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Prescription Updater for Victims with Hyperglycemia

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Abstract:- Diabetes and its complications are major cause of morbidity and mortality in India. It can't be cured but treatment may help the patients and regular medical diagnosis is required. One possible way to address the challenges facing the health care industry is by caring for patient in their environments such as their residences. The victims with hyperglycemia checks the glucose level it is sent to the cloud. According to the glucose level, prescription given by the Doctors are show in web pages; any changes made in the prescription by the hospital management is automatically updated in web pages. It is developed to provide remote monitoring of patients. And if the patient is in critical healthcare situation GPS information can be accessed to track patient location.

Keywords:- *cloud technology, hyperglycemia ,GPS, IoT.*

I. INTRODUCTION

Diabetes is the condition in which the body does not properly process food for use as energy. Most of the food we eat is turned into glucose, or sugar, for our bodies to use for energy. The pancreas, an organ that lies near the stomach, makes a hormone called insulin to help glucose get into the cells of our bodies. When you have diabetes, your body either doesn't make enough insulin or can't use its own insulin as well as it should. This causes sugars to build up in your blood. This is why many people refer to diabetes as "sugar". Diabetes can cause serious health complications including heart disease, blindness, kidney failure, and lower-extremity amputations.

II. EXISTING SYSTEM

IoT-based m-Health approach to diabetes self-management with the goal of integrating multidimensional aspects of treatment, shifting the emphasis from a traditional clinician-centered approach to a patient centered one. The main contributions of this work are the new architecture and development of a platform to support a new multidimensional approach for diabetes care. The suggested platform offers remote manageability capabilities and enables care over distance. It is through remote collection and monitoring of patients' data and delivery of various health care services including, real-time healthcare advices, decision support, and long-term behavioral-change support which is tailored to meet the individual needs of each patient. The end-to-end functionality tests have been demonstrated a seamless, secure and accurate data transfer between the physical-layer objects and the remote health portal. The results obtained from a pilot clinical evaluation of the platform also showed a high level of acceptability by the patients. The developed dialogue structure that is currently driven by the needs of textual and graphical interactions can be further improved by using an animated human-like objects or a robot.

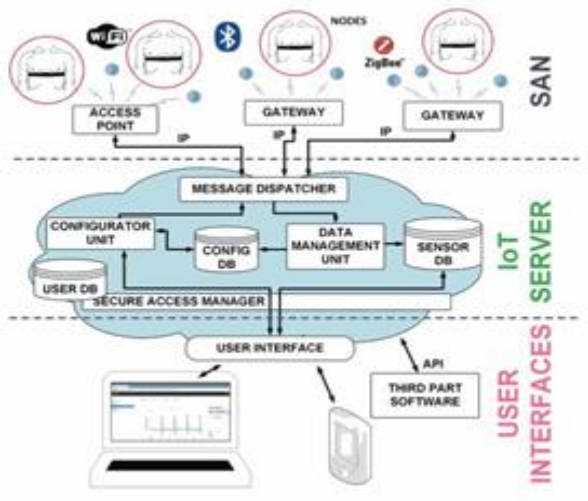

Fig 1:- Block diagram of IoT Platform

Although the acceptability figures of a small-scale clinical study have been relatively high, the full extent of the clinical impact on the patients' quality of life should be assessed prior to potential future commercialization, and lessons are constantly being learnt from this work as it progresses. These suggested improvements and further studies are currently part of the author ongoing research.

III. PROPOSED SYSTEM

In proposed system, the patient health is monitored continuously and the database is maintained. The objective is to integrate IoT and cloud technologies and to provide a data monitored continuously to both data center and observation server simultaneously and to provide an alert system and data retrieval capability whenever needed. In this system, PIC microcontroller is used to control the operation of the system. This proposed system shown in figure 2.

The glucometer is used to measure the blood glucose level. The reading obtained is fed into the microcontroller or a blood glucose sensor is used to automatically detect the value obtained from the glucometer. The data is stored in the cloud automatically. The doctor uploads the diet and the prescription for the various ranges of blood glucose level. The data changes in the web sheet can be easily made by the health center and it can be easily viewed by the patients. This process system shown in figure 3.

