Intelligent Patient Monitoring System Using Smart Phone Based Technology

Vivek Doke[1], Vishal Gaje[1], Manoj Kalambe[1], Rakesh Nalawade[1]

Final Year B.E Student, Dept. of Computer Engineering, P.E.S.'s Modern College of Engineering, Shivajinagar, Pune,

India[1]

ABSTRACT: This Project aims at developing the automated health care system based on the NFC technology which facilitate automated, streamlined and low cost patient identification processes and monitoring system in hospitals by use of smartphone technologies like PDA, smart phones, tablets, etc. and Internet of things (IOT). It also focuses on the safety and security of patients. It gives remote access of patients data to doctor and data is maintained in centralized cloud server. This system make the hospitals as an intelligent hospitals.

KEYWORDS: NFC (Near Field Communication), Sensors, Smart phone, Buzzer

I. INTRODUCTION

In the future, the development of information technology will inevitably affect the healthcare system and its practices. Healthcare practices must adapt to the challenges of expenses vs. assets well as ageing people Use ofinformation technology in different operations can improve patient's safety and nursing efficiency and therefore decreasehealthcare expenses. Mistakes in patient care can causes serious effect on patient's health. According to various internationalstudies, harmful effects in nursing are happen to about 13% of patients that are in medication care. The motivation of ourproject was because of our interest in artificial intelligence and to develop a complete automated system that helpsreducethe manual work. Now-days, there is no such system to monitor patient in health care. Monitoring of patient is done throughmanual checking of patient, so we have decided to build smart system. Hospitals doesn't contains alert generation systemin serious condition of patient. Also, Doctors cannot view patient details remotely. Our systemmanages all this requirementsand aims to give better services to patient [1].

There are various technologies like microchips, sensor technology that provide real time information about vital signs in the human body before they actually appear. As many systems are enabled with NFC technology, it's easier to use and operate.This is being tried to extend to rural areas as well. All this facilities can be achieved through the use of the latest mobile technology known as NFC (Near Field Technology). The NFC is an extraordinary technique that provides wide range of solutions to different kinds of needs and also in this advanced technology one can integrate the smart tags (NFC) and data processor into a single system

II. RELATED WORK

Compared to other industries the efficiency of the health care sector is poor, this mainly due to lack propermaintenance which is caused due to many reasons. Now-a-days there is a huge increase in the number of health issues beingreported across different parts of the world. The hospitals have not been able to manage this increase due to lack of proper monitoring system. This is being tried to extend to rural areas aswell. All this facilities can be achieved through the use of the latest mobile technology known as NFC (Near FieldTechnology). The NFC is extraordinary technique that provides wide range of solutions to different kinds of needs and alsoin this advanced technology one can integrate the smart tags (NFC) and data processor into a single system. Generally manyhospitals across the world use the paper based flow chart to capture patient information during registration period which islater passed to many other people over different shifts of time. Even though the hospital people try to update the paper workevery time beside the

patient it is not most accurate as it is hand written.

III. PROPOSED SYSTEM

A. Goals and objectives

Monitoring the patient is very important in all the Hospitals for checking the patient and there health parameter. Every hospitals has its own method in this regard. Some are monitoring patients manually using the old paper or file based approach and some have adopted methods of automatic monitoring system using some RFID and Servlet techniques. But in these methods are not efficient because they are not scalable and also they are not cost effective. In a present busy day constant monitoring of the patient's body parameter such as temperature heart beat rate etc. become difficult and it is also difficult to maintain this information by the doctors when there is so many patients in hospital. This can be lead to the loss of patient's data and this type of human error affect the safety of patients. Hence to remove the burden of monitoring patient's health from doctors head and also reduce the human error. This project present the methodology for monitoring patient remotely using NFC and Smart phone technology.

In the opposite to read the NFC tag we does not require any special reader. We can use smart phone to read thistags. Also smart phone provides the various extra features like Wi-Fi, Bluetooth, Camera etc. which can be used forinterfacing with network and it will be cost effective too. To propose a new automatic Patient monitoring system, which facilitates automated streamlined and low cost patient identification and monitoring in hospitals.it also enhances safety and security of patient by securing and providing remote access to data [3].

