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

Date	03 October 2022
Team ID	PNT2022TMID04701
Project Name	Smart Farmer-IOT enabled smart farming
Maximum Marks	4 Marks

Technical Architecture:
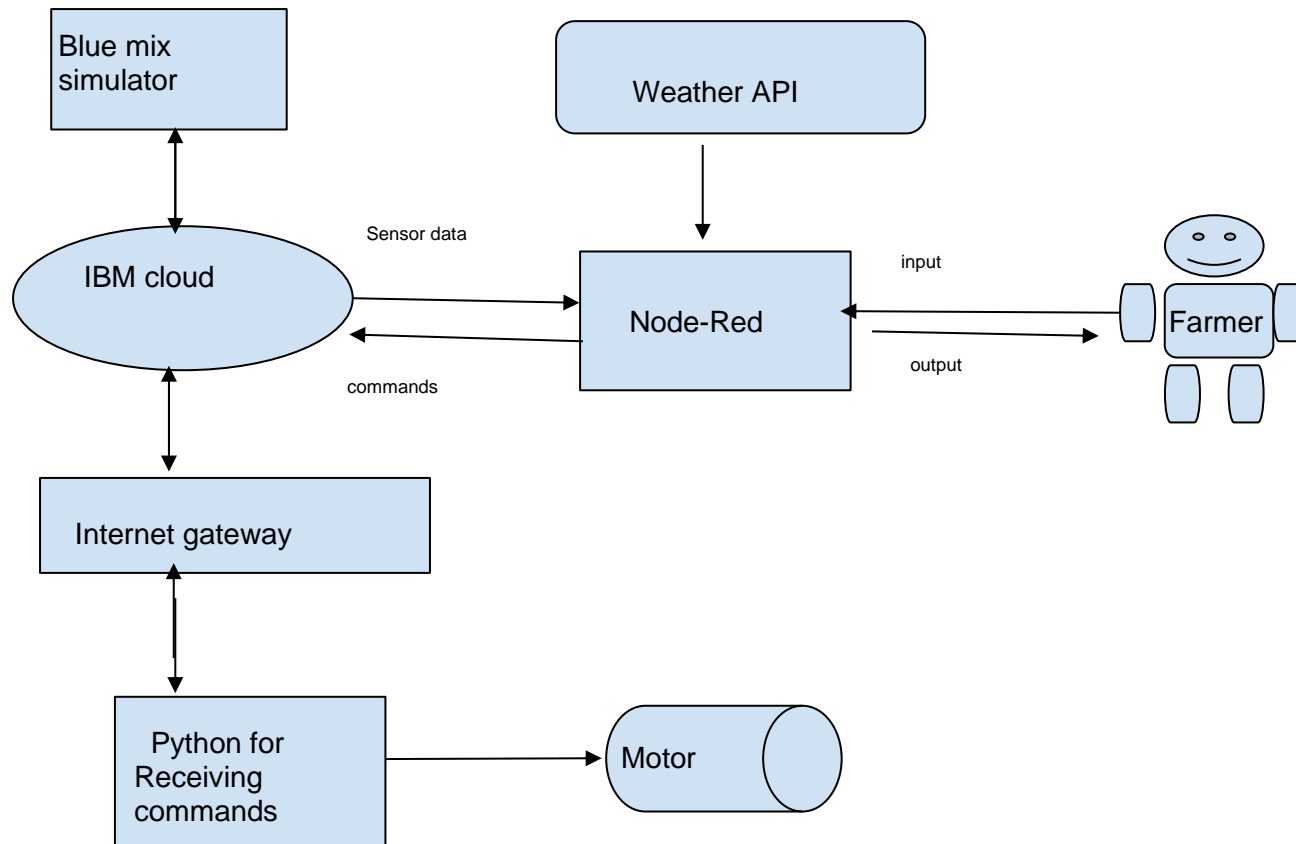
Guidelines:

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

- Sensors are placed in the field to check the water content or moisture in the field so that it will intimate the user when the field is dry and remotely switch on the motor to pump water from the well and also irrigates the crop based on the type of crop the farmer has cultivated.
- Sensors are also made to collect data regarding the temperature and humidity of the surrounding.
- The data collected by the sensors will be sent to the IBM cloud.
- The data is processed by the Arduino UNO which acts as the processing unit
- The Arduino also collects data from the weather API.
- Node Red is used to program the software, hardware and API.
- MQTT is an OASIS standard messaging protocol for the Internet of Things (IoT). It is used to enable communication between the software, hardware and API.
- The data after being processed by the software, hardware and API is sent to the mobile phone of the farmer through an app developed based on MIT.
- MIT App Inventor is an intuitive, visual programming environment that allows everyone, even children, to build fully functional apps for smartphones.
- Then the farmer can decide whether to water the field or not based on the information provided by the application and if he wishes to water the field he can switch on the motor through the application remotely.

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
9.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model
10..	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration / Cloud Server Configuration	Local, Cloud Foundry, Kubernetes

Table-2: Application Characteristics:

S.no	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Open-source framework
2.	Security Implementations	The data collected and stored should be kept safe until the User takes his decision or till the final stage of his cultivation. The data should be not available to anyone without the knowledge of the User.	e.g Node red, MQTT, APT, MIT app inventor
3.	Scalable Architecture	Scalability is a major issue in IOT field based on the architecture of the system and it is more important in an environment where it has to make its decision based the problem.	Technology used