INTERNATIONAL JOURNAL
FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

IOT & Raspberry Pi based Smart and Secure Health Care System using BSN

Mr. Akshay Deelip Shewale[1], Prof. Dr. Mrs. S. V. Sankpal[2]

[1]Student, Department of Electronics & Telecommunication Engineering, DYPCET, Kolhapur, India.
[2]Professor , Electronics & Telecommunication Department, D. Y. Patil College of Engineering & Technology, Kolhapur, India

Abstract: Advances in ultimate technologies should be begun to the growth of the Internet of Things (IOT). During the new health care situation, the usage of IOT technologies makes the assistance of doctors and patients since they are utilized in various medical sections (such as real-time monitoring, patient data administration, and healthcare supervision). The body sensor network (BSN) technology is one of the central technologies of IOT developments in the healthcare system, wherever a patient can be observed using a group of small powered and lightweight wireless sensor nodes. Yet, the evolution of this new technology in healthcare applications externally thinking security makes patient privacy unprotected. highlight some essential protection provisions in BSN based modern healthcare system. Consequently, begin a secure IOT based healthcare system using BSN, which can efficiently fulfill those conditions.
Keywords: Remote monitoring, probable diseases, medical web, drug delivery, philological factor.

I. INTRODUCTION

Health care is one of the primary problems that the world faces irrespective of the case of a developed or developing country. The key issue in health care is that collecting all patient data stored in the electronic medical record then analysis and taking action on the patient. The new sensor is managing the health information and is established when the steady stream of fresh health data is collected at extraordinary rates. As the volume, velocity, and variety of health data that is collected and stored are dynamic, it is difficult to retrieve the data that is critical for analyzing. These data have to be compared to deciding by the physicians. Healthcare is mostly wireless this may result in various security threats to these systems. These are the security issues cloud poses serious problems to the wireless sensor devices. Data privacy is considered to be the most important issue in BSN, it is required to protect the data from disclosure To avoid all such hazardous and maintain regular health and ensure the privacy of data transmission this system proposes a smart and secure health care system. The main purpose of the work is to develop a smart and secure intelligent health care system for a proper health parameter management by signaling an alert message to the medical web server for an instant of taking actions. This process is aided by the automatic drug delivery system which is interfaced with raspberry-pi to check the status of patient health and sends this information to medical web server, An Android application is developed and linked to a web server to intimate the alerts from the medical web server and to perform the remote monitoring & controlling of the patient health.
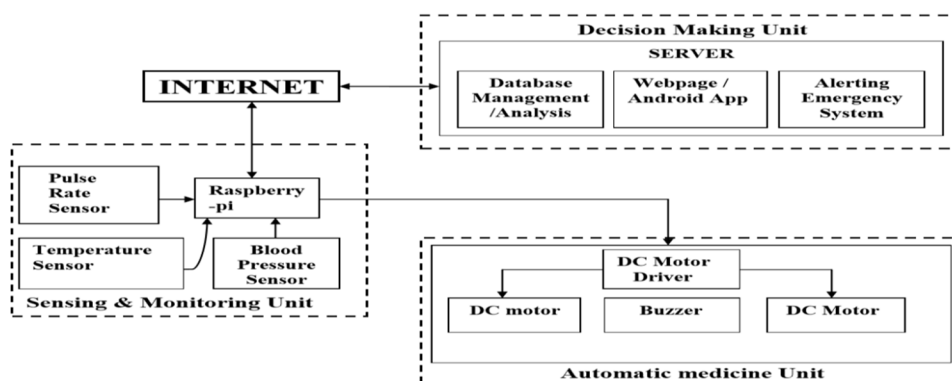
II. BSN BASED HEALTH CARE SYSTEM

Fig: Basic block BSN Based Health care system

Figure1 shows the basic diagram of health care process in which the specific sensors uses according their applications .

The system can determine the patient health by measuring the time to time with heart rate, temperature & Blood pressure sensor. The sensed data is secured for integrity & privacy by using security algorithm & sent to a remote server via a wireless link.

The forecast of health parameter for the future and learning how to select the daily check up is based on historical data through electronic medical record base (EMR).If the abnormal health parameter are identified then required action will takes place through automatic drug delivery or calling emergency team. Quickly analyzed data forwarded to the emergency team for the next treatment, a medical record could help to learn and make the better selection of medicine

The implementation of smart health care system is based on the level of the patient health situation. The data obtained through sensors is transmitted over the Internet to a server for storage and processing mechanisms. It is used for monitoring the daily patient health parameter, based on which the calculation of heart rate, temperature & blood pressure parameter. Every day, the patient health parameter receives the updated optimized in the electronic medical record (EMR). The significant feature of this system is that it is designed to update from the previous experience and patient health status predict to the future state. Based on this historical data, the rate at which controlled & uncontrolled situations easily analyzed. As a result, it can make a choose decision of giving automatically drug delivery or alert to the emergency system.

