

**SURVEY PAPER ON REMOTE PATIENT HEALTH MONITORING SYSTEM**Anchal Maurya¹¹M.Tech, Department of Electronics and Communication Engineering,
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Abstract: In our day to day life internet plays a very crucial role since it makes available a lot of useful data anywhere. To make our work simpler and easier we are using this technology of Internet of Things(IOT) to connect anything to the internet. IOT is beneficial at several places Smart Such As Smart Home, Smart City, Smart Environment, Agricultural Fields And Medical Fields. Taking medical field into consideration IOT has proved very helpful in taking care of this large population. The aim of this paper is that it basically summarizes the various technologies used in remote patient monitoring and also how IOT is useful in the application of Monitoring Patients Heart Rate, Body Temperature, Respiration Rate And Body Movements. We made the use of Raspberry Pi to fulfill our purpose of monitoring patient. We connect internet to the Raspberry Pi after which it acts as a server and after which it automatically sends data to the web browser.

Keywords: Raspberry Pi, IoT, pulse rate monitor, body temp sensor, Healthcare system

1.INTRODUCTION

Internet of things plays essential role in many applications like health monitoring system, remote sensing. In cases where the patients must be under continual observation or under active medical care for longer duration for this purpose the constant monitoring is required IOT is used to monitor various parameters of the patient. The patient monitoring system based on Internet of things gathers the real-time parameters of patient's health and send to the internet. Recent years have seen a rising interest in wearable sensors and today several devices are commercially available for personal health care, fitness, and activity awareness. In addition to the niche recreational fitness arena catered to by current devices, researchers have also considered applications of such technologies in clinical applications in remote health monitoring systems for long term recording, management and clinical access to patient's physiological information. Based on current technological trends, one can readily imagine a time in the near future when your routine physical examination is preceded by a two – three day period of continuous physiological monitoring using inexpensive wearable sensors. Over this interval, the sensors would continuously record signals correlated with your key physiological parameters and relay the resulting data to a database linked with your health records. When you show up for your physical examination, the doctor has available not only conventional clinic/lab-test based static measurements of your physiological and metabolic state, but also the much richer longitudinal record provided by the sensors. Using the available data, the doctor can make a much better prognosis for patient's health and recommend treatment.

2.LITERATURE SURVEY

Remote patient monitoring system is designed to monitor patient's physiological data such as Electrocardiogram(ECG), Electroencephalogram(EEG), heart rate, body temperature. A number of researches have been done in this field. This section briefly reviews past research on remote patient monitoring system.

In the research paper(Chen et.al)[1] WANDA system for patients with Congestive Heart Failure (CHF) is discussed. It occurs when the heart is unable to adequately supply enough blood for a healthy physiological state. CHF typically occurs when cardiac tissue becomes ischemic from coronary vessel blockage. Ischemia reduces the mechanical functionality of the heart and disrupts normal electrophysiological processes. This paper presents WANDA (Weight and Activity with Blood Pressure Monitoring System) ; a remote health monitoring system for patients with CHF. This system uses sensor technologies and wireless communications to monitor the health status of CHF patients. The system architecture is divided into three tiers. The first tier is composed of wireless sensors and mobile devices for monitoring patients' health related measurements. These readings are wirelessly transmitted to the second tier. The second tier consists of web servers that store sensed data and maintain its integrity. The third tier is a back-end database server that performs backup and recovery jobs. WANDA utilizes a Bluetooth weight scale, blood pressure monitor, activity monitor, and questionnaire systems to collect health related measurements and transmit data.

In the paper (Kamal et. al.)[2] remote patient tracking and monitoring system is discussed. This system uses wireless medical devices that is connected to Android based medical devices. It also tracks patients position using internal GPS sensors. This mobile device reads health information (i.e. temperature, heart rate and blood pressure) from the wireless medical devices, and in addition stores them locally before sending them to server via GPRS; it also checks for abnormal health status, and in case of occurrence of such abnormal status the mobile devices generates an alarm and sends emerging alarm to the server. The server does a set of emergency steps to direct patient to a medical care team and, if needed, ensures that a medical care team will reach the patient. All local and remote information are encrypted to ensure secrecy of sensitive data (such as position of each patient).

This paper (Harsha G S)[3] discusses the design and implementation of online patient monitoring system. Patients condition is continuously monitored and web access functionality is embedded in the device. This project develops Ethernet device drivers or Cortex-M3 core to transmit the monitored sensor data (patient condition) to internet. The system uses web browser for remote monitoring of the patient. The main essence of this project is to design and implement online data monitoring system using ARM CORTEX M3 CORE and TCP/IP Ethernet connection for data monitoring applications. The system also uses LPC1768 Ethernet module and then a software is generated that can provide embedded system with Ethernet connectivity.

In this paper (Zahhad et. al.)[4] presented a Wireless emergency telemedicine system for patients monitoring and diagnosis. The term telemedicine refers to the utilization of telecommunication technology for medical diagnosis, treatment, and patient care. The aim of telemedicine is to provide expert-based healthcare to understaffed remote sites through modern telecommunication (wireless communication) and information technologies. The main telemedicine system components in recent years include biosignal sensors, processing units, data communication networks, and medical service center. This system consists of Home care unit Data communication networks, Medical server and Management unit. The home care unit consists of biosignal sensors, Processing unit and communication unit. The processing unit may evaluate patient status and trends in patient's medical condition. Processing unit can be PC, mobile phone, or embedded system (microcontroller, DSP processor, and FPGA) In the proposed system mobile care unit is used which is light weight and easy to use.

