

TERM PAPER

ON

Research Methodology (PROJ-CS601)

Submitted in Partial Fulfillment of requirements for the
Award of Degree of Bachelor of Engineering in Computer
Science & Engineering

Submitted By

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HOOGHLY(W.B.)

1. Tell about the final year project that you are parsing.

As we know India is an agriculture-based country. In India Agriculture and its allied activities act as main source of livelihood for more than 80% population of rural India. It provides employment to approximately 52% of labour. Its contribution to Gross Domestic product (GDP) is between 14 to 15%. With a thriving Indian population, predicted to touch 1.64 billion by 2050.

Internet of Things has capacity to transform the lives of people in the world in an efficient manner. The Indian population is growing every year. So, to feed such an immense population, agriculture industry needs to embrace IoT. The demand for more food has to address challenges that include excessive climate conditions, weather change and different environmental affects that results from farming practices.

So, We come to an idea to design an IoT-based smart farming is a system that monitors the agricultural land with the help of sensors (soil moisture, humidity, light, temperature, etc.) and automate the irrigation practices. The farmers can observe the field conditions from anywhere. For example, it will alert the farmer when the soil moisture level is low, the farmer can use sensors to initiate irrigation by android app. That IoT-based smart farming is highly efficient in contrast to traditional methods.

It makes the agricultural practices more precise and well-planned by including processes like soil condition monitoring, and weather prediction and automate the irrigation system. The farmers can administer their fields based on the insights obtained by this system. Moreover, by using mobile devices, high-speed internet, and durable, The system can give up-to-date alerts and data to optimize crop growth processes and to reduce yield loss because of pests, detrimental soil moisture level, or weather damages.

2. What are the different technologies / concepts / theories are used in your project?

Technologies We Use:-

- **Internet of Things (IoT)** : - Internet of Things has capacity to transform the lives of people in the world in an efficient manner. The Indian population is growing every year. So, to feed such an immense population, agriculture industry needs to embrace IoT. The demand for more food has to address challenges that include excessive climate conditions, weather change and different environmental affects that results from farming practices.
- **Android**: - Android is an open source and Linux-based operating system. Here we use Android to develop an mobile application for showing the data and controlling the system from anywhere.
- **Cloud-Computing**: - Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user. The term is generally used to describe data centers available to many users over the Internet. Here we use cloud as online data storage and all the that collected by sensors and further process.
- **DBMS**: - A Database Management System (DBMS) is software designed to store, retrieve, define, and manage data in a database. By the use DBMS we fetch the processed data and show in our android application.

3. What kind of value addition it will do to the current technology / product.

Till what we researched there are few technology or application is available but they have only the soil moisture detection mechanism.

Here we are adding some important features:-

- **Weather**
- **Soil Condition Monitor For Particular Crops**
- **Smart Irrigation System**
- **Advance Weather Report**

4. Who are your clients?

Our Main clients are farmers and gardeners.

5. What are the methods you have used for requirement elicitation?

6. Have you used any standard methodology carry out your project work? Why?

7. Have you done cost estimation for your project? How?

Yes, we have done an approximation of the cost of our project. The amount is Rs.5000. We estimate our project cost from retailer websites based on our research on sensors and micro controllers that we use in our project.

8. Have you done the feasibility study for you project? What are those?

Yes, First we study various online research papers and various company blog on same kind of technologies from there we found by using this technologies (Above Mentioned) and various kind of sensors and other components we required available in market.

9. Why you have selected this topic?

As we know India is an agriculture-based country. In India Agriculture and its allied activities act as main source of livelihood for more than 80% population of rural India. It provides employment to approximately 52% of labour. Its contribution to Gross Domestic product (GDP) is between 14 to 15%. With a thriving Indian population, predicted to touch 1.64 billion by 2050. The Indian population is growing every year. So, to feed such an immense population, agriculture industry needs to improve Indian Agriculture System. So, We decide to develop a IoT-Based Smart Farming system to make our Indian Agriculture System Advance.

