ABSTRACT

In the era of the Industrial Revolution 4.0, various social, educational, agricultural, and other activities are increasingly linked to the application of automation systems connected to the internet network. Major changes occur at this time, with the main purpose of applying the technology is to optimize results and increase efficiency in the use of available resources. Extreme weather changes are one of the causes of low productivity in agriculture, both food crops and horticulture.

Erratic weather conditions often make it difficult to determine the right time for planting and harvesting. This final project aims to design an internet of things-based Greenhouse Environmental parameter monitoring tool implemented on the rooftop of the Faculty of Applied Sciences (FIT). the Greenhouse environmental parameter monitoring tool system uses an ESP32 Microcontroller with DHT22, MQ135 sensors. The data collected from these sensors is sent to Firebase to be displayed in real time on the monitoring dashboard. In addition, this tool is portable which can be carried anywhere and uses 18650 batteries as a power source.

From the test results, it was found that the percent error accuracy of testing the temperature sensor in the morning was 1.4%, at noon it was 1.5%, in the afternoon it was 1.8%, the humidity sensor in the morning was 1.6%, at noon 1.8%, in the afternoon 1.9%, the MQ135 sensor in the morning was 2%, at noon 2.2%, and in the afternoon 2.1%. Greenhouse room monitoring test results were also obtained, which were carried out every 2 minutes in the morning, afternoon and evening, within a period of 40 minutes showing that the average temperature in the morning was around 28 ° C, the average temperature at noon was around 33, the average temperature in the afternoon was around 31, the average humidity in the morning was around 63%, the average humidity at noon was around 56%, the average humidity in the afternoon was around 59%, the average CO2 levels in the morning were around 403 ppm, the average CO2 levels in the afternoon were around 191 ppm, the average CO2 levels in the afternoon were around 286 ppm. From these results, the system is proven to run well and help reduce time and energy in caring for plants in the Greenhouse room.

Keywords: *IoT,temperature,GreenHouse,plants*