Industrial Engineering Journal
ISSN: 0970-2555
Volume : 52, Issue 2, No. 1, February : 2023

IOT BASED PATIENT MONITORING SYSTEM

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ABSTRACT

In this IoT based observation and intimation of a paralyzed patient healthcare system, is designed to help the patient to convey their health issues/status and various messages to the doctor, nurses, or to the caretaker over the internet or by sending a message works by reading the data of the patient, in case of any non- typical value of blood pressure, oxygen level, or any other desired sensor for the patient. Any worst-case scenario it will be intimated by a message or over the internet to the doctor or to the caretaker. This system takes cares when the patient is most of the time not taken care and any worst scenarios it sends a message through GSM and uploads to the cloud (Thing speak). It also buzzers when it receives a risk message. In this way our project truly automates caretaking ability of the patient which ensures periodically.

keywords: Health monitoring Internet of Things (IoT), Medical devices Sensors Platform implementation Cloud computing.

I. INTRODUCTION

These days, the expansion of innovations by wellbeing specialists is exploiting these electronic devices. IoT devices are profoundly utilized in the clinical area. In this paper, the research is about an IoT-based health monitoring system. In particular, for COVID-19 patients, high blood pressure patients, hypertension patients, diabetic patients, etc., in a country territory, in rural areas, the number of doctors is not exactly the same as in urban areas. Medical equipment is not readily available in rural areas, except for government medical centers. The percentage of patients in these clinics is greater than that in government medical facilities. Similarly, the equipment has, for the most part, ended. As a result, if an emergency arises, this hardware component will send a report to the physicians or medical professionals as soon as possible Patient Monitoring system is a process of continuously tracking the patient's vital parameters suggested by the doctor that has to be continually monitored. Usually, the patient monitoring is carried out by attaching the sensors like heat rate sensor, blood pressure sensor, temperature sensor, ECG probes etc. The components involved in the conventional patient monitoring system usually include the sensors network, Display Devices, Communication Wireless.

Due to IoT-based health monitoring systems, it has become possible for users to get the necessary physiological information while sitting at home. This system has made life easier for elderly patients, as for them, the long way to the hospital can be both difficult and tiring. In this paper, we have chosen some specific sensors to detect certain problems. The system will collect data on the patient's heartbeat, oxygen saturation level, temperature, and other parameters IoT-based patient monitoring systems using sensors to detect, evaluate, and monitor two basic vital signs are discussed in a paper nodes and other supporting components Sensors are nothing but the Transducers which is used to capture all the physical quantities of the patient and converts them into its equivalent electric signal for data processing. Display devices are the devices which are used to accumulate the desired received signal and display in the appropriate content in the LCD or HMI displays. Communication devices, are usually shorter distance communication devices which is used to transmit the captured sensor data to the nearest sensor nodes where the display devices

have been attached. Usually, the other supporting components involved in the patient monitoring system are the microcontroller units which is used to decode the received signal additionally the microcontroller are used to take appropriate decisions when it is required.

II. LITERATURE REVIEW

Internet of Things (IoT) and cloud computing plays a vital role in today's Tele-monitoring health system. This system keeps track of patient's physiological parameters through collection of body sensors' data using Raspberry Pi board. The patient's health card are developed by the doctors and displayed on a webpage where doctors and patients can access and communicate each other without physical presence [1].

Using cloud computing, the data can be stored, updated and accessed from anywhere in the world. It is very suitable for rural areas where medical facilities are not available. In Remote health monitoring system using IoT, Body wireless sensor Network (BWSN) is used to transmit the patients' health parameters collected
through Raspberry Pi microcontroller to the physicians and caretaker wirelessly [2]. Being long range wireless technology, emergency situation of the patient's health is quickly detected and timely intervention leads to save the life of the patient. Owing to costlier healthcare and long waiting time in hospitals, the concept of in-home patient monitoring system have been emerging in the recent years. This system collects data of various body parameters through Biosensors, wearable devices and smart textiles and it transmits the data to central node server securely through Cipher text Policy Attribute Based Encryption (CP-ABE) method. In turn, the server shares the collected data to the hospitals for further treatment. The server rings alarm to the
ambulance [3] during emergency situation. It is very beneficial for elders and chronic patients who require continuous monitoring. The specialized healthcare monitoring system for elderly people is a growing need in the aging population world. This system performs basic health checkups by measuring the body parameters regularly and report the data to the doctors. The result data are then displayed as statements in a web application where doctors and patients can interact with each other[4]

