IOT Based Smart Farming Under Artificial Environment for Mars

Mr. P. Manga Rao[1], P. Anil Kumar[2], P. Sai Vivek[3] and P. Sai Teja[4]
[1]Associate Professor,[2,3,4] UG Students
Department of Electronics and Communication Engineering
TKR College of Engineering and Technology

***Abstract*— Accelerating plant growth is the main objective of modern agriculture in order to produce the biggest crop on Mars. We urgently need to increase output in order to support the growing population. The DHT11 sensor, which measures temperature and humidity, the soil moisture sensor, which measures soil moisture, and the MQ135 air quality sensor, which gauges the atmosphere in a particular location, are the three sensors utilized in this project.**

According to the amount of soil moisture, soil moisture sensors are used to automate the water delivery system, and RGB led's are largely utilized to create artificial light that is beneficial for photosynthesis. We can stabilize the humidity, temperature, and air quality by turning on the exhaust fan if any of these factors is out of the ordinary.

Additionally, each of these may be monitored using the Blynk APP, an IOT-based platform. which is used in the creation of server and application services? The plant growth rate can be increased by twofold with these factors. The outcomes demonstrated that, when all of the factors influencing plant growth are stabilized, cultivating a plant on Mars is feasible in 60 places.

***Index Terms*—ESP32, L293D Motor driver, DC fan, Motor pump.**

I. INTRODUCTION

Global issues include irregular weather patterns, degradation of the environment, and shortages of water, fossil fuels, and plant biomass are becoming more and more prevalent. As a result, there will be a threat to the steady and secure supply of food and other items made from plants. The local climate, weather, and soil fertility all influence the quality and production of leafy vegetables cultivated in open fields. On the other hand, plants grown in this artificial environment often result in crops that are more productive and of greater quality.

With the help of a synthetic environment, crops can be produced under controlled conditions indoors. given that the environment indoors, there won't be any insects or other pests that could harm the crops, so no insecticides or pesticides are needed. Water requirements are very low because the indoor climate won't allow water to evaporate or seep into the ground. Artificial lighting is available indoors, making it possible to produce crops year-round.

II. EXISTING FRAMEWORK

Temperature, light, CO2, water, and nutrients are the five fundamental environmental elements that have an impact on how a plant grows and develops.

- In this project we are implementing three sensors they are DHT11 which is used to monitor the temperature and humidity parameters soil moisture sensor for the detection of moisture content in the soil and MQ135 which is an air quality sensor for monitoring the environment of the particular region.
- If any of this parameter is in abnormal condition then exhaust fan get turned on, so that we can stabilize the humidity, temperature and air quality and RGB leds are mainly used for Creating Artificial Light which will be helpful for photosynthesis. And these all can be monitored using a IOT based platform i.e., using a Blynk App.

III. PROPOSED SYSTEM

This system was created for environment monitoring and control, and it works by using sensors placed in various locations to measure temperature and humidity. Through an Android smartphone, environmental conditions are monitored and controlled. The DHT11 humidity sensor,

microcontroller, wireless connection, and power supply unit make up the system. The values from the sensor are used as input by the microcontroller. The microcontroller then uses serial communication to transmit the values to the Blynk server. The Blynk app's function in this system is to wirelessly send data to an Android mobile device. The microcontroller and other parts, including the heater and fogger, are controlled by an Android smartphone.

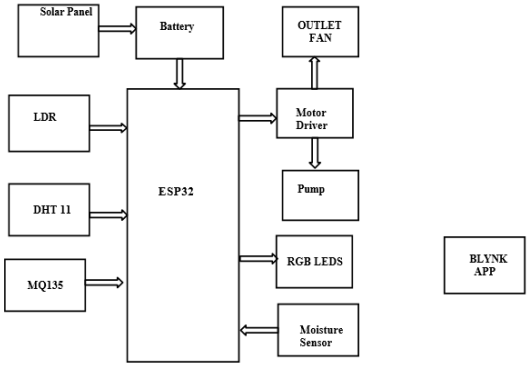

Fig-2. Block Diagram of Proposed System

In this project we are implementing three sensors they are DHT11 which is used to monitor the temperature and humidity parameters soil moisture sensor for the detection of moisture content in the soil and MQ135 which is an air quality sensor for monitoring the environment of the particular region. If any of these parameter is in abnormal condition then exhaust fan get turned on, so that we can stabilize the humidity, temperature and air quality and RGB leds are mainly used for Creating Artificial Light which will be helpful for photosynthesis. And these all can be monitored using a IOT based platform i.e., using a Blynk App.

IV. METHODOLOGY

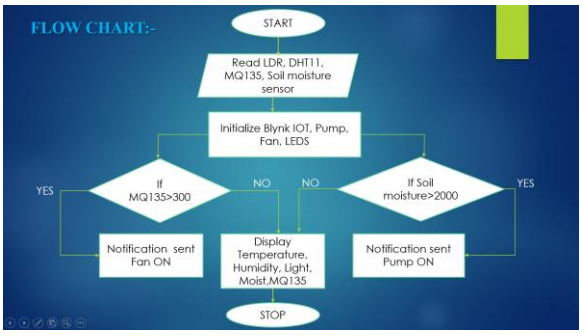

Fig-3 Flow Chart

V. RESULTS

When a fall has been detected, the wearable device/sensor will locate the user and send alarm SMS to caregivers immediately as shown in Fig.4.

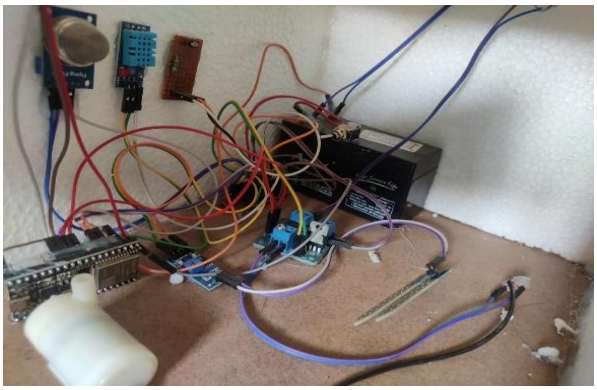

Fig.5.1 Practical Representation of Experiment

The Worldwide Situating Framework (GPS) is a satellite route gadget can get data from satellite's and afterward compute the gadget's topographical position. It generally works and in practically every one of the atmospheric conditions. In this venture, the GPS for the most part utilized for following reason, that screens the item or people. A caution Short Message Administration (SMS) containing a guide URL has been gotten by the handset as displayed in Fig.4.when a fall is identified. Tapping the URL will open a guide in internet browser on which the fall area will be shown as displayed in Fig.5

VI. CONCLUSION

The research and development effort for a system to produce crops was mostly reviewed in this study. This automated system maintains constant climatic settings. This steady flow of variables gives plants the nutrients they need and safeguards them from pests. In this project, we created a rack structure so that we could increase crop yield in a limited space by building racks on top of one another. We are employing sensors in this simulated environment to keep an eye on the temperature, humidity, and air quality.

REFERENCE

[1] "Greenhouse automation system," by Uday A. Waykole and Dhiraj G. Agarwal. The July 2015 issue of International Journal of Latest Trends in Engineering and Technology (IJLTET), Volume 5.

[2] Study of Photosynthetic Properties in Spinach and Geranium: Pigments, Starch Production, and Light Wavelength Absorption, Alison Lederer. Art. 29 in ESSAI, Vol. 5 [2007], 1-1-2007.

[3] "Artificial- Lighting Source for Plant Growth," by Hau-Chen Yen, Ching-Ran Lee, and Shun-Yu Chan. International Conference on Power Electronics and Drive Systems, 10th IEEE, 2013 (PEDS).

[4] Urban Barns Report, McGill University, May 5, 2014 "LEDs: Shedding Light on Optimizing Plant Production," by Polina Fateeva and Mark Lefsrud. McGill College.

[5] "Quantifying Water Savings with Greenhouse Farming," by Kelsey A. Czyzyk, Shayne T. Bement, William F. Dawson, and Khanjan Mehta. The 2014 Global Humanitarian Technology Conference.