The smart health care system is divided into three units as:
1) Sensing & Monitoring Unit
2) Decision Making Unit
3) Automatic Medicine Unit

The Sensing & Monitoring unit will continuously sense the level of patient health parameter. This information is sent to the Decision Making unit (Doctor team) over the internet. The Decision Making Unit will determine whether the patient is health is abnormal & taking action in this situation. These optimized medicine unit automatically alert to the particular medicine to the patient, to the end users via mobile phones. Suppose the situation in uncontrolled then system automatically alert to the emergency system.

The block diagram can be explained as follows. The system can determine the patient health by measuring the time to time with heart rate, temperature & Blood pressure sensor. The sensed data is secured for integrity & privacy by using security algorithm & sent to a remote server via a wireless link. The forecast of health parameter for the future and learning how to select the daily check up is based on historical data through electronic medical record base (EMR).If the abnormal health parameter are identified then required action will takes place through automatic drug delivery or calling emergency team. Quickly analyzed data forwarded to the emergency team for the next treatment, a medical record could help to learn and make the better selection of medicine. The flow graph used for health care is described as follows.
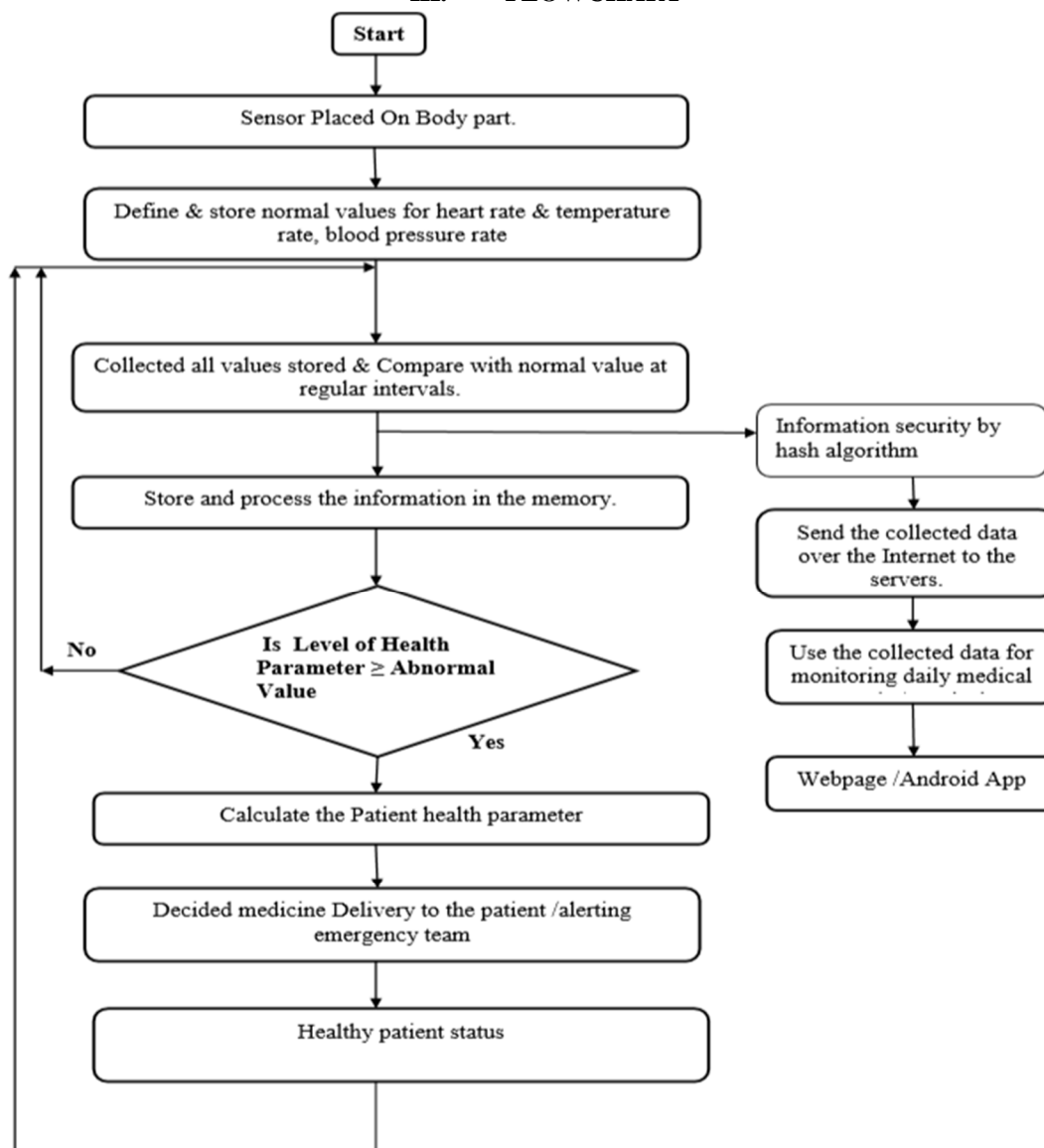
A. *Raspberry Pi*
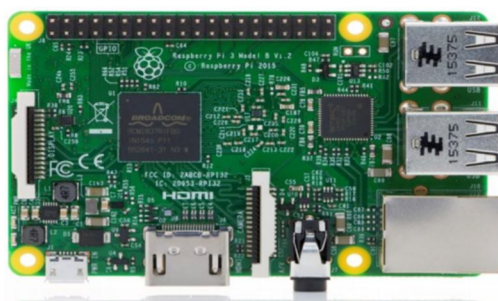
The Raspberry Pi Foundation slaves to put the potential of computing and digital production into the hands of characters all over the world. It does this by producing low-cost, high-performance processors

