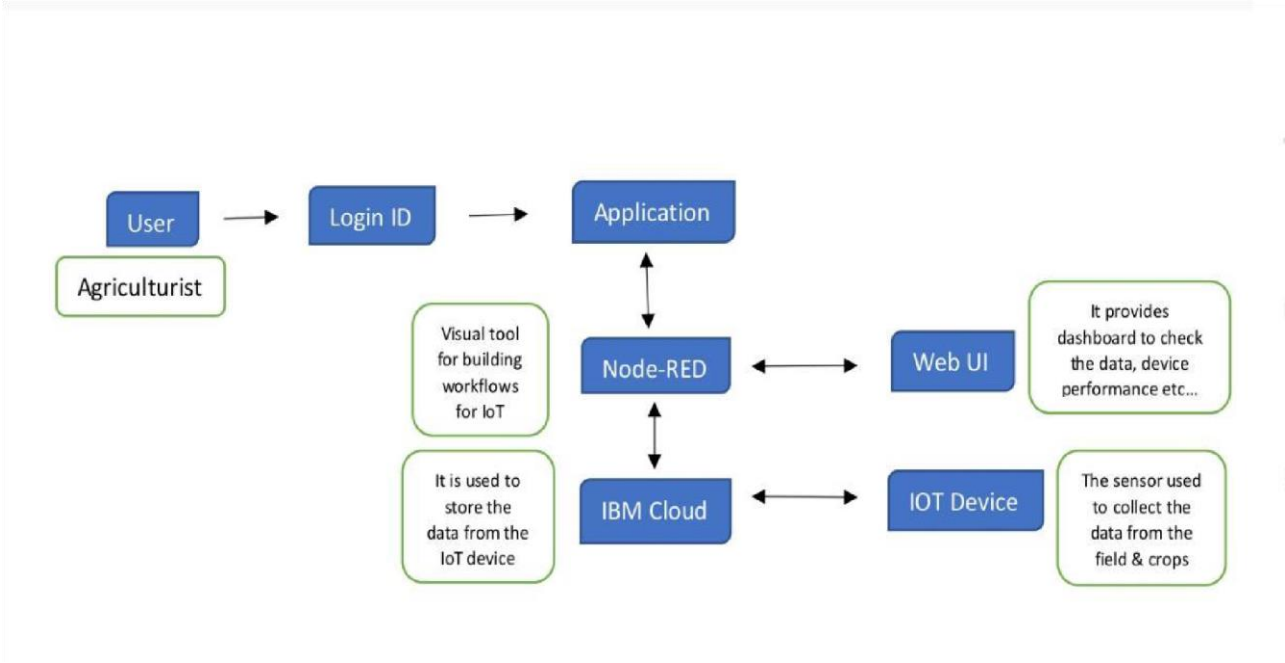
PROJECT DESIGN PHASE-II
Technology Stack (Architecture & Stack)

Date	12 November 2022
Team ID	PNT2022TMID29937
Project name	Project – Smart farmer-IoT enabled smart farming application.
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2



- The various parameters like temperature, soil moistures, weather detection, humidity, volve control are sensed and control by using the different sensors.
- The sensed values are transfer to the Arduino UNO that process the data obtained from the sensors.
- The GSM module is connected to the Arduino UNO and the data transfer happens then the data will be stored in cloud storage.
- NODE-RED is used to write the hardware, software, and APIs.
- The MQTT protocol is followed for the communication.
- All the collected data are provided to the users (Agriculturist) through a mobile application that was developed using the MIT app inventor.
- The user (Agriculturist) can decide through an app, whether to water the crop or not depending upon the sensor detection
- By using the app, users (Agriculturist) can operate the motor switch by remotely.

Table - 1: Components & Technologies:

S. No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g.Web UI, Mobile App.	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
			IBM Block Storage or Other
7.	File Storage	File storage requirements	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 their production	e.g.Node-Red, MIT App Inventor, etc.

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
4.	Availability	Automatic adjustment of farming equipment made possible by linking information like crops/weather and	Technology used
		equipment to auto-adjust temperature, humidity, etc.	
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