Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03October 2022
Team ID	PNT2022TMID48383
Project Name	Project – Smart farmer – IOT Enabled Smart Farming application
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Technologies used in Smart Farming:

- Edge-based sensor systems in smart farming
- Low energy machine-learning algorithms for edge-based sensors in smart farming
- Energy harvesting (image) sensor systems in smart farming
- Advanced image processing techniques and applications in smart farming
- Emerging IoT-based sensor applications in smart farming
- Sensing hardware platforms in smart farming
- Security solutions for sensing hardware in smart farming
- Energy efficient network-based analysis in smart farming
- Low energy wireless connectivity solutions for smart farming (LoRa, NB-IoT, etc.)
- Multimodal sensor integration in smart farming
- Emerging sensing methods (hyperspectral imaging, compressed sensing, etc.)

Example: Smart farming using IOT

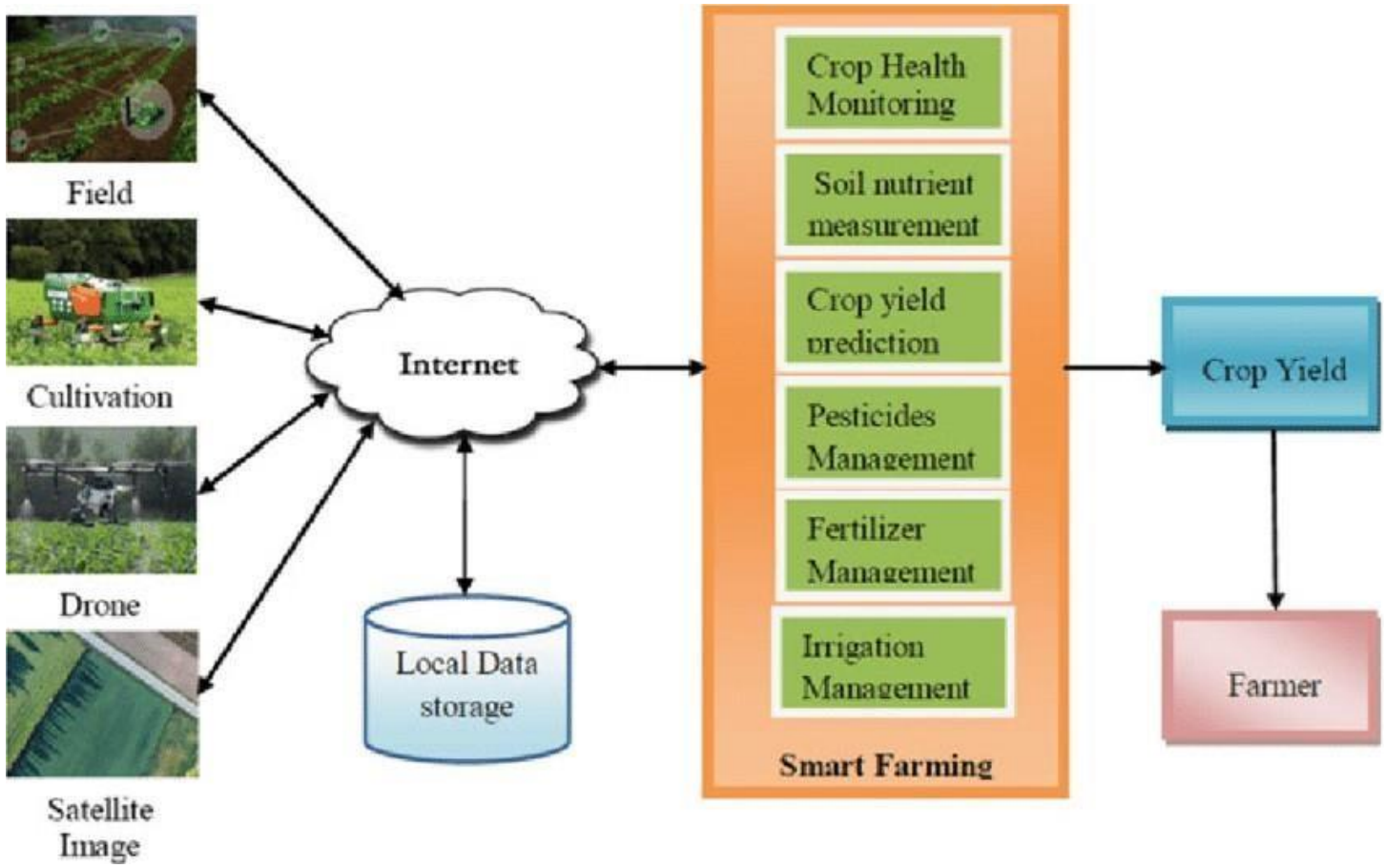

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	**User Interface**	user interface designed for smart farms which are controlled by mobile phones and applications user requirements and experience as a strategy for defining the scope and structure of the crop field	Internet Of Things(IOT), Artificial Intelligence(AI)
2.	**Application Logic-1**	monitoring the water levels in tanks. tracking of seed-growth	IOT, Cloud computing AI, Machine learning
3.	**Application Logic-2**	crop health, crop monitoring, planting, crop spraying, and field analysis.	Ground and Aerial drones
4.	**Application Logic-3**	to maintain the quality of crops and fertility of the land, thus enhancing the product volume and quality.	data analytics, Cloud, IOT
5.	**Database**	massive quantities of data, such as streaming data, time-series data, RFID data, and sensory data, among other things.	SQLite Database, MySQL
6.	**Cloud Database**	Database Service On Cloud	IBM DB2, IBM Cloudant etc.

7.	**File Storage**	Monitoring, Sensors and requirements	IBM Block Storage or Other Storage Service or Local File system
8.	**External API-1**	API done well are the most efficient way to connect data, thereby enhancing the overall IOT value	IBM Weather API, Robotics, AI etc.
9.	**External API-2**	the logical connectors that allow applications to communicate with each manufacturer's IOT devices	API and IOT
10.	**Machine Learning Model**	collect the data, train the systems and predict the results	Machine Learning
11.	**Infrastructure (Server / Cloud)**	Application Deployment on Local System / Cloud Local Server Configuration: TCP and UDP Cloud Server Configuration : CM	Local servers , Cloud, WirelessSensor Network (WSN)

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	**Open-Source Frameworks**	Things Board, Thing Speak, My Devices	HTTP, Web Socket, edge computing
2.	**Security Implementations**	GSM, Firewall	Confidentiality, Integrity and Availability Triad
3.	**Scalable Architecture**	Collaborate and Connect	Artificial Intelligence
4.	**Availability**	Monitoring greenhouses	PS and GIS

S.No	Characteristics	Description	Technology
5.	**Performance**	Number of yields per month	IOT, Robotics, etc.