

IoT Based Smart Patient Record Maintenance System

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Abstract— The advancement of the Internet of Things technology is playing a key role in developing the health sector by making it much more accessible and affordable through easy to use applications for virtual and distant interactions with patients. Taking the capability of IoT technology into account, it is possible to overcome the difficulties faced by physically unstable patients in consulting a doctor physically on a regular basis. This work has led to a prototype of IoT Based Remote Health Monitoring System for Patients. This prototype consists of three health sensors: heart pulse sensor, body temperature sensor and galvanic skin response sensor.

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I. INTRODUCTION

Today, Internet application development demand is very high. So Internet of Thing (IoT) is a major technology by which we can produce various useful internet applications. Basically, IoT is a network in which all physical objects are connected to the internet through network devices or routers and exchange data. IoT allows objects to be controlled remotely across existing network infrastructure. IoT is a very good and intelligent technique which reduces human effort as well as easy access to physical devices. This technique also has autonomous control feature by which any device can control without any human interaction. “Things” in the IoT sense, is the mixture of hardware, software, data, and services. “Things” can refer to a wide variety of devices such as DNA analysis devices for environmental monitoring, electric clamps in coastal waters, Arduino chips in home automation and many other. These devices gather useful data with the help of various existing technologies and share that data between other devices. Examples include Home Automation System which uses Wi-Fi or Bluetooth for exchange data between various devices of home.

II. LITERATURE SURVEY

Author has presented “An IOT Based Health care monitoring system”. Constant observation is required in hospitals where the patients are under medical care for a longer period of time. Although the patient is not in a critical situation, the doctors still need confirmation on their health parameters. Now a day, the expenses for hospitalization are high and expensive. So the health policies in various countries have shifted its focus from providing reactive, acute care to provide care outside the hospital. Hence author designs and build the sensing data that conditions the system to display accurate body parameters of the patients. The aim of this paper is to

supervise the heart rate, blood pressure, temperature and ECG continuously through respective sensors. The recorded data is sent to the device and if the value exceeds, the alert message will be sent to the doctor. An IOT Based Smart Health care system using Raspberry Pi”. They have used an exclusive sensor to monitor a patient’s health parameters. Hence author has used platform Raspberry Pi for IoT. The Raspberry Pi is a platform which offers compact platform for a Linux server with a low cost. The combination of Raspberry Pi and IoT is a new changing technology in the healthcare system. Raspberry Pi collects various data from sensors and transfers to database.

Cloud computing possess numerous advantages such as flexibility, highly automated, low cost etc. The Clouds features enable customers to build and deploy their applications on virtual servers. Here the author has concentrated over the idea of separating wireless sensor network and cloud computing. Once sensors are connected to patients’ bodies, they start to receive and transmit data to the database sensors like temperature (DS18B20), heartbeat, blood pressure, ECG (AD8232) services available in the cloud are responsible for receiving, storing, and distributing patient’s data. In author has presented “Internet of Things as Key Enabler for Sustainable Healthcare Delivery”. Here the author considers IOT as a global network infrastructure, linking physical and virtual objects. This architecture consists of existing and evolving internet and network developments. Exclusive object-identification, sensor and connection capability are offered. Hence sensors will be characterized by a high degree of data capture. This paper aims to show how radio frequencies are identified and Internet of Things technologies allow patients to access healthcare services. In this author has presented “Simulation of Health care Monitoring System in Internet of Things by

Using RFID". Author has designed the effective healthcare monitoring system using the IoT. The health monitoring system plays a vital role with IOT; the RFID tag is used to initialize the bed system as a key. The sensors are used to observe the patient's condition frequently. The information report of patient is transmitted to the website through IOT system so that the doctor can know about the condition of the patient. The movable bed mechanism is used to adjust the bed according to the patient's condition. The buzzer is to indicate the nearby persons that the patient is in critical situations. In this paper, there is a discussion over the security requirements of authentication. Particularly they have represented a ECC-based RFID authentication in terms of implementation and authentication. Even though most of these cannot satisfy the security requirements and implementation. In author has presented "A Literature Survey in ECG Feature Extraction". Patient's health has been observed in this paper. There is a well organized health monitoring system developed and designed by author. The system enables the doctors to monitor patient's health parameters (temp, heartbeat, ECG, position). The parameters of the patient are measured continuously (temp, heartbeat, ECG) and wirelessly transmitted using zigbee. It provides a solution for improving the performance and power management of the patient health monitoring system. The presented system is used to continuously observe and analyze the data in microcontroller. If a particular patient's health parameter falls below the particular range, SMS is sent to the doctor's mobile number using a standard GSM module. They have used Zigbee for wireless networking. The doctor can collect a record of a particular patient's data by accessing the database of the patient on their respective PC which is persistently updated through Zigbee. In author presented "IOT Based Patient Monitoring System". It is a mobile physiological monitoring system that is capable of continuously monitoring the patient's heart rate using ECG. Using replaceable electrodes ECG sensor can be attached to the patient's chest. Signals produced during muscle contraction is sensed by the system and recorded. The signals collected from the body are converted to an electrical signal. This paper shows the use of smart healthcare system. This new technology is capable of offering a large range of benefits to patients through early detection of abnormal conditions. In author presented "Health Monitoring Systems using IoT and Raspberry Pi". IOT Raspberry Pi based health care monitoring system has been analyzed by author in this paper. Any unusuality in condition of patient health can be detected and informed to the related person of patient. The elemental component of ECG is Instrumentation Amplifier, which is responsible for taking the differences in the voltage. The exhibited system is efficient and easy to understand. It is a connection between patient and doctor. In author presented a "Review on-IOT Based smart healthcare system". Here architecture of Smart Health Care Monitoring and IOT is demonstrated by author. New technologies help

