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Smart Wi-Fi based Communicator and Scheduler

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Abstract: *Currently, security and confidentiality of information play a vital role in the organization. Hence, organization prefers to use their own developed application over the existing freeware applications in the market. This paper proposes an organization support system using Android as an operating platform. In this application, client-server based architecture is used. Android based smart phones will be on the client side and PC will act a server which consists of the centralized database. It provides notification to the users connected to the organization's network about their schedule on an hourly basis. It will also provide features like voice communication, text messaging, file sharing, broadcasting of messages over short range wireless network mainly Wi-Fi. This application verifies whether the user is connected to organization's network; if the user is out of coverage area then he receives a text message as an SMS.*

Keywords: *Client-Server, Wi-Fi, Android, smartphone, call, text, notification.*

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I. Introduction

Technology is enhancing rapidly and thus the whole world pursues an expedient and effective way of communication. In the organization, choosing communication channels within fixed range with real time, low cost and high efficiency for the employees is vital.

Nowadays, mobile phone comes with a feature of Wi-Fi which allows the user to access the internet through Wi-Fi router. Using the bandwidth of Wi-Fi employees can communicate (voice call, text message, file sharing, etc.) with each other. Due to all these facts, it is necessary to deploy such a system which is easy to access and cost efficient.

The objective of our system is to provide users with real-time communication through the voice call, text message and file sharing in an intra-organization environment. The server also contains a database of employee's day to day schedule and updates the employee about their schedule on an hourly basis through notification.

In order to achieve these two Android devices, centralized server and Wi-Fi router are the only hardware required, hence it is cost effective. For the connection establishment and sending of packets from one device to other UDP protocol will be used. The centralized server in our system will be used to maintain a database in order to identify the registered users.

II. Review Of Literature

This Section presents the review of the previously used technologies.

Android is a free open-source mobile operating system. It was developed especially for the mobile terminals which consist of user interface and application software program. Platform openness, Application equality, quickness in development of the application by providing several in-built API's and sees use libraries; with these advantages, it is easy to develop an application by writing few lines of code [1]. Several technologies are used to develop an android based communication application.

A. VoIP

VoIP is an Internet-based technology, and it can transform almost any Internet-connected device into a telephone [2]. These VoIP telephones can often be integrated into a business' existing phone system, and then be used to make and receive calls just like any other office extension [3]. This system will require additional cost to setup, service providers to connect and dedicated manpower for maintenance.

B. Existing Messaging Application

There are several messaging apps are available in the market like whatsapp, viber, Skype, etc. which will allow users to send or receive messages instantly but require internet connection [4]. These apps don't check the availability of the user. The messages are stored in the database until the user is active.

C. File sharing Application

Some file sharing application is developed like mbit, Mobile Mule, Symella but these applications requires an internet connection to share files and internet connection is not that reliable[5].

Advantages of Proposed system over existing system

1. Secure-The system provided security of the organization by storing the database at the server of the organization. Unlike Skype and other VoIP applications, the system has a particular database for a particular organization which avoids the database to leak.
2. Less Hardware requirement-The system uses existing Wi-Fi network and will also help to reduce the communication cost as we have to pay only for the wireless network, not for any other carrier charge.

III. Proposed System

The objective of our application is to provide employees with such an Android application based system which will include features like voice call, text messaging, file sharing, broadcasting of messages, providing hourly basis update to employees about their schedule over Wi-Fi network using User Datagram Protocol for intra-organizational use. Every User of the system must have this Android application installed on their Phone and should be authenticated by the Admin of the system.

For the implementation of this system, two Android devices will be used and a dedicated centralized server which will be unique for a particular organization. In order to communicate with each other using the android devices, we will be using the UDP protocol for the connection establishment and sending of packets from one device to other. The centralized server in our system will maintain a database which will contain information about the registered employees.

Within the range of the Wi-Fi, the registered employees will get the notification about their schedule on an hourly basis and employees can call, send text messages, share files with each other, broadcasting of messages.

