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Patient Health Monitoring System Using IoT

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ABSTRACT: Ongoing patient health checking framework with remote sensor system using delicate registering is an innovative concept that has been already introduced in developed country in recent years. Body Area network is implemented by using compact sensors that gather and assess body parameter and development. The device gives few assistant capacities that satisfy the living request of patients. What's more it uses different sort of sensors to obtain ceaseless key signs of patients counting heart rate and body temperature. Transmission of these patients records over web is done by sensor and Arduino to web server where data base is stored. Moreover, it will produce a prediction on patient's wellbeing condition based on summation of all records of patient. Generated report will be shown on web application. With the assistance of web application both doctor and patient can have real time communication. The prototype has been effectively implemented where data has been obtained and shown. The purpose to build the prototype is to help in developing countries as they still lack access to medical technology and proper diagnosis and treatment in proper time.

KEYWORDS: Front End Development; Database Back End Technology; Mysql Database; Dot Net, PHP Web Tech

I. INTRODUCTION

Advancement in medical technologies have made rapid changes in e-health care system. An innovative and effective e-health monitor model with wireless technology can be a great help for the people of developing countries. The technology provides assistance physicians to better diagnose and treat patients not physically presence on spot as sometimes it's crucial to provide remedy or treat patients who are unluckily away from well treatment. In modern era advanced medical technology effectively contributing in our personal lives. This assists on improving and saving countless lives all around the world. Medical technology is a broad field where innovation plays a crucial role in sustaining health. A Body Area System is characterized by IEEE 802.15 as, 'a communication standard optimized for low power devices and operation on, in or around the human body to serve a variety of applications including medical, consumer electronics/personal entertainment and other'. Wireless body area framework is a key technology of nonstop wellbeing observation which is more proactive and provides reasonable medical service. The point of remote body region system is to encourage consistently recording and checking of a man's wellbeing condition and exchange it over a long separation communication. The existing medical environment in developing countries allows patients to appear physically for regular health check-up or patient needs to get admitted for continuous observation. The system is non-flexible and time consuming. Today remote sensor system allows patients to control their daily lifestyle constantly from anywhere at any places. Hence, to support real time patient health monitoring, in this work we propose constant health monitor of a person by transmitting one's body temperature and heart rate's data utilizing sensor and Arduino to a web server that is accessible to both doctor and patient. Potential utilization of remote e-health framework is useful for regular check-up, crisis alert to avoid further critical situation based on patient's constant record. According to American Heart Association treatment within first 12 minutes can bring positive rate about 45% to 60%. Here it is mentionable that the proposed design is aimed for everyone including patients to keep their regular health condition's record and create a flexible environment between doctor and patient by checking persistent well-being of ones. Today, the use of technology to improve the quality of life is becoming a common attribute of modern society. When the technology is oriented to improve the Quality of Life, it is referred to the Internet of Things. In a hospital health care monitoring system it is necessary to constantly monitor the patient's physiological parameters. Usually, ward evaluation does not imply continuous physiological parameters monitoring and therefore patient relapse is not uncommon. So to overcome such problem Embedded technology is to be use for monitoring the patient condition easily.

The specialist at a distance can monitor the patient condition so that they can save the life also doctor gives the prescription. The system will help for searching the medicines for patient in medicals of that hospital premises. At Emergency case we automatic know the available doctors list and their live location with the help of Kiosk screen at entry point of that hospital. The system provide automatic recommendation of doctor according to priority only when the existing doctor is unable to treat that patient.

II. BACKGROUND

Today, the use of technology to improve the quality of life is becoming a common attribute of modern society. When the technology is oriented to improve the Quality of Life, it is referred to the Internet of Things. In a hospital health care monitoring system it is necessary to constantly monitor the patient's physiological parameters. Usually, ward evaluation does not imply continuous physiological parameters monitoring and therefore patient relapse is not uncommon. So to overcome such problem Embedded technology is to be use for monitoring the patient condition easily.

The specialist at a distance can monitor the patient condition so that they can save the life also doctor gives the prescription. The system will help for searching the medicines for patient in medicals of that hospital premises. At Emergency case we automatic know the available doctors list and their live location with the help of Kiosk screen at entry point of that hospital. The system provide automatic recommendation of doctor according to priority only when the existing doctor is unable to treat that patient.

