

Smart Environment Monitoring Device

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Abstract-- In the 21st century Internet of Things (IoT) has won great attention from the researchers leading to a series of intensive and extensive studies with the development of various project works on different field of researchers' interest. The system discussed in this paper is an efficient and a productive solution of monitoring the environment in a proper way making an IoT based smart environment monitoring device that collects data related to the weather and environment using different sensors. Microcontroller will use the data using the sensors along with the power source and sends it to the database using WIFI which then using IoT receives the data to the client as a receiver. This device uses temperature and humidity sensor, smoke sensor to measure temperature, humidity and presence of smoke and also an alarm device (buzzer) for notification. This device had been developed focusing on the old aged or asthmatic patients who are bedridden in their house.

Index Terms-- IOT; temperature sensor; humidity sensor; Smoke sensor; Buzzer.

I. INTRODUCTION

In the 21st century nothing is impossible to implement since we have a significant technology introduced in today's market for the developing and improving the society. It helps in implementing our thoughts and imagination and makes them come up to work using such devices and technologies and implanting to our knowledge giving and better life to our future awaited world. The Internet of Things (IoT) is the network of physical objects or devices "things" that are embedded with sensors, software, and other technologies. They are used for the purpose of connecting and exchanging data with other devices using the internet. In this modern era we want every solution to be at our finger tips making the life move in a smarter way and have a complete control on life. We get awareness either through messages or an alarming situation will be virtually created that would be impossible for

the user to ignore the matter or might let the people be up to date about various circumstances. There are various fields which had already started developing few devices using IoT and few are about to accept their work to make the society and the world move on an easier note like [1] collects data of pulse, respiratory rate with position of the body and send the doctor to get an immediate medical support. [2] Discusses about the polluted environment surround the patient and give an alarm immediately. [3] Proposes a smart medical box that helps in checkup the patient on daily basis and doctor can suggest without meeting a patient physically. [4] to detect if a person in the room is suspected to conduct any kind of suicidal attempt. This device gives prior information to avoid the situation. [5] detects the healthcare for sleep Apnea monitoring. [6] had proposed the health monitoring during COVID to help people avoid visiting hospitals unnecessarily. [7] Uses AI, detecting any person illness at home and brings attention for its prevention. [8] discuss about the health monitoring concept using Machine Learning. [9] uses a latest technology Fog computing to detect the health of patient. [10] discuss about the mental illness dealing with psychiatry and neuroscience knowing the data and notifying the patient family members. Hence we are implementing IoT in our project focusing on the aged people or some hospitalized person who are kept at home for observation under the family environment. The main reason of developing such devices is for looking into the present scenario of our today's life. In 21st century almost every member above the age of 20 are working on various professional life leaving behind their old aged parents in their house. Hence if an emergency situation occurs or any situation that needs an immediate attention that would not be left avoided and needs an immediate attention to the environmental condition as well then staying away from home will lead a critical situation. We wish to use IoT in our daily activities in order to live in a smarter way. Our device Smart environment monitoring system works as a medical equipment or device. We think this device will make a significant role to solve a huge loophole for the critical bedridden and asthmatic patients. Hence we have thought of developing a device using IoT for such patients whose environmental circumstances need a great attention and an immediate care is required for which the information records on daily basis needs to be available with us. Hence with the developed device the environmental atmospheric data will be recorded hourly and be informed on daily basis. If any such unwanted situation occurs while the family member is not around, even then it will be immediately

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informed through message or an alarm over phone which will help them to be informed and contact for help them over phone virtually or inform the near about hospitals before the members could even get a chance to reach. This device will help several people around the globe not to become getting unnecessarily hyper during work and unwanted tensions which will hamper their professional work and lead a smooth environment and balance maintaining both the professional and family life. These devices are more effective, efficient and also less costly. With emerging technologies, which IoT also make business opportunities thinking and making life smarter, faster and gift a better developed society to the population in the long run as well.

II. PROBLEM STATEMENT

Suppose we consider an asthmatic patient in our home that is required an all-time attention regarding the health situation, the external environment monitoring is also needed as well. For this patient the room atmosphere should be appropriate. Asthmatic patients are very sensitive to temperature, humidity and smoke/gas. So, if there is any unwanted atmosphere in the room it might lead to a very critical situation for the patient. The traditional solution is to arrange a nurse for them. But that is a very costly solution to this problem. And there isn't any available smart solution in the market as well. Hence, a device is being proposed that will help in monitoring the environmental condition and inform over phone. Even in buzzing situation the gravity of the situation may be understood and necessary actions could be taken immediately before it gets too late due to lack of man power at home. The smart environment monitoring system is a device which collects data from the room like temperature, humidity, smoke present in the room and monitors it constantly. If there is any unwanted situation in the room like the temperature increases, humidity increases, or presence of harmful smoke, the device will immediately sense and make an alarm and also will send an alarm/notification to the family member's smart-phone. Below attached Figure 1-3 covers the complete Circuit diagram, Prototype design and block diagram of the circuit device.

