Volume 9, Issue 4, April – 2024 International Journal of Innovative Science and Research Technology
ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24APR615

An Efficient Indoor Nursery Controlled by IOT and Monitored by Android App.

B. Rajendran[1]
Murugappa Polytechnic College

B. L. Philomina Suganthi[2]
Murugappa Polytechnic College

S. Deepa[3]
Murugappa Polytechnic College

S. Danush[4]
Murugappa Polytechnic College

S. Mathesh[5]
Murugappa Polytechnic College

Abstract:- Gardening is one of the greatest hobbies or mind relaxing activities for all age groups, which kindles them to make nursery management system. Nowadays also most of the nursery owners using a manual system to water and monitor their plants. There are many difficulties or challenges for nursery owners to take care of the plants growth, so that they need to check the moisture of the soil, monitor the air humidity and temperature, and others parameters. This paper offers a solution to combine the Internet of Things (IoT) system and Android apps to monitor the plant's growth with a real-time data monitoring and also provides the system control. In this paper, the sensors are used to sense the moisture of soil, check the air humidity and temperature, discover the light intensity and measure the soil temperature. This system allows nursery owners to monitor and control the irrigation system where they can water their plants using mobile application. The sensor checks the condition of the plant and updates the data in every one hour. Other than that, Indoor nursery often faces the issue of inadequate sunlight. Natural light coming through windows may not be as strong as outdoor sunlight, which is essential for photosynthesis. Therefore, this system offers a solution that allows nursery owners to control a specific light-emitting diode (LED) or UV LED to simulate sunlight. This ensures that plants receive the necessary light for photosynthesis and grow healthy. Growth of Plants contribute towards air purification providing fresher air to breathe.

