A Secure Information Forwarder for Mobile Healthcare System using Sensors

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Abstract: **A secure information forwarder for mobile healthcare system that combines mobile with sensor network to monitor the health condition of patients. The mobile Healthcare system can benefit medical users by providing high-quality healthcare monitoring, the challenges facing in m-Healthcare system, especially during a medical emergency. It provides a wide range of effective healthcare services. The sensor data measures the health parameters and is connected to the Bluetooth and 3G network, to the sensor node for wireless transmission through the internet. A visualization module of the recorded biomedical data on Android mobile devices used by patients and doctors at the end of the networks in real-time. Our approach for a mobile healthcare solution is managed to process the large amount of biomedical data combining 3G network and mobile technology for daily lifestyle to users appropriately.**

Index Terms— Android, Bluetooth, sensors, smart phone, 3G, server

I.INTRODUCTION

The mobile healthcare information and communication technologies are transforming our social interactions, lifestyles, and work places. One of the most promising applications of information technology is healthcare management. Healthcare is based on the reactive responses to acute conditions to a proactive approach characterized by early detection and prevention of long term management of health conditions. The current places an emphasis on the monitoring of health conditions and the management of wellness as significant contributors to individual healthcare. This is particularly important in developed countries. The aging population, where information technology can significantly improve quality of life. In particular, the biomedical data is critical for the advancement of temperature and pressure by using sensors. Each mobile medical user's personal health information (PHI) such as heart rate, blood pressure and temperature can be first collected by BSN. The sensor data transmitted to smartphone via Bluetooth. Finally, the data further transmitted to the healthcare center via networks. The collected PHI data, medical professionals at healthcare center can continuously monitor medical users. The health conditions as well quickly react to users life-threatening situations and save their lives. The healthcare center dispatching ambulance and medical personnel to an emergency location.

II. RELATED WORKS

Considering the phase of the art, it is conceivable to concern that the works on user interface for mobile healthcare for people with disabilities are very specialized and distinct one. There are some researches which are concentrating on elder peoples, physically challenged people and psychical disabilities. This research develops a practical accessible interface networks figuring out the important requirements for a diversified group of impairments [1]. In [3] a framework for managing security & preserving privacy for analysis of sensor data from smart phone, without compromising on data utility is presented. In that paper they suggest a method to achieve data security & privacy throughout the complete data lifecycle. yan conferred an architecture for mobile healthcare [4] which spotlight on how an integrated system control the home. This system only pinpoints how to solve the server problems at the software level while hardware aspects were not studied. A system that could control electrical appliances using Bluetooth technology proposed by Mr.liang in the year 2010 [4].The disadvantage of this system was that it was unable to control the system remotely through a dedicated network. The embedded system which is connected to android in home is ready to receive control through bluetooth receiver. Any bluetooth enabled device is connected to that embedded system and send a command for hospital server.

III.PROPOSED WORK

By accounting all the merits and demerits of previous related works, few things are sorted for betterment of smart home. They are listed as

- No network area limitation
- Importance of Android application
- Android application should be user friendly, dynamic and universal
- Cost effective

As per the list the proposed system is one which control the mobile healthcare with the combination of GSM technology by using a Smart phone having an android application.
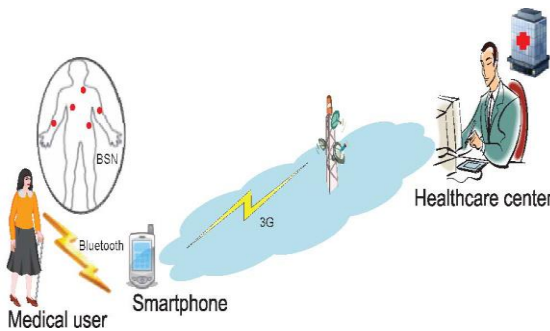

Fig.1. Pervasive health monitoring in m-Healthcare system.

The android application is dynamic one i.e. we can add the sensors as per our requirement and we can choose the sensor level and hospital server. It is universal to all the users.

IV. HARDWARE DESIGN

In case of secure information forwarder for mobile healthcare system using sensors with Bluetooth act as transmitter and the android act as receiver. This android is connected with the nearby hospital server.

The temperature and pressure sensor will be equipped directly in the medical user. The sensor data transmitted to the healthcare center for every time period. For example, the mobile medical user's health information such as heart rate, blood pressure and temperature will be collected by the medical users Smartphone.

A. Smartphone communication

For each sensor data transmitted to the medical center will be aggregated by the Smartphone. The medical users using Bluetooth communication. This received medical information will be transmitted to healthcare center periodically with the help of network.

