

# **IoT Smart Plant Care and Plant Monitoring System**

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**Abstract:** *This project introduces an innovative ESP32-based system designed for automatic care and comprehensive monitoring of plant environments. The system utilizes an ESP32 microcontroller that integrates with a network of sensors to collect real-time data on essential plant health parameters, including temperature, humidity, and soil moisture levels. This real-time data serves as the foundation for autonomous plant care actions. The system actively manages an air fan to maintain optimal temperatures and controls a water pump for precise soil dampening. All collected sensor data and the current status of actuators are wirelessly transmitted and securely stored on the Firebase cloud platform. This cloud integration facilitates easy remote monitoring and complete oversight via an intuitive mobile application developed using MIT App Inventor. This user-friendly application allows consumers to monitor current plant environments, review historical patterns, and manually control actuators as needed. The implementation of this system promotes healthier plant growth, ensures the efficient use of resources like water and energy, and ultimately provides a convenient and effective method of plant care administration, regardless of the user's physical location. This innovative system represents a significant advancement towards automating and optimizing plant cultivation for both individual hobbyists and large-scale agricultural applications.*

**Keywords:** Internet of Things, Smart Agriculture, Plant Monitoring, Automated Plant Care, Environmental Sensors

