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Intelligent Irrigation System Hosted Online

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Abstract- Rural modernisation may be sparked by fusing conventional methods with cutting-edge technologies like the Internet of Things and wire-less sensor networks. Device based on the Internet of Things capable of parsing observed data and sending it on to the client. It is possible to use this device in agricultural settings, monitoring things like crops, soil, water levels, water weight, and engine performance from afar. This project is structured to show the methods for dealing with concerns like determining which soil type produces the best yield, how much water is in the soil, how wet it is, and so on. Sensors and technical devices such as the Raspberry Pi and a DC motor are integrated with Python material for this project. The agricultural sector, the backbone of the Indian economy, deserves protection. Not only do valuable assets need protection, but so do newly developed agricultural products.

Keywords: *IoT (Internet of Things), Raspberry Pi (RPi), DC motor, Soil Moisture Sensor, and Gardening.*

INTRODUCTION

Due to agriculture's central role in the economies of most nations, the process of horticulture production is always being refined. The widespread deployment of an IoT (Internet-of-Things) infrastructure has been facilitated by developments in embedded devices, neighborhood remote availability, and efforts in defining communication norms and equipment for joining systems to IP (Internet Protocol) based Internet. The project's overarching objective is to enhance product quality while also maintaining a sustainable agriculture via the collection of continuous data from the planet. As a result, there is a need to upgrade the horticultural processes' assets, especially the water system infrastructure. The amount of water needed for various harvests varies with each crop's stage of growth. The amount of water provided by siphon is insufficient to ensure the plants' healthy growth. This technique, you can water the crop appropriately by monitoring its moisture content. Seventy percent of the freshwater used today goes to irrigate crops. Reducing this rate is possible via efficient water board procedures. This project makes efficient use of water by applying it precisely where it's needed, when it's needed, and in the right quantity. It has several benefits, including improved yield quality, water reserve funds, and cash investment funds. The most crucial agricultural technique is related to the water system since it may be managed and modified to better suit the plants' growth. connected devices of the internet of

The wide variety of sensors and hardware now in use in farming and with domesticated animals has the potential to unleash brand-new applications.

PROBLEM STATEMENT

Ranches need to be automated since they often lack resources like labor, water, and so on. The soil moisture and temperature sensors are spaced out throughout the landscape. The ability to remotely operate many machines is a direct result of robotics. The goal of the proposed project is to use IoT to measure various soil properties and base water delivery needs on the measured data.

LITERATURE SURVEY

Description:

Even today, different developing countries are also using traditional methods and backward techniques in agriculture sector. Little or very less technological advancement is found here that has increased the production efficiency significantly. To increase the productivity, a novel design approach is presented in this paper. Smart farming with the help of Internet of Things (IOT) has been designed. A remote controlled vehicle operates on both automatic and manual modes, for various agriculture operations like spraying, cutting, weeding etc. The controller keeps monitoring the temperature, humidity, soil condition and accordingly supplies water to the field.

(1) Name: IOT for smart farm: A case study of the Lingzhi mushroom farm at MaejoUniversity
Author: Oran Chieochan ; Anukit Saokaew ; Ekkarat Boonchieng (Springer 2015)

Description:

An intelligent Lingzhi mushroom farm prototype is the end goal of this study. The humidity at a Lingzhi mushroom farm was measured and monitored using IOT and a sensor in this study. NECTEC created and offered NETPIE as a free solution for IOT to handle humidity data. The humidity readings were sent to a NET FEED (a NETPIE sub service) and made available on smartphones and PCs through the NET FREEBOARD service. This study also sent messages to users through the LINE API on the LINE app on the operational status of sprinkler and fog pumps (including when they were turned on and off and for how long). NodeMCU, humidity sensor, real-time clock, relay module, sprinklers, and fog pumps were all used in this study. The languages utilized for development were C++ and Node.JS. NETPIE (Network Platform for internet of things) and its associated subservices NETPIE FEED, NETPIE FREEBOARD, and NETPIE REST API were the protocols and services used. The study found that the smart farming prototype benefited from combining IoT and the sensor.

(2) Name: Empirical test of Wi-Fi environment stability for smart farm platformAuthor: O JiHye ; Dong-Hee Noh ; Young-Ho Sohn (IEEE 2016)

Description:

With world population growth, increasing agricultural production with a declining agricultural workforce has brought a new spotlight on agricultural ICT. As the cultivable land in South Korea is relatively small, farmers prefer the high productivity of greenhouse cultivation. In this case, labour efficiency can be achieved by developing an integrated smart platform to collect environmental information and control the greenhouse facility. This requires the construction of a network to transfer the sensed information to the control server and transfer commands from the control server to the control device. When installing a Wi-Fi communication network inside a greenhouse, verifying the communication stability is crucial. Therefore, this study measured the wireless communication transmission/reception ratio and confirmed that the communication distance varied according to the crop density.

Name: SMART FARMING: SENSING TECHNOLOGIES Description:

India relies heavily on agriculture. Soil health rapidly declines as land and surface and ground water supplies are depleted. In this study, we describe an Internet of Things (IoT)-based agricultural production system for balancing agricultural product supply and demand via research into, and implementation of, environmental sensors and a prediction system for crop growth and yield. Although it is possible to make quantitative predictions about the demand for agricultural products based on the amount of food consumed, it is currently impossible to predict how much agricultural products will be harvested or how many pests and diseases will strike a given farm. The proposed study addresses this challenge by developing an Internet of Things (IoT)-based agricultural environment monitoring system and a strategy to enhance the effectiveness of decision making via the examination of harvest data. Indian farmers would be able to access up-to-date data on agricultural inputs and crop production methods. The Internet of Things is the networked computing of everyday objects that promises vast improvements in productivity, economic development, and human well-being. It's empowering farmers to take on the massive issues facing their sector and the world at large. In order to meet the demands of a growing worldwide population, the business must face challenges like as dwindling water supplies, scarce land, and high consumer prices. The only way to solve this issue is to introduce smart agriculture by updating conventional farming practices. The system's ultimate goal is to use automation and IoT technology to create "smart" farming. The clever GPS-based remote operated robot is one of the model's standout characteristics. All of these functions may be managed from afar using a standard smart phone or sensors, Wi-Fi or ZigBee modules, cameras, actuators, and a Raspberry Pi will serve as the brains of the Internet-connected computer.

(3) Name: Design of a fuzzy-based automated organic irrigation system for smart farmDescription:

Irrigation system plays a very important role in organic farming. It provides the necessary water requirement for the whole farm. But it is necessary for the irrigation system to be efficient, especially in providing the optimal distribution of available water resources. Also, since the water from an irrigation system will come from an underground reservoir, it requires electrical water pump to collect water. In a smart farm, proper allocation of resources is required. In order to control the usage of water resources for irrigation, this paper proposes the design of an automated organic irrigation system in controlling and properly allocating the available water resources for the irrigation system and available electricity for the use of the pump. Experiments through MATLAB simulation were done using a proposed system to achieve the optimum water and electrical resource distribution.

PROPOSED SYSTEM

The proposed system will replace the traditional system of Existing VDMA system with newOffline, Fast & Reliable system.

A. **Motivation for System** :

The most beneficial development for the average Indian is the widespread adoption of sensor systems for use in farm monitoring. As farming is the major source of employment, increasing profits while decreasing expenses, time, and labor is essential. The data collected from farms is stored in a database and then analyzed using IoT. Raspberry pi, Internet of Things (IoT), and sensors provide a challenge for testing in the context of a secure Farm Management System for agriculture businesses. Temperature, humidity, soil moisture content, and flame are monitored and evaluated as test results. Physical factors such as temperature, humidity, and fire risk are being used to make decisions in the agricultural industry.The downsides of this approach include an increase in labor costs and time, as well as the impossibility of regular monitoring. In the homestead, you must put in a lot of physical effort. In this research, a variety of sensors are used to finish the water system procedure in a timely manner. When the moisture level in the soil drops below a certain threshold, a soil moisture sensor is used to switch the water siphon over to the new field automatically. The DHT11 Module may provide approximations of both temperature and humidity. Ace The design makes use of the slave correspondence convention, whereby one device (the ace) commands one or more devices (the slaves). Smart ranch monitoring with IoT collects data from different types of sensors that act as slaves and sends it to the primary server using a Raspberry pi, which is an expert, and the parameters may be seen on an LCD display.

1. ARCHITECTURE

This section will give us an idea about the system architecture and the flow of the system.

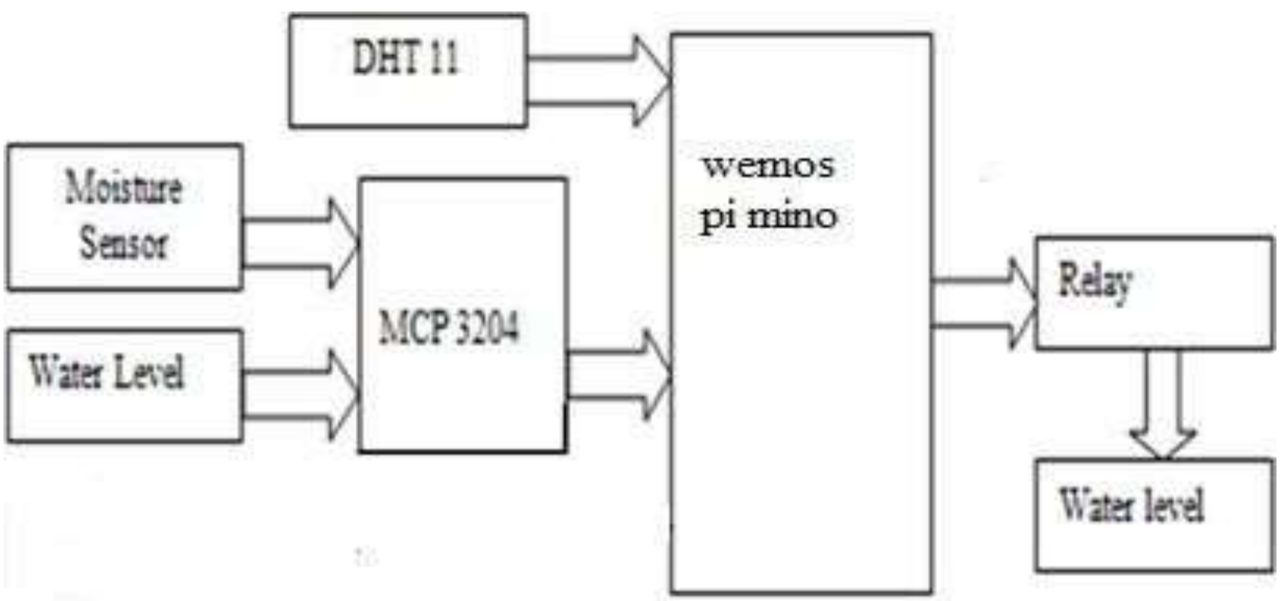

Figure 1 : System Architecture.

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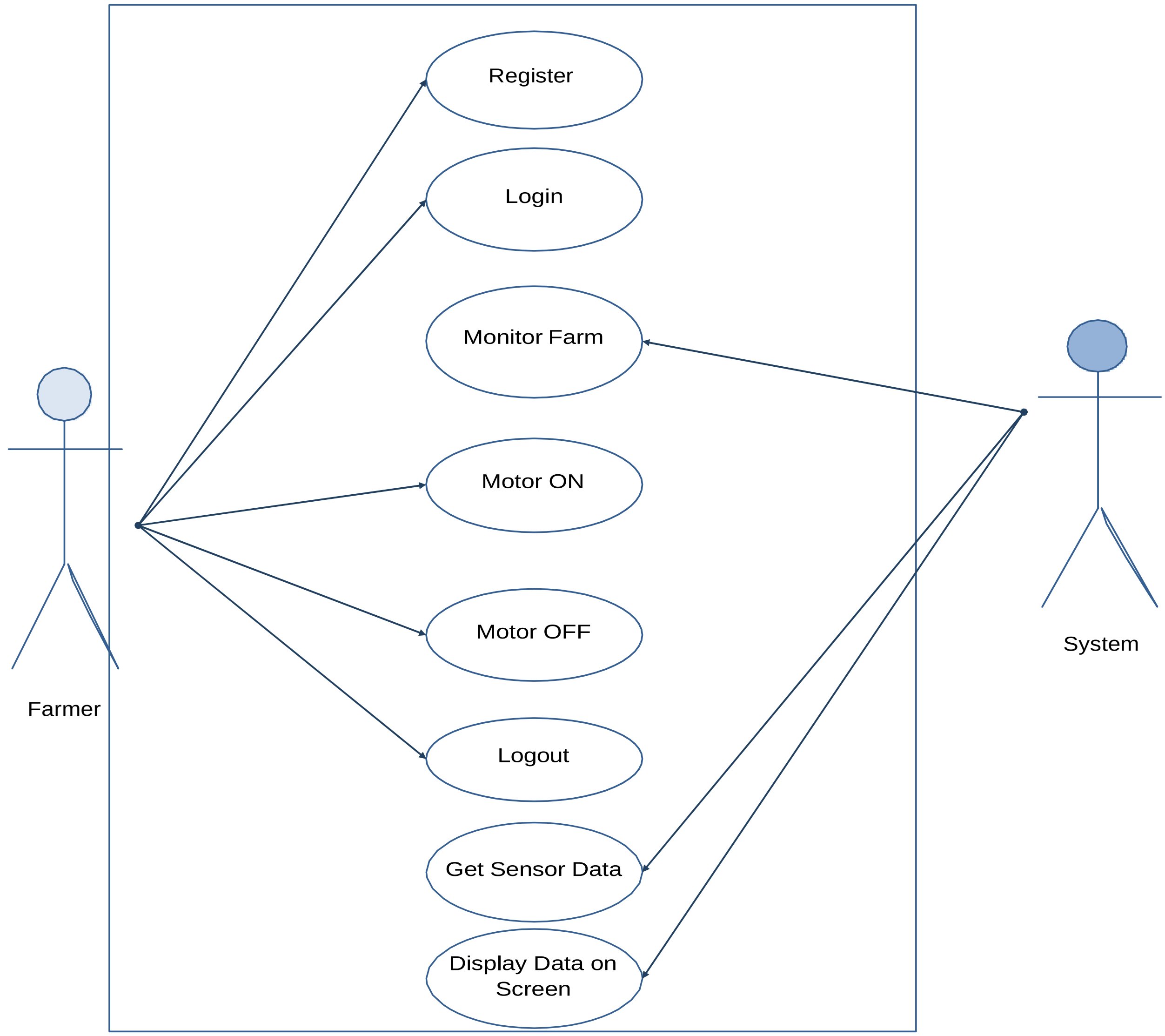

Figure 2 Use Case

In Figure 2, A Use Case Diagram is shown, a Use case diagram is a simple graphical representation of a user's interaction with the system and which also depicts the specifications of a use case. A use case diagram can represent the different types of users existing in a system and the multiple ways in which they interact with the system.

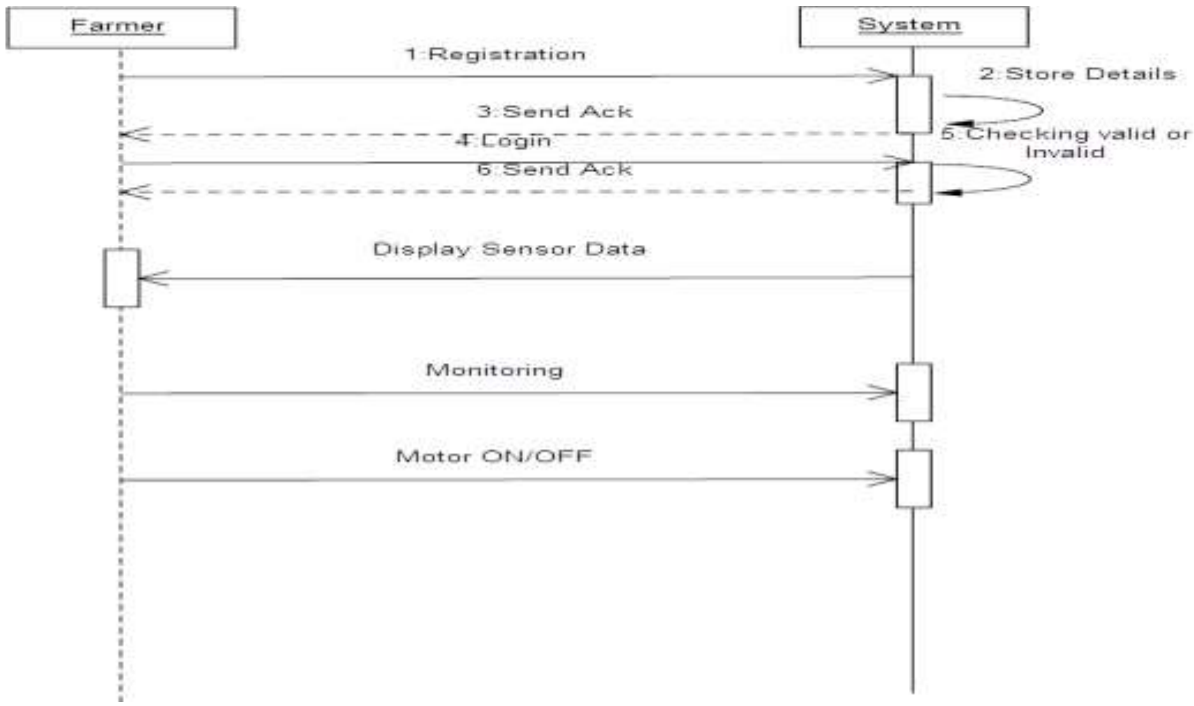

Figure 3 Sequence Diagram for PLM User

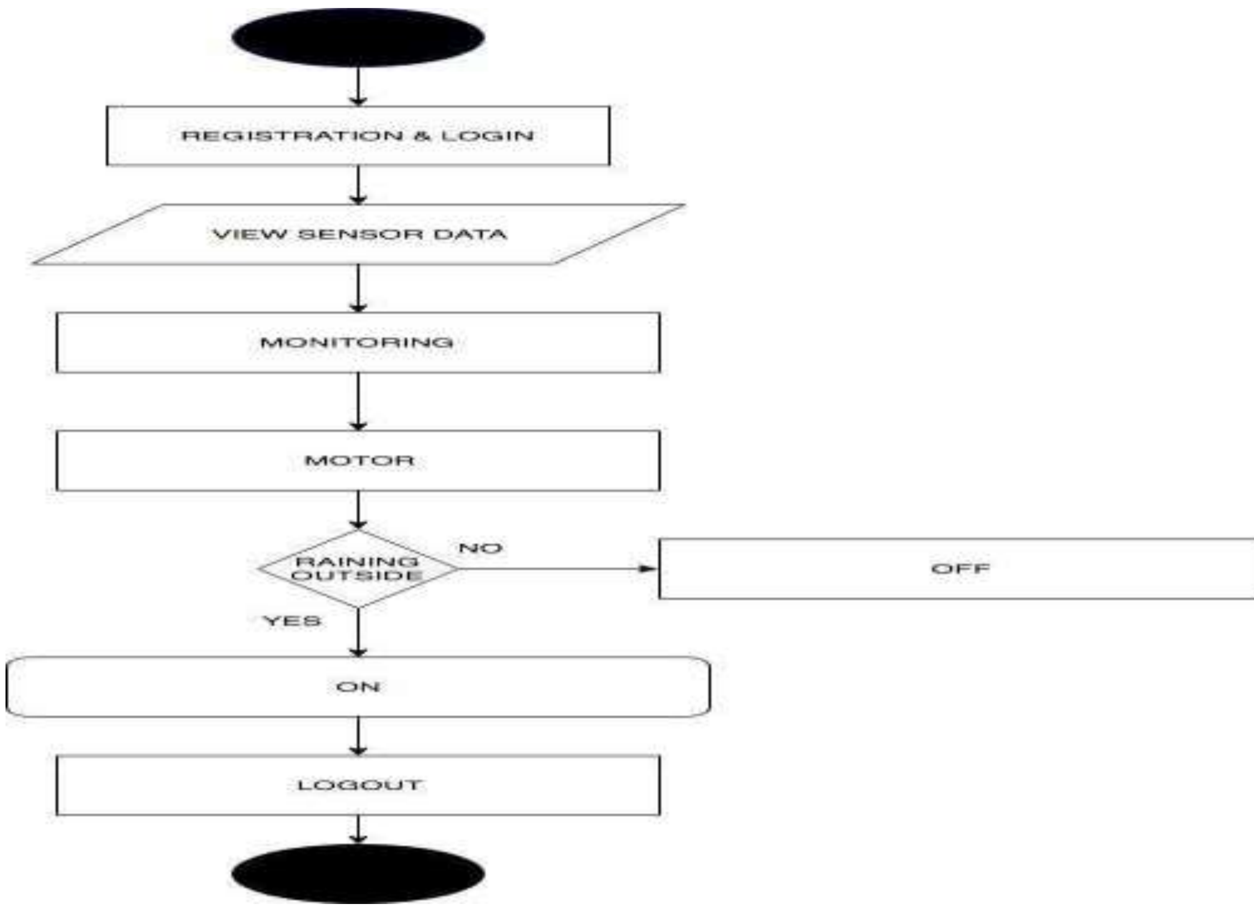

Figure 4 Sequence diagram for Manufacturer.

ADVANTAGES & APPLICATIONS

1. Expanded Production – Improved yield treatment, for example, exact planting, watering, pesticide application and reaping straightforwardly influences creation rates.

2. Water Conservation – Climate forecasts and soil dampness sensors take into account water utilize just when and where required.

3. Brought down Operation Costs – Mechanizing forms in planting, treatment and collecting can diminish asset utilization, human blunder and in general expense.

4. Remote Monitoring – Neighborhood and business ranchers can screen numerous fields in different areas around the world from a web association. Choices can be set aside a few minutes and from anyplace.

5. Hardware Monitoring – Cultivating hardware can be observed and kept up as indicated by creation rates, work viability and disappointment forecast.

7. CONCLUSION & FUTURE SCOPE

With the rising need to preserve water and power, an increasingly advance watering framework should be created. An affordable framework that can tell if watering is required dependent on climate conditions as well as other surrounding parameters, tells about market rate and aides in choosing ideal yield for specific kind of soil. With the assistance of K-Means Algorithm all the preparing work is done. On the off chance that there is any adjustment in the earth, at that point the Algorithm does all the handling work with the assistance of the computational power in the system. All sensors screen the natural condition and as indicated by this conditions raspberry pi takes its choice. The engine will be consequently killed if it's drizzling outside or dampness of soil is more or sufficient

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