International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 08 Issue: 07 | July 2021 www.irjet.net p-ISSN: 2395-0072

# "IoT Based Healthcare Monitoring System"

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**Abstract -** *Medical care is given the outrageous significance now a-days by every country with the approach of the novel Covid. Internet of Things (IoT) is the new transformation of web which is the developing exploration region particularly in the medical services. With the increment being used of wearable sensors and the PDAs, these distant medical services checking has developed in such a speed. IoT observing of wellbeing helps in forestalling the spread of illness just as to get an appropriate finding of the condition of wellbeing, regardless of whether the specialist is at far distance. Gadget which will associate with clinics, specialists and family members to caution them of health-related crises and take preventive measures. This gadget will quantify the internal heat level, oxygen level, beat rate, feeling of anxiety and furthermore alert the patients about their meds. Every one of these will be finished by utilizing the Android application and a clinical wristband. For cautioning patient about meds, patient need to set the timings on the android application. Then, at that point as per that notice will be gotten by the patient through bell on the clinical arm band. All information will be put away on data set. Internal heat level, oxygen level, beat rate and feeling of anxiety alongside the outcomes if every one of these are leveled out will be shown on the application gave.*

***Key Words***: *Healthcare system, IoT, Automation in healthcare, Stress monitoring, Medication alert, oxygen level.*

## 1.INTRODUCTION

Wellbeing is consistently a significant worry in each development mankind is progressing as far as innovation. Like the new Covid assault that has demolished the economy of China to a degree is a model how medical services has happened to significant significance. In such regions where the scourge is spread, it is consistently a superior plan to screen these patients utilizing distant wellbeing observing innovation. Internet of Things (IoT) based wellbeing observing framework is the current answer for it.

As per world wellbeing association (WHO) examination almost 32% of grown-up passing's all around the world and furthermore in India are because of cardiovascular infections which are brought about by problems of the heart and veins. These incorporate different heart related sicknesses including coronary illness (coronary episodes), rheumatic coronary illness, raised circulatory strain (hypertension) fringe conduit infection, inborn coronary illness and cardiovascular breakdown. As per ebb and flow gauges, India will before long have the most elevated number of coronary illness cases on the planet. These sorts of cardiovascular infections need consistent observing of certain body boundaries which need long medical clinic stays.

Through prescription administration people get the meds they need on time each and every day. Their personal satisfaction improves massively and everybody included can stress less over the soundness of their friends and family. Inability to adherence is a significant issue which influences the patient as well as the medical services framework. Drug non-adherence in patients prompts significant deteriorating of illness, passing and expanded medical services costs. To conquer this issue point is to alarm patients for their medicine with this IoT based clinical gadget. It cautions the patients and makes it conceivable to require some investment. This framework helps in lessening the reliance on medical caretakers or help by utilizing web of things.

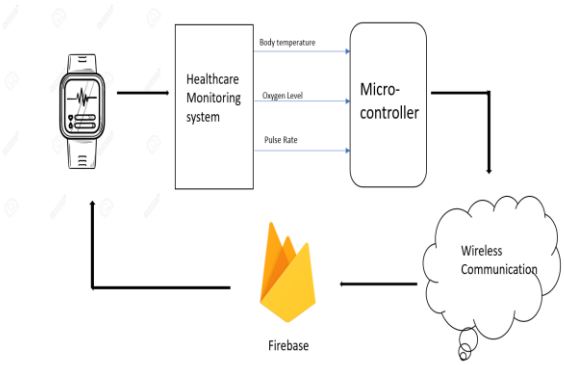


Fig. 1.1.1 Health Monitoring System

Wireless health monitoring system or patient monitoring system involves monitoring of patient as vitals remotely by means of devices that transfers patient data to remote locations wirelessly. It consists of a wearable wireless device like a bracelet with sensors that are paired with an application for a doctor to access the medical information. The main of this project is improving lifestyle with focusing on self-healthcare and also improving the quality of the care provided, patient outcomes and reducing the cost of care. The core objective of this project is the design and implementation of a smart patient health tracking system. The sensors are embedded on the patient body to sense the body temperature, oxygen level and pulse rate of the patient.

