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Iot Based Smart Healthcare System

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Abstract:- The rapid development of Internet of things (IoT) technology makes it possible for connecting various smart objects together through the Internet and providing more data interoperability methods for application purpose. Recent research shows more potential applications of IoT in information intensive industrial sectors such as healthcare services. However, the diversity of the objects in IoT causes the heterogeneity problem of the data format in IoT platform. Meanwhile, the use of IoT technology in applications has spurred the increase of real-time data, which makes the information storage and accessing more difficult and challenging. Here in this paper a more efficient machine to machine communication is achieved for health care data's.

Keywords:- Internet of Things (IOT),Machine to Machine communication (M2M), Pulse Oximeter, EoR.

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I. INTRODUCTION

In the last decade, a growing number of researches have been conducted toward using IoT technology to acquire data ubiquitously, process data timely, and distribute data wirelessly in the healthcare field Ambient Assisted Living (AAL) is designed to support daily activities of elderly people independently as long as possible. IoT technology is used to support medical consultations among rural patients, health workers, and urban city specialists. With the use of IoT, M-health concept, which is defined as mobile computing, medical sensors, and communication technologies for healthcare, attracts more and more researchers applying fourth-generation (4G) mobile communication technology and IoT in healthcare service.

The above-mentioned uses of IoT technology bring both opportunity and challenges in ubiquitous data accessing medical services. More attentions have been paid in developing ubiquitous data accessing solutions to acquire and process data in decentralized data sources he software adaptation approaches are surveyed in ubiquitous computing for resource constrained devices to react to the changes of user requirements actively and transparently control functionalities are designed to coordinate hybrid wireless networks in cloud computing. a metro system based on data-centric middleware is simulated to publish/subscribe message remotely.

Researchers use subscribe-based middleware to disseminate sensor data in cyber-physical systems. A cloud platform is developed in to handle heterogeneous physiological signal data to provide personalized healthcare services. In the related research, clinical data heterogeneity is still the main obstacle that hinders the clinic data integration and interoperation. Recently, Restful (Representational State Transfer) resource oriented model has been extended from a kind of software architecture originated from Web service research mainly for Web service interoperation to Web resources management. In this research an efficient interoperability of medical data through Internet of things is explained and successfully shown how it is helpful to patients and doctors. The rest parts of the paper are organized as follows. In Section II, interfacing of components of different parameters to be measured is discussed.

These physiological conditions of the patients are forwarded using serial module and if there is any change occurs in this continuously monitored data then an alert sound is directly forwarded to the care taker. A survey of E- healthcare information focuses on the very significant issue in the healthcare monitoring system that is to monitor and optimize the data quality extracted from environment, which can improve the diagnostics and decision making. Reatime Interactive medical consultation uses CARA (Context Aware Real Time Monitoring System) to continuously keep an eye on the physiological parameters of the patient and then either to store the data on server or stream the data to remote location in real-time. The system also uses webcam for real time monitoring of the patient. E-Healthcare information focuses on the very significant issue in the healthcare monitoring system that is to monitor and optimize the data quality extracted from environment, which can improve the diagnostics and decision making.

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II. LITERATURE SURVEY

Proliferating Cloud Density through Big Data Ecosystem,:-Novel XCLOUDX Classification and Emergence of as-a-Service Era Big Data is permeating through the bigger aspect of human life for scientific and

commercial dependencies, especially for massive scale data analytics of beyond the Exabyte magnitude. As the footprint of Big Data applications is continuously expanding, the reliability on cloud environments is also increasing to obtain appropriate, robust and affordable services to deal with Big Data challenges. Cloud computing avoids any need to locally maintain the overly scaled computing infrastructure that include not only dedicated space, but the expensive hardware and software also. Several data models to process Big Data are already developed and a number of such models are still emerging, potentially relying on heterogeneous underlying storage technologies, including cloud computing. In this paper, we investigate the growing role of cloud computing in Big Data ecosystem. Also, we propose a novel XCLOUDX {Clouds, X…X} classification to zoom in to gauge the intuitiveness of the scientific name of the cloud-assisted NoSQL Big Data models and analyse whether XCloudX always uses cloud computing underneath or vice versa. XCloudX symbolizes those NoSQL Big Data models that embody the term "cloud" in their name, where X is any alphanumeric variable. The discussion is strengthen by a set of important case studies. Furthermore, we study the emergence of as-a-Service era, motivated by cloud computing drive and explore the new members beyond traditional cloud computing stack, developed over the last few years.

