

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	12 October 2022
Team ID	PNT2022TMID40121
Project Name	Project - Smart Farmer-IoT enabled smart farming applications

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Objective	Automatic Irrigation System is used to irrigate the land without the help of manpower. It works by using various sensors which senses the values of various parameters and the process them using ESP32. The cloud is used to store and transmit data using IoT. The field need water then automatically motor will get ON and it will get OFF when it's get enough.
FR-2	Product Features	<p>The smart irrigation system is self-explanatory and user friendly plant watering system.</p> <p>In this system, ESP32 is compatible to operate the hardware module. For the monitoring and controlling the water pump and, the multiple sensors are used. This system is used for monitoring and controlling water pump with the help of software applications. Wi-Fi connectivity and android app are provided for field testing.</p> <p>This smart system has software to view a sensor's real time graph analysis on mobile.</p>
FR-3	User Requirement	<p>The users of this system will require a simple yet effective and fully functioning automatic system. The mobile application should be simple and easy to use allowing users to navigate all of the sensor data with ease. Users will expect a system that once installed will actually work and water their plants when needed. This is the main requirement for users as the project will be a failure if it does not water the plants when they need to be watered.</p>
FR-4	Use Case	<p>The data that will be collected from the sensors and sent to the cloud. These readings will then be displayed on the mobile app in a clear and easy to read manner. This use case describes the communication between the mobile app and the user. The application will mainly be used for displaying the sensor data in a user-friendly manner. The user will be given notifications with certain sensor data readings.</p>

NON-FUNCTIONAL REQUIREMENTS:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	By using automatic irrigation system we are using various equipment like temperature sensor, humidity sensor, and soil moisture sensor. These sensors will find the various situations of the soil and based on soil moisture percent, land gets automatically irrigated, when field needs water then automatically motor will get ON and it will get OFF when it's get enough. These sensed parameters and motor status will be displayed on user devices.
NFR-2	Security	There is no deploying of this application and the only instance of the app will be the single local android app that we used for developing.
NFR-3	Reliability	Thankfully due to the robustness of the hardware and the simple nature of the software, the project is unlikely to fail. There may be some cable damage over time but that would be a simple fix.
NFR-4	Performance	The project should update the application with the relevant information quickly but there is no need for extremely fast data transfer. Cloud MQTT data transfers seem nearly instantaneous to the user so this should be sufficient.
NFR-5	Availability	The data gathered from the sensors and transfer the data to the cloud will be available to the project and the application as long as the Python code is running.
NFR-6	Scalability	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 irrigation system.