An IOT Based Decision Making Model for Analyzing Patient's Record

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***Abstract*- Our research focuses on real-time health control of different numbers of patients. In clinics / hospitals, patient data must be constantly monitored, such as heart rate (HR), blood pressure (BP) and electrocardiogram (ECG). The proposed system monitors the heart rate, blood pressure and ECG data of the patient's body. Cloud computing with the combination of IOT technology is a new way to manage and process sensors data online. More generally, the problem is specifically to address the challenges of the wireless sensor network and the processing of associated data. Much emphasis has been placed on the hardware and not on the data processing part. In this Paper we try to overcome the inconveniences we faced in the past. The proposal contains a cloud-based forecasting mechanism for data assimilation, filtering and prediction of health for a large number of people. The data is generated and processed using the MATLAB simulation and communicated with the cloud-based server, which in turn combines the different pieces of information to provide accurate health predictions. To achieve this fusion of cloud computing and Iot is used when the data from the different sensors placed in each individual are communicated to the cloud-based server which in turn combines the different information to provide an accurate prediction of health status . The scheme is implemented with the help of MATLAB simulation to process medical care data, such as heart rate, ECG and BP. This allowed doctors and health professionals to connect remotely with patients and provide appropriate care.**

Index Terms- Health Rate, ECG, BP, WSN, IOT, MATLAB.

I. INTRODUCTION

1. Internet of Things (IOT): Basically it is used to connect and exchange data with the help of sensors, actuators and network connectivity. These are integrated with a network of devices. We can communicate internally within the internet infrastructure. IOT provides a function to detect or control remotely through an existing network. Create opportunities for more direct integration of the physical world, with consequent reduction of human intervention with improvements efficiency, precision and economic benefit. Figure: 1.1 shows the pictorial representation in which we can easily use this technology.

Figure 1.1 Uses of IoT

Internet of things opens a new field for research and exploration in all fields but our concern is medical and health. Give the opportunity for improved services to patients and staff. In the IOT combination of microcontroller together with the sensors are introduced. We can also monitor and evaluate a patient's health status.

2. Cloud Computing: Cloud computing is a relatively new business model in the computer world. In accordance with the official definition of NIST."Cloud computing is a model to enable access to the ubiquitous and convenient network upon request to the group configurable computing resources (such as networks, storage, servers, applications and services) that can be quickly released and delivered with minimal management

effort or interaction of the service provider. "This cloud model consists of five functionalities, three implementation models and three service models. It's called cloud computing because the information we access it is in "cloud" and does not require that a user is in a particular place to access data and information. This system allows a user to work remotely. Multinational Companies that provide services in the cloud allow users to store files and applications in remote servers and access to data via the Internet

3. Cloud Computing Models & its applications: There are two types of cloud computing models.

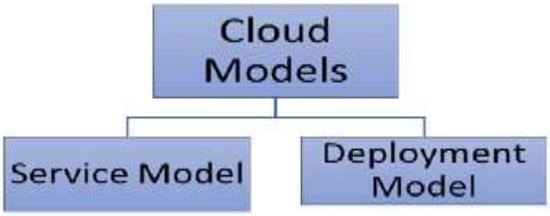

Figure 1.2 Cloud computing model.

(1)-Service Model

(2)-Deployment model

Applications of cloud computing is very vast. The application of cloud is limitless. It provides the virtual way to store the data and other information. There is no area where cloud computing not shows its miracle. Figure: 1.3 represents all the possible application where cloud computing gives his contribution.

Figure: .1.3 Applications of Cloud Computing.