Conference on Advances in Communication and Control Systems:- The advanced development in wireless sensor networks can be used in monitoring various parameters in agriculture. Due to uneven

Natural distribution of rain water it is very difficult for farmers to monitor and control the distribution of water to agriculture field in the whole farm or as per the requirement of the crop. There is no ideal irrigation method for all weather conditions, soil structure and variety of crops cultures. Farmers suffer large financial losses because of wrong prediction of weather and incorrect irrigation methods. In this context, with the evolution of miniaturized sensor devices coupled with wireless technologies, it is possible remotelymonitor parameters such as moisture, temperature and humidity. In this paper it is proposed to design, develop and implement wireless sensor network connected to a central node using ZigBee, which in turn is connected to a Central Monitoring Station (CMS)through General Packet Radio Service (GPRS) or Global System for Mobile (GSM) technologies. The system also obtains GlobalPositionting System (GPS) parameters related to the field and send them to a central monitoring station. This system is expected to help farmers in evaluating soil conditions and act accordingly.

Low Cost Hardware Design of a Web Server for Home Automation Systems:-In the present scenario the world is moving towards automated systems. To design a hardware which is able to interact via internet is a challenging task in design of any automation system. A new term known as 'Internet of things' also faces the same kind challenge, of interfacing a dumb electronic terminal with the internet. As we know that Ethernet is the most preferred serial bus, and can be utilized for high speed data transmission system. In this paper a new kind of design is proposed which support's bi-directional data transmission. This approach require very low cost hardware units including 8 bit RISC processors, Ethernet controller, Ethernet adaptor, sensor's and actuating device like webcam or may be a motor, based on the type of application. The processor to be used can be AVR or PIC depending upon the availability. The main advantage of this design is that it does not require any pre-defined operating platform like Linux or Python.

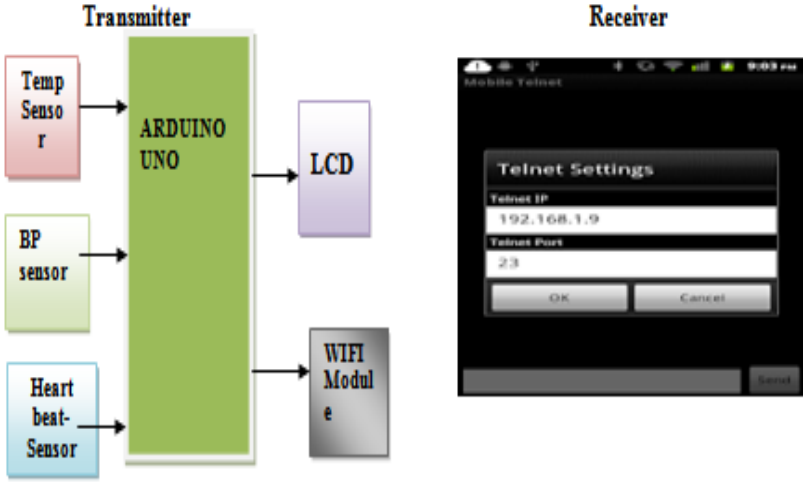
A New Intelligent Remote Control System for Home Automation and Reduce Energy Consumption",:- design and implementation of an internet-based smart remote control system for home automation, dedicated to power management that adapts power consumption to available power resources according to user comfort and cost criteria. Sensors and home appliances are connected to the designed and implemented control panel and then they are monitored and controlled from every corner of the world through the Internet cloud. The system is scalable and allows additional appliances to be added to it with no major changes to its core. New communication format is proposed to enable communication between the control panel and the servers well. To verify the principle operation of the design, some home applications are experimentally tested. Experimental results show the efficiency and accuracy of proposed intelligent control system in terms of energy saving and being user friendly.

"Pervasive medical information management and services:-A confluence of developments has led to the possibility of realizing a vision of pervasive healthcare. These include, but are not limited to, society becoming increasingly mobile, dramatic advances in various areas of technology and computer science, exponentially increasing healthcare costs coupled with workforce issues, the need to provide effective and efficient healthcare, and the change in the makeup of leading diseases most notably the increase in no communicable (or chronic) diseases. This is actually a very exciting time in healthcare delivery and one of the major

Challenges are to prudently adopt and implement appropriate pervasive healthcare solutions. To do this successfully, naturally requires a full appreciation of the key considerations in pervasive computing and healthcare; in particular, an appreciation of network healthcare operations. The objective of this chapter is to provide such a holistic perspective.

III. SYSTEM ARCHITECTURE

All IOT Health Care Monitoring System It contains transmitter and receiver sections the below figure shows the transmitter block diagram of IoT health Care monitoring System.



Working of the project:-

IOT patient monitoring has 3 sensors. First one is a temperature sensor, second is Heartbeat sensor and the third one is blood pressure sensor. This project is very useful since the doctor can monitor patient health parameters just by visiting website or URL. And nowadays many IOT apps are also being developed. So now the doctor or family members can monitor or track the patient health through the trough web operate To operate IOT based health monitoring system project, you need a Wi-Fi connection. The microcontroller or the Arduino board connects to the Wi-Fi network using a Wi-Fi module. This project will not work without a working Wi-Fi network. You can create a Wi-Fi zone using a Wi-Fi module or you can even create a Wi-Fi zone using Hotspot on your Smartphone. The Arduino UNO board continuously reads input from these 3 senses. Then it sends this data to the cloud by sending this data to a particular URL/IP address. Then this action of sending data to IP is repeated after a particular interval of time. For example in this project, we have sent data after every 30 seconds.

