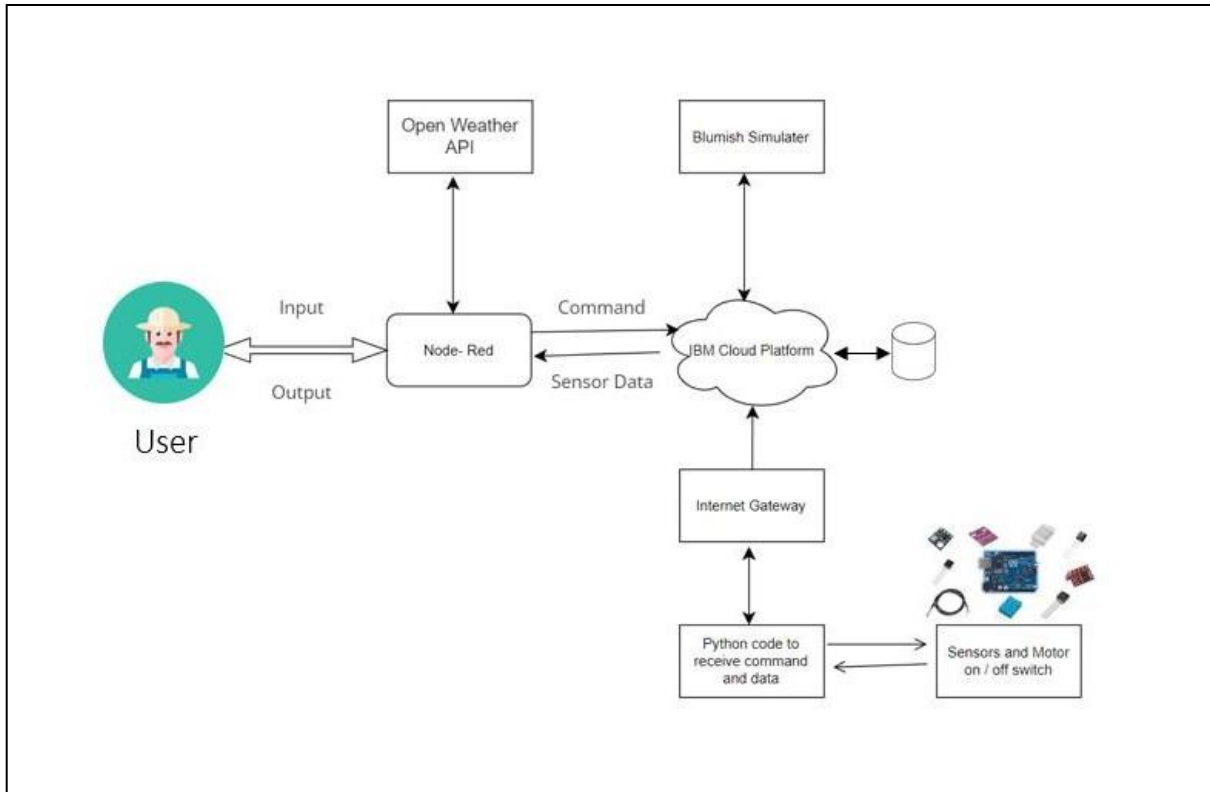


## Project Design Phase-II Technology Stack (Architecture & Stack)

|               |   |
|---------------|---|
| Team ID       | PNT2022TMID51472  |
| Project Name  | Project-SmartFarmer-IoT Enabled smart Farming Application |
| Maximum Marks | 4 Marks   |



1. The different soil parameters temperature, soil moistures and then humidity are sensed using different sensors and obtained value is stored in the IBM B2 cloud.
2. Arduino UNO is used as a processing Unit that process the data obtained from the sensors and whether data from the weather API.
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. All the collected data are provided to the user through a mobile application that was developed using the MIT app inventor. The user could make a decision through an app, weather 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:**

| Component                             | Description   | Technology                         |
|---------------------------------------|---|------------------------------------|
| 1. User Interface                     | How user interacts with application e.g. Web  | 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, NoSQL, etc.                 |
| 6. Cloud Database                     | Database Service on Cloud   | IBM Cloud                          |
| 7. File Storage                       | File storage requirements   | IBM Block Storage or Other Storage |
| 8. External API-1                     | Purpose of External API used in the application   | Open Weather API                   |
| 9. Infrastructure<br>(Server / Cloud) | Application Deployment on<br>Local System / Cloud<br>Local Server Configuration:<br>Cloud Server Configuration: | Local, Cloud Foundry.              |

**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 their production until the decision-making and storage stages.   | Node-Red, Open weather App 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. | Technology used                                  |

**References:**

<https://c4model.com/>

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

<https://www.ibm.com/cloud/architecture/>