

## ABSTRACT

Bees are a type of social insect that live in colonies. Bees have benefits in human life, such as crop pollination and honey production. Honey can be consumed due to its high nutritional value. In modern beekeeping, there are several things that need to be considered. One of them is the temperature and humidity of the surrounding air which will affect the life of bee colonies. Most beekeeping farms today still make regular visits to monitor the condition of the bee house. Physical inspection can affect the lifespan of the bees, cause stress to the bees, and disrupt bee productivity.

In this final project, the design of a honey bee monitoring system is made to make it easier for beekeepers to monitor the condition of the bee cage in controlling the bee routine. Monitoring can be done remotely and breeders easily determine the prediction of harvest time.

The beekeeping monitoring system is implemented in the form of Internet of Things (IoT) by using ESP32 microcontroller. It aims as the main control in running the sensor and functions to send data to Blynk Cloud which is already integrated with Blynk App on a smartphone. This system uses three kinds of sensors, namely the DHT22 sensor functions to read the temperature and humidity values in the bee cage with an accuracy value of 98.31% for temperature and 95.12% for humidity, the Load Cell sensor functions to determine the weight of the bee cage with an accuracy value of 99.68%. For the KY-037 sound sensor, it cannot measure ambient noise because the analog value reading on the ESP32 is unstable. Compared to using Arduino Uno, analog readings on ESP32 get an accuracy value of 18.27% for silent conditions, for medium conditions of 18.77% and 20.02% in noisy conditions. Sensor data readings are successfully displayed on the Blynk application with an average ping of 2 ms. Based on all the accuracy values obtained, this research can be concluded to be close to perfection.

**Keywords:** blynk, humidity, noise, Internet of Things, temperature, weight,