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ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 4, Issue 10, October 2017

Lowering Glucose Elevations using Smart Head-on conjunction through virtual Congruence of Cloud on Internet

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Abstract;- **This sensible work proposes a novel idea provoking a common issue which is faced by (4.7 out of 10 people as per the summary report released by WHO on November 2016 summit on Diabetics) common people and provides an alternative from the traditional rule of vaccination on day orders using technology agglomeration. This project discusses Diabetes patient monitoring system using IoT. The system coins two modules a. co-ordinator module and b. sensor module. The co-ordinator module collects all the information from all the sensor modules and provides information to the end user (say doctor). The sensor module is interfaced with microcontroller for monitoring and it will produce an indication if any faults occurred. The intercommunication between these two modules is done using Personal Area Network technology for regularizing the Transfer of data. The experimental results obtained confirms the rapid-adoptive nature of proposed system in terms of low power consumption (From the bible of VLSI road map), low cost(From customer perspective to cowardice to market level product), targeted towards automation and remote control applications.**

Keywords: **Agglomeration, WHO, IoT, Personal Area Network**

I. INTRODUCTION

The advancements in medical based technology were improving everyday where it also plays a major role to save many lives in critical conditions. Nowadays, patients are implants with sensors with various detection purposes to check and analyze the current condition of the patient and the details are stored in cloud storage. It also depends on applications created to analyze the condition of patient the latest software are made by using IoT (internet of things), these software are mainly employed to check the health of the patients simultaneously and send these information’s to the cloud or directly to the smart devices. This method is depends on ubiquitous sensor such as Heartbeat sensor, temperature sensor, blood pressure sensor, pH sensor and etc. The application which is commonly used for this purpose is named as E-Health, E-check and etc.. The proposed model is named as "K-Healthcare" makes use of four layers. They are, 1) Sensor layer, 2) Network layer, 3) Internet layer and 4) Service layer. All layers co-operate with each other effectively and efficiently to provide a platform for accessing patients data using smartphones.

II. OVERVIEW OF THE EXISTING SYSTEM

m-Health and e-Health are providing different services remotely, such as prevention and diagnosis against disease, risk assessment, monitoring patient health, education and treatment to users. This is why e - Health and m-Health is being widely accepted in the society. The emerging of state of the art tools and technologies of IoT can be really beneficial for e-Health and m-Health. Different e-Health and m-Health architectures for IoT have been developed which handle an emergency situation efficiently. However, the existing e-Health and m-Health architectures do not use smart phone sensors to sense and transmit important data related

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to the patients' health. We proposed a novel framework for e-Health and m-Health which makes use of smart phone sensors and body sensors to obtain process and transmit patient health related data to centralize storage in the cloud. This stored data could be retrieved by patients' and other stakeholders in the future. Our proposed model, named k-Healthcare makes use of four layers which work closely together and provide efficient storing, processing and retrieving of valuable data. We have provided a comparative analysis of different architectures and applications of IoT which can be used in e-Health and m-Health. The ongoing work focuses on the actual development and deployment of k-Healthcare. One way could be the design of a software or Smartphone application which will obtain the data directly from the sensors and process it automatically. Furthermore, we will investigate the security and privacy issues of k-Healthcare.

Diabetes therapy management in AAL environments, such as old people and diabetes patient's homes, is a very difficult task since many factors affect a patient's blood sugar levels. Factors such as illness, treatments, physical and psychological stress, physical activity, drugs, intravenous fluids and change in the meal plan cause unpredictable and potentially dangerous fluctuations in blood sugar levels. Right now, operations related to dosage are based on insulin infusion protocol boards, which are provided by physicians to the patients. These boards are not considering very influential factors such as glycemic index from the diet, consequently patients need to estimate the dosage leading to dose error, which culminates in hyper glycaemia and hypoglycemia episode. Therefore, right insulin infusion calculation needs to be supported by the next generation of personal-care devices.

For this reason, a personal device has been developed to assist and consider more factors in the insulin therapy dosage calculation. The proposed solution is based on Internet of things in order to, on the one hand, support a patient's profile management architecture based on personal RFID cards and, on the other hand, provide global connectivity between the developed patient's personal device based on 6LoWPAN, nurses/physicians desktop application to manage personal health cards, glycemic index information system, and patient's web portal. This solution has been evaluated by a multidisciplinary group formed by patients, physicians, and nurses.

