blended video conferencing call, at that point they would each begin a regular balanced meeting with the blender and send their video streams to it obviously. In return, they would receive a solitary video stream that would happen to contain every other person's substance regardless of whether somewhat downsized.

The straightforwardness, all things considered, is very engaging for a customer: conferences are

similarly as some other call and no extraordinary exertion is required to help them. Tragically things aren't exactly so basic at the server side. The reason is that video content blending requires a tremendous measure of preparing resources. JRES 2013 - Montpellier 2/8. When performing video content blending, one necessity to decipher every single approaching edge (one for every member), downsize every single one of them, create composite images and afterward re-encode them by and by (Sami Andberg, 2008).

3 METHODOLOGY

Jitsi Meet is a JavaScript application that utilizations WebRTC and can work with server's dependent on Jitsi Videobridge (a door to communicate video transfers to video gathering members). We did the tests on Jitsi Meet on a devoted server. The server had every one of the administrations for Jitsi Meet: web server (nginx), XMPP server (prosody) and Jitsi Videobridge. During testing, we discovered the issue with the Jitsi Videobridge, which is over-burden to send an enormous enough measure of traffic. Utilizing programs to fill enough gatherings will probably require hundreds or even huge number of PCs (Rachel Roberts, 2009). To tackle this issue, a full star geography was utilized to make a gathering. With this geography, inbound traffic from any endpoint is engendered to any remaining endpoints associated with Jitsi Videobridge. In this design, we have streams A * (A-1) leaving the video connect (and showing up A-1). Jitsi Videobridge - is a part of the XMPP server, it permits you to sort out multi-client video correspondence. Its distinction from costly committed equipment video spans is that it doesn't blend video channels into a composite video transfer, however, just transfers the got video diverts to all members in the call.

The force of the processor doesn't make any difference for its work. Jitsi Meet backings highlights, for example, work area and window sharing, programmed video changing to the dynamic speaker's video, community record altering in Etherpad, show sharing, real time a gathering on YouTube, sound conferencing, member network through the Jigasi telephone passage, secret phrase insurance, "talk at the hint of a catch" mode, URL greeting sending, and text visit. All information streams between the customer and the server are encoded (expecting that the server is running all alone limit). Jitsi Meet is accessible as a different application (counting Android and iOS) and as a

library for reconciliation into sites (Rachel Roberts, 2009). By and large, Jitsi is an incredible video meeting, helpfully composed and effectively inserted on Linux family frameworks. We made Jitsi meet application window and gathering with interconnection between clients, just as full web usefulness accessible to members from the authority Jitsi archive. We utilized the Make file to make an application and set up everything, libraries, files.

3.1 API Integration

Jitsi is a collection of Open-Source projects which provide state-of-the-art video conferencing capabilities that are secure, easy to use and easy to self-host (Lynne, 2007).

3.1.1 Architecture Jitsi Comprises a Collection of Projects

1.Jitsi Meet - WebRTC compatible JavaScript application that uses.
2.Jitsi Video bridge to provide high quality, scalable video conference.
3.Jitsi Video bridge (jvb) - WebRTC compatible server designed to route video streams amongst participants in a conference.
4.Jitsi Conference Focus (jicofo) - server-side focus component used in
5.Jitsi Meet conferences that manages media sessions between each of the participants and the video bridge Jitsi Gateway to SIP (jigasi) - server-side application that allows regular SIP clients to join Jitsi Meet conferences Jibri - set of tools for recording and/or streaming (Lynne, 2007).
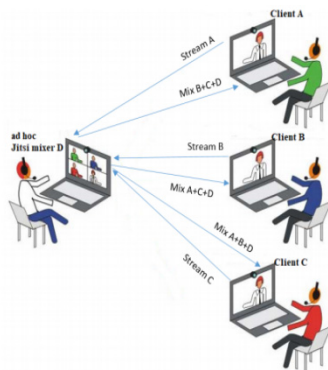

Figure 1: Connection Diagram.

3.1.2 Pre-build SDK Artifacts/Binaries

The repository goes into the build.gradle file in the root of the project:
allprojects {

```
repositories {
    google()
    jcenter()
    maven {
        url "https://github.com/jitsi/jitsi-maven-repository/raw/master/releases"
    }
}
}
```

3.1.3 Dependency Definitions Belong in the Individual Module Build: Gradle Files

```
Dependencies {
    // (other dependencies)
    implementation ('org.jitsi.react:jitsi-meet-sdk:2.+') { transitive = true }
}
```


Figure 2: Index file.

