

# Android Application Supporting Old Age Life

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**Abstract:** Nowadays medical life is more dependent on healthcare modern technologies. In this modern era, smart phones have become the integral part of our lives; henceforth we can't avoid the most popular, talked about mobile OS (operatingsystem), i.e, Android. These days when our government is taking so many initiatives for Senior Citizens then how could technology can be left behind in supporting these experienced Senior Citizens. Old age life has its own constraints but in era of this digital world, android apps have come up as a Life support for these senior citizens. This paper proposes a smart solution to the family member of concerned senior citizen and also to the doctor in vicinity of 5 km for immediate response and care of the senior family member. A wearable sensor which is connected to the android smart phone of old family member, is not only used to measure his/her blood pressure but also used to transmit the measured BP to the Android Smartphone of the concerned person. That is connected to the Smartphone with the help of Bluetooth device. The BP reading is then transmitted to the family member whose number whose number is in speed dial or the doctor. Google Map API is used to search nearby doctors.

**Keywords:** Blood pressure, wireless network, Android, wearable sensor, Google Map API, Bluetooth

## 1. Introduction

Wearable sensors are used in many of the monitoring devices for monitoring the health of the individual wearer or the elderly. There are many wearable sensors those can measure the health condition of the patients. Use of wireless technology is growing at a faster rate in the medical field and is proving to be a boon for the healthcare sector in many ways. Different varieties of sensors can be used for monitoring body movements, body temperature changes, heartbeat, blood pressure, respiration rate and much more to establish a patient monitoring system [17]. Mobile phone based applications are becoming popular for its instant support, connectivity and reach for the patient, care takers and the doctors also. It is a cheaper solution in comparison to the stay in hospitals again and again for our elderly family member. The wearable sensor can be in the form of smart shirts or thin bandages which are made for constantly measuring the BP, blood glucose levels and other biometric data of the senior member.

Blood pressure (BP) varies significantly throughout the day and in response to environment such that a single measurement at home or in a clinic cannot be used to reliably diagnose and monitor the disease. This cannot be for the particular age this is nowadays found in the body of small kids. High blood pressure can be result to the heart attack strokes and aneurysms, so diagnosing and monitoring it are critically important. Blood pressures reading can be change in a minute so continuously visit to the doctor is not possible. The unit for the hypertension is mmhg and the notation will be followed by diastolic blood pressure. Normal blood pressure is less than 120/80 mmhg. When the blood pressure reaches to 140/90 then it will be high blood pressure or hypertension.

Smartphone is a device which is a collection of high end technology. Which is used by modern population in a very better and useful way. Nowadays everyone is trying to adopt new technologies very rapidly. These technologies are also very helpful for them. Smartphone have lots of features like touch, camera, sound, Bluetooth, GPS, and many other useful application. old age people are also easily to adopt

these technologies anxiously for their better day to day activities. They are also using application for their personal use. Old age people are also trying their hands in smartphone application like shopping, travel ticket booking, doctors appointment, messaging, listen music, watch news, weather forecasting, and lots of health facilities which can be used by the application which are in smartphones. Smartphone are launched on many operating system like IOS, Blackberry, Android, etc. [10]

In the last past years, the design and the development of wearable sensor and health monitoring android application have lots of attention in the scientific community and the industry. These days healthcare sector is the priority of our government

In this proposed system our objective is to develop mobile platform that has the capability to collect data from the wearable sensors. And then process the data and analyse it after that triggers an informative or warning message to the relative or the doctor. The message which is delivered to the doctors within the range of 5km by using Google Map API or the family member. There is some limits for the warning message to the doctor when the blood pressure reaches beyond the patients normal high blood pressure limit then only warning message goes to the doctor otherwise it inform the family member or the patient. This application is for old age people who live alone. Once the doctor receives the informative message will call to the family member and intimate them.

This paper is organized as follows. In section II, we will discuss about the previous study related to research such as Bluetooth, Android, Smartphone. The system architecture of blood pressure application design of the proposed system is presented in section III. The implantation of the application is described in section IV. In section V, we discussed about the future work. Finally, In section VI provides concluding comments.

## 2. Literature Review

### A. Smart Patient Care System (SPaCS).

In the year 2011, The 'Smart Patient Care System (SPaCS)' developed by the MTM LTD. The Ministry of Knowledge Economy of Korea helped them for this [6]. Healthcare system SPaCS that comprised of two applications that is PCS (Personal Care Service) and PRM (Patient Record Monitoring & Feedback System) in respect to handle health of the individual by using smartphones. The expected system is to be launched in 2012. In Korea Pukyong University designed the 'Wearable ECG module which does not require electrodes on bare skin [3]. This module can be possible in the form of t-shirts that individuals can normally put on and take off any time, and results can be monitored and transferred wirelessly in real-time.