in minimizing the better quality as well security concept. ECG signals are obtained by electrodes that are placed on the chest. Later wires are connected to ECG sensor (AD8232).The sensor is used in measuring the electrical activity of the heart. Problems and challenges that could be faced in future are presented by this system. Applications of IOT can be improved using new methodologies and technologies. Sensors like Blood pressure, Temperature, Heart rate, ECG are used in IOT along with Raspberry Pi kit and Wi-Fi module. In author has presented "An Overview on Heart rate Monitoring and Pulse Oximeter System". In this paper a lowcost device is described that measures the heart rate of the patient by placing sensors on the fingers, later the result will be displayed on LCD. The designed system can be used by unprofessional people. The change in heart rate can be displayed by graph using graphical LCD. Over a period of time, maximum and minimum More Medical Applications Right now, health-related sensors in the main have applications within the recreation and mode sectors as a result of their capabilities don't seem to be nevertheless thought of medicalgrade. This has presented "Heart rate Measurement from the Finger Using a Low Cost Microcontroller". IOT has a wide range of application. IoT has been developed for Wireless sensor network (WSN). Using IOT, health monitoring designs are presented. There are some problems that are related to health monitoring and IOT. New technologies help to minimize better quality as well as security concept. New technologies and methodologies are used. Aurdino board, Wi-Fi modules, temperature, pulse oximeter, blood pressure, heartbeat rate sensors are used in IoT. This has presented, "Heart Attack Detection and Heart Rate Monitoring Using IOT". In this paper with the help of observed heart rate through IOT device, heart attack can be detected. Here the methods used by author includes Arduino board, Wi-Fi module and pulse sensor. Pulse sensor will start sensing the heart rate readings once the system is set and heart rate of the patient will be displayed on LCD screen. Data can be transmitted over internet with the use of Wi-Fi module. By checking a patient's heart rate it can be determined if the patient is healthy or not based on heart rate displayed on the LCD screen. Limits are set to the system, heart rate of the patient is monitored and immediately alert message will be sent by the system if the heart rate goes below or above threshold value. They have implemented an application that will track and monitor heart rate of patient correctly and message will be sent in case of possibilities of heart attack. It also has presented "Heart rate Monitoring System". This paper explains a unique contribution in identifying all components of an IOT healthcare system. A generic model is proposed that can be applied to IOT based healthcare monitor. It is important and no known end-to-end system is found for remote monitoring of health issues. Here concentration is given more on the sensors to observe the various parameters of the patient body. The contribution is done by

concentrating on LPWANs (Wide Area Network), by focusing on their unique suitability for use of IoT systems. This system has "Survey of IOT Based Patient Health Monitoring System". Here author proposes a smart health care system that includes smart identification tag, server and internet. Physiological conditions are provided by smart identification tag on the basis of medical report of the patient which is diagnosed by doctor via WLAN. The objective of this paper is to monitor the patient often. New technology proposed here is capable of providing a large range of benefits to patients. The author has proposed a mobile physiological monitoring system, which is capable of monitoring the patient's body parameters in the hospital. Sensing, and controlling are the functions of smart system and decision made is based on available data. It evolves "Survey Paper for Health Recommender System". Here various parameters of the human body are detected by the designed health monitoring system. Later this data is made available to doctors via internet. In case of emergency when the person is not in a state of conscious, the alerts will be generated automatically and sent to the doctor. Here records of health parameters can be instantly used. People pay attention towards prevention and early identification of disease, Author has examined arduino based health monitoring system. Disability can be detected in the health through sensors through internet and informed to the particular person. The proposed architecture is efficient and easy to understand. It plays as a connection between doctor and patient. This presents "Board over Distributed Ubiquitous Environment". here author concentrates on IoT based Smart Healthcare System. The major objective of this designed system is to transfer the patient's health parameters. This paper proposes the efficient system for observing patient pulse rate and temperature. The system uses pulse sensor to keep track of heart rate of the patient. With the use of sensors we can access the various parameters of body. These input data are transmitted to the computer for family and doctor's for reference. Thus in the modern health care system, the usage of IoT technologies have brought

III. CONCLUSION

The idea of this project work is to record the patients' health parameters such as temperature, heart rate, ECG using the IoT. So that it will be easier to share the record with remote doctors and get the diagnosis easily.

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