3.2 JITSI Conference

The object represents a conference. We have the following methods to control the conference:
1.join(password)
2.leave()-
3.myUserId()
4.getLocalTracks()
5.addEventListener(event, listener)
6.RemoveEventListener(event, listener).
7.on(event, listener)
8.off(event, listener)
9.sendTextMessage(text)
10.setDisplayName(name)

3.3 Develop for Android

Android, this word means a lot in present High-Tech World. Today Smartphone are known for its operating system which is Android. Earlier there is no option for operating systems like Android in mobile, as usual there are symbian, java featured operating systems but today things have changed a lot, everyone wants a Smartphone which is functioned on Android only. In a very short span of

time android created a reputed place in the market. What is this Android actually? Android is a software cluster for mobile devices that includes an operating system OS, key applications and middleware (JNT Association, 2007). The Android SDK provides the tools and APIs required to begin developing applications on the Android platform using the Java programming language. About the design, Kernel of Android is based on Linux kernel and further furnished by Google (Greenberg. 2009). Currently an SDK is hosted by Google, which is a leading player in the initiative. This SDK allows creation of various Java based programs by using a special Eclipse plug-in that interfaces with the kit. Android is not only an OS but also includes a middleware and an array of applications for the users (Greenberg. 2009). Some of the supported features are – a Dalvik Virtual Machine, built in browser and database support, media, camera, GPS, maps and other features.
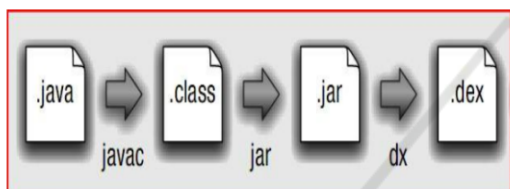

Figure 3: Technologies Used.

3.4 Basics for Building a TV App

To make your application effective on TV gadgets, you should plan new formats that can be handily perceived from 10 feet away and furnish navigation that works with simply a directional cushion and a select catch.

3.4.1 Build a Great Search UI

The Learn back help library gives a bunch of classes to empower a standard hunt interface inside your application that is predictable with other pursuit capacities on TV and gives highlights, for example, voice input.
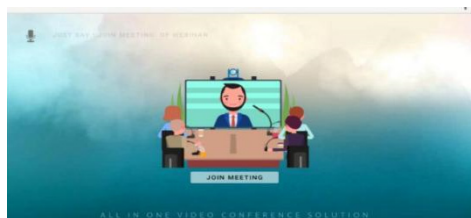

Figure 4: Android Tv UI.

3.4.2 TV Appropriate Apps

Applications most appropriate for TV offer vivid diversion encounters. Applications that give getting the hang of, playing, conveying, and substance utilization are genuine models, however this is anything but a thorough rundown (Lynne, 2007).

3.4.3 A Large Screen UX

Because of the survey distance of the TV, clients will most likely be unable to measure as much data on TV as they would on a PC or cell phone. Breaking point the measure of text and perusing on TV screens.

3.5 The Hardware Components

Fundamental gear required for a video meeting incorporate a camera, receiver, a video conferencing unit, show unit, and sound framework (JNT Association, 2007; Alan, 2009).

3.5.1 Camera

A camera to catch pictures and convert them into an electrical sign. Area of the camera must be ideal to consider reasonable eye to eye connection. Likewise, great quality and usefulness of the cameras ought to have the option to give a more honed, more brilliant picture, with less visual commotion.

3.5.2 Microphones

Microphones utilized in VC are normally touchy and should be set away from supplies like projectors which can create some foundation commotion.

3.5.3 Video Conferencing Unit

The VC unit normally alluded as the codec (Coder/Decoder) acknowledges the vision and sound signs (video and sound) and cycles them into a reasonable configuration for transmission through the organization to the distant site. To get data the Decoder does the converse: it acknowledges the computerized signals from the distant site over the organization and unravels or changes over these into video and sound. At last this video and sound are taken care of to a showcase unit and speaker to show the photos and replicate the sound from the distant site separately.

3.5.4 Display Unit

A showcase unit can be either a TV unit or a

projector anticipating onto a surface. The display unit is associated onto the codec.

3.5.5 Sound System

A decent sound framework is ideal for video conferencing. In certain occurrences, TV speakers are utilized however in many occurrences (for example homeroom, meeting rooms, and so on), a decent sound framework with blender, enhancer furthermore, speakers may be required.
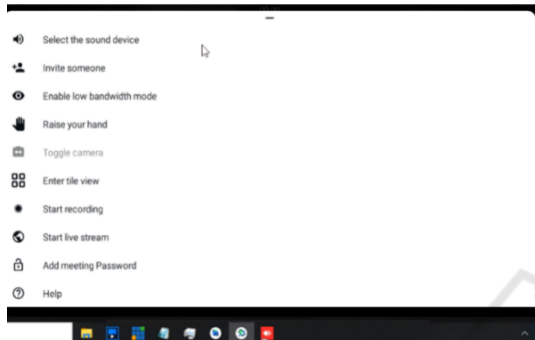

Figure 5: UI Components of the Android Tv.