II. LITERATURE REVIEW

1. "Mcgarth" describe about Ambulatory blood pressure monitoring (ABP) which uses for measuring blood pressure (BP) at regular intervals.[1] He proposed a system in which the device is connected to a system that prepares a report of 24*7. The measurement obtained from ABP monitoring must be interpreted carefully with reference to the daily information. In addition, measuring patient's blood pressure at regular intervals even when patient undergoes activity including sleep.
2. "Salynn boyles" explain "white-coat-effect" is real and common in the management of hypertension. He introduced the fact that the BP measurement that we take in our home is always higher than that, which is measured in hospital. Even doctors always take two-three readings to determine patients need to decide that whether patient having high BP/low BP. The researchers concluded that repeated measurements taken at home help in getting a more accurate picture of blood pressure rather than a single reading.[2]
3. "Aysram Zyrati binti yahya" presents the modern age of computers, everything comes with the wireless portability. Wireless devices and system proves their importance in the field of medical.[11] Anyone can use medical devices without any technical knowledge they get their health report. It became easier for one to know about the health condition .
4. "Shih E et. Al". Represents how depending upon the heart beat rate system will generate emergency signal. They introduce an alarm signal in case of emergency to provide urgent help for patient. In case of normal heart beat rate, data is stored and daily/weekly graphs are provided to the doctor. The proposed system collaborates with smart phones and includes sensors to collect the data from patient. Thus, the main purpose of paper is to inform doctor and family about patient's condition so that appropriate action should be taken. The monitoring and maintenance of patient outside the hospital is much cheaper and easy with the low power, low cost, wearable and portable system.
5. "Eko" et. al. represents the application of ZigBee and WIFI networks for microclimate monitoring. WSN uses many wireless communication protocols such as WIFI, Zigbee and Bluetooth but WIFI has many advantages. In this paper basically, compare the ZigBee and WIFI. Zigbee

uses less power than WIFI but it provides less power. Data of air temperature and humidity are gathered by using Zigbee-WSN. In this system here, we using ZigBee WIFI interface for data conversion from there data is transmitted to the monitoring center by using WIFI transceiver [4].

III. PROPOSED WORK

The proposal contains a cloud-based forecasting mechanism for data assimilation, filtering and health prediction for a large number of people. Data is generated and processed using MATLAB simulation and communicated with the cloud-based server which in turn combines the different information to provide accurate health predictions. The conditions can be classified as: "Normal", "Unwell", "Emergency" with the corresponding data that will be communicated to the hospital and / or the doctor. The prediction is based on merging the information provided to the doctor at regular intervals. The proposed solution is not a local network of the body, but a global multimode wireless sensor network. This information processed through the cloud can be used later to identify disturbances in different regions of a country / city / country in the country anywhere in the world.

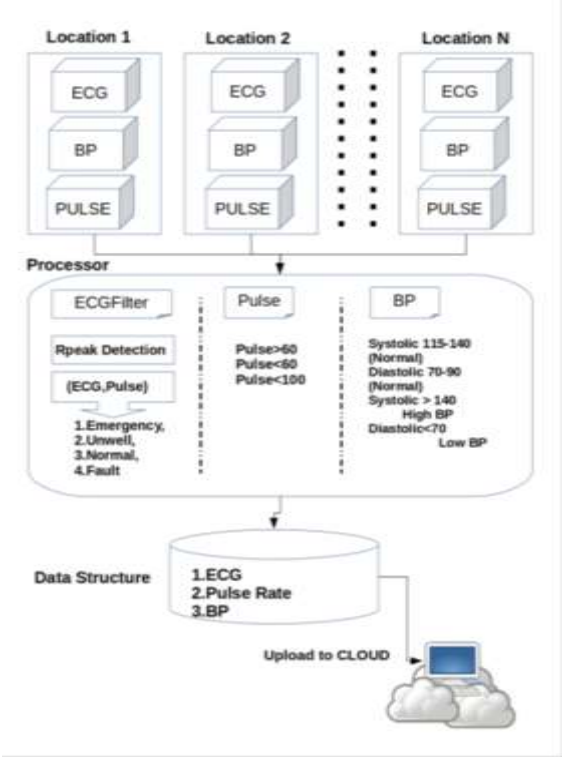

Figure1.3 Block diagram.

The most of important concern is technology and with the help of technology make lifestyle easier and happier. No need for a doctor to go to clinic and check the reports there. He/she can check patients report in their tablet, mobile phones, desktop and laptop. Customer also checks the feedback shared by the doctor according to their report.

