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Real Time Chat Application Clone

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Abstract: *Nowadays, Internet-based communication is becoming more and more important. Online communication users can connect with others quickly and conveniently. Therefore, the online communication tool must be able to send messages, photos or any other type of files quickly and without delay. Google's platform for creating mobile apps is called Firebase. It has a scalable infrastructure, an end-to-end development environment, and a quicker time to market for developing apps. One method of staying in touch is instant messaging. To start chatting, users need to connect to a server where they can chat privately and in groups securely where both parties need an active internet connection to communicate.*

Keywords - *Chat Application, Communication, Firebase, Internet Connection, Online Messaging.*

1. INTRODUCTION

Utility software that supports user-to-user communication over a network is called a chat application. It is effective to use a chat application as a platform for different forums. Chat programs provide features such as display of messages in chat rooms, display of online member lists, and the ability for users to send private messages to other users. Moreover, chat software allows you to chat with other chat friends Online chat applications can therefore provide a fault-free, safe, trustworthy, and quick management system. It can assist users in concentrating on their other tasks rather than record keeping. Consequently, it will enable users to utilise resources more effectively.

An on-line chat gadget allows customers to talk with every different in actual time the use of without difficulty used internet interfaces. It is a selected kind of internet chat that stands proud for its accessibility and simplicity of use for customers who do not need to spend the time putting in and getting to know the way to use specialized chat software. There are several chat programs handy today, like Facebook Messenger, Hike, WeChat, Telegram, Snap Chat, WhatsApp and others. For our project, we've got selected to clone the capabilities of WhatsApp, a totally famous messaging program.

Before using the Service, Users must register or login with their email ID. When users log into the program, they can search for other users with whom they need to communicate. After the conversation, the user can delete the chat. Users can design their profiles so that other users can recognize them. Users can respond to incoming communications by simply composing a reply message and pressing the send button. Users of this web-based service can easily delete their accounts. The user has the option of logging out of their current device and logging back in on another device.

Chatting may help any firm communicate more quickly and with less risk of particular security breaches and message failure due to internet connectivity issues. After reviewing earlier efforts, it was determined that in addition to the usual functionality, such a system required additional security measures. CAPTHA and encryption were used to put this into action. After a thorough examination of the system's goals and needs, the best design techniques were chosen and used to create the effective Private Secure Chat System. In order to troubleshoot and correct flaws, various tests were run on the system. These tests were used to determine the minimal system requirements.

The result will be a secure private chat system that gives user organizations access to recorded chat messages while reducing the danger of confidentiality violation through encryption. The design and implementation of such systems can be supported by it as well. The developed private chat system claims to help the organization gain a competitive edge. It is anticipated that the effective implementation of this system will promote faster and more secure user communication. Voice, video, multicast, and smiley chat features may be added to the secure chat system in the future. More investigation into these topics will help the system.

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2. FEASIBILITY STUDY

After working on the Real Time Chat Application Clone project, learning about it, and examining all the system's functionalities that are currently in place or that are required, the following task is to do a feasibility analysis for the project. All endeavors are possible if given unlimited resources and time. All potential remedies to the current situation are considered when conducting a feasibility assessment. The given solutions should satisfy all user requirements and should be adaptable enough to change in the future to meet new needs.

2.1 Economic Feasibility: This is an important issue to take into account when developing a project. With the least expensive technology possible in mind, we made our choice. Overall, we estimate that the benefits the user would receive from the proposed system will not require any operational costs, making this system economically viable. There are no hardware or software costs for the user.

2.2 Technical Feasibility: This encompasses the examination of how performance, function and restrictions may debar the ability to develop a functional system. We investigated all of the system's capabilities as mentioned in the Software Requirement Specification (SRS) in order to undertake this feasibility study and evaluated its viability using a variety frontend including backend platforms.

2.3 Operational Feasibility: The provided system is undoubtedly entirely GUI-based, making it self-explanatory. It is also very user friendly, even a novice can use it without any difficulty. Additionally, users have received enough training to guarantee that they are familiar with the new system and grasp its fundamentals. Our research indicates that because the system has lessened users' workloads and responsibilities, they would feel more comfortable and satisfied.