3.6 Jitsi Meet

Figure 6.

The initial step to an answer, was to check whether utilizing a different application would prompt better results. All Japanese understudies have LINE, it is by a long shot the most mainstream courier application in Japan. In any case, as instructors, we preferred not to request understudies to give up their own LINE ID to individuals that they may not wish to do as such. Google Hangouts had just required them to share a school provided email address which is undeniably less intrusive. Thus, Jitsi Meet was chosen as the subsequent application, as it provided greater protection to the understudies.

JitsiMeet (https://jitsi.org/jitsi-meet) is an open source communicator that provides sound/video conferencing ability, video streaming, text-based visit, and file move. Jitsi Meet is a decent decision for anybody with protection concerns. Jitsi Meet doesn't require the understudies to share individual email addresses or other individual data with different understudies. Indeed, no record is required.

Conference individuals can without much of a stretch create tweaked codes with letters and numbers, and individuals would then be able to join video conferences by just composing the provided code. Survey from effortlessness and protection points of view, it is a brilliant decision.

4 ANALYSIS

Getting information directly after the classes, the first impression of the educator's dependent on their experience was that Jitsi Meet had less issues than Google Hangouts. Be that as it may, upon investigation, the Jitsi Meet information appears to agree definitely more intimately with the Google Hangouts information than the educator experience may have recommended. Basically, there were undeniably more gadgets in use during the Jitsi Meet investigation periods and this very likely prompted more specialized troubles instead of a lack in Jitsi Meet itself. There are three focuses that help this end. Initially, the model container information. Jitsi Meet had four times of information. Three periods fall into the huge over-spill container four. There were numerous issues on the grounds that there were numerous gadgets being utilized (43-66 gadgets). The fourth time of a day and a half, which corresponds to can three, had 30.56% of hazardous gadgets and was identical to the Google Hangouts information for 36 gadgets. Besides, while 66 gadgets prompted 32 issue groupings, it is additionally evident that 34 gatherings associated effectively to Jitsi Meet rather than a high of 25 for Google Hangouts.

Figure 7.

This would propose that Jitsi Meet was not any more tricky than Google Hangouts, but instead Jitsi Meet was utilized under greater stress creating a negative response from the educators. At long last, the linear regression investigation, dissipate plot, unequivocally upholds this contention.

5 ANDROID TV VIDEO CONFERENCING

Figure 8.

Android Tv Videoconferencing is a method of communicating between two or more locations in which sound, vision and data signals are conveyed electronically to enable simultaneous interactive communication? Much more personal and effective than audio conferencing, all parties involved can see the facial expressions and body language that are so vital to the way we communicate (JNT Association, 2007). Video conferencing works by using a few different technologies. Some of these technologies are hardware while others are software related. A Video conference can be between two sites, i.e. locations which are connected to each other via the video conference, or the conference can connect multiple locations (Greenberg. 2009). The communication can take place in a special video conferencing studio, or on a normal home computer equipped with a webcam or even a video call on a modern 3rd generation mobile phone falls into this scope (Roberts, 2009). Besides the audio and visual transmission of meeting activities, allied videoconferencing technologies can be used to share documents and display information on whiteboards.

6 DISTANCE DELIVERY

The contention for conveying courses a good way off utilizing videoconferencing alone is less convincing. In certain areas, videoconferencing is seen by instructors, directors, students, and the bigger local area as a way to reproduce the study hall experience a good way off – a fare work that requires insignificant change in instructional method also, study hall conduct. As one instructor clarified: "I put on a façade for the students like all is Well and made an effort not to treat it any distinctively that a normal study hall." Early discoveries, nonetheless, show that the video-conferencing experience is inalienably unique in relation to

homeroom educating and, much of the time, more trying for instructors and students. "I felt very unsteady the main day. (Rachel Roberts, 2009) It likely took me a month to be agreeable in there", said another instructor. The scientists' experience as distance instructors moreover drives them to contend that videoconferencing can be utilized as just one instrument in a set-up of many distance training innovations.
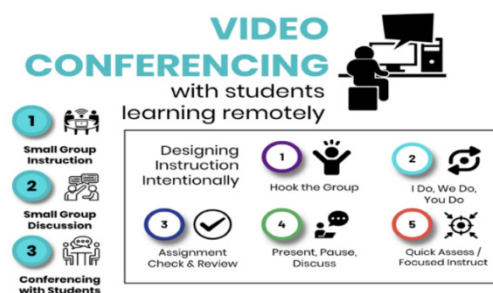

Figure 9. Remote Learning.

