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Voice over IP Via IEEE 802.11 Wireless LAN

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ABSTRACT

The purpose of this project is to design and implement an android application that uses WIFI as a means of communication between mobile phones to provide voice communication at no cost. Wi-Fi is a WLAN standard which is used to share data over the transmission range larger than Bluetooth. Wi-Fi can also be used to share the voice from one mobile to another by receiving the data from one mobile (user) and sending the data to the destination user. The basic concept behind this data transferring is VOIP (voice over protocol).Voice telephony over mobile is currently supported at a cost using service provider such as GSM, or using IP service provider at cheaper cost. The system will allow users to search for other individuals within WIFI range and to establish free voice connections. If the users are not in the specific range, they are not allowed to establish free voice connections; they are provided communication by means of service providers. In time this will become a cheap and secure way to communicate and will have a large effect on university, business and personal communication.

Keywords: Wireless Local Area Network, Voice Over Internet Protocol

I. INTRODUCTION

Voice over Internet Protocol or IP telephony is the routing conversations over a public network (Internet) or private network (Intranet).VoIP services allows users to make Internet calls from their Smart Phones with the use of VOIP apps. People are gradually shifting from traditional voice calling to Voice over IP. This gradual migration is beginning to lower the revenue earned from voice minutes. This is leading to loss to the telecom sector as low data rates make VoIP an attractive alternative to traditional calling.

In the past, the goal of telecom engineers was to provide better services at whatever costs. The costs were then being levied on the customer. To this end, only the rich could afford these services. Over the years, there have been changes to this situation. The industry is driving to the positive direction where better services are being provided at very low charges to the customer. In addition, telecom companies have in recent years multiplied, which has led to a high level of competition among them. At the same time, the number of customers has also grown tremendously. Thus, there is then need for better management of resources such as optimization of the quality of the services they provide to these and other carrier customers. The basic concept behind this data transferring is VOIP(voice over protocol). Voice telephony over mobile is currently supported at a cost using service provider such as GSM, or using IP service provider at cheaper cost. The purpose of this research is to design and implement a telephony program that uses WIFI in p2p (Peer-to-Peer) or WLAN (Wireless Local Area Network) as a means of communication between mobile phones at no cost. The challenge is to provide the same service over mobile phone at no cost paper. This system is based on the concept of connecting devices wirelessly instead of cables. It uses 2.4GHz UHF and 5GHz SHF radio. The major advantage of WIFI is that it is compatible with almost every operating system. This paper investigates mobile phone WI-FI calling sissues. A finding from this paper has indicated positive effects on the use of WI-FI calling hence consequently a need for more in-depth and longitudinal research into the issues related to this splendid technology Chances of intrusion in wireless network are high. We can protect Wireless LAN by some tools like Air-Defense, Isomair wireless sentry, Wireless security auditor. In paper, this system is based on the factors involving high quality VOIP call and efficient use of bandwidth. A large

number of factors are involved in making a high-quality VoIP call. These factors include the speech codec, packetization, packet loss, delay, delay variation, and the network architecture to provide QoS. Other factors involved in making a successful VOIP call include the call setup signaling protocol, call admission control, security concerns, and the ability to traverse NAT and firewall. The application on implementing Sinch-based VoIP (Voice over internet protocol) is for Smartphone Android OS mobile. The purpose of this application is to implement a program that uses VoIP as a means of communication between mobile phones at no cost. The system will allow users to search for other individuals within WIFI range and to establish free connection for voice communication. If the users are not within the WIFI range, they cannot communicate with each other. If the users are not connected with WIFI, they can also communicate with other users by means of mobile data network.

II. METHODS AND MATERIAL

The main components of the proposed system are clearly depicted below. Whenever user wants to make a call, he has to log-in into the application and enter the credentials. After validation, users can make call by entering their name and recipient name and thus the call initiates.

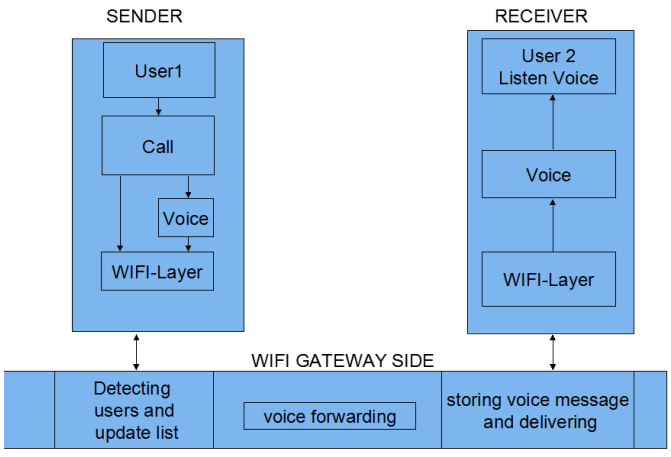


Figure 1: System Architecture.