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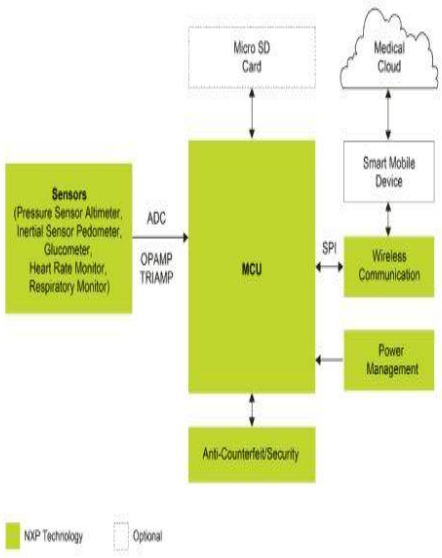


Fig 2:- Interactive Mobile Health Service

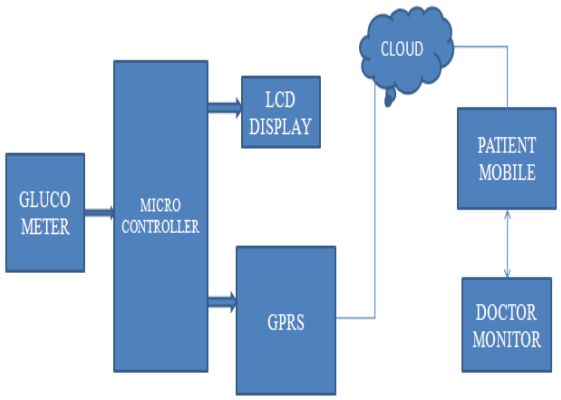


Fig 3:- Process Block Diagram

The basic componets are mentioned in below,

A. Glucometer

The sensor used has an electro-enzymatic approach, which means that it takes advantage of glucose oxidation with a glucose oxidize enzyme. The presence of glucose oxidize catalyzes the chemical reaction of glucose with oxygen, which causes an increase in pH, decrease in the partial pressure of oxygen, and increase of hydrogen peroxide because of the oxidation of glucose to gluconic acid:

The test strip measures changes in one or several of this components to determine the concentration of glucose. The strips used in this design have three terminals or electrodes. The test strip terminals:

- Reference electrode
- Working electrode
- Trigger electrode

B. Audio Amplifier

An audio amplifier is an electronic device used in wireless communications that increases the strength (amplitude) of audio signals that pass through it. An audio-amplifier amplifies low-power audio signals to a level which is suitable for driving loudspeakers.

C. Lcd Display

There are many display devices used by the hobbyists. LCD displays are one of the most sophisticated display devices used by them. Once you learn how to interface it, it will be the easiest and very reliable output device used by you! More, for micro controller based project, not every time any debugger can be used.

D. Software

Proteus PIC Bundle is the complete solution for developing, testing and virtually prototyping the embedded system designs.

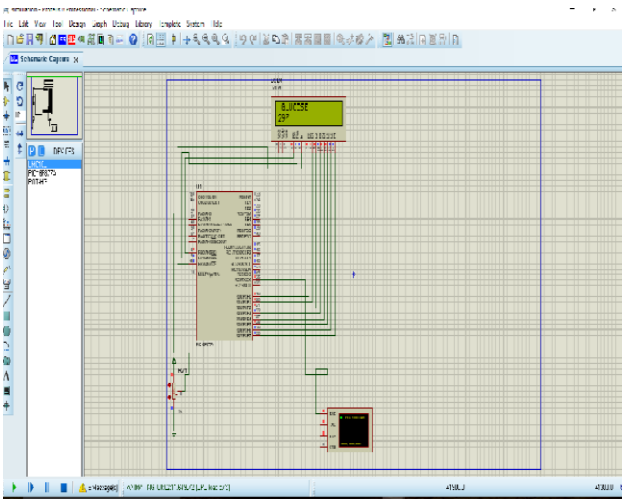
E. Peripheral Interface Controller

It also known as PICs, are used in electrical circuits and circuit that require a set amount of processing. They are inexpensive, simple to use, and the majority kind are flash so that they can be reprogrammed.

IV. EXPERIMENT SETUP AND RESULTS

Whenever the patient checks the glucose level, the data is processed and stored in the cloud for future retrieval. Any changes made in the diet or prescribed medicines the Doctor or the Hospital Management based on the patient's condition can be easily noted. The noted data's are stored in the cloud. The data is monitored continuously and immediate alert is send to the Doctor or Hospital Management in case of emergency.

If the glucose level in the blood is normal, only the value send to the cloud will be processed and diet chart and the prescribed medicine will be displayed. If the patient is in critical situation or high risk immediate alert will be send to the Hospital management through GSM. The test experimental setup is shown in figure 3.



