

# **Patient Room Monitoring System**

*Mini Project Report submitted in partial fulfillment.*

*of the requirement for the degree of*

**T. E. (Information Technology)**

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CERTIFICATE OF APPROVAL

**For  
Mini Project Report  
On  
Sensor Network Lab**

This is to Certify that

**Komal Rane  
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Have successfully carried out Mini Project entitled

**“Patient Room Monitoring System”**

In partial fulfillment of degree course in

Information Technology

As laid down by University of Mumbai during the academic year 2020-21

Under the Guidance of  
“Prof.Vinita Bhandiwad”

Signature of Guide

Head of Department

Examiner 1

Examiner 2

Principal  
Dr. S. A. Patekar

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The days we have spent in the institute will always be remembered and also be reckoned as guiding in our career.

1. **Komal Rane**
2. **Saish Khade**
3. **Tanaya Desai**

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# **Abstract**

In the current scenario of technological developments the healthcare infrastructure is still underdeveloped and facing a lot of issues. It is estimated that 2.4% of the deaths in the country are incurred due to improper hygiene and non-monitored medical facilities. The main goal of the project is to build a working system which can help monitor the environment of the patient's room.

The system is aimed at monitoring the temperature, air quality, humidity and light intensity in the room of the patient. The major aim is to provide a monitored facility to avoid chances of any mishaps and to enhance our existing infrastructure.

# 1.

## **Introduction**

Continued deterioration of public health resources and poor environmental conditions is a major public health concern in developed and developing countries. It is estimated that the pollutants responsible for poor air quality cause nearly 2.5 million premature deaths per year world-wide. Significantly, around 1.5 million of these deaths are due to polluted indoor air, and it is suggested that poor indoor air quality may pose a significant health risk to more than half of the world's population. Due to its link with industrialization, societal health problems associated with poor air quality disproportionately affects developed and developing nations – it is estimated that improper environmental conditions in the room of the patient may account for premature deaths. Remedial action is needed to improve the existing infrastructure and our idea of project is focusing in helping to overcome the existing problems.

## **2. Aim**

The main aim is to develop a simple but robust model which can efficiently detect the room temperature, humidity, air quality and light intensity.

## **Objectives**

The main objectives of the model are described and mentioned as the following :

- To develop an integrated system for patient room monitoring
- To build a cost effective solution model
- To measure and display the temperature and humidity level of the environment.
- To combine advanced detection technologies to produce an air quality sensing system with advanced capabilities to provide low cost comprehensive monitoring.
- To display the sensed data in user friendly format

### 3. **Problem Definition**

One of the major issues to decreasing healthcare infrastructure is the unmonitored use and optimization of resources. There is a big loophole and in the majority of cases lack of proper healthcare facilities to tackle the rising need by the patients. In such a scenario with increasing numbers of patients there is a load on the healthcare system and it burdens the infrastructure leading to unmonitored resources. In such cases there is an urgent need for a proper monitoring system to avoid any hasty incidents.

This project provides a combination of process of sensing several gas levels in the air and also the ambient temperature and humidity along with light intensity, thus sensing the quality of the air and intensity of light. The levels of the gases and the temperature is displayed on the Blynk panel which continuously shows the real time output values of the gas sensors, temperature and humidity sensor and LDR sensor.