MOTIVATION

India is the largest population country. The growth here increases day to day, and the basic need for people is food and health care. Health care is mainly needed for elderly people who cannot afford more money for health-care checkups in their day-to-day lives**.**

The system's goal is to build a health monitoring system that can quickly measure a variety of health factors. In this part, the techniques and materials used in the system are detailed. The system's block diagram is presented in the first subsection. In this part, the techniques and materials used in the system are detailed.

OBJECTIVE

The main objective is to increase affordability for regular people. Besides sustainability in the context of finance, patients will have easy access to personal healthcare.
A number of technologies can reduce overall
costs for the preventing or managing the illnesses. It includes devices that constantly monitor health, devices that auto-administer therapies, or devices that track real-time health data when a patient self-administers a therapy. Nowadays there exist a strong network connectivity and internet services that interlink the smart devices to maintain. These devices are now increasingly used and integrated with telemedicine and telehealth through the IoT.

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III. PROPOSED SYSTEM

In the proposed system of methodology, the vital parameters of patient like Heart rate, Blood pressure level and the Temperature is continually monitored and displayed in the local display unit with the help of 16X2 LCD Display. Additionally, the measured values from the sensor are decoded, processed and transmitted to the remote server with the help of SIMCOM GSM modem. Our project has also included smart decision-making algorithm in order to predict the patient critical position and automatically provide the triggered SMS notification and Call alert to the concern person (here we have used for Nurse. Station and corresponding Doctor). In the SMS which has been sent to the Doctor, the URL of the static webpage which is allocated to the patient is sent. IOT based patient health monitoring system project, we are monitoring various parameters of the patient using the internet of things. In the patient monitoring system based on the Internet of things project, the real-time parameters of a patient's health are sent to the cloud using Internet connectivity. These parameters are sent to a remote Internet location so that users can view these details from anywhere in the world.

There is a major difference between SMS based patient health monitoring and IOT based patient monitoring system. In the IOT based system, details of the patient's health can be seen by many users. The reason behind this is that the data needs to be monitored by visiting a website or URL. Whereas, in GSM based patient monitoring, the health parameters are sent using GSM via SMS.

This is one of the Latest Electronics Project Ideas related to medical applications which engineering students can select as their final year project. One more benefit of using IOT is that, this data can be seen using a desktop computer, laptop, using Android smartphone comma using a tab or Tablet. The user just needs a working Internet connection to view this data. There are various cloud service providers that can be used to view this data over the Internet.

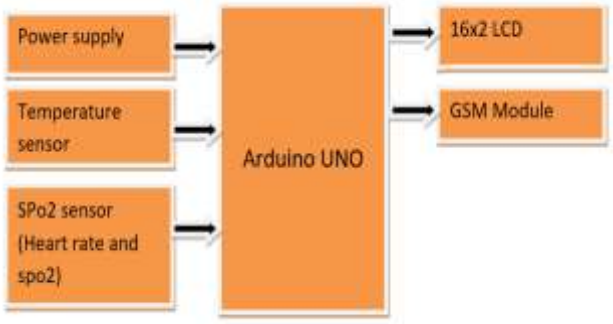

Fig1. Block diagram of the Proposed System.

Arduino UNO:

Atmega 328p Processor

The Arduino UNO R3 is the perfect board to get familiar with electronics and coding. This versatile microcontroller is equipped with the well-known ATmega328P and the ATMega 16U2 Processor.