The system is based using commodity hardware, comprised of an authorized Bluetooth home blood pressure monitor, a mobile device to receive and transfer of data, a centralized Server for data transformation, a fax reply report to physician and ECG alerting device.[7]

### B. About Android

In android framework Figure 1 (Android System Architecture) there are four layers which are Application layer, Application Framework layer, Libraries, Android Runtime layer and kernel layer. The first which is at top of the framework is Application layer. The application which gets complete are compiled and run in this layer. The second layer is Application Framework layer, It is a type of toolkit that is used by all the applications, ones which all comes with mobile device gadgets such as Contacts or SMS box, or some of the applications that are already developed by Google and some of the Android developer. The next layer is library and runtime layer where a set of libraries written in C/C++, that are responsible for static performance of different components and in runtime layer where the important component Dalvik Virtual Machine is set. It was developed particularly for Android running in specific area, where the limited power backup, CPU, memory and data storage are the major concern. The final layer is Kernel layer provides developer to manage the security issue, memory management of the device, process management of the CPU, network stack and some other related important problems [20]



Figure 1: Android System Architecture

### C. Bluetooth

Bluetooth is a wireless communication protocol that is used at 2.4 GHz, with client-server architecture, it is suitable for a private networks. It is designed for the devices which have low power for example-mobile phone [4][5].

Initially Bluetooth was used by the Ericsson for a purpose of cable replacement technology and also for the adhoc personal network. Together with Intel, IBM, Nokia and Toshiba, they formed the Bluetooth Special Interest Group (SIG) in May 1998. [21].

## 3. System Architecture

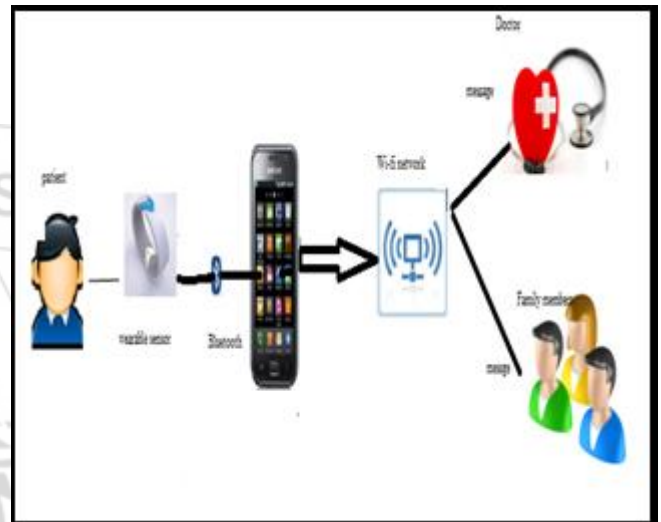


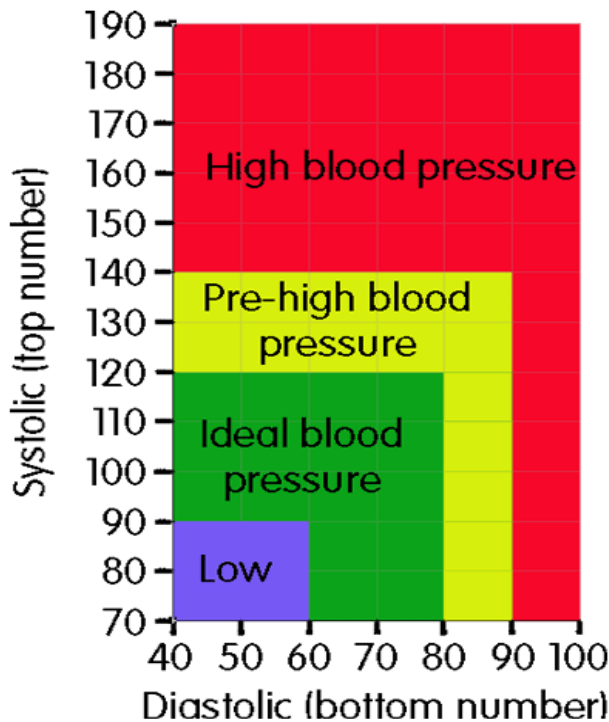
Figure 2: System Architecture

In the couple of years the technology has changes at every moment. Smart monitoring device to detect human body with the help of technology like Wearable sensor band, Wireless network. This system consist a wearable sensor which is connected to the patient body to continuously monitor the blood pressure of the elderly patient with the help of the sensing nodes. Sensing nodes are the nodes which is used for sending signals of the measured blood pressure.

The signal which will be received from the sensor will send to the senior family member smartphone which has the android application, that android application will be connected to the wearable sensor with the help of the Bluetooth device. In case of problem or emergency is detected then the android application will automatically send an alert message or warning message to the doctor and the family member. The blood pressure of the oldage people is measured by considering the further figure 3. With this figure we come to Know about the systolic means top number and diastolic that is bottom number in the blood pressure measuring device. There are four levels for measuring blood pressure which are:-

- 1) Low Blood Pressure:- when the systolic BP range is 70-90 and diastolic BP range is 40-60 than the old person is in the low BP condition.