A Use Case diagram in the Unified Modelling Language (UML) is a type of behavioural diagram defined by and created from a Use Case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as Use Cases), and any dependencies between those Use Cases. In this Use Case diagram of our system, we have three actors. We have six possible Use Cases that interact with each other as a flow. The cascade begins with the user registration and log-in and after credentials validation. It moves on till the user makes a call.

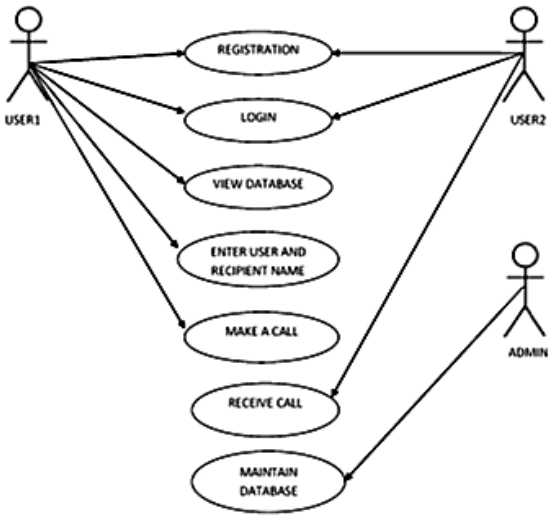


Figure 2 : Use Case diagram

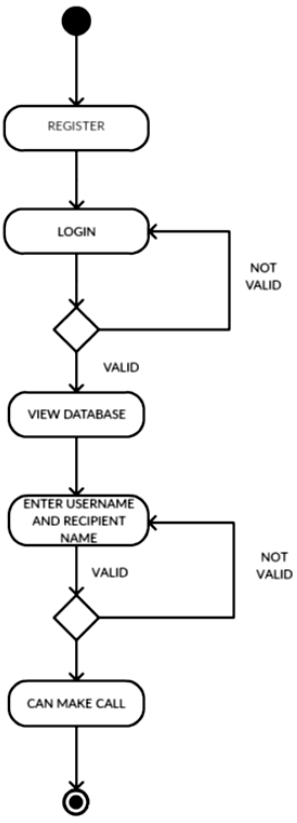


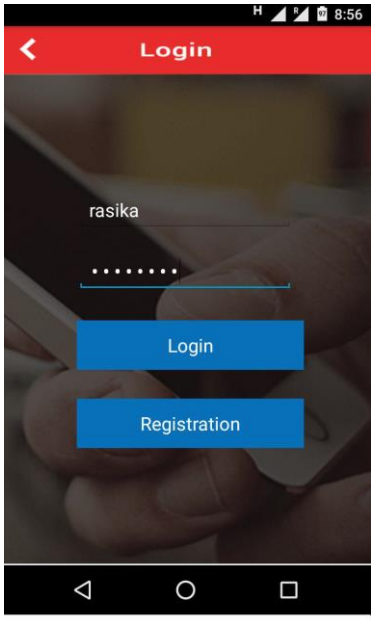
Figure 3 : Activity Diagram

Activity Diagram is basically a flow chart to represent the flow from one activity to another activity. It captures the dynamic message flow from one activity to another. In this project the activity starts with the register activity. When the user is new, he must register first and then log-in. User is allowed to make calls only if the details he entered are valid. Once the user has registered and logged in, he is allowed to see the database and enter his name and the recipient name to place the call. The call gets established only if the entered user name and recipient name are valid.

III. RESULT AND DISCUSSION

Login Screen

This is the first screen when the application get *Started up*.

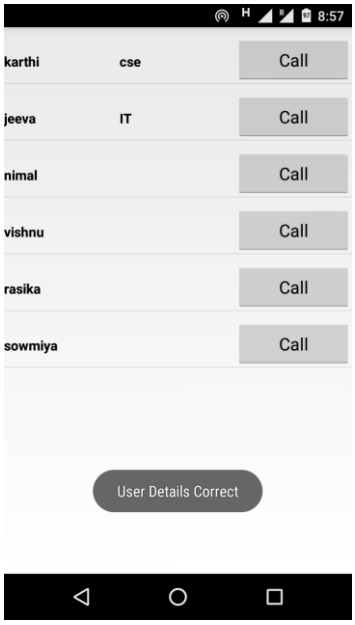


Register Screen

After clicking Register button, Registration Screen will be displayed.