2.1 Create convenient communication among doctors and patients:

Our system is a platform and through this system doctor and patient can communicate easily. Patients do not have to go through hassle to reach the doctors.

2.2 Monitoring multiple patients at a time:

Doctor can monitor his patients continuously. He does not need to be present there physically to get the data. This is definitely a convincing reason.

2.3 Provides flexibility in health management:

This system will provide flexibility in health management.

2.4 Saves time for both doctors and patients:

As the doctor and patient can communicate and the doctor can monitor him from a remote area, it saves time for both doctors and patients.

2.5 Cost efficient for developing countries:

Our system is cost efficient and it also gives almost accurate output. So, the project is efficient for developing countries like ours.

2.6 Reduce burden of traveling to doctor's chamber:

The main purpose of our system is that the doctor can monitor the patient from remote area. Our device can also be used at home and there is an application through which the patient can communicate with the doctor.

2.7 User friendly interface:

We have introduced an application for both users (doctor and patient). This application has a user friendly interface which is easy to use and that is very simple application

III. LITERATURE SURVEY

1. Title of the paper: Internet of Things Technologies and Projects for Healthcare services.

Author Name: Noha MM. AbdElnapi , AbdeImageid A. Ali,Nahla F. Omran , Fatma A. Omara.

Journal Name & Year of publication: A Survey of internet of Things Technologies and Projects for Healthcare services. 2018

Abstract: This paper provides an overview of the main medical sensors in IoT and a review of the current state-of-the-art of IoT projects, and technologies required for healthcare services. The paper specifically, focuses on the using of IoT technologies in the healthcare area nowadays. A conclusion regarding the current stage of development and open issues are presented.

Advantages: Data By making use of more inserted data, we can treat patients more efficiently.

Disadvantages: Limited inventory affects the availability. Privacy of Data. Privacy is the biggest challenge with IoT, as all the connected devices transfer data in real-time

2. Title of the paper: RFID Authentication schemes for internet of things in healthcare environment.

Author Name: Debiao he and Sherali Zeadally.

Journal Name & Year of publication: IEEE INTERNET OF THINGS JOURNAL, VOL. 2, NO. 1, FEBRUARY 2016.

Abstract: The author in this paper, discuss the security requirements of RFID authentication schemes, and in particular, we present a review of ECC-based RFID authentication schemes in terms of performance and security. Although most of them cannot satisfy all security requirements and have satisfactory performance, we found that there are three recently proposed ECC-based authentication schemes suitable for the healthcare environment in terms of their performance and security

Advantages: The radio-frequency identification (RFID) technology is one of the core technologies of IoT deployments in the healthcare environment

Disadvantages: The security issue of RFID is becoming more and more important.

IV. PROPOSED WORK

Current system Medical Science is expanding by leaps and bounds in the last couple of decades for their considerable aim towards wireless and e-health monitoring systems providing remote monitoring of patients. But the tools used to deal with health conditions are tedious to maintain and limited to specific number of parameters. The system being complex and labourious to operate also raise the cost of health care services and hospital expenses which is not affordable to economically challenged community.

In early 1960's, kadish used a system, which includes several things namely glucose sensor, a processor and and a pump to control glycerin in patients with diabetes. To manage complex situations, the pump will need several MEMS based sensor to monitor more parameters like Heart rate, Temperature and Blood Pressure.

V. IMPLEMENTATION

A web server is a pc frame work that processes requests by means of http, which is the fundamental network protocol to circulate data on World Wide Web. One of the main functions of web server are to store, process and deliver the data to client. On our project we have used GATEWAY to send data and used web server to store data.

We have used MySQL database management system for our project. The reason to use of MySQL database is because it is open source, widely used and most popular SQL database management system which is distributed, developed and supported by Oracle Corporation. Again, another reason to choose MySQL is it supports relational database. Therefore, it is very flexible to use since we can put information in different table rather than to put all information in one table.

Initially we have used our localhost for the development, creation, manipulation of databases and testing our project and ensure the quality assurance checking since it is difficult sometimes to identify bug in online and live. We have used agile approach, since it is helpful method for flexible changes and to make it robust and fast. After the successful implementation on localhost, we purchased paid hosting and upload our application for real time testing.

