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Smart Multifunctional Motor Stater for Farmer

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Abstract: *India is the country of agriculture. Agricultural sector is very important as far as villager's point of view. Productivity of agriculture field's depends on a main factor: water supply. Irrigation is a scientific process of artificially supplying water to the land or soil that is being cultivated. Agriculture motor is used to irrigate field by pumping ground water to the surface. This project ease the farmer's work by controlling their field's motor by their mobile The integration of these technologies enables remote control and monitoring of the stator motor, providing enhanced functionality and convenience in various applications. This report outlines the system architecture, hardware components, software implementation, and potential use cases for the smart multifunctional stator motor. The "Smart Multifunctional Stator Motor for Farmers" is a system designed to provide advanced functionality and remote control capabilities to agricultural applications. The system utilizes a multifunctional stator motor combined with technology to enable farmers to monitor and control various agricultural operations using their mobile devices. Traditionally, farmers have relied on manual control and monitoring methods, which can be time-consuming and inefficient. The proposed system aims to enhance productivity and convenience by leveraging automation and remote connectivity. The multifunctional stator motor serves as a versatile and adaptable component that can be integrated into various agricultural machinery and equipment.*

Keywords: Agriculture

I. INTRODUCTION

India is basically an agricultural country, and all its resources depend on the agricultural output. Even in the modern span of industrialization, agriculture is the key area that decides the economic growth of the country. Agriculture also accounts for 8.56% 0f the countries total exports. Agriculture is the most important field has compared to others in India the underground water level is slowly falling down and as well as rainfall is also reduced due to deforestation. In order to get the maximum yield in agricultural process, it is necessary to supply the optimum quantity of water and it should be supplied periodically.

This project easy the farmer's work by controlling their field's motor by their mobile this is achieved only through a systematic irrigation system. Irrigation is the science of planning and designing an efficient, low-cost, economic irrigation system designed in such a way to fit natural conditions. By the construction of proper distribution system and providing of adequate water supply will increase the yield of This project is used to control the agricultural motor using ESP32 module according to the moisture of the soil and it also indicates the status of the field on the LCD. The system will sense the moisture by soil moisture sensor and it will ON/OFF the agriculture motor. The system is fully controlled by microcontroller. Microcontroller is programmed according to the desired operation when the soil is in dry condition. The moisture sensor senses it. The LCD displays the status on the display screen. The farmer receives the text message that the field is in dry condition. So, farmer can on the motor from his mobile itself instantly from anywhere.

1.1 Project Statement:

- Most of the agriculture lands in India are highly productive but the problem lies in irrigation.
- Irrigation plays a dominant role in agriculture most of the productive lands use ground waterirrigation since there is no proper rainfall in present situations.
- The basic need that is electricity, as we know that Indian electricity has 0.5Probability it may or may not be present at any instant.

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With this irregular power cuts it is very difficult to depend on ground water irrigation, but there is no alternative. So to overcome this problem we need to utilize electricity whenever it is present.

1.2 Features

- Scheduling and Timer: The system can include a scheduling feature that allows farmers to set specific time intervals for motor operation. They can program the motor to start and stop automatically at designated times, ensuring efficient water management and reducing the need for constant monitoring.
- Real-time Monitoring: The motor control unit can provide real-time monitoring of various parameters such as motor status, power consumption, voltage, and current. This information can be accessed through a mobile application or SMS alerts, enabling farmers to stay updated on the motor's performance and detect any issues promptly.
- Fault Detection and Alerts: The system can incorporate sensors and algorithms to detect motor faults or anomalies. In case of any malfunction, the farmer can receive immediate alerts via SMS, notifying them about the problem. This enables timely maintenance or repair actions, reducing downtime and preventing potential damage to the motor.
- Energy Efficiency: The smart starter motor can include energy-saving features such as automatic shutdown after a specific idle period or power optimization algorithms. This ensures efficient energy utilization and cost savings for farmers.

1.3 Basic concepts:

The ESP32 module is connected to Arduino. When the farmer shoots a message to turn ON the motor, it will be received by the ESP32 module. Then ESP32 module forwards this message as a signal to the Arduino board. After this, the Arduino will make the relay input HIGH, resulting in turning ON the motor pump and this way our smart irrigation system will start supplying the water to crops. The procedure remains same while turning OFF the motor. This time the farmer will send a message to turn OFF the motor, and the relay output will be made LOW which is then followed by the shutdown of the water pump.This project is used to control the agricultural motor using ESP32 module according to the moisture of the soil and it also indicates the status of the field on the LCD. The system will sense the moisture by soil moisture sensor and it will ON/OFF the agriculture motor. The system is fully controlled by microcontroller. Microcontroller is programmed according to the desired operation When the soil is in dry condition. The moisture sensor senses tithe LCD displays the status on the display screen. The farmer receives the text message that the field is in dry condition. So, farmer can on the motor from his mobile itself instantly from anywhere

II. LITRATURE SURVEY

1.Zuraida Muhammad, Muhammad Azri Asyraf Mohd Hafez, Nor Adni MatLeh, Zakiah Mohd Yusoff , Shabinar Abd Hamid [1] The term "Internet of Things" refers to the connection of objects, equipment, vehicles, and other electronic devices to a network for the purpose of data exchange (IoT). The Internet of Things (IoT) is increasingly being utilised to connect objects and collect data. As a result, the Internet of Things' use in agriculture is crucial. The idea behind the project is to create a smart agriculture system that is connected to the internet of things. The technology is combined with an irrigation system to deal with Malaysia's variable weather. This system's microcontroller is a Raspberry Pi 4 Model B. The temperature and humidity in the surrounding region, as well as the moisture level of the soil, are monitored using the DHT22 and soil moisture sensor. The data will be available on both a smartphone and a computer. As a result, Internet of Things (IoT) and Raspberry Pi-based Smart Agriculture Systems have a significant impact on how farmers work. It will have a good impact on agricultural productivity as well. In Malaysia, employing IoT-based irrigation systems saves roughly 24.44 percent per year when compared to traditional irrigation systems. This would save money on labour expenditures while also preventing water waste in daily needs.

2. Divya J., Divya M.,Janani V. [2] Agriculture is essential to India's economy and people's survival. The purpose of this project is to create an embedded-based soil monitoring and irrigation system that will reduce manual field monitoring and provide information via a mobile app. The method is intended to help farmers increase their agricultural output. A pH sensor, a temperature sensor, and a humidity sensor are among the tools used to examine the soil. Based

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on the findings, farmers may plant the best crop for the land. The sensor data is sent to the field manager through Wi-Fi, and the crop advice is created with the help of the mobile app. When the soil temperature is high, an automatic watering system is used. The crop image is gathered and forwarded to the field manager for pesticide advice.

3. H.G.C.R. Laksiri, H.A.C. Dharmagunawardhana, J.V. Wijayakulasooriya [3] Development of an effective loT-based smart irrigation system is also a crucial demand for farmers in the field of agriculture. This research develops a low-cost, weather-based smart watering system. To begin, an effective drip irrigation system must be devised that can automatically regulate water flow to plants based on soil moisture levels. Then, to make this water-saving irrigation system even more efficient, an IoT-based communication feature is added, allowing a remote user to monitor soil moisture conditions and manually adjust water flow. The system also includes temperature, humidity, and rain drop sensors, which have been updated to allow remote monitoring of these parameters through the internet. In real time, these field weather variables are stored in a remote database. Finally, based on the present weather conditions, a weather prediction algorithm is employed to manage water distribution. Farmers would be able to irrigate their crops more efficiently with the proposed smart irrigation system.

4. Anushree Math, Layak Ali, Pruthviraj U[4] India is a country where agriculture plays a vital role. As a result, it's critical to water the plants wisely in order to maximise yield per unit space and so achieve good output. Irrigation is the process of providing a certain amount of water to plants at a specific time. The purpose of this project is to water the plants on the National Institute of Technology Karnataka campus with a smart drip irrigation system. To do this, the open source platform is used as the system's fundamental controller. Various sensors have been employed to supply the current parameters of components that impact plant healthiness on a continual basis. By controlling a solenoid valve, water is provided to the plants at regular intervals depending on the information acquired from the RTC module. The webpage may be used to monitor and manage the complete irrigation system. This website contains a function that allows you to manually or automatically control plant watering. The health of the plants is monitored using a Raspberry Pi camera that gives live streaming to the webpage. The controller receives water flow data from the water flow sensor through a wireless network. The controller analyses this data to see if there are any leaks in the pipe. Forecasting the weather is also done to restrict the quantity of water given, making it more predictable and efficient.

5. Dweepayan Mishra, Arzeena Khan, Rajeev Tiwari, Shuchi Upadhaye [5] Agriculture is a substantial source of revenue for Indians and has a huge impact on the Indian economy. Crop development is essential for enhanced yield and higher-quality delivery. As a result, crop beds with ideal conditions and appropriate moisture can have a big influence on output. Traditional irrigation systems, such as stream flows from one end to the other, are usually used. As a result of this delivery, the moisture levels in the fields can alter. A designed watering system can help to enhance the management of the water system. This research proposes a terrain-specific programmable water system that will save human work while simultaneously improving water efficiency and agricultural productivity. The setup is made up of an Arduino kit, a moisture sensor, and a Wi-Fi module. Data is acquired by connecting our experimental system to a cloud framework. After then, cloud services analyse the data and take the necessary actions.

6. R. Nageswara Rao, B.Sridhar [6] Agrarian countries like India rely heavily on agriculture for their development. Agriculture has always been a roadblock to the country's development. Smart agriculture, which comprises modernising present agricultural systems, is the only answer to this challenge. As a result, the suggested strategy attempts to use automation and Internet of Things technologies to make agriculture smarter. Crop growth monitoring and selection, irrigation decision assistance, and other uses are possible thanks to the Internet of Things (IoT). To modernise and boost crop yield, a Raspberry Pi-based autonomous irrigation IOT system has been proposed. This project's main purpose is to produce crops using the least amount of water possible. Most farmers waste a lot of time in the fields in order to focus on water available to plants at the appropriate time. Water management should be improved, and the system circuit's complexity should be minimised. Based on the data collected from the sensors, the suggested system determines the amount of water required. Two sensors detect the humidity and temperature of the soil, as well as the humidity, temperature, and length of sunshine each day, and send the data to the base station. Based on these characteristics, the recommended systems must calculate the irrigation water quantity. The key benefit of the system is the integration of Precision Agriculture (PA) and cloud computing, which will reduce water fertiliser consumption while increasing crop yields and assisting in the evaluation of field weather conditions.

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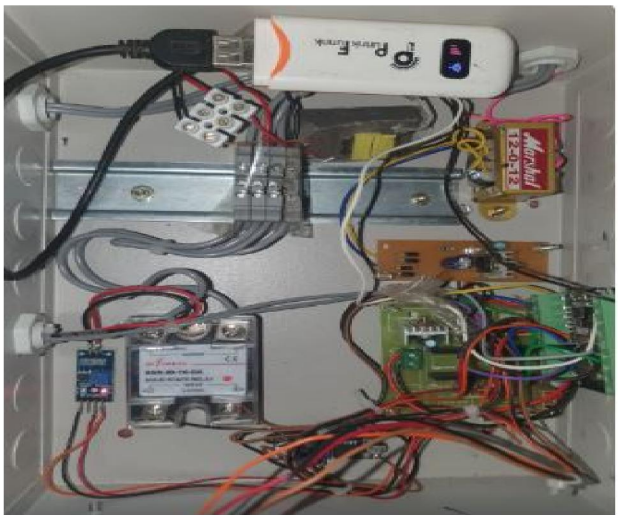
III. METHODOLOGY

A remote-control application will help or guides the farmers to perform the operation like turn on and turn off the motor once the message is received to them. The motor can be turn on and turn off automatically by using the mobile phone by sending a text message. A microcontroller-based control panel is designed to control and monitor the level of well and bore well. Principally, in the agricultural irrigation the motor is associated to the control panel. The control panel checks the generally known problems and rectify it prevent the motor from damage. The identified faults that might happen are phase sequence change, dry running of motor, over load situation and absence of a phase. Microcontroller is programmed to check the faults and level in both well and bore well through commands of the user. The messages are received from the user mobile to do particular task. Based on the received signals, the signals are sent to the microcontroller to switch on/off the motor1 and motor2 through the starter using the two relays circuit. The relays are controlled by the ports. Serial Port Adapter works in data and requires to be appropriately configured. Microcontroller was already programmed to perform specified task. When the command STATUSCHK is received by the microcontroller, it checks status of the motor and level in well and bore well. And then the microcontroller sends message to the user related to condition of level in well as well as bore as well. It follows that the user only decides HBRP Publication Page 1-6 2021. All Rights Reserved Page 4 Journal of Advancement in Communication System Volume 4 Issue 1 which motor is going to on/off. B. SMS Approach SMS is stored and forwarded in the way of transmitting messages between Mobile phone.

IV. RESULTS AND DISCUSSION



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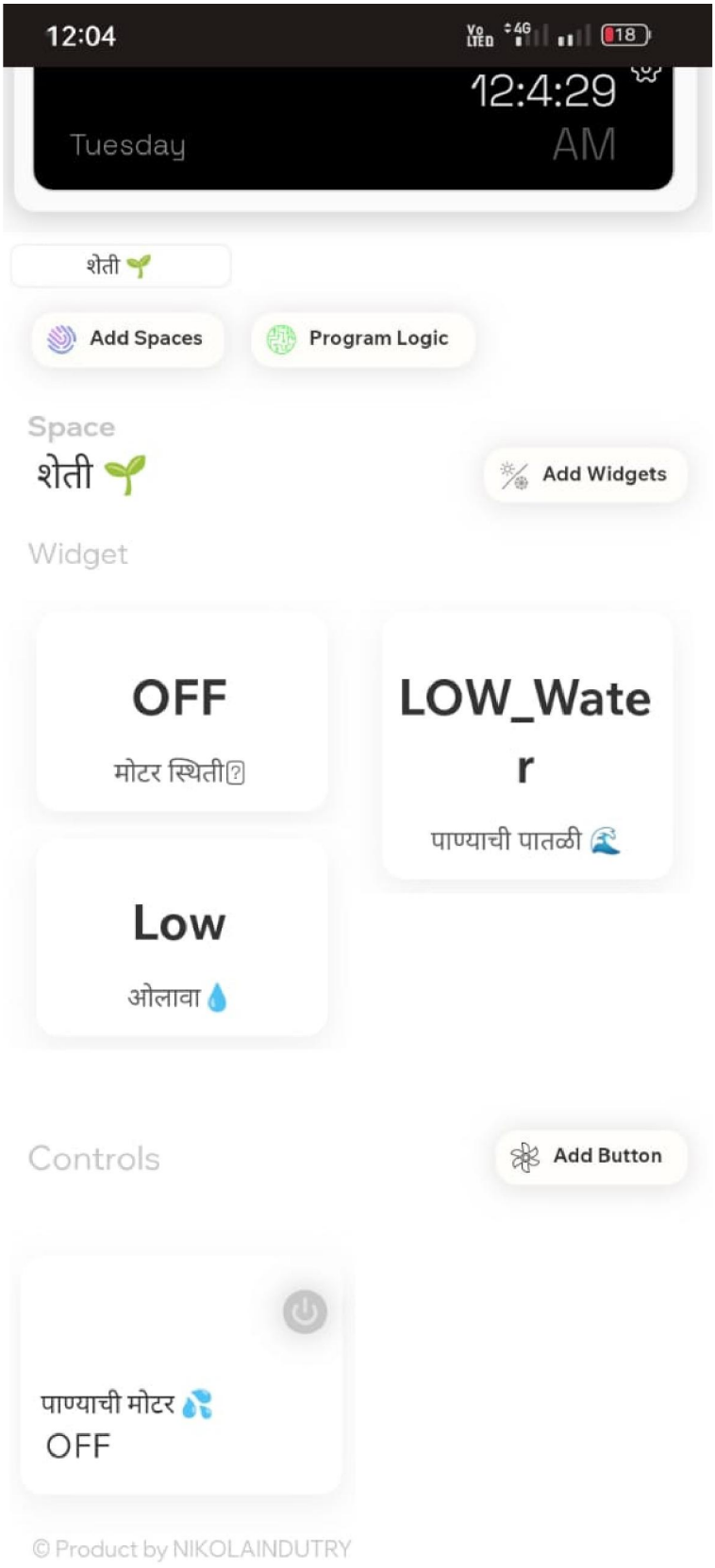

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V. CONCLUSION

The integration of ESP32 and Arduino technology into a stator motor system offers advanced functionality and convenience. The smart multifunctional stator motor system facilitaes remote
Control and monitoring , providing improved efficiency , flexibility , and adaptability in system ensures protection of motor against overloads , dry run and phase imbalances. It likewise gives automated restarting if typical conditions are restored. Uniform distribution of water at regular intervals , reduction in laborcast , minimization of occurrences of motor faults and intimation to user about the completion of task are the major advantage of this system. The utilization of mobile phone has gotten more normal among the farmers and hence utilize.

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