I. SYSTEM DESIGN

➢ *System Architecture*

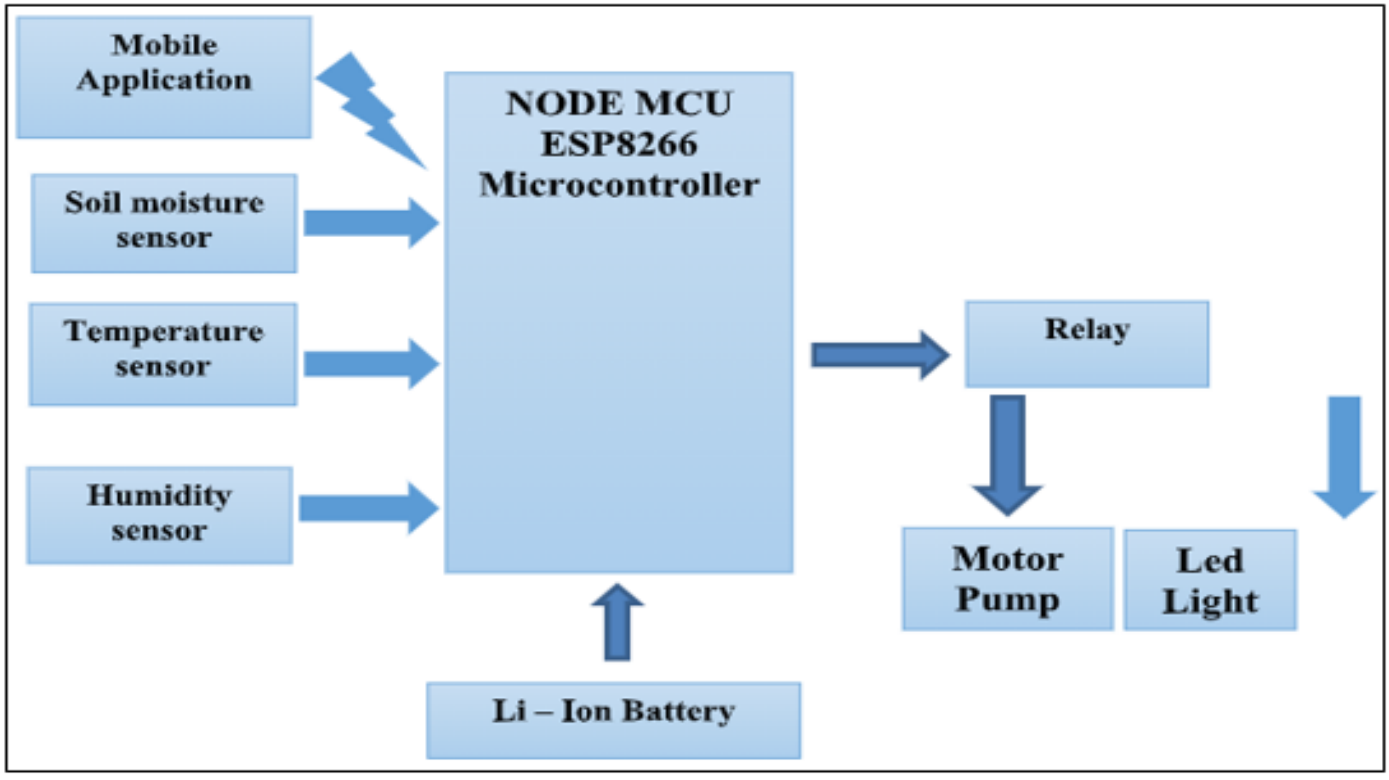

Fig 1 System Architecture

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24APR615

➢ *Soil Moisture Sensor Architecture*

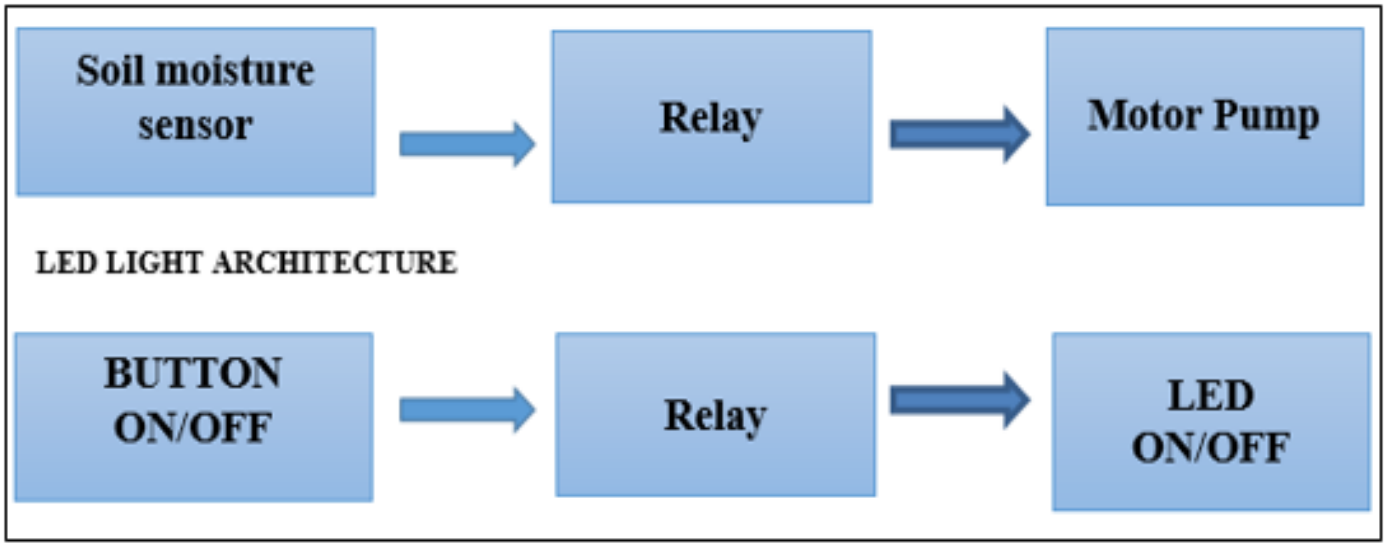

Fig 2 Soil Moisture Sensor Architecture

➢ *Application Architecture*

Fig 3 Application Architecture

➢ *Modules Description*

- Soil Moisture Sensor Integration
- Temperature and Humidity Sensor Module
- Automated Irrigation Controller Module
- Integrating IOT Components Control
- Alert and Notification Module

II. SOIL MOISTURE SENSOR INTEGRATION

Digital soil moisture sensor is easy to use by inserting it in the soil and it canmeasure moisture level in it. It gives a digital output of 5V when moisture level is high and 0V when the moisture level is low in the soil. The sensor can be controlled using potentiometer to set the desired moisture threshold. When the sensormeasures more level of moisture content than the set threshold, the digital output goes high and an LED indicates the output. When the moisture level in the soil is less than the set threshold, the outputbecomes low. The digital output can be connected to a micro controller to monitor or sense the moisturelevel.

➢ *Temperature and Humidity Sensor Module*

DHT11 is a Temperature and humidity sensing module, which uses for Digital Signal Acquisition, which converts the Temperature and Humidity to a digital Reading, which can be easily read by a Microcontroller. Operating range of DHT11 sensor is 0 to 50 degree Celsius which is sufficient for Home purposes. This sensor has 3 pins that are Vcc, Data and Ground pins directly we can connect to the Arduino.

➢ *Automated Irrigation Controller Module*

Irrigation is the most important for gardening. Here we are sensing the moisture level of the soil and based on the output, it sprinkles the water from the motor pump connected to the system.

➢ *Integrating IOT Components Control*

This project aims on enabling control over electrical appliances via an Android phone. In this project we utilize Wi-Fi communication between the Android phone and a receiver connected to the appliances. ESP8266 is a commonly used Wi-Fi module that provides seamless connectivity for IoT applications.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24APR615

III. ALERT AND NOTIFICATION MODULE

To create an alerts and notification module for a water supply irrigation system using theBlynk app, you can follow these steps:

- *Set Up Blynk App:*
  Download the Blynk app on your smartphone from the respective app store. Create an account and log in to the Blynk app.

- *Create a New Blynk Project:*
  In the Blynk app, create a new project. Choose the appropriate hardware (e.g., Arduino, Raspberry Pi) and connection type (Wi-Fi,Bluetooth, etc.) for your irrigation system. Blynk will generate an authentication token that you'll need to use in your hardware setup.

- *Connect Hardware to Blynk:*
  Set up your hardware (Arduino, Raspberry Pi, etc.) and connect it to the internet. Use the Blynk libraries and your authentication token to establish a connection between your hardware and the Blynk app.

- *Implement Alert Logic:*
  Write code on your hardware to monitor relevant parameters such as water levels, flow rates, or system malfunctions. Define thresholds for these parameters. When thresholds are exceeded, trigger alerts.

- *Integrate Notification Widget:*
  In your Blynk project, add the Notification widget. Configure the Notification widget to send alerts when specific conditions are met. You cancustomize the message content and recipient(s).

- *Test and Deploy:*
  Test your setup to ensure that alerts and notifications are triggered correctly.Deploy your hardware in the irrigation system environment.

- *Monitor and Adjust:*
  Continuously monitor the system to ensure proper functioning. Adjust thresholds and notification settings as needed based on real-world performance anduser feedback.

Fig 4 Screen Shots Front View

Fig 5 Side View

- *An Efficient Nursery Controlled by the Circuit*

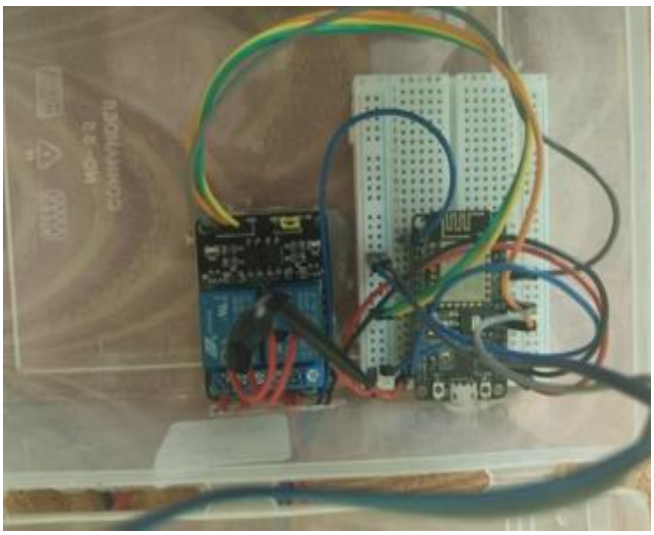

Fig 6 Soil Mositure Sensor

Fig 7 Soil Moisture Sensors Measures the Volumetric Water Content.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24APR615

