IOT Based Smart Patient Monitoring Using NFC

Ms. B**.** Karthika Devi [1,] Mrs. R. Anitha [2]

[1]Master of Computer Applications, S.A. Engineering college, Chennai-77,
keerthika33111@gmail.com

[2]Assistant Professor, S. A. Engineering college, Chennai-77,
anithar@saec.ac.in

Abstract:

The premise of this research idea is to develop smart patient monitoring using IOT. Nowadays Internet of things become an important technology that promises a smart human life by allowing communications between objects and things together with human. IOT will provide a means of smart cities, smart homes, smart transportation, smart hospitals etc. Due to the negligence of the hospital staff's, many patients are supposed to die. To overcome this, we proposed a theory to monitor a patient using IOT.Technology like pulse sensor, heart rate sensor, Temperature sensor, BP sensor, Arduino microcontroller are used to develop a smart patient monitoring system. Generally smart patients monitoring uses RFID tags that capture an object attached to the tags. As security is the major issue in the existing system i.e. rfid tags, so we use NFC tags. NFC is advanced from RFID. This proposed system uses a smart phone for monitoring the patient using NFC tags using internet of thing. NFC based patient monitoring helps in doctor-patient interaction using internet.

KEYWORDS-RFID tags, NFC, Arduino Microcontroller.

1.Introduction

This paper is mainly based on IOT. The term Internet of Things was introduced by Kevin Ashton, director of the Auto-ID Centre of MIT in 1999. The initial technical realization of IOT was achieved by utilizing RFID technology for the identification and tracking of devices and storing device information. The internet of things is a network of physical device, vehicles, home appliances, and other items embedded with sensors, actuators, and network connectivity which enables these objects connect and exchange data. Building Iot has advanced significantly in the last couple of years since it has added a new dimension to the world of information and communication technologies [11]. In IOT object recognize itself and obtain intelligence behavior by making decision and communicate with attached device [1]. Using IOT for patient monitoring for quick assistance and emergency which would save the lives of many. With smart patient monitoring physiological status of a patient can have monitored continuously. There is no other technology emerging [11] NFC. Near Field Communication is a smart little chip that allow to snag digital information with smartphone at short range up to 10cm.
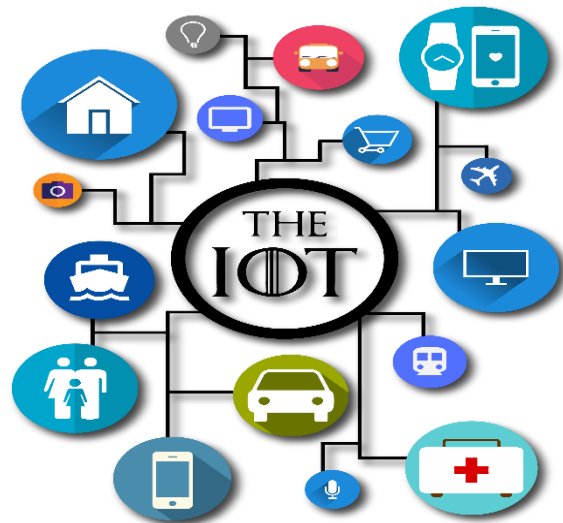

Figure 1. The IOT.

NFC works with three modes such as read/write mode, peer-peer mode and card emulation mode.

Health Care IOT

The Internet of Medical Things (IoMT) is the collection of medical devices and applications that connect to healthcare IT systems through online computer networks. Medical devices equipped with Wi-Fi allow the machine-to machine communication that is the basis of

International Journal of Research

e-ISSN: 2348-6848 & p-ISSN 2348-795X Vol-5, Special Issue-10
International Conference on Innovations in Information and Communication Technology
Held on 9th and 10th March 2018 organized by **The Department of Information Technology,Meenakshi Sundararajan Engineering College Kodambakkam,Chennai, India**

IoMT. IoMT devices link to cloud platforms such as Amazon Web Services, on which captured data can be stored and analyzed. IoMT is also known as healthcare IoT.

Applications of IOT

- Smart cities: In reducing traffic congestion, keep city clean and safe, etc.
- Smart home: Home security, smart TV, smart door lock, smart oven and soon.
- Smart health: Smart health sensors are used to collect physiological information and the cloud to analyze the status.
- Smart agriculture: Monitoring the moisture level of soil, control climate conditions to maximize the production of fruits and their quality.