III. PROPOSED METHOD

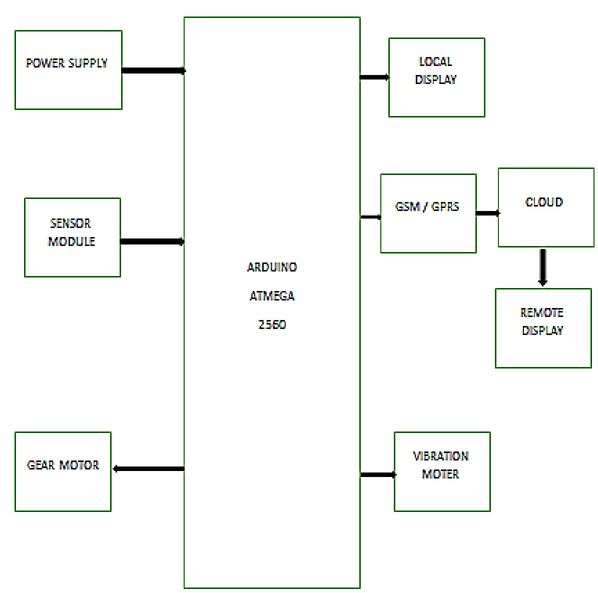

Fig. 1 Proposed Block Diagram

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A. pH Sensor

pH levels are important because many human metabolic functions only run smoothly if the acid level in the body remains neutral and stable. For humans, normal blood pH values lie between 7.35 and 7.45. By way of comparison, an empty stomach is extremely acidic, with a pH value of 1.5.

Fig. 2 pH sensor

A pH Meter is a device used for potentiometrically measuring the pH, which is either the concentration or the activity of hydrogen ions, of an aqueous solution. It usually has a glass electrode plus a calomel reference electrode, or a combination electrode. pH meters are usually used to measure the pH of liquids, though special probes. No battery required, simple and convenient to use

B. Heart Beat Sensor

The new version uses the TCRT1000 reflective optical sensor for photo plethysmography. The use of TCRT100 simplifies the build process of the sensor part of the project as both the infrared light emitter diode and the detector are arranged side by side in a leaded package, thus blocking the surrounding ambient light, which could otherwise affect the sensor performance. We have also designed a printed circuit board for it, which carries both sensor and signal conditioning unit and its output is a digital pulse which is synchronous with the heartbeat. The output pulse can be fed to either an ADC channel or a digital input pin of a microcontroller for further processing and retrieving the heart rate in beats per minute (BPM).

Fig.3 Heartbeat Sensor

The sensor used in this project is TCRT1000, which is a reflective optical sensor with both the infrared light emitter and phototransistor placed side by side and are enclosed inside a leaded package so that there is minimum effect of surrounding visible light. The circuit diagram below shows the external biasing circuit for the TCRT1000 sensor. Pulling the Enable pin high will turn the IR emitter LED on and activate the sensor. A fingertip placed over the sensor will act as a reflector of the incident light. The amount of light reflected back from the fingertip is monitored by the phototransistor.

The output (VSENSOR) from the sensor is a periodic physiological waveform attributed to small variations in the reflected IR light which is caused by the pulsatile tissue blood volume inside the finger. The waveform is, therefore, synchronous with the heartbeat. The following circuit diagram describes the first stage of the signal conditioning which will suppress the large DC component and boost the weak pulsatile AC component, which carries the required information.

C. GPRS/SIM800

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D. Vibration Motor

The primary function of the vibration motor is to alert the user to incoming calls. Vibration motors are normally classified into cylinder type and button type. The proposed system here contains a cylinder type vibration motor.

ISSN (Online) 2394-2320

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An offset counterweight is fitted to the end of the motor shaft. When the shaft turns, the imbalance in the counterweight causes the handset to vibrate.

E. Working principle

The main concept of the proposed system is to provide reliable environment for the doctors as well as the Government Corporation to detect diabetes diseases. The proposal also allows the detection of fake doctors as the doctor would be able to log in only with his valid identification number. This simple step of feeding information into the cloud can ensure that the Health Department/Doctors to know about the disease 24X7 of the particular Patients and the medicines (Insulin) can also be injected if it is spread one of the way to get rid of the disease.

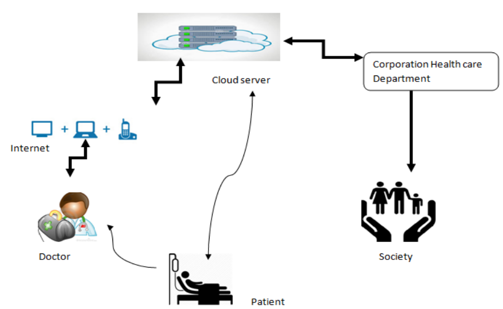

Fig. 4 Design flow of proposed system

The system can be enhanced using sensor based health condition monitoring system with IoT as base where IoT gateways collects data from all sensors and stores in cloud providing total automated system for monitoring patient's Ph level and Heartbeat level.