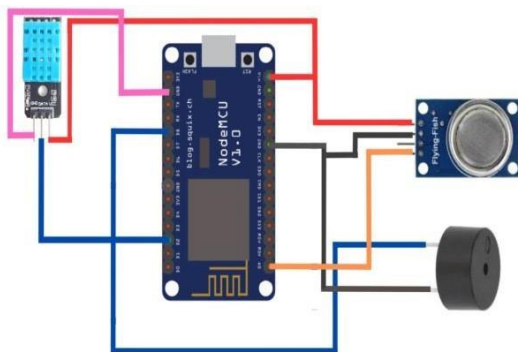


Fig1: The Overall circuit diagram

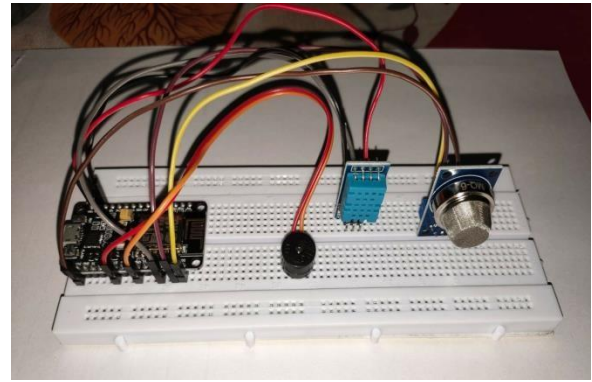


Fig2: Prototype design

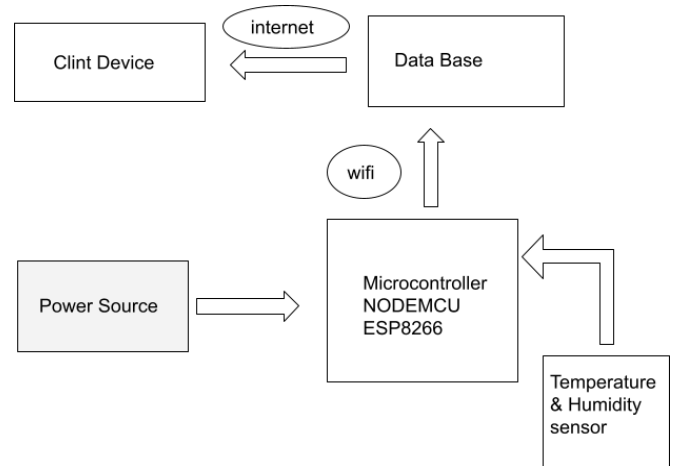


Fig3: Block diagram of the overall circuit design.

III. COMPONENTS REQUIRED

- NODEMCU ESP-12E
- BUZZER
- MQ-6
- DHT-11

IV. COSTING OF THE PROTOTYPE

For the bulk production

- A. Device Cost is only (Rs. 200-300/-)
- B. Software is only (Rs.100/-)
- C. Total Rs. 400/-

It is very cost effective for a person so that anybody can install it in their home and we can also use it for global market.

V. RESULT

We have tested our device under one or two such cases, of situations detecting the temperature, moisture and have found to give a successful result. Figure 4 denotes the result display of our prototype on its running condition. We made an artificial unwanted environment in a room which is basically for an asthmatic patient's room. When the parameters of temperature, humidity and also gas or smoking increased the device was able to make an alarm and also send a successful alarm in the Smartphone through an android app. So, the result of the device is impressive. The cost of the device is very low which has been estimated in the earlier section and proved to be pocket friendly, very economical and readily acceptable to the society that plays the very essential parameter. If we want to manufacture it in large scale, then within four hundred rupees we can handover this device to the required interested people as well. So, this device is very cost effective. The other advantage of the device is portability. It can be easily carried anywhere. So, there are no installation hazards.

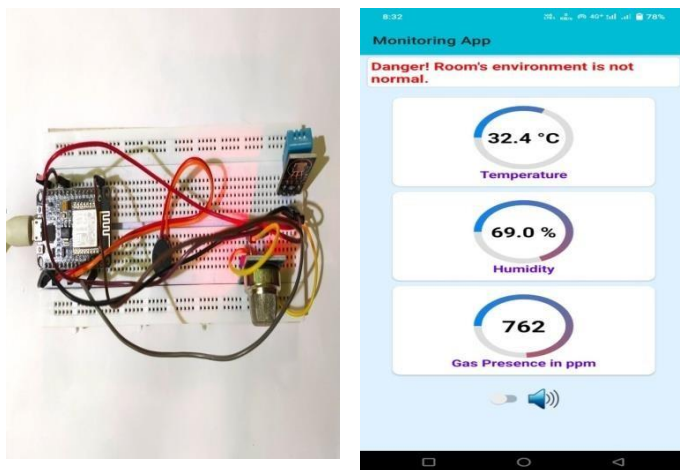


Fig4: The working and result display of the prototype

VI. CONCLUSION

Everybody should contribute in any way to the society for its up gradation and well-being of the population. We have decided to contribute and research in the field of requirement that would be helpful for the people who are working and for the aged people who are needed to take care off. Our smart environment monitoring system which is an IoT device works for medical patients. We had tried to help that crowd of people who are working leaving their aged parents at home. This device has been developed for getting rid of the unwanted and emergency situation by getting alarm prior, so that all the necessary actions would be controlled within time bounds and help to avoid such situations to occur. It solves a huge problem of the society nowadays with minimal cost and smaller sized device which can be taken and travelled to any place.

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VIII. BIOGRAPHIES



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