Significance of This Study

WhatsApp is a well-liked smartphone app that offers instant messaging functionality. It makes advantage of Internet services to send various text and multimedia messages to users or groups. And to address the following needs, we have proposed this system, which works similarly to WhatsApp but has several distinctions of its own:

- Privacy: To protect privacy, exchanged messages between users should be encrypted.
- Robustness: To enable recoverability in the event that a user's system breaks down, a backup of user conversation history must be kept on distant database servers.
- Application performance: The application must be quick and light on resources.

3. OBJECTIVE

Our main objective is to maximize the system's significance, and in order to do so, the system will guarantee the following:

Communication: To create a platform for instant messaging that would allow users to connect with one another without any hassle.

User friendliness: The project has to be very simple to use so that even a complete novice can utilize it.

4. RELATED WORK

One of the most important innovations in the history of Internet chat was IRC, which was developed by Jarkko "WiZ" Oikarinen in 1988 at the University of Oulu in Finland while he was working at the Department of Information Processing Science. This service was already being provided by 40 servers in 1989. IRC gradually gained popularity and became available in about sixty different countries (Oikarinen & Reed, 1993).

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To compete with IRC, several alternative chatting applications were created. The most successful innovations in the history of Internet chat were IRC and Dalnet, which stood the test of time.

The methods and tactics of conversing have progressed thanks to ground-breaking developments. Today, various chat options including voice and video chat are available. The sentences that follow will discuss the chat programmes like GoogleTalk, MushClient, Skype, Voodoo and Facebook. Voodoo Chat, a text-based chat programme with voice chat features, launched in very late December 2001 in response to Excite's Virtual Places being shut down due to the company's bankruptcy after being acquired by the @Home Network (Parniak, 2009).

Voodoo Chat that uses two scrutiny mechanisms. Encryption is a prime illustration. The second is the application of system hashes. It has a server hub that organises other servers, a chat server that controls the chat feature and a login server that functions as a firewall. Each user of Voodoo is restricted to a single machine, which is one of its shortcomings. Once registered, a user's computer prevents them from chatting on any other computers and gives them simple access to the server in the event that it is stolen.

The *MUSHclient chat system* has several features, including calling another player (after acquiring the player's TCP/IP address and the port to use for talking), receiving calls from one or more other players, verifying incoming calls, and accepting or rejecting them. Group discussions, file sending and receiving, and the separation of individuals into groups are all made possible. One of the chat system's downsides is its low security level, which makes it susceptible to penetration assaults (Gammon, 2005). *MUSHclient Chat System* is a peer-to-peer messaging platform.

Google Talk is an instant messaging platform that offers voice and text messaging. Applications for Google Talk are available for the Google Chrome OS, Android, Blackberry, and Microsoft Windows (Vista, Server 2003, XP, and Windows 7). The Google Talk servers use the open XMPP protocol to communicate with clients, so any other client that supports XMPP can also be used to access the service. All communications between the Google Talk server and the Google Talk client are end to end encrypted except when using Gmail's chat over a HTTP protocol, a federated network that does not support encryption. Communication from start to finish is not encrypted. Some XMPP clients come with native encryption capability for Google Talk servers (Google Talk Beta, 2011; Betabeat, 2012; Google Talk Help, 2013). However, the technology employed by the Google server network is not widely known. It has drawbacks like being vulnerable to attacks when using HTTP or IMLogic for communication.

Skype is a piece of software that allows users to place calls over the internet. Additionally, it features integrated video, chat, SMS, and presence awareness (Higginbotham, 2008). Skype doesn't have a centralised server to manage the network, with the exception of logon servers. Instead, to decentralise the network and support a very high uptime %, Skype uses peer-to-peer technology. Once you connect in to Skype, your computer joins the network, which helps decentralise the burden of phone call routing. For security, Skype uses an encryption scheme. There is no on or off switch for this system. Skype offers users an unregulated registration process. There is no way to verify that the person they speak with is who they claim to be, so users can utilise the system anonymously without endangering their real-life identities. It is quite affordable to call another phone while using VoIP to make the calls. Making a call to another Skype user is free. Each Skype user has a distinct username that can be used to contact them (Wikipedia Skype, 2013). Lack of privacy is one Skype drawback. Additionally, Skype makes it challenging to enforce (business) security policies. Additionally, the Linux version has glitches and delays.

