HEALTH CONNECT

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Abstract- *Among the array of applications enabled by the web of Things (IoT), sensible and connected attention could be a significantly necessary one. During this paper, associate intelligent home-based platform, the iHome Health-IoT, is projected and enforced. This project offers U.S. the event of a microcontroller based mostly system for wireless heartbeat, force per unit area and temperature observance exploitation Wi-Fi module. By this we are able to simply give real time info on the market for several users and might send them alert in vital conditions over computer network. In India several patients are dying due to heart attacks and reason behind this issue is that they're not obtaining correct facilitate throughout the amount. To offer them timely and correct facilitate initial we wish to continuous observance of patient health. The system is developed for home use by patients that don't seem to be in a very vital condition however got to be timely monitored by doctor or family. In any vital condition the SMS is send to the doctor or any loved one. Doctor may give any prescription required to patient simply checking patient standing on his robot app. so we are able to simply save several lives by providing them fast service.*

Keywords: Remote patient health monitoring, Sensors, Doctor's application, I-med Box.

1. INTRODUCTION:

With the development of world, Health monitoring system is used every field such as hospital, home care unit, sports. Nowadays, global ageing and the prevalence of chronic diseases have become a common concern. Many countries are undergoing hospital restructuring by reducing the number of hospital beds and increasing the proportion of home healthcare. A promising trend in healthcare is to move routine medical checks and other healthcare services from hospital (Hospital-Centric) to the home environment (Home-Centric). By doing so, firstly, the patients can get seamless healthcare at any time in a comfortable home environment; secondly, society's financial burden could be greatly reduced by remote treatment; thirdly, limited hospital resources can be released for people in need of emergency care. In-home health care and services can drastically reduce the total expenditure on medical care or treatment. Therefore, it is urgent in the near future for the healthcare industry to develop advanced and practical health-related technologies and services by leveraging information and communication technology (ICT), and apply them directly in the home environment.

The growth of internet is tremendous and has been further extended to connecting things through internet. All devices are connected to one another with various smart technologies to create worldwide ubiquitous network called Internet of Things (IoT). The development of technologies such as IoT generates huge amount of data, leads to new age of information. Data generated by the IoT devices are used for analysis and decision-making process. The applications of IoT can be grouped into domain like Transport and logistics, Health care, Smart Environment, Personal and Social. IoT devices are used to collect, monitor, evaluate and notify the patient with the information. The penetration of IoT devices in medical and health care is Remote monitoring medical parameters, Diagnostics, Medical Equipment tracking, Secure and access the indoor environment, Smart hospital services, Entertainment services. The remote monitoring of a patient by the doctor is still a challenging task. To analyses the health condition of the patient, various medical parameters are needed about the patient. Collecting the parameters and communicating them to the doctor through the proper networking channel is another challenging task.

In this paper, using IoT devices is proposed to collect the required parameters and evaluate the data obtained from the IoT devices. It also notifies the patient with possible precautionary measures to be practiced by them. This system suggests the patient with medical care and next step to be followed in case of critical situation. This system is evaluated for certain parameters and the decisions made on the data obtained from the source are assumed to evaluate the system.

2. LITERATURE SURVEY:

Sumit Majumder have presented a review on the state-of-the-art technologies for elderly care in smart home platforms. The primary objective of the smart homes is to allow the elderly to receive continuous, non-invasive and seamless healthcare service while staying in their convenient home environment. It allows the elderly to minimize their frequency of visits to, or length of stay in expensive healthcare centers such as clinics, hospital and long-term care centers, thereby allowing them to lead independent and active lives. Smart homes can also monitor and control the home environment by assessing the behavioral and daily living patterns of the users. The significant advancement in the technology that enables the development of low-power, small and low-cost sensors, and actuators coupled with modern communication technologies paved the way towards realizing continuous monitoring services in a smart home platform from a distant facility.