➢ *Water Pump*

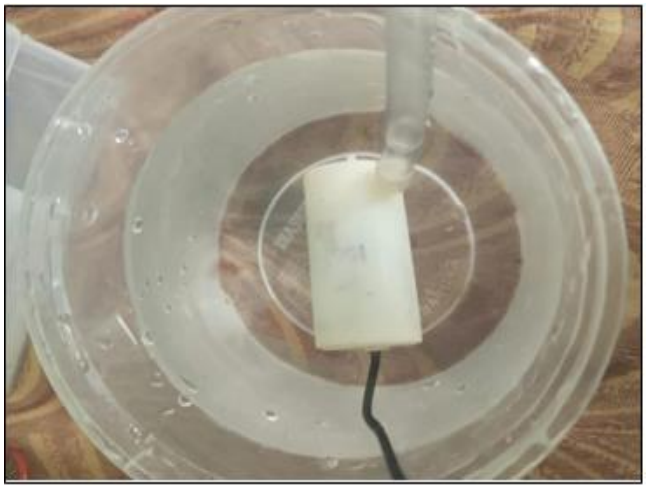

Fig 8 Water Pump

- Immerse the pump in water, connect a suitable pipe to the outlet and power the motor with 3-6V to start pumping water

➢ *DHT 11 Sensor*

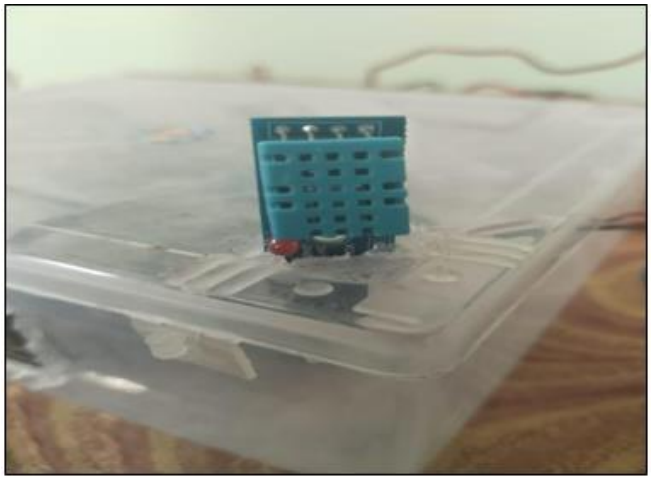

Fig 9 DHT11 Is a Used to Measure Temperature and Humidity

Fig 10 An Efficient Nursery Monitored by App Interface

IV. CONCLUSION

This system details the design and implementation of an Efficient Nursery controlled by IoT technology. The system effectively responds to commands provided by the user, ensuring optimal care for indoor plants. Upon designing the circuit, individuals with physical disabilitiescan control this system using android application on their smartphones. The system has undergone through testing and validation. In comparison to existing market offerings, our system remains affordable. It stands as a testament to our commitment to accessibility and innovation in IoT Solutions. Hence, we can confidently label it as a "Low-cost Efficient Nursery system controlled by IoT for individuals with disabilities and elderly individuals.

REFERENCES

[1]. N. Sukhdev, N. Nahata, S. Sridhara and G. Swamy, "IoT Enabled Smart Gardening," *2018 Fourteenth International Conference on Information Processing (ICINPRO)*, Bangalore, India, 2018, pp. 1-2, doi: 10.1109/ICINPRO43533.2018.9096672.

[2]. K. Masaba, A. Ntakirutimana and T. S. Ustun, "Design and Implementation of a Smart Irrigation System for Improved Water-Energy Efficiency", *4th IET Clean Energy Technol. Conf. (CEAT 2016)*, pp. 100 (5.)-100 (5.), 2016.

[3]. B. Khelifa, D. Amel, B. Amel, C. Mohamed and B. Tarek, "Smart irrigation using internet of things", *2015 4th Int. Conf. Futur. Gener. Commun. Technol. FGCT 2015 no. Fgct*, pp. 91-96, 2015.

[4]. Matti Satish Kumar;T Ritesh Chandra;D Pradeep Kumar;M. Sabarimalai Manikandan "Monitoring moisture of soil using low cost homemade Soil moisture sensor and Arduino UNO" 2016 3rd International Conference on Advanced Computing and Communication Systems (ICACCS)

[5]. Explainable AI Over the Internet of Things (IoT): Overview, State-of-the-Art and Future Directions Senthil Kumar Jagatheesaperumal;Quoc-Viet Pham;Rukhsana Ruby;Zhaohui Yang;Chunmei Xu;Zhaoyang Zhang, IEEE Open Journal of the Communications Society.