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RFID-based Health Services for Remote Areas

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Abstract: ***Nowadays healthcare technology is aiming towards empowering people to live a healthier life with the help of IoT. The health care industry has been adopting and utilizing information and communication technologies (ICT) for efficient health care administration. Recent developments in wireless sensors, communication and information network technologies have created a new era of the Internet of things (IoT)[1]. The concept of the automated health care system and smart medical devices bears enormous potential for the well-being of people majorly in remote areas. Patients who can not visit the hospitals regularly can be constantly monitored using IoT-driven monitoring. This type of solution includes sensors to collect comprehensive symptoms as well as information and uses gateways and send the analyzed data wirelessly for further analysis and review if needed. It replaces the process of having a health professional come by at regular intervals to check the patient's vital signs, instead of providing a flow of information at certain intervals. The main aim of our project is to provide an alternative to the current system in rural areas and providing basic level diagnosis as well as prescriptions and ambulance support if needed by the use of technology***

Keywords: RFID, PIC Microcontroller, Healthcare Device, GSM Module, IR Module

I. INTRODUCTION

Remote wireless health monitoring systems are generally based on using wearable sensor devices for collecting medical data from patients residing outside health institutions and transferring the measured biomedical parameters to central storage with the help of emerging communication and information technologies. Remote monitoring systems have advanced recently with the advent of Short Message Service (SMS) provided by telecommunication service providers. Monitoring devices can be interfaced with PCs and with the help of GSM gateway devices, messages can be sent to programmed mobile numbers if there is an abnormal activity recorded by the monitoring device. The task of the project undertaken is to design, implement, test and develop a prototype of the RF-ID based health services for remote areas. The main concept of the project is to implement a complete unit consisting of health monitoring sensors for measuring biological parameters like body temperature and pulse rate and then choosing the correct option on the basis of the seniority of the person. In the local computer after processing and analysis, decisions are made on sending an SMS to a specific doctor if readings go above a certain set threshold. The whole system can be subdivided into three main units that interact with each other to provide real-time monitoring, processing, and reporting. They are data acquisition unit, data processing unit and Data communication unit. The data acquisition unit mainly consists of biomedical sensors for measuring heart rate and body temperature with interfacing with the basic stamp microcontroller. This unit acquires the data and makes it available for the data processing unit. Medical sensors allow for the easy and pervasive electronic measurement of several health parameters. Such medical sensors will be mounted on the person's body, which continuously monitors the body parameters of the person like pulse rate, body temperature, etc. and provides output in the form of electric signals.

II. LITERATURE SURVEY

One of the primary objectives of this healthcare system is to maintain the data of patients in the rural areas who can't afford visiting the hospital for deceases such as flue cold etc. When surveyed the existing systems to know more about the drawbacks so that we can overcome them in our system. The first system[1] uses the three parameters to detect the deceases and its seniority and according to it updates the data at the hospital remotely using GSM module and strong internet connection. For this system to work it is needed to wear the wearable sensors device all the time for real-time monitoring. The second system[2] designed the wristwatch-like device which senses the oxygen amount of the blood, senses heartbeat as well as body temperature. The system has its own app which monitors and records given by watch and this data is used for further, and also tracks calories burned each day. The third system[3] uses android based gateway for data transmission and data processing. They have designed an application with 3 slides in it where users can scroll it to find different content, the first slide includes the doctor's prescriptions whereas other twos are used as the data storage as well as for monitoring.

The fourth system[4] uses the raspberry pi and the python language as well as different sensors and sends data to the cloud on the real-time for proper monitoring Our system provides health service for remote areas and also informs local doctors in situational conditions. The system is also able to provide the basic prescription as well as local ambulance contact in case of emergency.

III. SYSTEM MODEL AND ASSUMPTIONS

In this system, the four raspberry pi with a camera mounted on it is placed in four corners of the intersection. The cameras are located such that they face the opposite lane from the lane they are located on. One of the four raspberry pis will be the master raspberry pi and it will control every process of the system, the remaining three raspberry pi are slaves which are used only to detect the traffic density by image processing. All the raspberry pi are connected to each other by using the inbuilt wifi module and are interfaced by connecting them on the same wifi router or hotspot terminal. The system will restart itself every day at 9 am and for the first iteration all the four cameras will capture the current traffic densities by using image processing and the count is sent to the master raspberry pi. Then it will set the traffic signals accordingly. When one of the lanes is green, the cameras facing the remaining lanes will monitor both the traffic rules violation as well as current traffic density to make it real-time and if the traffic rules are violated then the number plate will be recorded. For night time the same system will monitor for the over-speeding vehicles.