Mobyen Uddin Ahmed presented a generic Health-IoT framework with a Clinical Decision Support System (CDSS). The generic framework is mainly focused on the supporting sensors, communication media, secure and safe data communication, cloud-based storage, and remote accesses of the data. The CDSS is used to provide a personalized report on persons" health condition based on daily basis observation on vital signs.

K. Natarajan proposed a concept to design the smart healthcare system using IOT. The expected result was Raspberry Pi collects and stores the medical data through the sensors attached. The collected data is transferred to the user through apps. The information provided through apps improves the health of the patients. Innovative uses of IoT technology in healthcare not only bring benefits to doctors and managers to access wide ranges of data sources but also challenges in accessing heterogeneous IoT data, especially in mobile environment of real-time IoT application systems. The big data accumulated by IoT devices creates the problem for the IoT data accessing.

Arman Anzanpour have presented a solution to expand the early warning score (EWS) system beyond the hospital beds and into patients' homes. To take advantage of the benefits of EWS, they claimed that patients do not necessarily need to be monitored in hospitals, a well-structured automated solution can be utilized for patient to be monitored remotely. They demonstrated the possibility of collecting vital signs remotely on the basis of Internet of Things technologies and hence enabling in-home patients to be monitored continuously by health experts and early warned when deterioration is detected

S. M. RIAZUL ISLAM surveyed diverse aspects of IoT-based healthcare technologies and presents various healthcare network architectures and platforms that support access to the IoT backbone and facilitate medical data transmission and reception. Substantial R&D efforts have been made in IoT-driven healthcare services and applications. In addition, the paper provides detailed research activities concerning how the IoT can address pediatric and elderly care, chronic disease supervision, private health, and fitness management.

3. FEATURES-

3.1 Patient side

- Arduino Uno: Controller for Patient side

- Temperature sensor: For Monitoring temp of patient

- Heartbeat sensor: For heart beat monitoring of patient

- Blood Pressure: For measuring the BP of the patient.

- Wi-Fi Module: To send all data to Server i.e to PC (IOT -Intranet)
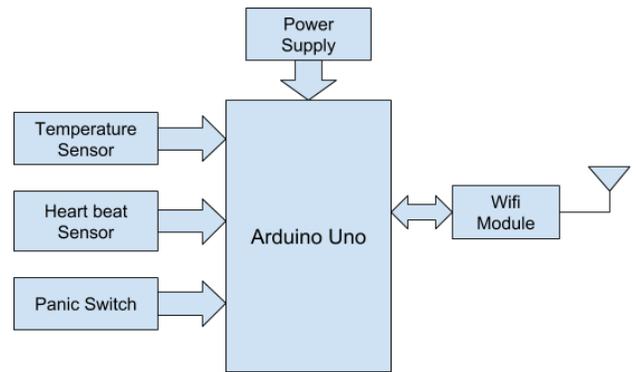
FIG.1- Patient Side

- Panic/Emergency Switch: In case of emergency on patient side

- Automated S.O.S sent to the doctor in case the patient is collapsing based on the reading of the sensors.

- Automated Requesting for ambulance based on the patients location if the patient is collapsing.

3.2 Med Box

- Arduino Uno: Controller for Medicine box side
- Wi-Fi module: To send and receive data from server (IOT -Intranet)
- 1 tablet facility
- Medicine box structure as per JTS
- DC motor: To open medicine box of respective tablet mentioned by the doctor
- Switch: indication to Doctor about consumption of tablet
- Buzzer: Indication for taking tablet.
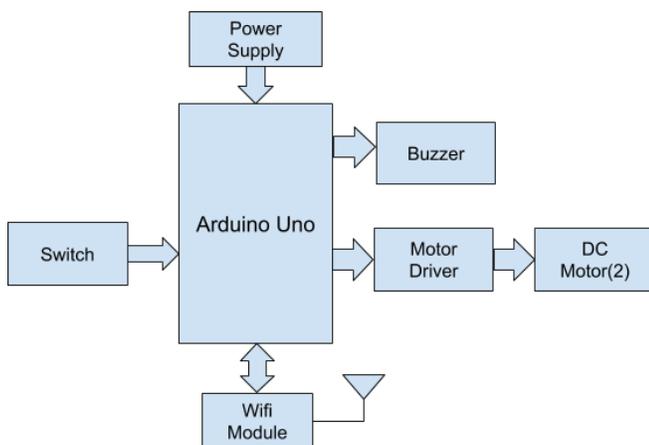
FIG.2 – Medical Box

