Project Scope Document

- **Project Summary** :

Agriculture is the major sector of any country in the world because no human in the world can live without food. In present scenario when we consider the farming system of India it is strategically utilized based on the type of soil and the season and considering various factors in order to farm the land. Where as in earlier days farmers used to figure out the ripeness soil and influenced suspicions to develop which to kind of yield. They won't bother regarding humidity, climatic conditions and water level. Most probably we should have to consider the amount of micro and macro nutrient and various chemicals while farming in order to have an healthy lifestyle. In such a scenario where we should have to consider all the factors IOT(Internet of things) plays an important role by empowering the agriculturists through various strategies like accuracy practicing farming to deal with challenges in the field. The main idea and the scope of the project is to create a smart agriculture system which is easy to use and accurately gives the information regarding various factors that are required to farm the land remotely. The project uses IBM cloud for various services, platform and for node red. Internet of Things is an emerging topic of technical, social, and economic significance. Consumer products, durable goods, cars and trucks, industrial and utility components, sensors, and other everyday objects are being combined with Internet connectivity and powerful data analytic capabilities that promise to transform the way we work, live, and play.

In this project, we develop an app to handle agricultural requirements using IoT. The farmer can also get the real time weather forecasting data . Farmer is provided a mobile app using which he can monitor the temperature, humidity, soil moisture parameters along with weather forecasting details. Based on all the parameters he can water his crop by controlling the motors using mobile application. IoT is the technology that extends the limit of internet connectivity from digital devices to physical objects. It enables the communication between digital devices, objects, and other systems. The data collected can be shared between person to person, machines to person or data, and monitoring system could be connected and information exchanged via sensors is available to the farmer on the mobile phone.

- **Project Requirements** :

Here we are using the Online IoT simulator for getting the Temperature,Humidity and Soil Moisture values. We get the real time weather forecasting data by using external platforms like Open Weather API. We are also using IBM cloud which is PaaS which can be used to aggregate data from tools like soil sensors, weather stations to help farmers make better decision about managing their crops .

- **Functional Requirements:**

  ➢ Install the web application and connect to internet.

  ➢ The IBM IOT simulator reads the random temperature, humidity and soli moisture and will pass the data to IBM Watson cloud platform which are called as events.

  ➢ These events can be visible on the web application with the help of NODE-RED.

  ➢ The weather conditions which are noticed on the Open Weather API are passed to the NODE RED which can visible on the web application.

  ➢ Based upon the weather and soil conditions the farmer decides whether to ON/OFF the motor which helps in increasing the quality of production.

- **Technical Requirements :**

  ➢ **Performance :** Improves the performance of the agriculture system by monitoring the field in real time .

  ➢ **Crop Monitoring :** IoT sensors will enable the collection of crucial data such as soil moisture where it will be monitoring the crop health and soil composition.

  ➢ **Weather Monitoring :** By constant weather monitoring which alerts farmer on changing weather conditions.

  ➢ **Management :** The smart Agriculture system ensures proper water management for irrigation and in turn reduces water wastage.

  ➢ **Mobility :** Farmer can monitor and can able to access the information remotely via smartphone.

- **Software Requirements:**

IBM IOT PLATFORM :

The IBM® cloud platform combines platform as a service (PaaS) with infrastructure as a service (IaaS) to provide an integrated experience. The platform scales and supports both small development teams and organizations, and large enterprise businesses. Globally deployed across data centers around the world, the solution you build on IBM Cloud™ spins up fast and performs reliably in a tested and supported environment you can trust.

The platform is built to support your needs whether it's working only in the public cloud or taking advantage of a multicloud deployment model. With our open-source technologies, such as Kubernetes, Red Hat OpenShift, and a full range of compute options, including virtual machines, containers, bare metal, and serverless, you have as much control and flexibility as you need to support workloads in your hybrid environment. You can deploy cloud-native apps while also ensuring workload portability.

Whether you need to migrate apps to the cloud, modernize your existing apps by using cloud services, ensure data resiliency against regional failure, or leverage new paradigms and deployment topologies to innovate and build your cloud-native apps, the platform's open architecture is built to accommodate your use case.

NODE-RED:
Node-RED is built on Node.js, taking full advantage of its event-driven, non-blocking model. This makes it ideal to run at the edge of the network on low-cost hardware such as the Raspberry Pi as well as in the cloud.

IBM WATSON IOT PLATFORM :

Every day, vast quantities of data are collected about patients as they pass through health service organizations—from operational data such as treatment history and medications to physiological data captured by medical devices. The insights hidden within this treasure trove of data can be used to support more personalized treatments, more accurate diagnosis and more advanced preparative care. But since the information is generated faster than most organizations can consume it, unlocking the power of this big data can be a struggle. This type of predictive approach not only improves patient care—it also helps to reduce costs, because in the healthcare industry, prevention is almost always more cost-effective than treatment. However, collecting, analyzing and presenting these data-streams in a way that clinicians can easily understand can pose a significant technical challenge.

Python IDE :

Python is an interpreted, high-level, general-purpose programming language. ... It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented, and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library.

- **Project Deliverables :**

A web application which provides -

- ➤ Weather Information
- ➤ Control motors
- ➤ Soil data

- **Project Schedule :**
  - ➤ Setting up the Development environment - 24May 2020
  - ➤ Installing Slack , creating IBM platform and exploring IBM cloud platform - 25 May 2020
  - ➤ Installing Node-red -27 May 2020
  - ➤ Creating IoT platform in IBM cloud platform and creating devices and connecting to Watson simulator - 28 May 2020
  - ➤ Configuring the node in nodered platform to get the data from the device connected and creating an UI - 30 May 2020
  - ➤ Python code to display the motor status - 1 June 2020

➢ Creating an account in open weather api and get the details of a city- 6 June 2020

➢ Creating an account in open weather api and get the details of a city ,. configuring the nodes in nodered to get the api data and Creating buttons and getting it in UI - 11 &12 June 2020

➢ Project scope document and project report document- 15 & 16 June 2020