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System Architecture:-We have proposed a robust health monitoring system that is intelligent enough to monitor the patient automatically using IOT that collects the status information through these systems which would include patient's heart rate, blood pressure and ECG and sends an emergency alert to patient's doctor with his current status and full medical information. This would help the doctor to monitor his patient from anywhere and also to the patient to send his health status directly without visiting to the hospital. Our model can be deployed at various hospitals and medical institutes. The system uses smart sensors that generates raw data information collected from each sensor and send it to database server where the data can be further analyzed and statistically maintained to be used by the medical experts. Maintaining a database server is a must so that there is even track of previous medical record of the patient providing a better and improved examine

Hardware: The brain of our model is the 2nd generation Intel Galileo board, a single board which is based on the Intel QuarkSoCX1000, a 32-bit Intel Pentium processor- class system on a chip (SoC). It is Arduino-certificated and designed to be hardware, software, and pin compatible with large range of Arduino Uno R3 shields. Intel Galileo board is preferred over Arduino because this provides a Linux platform with high processing and computing power within build Ethernet shield and SD card support. It gets the information. This brain collects the data from all the sensors connected to the patient and uploads this data on the web server via Ethernet. The doctor can keep track of all the patient's data through the web client.

Software:-The Software part includes an Arduino IDE which is needed to program our Intel Galileo Board which was used to upload our final code of maintaining a database. All the data connected to the sensors is sent to a Xampp based data base server to log the patient timely record or sensed data, which will help the doctor for better consulting and prescription to patient. More over these datasets stored in database are used to plot graph for each of the sensors are shown. The server has an option for uploading the database of the patients with their details and their medical history. The data server can be accessed any time by the doctor and the doctor can also see the current live feed of the patient's medical condition. A track of patient's health record is also maintained for future reference on the web portal. The portal also has the option to maintain and track the 24-Hour records of multiple patients. The patient can also see his/her medical details on the web portal.

IV. RESULTS

The Deployed and tested over a patient whose personal details are entered into the web portal. The patient is connected with our health monitoring system which consists of a heart rate sensor and a temperature sensor. The live graph of the patient's the proposed intelligent health monitoring system is being heart rate and temperature is being monitored on a Xampp based database server. The IOT device used here is Intel Galileo board. The system architecture of the proposed model is explained by the given below figures which includes a server connected Intel Galileo board that uploads the data received by the sensors onto the database and statistical graphs are being plotted for further analysis and recording. The index or the Home page of the the web portal consists of various tabs including the Login, Services,

System web portal design

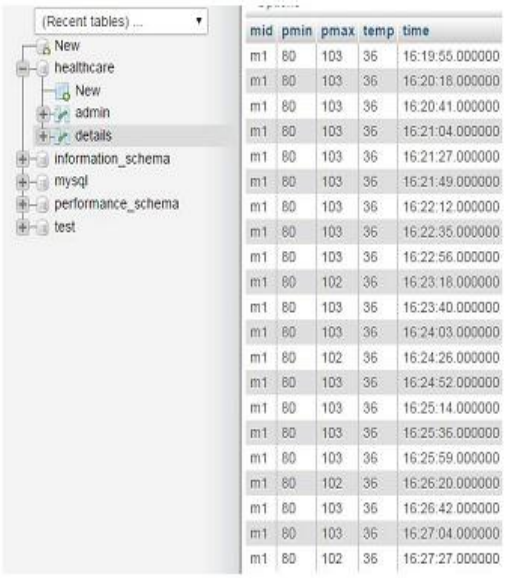
System web portal Admin Page

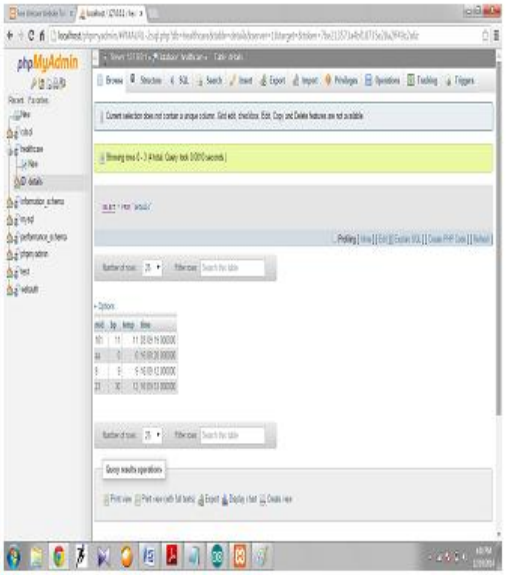
The Admin page of the web portal allows the user to enter the personal details of the patient including his name, age, blood group and various other essential details in order to maintain their cords systematically.