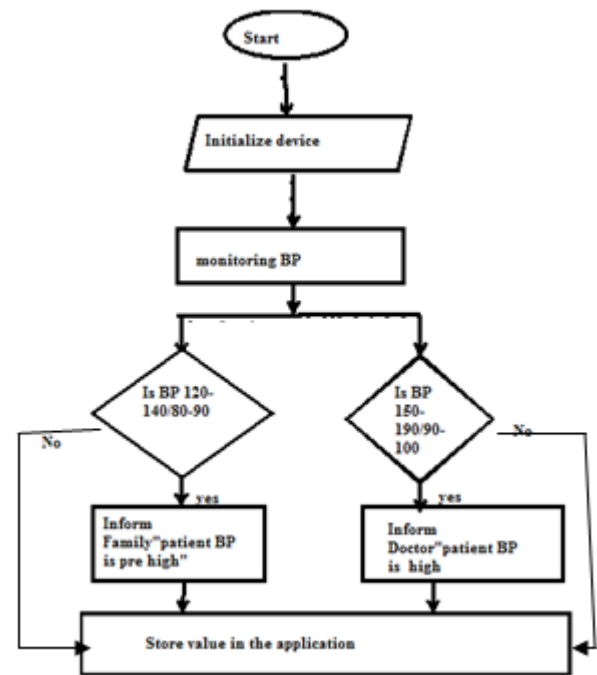
- 2) Ideal Blood Pressure:- when the systolic BP range is 90-110 and diastolic BP range is 60-80 then the old person is in the ideal BP condition.
- 3) Pre High Blood Pressure:- when the systolic BP range is 90-110 and diastolic BP range is 60-80 then the old person is in the Pre high BP condition.
- 4) High Blood Pressure:- when the systolic BP range is 90-110 and diastolic BP range is 60-80 then the old person is in the High BP condition.



**Figure 3:** Old age Blood pressure

#### 4. Implementation

The flow chart below in figure 4 of the application gives information about the working of the application. If the patient blood pressure is in the range of 140-120/80-90 then the message goes to the family member of the patient that "patient blood pressure is in the Pre high condition" due to this family member can reach to the patient. And if the patient's blood pressure is 150-190/90-100 then the message will be delivered to the doctor and gives information that the "patient blood pressure is high". This message is delivered to doctor who is in the vicinity of 5km else the message will deliver to the cardiologist contact number which is stored in the phone contact list. Due to this doctor will try to give instant first aid through the family member and can reach to the patient as soon as possible. If the patient blood pressure is not in any other situation then no message will be delivered to anyone and it will be stored in the application. The saved data can be viewed by the doctors for the future reference it can be useful in the treatment if required.



**Figure 4:** Flow chart of the flow of application

#### Algorithm Of BP Levels

1. User is at normal mode
2. if ((sbp >= 140 & sbp <= 190) & (dbp >= 90 & dbp <= 100)) then
3. label = "High BP"
4. else if ((sbp >= 120 & sbp <= 140) & (dbp >= 80 & dbp <= 90))
5. bplabel = "Pre High BP"
6. else if ((sbp >= 90 & sbp <= 110) & (dbp >= 60 & dbp <= 80))
7. bplabel = "Ideal BP"
8. else if ((sbp >= 80 & (dbp <= 60)))
9. bplabel = "Low BP"
10. else if ((sbp == 120) & (dbp == 80))
11. bplevel = "Normal"

The proposed consists of four Hardware, Android application, wireless media and Bluetooth. Hardware is the wearable sensor which is used to monitor the blood pressure of the elderly person, sending the status with the suitable keyword to the speed dial mobile number of the application. Android application use to detect the status of the patient with the help of the received data from the sensor that is stored in the database, first it verifies and then delivered message to the respective person. Bluetooth device is attached to the wearable sensor and to the smart phones of the patient and with Bluetooth android application receives data from the blood pressure monitoring sensor and uses it respectively.

#### 5. Conclusion

Government, family member and also non-government agencies are trying to take care of our senior citizen by introducing technologies in the day to day life of Senior



Family member. Life of the senior family member can be easier and secure with a use of the technologies. Health issue is the major concern for the Senior Citizen. In this paper, there is a smart solution proposed. For the Senior family member of the concerned family. A wearable sensor which is connected to the patient body, which can monitor the blood pressure of the patient. Wearable sensor measures the blood pressure of the person and transmits data to the android phone application of the patient with the help of the Bluetooth device. Though the application will then review the data received and send a message to the family member or the doctor who is in the distance of 5 km. Due to this doctor or the family member can take possible steps for the patient treatment and the first aid. This application is user friendly and can be helpful for the senior citizen of the society.

## 6. Future Work

Android application is a booming technology that provides many benefits to the users. This paper proposed an initial framework of the android application. In present scenario it is not a working application. We will develop this application in the future, by solving all the issues related to the security and the regional message sending. We will develop this application in physically working condition. In future there will be a more features also and the development will be greater.

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