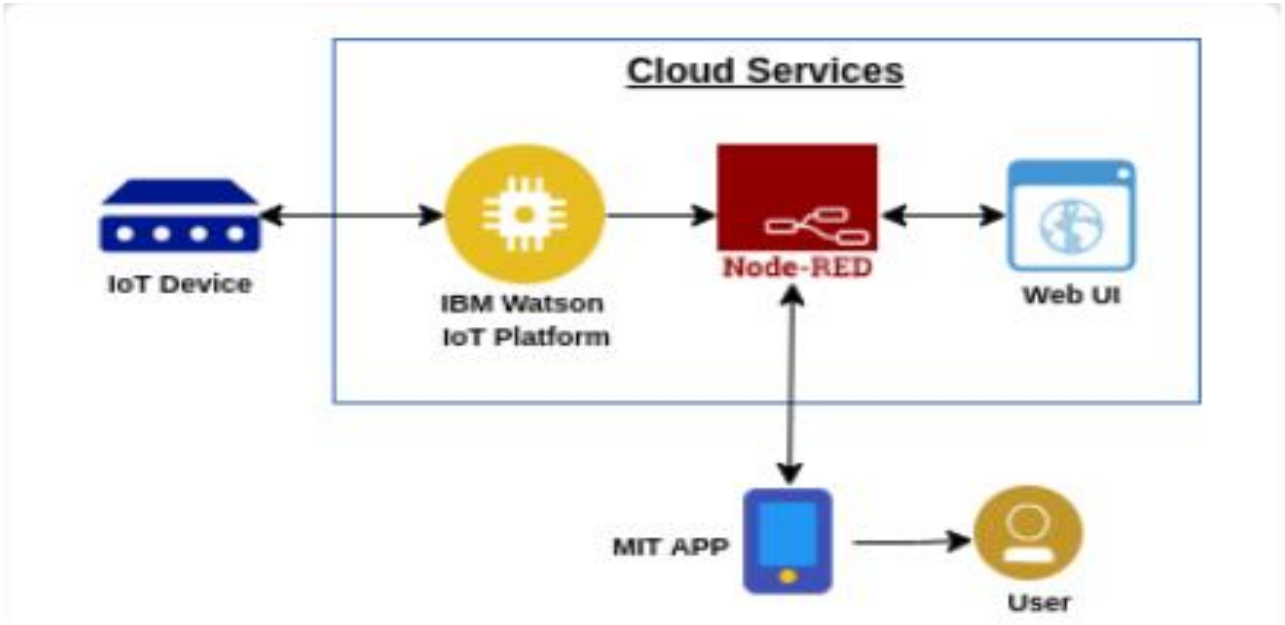
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	14 October 2022
Team ID	PNT2022TMID42568
Project Name	Smart Farming– IOT enabled Smart Farming
Maximum Marks	4 Marks

Technical Architecture :



Guidelines:

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.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Mobile app. In our application, were data are displayed using widgets like structure. Users interacts with widgets to additional info	MIT App Inventor
2.	Application Logic-1	Helps to predict future outcomes, automate complex processes, and optimize employees' time.	IBM Watson, IBM cloudant service, IBM node-red
3.	Application Logic-2	Develop python script to publish and subscribe to IBM IoT Platform	Python
4.	Application Logic-3	Programming tool to write the hardware, software and APIs.	IBM Node-red
5.	Database	Data Type, Configurations etc.	My SQL
6.	Cloud Database	Provide solutions for the security and management service	IBM DB2, IBM Cloudant
7.	File Storage	Developing mobile application to store and receive the sensors information and to react accordingly	IBM Block Storage or Other Storage Service or Local Filesystem

8.	External API-1	To predict the forecasted weather data information	Open Weather API, etc.
9.	External API-2	Provides a real-time database service, cloud storage	Firebase API, etc.
10.	Machine Learning Model	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration	Local, IBM Cloud, Firebase
11.	Infrastructure (Server / Cloud)	It used to monitor the soil, temperature, humidity	IBM cloudant, IBM IOT Platform

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Node Red, MIT App Inventor, Arduino IDE Node Red for connecting with application, MIT App Inventor for building app, Arduino IDE to write and upload codes, Node red to write the hardware and software.	It is a software, which helps in connecting and building application. Node Red, MIT App Inventor, Arduino IDE.
2.	Security Implementations	IBM Services	Encryptions, IBM Controls
3.	Scalable Architecture	Leverage information that has been mined and filtered.	Cloud computing and AI
4.	Availability	Mobile, laptop, desktop	MIT app
5.	Performance	Detects the water level, soil growth, humidity, weather from the physical environment	Sensors