User Details

After Login button, Database listing user details will be displayed.

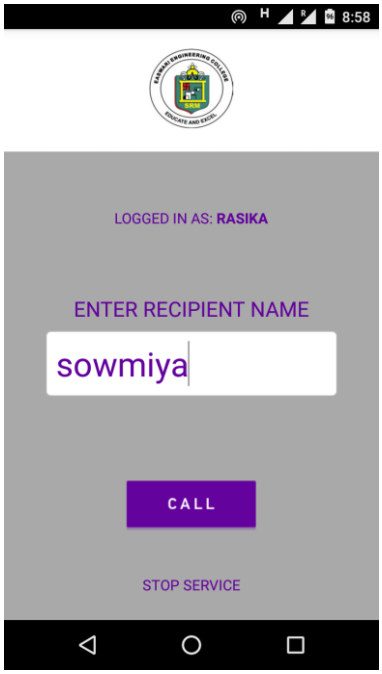


User name Screen

After pressing call button,It will ask to enter user name.

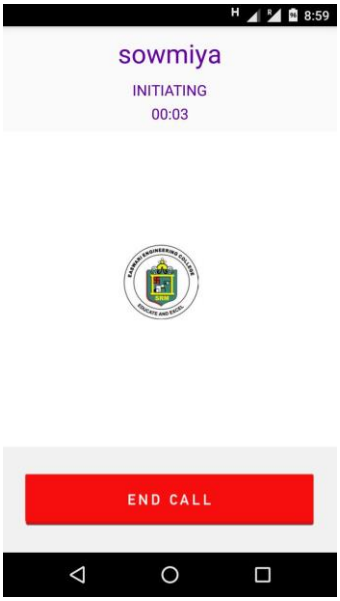
Recipient Name screen

After entering user name, next step is to enter recipient name, whom the user wants to call.



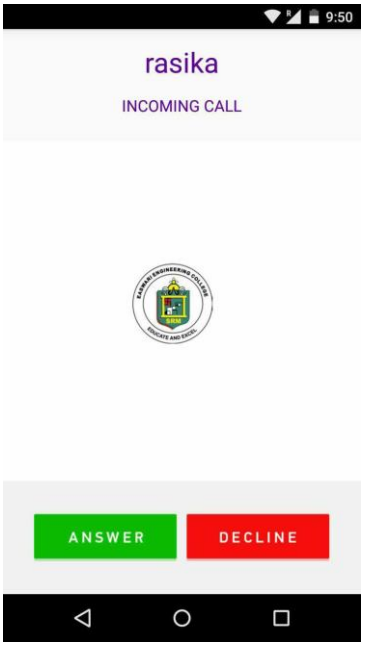
Outgoing call screen

After entering the user name and recipient name, outgoing call will be initiated.



Incoming call screen

Incoming call is received by recipient, he can either accept the call or decline the call.



A. Performance Analysis

On an analysis, Indian telecom companies, are losing Rs. 5000 crore per year due to immense popularity of these free OTT apps. Further research indicates that loss may extend up to Rs. 16000 crore in the next 2-3 years as user base for such free mobile apps is continuing to soar. In addition, users have literally ditched SMS services provided by telecom companies as average SMS being sent by Indians have fallen to an all-time low

of 2 per day. A message costs a few rupees in local and twice the amount when on roaming whereas a message over WhatsApp costs a few paisa because of the small amount of data used.

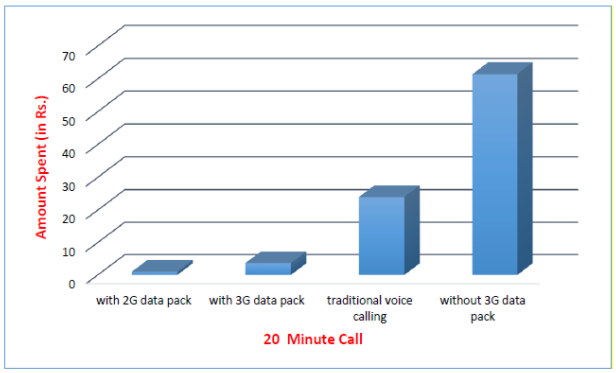


Figure 7: Performance Graph

IV. CONCLUSION

In this system, an Android based mobile application for making calls via WIFI is presented. The application offers reliability, saves costs and easy control. The application is error-free and there is no delay and noise disturbance when the user communicates. The only drawback is that the users cannot communicate when server gets shutdown.

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