In this research paper (Kavitha et. al.) [5] gave a wireless health care monitoring system which deals with design and development for remote patient monitoring in healthcare field. The primary function of this system is to constantly monitor patient's physiological parameters such as pulse rate, breathing rate, blood pressure rate and patient's body movement, and display the same information to the doctor. Using a Zigbee transmitter the retrieval information be send to corresponding receiver locate at the computer. The Zigbee receiver receives the data from transmitter and finally displays record to doctors via web browser. Provide notification message about the emergency to the physicians through GSM module.

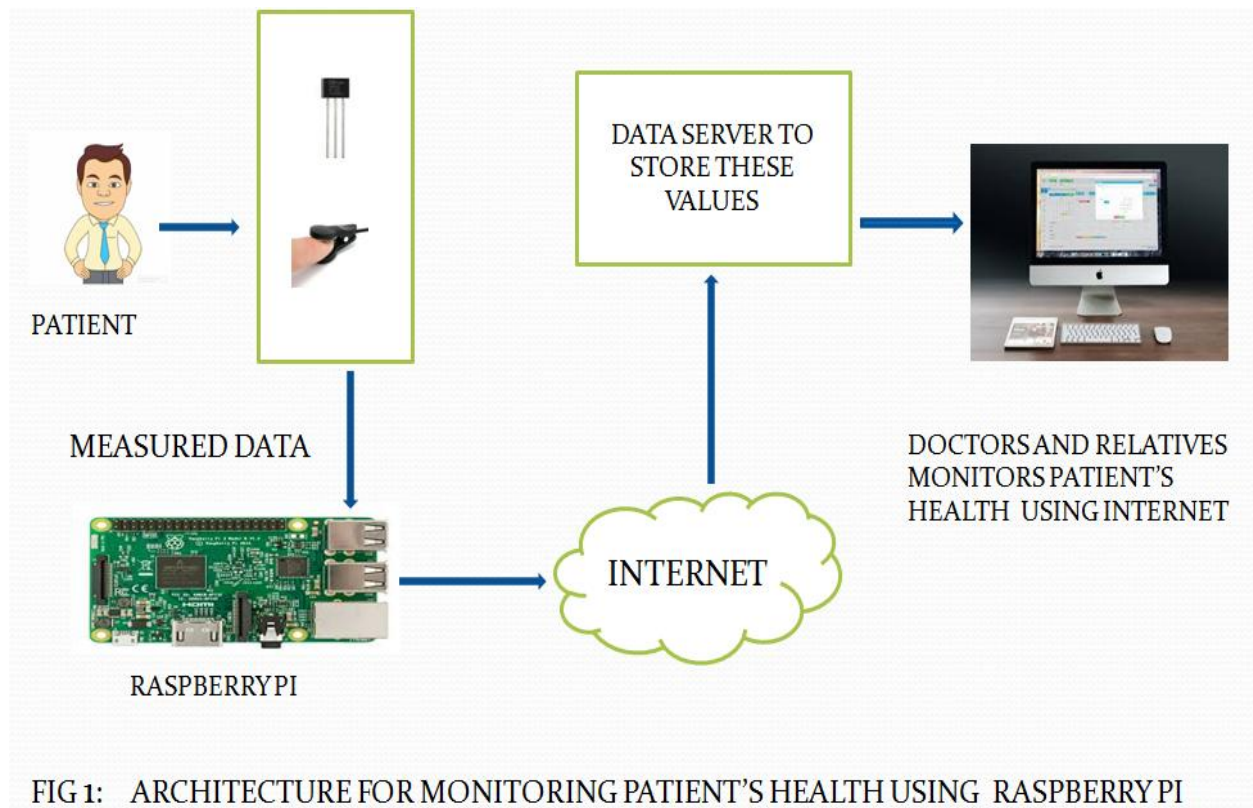
In this paper (Hassanalieragh et. al.)[6] gave a health monitoring and management system using Internet-of-Things (IoT) sensing with cloud-based processing. This system consist of Data Acquisition, Data Transmission and Cloud Computing Unit. Data Acquisition is performed through multiple wearable sensors. These sensors are connected to the intermediate data aggregator or concentrator, which is typically a smart phone located in the vicinity of the patient. Data transmission is typically done through the sensors data acquisition platform which are equipped with a short range radio such as Zigbee or low power Bluetooth which it uses to transfer the low power data to the concentrator. Now the cloud processing unit is divided into three distinct components: storage, analytics and visualization. The system is designed for long term storage of patient's biomedical information as well assisting health professionals with diagnostic information.

In this paper (Abdelhedi et. al.) [7] discusses fall detection FPGA-based systems. Falls are a major health hazard for older people, and are a key cause of trauma, disability, hospitalization and morbidity. Wireless networks and mobile computing devices allow for the development of new approaches to fall prevention and response. Portable devices originally developed for monitoring the health of chronically ill patients have been used to detect falls through the use of low-cost MEMS accelerometers. A new trend in fall detection is the development of small, smart wearable devices with adaptive fall detection algorithms. Multiple technologies like micro-controllers, FPGAs and smart phones have been successfully used to detect falls.

4. PROPOSED SYSTEM

Based on earlier work on remote patient monitoring a new model is proposed. The proposed system will monitor patient's Heart Rate, Body Temperature Respiration Rate using Raspberry Pi. The sensed data is relayed on Raspberry Pi. Patient diagnosed can be monitored in the monitor screen of computer using Raspberry Pi as well as monitoring through anywhere in the world using internet. This system is reconfigurable and can monitor several parameters simultaneously.

5.ARCHITECTURE



6.CONCLUSION

A survey of some health monitoring system is done. This paper concludes different technologies and IoT Applications for health monitoring system. The paper has given an explanation and analysis of the technologies, applications, methods and implementation for the procedure of health monitoring system in the medical field. Each and every applications and technologies have some advantages and limitation. Also a Raspberry Pi model for patient monitoring is proposed. This model is cheaper than the earlier model.

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