This processor collecting all patient data from ADC and sending to GSM modem and website for monitoring purpose, Raspberry connected to emergency system fort any danger situation, automatically call to emergency team, in this memory card all codes are stored for running all modems, all patient data saving in memory card as well as in electronics medical website, HDMI port are used for monitoring and editing python codes for patient health parameter changes and doing variation in time for analysis purpose, python codes are easily writable and editable for this system work .

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 8 Issue II Feb 2020- Available at www.ijraset.com

III. FLOWCHART

IV. HASH ALGORITHM

Smart health Care System The privacy and security of patient health information is at top priority for patients and their families, health care providers, professionals, and the government. Many of the key persons and organizations that handle health information have policies and security safeguards to protect patient health information. The primary justification for protecting personal privacy is to protect the medical record. Physician accesses to new medical data, improved diagnostics, and uses more effective ways to prevent illness and deliver care.

1) *Data Privacy:* BSN should not loss patient's important data to the outsider network. IOT based health care application, that sensor nodes receives and forwards important data to a physician. This important information must be secure otherwise hacker can hack the data & create critical damage for any criminal intentions.

2) *Data Integrity:* Managing data code does not defend it from outside changes. An hacker can modify the data by adding any parts or by managing the data within a packet. The modified data can be sent to the physician. Loss of integrity may Crete damage to the data.

3) *Data Freshness:* The hacker may sometimes take data in communication and replay them with modification to the physician. Newly created Data may indicate that data is safe & true data may be sent.

V. RESULT & DATA ANALYSIS

After connecting and programming all the components with each other, we have performed the experiment. According to the proposed system, we have designed prototype IOT based Patient monitoring System. Raspberry pi, GSM module and all the sensors are connected
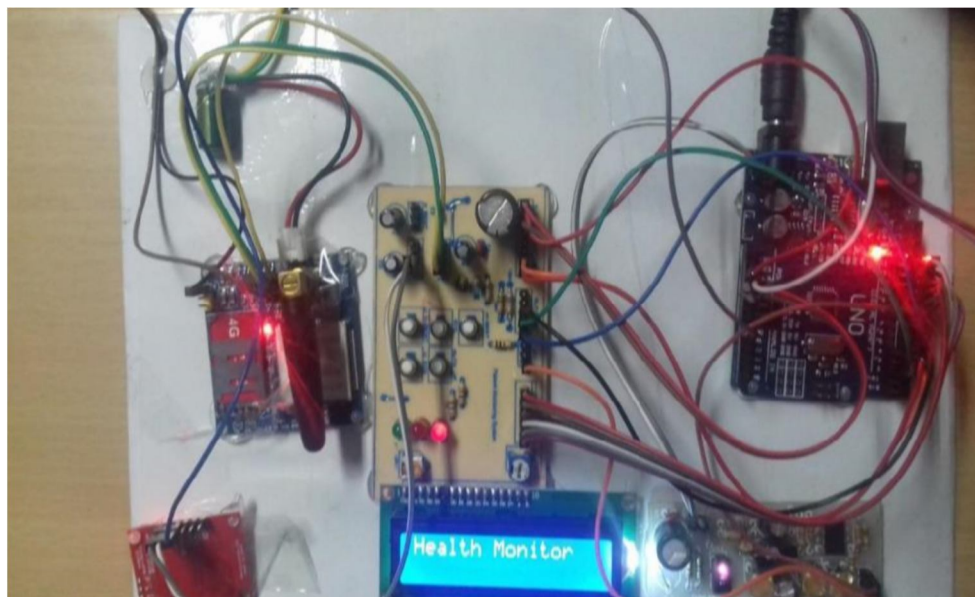