3.3 Doctor Side

- Android app with TTS
- Predefined sms send to I.C.U and Ambulance
- Prescription facility - Doctor app – Type
- A database for maintaining the history of the patient's health.
- A message sent to the patients registered number of the prescription given about the medicines

3.4 Server –

PC side vb application

- PC-, 2- Android Phone and Router from Student side.

4. HARDWARE AND SOFTWARE REQUIREMENTS

4.1 Hardware-

- Arduino UNO 328 (1. Patient side 2. MED box side)

- Wifi module x 2

- Temperature sensor (LM35)
- Heart beat sensor
- Switches
- Motor driver (L293D)
- DC motors x 2
- Buzzer
- Power supply

4.2 Software-

- VB 6.0 - PC side application
- Android studio- Android app
- Arduino IDE - Arduino UNO
- Diptrace - PCB layout

5. FLOW OF PROJECT

5.1 PATIENT SIDE (ARDUINO MODULE)

- Temperature sensor will check the temperature, Heartbeat sensor will give the pulse count of patient continuously, and Blood pressure sensor will check the blood pressure which are connected to Arduino Uno and send this data using Wi-Fi module on server and will be updated in datalog.

- One panic/emergency switch is provided to inform Critical conditions directly.

- Monitoring will be continuous.

- If patient is going to be unconscious or his condition is getting critical according to sensor readings then a S.O.S will be sent to the doctor automatically.

5.2 SERVER SIDE (PC)

- Server used is Xampp which will collect the data from patient side kit and will update it in datalog.

- It will check if the condition is normal or critical, according to that action will be taken.

- If the condition is not normal the doctor will get notification in his/her android app. The message will be in text as well as in speech form. After that

according to patient condition doctor will take an action.

- If the condition is critical, it will inform to doctor about this and doctor will send sms to an ambulance as well as an ICU from doctor side app.

- If doctor gives any prescription to patient, it will a send signal to medical box kit to open the mentioned tablet box. And after getting a reply from medical box that patient has taken the medicine it will send indication to doctor about same via single switch (which is mounted at medicine box side).

5.3 DOCTOR SIDE (ANDROID APP)

- After getting a notification in text as well as speech format, doctor will take an action according to patient condition.

- If any prescriptions have to be given to a patient, it will send that in server through android app.

- Doctor will get notification through server when patient will take his medicines.

5.4 I-MED BOX (ARDUINO MODULE)

- The medical box will be kept near to patient.

- When doctor gives any prescription, server notifies to medical box kit about it. And according to respective tablet will come out and buzzer will buzz as indication to patient, that he/she has to take a tablet.

- To open the medicine box automatically DC motor is used.

- After taking a medicine, patient will press the switch as an acknowledge that he/she has taken the medicine.

- Server will receive this and update patient has taken the medicine.

6. CONCLUSION AND FUTURE SCOPE

An efficient system is developed to monitor the up to date status of the patient irrespective of the presence of the doctor. The system collects information like temperature, pulse rate, cough and cold of the patient and updates the same to the doctor. The doctor can monitor the progress of patients' health now and then to advise them about their

health. The system can be extended by adding more features like leading doctors list and their specialties, hospitals and their special facilities etc., Doctors can create awareness about diseases and their symptoms through the mobile application. From the evaluation and the result obtained from analysis the system is better for patients and the doctor to improve their patients' medical evaluation.

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