

# Internet of Things for Healthcare

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**Abstract**— The IoT has numerous applications such as health care from remote monitoring to smart sensor and medical device integration. Health care IoT can also boost patient engagement and satisfaction by allowing patient to spend more time interacting with doctor. Clinic shortage, time and cost pressure and increased patient need create a number of challenges for health organization. We create out a solution to build a system that was intuitive, good value for money and was going to deliver the speed benefits. The technology like Radio Frequency Identification (RFID) is used. Which use radio wave to identify items and it also track items in real time to get important information about their location and status. It is valuable application for health care.

**Key words:** Internet of Things (IoT), Healthcare

## I. INTRODUCTION

The IoT has many applications in healthcare, from remote monitoring to smart sensors and medical device integration. It has the probable to not only keep patients unassailable and healthy, but to improve how doctors provide care as well. Healthcare IoT can also satisfaction by allowing patients to spend more time interacting or communicating with their doctors. But healthcare IoT isn't without its obstacles. The number of connected devices and the more amount of data they collect can be a challenge manage. There is also the challenge of how to keep all of that datasecure. The Healthcare field remains among the fastest to adopt the Internet of Things. The reason for this direction is that integrating IoT features into medical devices fastly improves the quality and productiveness of service, bringing especially high value for the elderly, patients with chronic conditions, and those requiring continuous supervision. According to estimation, spending on the Healthcare IoT solutions will reach a staggering \$1 trillion by 2025 and, hopefully, will set the stage for highly personalized, accessible, and on-time healthcare services for everyone.

## II. PROBLEM STATEMENT

In Healthcare System, the patient did not get the facility at an emergency time so there is a chance to loss of life so we build a system to monitoring the patient and give the treatment from anywhere.

## III. OBJECTIVES

Wearable sensors for measuring blood trends like heartbeat, body temperature, blood pressure etc. in a periodic basis. Inhaler devices for measuring and evaluating the medical adherence of the patients.

## IV. SYSTEM ARCHITECTURE

It is composed by three main components:

- 1) Wristband.
- 2) Service Board.
- 3) Cloud Services.

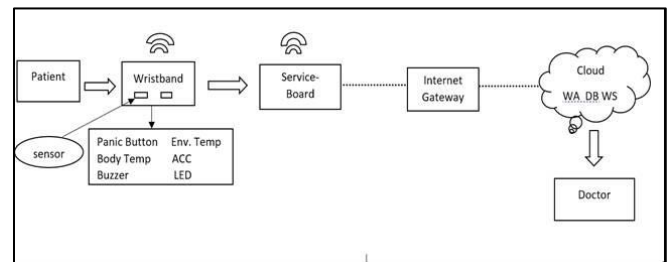


Fig. 1: Illustrates The General Architecture of The Healthcare System

### A. Wristband

It consists of a Node MCU with inbuilt wifi module (ESP8266). Along with several on-board MEMS sensors. It require minimum power for working this multi standard MCU supports Bluetooth LE 4.0 and 6LoWPAN over the IEEE 802.15.4 standard. Each wristband can collect data from the available sensors like environmental and body temperatures, pressure, humidity, light, Received Signal Strength Indicator values, accelerometer and push buttons. All the collected data is send to service board.

### B. Service Board

The software services and cloud interface were developed using the TI Simple Link CC3200 Launchpad kit. The CC3200 System-on-Chip consists of a powerful ARM Cortex-M4 CPU Core along with built-in Wi-Fi connectivity. For the software stack we used a real-time operating system for TI microcontroller. The service board can act either as a Wi-Fi Access pointenabling any station device on the same network to connect andtheavailable services, such as themobile application, or as a station, connecting thesystem to the Internet and the cloud services.

### C. Cloud Services-

In the last few years, research efforts have been made in IoT driven healthcare applications. First of all this direction have their roots on wireless sensor networks In an IoT smart hospital system (SHS) is presented and discussed, providing innovative services for the automatic monitoring and tracking of patients,

It consist of many services suchas-

#### 1) Web Server-

The webserver was specially designed for running on the low-power CC3200 MCU, can handle four clients at a time. It is designed in two API: IoT. C and IoT.JS. The server is used to store database which is collected from sensor.

#### D. Web Application-

The web application was also designed targeting the low-power requirements of the system. Written in the web language HTML5 and CSS3, it can run in any browser and any device. The application files are directly accessed from the SD Card through the File System API. This application is used to display the server database.

## V. LITERATURE SURVEY

Personnel, and biomedical devices within hospitals. Arboreta developed an IoT system for in-home health care services of elderly patients with chronic heart and respiratory diseases. The system contains of a single wireless sensor node capable of monitoring heart rate, temperature.

### A. Communication and Security in Health Monitoring Systems:

The Improvement of Sensing Devices And Radios Move towards Powerful And Flexible Remote Health Monitoring System. There is challenge to collect the data from human body through sensor in efficient way. The data collecting from human like blood pressure, temperature is difficult. so we design a system which can collect the data from human body through sensor in efficient way. We uses the sensor like heartbeat sensor, LM35 etc. to collect the data.

### B. Design and Development of E-Health Care Monitoring System:

Building E-Health care monitoring system which store the data online and transferred it to doctor and Caretaker. So there is challenge to continuously monitor the patient health care data is difficult. so we design a system which collect the data through sensor and regularly delivered to doctor and caretaker. In case if network are down then it connect through Bluetooth.

### C. Low Cost and Portable Patient Monitoring System for E-Health Services:

There is such type of technology which exist but it is costly so normal person can't afford it. So we are developing the system which reduce the cost and it is portable and easy to handle. Normal people can buy and wear in hand.

### D. Patient Health Management System Using E-Health Monitoring Architecture:

Sensor is used to collect the data continuously and saved data on to Server. The Patients Medical History is being stored on server. In emergency the system send the notification to doctor or caretaker. The doctor can treatment to patient according to his medical history. This data can access by authorize person only. In case the server lost the data or steal by someone we create backup server to catch all data. We provide security service to safe the patient data.

## VI. CONCLUSION

The Internet of Things is enriching our everyday life, and promises to drive significant changes and cause a huge impact in modern healthcare, by enabling a more personalized, preventive and collaborative form of care. In this paper we presented healthcare, an IoT-based health care system designed to monitor and collect vital data on people. The system is able to detect temperature falls, as well as the absence of vital signs, triggering alerts in case of emergency situations. The wearable device to be integrated on a simple, discrete and comfortable wristband, the developed web application collects all the data retrieved and sent by the wristband to the server, and is also able to remotely alert the caretaker or medical status in the case of emergency. The stored data can later be used for analysis, which may help

medical to trace the evolution of patients. Work in the near future will focus on the addition of new sensors to the wristband in order to collect data from other vital parameters such as the blood pressure, heart rate and temperature. This will be particularly helpful to determine the evolution of patient as medical condition. The results will help in evaluating the solution.

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