A. Heart Beat Result in Mobile Message

heart beat and health parameters are high or low results are shown by mobile message with time and date , this upcoming message are after 30 second sent with parameter name for monitoring purpose .
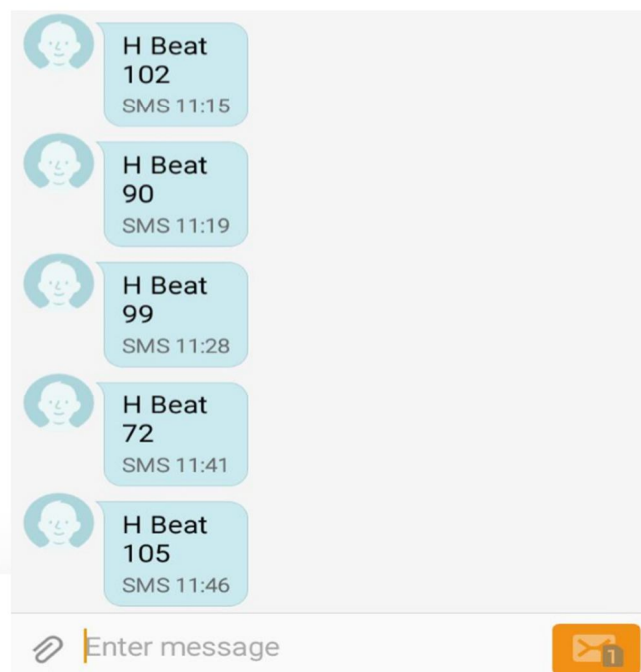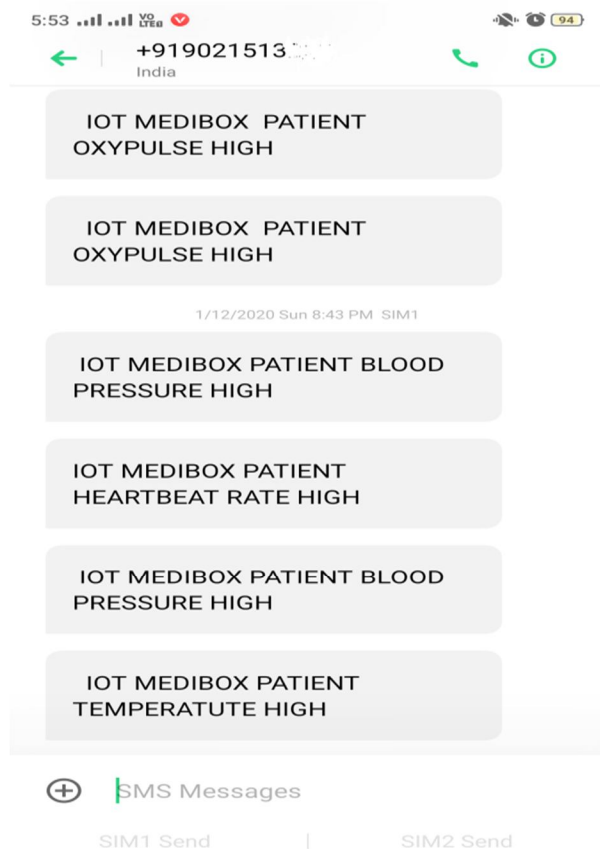
VI. WEBSITE MONITORING