B. Software Context

From past few years, in almost every country across the world, significant financial resources have been allocatedto the health care sector. The two factors that triggered this shift are modern technology developments and also the latest medicine practices. Most of the developed countries are facing currently the problem off middle and older aged marketplacefrom a largely youth-driven marketplace. Due to this trend there is a great competition among health care providers and alsothere is a great demand for the health services. Due to this competition there is a huge effort put by the health care providersthrough different ways. From the management point of view the cost of the medical services in hospitals can be controlledthrough high operational efficiency and also by providing improved access to public that too at an affordable cost. In orderto achieve these goals of lowering costs and improving efficiency the intelligent systems can play a crucial role at this stage.

Compared to other industries the efficiency of the health care sector is poor, this mainly due to lack propermaintenance which is caused due to many reasons. Now-a -days there is a huge increase in the number of health issues beingreported across different parts of the world, The hospitals have not been able to manage this increase due to lack of propermonitoring system. There are lots of latest technologies like microchips, sensor technology that provide real timeinformation about vital signs in the human body before they actually appear. This is being tried to extend to rural areas aswell. All this facilities can be achieved through the use of the latest mobile technology known as NFC (Near FieldCommunication). The NFC is an extraordinary technique that provides wide range of solutions to different kinds of needsand also in this advanced technology one can integrate the smart tags (NFC) and data processor into a single system.

The other major advantages of using these NFC technology is that the NFC standards cover the data exchangeformats and as well as the communication protocols, and are based on the existing Radio Frequency Identification (RFID)Standards like ISO/ IEC 18092, ISO/IEC14443, FeliCa and other rules defined by the NFC Forum that was jointly formedby the Nokia, Philips, Samsung and Sony, that presently has over 160 members [4].

C. Major Constraints

1.Phone should have NFC technology.
Many of the smart phones like Nexus, Samsung S, Sony Xperia, etc. mobiles contains NFC technology.

2. Accuracy
Accurate measures should be detected by sensors. Measurement factors are important while processing.
3. Availability
The cloud server should be always available while monitoring the patients.

IV. ARCHITECTURAL DESIGN

In the Intelligent patient monitoring system we aregoingto the design the system which monitors the various health parameters of the patients. It generate notifications and provides the alerts to the management system. It also store all patientslog in the cloud server. There are mainly five modules in this System these component interact with each other throughwireless technologies like Wi-Fi and Bluetooth. Its main components are:

1. Android Application
2. Admin Application
3. Doctor Application
4. Server Application
5. Database
6. Hardware Device

V. DESIGN

According our requirement, we used MySQL database. Our project having fixed schema of various tables. As MySQL is Open source and easy to use, it's appropriate for our project. Smart Phone system NFC enabled smart phone with Bluetooth and Wi-Fi and some more extra feature should berequired. Operating System The development Environment shall be windows 8.
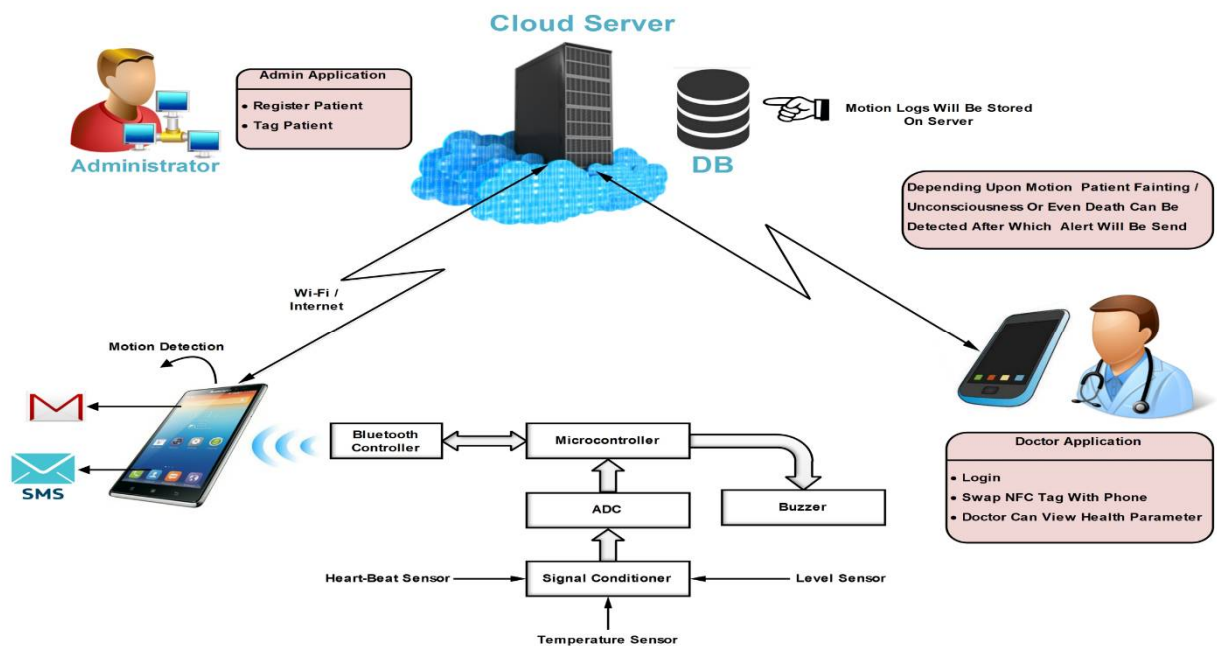
Basic flow of events
1. The system is activated.
2. NFC tag is given to each patients.

3. During the period of treatment various health parameter s are monitored.
4. If health parameter values are beyond threshold values notifications are generated.
5. Doctor read and update patient's data through NFC.
6. Data log are stored on centralized cloud server.
7. Notifications are send through message and email.

Screenshot of Healthcare Application –
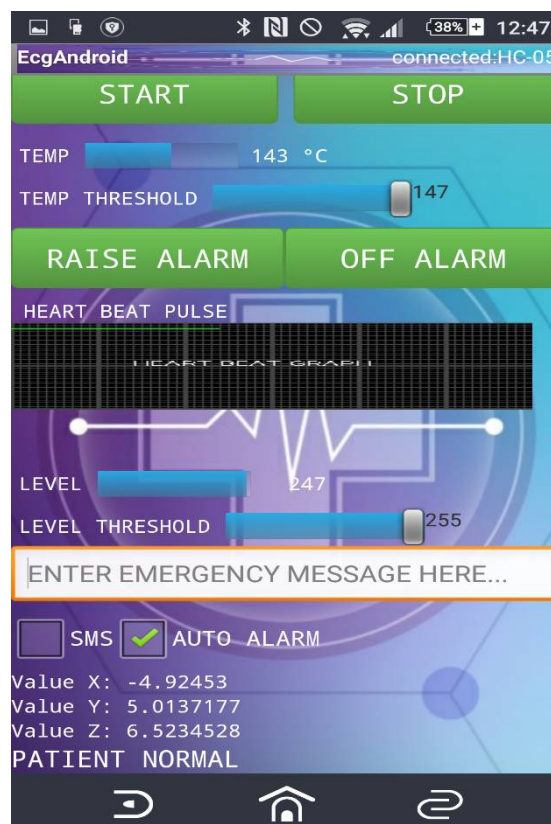
VI. CONCLUSION AND FUTURE WORK

The role of information technology in healthcare will be emphasized at same time as operation models and patient safety are developing. New identification technologies can be used to facilitate healthcare and medication care processes. NFC technologies bring needed functions for developing and building a modern identification system for decreasing mistakes in healthcare. With these technologies, controlling different materials and patients can be improved. Also, payment systems for paying the services are one thing that the automated identification has been used for and this possibility seems also tempting in certain areas of healthcare. Some changes with the work processes are needed to be done. The benefits of the technologies won't be fully utilized by just installing tags and using readers.

The processes need to be changed so that they take full advantage of the technologies as well. Also, connecting medical records to the electronic patient record with automated identification is a task that needs development from present systems. With this the validity of information improves substantially compared to existing medication management processes and documentation.

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