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

Date	15 October 2022
Team ID	PNT2022TMID30663
Project Name	Project - SmartFarmer - IoT Enabled Smart Farming Application
Team Members	Sevvanthi D, Preethika S, Pavithra M, Sowmiya N
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

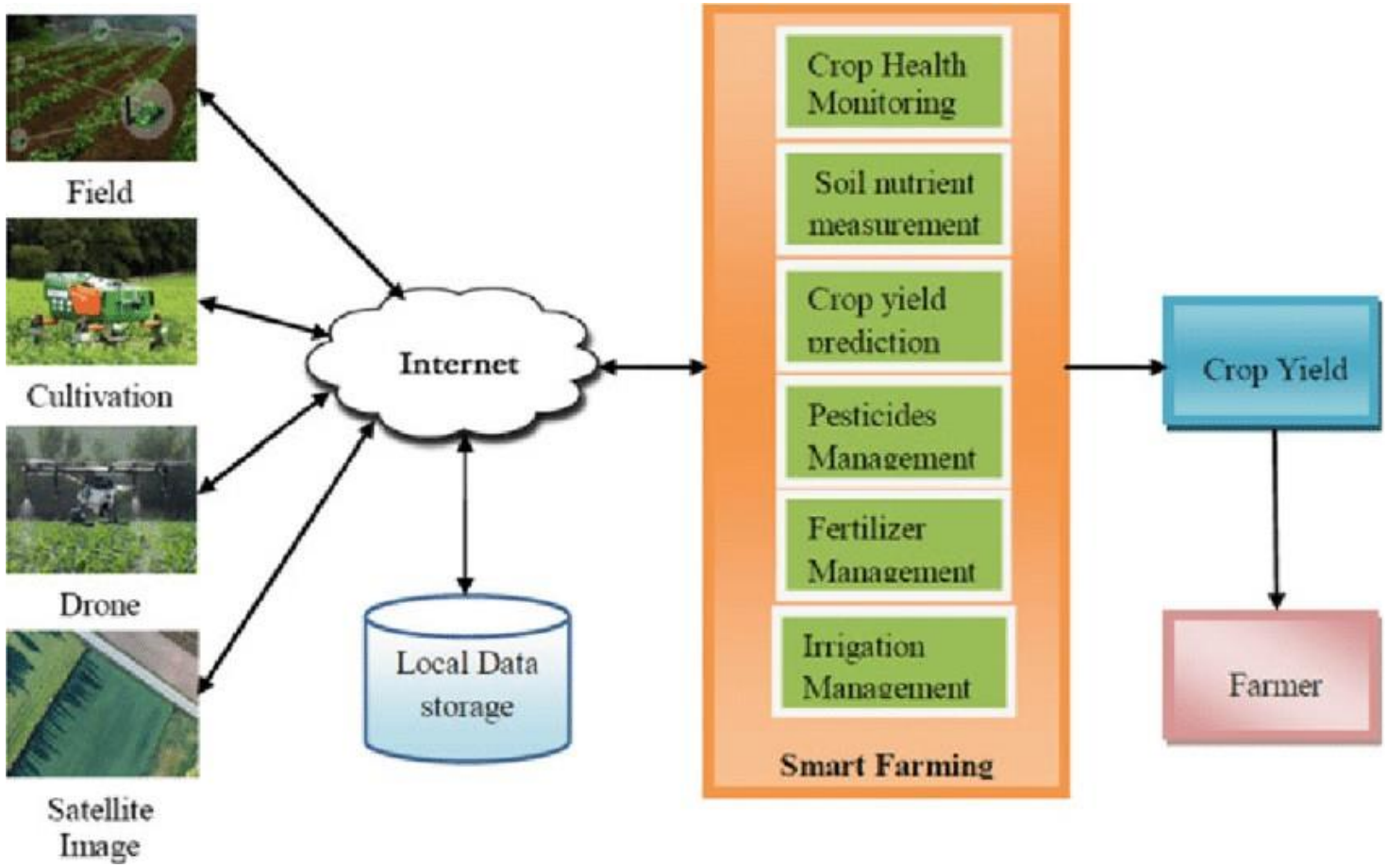

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	**User Interface**	user interface designed for smart farms which are controlled by mobile phones andapplications user requirements and experience as astrategy 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, cropspraying, and field analysis.	Ground and Aerial drones
4.	**Application Logic-3**	to maintain the quality of crops and fertilityof 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 Filesystem
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 UDPCloud 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.

References:

https://www.i-scoop.eu/internet-of-things-iot/iot-technology-stack-devices-gateways-platforms/

https://www.researchgate.net/publication/347563621_Smart_Agriculture_System_using_IoT_Technology_2319-8354

https://www.researchgate.net/publication/342608407_A_Review_on_Smart_IoT_Based_Farming