Project Design Phase-I
Solution Architecture

Team ID	PNT2022TMID33417
Project Name	Smart Farmer - IoT Enabled Smart Farming Application

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Using these components its helps a lot in business sector and for farming

1.Solar Panel acts as a power source and offers an opportunity to stabilize the energy cost to the farmers. These solar panels are of three types namely.

➢ Grid solar: This reduces the final cost for the power utilization for the home

and business. The energy generated from the sun is utilized by this panel and earns the credits which are used further.

➢ Hybrid solar: These are used as power bank to the systems which are used for

backup purpose. The power is supplied to the grid via battery bank in the event of power of outage.

➢ Off-grid solar: These type of solar panels are independently used for a remote

location and are limited.

2. Sensors: The sensors structure an organization with one another. An expert sensor can go about as a passage by gathering the sensor readings to the web utilizing portable network. This establishment requires any of the SIM cards to interface with the web. Node sensor is additionally having comparable usefulness as expert sensor. Node sensor can likewise goes about as an entryway by leading the information to the web where as expert sensor pushes information straightforwardly to the web. Most frequently, otherworldly sensors are utilized to analyse the development of plants in soils with various degrees of supplements

3.Base Station: In the agriculture field, Base station acts as a piece of equipment with wireless communication between user and a network.

4. Microcontroller: The Microcontroller plays a major role in field of agriculture by transferring the information about the motors in the farm. When the motor is turned ON by the controller then the pumping functionality of the water from the ground is activated. In the other case, it continually screens the digitized boundaries of the different sensors and checks those boundaries with some predefined edge values.

5. Server: This can act as a centralized system to store and share data among farmer and internet.

6. Modem: This can be used as a wireless device for connectivity to transfer the data between source to destination. The source and objective in the ranch might be office and rancher, vehicle and vehicle and so on.

7. Internet: This is a global computer network that provides a variety of information and communication facilities.

8. IOT Device: This may be any of the smart devices.

9. USB: It can be a flash drive that can act as portable storage device.

10. Power: It is one of the significant wellspring of energy utilized for water system and controlling the engines and lights in the cultivating.

11. Camera: The job of camera in the field of agriculture plays a vital role. The key

- Utilizations of these cameras are
- Distinguishing proof of the interlopers
- Safeguard the water supplies
- Vehicle Following
- Worker checking

12. Lights: A popular light source with eco-friendly features is LED. This LED is good for growth of plants by improving the life time and can have huge business opportunities by maintaining the quality. To keep up with the legitimate development of plants in the homesteads, Drove screens are to be introduced to give the enough light to germination.

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┌──────────┐        ┌──────────┐
│  Solar   │        │ Sensors  │
│  panel   │        └────┬─────┘
└────┬─────┘             ↕
     │            ┌──────────┐      ┌──────────┐
     │            │   BST    │◄────►│  Server  │
     │            └────┬─────┘      └────┬─────┘
     │                 ↓                 ↓
     │         ┌──────────────┐  ┌────────┐  ┌──────────┐
     │         │Microcontroller│◄►│ Modem │◄►│ Internet │
     │         └──────┬───────┘  └────────┘  └──────────┘
     │                ↓
     │         ┌──────────────┐        ┌──────┐
     │         │  IOT device  │◄───────│ USB  │
     │         └──┬────┬───┬──┘        └──────┘
     ↓         ↓    ↑   ↑
┌──────────┐ ┌──────────┐ ┌──────────┐
│  Power   │ │  Camera  │ │  Lights  │
│  supply  │ └──────────┘ └──────────┘
└──────────┘
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2G / 3G / 4G / 6LoWPAN WSN

RFID WLAN WBAN NFC

IOT Based Agricultural System

Wireless

Wireless

Cloud Service

Agriculture Server

Data Base

Gateway

User Terminal

Farmer

Farm Record Keeping

Real Time Monitoring

Fire Alarm

Livestock

MooMonitore

IOT Based Monitoring App

Leaf Disease

Crop/ Plant Monitoring Sensor Kit

Farm / Field

Libelium Smart Agriculture Xtreme IoT Vertical Kit

Green House

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