B. Healthcare center

A secure information forwarder for mobile healthcare using the sensors. The sensor data transmitted to the Smartphone via Bluetooth. The Bluetooth information transmitted to the healthcare center for every time period. For example, the mobile medical user's health information such as heart rate, blood pressure and temperature will be collected by the medical users.

C. ATmega 528

In this proposed design ATmega 528 act as CPU of the hardware unit. It can be programmed to bring out an enormous amount of tasks. The features of ATmega528 is given below:

- High performance RISC CPU
- Interrupt capability (up to 14 sources).
- Power on Reset (POR).
- Low power and high speed CMOS flash/EEPROM
- Wide operating voltage range (2.0 – 5.56) volts.
- High sink/source current (25mA).

D. Bluetooth

The serial Bluetooth products consist of Bluetooth serial interface module and Bluetooth adapter. Bluetooth is a computing and telecommunications industry specification that describes the mobile phones can easily interconnect with each other and with home and business phones and computers using a short-range wireless connection. Send a data from one electronic device to another via Bluetooth.

V. SOFTWARE DESIGN

Eclipse is an integrated development environment (IDE). It contains a base workspace and an extensible plug-in system for customizing the environment. The application Written mostly in Java, Eclipse can be used to develop the applications in phone. Eclipse may also be used to develop applications in other programming languages.

The Eclipse software development kit (SDK), which includes the Java development tools, is meant for Java developers. Android Development Tools is a plug-in for the Eclipse IDE that is designed to provide an integrated environment. Its build the Android applications. ADT using the Eclipse to let developers set up new Android projects. To create an application UI, add packages based on the Android Framework API, debug their applications using the Android SDK tools, and export signed or unsigned .apk files in order to distribute their applications.

Eclipse uses plug-ins to provide all the functionality within and on top of the runtime system. The runtime system is based on the application in smartphone, an implementation of the core framework. To allow the Eclipse Platform to be extended using other programming languages, such as C language Python language, the plug-in framework allows the Eclipse Platform to work with typesetting languages like Latex and networking applications such as telnet and database management systems. The information forwarder for mobile healthcare system creates application using the eclipse tool.

VI. IMPLEMENTATION

Create app with android, eclipse software can run call service program. Google announced the availability of app inventor for eclipse, a web based visual development environment for programmers, based on open blocks java library and providing access to android devices. The eclipse software additional functions are orientation data. The phone functions are text messaging and speech to text conversion and contact data and persistent storage and web services. The AVD manager provides a graphical user interface in which create and manage android virtual