Fig 2. Aurdino Uno

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Power Supply

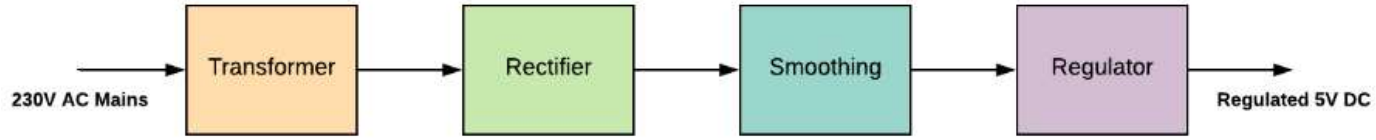

Fig 3. Block Diagram for Power Supply

LM35 Temperature Sensor

The **LM35** series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. The LM35 device does not require any external calibration or trimming to provide typical accuracies of ±¼°C at room temperature and ±¾°C over a full −55°C to 150°C temperature range.

The LM35 Temperature sensor is used in our project in order to determine the patient body temperature. This sensor is capable of measuring the temperature ranging from -55 degree to 150 degree Celsius. LM35 temperature sensor can be calculated more precisely than with a thermistor. The Heartbeat sensor module is used to determine the patient heart rate which works basis of the light intensity that penetrates in to the blood vessels and hence the reflected back light is captured by the photo transistors. The value of the blood in the finger changes with time.

Fig 4. LM35 Temperature Sensor

Max30102 Spo2 Sensor

Pulse Sensor 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. The essence is an integrated optical amplifying circuit and noise eliminating circuit sensor. Clip the **Pulse Sensor** to your earlobe or fingertip and plug it into your Arduino, you can ready to read heart rate.

There is also a LED in the center of this sensor module which helps in detecting the **heartbeat**. Below the LED, there is a noise elimination circuitry that is supposed to keep away the noise from affecting the readings.

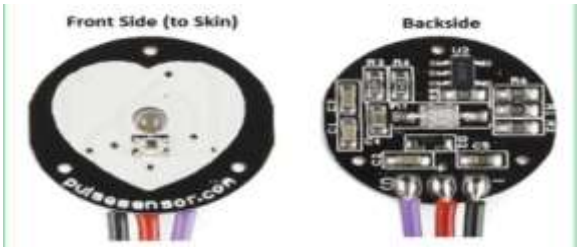

Fig 5. MAX30102 SPO2 Sensor

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LCD (Liquid Crystal Display)

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector.

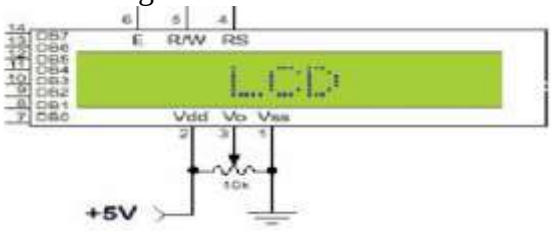

Fig 6.LCD Display

Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

GSM module

GSM stands for Global System for Mobile Communications. It's a standard that specifies how 2G (second generation) cellular networks operate. GSM was a significant improvement over the first generation of cellular networks and represented a transition from analog to digital telecommunications. If the device is located outside of the range of Wi-Fi or wired connectivity, the long range communication means are considered, Especially when IoT devices installed in remote locations need connectivity. But to overcome this issue, GSM and LTE technologies have been integrated with modern IoT devices.

Fig 7.SIM 800L GSM Module

IV. EXPERIMENTAL RESULTSl

V. CONCLUSION & FUTURE SCOPE

This system is really helpful for paralyses patients. When they need help then they can ask by using some movements they can also survive in this world like normal people by using this movement detection. This system is reliable and cheap and less weight.so they can buy without debt. This system will make paralyses patients to achieve a independent of mobility. This is not a trivial task just because it varies from person to person in its nature and type. Therefore, different methods are essential to support these people, and it is our duty, as future engineers, to develop new technologies to help paralyzed patients. And enabling the doctor to give first aid remotely my monitoring the patient health condition remotely which is made available globally.

In future, we can use the chipset to implement this system. All parts are integrated in the chip, so that we can. This chip fits easily with the patient with paralysis Gloves and bands avoid clothes. But there is one disadvantage that will happen increase cost but the increase

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