IV. EXPERIMENTAL SETUP

To performing this experiment we use following setup:

HDD	1TB
RAM	4GB
Operating System	Ubuntu 16.04 LTS
Tool	Matlab R2017a, Apache Server, MySQL, PHP

V. DESIGN AND ANALYSIS

When measuring patient data, the parameter we focus on is BP, heart rate and ECG. They must be appropriate. We try to get the correct reading of the patients and on that basis, decide the patient's condition. The ECG filter then detects peak R, generates one of the signals, whether the patient is in Normal, Emergency, Failure or Unwell mode. The same in the case of BP, we have to detect the systolic and diastolic pressure. In which patients BP is normal if the systolic pressure is between 115-140 and the diastolic pressure is 70-90.

The parameters of all patients are collected. This information is uploaded to the cloud, so an authorized person can easily access these parameters remotely. It is not necessary for a doctor to go to the clinic to consult the patient's report. One can check the patient's report on his tablet, cell phones, desktop computers and laptops.

VI. CONCLUSION

In this paper, we proposed a cloud focus model based on prediction for data assimilation, filtering and health forecasting for a large number of people. Data from different sensors placed on each individual are communicated to the cloud-based server, which in turn combines the different peace of information to provide accurate health forecasting. Conditions can be classified as: normal, discomfort and emergency.

The scheme is implemented using MATLAB simulation for processing medical assistance data, such as heart rate, ECG and BP. The result is stored in the cloud server. This allowed doctors and health professionals to remotely connect with patients and provide adequate care. In this approach, much emphasis has been placed on the part of data processing that is a key module of any type of health monitoring system. The proposed model creates multiple nodes (the thesis nodes function as intermediate units for collecting and merging data) and with a node the doctors can connect more patients at the same time.

REFERENCES

[1] McGrath BP. Ambulatory blood pressure monitoring. Med JAustralia 2002; 176:588–92.

[2] Salynn Boyles, "White Coat Effect" Linked to Hypertension Overtreatment, 10 June 2011.

[3] https://en.wikipedia.org/wiki/Internet_of_things

[4] Nugroho, Eko, and Alvin Sahroni. "ZigBee and wifi network interface on Wireless Sensor Networks." In Electrical Engineering and Informatics (MICEEI), 2014 Makassar International Conference on, pp. 54–58. IEEE, 2014.

[5] Ling, Tonny Heng Yew, Lim Jin Wong, Jocelyn Ee Hung Tan, and Chong Kee Lee. "Xbee Wireless Blood Pressure Monitoring System with Microsoft Visual Studio Computer Interfacing." In Intelligent Systems, Modelling and Simulation (ISMS), 2015 6th International Conference on, pp. 5–9. IEEE, 2015.

[6] Prakash, R., Siva V. Girish, and A. Balaji Ganesh. "Real-Time Remote Monitoring of Human Vital Signs Using IoT and GSM Connectivity." In Proceedings of the International Conference on Soft Computing Systems, pp. 47–56. Springer India,2016.

[7] NIST Definition of cloud computing.

[8] Jorge Gómez Byron Oviedo Emilio Zhumahttps ://doi.org/10.1016/j.procs. 2016.04.103 Get rights and content Under a Creative Commons license.

[9] Date Added to IEEE Xplore, Date of Conference: 7-1 March2017. ISBN: Information: INSPEC Accession Number16854860Conference Location: Cambridge,UK.

[10] Jan Holler, vlasions Tsiatist etc all, presents "Machine-to- Machine to the Internetof Things" (introduction to a new life of intelligence).

[11] Aysran Zyrati Binti Yahya, "Portable Detection Device for Patients with Sleep Apnea", University Teknologi Malaysia, 2013, 2:16-17.

[12] http://www.Slideshare.net -" Medical and Healthcare IoT based application".

[13] Sparsh Agrawal, Chiew Tong Lau "Remote Health Monitoring Using Mobile Phones and Web Services".

[14] https://www.amrita.edu/center/awna/research/patient-monitoring.

[15] https://www.comp.hkbu.edu.hk/v1/proj/hkpfs/yw/1/.

[16] Shanzhi Chen, Senior Member, IEEE, Hui Xu, Dake Liu, Senior Member, IEEE, Bo Hu, and Hucheng Wang "A Vision of IOT: Application, Challenges and opportunities with China Prospective".

[17] Mobyen Uddin Ahmed, Mats Bjorkman, Aida Causevic et all. Construe "An overview on the Internet of Things for Helath Monitoring Systerms".

[18] https://en.wikipedia.org/wiki/Wireless_sensor_network.