Smart Medicine Box Using IOT

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Abstract— With rapidly growing population, it has become extremely difficult to monitor as well as look after the health of the patients who suffer from chronic diseases specially in the case of older people who find it difficult to look after their own selves. Hence we have come up with a smart system that can monitor the health and the patients dosage. A smart sensor will continuously monitor the health of the patient and send the readings to the arduino board. The arduino board will also be interfaced with boxes that will contain prescribed medicines for the patient. Each box will have its own timing information which will be continuously compared to real world time. If the information matches the alarm will start to ring and will remind the patient to take his medicine.

Index Terms— Arduino Board, Buzzer, Data cloud, Intrnet of Things (IOT), Health monitoring, Medicine box, Touch sensor.

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1 INTRODUCTION

Nowadays, a promising trend in healthcare is to move routine medical checks and other health care services from hospital to the home environment. With that patients get health care more easily specially in case of emergencies. Moreover, hospitals can reduce their burden by shifting the possible and easy tasks to home environment. One major advantage is reduction in expenditure. If the right medicines are taken at the right time, there are less chances that the condition of the patient getting worse. For the elderly people, ensuring that they take the right medicine at right time is a great challenge. There are chances that they may forget to take their medicines on time. So poor medication adherence is a major problem for the patient and medicine provider.

A modern healthcare IOT platform with an intelligent medical box along with sensor for health monitoring. Healthcare service using Internet of Things have great potential in medical field. When we researched we found out that about 60% of people above 60 years have poor record of medical history. The major reason for these was not adapting proper medication. An intelligent home-based smart medical box which can monitor health of patient by keeping track of medicine taken and also lets doctor to see the patient's medical history over internet. The major reason is to bring medical field and technology field closer and make something innovative to reduce the current medical problem.

2 PROPOSED SYSTEM

We propose a smart system that will continuously monitor the patient's health with the help of a sensor and also at the same time will monitor the patients daily dose of medicine. Each medicine box will have its own set of timing information which will be compared to a real world clock. If the information matches, the buzzer will go off and thereby remind the patient to take his/her medicine. A data will also be maintained regarding the patient's health and his daily intake of medicines.

3 DESIGN AND IMPLEMENTATION

The whole system is implemented in the following manner:
- The entire medicine box will be initiated once the power is switched on.

- Once initiated the circuit is set up according to the real time clock.
- The touch sensor for each slot or box is adjusted according to the real time clock as for how many intervals the box should be initiated.
- For example box 1 is set for twelve hours, box 2 is set for 'n' hours etc.
- Each box according to set time will have a buzzer set off at the intervals provided.
- If there is no touch detected the touch sensor will register as medicine not taken which is stored on the cloud.
- This process is repeated as required.
- A glucometer or any other health monitoring sensor is also interfaced to the arduino board to detect the glucose of a diabetic patient which will be stored on the cloud as well.
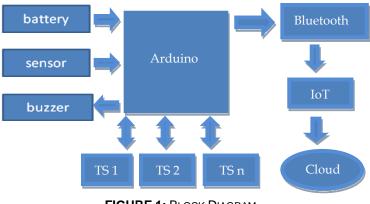

FIGURE 1: BLOCK DIAGRAM

4 COMPONENTS

4.1 Arduino microcontroller

Arduino is an open-source electronics platform for both hardware and software. Arduino is an electronics bread boarding platform based on very flexible, easy-to-use system. One can read inputs on arduino boards which contain inputs like light on a sensor, a finger on a button which turns into an output like activating a motor, turning on an LED lamp etc.

Arduino boards use printed circuit expansion boards which

are also called as shields, which plug into the normally supplied Arduino pin headers. Sheilds provide motor controls for 3D printing and other applications, Global Positioning System (GPS), Ethernet, liquid crystal display (LCD), or bread boarding (prototyping). Several shields can also be made do it yourself (DIY).

4.2 Glucometer

A glucometer is a medical device for determining yhe approximate concentration of glucose in the blood. It can also be a strip of glucose paper dipped into a substance and measured to the glucose chart. It is a key element of home blood glucose monitoring (HBGM) by the people with diabetes mellitus or hypoglycemia. A small drop of blood, obtained by pricking the skin with a lancet, is placed on a disposable test strip that the meter reads and uses to calculate the blood glucose level. The meter then displays the level in units of mg/dl or mmol/l.

4.3 Internet of Things

The Internet of Things (IoT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators and network connectivity which enables these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing internet infrastructure.

The IoT allows objects to be sensedor controlled remotely across existing network infrastructure, creating opurtunities for more direct integration of the physical world into computer based system and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems which also encompasses technologies such as smart grids, virtual power plants, smart homes, intelligent transportation and smart cities.

4.4 HC-05 Bluetooth module

The HC-05 bleutooth module can be used in a Master or Slave configuration, making it a great solution for wireless communication. You can use it simply for a serial portreplacement to establish connection between MCU and GPS, PC to your embedded project etc.

5 SIMULATION SOFTWARE

5.1 Arduino Controller

The arduino Integrated Development Environment also known as Arduino Software (IDE) has a text editor for writing codes, a text console, a toolbar with buttons for common functions. It also has a number of menus as option. It connects to the arduino and Genuine hardware to upload programs and communicate with them.

Arduino programs are written in C or C++. The Arduino IDE comes with a software library called "Wiring" from the original Wiring project which makes any common input/output operations much easier.

4 CONCLUSION

This system can help the doctors monitor a large number of patient's health with great ease and also keep a track of their daily medical doses. This medicine box is an active assistive project which overcomes the passive techniques used to help a patient and keep track of his/her health.

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