Graphic Era Hill University
DEHRADUN • BHIMTAL • HALDWANI

PROJECT AND TEAM INFORMATION

Project Title

"CLOUD BASED SMART AGRICULTURE SYSTEM"

Student / Team Information

Team Name: *Team #*	*#crop coders*
Team member 1 (Team Lead) *Khan, Akmal – 23011381* *Kamaalparvez786@gmail.com*	
Team member 2 *Gupta ,Naman –230111092* *shwrav123@gmail.com*	

Team member 3 *Kumar , Akarshan*– 211111010 *akarshank12@gmail.com*	
Team member 4 *Kathayat , Mahi – 230122585* *kathayatmahi764@gmail.com*	

PROJECT PROGRESS DESCRIPTION (35 pts)

Project Abstract (2 pts)

In the era of digital transformation, the agricultural sector is under increasing pressure to produce more with fewer resources, while facing challenges such as unpredictable climate conditions, inefficient resource utilization, and rising global food demand. Traditional farming practices, which rely heavily on manual monitoring and subjective decision-making, are often inefficient and unsustainable in the long run.

This project proposes the development of a **Cloud-Based Smart Agriculture System** designed to revolutionize conventional farming methods. By integrating **IoT-based environmental sensors**, **cloud computing**, and **data analytics**, the system continuously monitors critical environmental parameters such as **temperature**, **humidity**, and **soil moisture** in real time. The collected data is processed and stored in the cloud, enabling farmers to access insights anytime, anywhere through a user-friendly interface.

The system supports **automated decision-making** for efficient water management, fertilizer usage, and crop health monitoring. This intelligent approach not only increases crop yield and reduces labor costs but also promotes **sustainable agricultural practices** by minimizing resource wastage and environmental impact. Overall, this project aims to empower farmers with data-driven tools to make informed decisions, enhance productivity, and contribute to the evolution of **smart and sustainable agriculture**.

Updated Project Approach and Architecture (2 pts)

(Describe your current approach, including system design, communication protocols, libraries used, etc. Max 300 words).

-> IoT-Cloud Architecture

-> Data Collection and Transmission

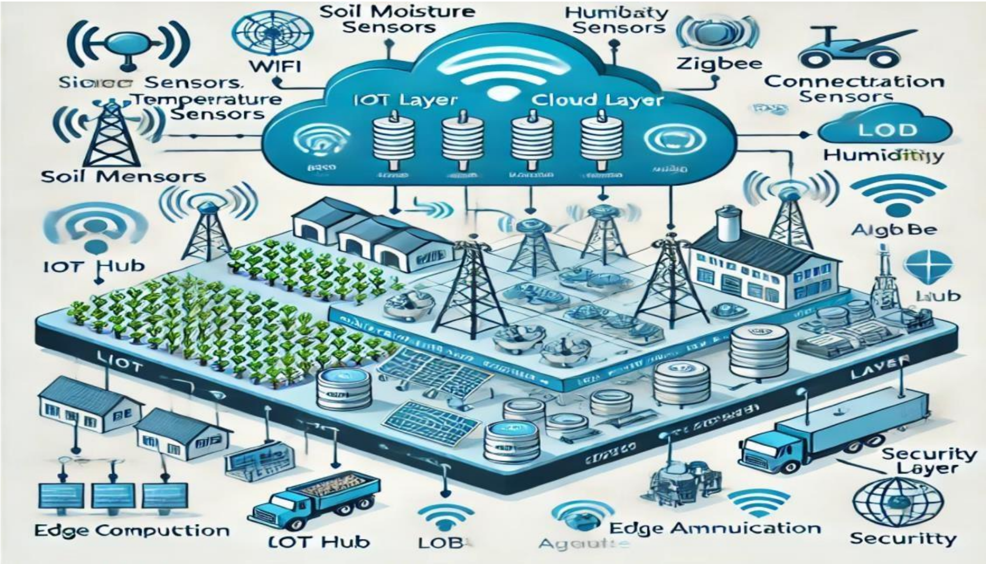
->Cloud Backend and Storage

->Data Processing and Analytics

->Dashboard and Visualization

->Notifications (Optional Future Enhancement)

->Automation and Actuator Control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LAYER
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Edge Compution
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LOB
Edge Amnuication
Security

Tasks Completed (7 pts)

Task Completed	Team Member
Akmal Ahmad Khan	Conducted initial research, and contributed to backend code structuring.
Naman Gupta	Developed core backend logic and server-side integration.
Mahi Kathayat	Sensor data handling and assisted with setting up the cloud database.
Akarshan Kumar	Checking up cloud infrastructure and connectivity and temporary testing

Challenges/Roadblocks (7 pts)

At this stage of our project, we have developed a code ,while doing this, we faced some basic but important challenges:

1. **Sensor Data Inaccuracy**
   Some sensors gave incorrect or fluctuating readings during testing.
   Plan: We will check connections, improve calibration, and filter out bad readings using simple code techniques.
2. **Hardware Connections**
   Connecting the sensors to the microcontroller was sometimes difficult due to loose wires or wrong pin configurations.
   Plan: Double-check wiring and use soldered or stable connections to avoid loose ends.
3. **Data Collection Speed**
   The data was not updating fast enough or had delays.
   Plan: Adjust timing in the code and reduce unnecessary delays to speed up data collection.
4. **Lack of Cloud Integration**
   We haven't yet connected the data to the cloud, which limits remote access.
   Plan: The next step is to send the collected data to a cloud platform like Firebase or AWS IoT.
5. **Team Learning Curve**
   Some team members were new to working with sensors and microcontrollers.
   Plan: We are learning together through online tutorials and sharing tasks based on each person's strengths.