## 2. PROPOSED SOLUTION

### 2.1 Message Queuing Telemetry Transport

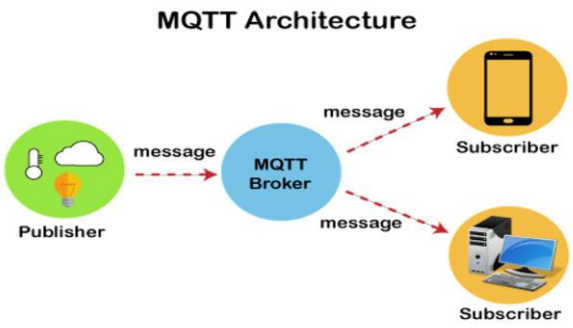


Fig. 2.1.1 MQTT Architecture

MQTT (Message Queuing Telemetry Transport) is a lightweight informing convention, it utilizes the bar/sub example and interpret messages between gadgets (clinical arm band), servers(firebase) and application (Android application).

•MQTT guarantees that messages go to the right gadgets during correspondence by using themes.

• A theme capacities equivalent to a document way would and coordinates correspondence by separating messages as indicated by components determined in the point work.

•MQTT is a distribute/buy in convention that permits edge of organization gadgets to distribute to an agent.

•Clients associate with this representative which then, at that point intercedes correspondence between the two gadgets. Every gadget can buy in or register to specific subjects.

### 2.2 Wireless Sensor Network

Wireless sensor network (WSNs), which are related with IoT, address helpful organizations in helping the checking, following and detecting diverse ecological exercises. Sensors qualities assume the primary part in planning and applying any WSN.

Because of the immense advances in correspondence and systems administration innovation, there are requirements to create, construct and apply different keen or canny (automated) administration organizations. Outfitting the genuine items with correspondence and registering offices and allowing them to help out one another, in actuality, applications, is the idea of the Internet of Things (IoT). IoT inclines toward the way toward Controlling, Communicating, Cost saving and Automation. This period will be the IoT time because of its different fundamental application.

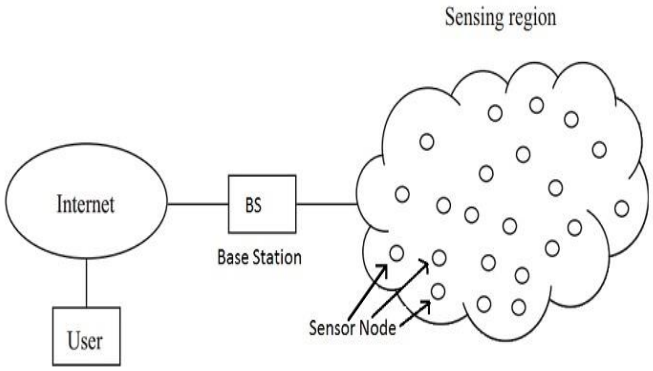


Fig. 2.2.1 Wireless Sensor Network

### 2.3 Proposed Method

Devices in the form of wearable like bracelets and other wirelessly connected devices like oxygen level, pulse rate, body temperature gives patients access to personalized attention. Especially for elderly patients, by enabling constant tracking of health conditions. This has a major impact on people living alone and their families. On any disturbance or changes in the routine activities of a person, alert mechanism sends signals to family members and concerned health providers.

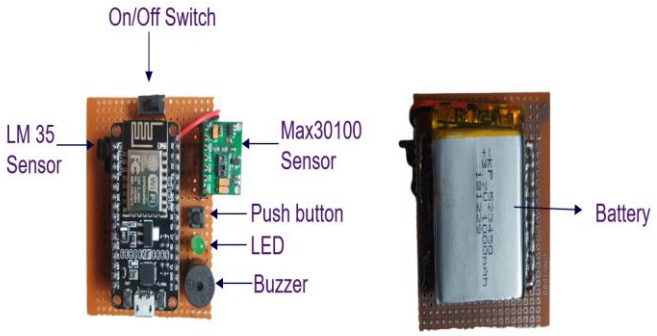


Fig. 2.3.1 Wearable Device

Medical bracelet which contains sensors like LM35(temperature sensor) which measure body temperature and Max30100 which measures oxygen level and heart rate. All the sensed data will be transmitted wirelessly through wi-fi module ESP8266 to google firebase and this data will be fetched on android application. Android application has a feature of alerting patients about their medication through buzzer, the medication details and alarm are set through android application.

1000mah rechargeable Lithium-polymer battery is used to support the proposed system which allows the system to work for 2-3 days.TP4056 charging module is used to charge the battery.