System web portal Login Page

System web portal upload data tab

In the Login tab, the user can login into the web portal as patient or as the doctor as per the credentials given. system web portal upload data tabbing the Upload tab, the doctor can manually upload the blood Pressure and the temperature of a patient with a specific machined so as to maintain the records for future purposes.

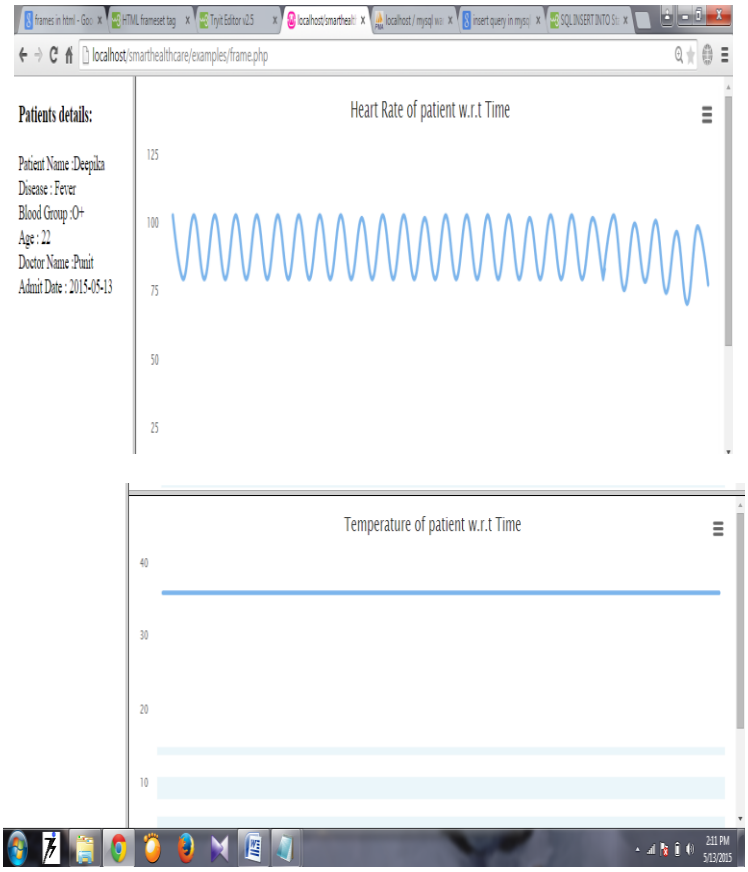




System web portal uploading data **System web portal database server**

The data from various sensors are being uploaded into the database server from which the data is further used to plot graphs and analyze the health reports.

This figure shows the full structure of the database which is being hosted currently on the local host and further can be connected to the whole world via IOT. The database has full details and record history of each and every patient through which a statistical graph is plotted in real time which is used for patients further analysis and tracking. The model is finally deployed over a normal fit person anther heart rate and temperature details are plotted on a real time graph. An example output of a proposed health monitor device is shown in which the patient's personal details are shown and9 her live heart rate and body temperature is being traced in real time.



An Example Health Monitor graph

V. CONCLUSION

The The developed system in the presented work is low cost, and light weight. It consists of sensing nodes. These nodes can be strategically placed on the human body and capable of creating a wireless sensor network (WSN) to monitor various physiological parameters. These parameters can be monitored for a long period of time and provide real-time feedback to the user and medical staff. The system is also capable of providing reliable and secure communication. A successful interaction among the Arduino UNO microcontroller and the different sensors fitted on the kit is achieved. The system further promises to revolutionize the health care monitoring approach. In this work temperature sensors are used to collect physiological data from patients. This healthcare monitoring sends an emergency notification message to the friends or relatives if any patient's health condition is critical. IOT Monitoring proves really helpful when we need to monitor & record and keep track of changes in the health parameters of the patient over the period of time. So with the IOT health monitoring, we can have the database of these changes in the health parameters. Doctors can take the reference of these changes or the history of the patient while suggesting the treatment or the medicines to the patient. Hospital stays are minimized due to Remote Patient Monitoring. Hospital visits for normal routine check-ups are minimized. Patient health parameter data is stored over the cloud. So it is more beneficial than maintaining the records on printed papers kept in the files. Or even the digital records which are kept in a particular computer or laptop or memory device like pen- drive. Because there are chances that these devices can get corrupt and data might be lost whereas, in case of IOT, the cloud storage is more reliable and does have minimal chances of data loss.

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