A Review On Medicare Consultancy Application Using IoT

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Abstract— It is fundamental right of human to get quality Health Care. Earlier days, people were unaware of the diseases they faced. They used the physical changes to determine the disease. But as the technology developed it also affected the Medical field. The methods of treatment got more effective. But still now a day’s people tend to ignore general diseases because of their busy schedule. People use Google as their personal Medical consultant which most of the doctors don’t suggest. To overcome this small issue, we come up with an idea which creates a platform for the interaction between the doctor and patient using IoT.

Keywords: - IoT, Arduino, Sensors, Doctor, Patient, Admin.

I. INTRODUCTION

The health is an important aspect of a person’s daily life. Health in the sense complete physical, mental and social well-being. To achieve the former, we need physically and mentally fit society. It is known fact that we are having doctors in a large number, but still people sometimes ignore all of them. People think that they are saving time by not consulting a professional doctor. But eventually they may suffer because of taking medicines on their own. This is where our system comes into play.

The application that we developed enables the user to get prescription from their home. The sensors like pulse, Temperature sends enough data to determine the general diseases like common cold, Viral fever etc. The data monitored will be sent to the database which the doctor can access and provide medicine. Features like chat and video call will help the doctor to determine the disease easily making the system reliable. The admin will have the control over the entire system.

II. SYSTEM DESIGN

In architectural design of proposed application contains the system used by doctors and patients. On registration, a unique id is generated for the patient as well as doctor. The web application helps the doctors to maintain complete information about the patient and review patient’s health status remotely. IoT is used for checking live status of patient’s health. The data received from sensors are stored in the centralized database. Admin has the control over entire system functionalities.
III. HARDWARE DETAILS

A. Arduino uno
- The Arduino UNO\(^1\) is a widely used open-source microcontroller board based on the ATmega328P microcontroller and developed by Arduino.cc.

B. Ethernet shield
- The Arduino Ethernet shield\(^2\) allows an Arduino board to connect to the internet using the Ethernet library and to read and write an SD card using the SD library.

C. Pulse Sensor
- Pulse Sensor\(^3\) Amped is a plug-and-play heart-rate sensor for Arduino and Arduino compatibles.

D. Temperature Sensor
- This is a pre-wired and waterproofed version of the DS18B20 sensor\(^4\). Handy for when you need to measure something far away, or in wet conditions.

IV. SOFTWARE DETAILS

A. Arduino IDE

The Arduino integrated development environment (IDE) is a cross-platform application that is written in the programming language Java\(^5\).

B. XAMPP Control Panel

XAMPP is a free and open source cross-platform web server solution stack package developed by ApacheFriends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages.

C. Programming Languages used

- Sketch
  A program written with the Arduino IDE is called a sketch based on c/c++ programming. It consist of 2 parts called setup for initializing sensor input and output modes and libraries. Loop which execute the sensor functions for dynamic looping and control of board.

- JavaScript
  It is a language which is also characterized as dynamic, weakly typed, prototype-based and multi-paradigm.

- PHP
  Hypertext Pre-processor (or simply PHP) is a server-side scripting language designed for web development but also used as a general-purpose programming language.

- CSS
  Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a mark-up language for user interface.

V. IMPLEMENTATION

Implementation is a design of the system translated into code and the aim is to implement the design in best possible manner.

A. Pseudocode

```
Begin
  If Username and Password Then
    If Select equals Admin and Login True Then
      Print AdminIndex Page
    EndIf
    If Edit equals Doctor Then
      Print DoctorReg page
    Else
      Print PatientReg page
    EndIf
  Else
    If Select equals Doctor and Login True Then
      Print DoctorIndex Page
    Else
      If OnSelect equals Home Then
        Print Chat, MyPrescription
      Else
        LogOut
      EndIf
    EndIf
  Else
    If Select equals Patient and Login True Then
      Print PatientIndex Page
    Else
      If OnSelect equals Home Then
        Print Chat, MyPrescription
      Else
        LogOut
      EndIf
    EndIf
EndIf
```

End
VI. EXPERIMENTAL RESULTS

IOT based medical device is a combination of pulse sensor and temperature sensor where ethernet shield is used to transmit wireless data to system. The results have been positive where only individual patient at time can send his data with kit attached to his body.

![Fig.4 Arduino Setup](image1)

![Fig.5 Sensor data available for patient](image2)

VII. HEALTHCARE APPLICATIONS

- Rural area can have more benefit from this application due efficient health care with quality at low cost.
- Application can be used in hospitals where data is sent to doctor in form of report and acknowledgment is provided in form of prescription for storing in patient record.

VIII. TEST CASES

A. TEST CASE DOCTOR PANEL

<table>
<thead>
<tr>
<th>SLNo</th>
<th>Test Cases</th>
<th>Expected Output</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Selecting chat function</td>
<td>Chat box to be activated</td>
<td>Success</td>
</tr>
<tr>
<td>2.</td>
<td>Selecting View my Patients function</td>
<td>Display of patients under the specified doctor</td>
<td>Success</td>
</tr>
<tr>
<td>3.</td>
<td>Selecting Send Prescription function</td>
<td>Generating prescription for specified patient id</td>
<td>Success</td>
</tr>
<tr>
<td>4.</td>
<td>Selecting Health Record function</td>
<td>Generating health record for particular doctor</td>
<td>Success</td>
</tr>
</tbody>
</table>

B. TEST CASE PATIENT PANEL

<table>
<thead>
<tr>
<th>SLNo</th>
<th>Test Cases</th>
<th>Expected Output</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Selecting chat function</td>
<td>Chat box to be activated</td>
<td>Success</td>
</tr>
<tr>
<td>2.</td>
<td>My prescription function</td>
<td>To view the prescription provided by doctor</td>
<td>Success</td>
</tr>
<tr>
<td>3.</td>
<td>Generate health record of patient using arduino</td>
<td>Health record and status of patient using sensor reading</td>
<td>Success</td>
</tr>
</tbody>
</table>
C. TEST CASE SENSORS

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Test Cases</th>
<th>Expected Output</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Temperature sensor</td>
<td>Appropriate temperature in form of Celsius/Fahrenheit</td>
<td>Success</td>
</tr>
<tr>
<td>2.</td>
<td>Pulse sensor</td>
<td>Appropriate heart rate in form of BPM</td>
<td>Success</td>
</tr>
<tr>
<td>3.</td>
<td>Ethernet</td>
<td>Send Arduino data to the local Server</td>
<td>Success</td>
</tr>
</tbody>
</table>

IX. CONCLUSION AND FUTUREWORK

After understanding this application and studying other existing work, Medicare consultancy application is integration of hardware and software. Here hardware includes sensor & microcontroller and server system for patient, doctor interaction. This is complete remote monitoring system which includes task like data acquisition, data monitoring, data storing & managing. data is then store in the database for future use.

The future work can be done by providing more sensors & Android application. So that person can have more user-friendly environment and be able to have more automatic function rather than manual operation with enhanced performance.

REFERENCES