IV. METHODOLOGY

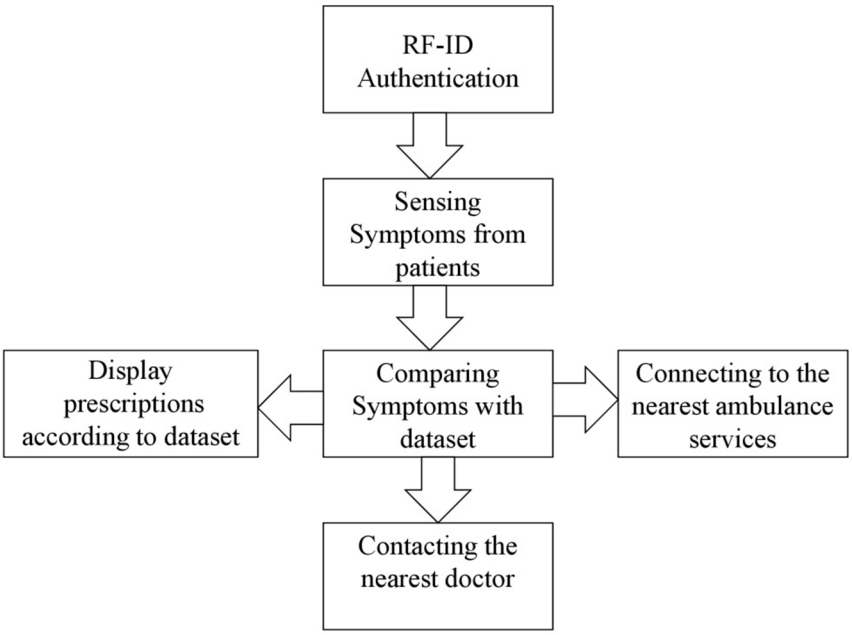


Figure 1: Flow chart of the Healthcare System

In the Flow chart given above, the detailed flow structure is given. Each of the above blocks is explained below in detail
The provided system is going to be installed where technology hasn't that much grown and people have to visit hospitals quite often for the checkups.

1) *RF-ID Authentication:* Every member has its own RF-ID card with its name and it is firstly fed with the basic bio-data of the patient. The RF-ID card data of the patients are already stored in the processor, so when the user places the RF-ID card in the slot it gets detected by the radio-frequency identification detector and then it checks its ID with the database and thus authentication is completed.
2) *Sensing the Symptoms:* This block includes detection of the symptoms of deceases from the patient's body, the three sensors used are, IR sensor for heartbeat measurement, LM35 for temperature measurement and general voltammetric method for ph value detection each sensor is active for 10 seconds each. The IR sensor measures the difference between the two pulses and thus calculates the number of pulses per minute. The LM35 is a temperature sensor that gives the output as digits which represents the current temperature detected at that sensor. the sensor is attached at the tip of a pen-like structure with a wire extension so that it is accurate. The ph is measured as different types of fluids are released from the body in the form of sweat when we are ill, the acidic or basic nature of the body is represented in terms of values on the display.

3) *Comparing Symptoms with Dataset:* As we know in the system as data is detected instantly when the temperature is detected the value of the temperature is compared with the value in the dataset and takes necessary action.for each detection done by the sensors the output values are first compared with the dataset before displaying it on to the LCD display.
4) *Prescriptions according to a dataset :* When the final output of any sensor is compared with the dataset but it doesn't fit in the emergency condition, then depending on the values of all three sensors are compared with the dataset and correct prescription is also displayed on the Liquid Crystal Display.
5) *Contacting to the nearest Doctors: For both* the cases where the values of all three tests don't fit or any of the test output doesn't match to that required for general health conditions, the message including patients info is sent over GSM gateway to the local doctors in the area informing them about prescription given to the patient.
6) *Connecting to the nearest ambulance services:* The system already has the number of the nearest local ambulance services as the patient may come for a normal checkup it happened to the emergency case. If the test output is at top of the limits provided the system will inform the doctor and it will contact the ambulance over the GSM gateway.

