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IoT: Automatic Plant Watering System using Android

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Abstract: *Water scarcity and inefficient irrigation practices pose significant challenges in agriculture and home gardening. Traditional irrigation methods often lead to overwatering or under watering, affecting plant health and wasting resources. This research presents an IoT-based Automatic Plant Watering System, integrating NodeMCU ESP8266, multiple sensors, and a Flutter-based mobile application to optimize irrigation. The system uses a soil moisture sensor to determine water needs, a DHT11 sensor for temperature and humidity monitoring, an ultrasonic sensor for water level detection, and a relay module to control the water pump. Sensor data is stored in an SQL database and displayed in real-time on the mobile app, allowing users to monitor conditions remotely. The proposed system enhances water efficiency, reduces manual effort, and promotes smart gardening solutions. Experimental results show that this system reduces water usage by 30-50%, making it a sustainable and cost-effective approach to irrigation*

Keywords: IoT, smart irrigation, automatic plant watering, NodeMCU, Flutter app, soil moisture sensor, water conservation

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