Facebook, in terms of traffic is the second-largest social network on the internet after Instagram. Facebook frequently divulges user data to third parties, including businesses that they collaborate with. Privacy is therefore not entirely guaranteed. Facebook also gathers user data from other sources, including publications and instant messaging platforms. It doesn't matter how the website is used—this data is collected nonetheless

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5. LITERATURE REVIEW

The use and consequences of WhatsApp, particularly on young people, has been the subject of extensive research and analysis. While some of these studies are especially targeted at undergraduates, others in particular subjects are also intended for the broader public. However, the public was not given access to a thorough research analysis from our examination of the literature. The following list of study specifications includes some of them:

The Financial Times report stated that: "WhatsApp Messenger, the mobile messaging service that offers limitless free text messaging, has done to mobile messaging what Skype did to international landlines. It has become the best-selling app for iPhone, Android and BlackBerry in dozens of applications in the market without marketing or sales promotion."

The authors of "Privacy Impact of Presence Sharing in Mobile Messaging Applications" conducted a study of two different groups of 19 participants in total, who consistently used WhatsApp over a four-week period. They collected and analysed presence data and conducted follow-up interviews. According to this research, up-to-date information is enough to identify daily trends, fluctuations, inappropriate mobile her news times and interlocutors.

To determine the importance of WhatsApp among young people, it was surveyed among the age group of 18-23 in Southern India (Chennai region). The study found that the student spends 8 hours a day on her WhatsApp and about 16 hours online each day. All of the respondents concurred that they use WhatsApp to talk to their pals. They utilise WhatsApp to share photographs, audio files, and video files with their friends.

Research is conducted to assess social media applications usage in South African universities in the article "Smartphone application usage amongst students at a South African University." This study has established the typical amount of time spent by pupils each day is five hours using social networking apps on their cell phones to interact with others. A June 16, 2013 Times of India online article reported on a study conducted by Tata Consultancy Services between 2012 and 2013. The study group was 17,500 high school students aged 14 to 15 living in his 14 cities in India. We found that about 70% of students.

One study found that using a combination of WhatsApp and Facebook accounts accounted for more than 30 minutes of total mobile time each day, as reported by Business Standard in a March 3, 2014 article. own smartphones and are beginning to reach their full potential.

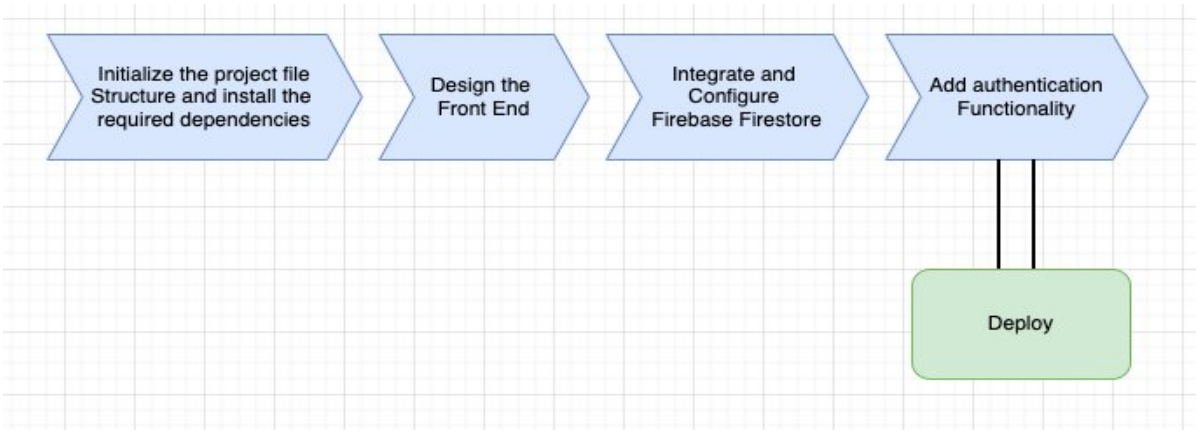

Fig. 6.1 Work flow diagram

6. METHODOLOGY AND PLANNING OF WORK

We can break down the project in the following stages: Front-end - Sidebar Component - Chat Component, Back-end - Authentication – Database

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6.1 User Registration

A legitimate phone number must be used by the user to register for the application.The user must be requested to enter their phone number when the application is first opened. Application should shut down if user skips this step. The Chat Application user's account will be uniquely identified by his or her phone number.