V. REQUIREMENTS

A. *Hardware Requirements*

1) PIC18F2520 Microcontroller
2) IC LM35
3) RF-ID cards for patients
4) RFID detector
5) GSM Module
6) IR sensor module
7) Liquid Crystal Display

B. *Software Requirements*

1) Ride, Xilinx uVision
2) Proteus, DipTrace

C. *Software Implementation*

1) *Back End:* This phase includes the use of the Assembly Language Programming for configuring the Periferrals of the PIC controller. GSM Module is connected and configured under Assembly Language Programming as for that USART is used. The GSM module Before transmitting or Receiving any of the information transmits the security codes for low data errors and thus it can only be performed fluently under USART. The back end other operations such as deigning the timers are also done
2) *Front End: the* front end of the system is designed under the embedded C programming language. Displaying on the Liquid Crystl Displays, transmitting messages to the doctor as well as ambulance services are also done under this section.

VI. RESULTS

Figure 2: LCD Showing to scan the RF-ID card

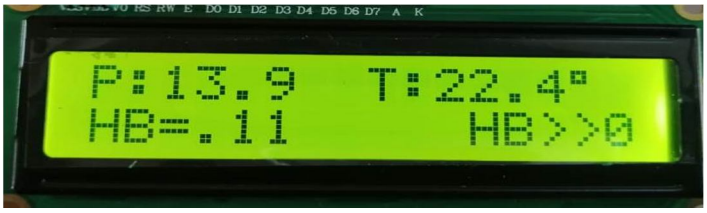


Figure 3: LCD displaying all the three values P=> Ph value, T=> Temperature, H=> Heartbeat per second

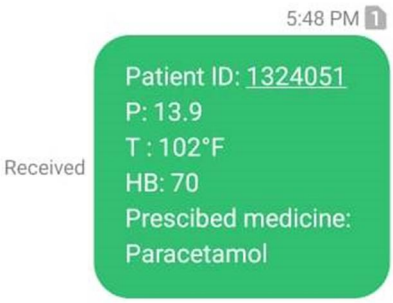


Figure 4: Message received by the Local Doctors

Figure 2 shows that at the start of the new test the Liquid Crystal Display Displays to scan the card with RF-ID reader to authenticate the patient. Also, the RF-ID cards of the patients are updated after each test. The figure 3 shows all the three test readings at the same time on an LCD display. Also if these values vary too much the message is forwarded to the local doctor and an ambulance services can also be contacted as an emergency. Figure4 shows the message received by the local doctors where the patient's ID is already given in the message. Then local doctor can search for the patient ID and can contact the patient according to the need. The message received by the doctor also displays the prescription provided by the system

VII. CONCLUSION

All the systems offered by us are using different technological advancements like us but there's no such system for the proper automatic health care system. Thus from the results seen above, the sensors are detecting the values perfectly. The GSM system for Ambulance, as well as doctors, are working fine. As the system can be installed in any part of the world the number of local doctors as well as ambulance services to be contacted is variable. One can change it according to the need and the system will definitely be implemented with proper data support from the medical department and can also be improved by adding more sensors and increasing the factors been considered while selecting the results for the different test outputs.

REFERENCES

[1] IoT Augmented Health Monitoring System A. Nishitha Reddy[1], Achsah Mary Marks[2], S.R.S Prabaharan*3, S.Muthulakshmi4 Embedded Systems Programme School of Electronics Engineering VIT University, Chennai 978-1-5090-5913-3/17/$31.00_c 2017 IEEE

[2] Monitoring Health Care System using Internet of Things - An Immaculate Pairing Veena Tripathi Department of Information Technology Model Institute of Engineering and Technology, Jammu, India. Faizan Shakeel Department of Information Technology Model Institute of Engineering and Technology, Jammu, India.