## 3. SYSTEM DEVELOPMENT

### 3.1 System Architecture

In this architecture User can communicate with IoT layer through Android application. In this, application takes all sensor data from cloud server and displays the health parameters. In IoT layer which contains bracelets which sense the Blood oxygen level, Pulse rate and Body Temperature and sends sensor data to cloud server through internet.

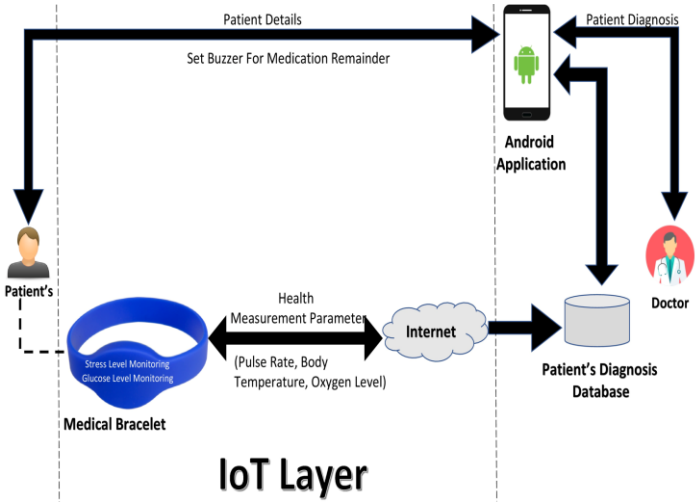


Fig. 3.1.1 System Architecture

In above architecture there are three layers user, communication and IoT layer.

1.User Layer- In this layer user is a patient or person who uses this system.

2. Communication Layer- In this layer user can communicate with system which contains components of IoT layer (Medical Bracelet) with User interface.

3. IoT Layer- This is the main layer of this project because all sensor upload on cloud server database(Firebase) through internet

### 3.2 USE CASE

A utilization case chart is a graphical portrayal of a client's potential cooperation's with a framework. A utilization case outline shows different use cases and various kinds of clients the framework has and will regularly be joined by different sorts of charts too. The utilization cases are addressed by either circles or ovals.

Use case is used to specify the context of a system. Requirements of the system can be identified using this diagram. Actors are User with android application and Wearable device. These all actors connect with each other to monitor health of a patient.

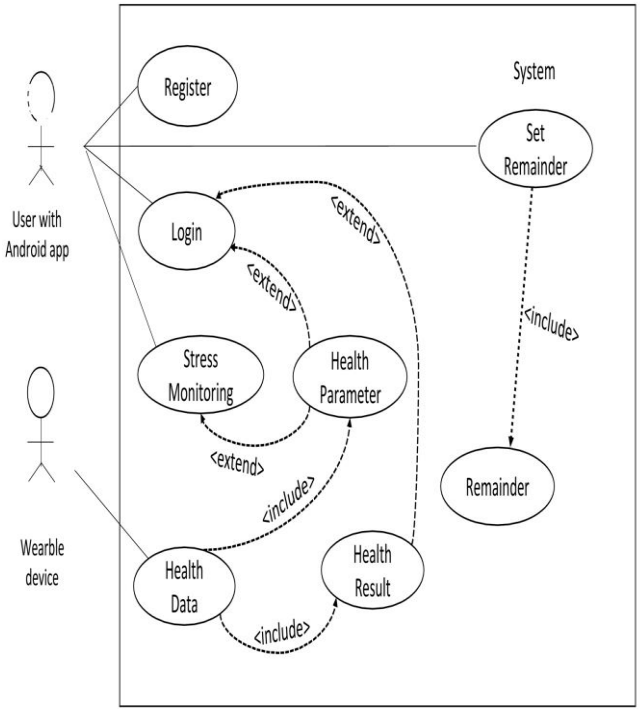


Fig. 3.2.1 Use Case Diagram

## CONCLUSION

Consequently, it works on the personal satisfaction by observing them as well as reminding them about their medicine. It likewise works with that the individual thriving boundary information is gotten inside the cloud, stays in the clinic are diminished for regular routine assessments and most significant that the wellbeing can be checked and infection analyzed by any specialist at any distance

## AKNOWLEGDEMENT

We take this opportunity to thank our project guide Prof. AK Gupta mam and head of the department Dr. J. S. Patil for their valuable guidance and for providing all the necessary facilities, which were indispensable in the completion of this project report. We are also thankful to all the staff members of the department of Information Technology of Jayawantrao Sawant College of Engineering, Pune for their valuable time, support, comments, suggestions and persuasion.

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