Health Monitoring using Internet of Things

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Abstract- *Nowadays some people are dying due to lack of care or knowledge about their health. This is mostly happens because, they don't have effective health monitoring devices. This situation can be minimized by increase the efficiency of healthcare by transferring information from patient tothe doctor or clinic through IoT. The Internet of Things (IoT) is a device which gathers and share information directly with transmitter and receiver, this enables the doctor to collect record and analyze new data streams faster and more accurate. This technology paves the way to improve the quality of care with constant attention and reduce the cost of care by eliminating the need of a regular checkup. The IoT technology possibly obtains the measured data from the sensor for monitoring and analyzing the health status of the patient with basic vital signs such as heart rate, blood pressure.*

Keywords:- IoT, Microcontroller,Patientshealth.

I. INTRODUCTION

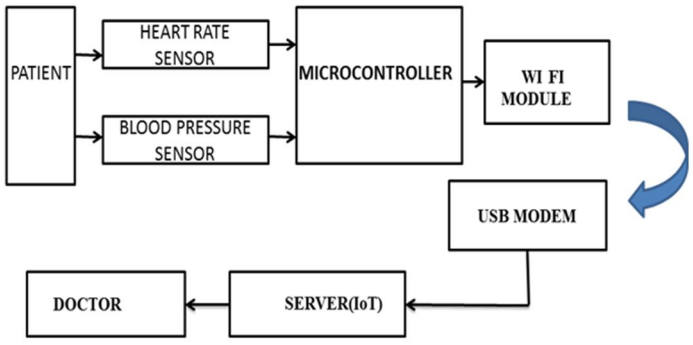
The objective of this project is to monitor and improve the quality of care of people in remote location and to provide continuous information about the patient for making better healthcare decisions in critical situation and to reduce the regular checkup of the aged patients. It helps the doctor to monitor their patients at any time apart from their consulting hours. Improved home care facilities and regular health updates to clinicians reduce the chances of redundant or inappropriate care. It improves patient care and safety by reduction in overall costs for care.

Internet of Things (IoT), gather and share information directly from patients and it also make possible to collect, record and analyze new Data Stream faster and more accurately. As the technology for collecting, analyzing and transmitting data in the IoT continues to mature, with the help of sensors, actuators, and computing devices. This provides data communication capabilities. These are linked to networks for data transportation. This connected healthcare environment promotes the quick flow of information and enables easy access to diseases such as hypertension, diabetics and cardiac diseases which needs continuous monitoring. This Internet of Things (IoT) is increasingly recognized by the researchers and analysts as one of the most sophisticated technologies for health monitoring and it is safety for people and it also tackled by all.

The ability of the devices to gather data on their own removes the limitations of human intervention and it reveals the data-automatically and send it to the doctor whenever they needed. The automation reduces the risk of error. This type of solution employs sensors to collect comprehensive physiological information and uses gateways and the cloud to analyze and store the information and then send the analyzed data wirelessly to caregivers for further analysis and review. It replaces the process of having a health professional come by at regular intervals to check the patient's vital signs, instead providing a continuous automated flow of information. In this way, it simultaneously improves the quality of care through constant attention and lowers the cost of care by eliminating the need for a caregiver to actively enhance in data collection and analysis. Powerful wireless solutions connected through the IoT are now making it possible for monitoring the patients. These solutions can be used to securely capture patient health data from a variety of sensors, apply complex algorithms to analyze the data and then share it through wireless network, for medical professionals who can give appropriate health recommendations for the patients.

II. METHODOLOGY

A. BLOCK DIAGRAM



B. CONSTRUCTION

In this paper, the sensing devices from the patient are connected to the PIC microcontroller and programed to convert the sensed data from patient to readable digital signals

and then transfer the signal wirelessly to IoT for the doctor's recommendation.

III. HARDWARE DESCRIPTION

A. SENSORS

HEART RATE SENSOR

Heart rate is a very vital health parameter that is directly related to the soundness of the human cardiovascular system. This project describes a technique of measuring the heart rate through a fingertip using a PIC microcontroller. While the heart is beating, it is actually pumping blood throughout the body, and that makes the blood volume inside the finger artery to change too. This fluctuation of blood can be detected through an optical sensing mechanism placed around the fingertip. The signal can be amplified further for the microcontroller to count the rate of fluctuation, which is actually the heart rate.

BLOOD PRESSURE SENSOR

Blood pressure sensor is a device that measures the blood pressure in the arteries as it pumps the blood throughout the body by the heart. When our heartbeats, it contracts and pushes blood through the arteries to the rest of our body. This force creates pressure on the arteries. Blood pressure is recorded as two numbers the systolic pressure (as the heart beats) over the diastolic pressure (as the heart relaxes between beats). The measured output from the sensors is given to the pic microcontroller where the data are processed and stored for further transmission.

B. PIC MICROCONTROLLER

A microcontroller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals.PIC defined as (Programmable Interface Microcontroller) is used here to perform the various modules. Based on the embedded C program it takes control over the modules. All the above mentioned modules are controlled by embedded C program. Once started, the modules will continuously run and when the work is completed, whisper-quiet operation will take place. Embedded C uses most of the syntax and semantics of standard C. It is small and reasonably simpler to learn, understand, program and debug. In comparison with assembly, C code written is more reliable and easy, more portable between different systems. C compilers are available for almost all embedded devices in use today. C has the advantage of processor independence i.e. it is independent of the kind of controller or processors used, and is not specific to any particular microprocessor/microcontroller or any system.PIC microcontroller transfer the information to the IoT devices through which the data from the sensors are transfer.

C. WIRELESS NETWORKING

The data Transmission components of the system are responsible for conveying records of the patient from the patient's house (or any remote location) to the data center of the Healthcare Organization (HCO) with assured security and privacy, ideally in real-time. The information hubs that collect sensor data and analyze it and then communicate it to the IP address, which is created to send the details about the patient condition to doctor. Gateways can be designed for clinic to transfer the data. Medical device designers can also use this platform to create remote-access devices for remote monitoring.

IV. CONCLUSION

Health of the patients are monitored using internet of things (IOT) and enables the doctor to monitor their patients outside the clinic and also apart their consulting hours. Connected healthcare devices utilizeresources to provide an improved quality of care, leading to better clinical outcomes. Measureable benefits of connected medical devices include reduces clinic visits, including reduction in bed days of care and length of stay in hospitals. Using Internet of Things (IOT), patient conditions are obtained and stored for further analysis. In this project the heart rate and blood pressure of patient are monitored. From this project it is expected to monitor the whole body of the patient from remote location and improve the technology to world widely for patient monitoring by providing personalized and optimized services, it will promote a better standard of living. Nations across the world to improve patient care and IoT provides a timely and cost-effective response to those critical situations. Healthy and active people can also benefit from IoT-driven monitoring of their well-being. It also enables features for the aged persons who want only a monitoring device that can detect a fall or other interruption in everyday activity and report it to emergency responders or family members.

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