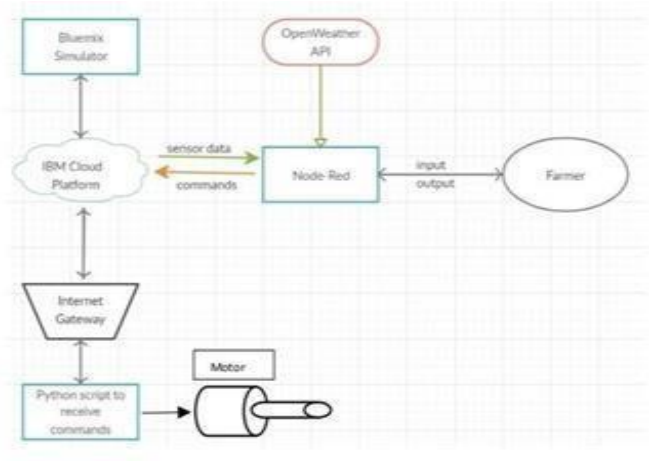
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	19 October 2022
Team ID	PNT2022TMID20250
Project Name	Smart Farmer – IOT Enabled Smart Farming Application
Maximum Marks	4 Marks

Technical Architecture:



Guidelines:

1. Include all the processes (As an application logic / Technology Block)
2. Provide infrastructural demarcation (Local / Cloud)
3. Indicate external interfaces (third party API's etc.)
4. Indicate Data Storage components / services
5. Indicate interface to machine learning models (if applicable)

1. Temperature, soil moisture, and humidity are three separate soil parameter measurements that are made using various sensors and recorded in the IBM cloud.

2. The data from the sensors and weather API are processed using an Arduino UNO as a processing unit.

3. NODE-RED is used as a programming tool to write the hardware, software and APIs. The MQTT protocol is followed for the communication.

4. Through a smartphone application created with the aid of MIT App Inventor, the user is given access to all the collected data. Depending on the sensor results, the user might decide whether or not to irrigate the crop using an app. They can control the motor switch remotely by utilising the app.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson IoT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM Cloud
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
10.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	Sensitive and private data must be protected from theirproduction until the decision-making and storage stages.	e.g SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	scalability is a major concern for IoT platforms. It hasbeen shown that different architectural choices of IoT platforms affect system capability and that automatic real time decision-making is feasible in an environment composed of dozens of thousand.	Technology used
4.	Availability	Automatic adjustment of farming equipment made possible by linking information like crops/weather andequipment to auto-adjust temperature, humidity, etc.	Technology used
5.	Performance	The idea of implementing integrated sensors with sensing soil and environmental or ambient parameters in farming will be more efficient for overall monitoring	Technology used

References:

https://c4model.com/

https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/

https://www.ibm.com/cloud/architecture **https://aws.amazon.com/architecture**

https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d