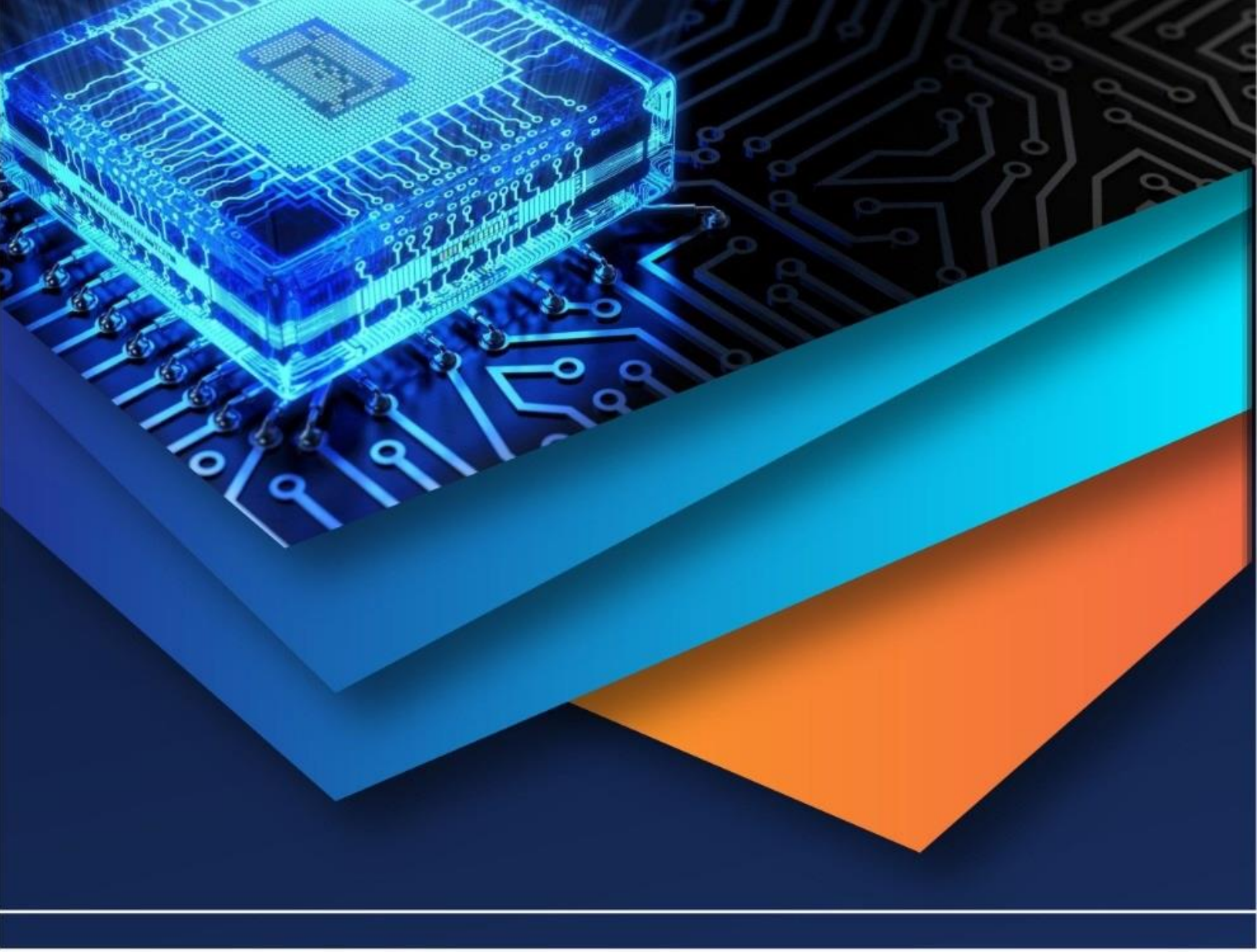
[3] Proposal of a Remote Monitoring System for Elderly Health Prevention Nawras GEORGI INSERM U1099 Universite de Rennes 1, LTSI AZNetwork Rennes, F-35000, France Regine LE BOUQUIN JEANN`ESINSERM U1099 Universite de Rennes 1, LTSIRennes, F-35000, France 2017 International Conference on Smart, Monitored and Controlled Cities (SM2C), Kerkennah, Tunisia, February 17-19, 2017

[4] Remote Wireless Health Monitoring Systems B. Priya, S. Rajendran, R. Bala, and Gobbi. R, *Member, IEEE* 2009 Conference on Innovative Technologies in Intelligent Systems and Industrial Applications (CITISIA 2009) Monash University, Sunway campus, Malaysia, 25th & 26th July 2009.

[5] Khuzadi, M, "On health monitoring", Aerospace Conference, 2008 IEEE, 1-8 March 2008, pp 1 – 8.

[6] Ahmed Alahmadi, Ben Soh, A Smart Approach towards a Mobile E-Health Monitoring System Architecture, Research and Innovations in information systems, 2011 Nov.

[7] Y. Ravi Sekhar "Android-based health care monitoring system" Department Of ECE, Vignan's University, Vadlamudi, India



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