

ABSTRACT

An Automated Hydroponic System using IoT integrates hydroponic farming with the power of the Internet of Things (IoT) to create a smart, efficient, and highly optimized agricultural setup. Here's a structured overview: Hydroponics is a method of growing plants without soil, using nutrient-rich water solutions. Automating this process with IoT technologies enhances productivity, minimizes human intervention, and ensures optimal growing conditions. Sensors continuously collect data on water quality, temperature, humidity, and light. The microcontroller analyzes sensor data in real-time. Based on predefined thresholds, actuators are triggered: Adjust pH or nutrient levels. Turn on/off lights or pumps. Regulate temperature and humidity. Real-time monitoring and alerts via a mobile app. Users can manually adjust parameters or let the system operate autonomously. Sensor data is stored and visualized in the cloud for insights. AI/ML models can predict issues or optimize growth based on historical data.