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

Date	11 november 2022
Team ID	PNT2022TMID44735
Project Name	Smart Farmer-IoT Enabled smart farming Application
Maximum Marks	4 Marks

- The different soil parametersliketemperature, soil moistureandhumidity are sensed using different sensors and obtained values are stored in the IBM cloud.
- Arduino UNO is used as a processing Unit that process the data obtained fromthe sensors and data from the weather API.
- NODE-RED is used as a programming tool to write the hardware, software andAPIs.
- The MQTT protocol is followed for communication process. Communicating betweencloud and the user (Farmer).
- All the collected data are provided to the user through a mobile application thatwas developed using the MIT app inventor.

- The user could make a decision through an app, whether to water the field or not, depending upon the sensor values. By using the app, they can remotely operate the motor switch.

Table 1: Components & Technologies:

S. No	Component	Description	Technology
1.	User Interface	The communication protocol being usedmight act as an interface	MIT App Inventor

2.	Arduino UNO	It is used as a processing Unit	Python
3.	MQTT protocol	The data to be collected and sent to the farmer via MQTT protocol providing the data toeasily monitor the crops	IBM Watson IOT service, IBMWatson Assistant
4.	Database	Data Type, Configurations	MySQL
5.	Cloud Database	Database Service on Cloud	IBM Cloud
6.	File Storage	Different soil parameters obtained values	IBM Block Storage
7.	External API	To monitor the weather	Open Weather API
8.	Infrastructure (Server / Cloud)	Application Deployment on Cloud Local Server Configuration:Cloud Server Configuration:	Kubernetes

Table 2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Open-Source Frameworks	MQTT protocol	python
2.	Security Implementations	Sensitive and private data must be protected from their production until the decision-making and storage stages.	Node-Red, Open weatherApp API, MIT App Inventor
3.	Scalable Architecture	Scalability is a major concern for IoT platforms. It has been shown that different architectural choices of IoT platforms affect system scalability and that automatic real time decision-making is feasible in an environment composed of dozens of thousand.	Node-Red service
4.	Availability	Available feasible	Open weather App