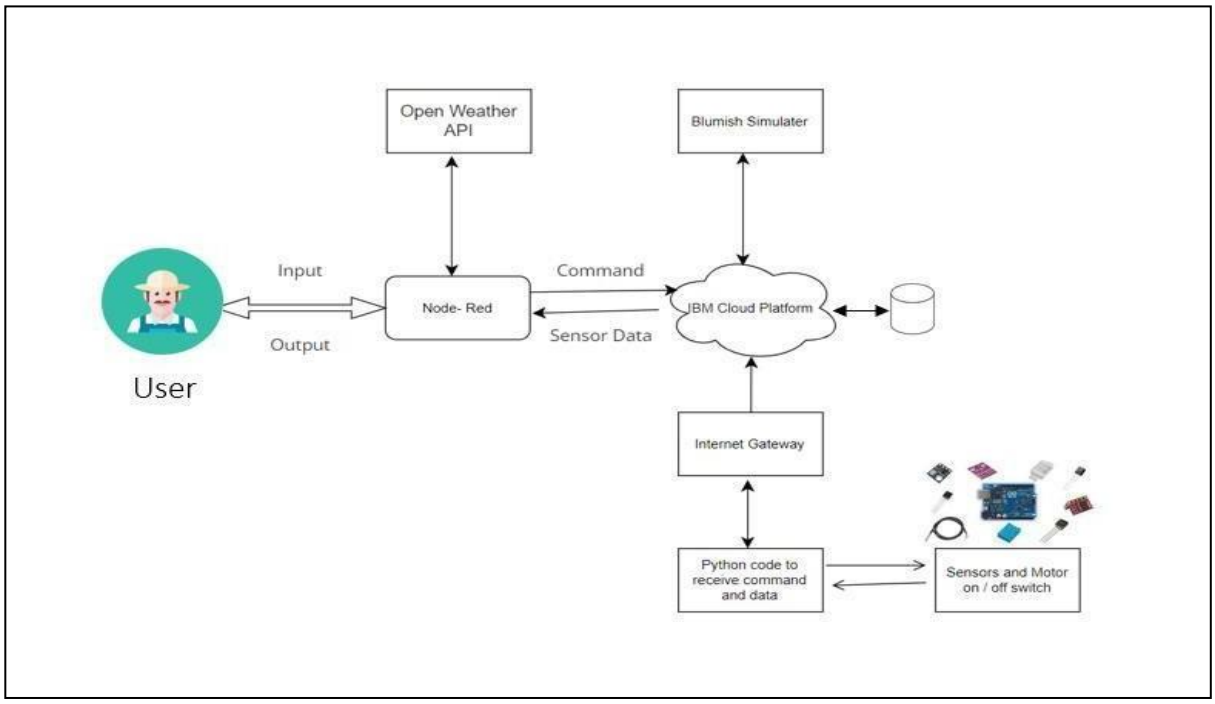
Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	18 November 2022
Team ID	PNT2022TMID18437
Project Name	Smart Farmer- IoT Enabled Smart Farming Application
Maximum Marks	4 Marks



1. All the sensors for sensing the temperature, soil moisture, water flow and humidity are included and their values are calculated and results are stored in the IBM cloud.

2. The sensor values and weather API are computed by Arduino UNO and stored in the cloud for display to the user.

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

4. A mobile application, developed using MIT App Inventor, provides the user with all the collected data. Based on the collected data the user can make decision on watering the crop.

5. The user can control the motor by using the app.

Table 1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User interaction with application	MIT App Inventor
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
6.	Cloud Database	Database Service on Cloud	IBM Cloud
7.	File Storage	Different soil parameters obtained values	IBM Block Storage
8.	External API	To monitor the weather , used in the application	IBM Weather API, etc
9.	Infrastructure (Server / Cloud)	Application Deployment on Cloud Local Server Configuration: Cloud Server Configuration:	Local, Cloud Foundry
10.	Flow Sensor	Monitors the flow of water	Smart Sensors
11.	Soil moisture sensor	Monitors the soil temperature	Smart Sensors
12.	Temperature sensor	Monitors the temperature of the crop	Smart Sensors
13.	Humidity sensor	Monitors the humidity	Smart Sensors

Table 2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	MQTT protocol is used	Python
2.	Security Implementations	Sensitive and private data must be protected from their production until the decision-making and storage stages.	Node-Red, 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
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc	MIT app inventor