6.2 Adding New Contacts

All contacts in the user's phone book should be recognized by the application. If any of the contacts have Chat Application user accounts, they must be added automatically to the users' contact lists there.If any contacts haven't signed up for Chat Application yet, the user should have the ability to invite them by sending them a regular text message urging them to do so with a link to the Chat Application on the Google Play store.

6.3 Send Messages

When a message is successfully delivered to the intended recipient, the user should be notified via a tick next to the message that was sent. The Chat Application should allow the user to send instant messages to any contacts on the contact list.

6.4 Message Sent

The user should be able to organize contacts into groups. Messages sent to these groups should be able to be disseminated by users.

6.5Message Status

The user must be able to determine whether the message sent to the intended recipient has been read. The methods and strategy for addressing problems for this system are described in the following tables.

TABLE 6.1 Causes and Solutions of various Troubleshooting Problems

PROBLEM	CAUSE	SOLUTION
CANNOT REGITER (AUTHENTICATION)	1. THE MANDATORY INFORMATION FEILD WAS PARTIALLY FILLED OUT. 2. EITHER THE USERNAME IS INCORRECT OR IT IS ALREADY IN USER. 3. EITHER THE PASSWORD IS FLAWED OR IT IS TOO SHORT.	ENTER ALL THE INFORMATION IN THE REQUIRED INFORMATION FIELD. SELECT A USERNAME THAT IS UNIQUE—SOMETHING OTHER THAN YOUR NAME. ENTER THE CORRECT PASSWORD AND CHOOSE A PASSWORD OF GREATER OR EQUAL MINIMUM LENGTH.
CANNOT ADD NEW CONTACTS	YOUR DEVICE COULD BE RECEIVING INCORRECT REFERENCES.	RESTART THE APPLICATION.

7. FUTURE ENHANCEMENT

Regardless of how well and efficiently something is done, there is always space for improvement. But being open to additional adaptation ought to be the most crucial factor. We just use text messages to communicate at the moment. Future updates to this software might include features like File transfer, which lets users utilise the chat application to exchange files in a number of formats to other users. By allowing voice

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calling, similar to on a phone, for conversation, voice chat would elevate the application to a new level. Also, video chat will help make calling into video communication even more effective.

The improvements that can be made to this project to broaden its usefulness and scope are those that have already been highlighted. We can keep track of Online Chat and Chat Application records here. Additionally, as it can be seen that players today are adaptable, there is opportunity to introduce a method to maintain the Online Chat Application. The entire online chat system, including the chat application, chat history, chat profile, and chat users, can be improved.

We have looked everywhere, so it will be possible to include any future recommendations made by users for system enhancement. Last but not least, we want to thank everyone who helped build the system, whether they were directly engaged or not. By highlighting the process' success, we expect that the project will fulfill the objective for which it was developed.

8. CONCLUSION

Without writing a single line of server-side code, we can create a straightforward chat application using Firebase's real-time database. The creation of a Secure Chat Application is the project's primary goal. In order to complete all the chores, we used a wide range of literature reviews. Through these reviews, I learned about some of the items that are currently on the market. We conducted a thorough investigation along that line to close the gaps that exist in the current systems and to eliminate them from our application. As we conducted our investigation, we learned about the newest technology and various algorithms. The end result is a private, secure chat system that allows user organizations access to chat communications that have been recorded while also lowering the risk of confidentiality breach through encryption. It can also aid in the creation and use of such systems. However, in order to improve this application further, In the future, we might expand to encompass features such as audio, video and group call.

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