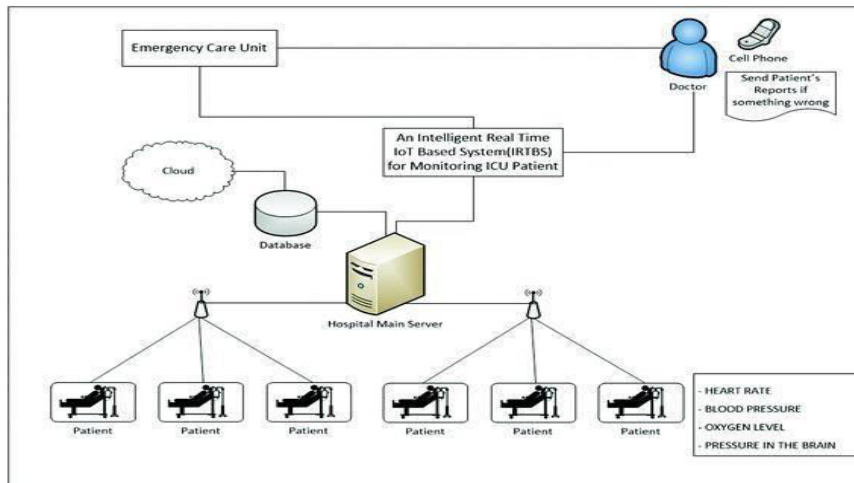


Fig.5.1 Software Flow Of Our System

FLOW CHART

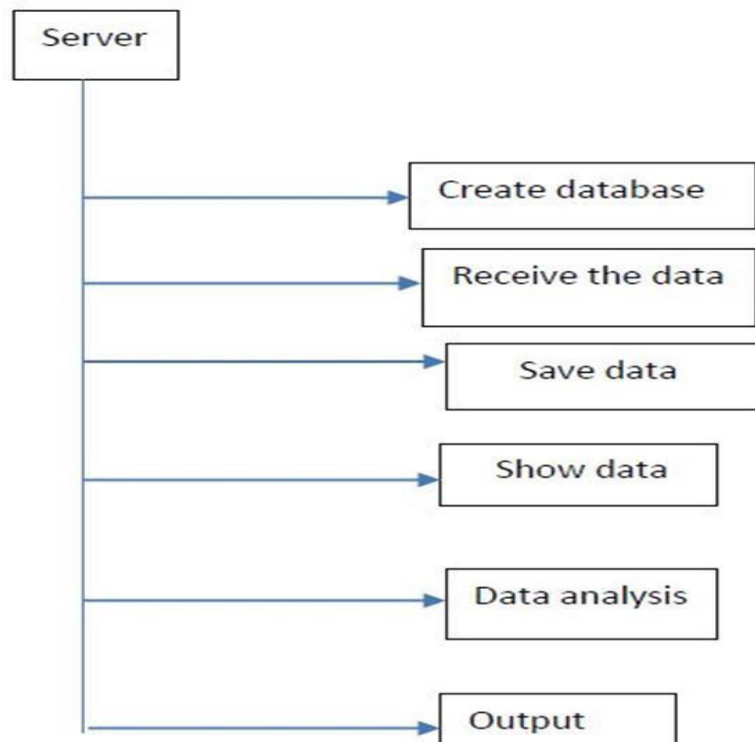


Fig 5.2 Server Flow of our system

VI. RESULTS

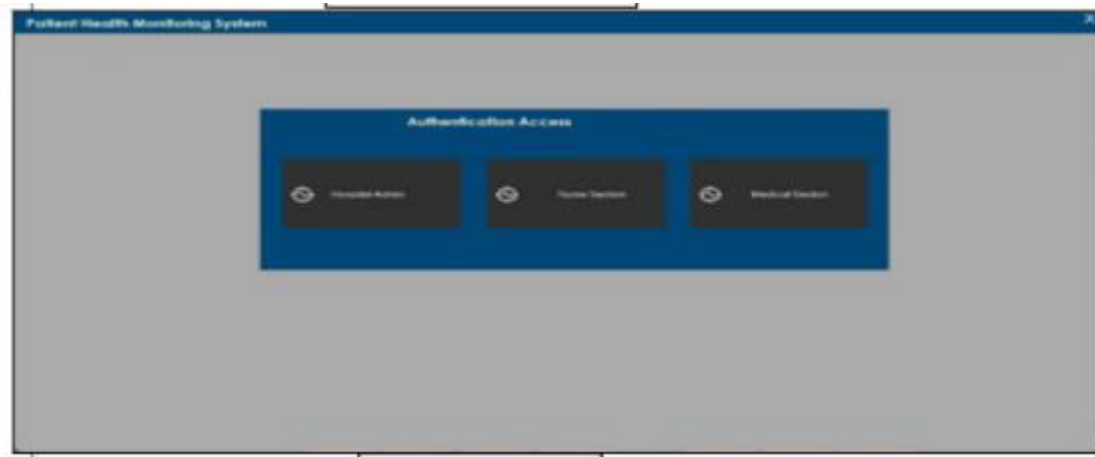


Figure 1. Authentication Window of Desktop integrated application

Admin Section:



Figure 1. Authentication Window of admin

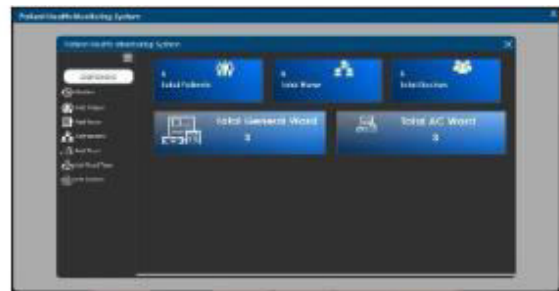


Figure 2. Admin Dashboard



Figure 3. Add patients



Figure 4. Add Nurses



Figure 5. Medical Registration

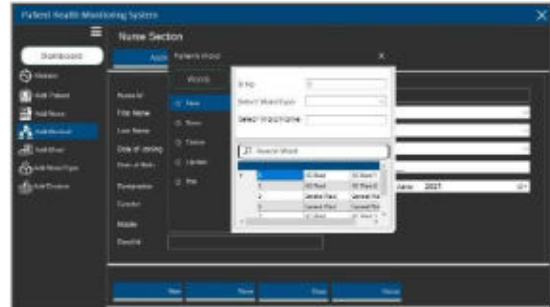


Figure 6. Add Wards

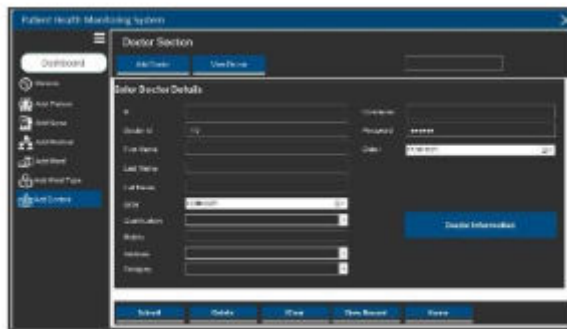


Figure 7. Add Ward Types

Nurse Section:

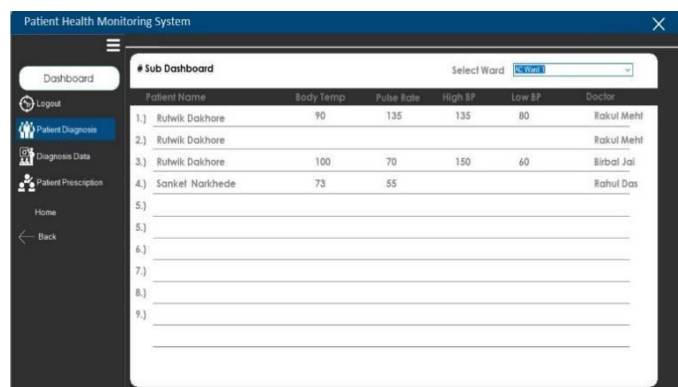


Figure 1. Nurse Authentication

Figure 2. List of Patients Allocated to Nurse

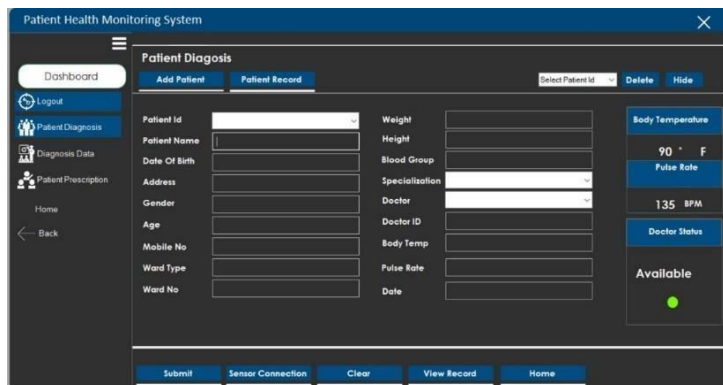


Figure 3. Patient Diagnosis

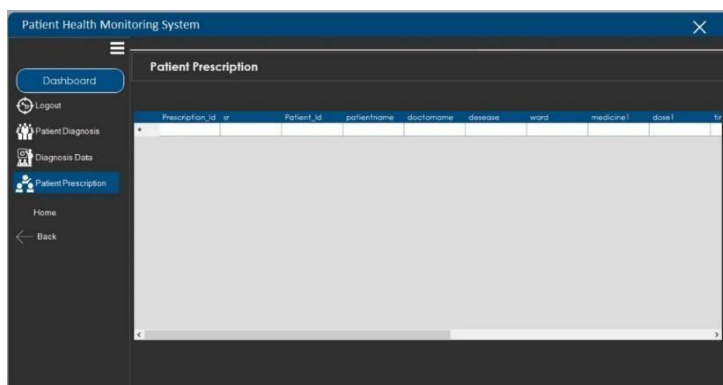


Figure 4. Patient Prescriptions

Kiosk System:

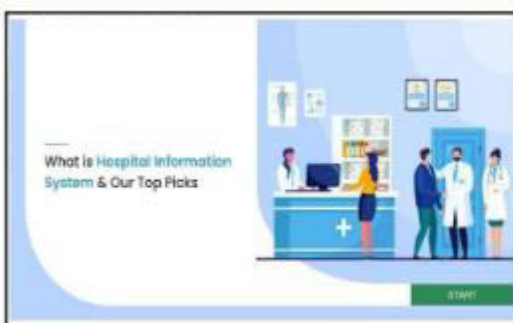


Figure 1. Dashboard



Figure 2. Finding Doctors



Figure 3. Doctors Information

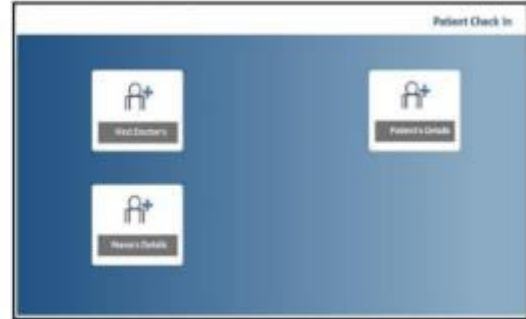


Figure 4. Top picks

Medical Section:

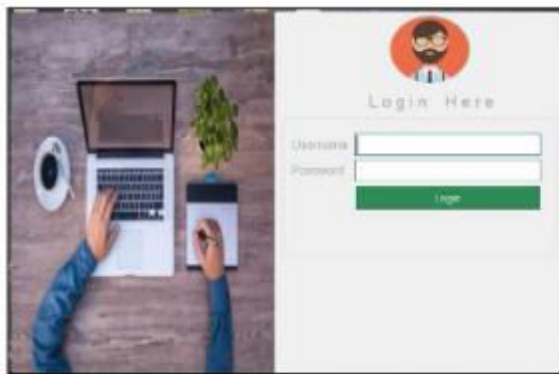


Figure 1. Medical Login

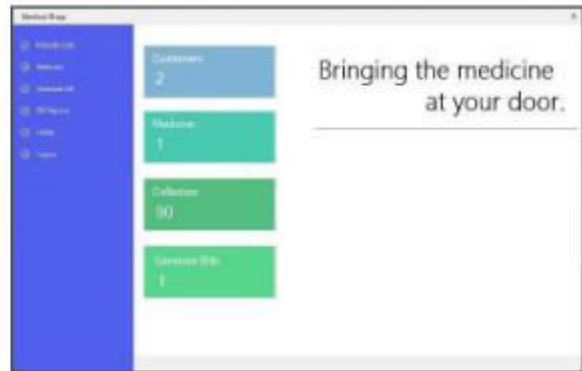


Figure 2. Medical Dashboard

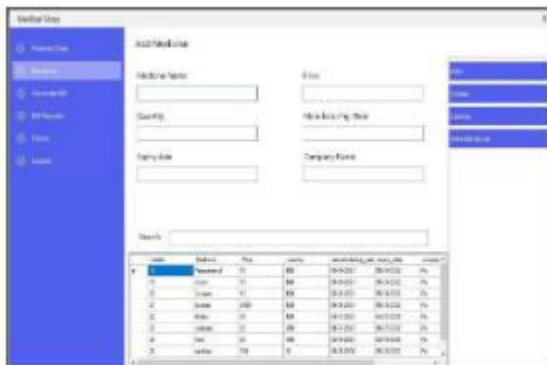


Figure 3. Inventory of Medicines

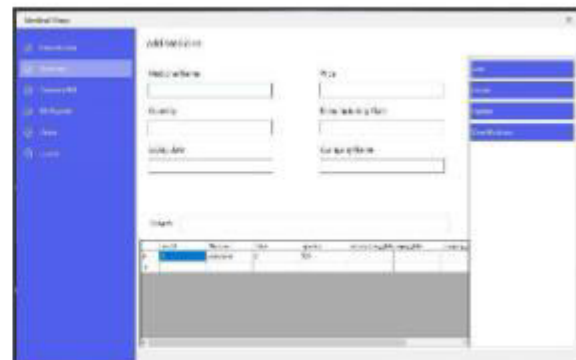


Figure 4. Add medicines



Figure 5. Generate Bills

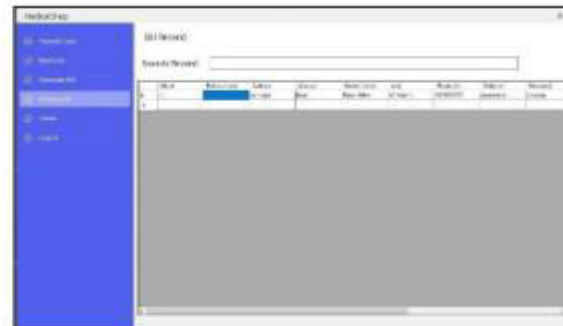


Figure 6. Bill Records

VII. CONCLUSIONS

The system that was proposed was a prototype system model. Our main objective was to focus on health monitoring with wireless body area network. However, we have successfully implemented the prototype and came up with an accurate result analysis. Basically wireless body area network is a vast area to expand. Implementing computer science on medical science has become a new era to develop. Introducing a health monitoring system with an application will really be helpful to people of developing country. One of the main motive of our project was to create a real time communication between doctor, patient, nurse and medical shops in an easier way. Though our model has implemented and tested but to introduce it in real life a lot more improvements and also equipment is needed. Actual goal of our system will be fulfilled when we can use the health monitoring system and “Novel approach for iot based patient health monitoring system using wearable sensors” application in real life and people will be benefited.

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BIOGRAPHY

Prof. Bhupesh B. Lonkar is pursuing Ph.D. (Computer Science & Engineering) in G. H Raison University, Saikheda, India. He is currently working as Assistant Professor in Department of Information Technology, Datta Meghe Institute of Engineering, Technology & Research, Sawangi (Wardha), India. He has presented at international conferences in India like IIT, NIT and abroad Singapore, Malta and published in many reputed international journal. His research areas include wireless sensor network, Mobile computing, Ad-hoc network, etc. He believes in continuous learning and has been doing a lot of professional certifications throughout his illustrious career. He has received 5 copyrights from government of India. Also, he has active SPOC of NPTEL/SWAYAM courses by IIT, Madras on organization level. He has organized International conferences and conducted several workshops & guest lecturers for students and faculties.



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