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

Date	15 October 2022
Team ID	PNT2022TMID35659
Project Name	Smart Farmer – IoT Enabled Smart Farming Application
Maximum Marks	4 Marks

Technical Architecture:

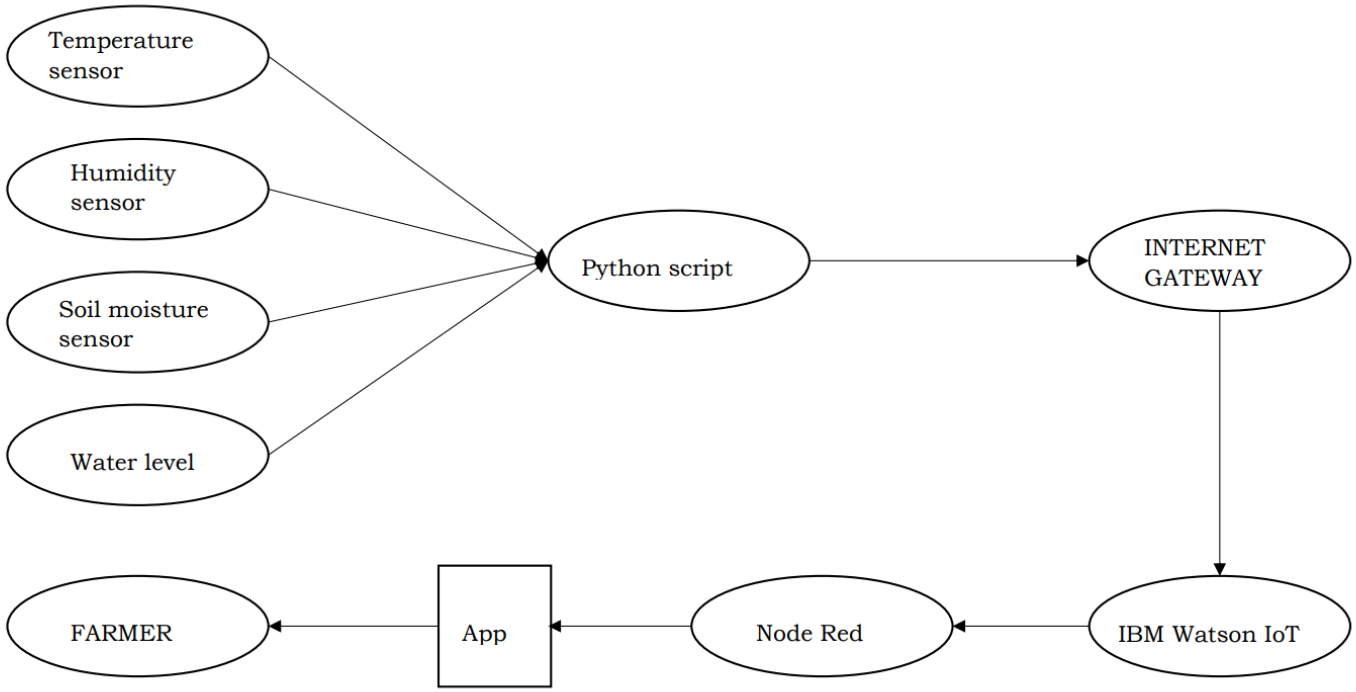

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI, Node-RED, MIT app	MIT App Inventor
2.	Arduino UNO	It is used as a processing unit.	Python
3.	Sensors	Temperature, humidity and moisture sensors, which sends data for the application.	Python
4.	MQTT Protocol	The data to be collected and sent to farmer via MQTT protocol providing the data to easily monitor the crops.	IBM Watson IoT, IBM Watson Assistance.
5.	Application Logic-1	Controlling the water pumps remotely.	IBM Watson, IBM Cloudant service, IBM Node-Red
6.	Application Logic-2	Notifying the farmer based on water requirements and based on weather.	Python
7.	Application Logic-3	Allowing the farmer to customise his field based on different crops.	Python
8.	Database	Data Type, Configurations etc.	MySQL
9.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant
10.	File Storage	System Storage.	IBM Block Storage
11.	External API	Using this IBM Weather API we can track the weather in the agriculture land and based on the weather reading the sensors will activate.	IBM Weather API
12.	Machine Learning Model	To predict the yield based on the crop growth.	Crop prediction model.
13.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Cloud Server Configuration.	IBM Cloudant, IBM IoT Platform

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Python, Arduino and MIT app Inventor	MIT License
2.	Security Implementations	Sensitive and private data must be protected from their production until the decision-making and storage stages.	Encryptions, IBM Controls
3.	Scalable Architecture	Scalable for more number of devices and for more area of the farm.	Node Red Service
4.	Availability	Mobile, laptop, desktop.	MIT app, Web UI
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN).	MIT app inventor.