10. Questions on technologies / concepts / theories used?

11. How your project-work going to help the society?

Helping our love framers is our project. The following are the points that our farmer's society projects will address:

- **We give knowledge about in which season which crop to farm.**
- **Farmers can monitor their fields from anywhere.**
- **Provide advance weather reports that will allow farmers to plan their future activities according to the weather forecast.**
- **Reduce the need for labor.**

12. What are the social implications of the project?

The project will contribute to the advancement of Indian agriculture. Hard work is known to farmers, but they get knowledge about what smart work is and how they can do it as well.

13. What are your own contributions in the project?

AS A PROGRAMMER

14. How you have break down the project modules and distributes among your team members?

Our team is consist of 6 members Three of our team members are experienced with software technologies such as Android, DBMS, Cloud, Java etc., so we decided to focus on research, analysis, and development of back-end, front-end, and cloud processing. Where The other 3 members know a lot about electronics: how to build circuits, sensors, micro controllers, etc. So they handling hardware parts.

15. Draw flow-chart / block-diagram / data-flow (high level design) diagram for your project?

16. Overall knowledge of the chip / microprocessor / micro controller / tool / kits used to implement the project.

Soil moisture sensor - he Soil Moisture Sensor uses capacitance to measure dielectric permittivity of the surrounding medium. In soil, dielectric permittivity is a function of the water content. The sensor creates a voltage proportional to the dielectric permittivity, and therefore the water content of the soil.

Water pump- water pump mainly depends upon the positive displacement principle as well as kinetic energy to push the water. These pumps use AC power otherwise DC power for energizing the motor of the water pump whereas others can be energized other kinds of drivers like gasoline engines otherwise diesel.

Connecting wire- Connecting wires is allows an electrical current to travel one point to another point on a circuit. most of the connecting wires are made up of copper or aluminum.

MCU-platform-It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espress if Systems, and hardware, which is based on the ESP-12 module.

Relay- Since the relay has 5V trigger voltage we have used a +5V DC supply to one end of the coil and the other end to ground through a switch. This switch can be anything from a small transistor to a microcontroller or a microprocessor which can perform switching operating.

Wifi router - Wi-Fi is a high-speed internet connection and network connection without the use of any cables or wires. The wireless network is operating three essential elements that are radio signals, antenna, and router. The radio waves are keys that make Wi-Fi networking possible. The computers and cell phones are ready with Wi-Fi cards. Wi-Fi compatibility has been using a new creation to constituent within the ground connected with community network

Battery - A battery works on the oxidation and reduction reaction of an electrolyte with metals. When two dissimilar metallic substances, called electrode, are placed in a diluted electrolyte, oxidation and reduction reaction take place in the electrodes respectively depending upon the electron affinity of the metal of the electrodes. As a result of the oxidation reaction, one electrode gets negatively charged called cathode and due to the reduction reaction, another electrode gets positively charged called anode.

17. What all data structure used in the project?

18. Have you used any database for your project? What?

Yet not we started the project but according to our research we can use cloud as a Database but it based on future work.

19. Basic algorithm for database connectivity used in the project?

20. Limitation / constrains of your project?

There are few limitations of our project: -

- Use of Mobile App might be difficult for some farmers that are not familiars to smart phones.

21. What is your future plan with the project?

Our IoT-based project has many scopes for implementation in the future. Agricultural machines and a range of other equipment can be automated in Future.

22. Have you implemented any security layer?

All connection between micro-controller and server is secured using ssl and wpa.

23. What are the methodologies you are going to use to test your project?

24. Tell few test cases for your project? Tell me the test cases where your project has failed?

25. What are the safety and security measure you have taken?

26. Explain the complexity of your algorithm?

27. How you have scheduled your time? What are the progresses (PERT / CPM)?

28. Any literature survey you have done for your project?

29. What is the scope of the project?

In near there will be food crisis due to population. We need a system here we can grow plants more efficiently and with low cost per area. Our model can used in vertical gardening by automating every task that need human interaction.

30. Have done any market survey for the work?

Yes

31. Which architecture you have used?

31. Type of database connection used in your project?