ABSTRACT

Rapid population growth and limited land for farming are major problems in this modern era, especially for urban residents. Aeroponics is one of the most efficient soil-free growing techniques. But aeroponics has the disadvantage of requiring continuous monitoring of temperature, pH levels, humidity, and requires consistent watering of the plant roots. This is the reason why the design of an automation system integrated with sensors is needed so that the process of undergoing aeroponic techniques can be carried out with minimal human interaction.

This Final Project uses the waterfall method which has the stages of needs analysis, design, system, code development, testing and system implementation. Design is carried out using an ESP32 microcontroller and Arduino IDE connected to temperature and humidity sensors, ultrasonic sensors, and pH sensors which will be used to carry out the automation function of this Final Project system.

The results obtained from automation testing show that the automation features of misting, fertilizer application, temperature and humidity control of the misting area, as well as notification of water levels in AB fertilizer containers and water tanks can run well. The system has good responsiveness by meeting all ideal time standards. However, the pH sensor notification has limitations that make the notification function not work properly.

Keywords : *Internet-of-Things, Aeroponic, ESP32, Arduino, Automation*