6.1 Teaching Benefits

Educational video conferencing provides teachers with more flexibility as they are able to convey ideas and subject matter without the boundaries of distance (Rosenberg et al., 2008). The daily commute that some teachers typically make to reach their place of employment is eliminated when their options for reaching students are expanded. For example, one lecture could teach to all fourth-year university students in four different school buildings across campus simultaneously (Rosenberg et al., 2008). Time and money can be saved along with the same subject matter not having to be taught to each class independently. Evening lessons may be provided as teachers could provide lessons via VC from home.

6.2 Real-world Education VC Benefits Enabling Better Course Delivery

• Allows collaboration with other schools and students worldwide.
• Organization of projects based around overseas schools and their communities.
• Low-Cost Single Site-to-Site Setup, easily call other schools via dial codes.
• Utilizes one originating teacher and a facilitating teacher at each connected site.
• Small- and Large-Scale Solutions to suit primary, secondary or higher education.
• Requires that students and the facilitating teacher be active participants in the learning experience.

• Face-to-Face communication allows students better appreciation of other cultures, languages & dialects.
• Provides lessons (such as specific foreign languages) which would not normally be catered for due to staffing requirements or facilities.
• Allow teachers to attend meetings without the need for travel & spend more time lesson planning etc.

7 CONCLUSIONS

Android Tv conferencing application could lead the way of learning very effective and interactive. It will give the responsibility for Video conferencing could lead the way in both the approach, it will provide the students effective way for their learning, or working in a team, and also doing academic tasks, which would be beneficial for teaching, for corporate workers. It would not change the utilization of print or different strategies utilized in the conceptualization interaction. It may be utilized to energize development and its actual use lies in empowering exchange and expanding the distance learning courses. With the use of broadband or Internet Connectivity, Android Tv conferencing can be possible in a very efficient way also the accessibility of fast and modest web associations, it is normal that video conferencing will progressively become mainstream now a days, prompting more revenue and utilization of distance learning. In this paper, a prologue to video conferencing and its application in distance learning was introduced as a viable method of conveying topic in study halls or work from home. In this Research work Jitsi is used, which gives the vital programming to make your own Android Tv video conferencing administration that can be sent utilizing a virtual work. Jitsi meet is an open-source program that permits you to get sound/video calls and meetings, web based and work area sharing, texting, and numerous others.

8 FUTURE SCOPE

Figure 10.

Android Tv Video conferencing is very useful video conferencing task and acquiring reception is its first significant test. Ideally, we would be ready to depict video conferencing organizations in a future JRES version. From an advancement viewpoint we desire to have the option to address a few significant angles like help for portable customers, Scalable Video Coding (SVC) and additionally simulcasting, retransmission procedures and huge scope gatherings and instructing meetings. Making Android Tv using Jitsi Video conferencing amicable towards versatile customers would expect us to carry out exchanged or specific video handing-off so just a portion of the streams would be delivered on the Android Tv. Comparable retransmission systems would be needed for the help of on-line classes and enormous scope meetings. SVC and simulcasting would be significant for upgrading transmission capacity utilization, improving blunder flexibility and convenience for their users.

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APPENDIX

Videoconferencing

To help of a social affair among people from removed zones through conveyed sound and video messages over an association. In the Alberta Schooling structure, this transmission will happen over the SuperNet using the H.323 IPbased video-conferencing show. This isn't to be confused with the H.320 show, which is a telephone line-based

videoconference in any case called Integrated System Digital Organization (ISDN) Videoconferencing.

Web Conferencing

A program-based client/laborer application that gives video, voice besides, data transmission to individuals at inaccessible districts over an association. This kind of use normally incorporates an "http" request from a PC to a web specialist. Routinely, web conferencing applications can work with low-speed network accessibility similar to dial up (56 kbps). Essential features join content visit, whiteboarding, application sharing, record move, part studying and plan for lower layout rate.

Remotely Coordinating

A sound gathering or call, which requires an expansion or tele-convener (sound convener) to join unmistakable telephone parties (using the Public Switched Telephone Network (PSTN).

Webcasting

Close to consistent scattering of live video over an association to watchers at distant areas using an item-based video player or web program module (e.g., QuickTime, Windows Media Player or Real).

Video Streaming

The recuperation and audit of a pre-recorded or documented substance. The activity or show is seen through a web program using a film player module (e.g., QuickTime, Windows Media Player or Real)

Audio Graphics

The simultaneous transmission of voice and data across neighborhood telephone lines in a way that is natural among teacher and individuals at distant objections. There is no video transmission in this sort of use.