## 4. Proposed System

### Block Diagram

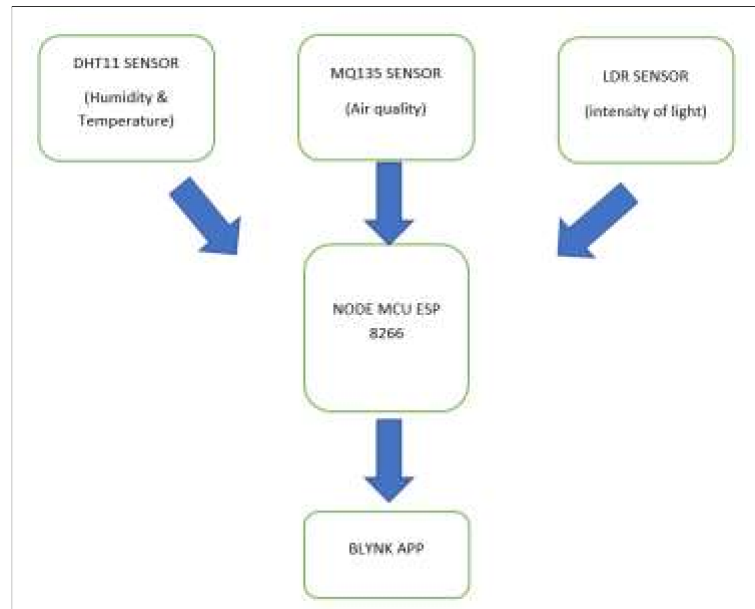


Figure 1

### Flowchart

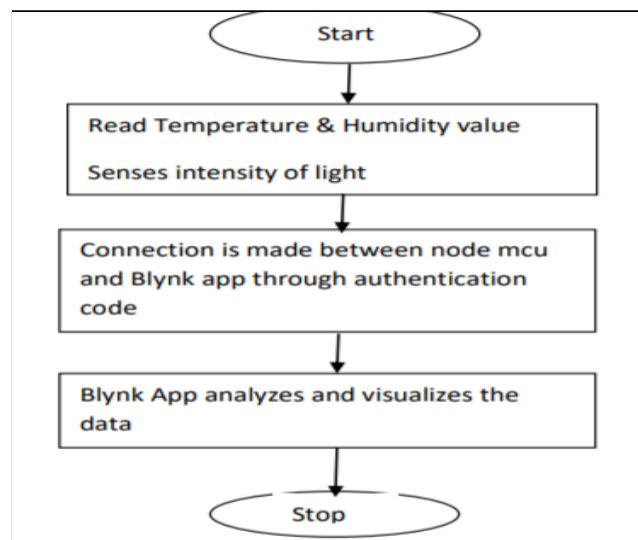


Figure 2

## **5. Components**

### **Hardware**

NodeMCU ESP8266

DHT 11 sensor

LDR sensor

MQ135 sensor

Jumper wires

Breadboard

USB Cable

### **Software**

Blynk

Arduino IDE

## 6.

## Logic

We put the model in the room. DHT11 will take the Temperature and Humidity and MQ – 135 will take the parameter of Air Quality, LDR will sense the light intensity. We use Blynk for monitoring the value. The node MCU which is connected to the internet connection will send the Temperature, humidity and air quality and light data to Blynk cloud and the cloud will send the data to our app.

## 7.

## Code

```
#include <ESP8266WiFi.h>

#include <BlynkSimpleEsp8266.h>

#include <SimpleTimer.h>

#include <DHT.h>

char auth[] = "*****"; //Enter the Auth code
which was send by Blynk

char ssid[] = "*****"; //Enter your WIFI Name

char pass[] = "*****"; //Enter your WIFI Password

#define DHTPIN 2 // Digital pin 4

const int ldrpin =5;    //D1 pin


#define DHTTYPE DHT11  // DHT 11

DHT dht(DHTPIN, DHTTYPE);

SimpleTimer timer;

void sendSensor(){

    float h = dht.readHumidity();

    float t = dht.readTemperature();

    float q = analogRead(A0);

    int l = digitalRead(ldrpin);
```

```

    if (isnan(h) || isnan(t)) {
Serial.println("Failed to read from DHT sensor!");

    return;
}

// You can send any value at any time.

// Please don't send more than 10 values per second.
Blynk.virtualWrite(V5, h);    //V5 is for Humidity
Blynk.virtualWrite(V6, t);    //V6 is for Temperature
Blynk.virtualWrite(V0, q);    //V0 is for Air quality
Blynk.virtualWrite(V1, l);    //V1 is for Light
}

void setup()
{
Serial.begin(9600);

Blynk.begin(auth, ssid, pass);

dht.begin();

    // Setup a function to be called every second timer.setInterval(1000L,
sendSensor);

}

void loop(){

Blynk.run(); // Initiates Blynk

timer.run(); // Initiates SimpleTimer }

```

**Github link :** <https://github.com/komal-30/Patient-Room-Monitoring-System>

## 8. Implementation

### Working

- The model is assembled according to the connections required by the sensors.
- After the connections are successfully made, the NodeMCU is interfaced with the sensors and the Blynk application.
- The connection with the Blynk application is made by providing a authentication code
- The sensors take up the necessary parameters and send the data to NodeMCU which is further sent to blynk cloud and displayed visually.