2.Existing System

Developing a highly secured health care system has more challenges. The existing system in health care uses RFID.RFID tags as a sensor as they can be used to identify, track any object using unique number which encoded in the tags. RFID has a chip, an antenna for receiving signal from RFID reader and view the details the patient. When a patient head to a hospital for the first time he will be given a rfid tags which encodes the details of him specially his current health conditions are updated each he visit the hospital. If a patient is admitted, sensors are attached with this tags and microcontroller. Through his current status can be noticed by doctor.

Disadvantages

- Using RFID is not cost effective.
- In RFID the servlets technology is used which is not
- flexible since the clients using java technology can only be interfaced.

3.Proposed System

Here we propose an NFC that able to act both as a reader and as a tag. NFC is a popular choice for contact less payment as it is secured than RFID [7]. when a patient admitted, he/she supposed to register and then patient will be given a unique number and NFC tags. And that NFC tags will be connected to the smart phone. Now the smart phone will be equipped to the nurse, doctors and other staff. Whenever NFC tag is placed near the NFC devices, the patient details will be automatically retrieved to server. Doctor can view the details of the patient at any time. The proposed system consists of administrator application, doctor application and cloud server. And also many sensors connected to

Arduino microcontroller. Data fetched from the sensors will send to cloud which can read by anytime. Bluetooth is connected with android application which has sensor in it.

Advantages of proposed system

- cloud server technology is used
- capable of being both tag and reader
- low cost
- easier accessibility

4.Methodology

Each sensor is connected to the Analog to digital convertor. And its directed to the Arduino microcontroller. Arduino sends the data to the cloud server. Applications are developed for doctor, patients. Arduino microcontroller sends the sensor rate to the doctor via Wi-Fi or internet. Through application doctor can view status of the patients.
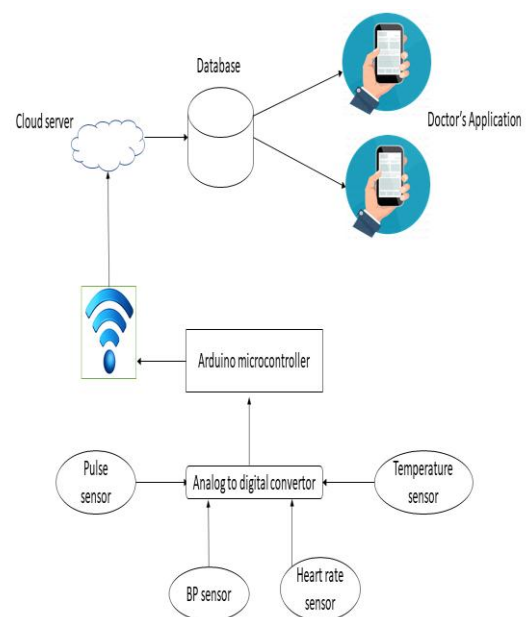

Figure 2: Working of Iot based patient monitoring

5.Implementation

Hardware Requirements
- Pulse sensor
- Temperature sensor
- ADC
- Body temperature sensor
- NFC reader
- Arduino microcontroller

1.Arduino Microcontroller

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jac.This board contains a microcontroller which is able to be programmed to sense and control objects in the physical world[10]. By using this Arduino microcontroller, data collected by the sensor are retrieved to the cloud server.
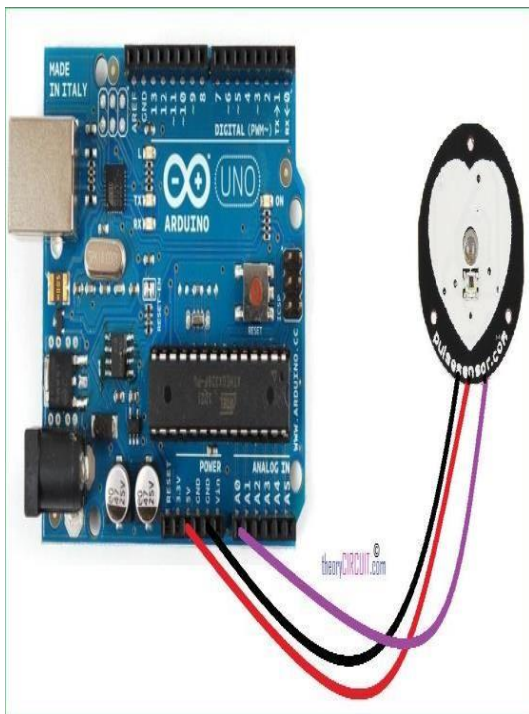

Figure 3. Arduino board with pulse sensor

2.pulse sensor
It is a plug-and-play heart-rate sensor for Arduino. It can be used by students, artists, athletes, makers, and game & mobile developers who want to easily incorporate live heart-rate data into their projects. It essentially combines a simple optical heart rate sensor. The sensor sends the signal to the associated device when there is a change in the threshold pulse rate.