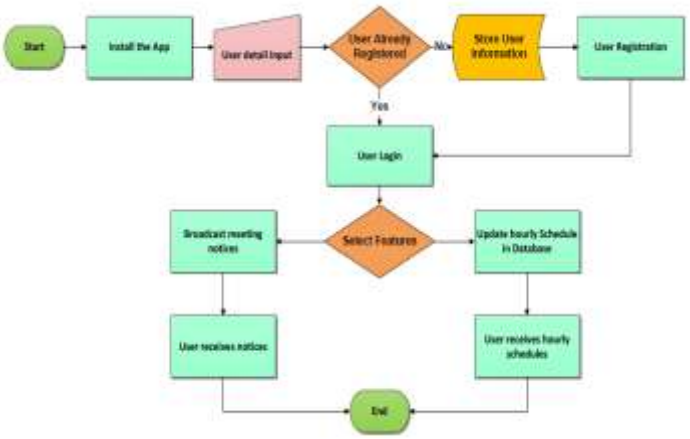

Fig 1: Proposed System

Requirements

Our System contains the following entities.

1) Android device: Which will act as a client
2) Centralized server: An operating system which will act as a server. It will also provide the front end for administrative tasks like user registration, user authentication, user data management (update user's information, delete user etc.).
3) Wi-Fi router: Standard Wi-Fi Router would be needed for the establishment of intranet connection.

IV. Module Description

The employee has to install the application on his mobile phone and should register through his smartphone so that server understands and verifies the user is active.

Once the user is registered he will have to log in to utilize the features.

This system consists of following modules

1. Timetable Notification

i. In this module, server consists of database which contains data of registered employees or users of the organization.

ii. At the server end, we added one more database in which employee's weekly schedule was inserted.

iii. The server will send a notification to the respected user which consists of information about their schedule on an hourly basis.

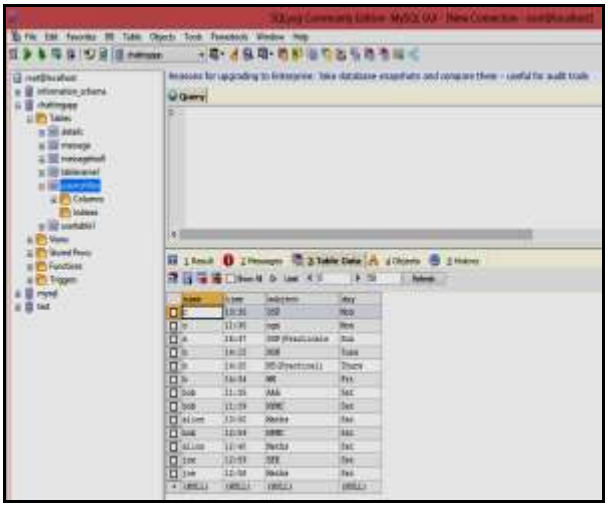

Fig 2: Database

Fig 3: Result showing Schedule notification

2. Broadcasting of Messages/Notices

In this module, employee or head of the department can send a broadcast message or share file to the rest of the employees connected to the organization's Wi-Fi network in order to update them about any meeting which will be scheduled or notifying about the holiday and other important notices.

The User have to select the option "Send messages to all" then the user will have the option either to broadcast a message or to send a notice in the form of file.

File can be downloaded from "Messages from all" and will be located in the folder named as "uploadftp41".

Below figure shows the results:

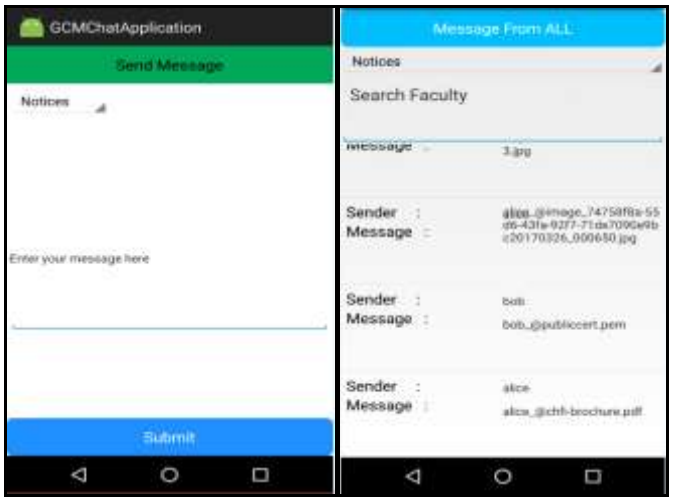

Fig 4: Output of broadcasting of Notices

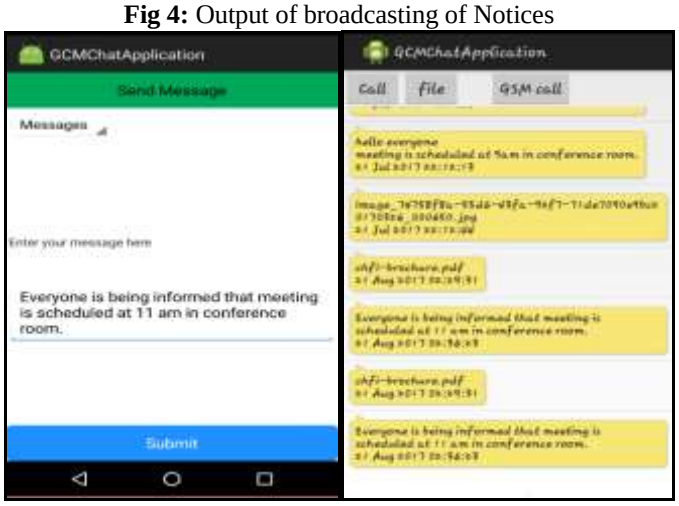

Fig 5: Output of broadcasting of Messages

3. Voice Call

In this module, employee can make voice calls over Wi-Fi using User Datagram Protocol, if employees are present in the same Wi-Fi network.

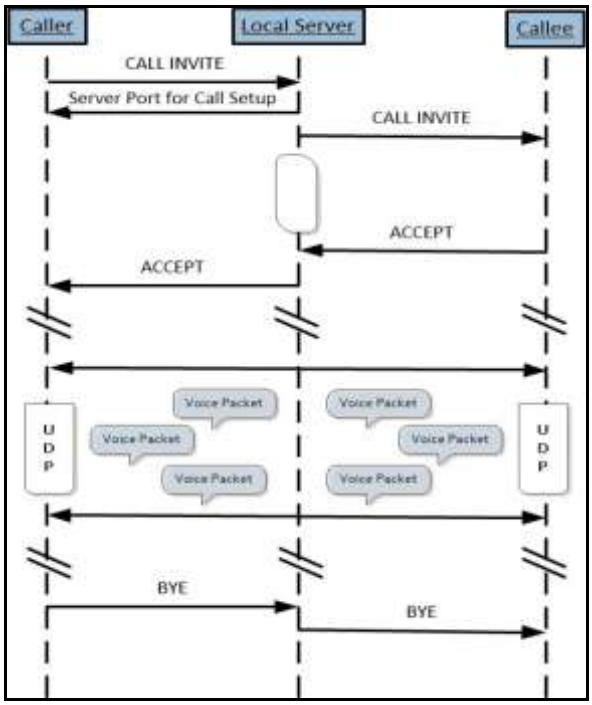

Fig 6: Call flow

4. Text Messaging

In this module, employees can send and receive messages within the same Wi-Fi network.
If the other employee is not connected to same Wi-Fi network then the server will automatically send the text message as an SMS.

5. File Sharing

In this module, employees can share files with the employees who are connected to the same Wi-Fi network. If the employee is out of coverage of the organization's Wi-Fi network, then file will be stored in the database and will be shared with the employee once they are connected to the same Wi-Fi network.

V. Conclusion

This application will provide the alternate solution to an organization for their internal communication. This system will provide secure, effective and cost efficient way of communication within the organization's Wi-Fi network. The system is cost efficient as it will require only initial set up investment. The application includes features like file transfer, text messaging, hourly basis notification about the schedule of a user and broadcasting of messages over organization Wi-Fi. In future, it will be possible for an organization to track an employee in the surrounding area of organization. This system can further be enhanced by integrating multiple routers and call handoff can be provided which will help to cover large area without any disruption. Also, broadcasting of voices messages, video calling can be included in the system.

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