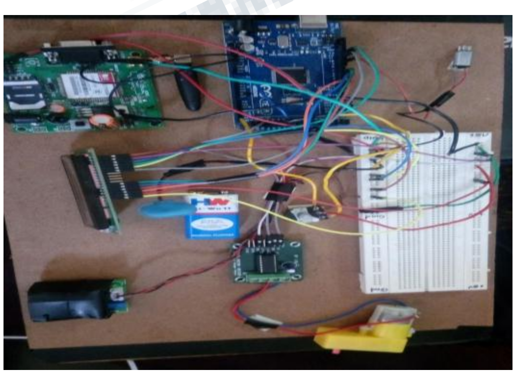

Fig.5 Hardware Setup

The ATmega328 microcontroller are used for the following purpose to fetch the patents heart beat using heartbeat sensor and also finds pH level of the patient using sensors The Program is designed so as to classify the particular data and intimate to doctor and also measures are taken to store the data in the cloud platform so that the data is safe and secure.

In any emergency cases Doctor can view the statistical measure of the patient attribute values in common and the probability that instances from different categories have different attribute values accordingly Insulin may be injected with the help of gear motor. The project is implemented in both simulation, verified using Proteus IDE and also as a prototype model.

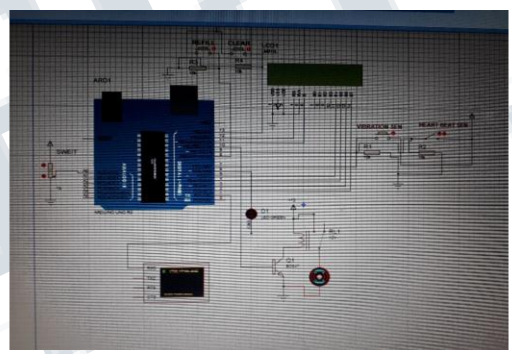

Fig. 6 Snapshot of Simulation

IV. RESULTS AND DISCUSSIONS

The measures are taken to store the data in the cloud platform so that the data is safe and secure FTP login uses normal username and password scheme for granting access. The username is sent to the server using the USER command, and the password is sent using the PASS command. This sequence is unencrypted "on the wire", so may be vulnerable to a network sniffing attack. If the information provided by the client is accepted by the server, the server will send a greeting to the client and the session will commence If the server supports it, users may log in without providing login credentials, but the same server may authorize only limited access for such sessions. The Doctor can be review the data using their login.

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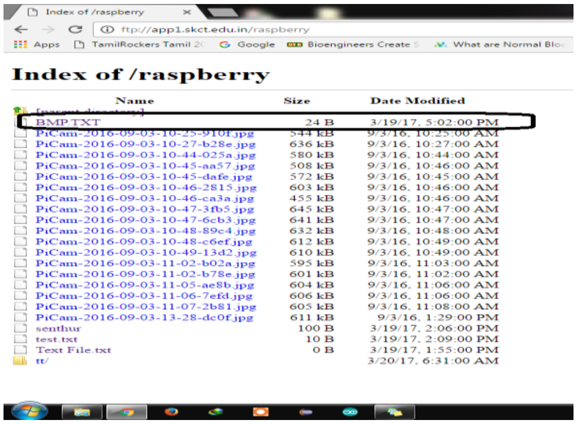

Fig. 7 FTP SERVER

V. CONCLUSION

The advancement in medical technology cautioned many lives across the world. Thus we conclude that our proposed system sweeps out the existing approach, polling the their own blood glucose levels several times a day, to determine how far above or below normal their glucose is and to determine how much insulin is in need to stabilize. The traditional way of blood sugar testing is usually done by placing a drop of blood onto a glucose strip and then inserting the strip into a glucose meter, a small machine that provides a digital readout of the blood glucose level. Our device is a wearable equipment where the user sugar level is analyzed by the sweat of body. If the sugar level of the user is above normal, then the device injects insulin into the body to control the sugar back to normal and the heart beat level update into cloud using IoT. The insulin level and sugar level is updated into local server via cloud. An insulin pump mimic of the normal pancreas's release of insulin, which is a small, computerized device that delivers insulin continuously throughout the day. It attempts to, but the pump should be prejudiced how much insulin to inject. It delivers insulin in two ways: a basal rate which is a continuous, small trickle of insulin that keeps blood glucose stable between meals and overnight; and a bolus rate, which is a much higher rate of insulin taken before eating to "cover" the food you plan to eat.

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