

SMART GARDENING SYSTEM FOR CACTUS PLANTS USING WEB-BASED INTERNET OF THINGS (IoT)

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ABSTRACT

A Smart Gardening System for cactus plants was developed to address common issues in cactus care, namely watering and real-time environmental monitoring. Incorrect watering can lead to root rot or dehydration, while unmonitored temperature and humidity can hinder optimal growth.

To achieve these goals, this study implemented an ESP32 microcontroller as the system's mastermind, incorporating a soil moisture sensor to measure soil moisture and a DHT11 sensor to monitor air temperature. Data collected by these sensors is then processed by the ESP32 and sent wirelessly to a web-based platform.

Test results showed that this Smart Gardening system successfully monitored the cactus' environmental conditions in both automatic and manual modes. The website interface facilitates monitoring sensor data and controlling the system remotely. The conclusion of this study is that this ESP32-based Smart Gardening system is a practical solution for cactus care, helping to prevent common problems caused by improper watering.

Keywords: *Smart Gardening, Internet of Things (IoT), Cactus, Automatic Control System, Web Monitoring*