The medical website used for patient health parameters continuously monitoring and analysis. it is useful for easily storing medical history and easily study for a physician for treatment ,an understanding well for actual medicine and treatment given to patient
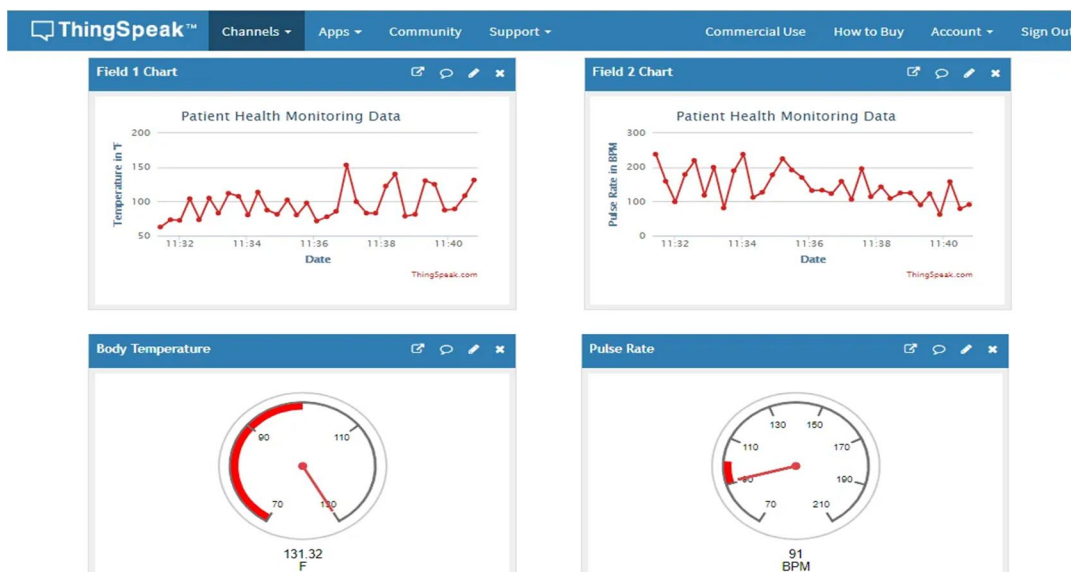
VII. CONCLUSION

This is a review paper focuses on a Patient health care monitoring and how to increase drug delivery efficiency. proposed IOT based smart health system a portable physiological monitoring method is performed, which container continuously observes each patient's heartbeat, blood pressure and different critical parameters in the hospital. We introduced a constant monitoring and key mechanism to monitor the patient's health and collect the patient data's in the server using Wi-Fi Module based wireless communication, we also introduced remote health care data recovery and intelligent storage methods.

The project is very necessary to get the treatment system extra advanced. In the designed method the improvement would be attaching more further sensors to the internet which includes various other health parameters and would be helpful for patient monitoring and drug delivery system.

REFERENCE

[1] Jayeeta Saha, Arnab Kumar Saha, Aiswarya Chatterjee "Advanced IOT Based Combined Remote Health Monitoring, Home Automation and Alarm System". Engineering & Industrial Services, Tata Consultancy Services, Kolkata, India, IEEE 2018

[2] Chanchal Raj, Chaman Jain and Wasim Arif "HEMAN: Health Monitoring and Nous an IOT based e-Health Care System for Remote Telemedicine" Dept.of DE Electronics and Communication Engineering, National Institute of Technology, Silchar Assam, India,IEEE 2017.

[3] M.H.Riaz, U. Rashid, M. Ali, L Li," Internet of Things Based Wireless Patient Body Area Monitoring Network" International Conference on Internet of Things (I Things) and IEEE Green Computing and Communications, IEEE 2017.

[4] J.K.Tamgno, Ndeye Rokhaya Diallo, "IOT-Based Medical Control System" International Conference on Advanced Communications Technology (ICACT)" RSI Research Group, ESMT, Dakar Senegal, 2017

[5] Chaitanya Kulkarni, Snehal Kenjale , Manasi Patil "Smart Self-Regulatory Health System" 2017 2nd IEEE International Conference On Recent Trends In Electronics Information & Communication Technology, May 19-20, 2017, India, IEEE 2017

[6] Samiksha Dubey, Anmol Gambhir, sanjiv K Jain "IOT application for the Design of Digital Drug Administration Interface ", Medi-Caps University, Indore, India, IEEE 2017.

[7] AmandeepKaur,Ashish Jasuja "Health Monitoring Based on IOT using Raspberry PI" International Conference on Computing, Communication and Automation ,ICCCA 2017.

[8] Ahmet Turan, Ozdemir, Cihan Tunc "Autonomic Fall Detection System", 2nd International Workshops on Foundations and Applications of Self Systems (FASW) ,IEEE 2017.

[9] Vivek Pardeshi, saurabh sagar, "Health Monitoring Systems using IOT and Raspberry Pi", International Conference on Innovative Mechanisms for Industry Applications ,ICIMIA 2017.

[10] Alba Amato, Antonio Coronato,"An IOT-Aware Architecture for Smart Health care Coaching Systems", 31st International Conference on Advanced Information Networking and Applications, IEEE 2017.

INTERNATIONAL JOURNAL
FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY