



Iotenabled patient monitoring system

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Abstract: Health is the major factor for a happy and healthy life in today's world. It is mandatory to administrate and manage the healthcare industry. In present day, with the expansion of innovations, specialists are always looking for innovative electronic device for identification of irregularities within the body. It is the need of the hour to administrate and manage the healthcare industry because of the advanced technological development. Patient Monitoring system provides better solutions for the complete one-time comprehensive solution and systematic approach for accurate control of administrative processes by IoT solution. This system provides effective ways to reduce the burden and focus on strategic planning to upgrade their services while fetching the information from the patient and monitoring their functions. It provides patient identification, tracking and monitoring process that can be controlled by authorized people. This system is designed by IoT based monitoring system that measures the patient's heart beat, temperature, blood pressure and the acceleration of the body.

Keywords: Heart rate measurement, Accelerometer, real time monitoring, pulse sensor.

Received 20 Apr., 2023; Revised 28 Apr., 2023; Accepted 30 Apr., 2023 © The author(s) 2023.

Published with open access at www.questjournals.org

I. INTRODUCTION

The Patient Monitoring system is provided by the IoT solutions. The centralized automation system tracks other functions and operations are only controlled by authorized person. The system will measure a patient's body temperature, heartbeat, blood pressure and acceleration of the body. A sensor in this health monitoring system will collect information about the patient's and their health condition. As a result, if an emergency situation arises, this hardware component will send a report to the physicians or medical professionals as soon as possible. The remaining work will be done by doctors based on their reports. It is a multi-parameter monitoring system that will monitor the patient's abnormalities. Various sensors have been used to measure the data of patients in

Realtime. A mobile application has also been developed.

II. LITERATURE SURVEY

The paper [1] proposes a different parameter can be measured through smartwatch. Among those parameters ECG, PPG and Heart Rate (HR) are main aspects to find the abnormal heart rates. To acquire these parameters the smartwatch has to be connected with the smart phone via android application. This setup provides continuous monitoring of our heart conditions. In that smart watch we are acquiring ECG & PPG signals from that we are extracting heart rate. These parameters we are predicting the heart condition based on their heart rate and age factor. If the patient is having abnormal heart 5 rate or any kind of heart disease trigger had been sent to particular person's relation or locality doctor as a precaution. This increases flexibility of the system.

The paper [2] proposes one of the main features of the Internet is the Intelligent Healthcare Network, called "IoT Net". It is mainly used for the sending and receiving of information. Internet of Things has various devices equipped with communication, identification, sensors and network functions due to which it has somewhat eliminated the complex and complicated healthcare system. IoT has contributed in enhancing and boosting the performance of the traditional healthcare system and making it attainable so that it is flexible with smart devices. IoT smart devices with healthcare system has promoted in living a better quality of life.

The paper [3] proposes if a patient visit the detail health information about the person can be accessed only with the help of this NFC tags. Instead of searching the patient record in bundles of papers, the doctors can very easily identify about patient record with the full necessary information by viewing patient EMR. The patient tests reports have to be updated in legible and proper manner in the EMR, once patient's all test has been completed as per procedure. The corresponding patient's all important relevant information needed to be uploaded regularly in the EMR software.

The paper [4] describes a technique to develop a mobile device where heart rate is measured through a pulse sensor, Arduino Uno board and microcontroller a t mega328p which is based on the PPG process. The system can monitor heart rate, detect missing heart beats due to premature ventricular contractions (PVCs) and initially display the information on a Liquid Crystal Display (LCD). Then the heart rate and missing beat information is transmitted serially to ESP 8266 Wi Fi module that uploads the information to a website through Message Queuing Telemetry

Transport (MQTT) protocol. With timely missing beat detection, a person can be notified prior to potential heart attack or other heart vulnerabilities.

The paper [5] work is focused on understanding the performance indicators of Hospital Information Systems (HIS), summarizing the latest commonly agreed standards and protocols like Health Level Seven (HL7) standards for mutual message exchange, HIS components, etc. The study is qualitative and descriptive in nature and most of the data is based on secondary sources of survey data. However, the researchers identified several modules for the implementation of E-Hospital Management and Hospital Management System.

The paper [6] presents Tag Scan, the first RFID-based system which utilizes the phase and RSS changes to perform material identification and target imaging at the same time. Comprehensive real-world experiments show that Tag Scan can achieve high accuracies for target material identification and is sensitive enough to differentiate even Pepsi and Coke. Tag Scan can also image more than one targets of different shapes, sizes behind a wall.

The paper [7] proposed system was developed to overcome the demerits of barcoding systems. With this system, reducing the need of skilled librarians is accomplished. The system reliability, easy to operate, and flexibility in tagging different types of media easily, are an important criterion in selecting an RFID system.

The paper [8] describes confront a diversity of problems in their day-to-day life. They do need some sort of assistance for movement from one place to another, and an outdoor navigation system. Most of the time this issue creates a dependence on sighted people. At the same time, it needs an indoor navigation system for object identification in a number of situations, as discussed in section. Taking into account the good acoustic abilities and memory, we propose a portable Blind-Assistance system for safe and smooth navigation.

The paper [9] the system allows users to conduct testing at home, or receive testing performed by healthcare service providers. The tests available are fundamental physiological parameters including blood pressure, blood glucose and pulse rate. The system uses radio frequency

identification (RFID) to verify user identity, and allows data transfer to mobile devices via Bluetooth tethering. The physiological parameter data such as blood pressure and blood glucose in mobile devices can be upload to the online database with 4G or Wi-Fi wireless network.

The paper [10] presented an NFC-based mobile medical patient tracking and diagnosis system that features low cost and ease of deployment. In addition to the original project in Karachi, Pakistan that inspired this solution, we believe that this system architecture can be used for similar health projects in any geographic location where mobile phone service is available. As prices for mobile phones

Equipped with NFC readers and writers come down, more such applications.

III. Proposed Methodology

The hospital visitor management system provides a method of transmitting and receiving data from the patient to the nurse/medical staff without human intervention. It is an automated data collection technology. However, doctors/medical consultants can remotely access and update patient data via an IoT connection with mobile and other wearable devices. Wireless LANs that allow healthcare providers to deploy networks faster, cheaper, and with greater flexibility than a wired system.

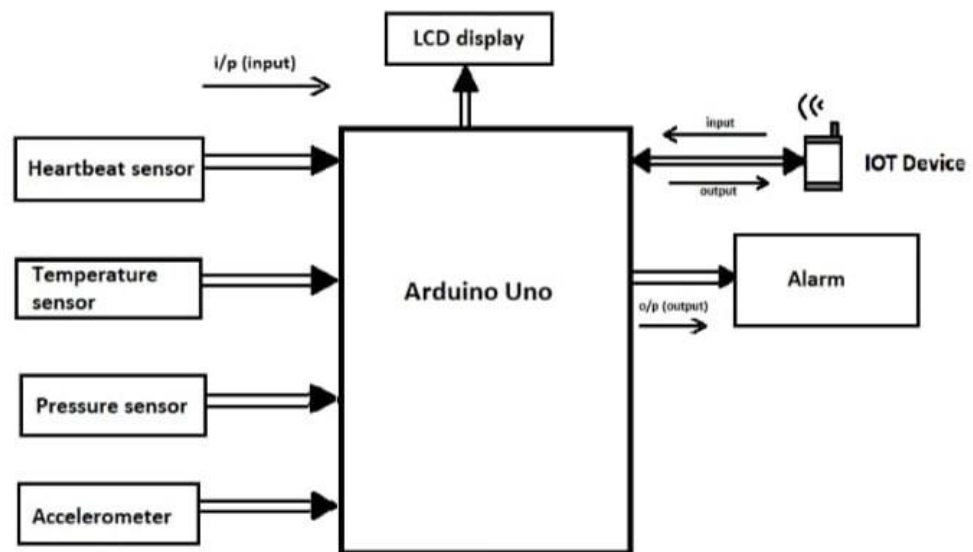


Fig.1 Block diagram

The purpose of using a step-down transformer to convert 120V to 5V. Bridge rectifier with 5V regulator to ensure constant power supply to the circuit. The pressure sensor detects the patient's pressure and provides an accurate value both on the LCD screen and in the app. The heartbeat temperature sensor also calculates and displays values on the LCD screen. The Arduino UNO is used to connect the components. This IoT module is responsible for sending data to an application.

The doctor can monitor over the internet. If the pressure and temperature or whatever is out of range, the alarm will tell us automatically. An accelerometer that measures the vibration or acceleration of a movement and generates an electrical charge proportional to the force applied to it. The microcontroller can identify the person and store the person's data and stored values, which are sent to the personal computer (PC) via the Arduino board. All patient data is sent to server via the IoT Wi-Fi device. Doctors or consultants can view the details through their mobile app.

IV. RELATEDWORKS

Experts have installed sensors to continuously monitor the elderly and chronically ill people's physiological criteria. This serves to deal proactively with older patients, informs them about their current state of health and prevents power consumption and extend communication range, as this is an emergency. Most wireless health monitoring systems aim to reduce optimistic approach to the feasibility of wireless sensor networks. Nowadays, countries with the best technological skills and highly qualified IT experts and workers face problems of availability of smart devices and smart objects and lack of technological innovation, which is a priority need for smart healthcare. The United Nations should jointly support smart technology as it is an important contribution to the country. The heart rate monitor uses wireless sensor alerts to notify Patient when it detects a threat that reaches a certain threshold. Body Sensor Networks (BSNs) help achieve this approach by using sensors attached to the patient's body. This visitor management traditionally uses a paper "chart" to record the patient, which is not always accurate as it is handwritten. Nurses play a key role in the inpatient and outpatient hospital system.

V. RESULT AND DISCUSSION

This system is designed and implemented at low-cost hospital visitor management system for a clinic. It is a solution that enables organizations to streamline and automate patient data by using this technology to monitor, track and record visitor information. This shortens the patient's waiting time. The quality control of hospital products and services have improved, so that the patient's individual health parameter can be constantly monitored by the doctor via a mobile device.



Fig.2 Patient monitoring kit



Fig.3 Patient monitoring kit using IoT

V. CONCLUSION

The main purpose of Patient Monitoring System is to systematically monitor the patient's health status using an android application and continuous monitoring. Regular updation of patient data is mandatory. This method allows physicians/consultants to obtain up-to-date patient data without human intervention. In the future, adding a heart rate monitor and pulse oximeter could provide better patient data.

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