

Project Phase – I , Presentation
on
“PreciFarm - Integrated wired and wireless IOT
solution for Precision Agriculture”

(SPONSORED BY: Infiniti Systems)

(Domain : Embedded Electronics and IoT)

By : Group No. - 02

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PROJECT PHASE – I, OUTLINE

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INTRODUCTION

- IoT has the capability to influence the world we live in; advanced industries, connected vehicles, and smarter cities are all components of the IoT equation.
- Applying technology like IoT to the agriculture industry could have the greatest impact.
- In today's world farming is something which dates many problems.
- The need of the hour is to automize farming and use the trending technologies to solve the major issue.
- PRECIFARM is an Integrated wired and wireless IoT Solution for Precise Agriculture aimed at solving problems using latest technologies available.
- Precision farming based on IoT technologies will enable growers and farmers to reduce waste and enhance productivity ranging from the quantity of fertilizer utilized to the number of journeys the farm vehicles have made.

LITERATURE SURVEY

- In farming maximum production requires certain parameters to be precise and some of them are as follows:
 1. Soil moisture
 2. Soil temperature
 3. Air moisture
 4. Air temperature
 5. UV and light
- The effects of soil salinity on plant growth are various:
 1. Physiological drought
 2. Destruction of normal metabolism
 3. Toxic effect of ions.
- Considering other factors of farming we know that wastage is something which comes into highlight not only water but also fertilizers.