Tasks Pending (7 pts)

(Describe the main tasks that you still need to complete. Max 250 words).

Task Pending	Team Member (to complete the task)
No task pending	

Project Outcome/Deliverables (2 pts)

The expected outcomes include:

->A fully functional cloud-based smart agriculture platform.

->Real-time monitoring dashboard for environmental data.

->Automated irrigation and fertilizer control system based on sensor data.

->Mobile alerts for critical conditions like low soil moisture or extreme temperatures.

->Comprehensive project documentation and user manual

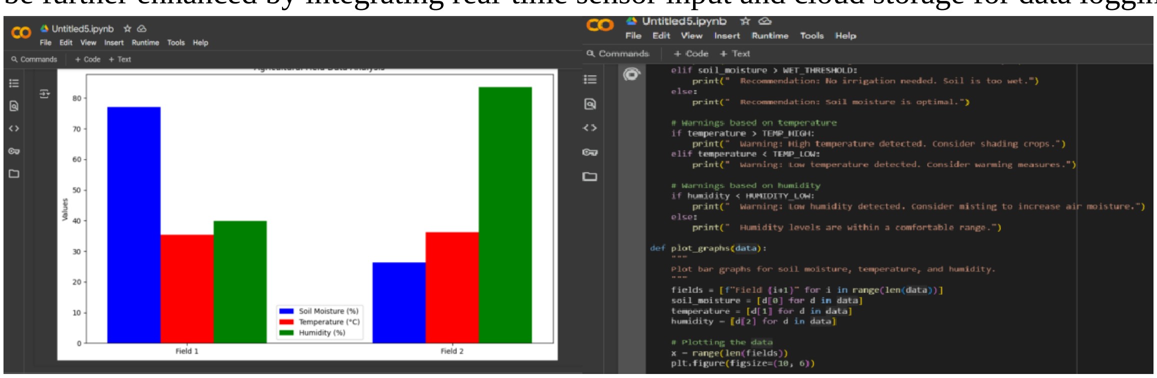
Progress Overview (2 pts)

The team has successfully developed the code(without integration of data and Api) , including temperature, humidity, and soil moisture levels. This marks the completion of the core functionality necessary for further system integration.
This phase of development is **on track**, and the data acquisition process is functioning reliably.
However, components such as **cloud connectivity**, **remote data storage**, and **frontend interface development** are still going on. We ensure stable sensor performance and accurate data readings.
On the other hand, tasks related to **project planning, role allocation, and backend structure design** were completed efficiently.
With the foundational work in place, the project is well-positioned to move forward into the cloud integration and user interface development stages within the planned timeline.

Codebase Information (2 pts)

(Repository link, branch, and information about important commits.)

The Smart Agriculture Monitoring System is developed in **Python** and utilizes the random and matplotlib.pyplot libraries. The random library is used to simulate real-world sensor data for soil moisture, temperature, and humidity by generating values within realistic ranges. The matplotlib.pyplot library is responsible for visualizing this data in the form of bar charts, making it easier to analyze trends across multiple fields. The code begins by taking the number of agricultural fields as input from the user, then generates random sensor readings for each field. It analyzes the data by comparing the values against predefined thresholds for dryness, wetness, high/low temperature, and low humidity. Based on the analysis, the program outputs recommendations such as whether irrigation is needed or if temperature/humidity adjustments are necessary. Finally, the plot_graphs function visualizes the data for all fields, aiding in decision-making for field management. This simple yet effective simulation can be further enhanced by integrating real-time sensor input and cloud storage for data logging.



Testing and Validation Status (2 pts)

Test Type	Status (Pass/Fail)	Notes
Input Handling Test	Passed	Entered both valid and invalid inputs (e.g., strings, negative numbers) for field count
Graph Output	Passed	Checked plot_graphs() with sample data for 3-5 fields
Warning Logic	Passed	Manually set high and low temp and humidity

Deliverables Progress (2 pts)

The project proposal has been successfully completed and received formal approval from all key stakeholders, setting a solid foundation for the work ahead. Currently, the requirements specification is in progress, with the initial draft completed and undergoing thorough review to ensure all needs are accurately captured. The design document is still pending and is scheduled to begin shortly, following the finalization of requirements. Prototype development is actively underway, with about 50% of the initial version completed, allowing the team to start preliminary testing and gather early feedback. The testing plan remains pending and will be developed once the prototype reaches a more mature stage. Finally, the preparation of the final report is planned to start after the testing phase concludes, ensuring a comprehensive and well-documented project closure.