ABSTRACT

Water quality in an ornamental fish pond, especially koi fish is one very important factor. Delays in knowing the ideal aspects of water quality will negatively impact the health of koi fish can even lead to mass death. One way to know and control water quality quickly is to create a monitoring and controlling system for water quality in koi ponds.

The system built on this final task can monitor and control the water quality of koi fish by utilizing the concept of the Internet of Things (IoT). The system is built with a regulatory unit in the form of NodeMCU microwifi connected to several sensors and control units. The connectivity side uses wifi modem communication connected to the MQTT broker as a link between the microcontroller system and android applications. Of the entire system that has been described, the author only focuses on designing, creating, and testing user interfaces in the form of android applications that can be used to perform water quality monitoring and controlling activities.

The quality of the application is tested with some characteristics of the ISO/IEC 25010 standard. The results of testing the functional aspects of the application by 100%, the performance efficiency aspect was tested on two activities, namely monitoring and controlling obtained the average use of resources in each activity of 4.5% and 3%, Memory 159.2 MB and 132.2 MB, frame rates of 4.3 fps and 37.2 fps, and thread counts of 0.02 and 0.03 thread / second. Test results of aspects of usability and compatiility are 89,27% and 100%. Network performance quality was tested to the ITU-T G.1010 standard with a test scenario between MQTT brokers and android apps on two activities, namely monitoring and controlling, the average on monitoring and controlling activity for delay was 155.69 ms and 275.95 ms, throughput was 3185 bps and 1185 bps, packet loss was 0.01% and 0.02%. Availability and reliability are 98.04% and 98%.

Keywords: Koi fish, Internet of Things, microcontroller, sensor, monitoring, controlling, MQTT, android