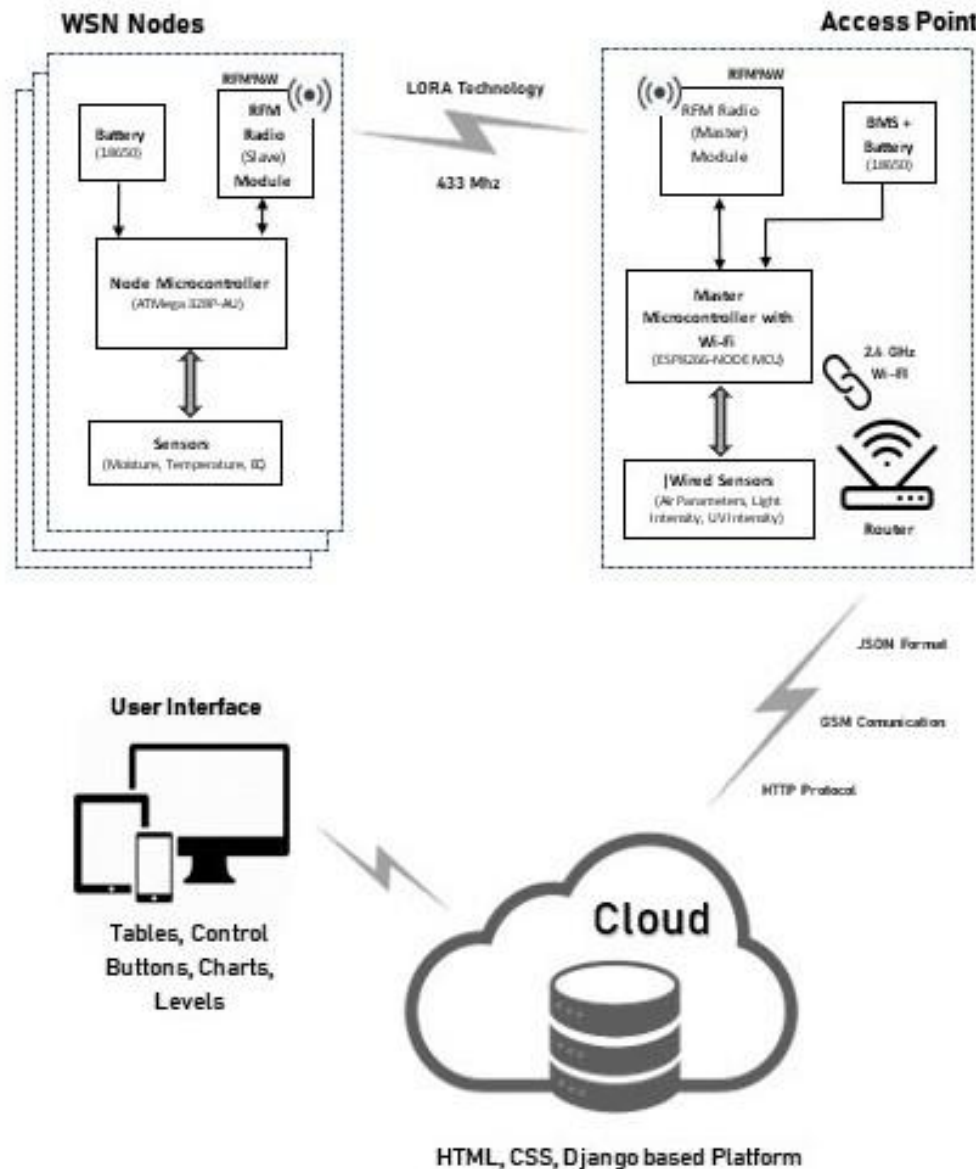
OBJECTIVES

- To precisely monitor the parameters and build a robust interface in order to increase the overall efficiency of agriculture.
- Automation of the overall process along with increasing the efficiency, in order to increase the yield.
- To commercialize the project into a product for future development in the agriculture industry.

MOTIVATION

- Agriculture in today's world holds the utmost importance and working towards its precision is our duty.
- This is a small attempt by us where we have applied our engineering knowledge practically for a better green life tomorrow and a happier farming today.

BLOCKRAM



METHODOLOGY

- Initiation (requirements specification)
 - Listing of Hardware and Software Requirements
 - Selecting of Radio Modules
 - Selecting of Controllers
 - Selection of Battery and Management Systems
- Planning and design
 - Access Point Development (Hardware)
 - Node Development (Hardware + Software)
 - Node and Access Point Integration (Software)
 - Cloud Platform Development (Django)
 - User Interface Development (HTML, CSS)
- Execution (construction and coding)
 - Construction of needed Libraries for LoRa Mesh
 - Hardware Design and PCB Manufacturing
 - Integration of Code from Sensors till cloud
 - Django and Interface Integration Code

METHODOLOGY (CONT..)

- Control and integration
 - PCB Assembly
 - Hardware Integration
- Validation (testing and debugging)
 - Testing and Debugging at every stage
 - Node and Access testing
 - Mesh Testing
 - Access Point with Cloud testing
 - Django Data Handling testing
 - User Interface to Hardware Connectivity and Control
- Closure (installation and maintenance)
 - Design of IPA rated Hardware Enclosure
 - Enclosure for various Sensors
 - 3D Printing of Enclosures

Hardware and Software Requirements

- Hardware:
 - ATMEGA 328P-PU
 - RFM 96W (LoRa Radio Module)
 - ESP8266 12-E
 - WIFI Hotspot
 - Battery Management Systems
 - Battery
 - 3D Printer
- Software:
 - Arduino IDE
 - KiCad
 - Espressif IDE
 - TinkerCad

APPLICATIONS

- **Farming:**

PRECIFARM is a precision agriculture organization focused on ultra-modern agronomic solutions while specializing in the management of precision irrigation.

- **Smart Greenhouses:**

This design intelligently monitors as well as controls the climate, eliminating the need for manual intervention.

For controlling the environment in a smart greenhouse, different sensors that measure the environmental parameters according to the plant requirement are used. We can create a cloud server for remotely accessing the system when it is connected using IoT.

FUTURE SCOPE

- We see PreciFarm as a product which will be used in near future in different types of agriculture methods, helping reduce wastage of resources for farming and helping increase crop productivity.
- In future, we intend to deploy the cloud over Aws based servers, and open with public access.
- Making WSN into product with different types of interfaces.

IMPLEMENTATION PLAN

Work Plan	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020
1.	Listing Features and Sensor Requirements	Making of Components Lists	Starting with master node (Hardware and Programming)	Code for master Station	Node Module Design And code	Implementing LoRa Mesh And Setting up Mesh with master	Starting with Cloud	Frontend & Backend	Integration and Packaging

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