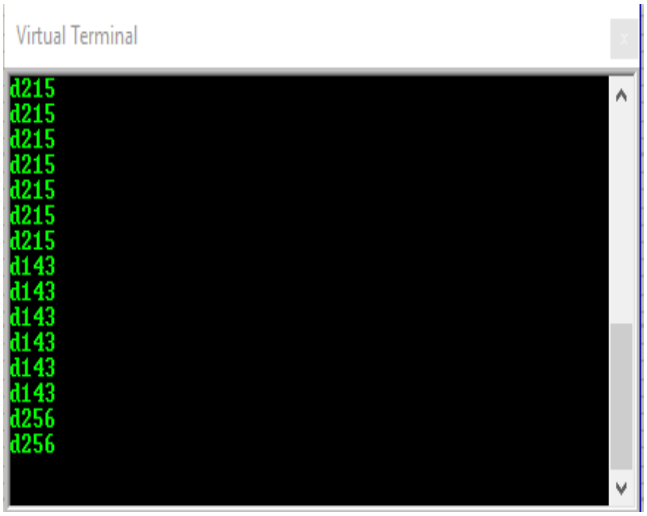


Fig 4:- Glucose Level Indication- Simulation Output

The simulation output is obtained using proteus software. The blood glucose level is measured using the glucometer and the measured data is manually given to the microcontroller. The measured data will be displayed in proteus IDE environment and it can be varied. This result was in displayed in figure 5.

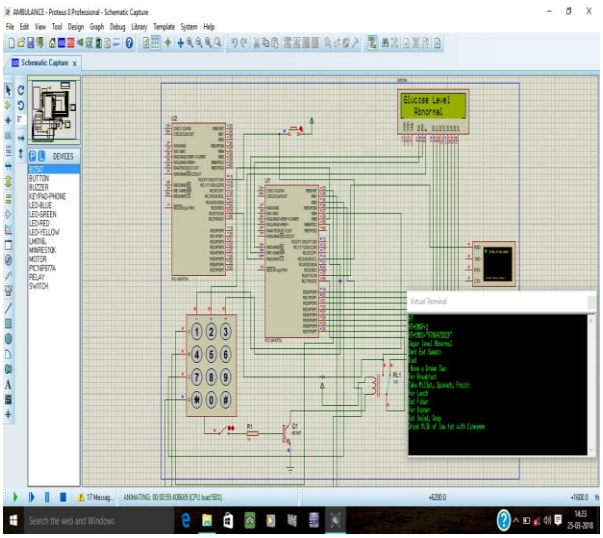


Fig 5:- Glucose Level Indication- Simulation Output

➢ *Hardware Setup*

The hardware setup is shown in figure 6.

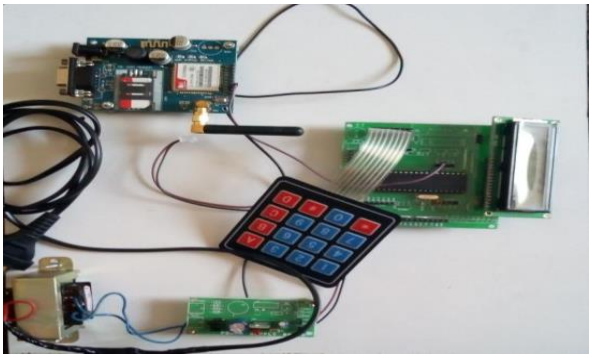


Fig 6:- Hardware setup

V. CONCLUSION AND FUTURE WORK

The system that integrates the capabilities of the IoT and cloud technologies for remote monitoring of patient's health status is proposed for monitoring patient health. The healthcare spending challenges by substantially reducing inefficiency and waste as well as enabling patients to stay in their own homes and get the same or better care is achieved.

Blood glucose sensor can be used to detect the blood glucose level, and the measured value is updated in the cloud through the IoT modules. The database stored in the cloud can be retrieved whenever required. The updated prescription can be easily accessed by the patients and alert is sent to the Doctor in case of emergency through GSM immediately.

➢ *Source Code:*

```
#include<pic.h>
CONFIG (0X3F3A);
Void delay (unsigned int X)
{
While (x);
}
Void main ()
{
TRISC=0X8F;
PORTC=0X00;
TXSTA=0X26;
RCSTA=0X90;
SPBRG=129;
While (1)
{
If (ROC==1)
{
For (int i=0; i<10; i++)
{
While (TRMT==0)
TXREG='a';
}
While ((RCO==1));
}
}
}
```

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