

A Study on Smart Farming Using IoT

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ABSTRACT

Internet of Things (IoT) expertise has brought revolt to each and every field of shared man's life by making everything smart and intelligent. Upgrading of the farming process is one of the crucial steps for a country like India, which has farming as back bone. Smart Farming shrinks waste of water, enrichers and rises the crop yield. This includes various structures like GPS based remote controlled observing, intruders scaring, security, leaf wetness, moisture & temperature sensing, and proper irrigation services. The rank buildings of this project includes smart GPS based remote measured robot to perform tasks like clearance, scattering, humidity sensing, birdie and animal scaring, possession vigilance, etc.

Keywords : IoT, Sensors, GPS, Microcontroller, Wi-Fi, Soil moisture sensor, Precision Farming (PA), Smart farming.

I. INTRODUCTION

India is a Farming oriented country. 60% of Indian people has Farming as their leading business or adjacent business. As the world is trending towards new implements and executions, it is necessary goal to trend up in Farming too. Unluckily, many farmers still use the outdated methods of farming which grades in low yielding of crops and fruits. But wherever mechanization had been fulfilled and human beings had been swapped by accepted technologies, the yield has been improved. This aims at making Farming smart using computerization and IoT technologies. The important features of this paper includes smart GPS that are used to built remote controlled robot to perform tasks like: weeding, spraying, moisture sensing, bird and animal scaring, keeping watchfulness, etc., Then it includes smart irrigation with smart button based on real time field data. Also smart warehouse managing which includes; temperature conservation, humidity maintenance and

theft detection in the warehouse. Observation of all these operations will be through any remote smart device or computer linked to Internet and the procedures will be done by interfacing sensors, Wi-Fi or ZigBee modules and raspberry pi.

II. IoT-INTERNET OF THINGS

The Internet of Things is the system of devices, motors, home-based appliances, and other items surrounded with computer electronics, software's, sensors, actuators, and connectivity which allows these things to link and interchange data, creating chances for more direct combination of the physical world into computer-based systems, consequential in effectiveness faultlessness, economic benefits, and rapid human actions.

III. IOT TECHNOLOGY & FARMING

Internet of Things- The term “Things” in IoT refers to numerous IoT devices having exclusive individualisms and have abilities to perform isolated sensing, initiating and live perceiving of positive sorts of data. IoT plans are also capable to have live interchange of data with other linked strategies and plans either straight or secondarily, or gather data from other approaches and sequence .The term “Internet” is defined as Worldwide Message network assembly stacks of CPUs across the planet allowing distribution of material. As forecasted by various researchers, 50 Billion devices based on IoT would be allied all across the planet by year 2022. The Internet of Things (IoT) has been definite as an active international network culture with self-configuring skills based on average and interoperable message modesties where physical and simulated things have types, physical structures, and virtual characters and use bright limitations and are perfectly united into the solid link, often link data connected with users.

3.1 Applications in Farming:

- Crop Water Organization
- Accuracy Farming
- Combined Pest Managing
- Food Manufacture & Safety
- Wireless Sensor Monitoring

3.2 IoT in Farming Current and Future Forecasts:

Table shows the growing of IoT based on Farming sector from Year 2000-2018 and Forecasts of year 2035-2050.

YEAR	DATA ANALYSING
2000	450 Million farms connected
2015	540 Million farms connected
2018	645 Million farms connected
2035	770 Million farms connected
2050	2 Billion farms will be connected IoT

IV. HARDWARE

4.1 Zigbee Module:

ZigBee is used for accomplishing wireless communication between Nodes. The range for Zigbee is roughly 50 meters and it can be increased using high power modules or by using network of elements. It functions on 2.4 GHz frequency.



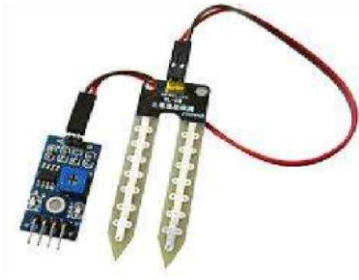
4.2 Temperature sensor:

It is very low cost sensor. It has low output impedance and linear output. The operating temperature range is -55° to +150°C. With rise in temperature, the output voltage of the sensor grows linearly and the value of voltage is given to the microcontroller. [2] which is increased by the translation factor to give the value of actual temperature.



4.3 Soil Moisture Sensor:

Soil moistness sensor processes the water contented in soil. It uses the stuff of the electrical hostile of the soil. The assembly among the splendid stuff and soil moisture is familiar and it differs depending on natural factors such as high temperature, soil type, or electrical conductivity.



4.4 Raspberry pi:

The Raspberry Pi is small compact size processor used to do minor computing and interacting operations [5]. It is the key part in the field of internet of things. It delivers access to the internet and hence the construction of automation system with remote location adjusting device becomes thinkable.



V. SOFTWARE

5.1 Proteus and simulator:

Proteus 8 is one of the best reproduction software for many circuit designs of microcontroller. It has almost all microcontrollers and electric workings readily presented in it and later it is widely used emulator. It can be used to test programs and fixed designs for microelectronics before actual hardware testing. The recreation of software design of microcontroller can also be done in Proteus.

VI. EXPERIMENTATION & RESULTS

The hardware is interfaced with all the sensors in the board. The hardware machineries include the microcontroller, buzzer, relay, ADC converter, GSM module and all the sensors interfaced. The board is injected with a SIM card which is used to interconnect with the owner and the logged values.

The output shown below denotes the temperature, soil moisture condition and the intruder revealing. The second result is the output from the Android app that is advanced in the mobile phone



Fig 6.1: Smart Farming app monitoring



Fig 6.2: Experimental Setup

7. CONCLUSION AND FUTURE WORK

Development of the crop efficiency is a major contest in the countries like India, the technological improvement is a mandatory work to improve the crop production to support and tolerate the need for ever green inhabitants of our nation. In the past some sensor driven web have been proposed to successfully screen the large Farming field. However most of the knowledge does not offer on the data mining technique and extrapolative analysis, which confines the data usage to correct state of the field and accumulate.

VII. REFERENCES

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