## Circuit Diagram

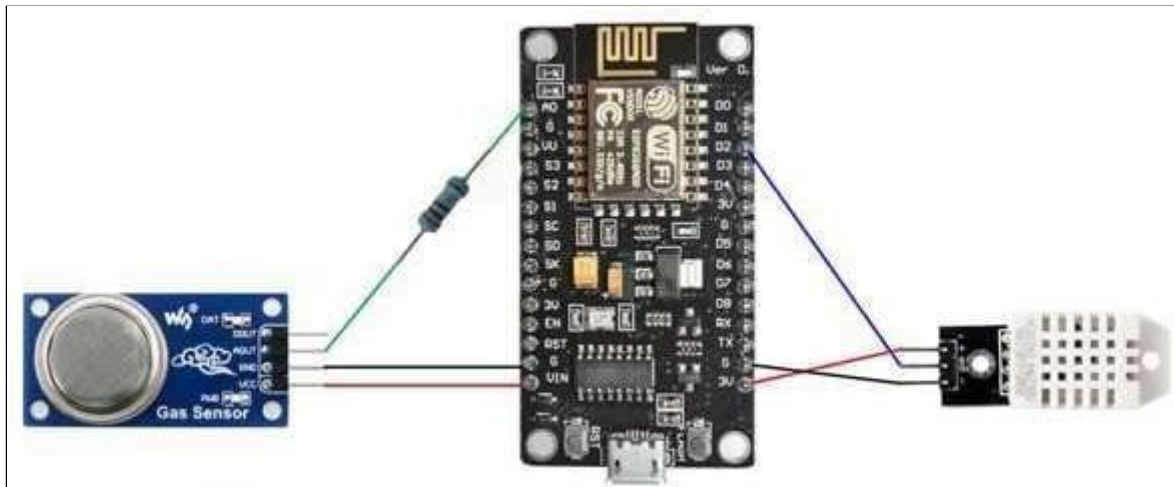


Figure 3

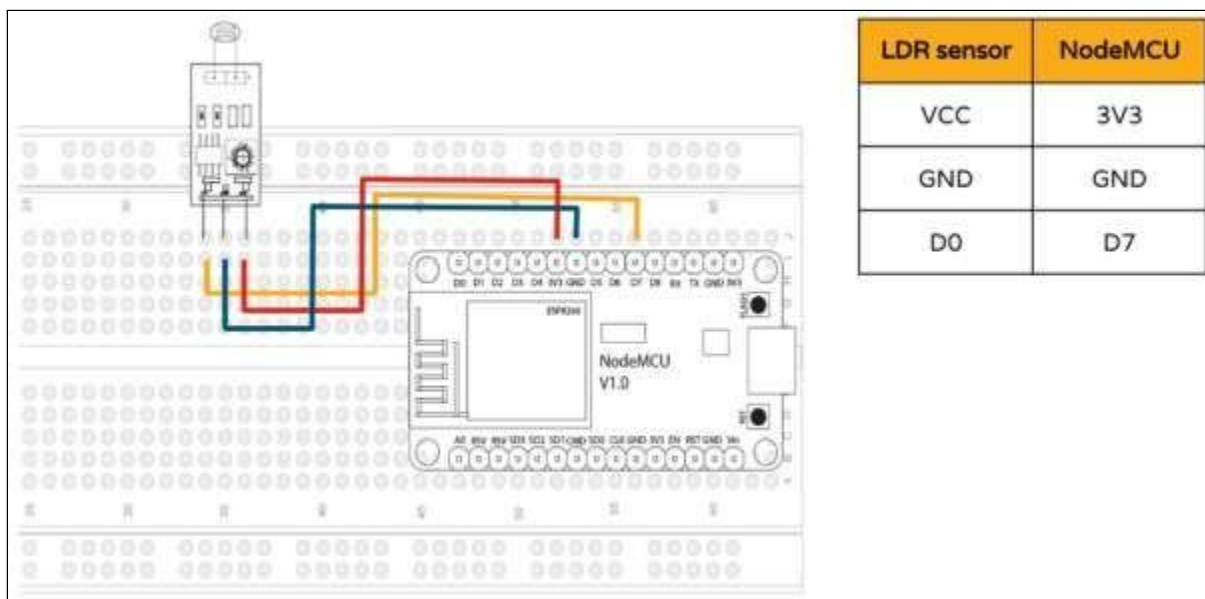


Figure 4

## 9. Deployment And Testing

- The finalized circuit image and blynk app output :

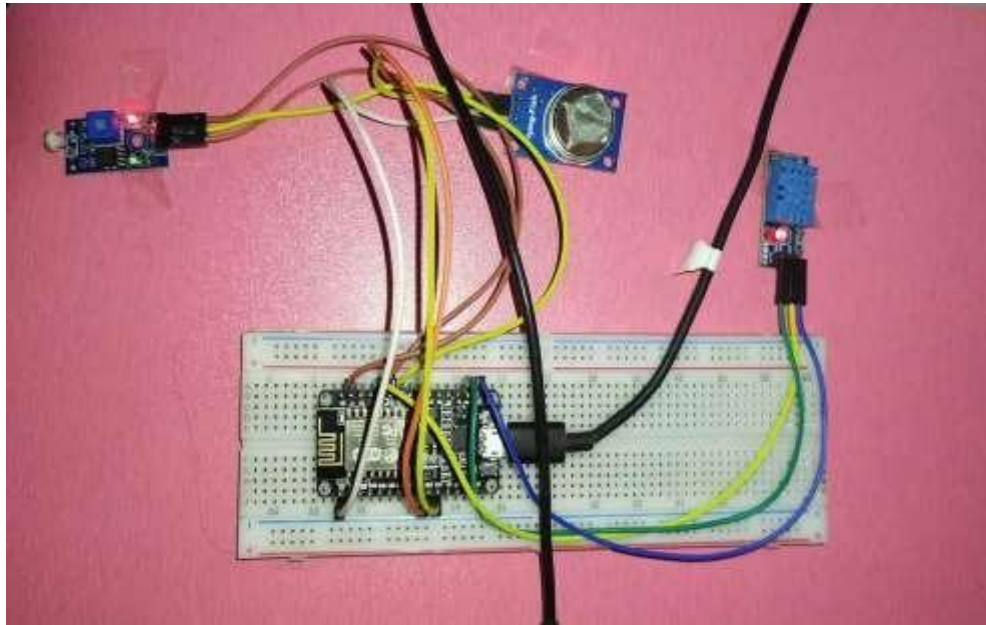


Figure 5



Figure 6



**10.**

## **Conclusion**

In this project, a patient room monitoring system is developed that allows patients to be mobile in their social areas. The system is intended to help monitor the room conditions of the patient like the air quality, room temperature and light intensity. The main purpose of the device is to make sure that they get medical aid as soon as possible, in case of a possible discomfort. So there will be an increased chance of survival of patients.

## **Future Scope**

- We can add a GPS module in IOT patient monitoring using Arduino MEGA. This GPS module will find out the position or the location of the patient using the longitude and latitude received. Then it will send this location to the cloud that is the IOT using the Wi-Fi module. Then doctors can find out the position of the patient in case they have to take some preventive action.
- Nowadays people are suffering from BP and heart attacks so if we add BP, ECG, EEG sensors in this project. With the help of these sensors we will find Blood pressure and we will check heart condition. Wi-Fi is an external module connected to Arduino mega. It is better if it is built, so complexity can be reduced.

# 11.

## References

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12.

## **Project Video Link**

**Link:**

[https://drive.google.com/file/d/1bmPsCK-KUgC8VPnMAr\\_AqHvevVTWGcN1/view?usp=drivesdk](https://drive.google.com/file/d/1bmPsCK-KUgC8VPnMAr_AqHvevVTWGcN1/view?usp=drivesdk)