3.Temperature sensor
This sensor sends a notification to the doctor when a temperature of a patient exceeds a prescribed level

4.Blood pressure
By using this sensor, the blood pressure level of the patient will be monitored throughout

by the doctor. When threshold limit exceeds as far doctor will get a notification regarding emergency.

5.Heart rate sensor:
Normal heart rate of a person is 50-60bpm.whenever the normal exceeds with patient there is a need for emergency. sensor will send the data to the device and make alert to the doctor.
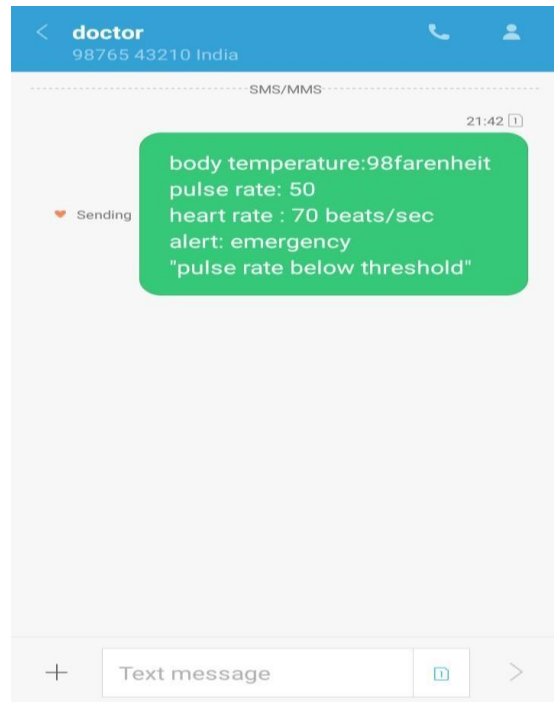

Figure 4. Notification sends to Doctor

6.Result

If successfully implementing this methodology patient's status can be monitored by doctors. This system can gather the status of the patient and sends to the cloud server to store database. As data are retrieved in cloud, the reliability of the system is high hence the security increases. Now the patient can be monitored smartly. IOT can be applied in many areas but using it in healthcare is vital. We proposed a NFC enabled mobile devices which can used to keep track of patients and their previous test records.

7.Conclusion

In this project I implement the concept of IOT in designing a smart patient monitoring. In successfully implementing this methodology patient are monitored using application provided to the doctor via internet. It is user friendly. It can be handled easily by everyone. Using Iot in healthcare helps in reducing the death count. It is

designed to reduce the complexity for the doctor and the patients. This proposed system uses cloud server architecture, rather than rfid.

8.Future Enhancements

In future IOT will applied everywhere as in future IOT will be applied everywhere. As there is more much focus needed in health care, these smart technologies can be implemented easily. IOT usage was rapidly increasing and has been implemented in everywhere. These smart patient monitoring has been existing in some of the hospitals, it need to be used in most applications. Smart IOT are developed and developing technology, it can also be improved with security and added features.

9.acknowledgements

10.References

[1] Vandana Sharma Ravi Tiwari, "A review paper in IOT & It's Smart Applications" International journal of science, engineering and technology research, volume 5, issue 2, February 2016.

[2] P. Raga lavima, Mr. G. Subhramanya sarma "an IOT based intelligent medicine box" ijcsmc, volume 4, issue 10, October 2015

[3] Rashmi Singh 'A proposal for mobile E-care health service system using IOT for Indian scenario" JNCET, volume 6, issue 1, January 2016.

[4] Pooja kanase, sneha gaikwad "smart hospitals using IOT" International journal of engineering and technology, volume 3, issue 3, march 2016. [5] M.S. manivannan "Smart card and IOT based electronic toll collection system for vehicles" International journal of modern Embedded system, volume 4, issue 1, February 2016.

[6] Iot applications – "https://iot-anaytics.com"

[7] NFC uses https://tech-vise.com

[8]https://www.bing.com/images/search?q=nfc+tags+images&id=A570555BEDA61B871D7DDB138E858D8E703B7D2C&FORM=IQFRBA

[9]https://www.bellevuecollege.edu/ce/2017/10/30/whatisthe-internet-of-things-read-our-qa-with-jim-palmeri/

[10] "https://www.makerspaces.com/arduino-unotutorialbeginners/"

[11] "Environmental Monitoring Using Wireless Sensor Networks(WSN) based on IOT "-Aarti Rao Jaladi 1, Karishma Khithani2, Pankaja Pawar3, Kiran Malvi4, Gauri Sahoo5