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device, which are required by the android emulator. Launch the AVD manager. An AVD is a device configuration for the android emulator that allows model different configurations of android powered devices. To create a new AVD, the first step is to launch the AVD Manager. The eclipse software used to implement the app in mobile.
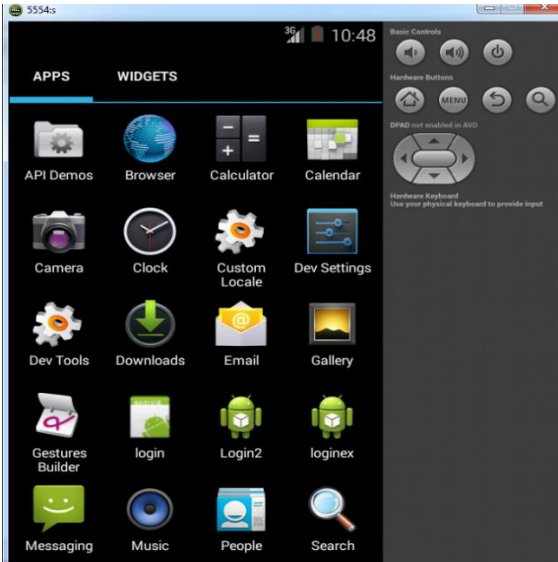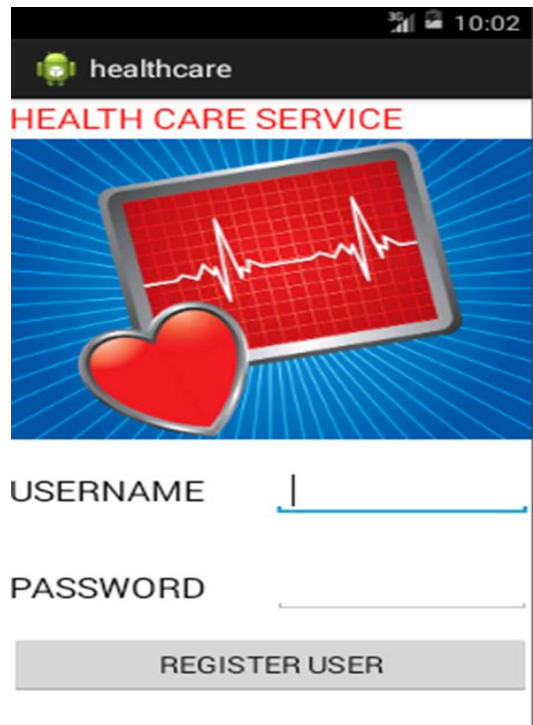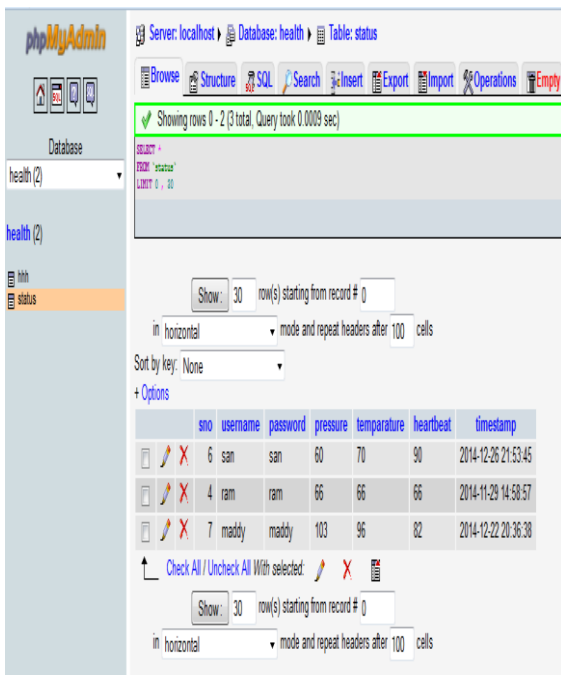

Fig 2. Eclipse AVD output

Fig 3.database server output

Fig 4. New user registration

Fig 5.New user registration page

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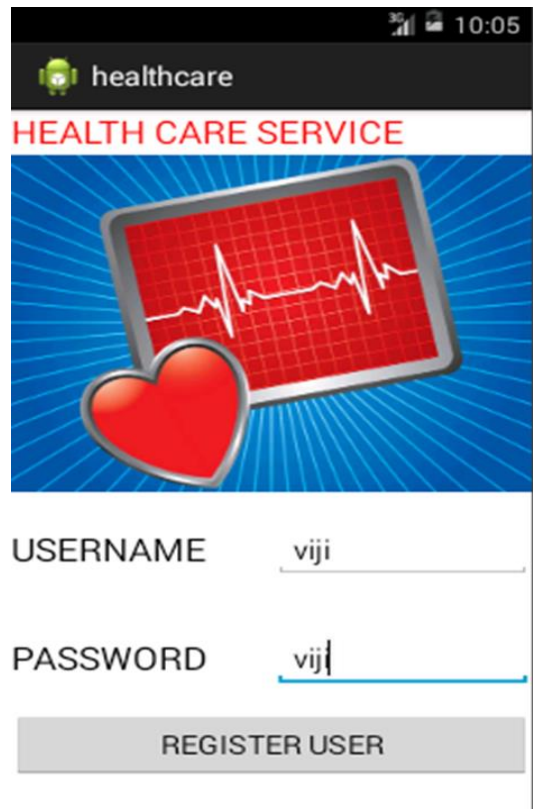
Fig 6. Android app output

VII. CONCLUSION AND FUTURE WORK

A secure information forwarder for mobile healthcare system using sensors, the Android mobile devices is successfully implemented. An information forwarder are designed and used for the measurement of temperature sensor and blood pressure sensor, while the Android mobile device is used to provide a mobile healthcare service by means of an Android application running on a Samsung device with wireless internet access. Medical users can walk outside and receive the high-quality healthcare monitoring. By combining the 3G network and mobile communication techniques, significant network extension and the higher accessibility of mobile healthcare system has been achieved. We have proposed the ideas of establishing the 3G applications. With the use of comfortable wearable sensors in global areas, the proposed mobile healthcare system promises to improve the flexibility and scalability of healthcare applications.

The query processes handle the communication between the server and Android mobile device to display the patient current location and nearby hospital on a mobile screen in real time. All the studies and implementation will be done in the next phase and any advancement if possible, is expected to be incorporated with that.

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