

## ABSTRACT

Density of settlements in urban areas makes the land used to produce food for human needs is also reduced. Foodstuffs such as vegetables and fish are sent from various regions to the city in order to meet the food needs of the people of the city. Thus we need a modern agricultural system that does not take up much space and time wasted, and produces maximum yields, one of the popular modern farming models is aquaponics, but the conventional aquaponics system still has many shortcomings in maintaining water quality, resulting in many failed aquaponics.

Along with the development of information technology, many tools have begun to make it easier for humans to carry out their activities, especially these can be used by households and it is not difficult to use them. Here a smart aquaponics system is designed which consists of tools with several water quality sensors (temperature sensors, pH sensors, water level sensors, as well as turbidity sensors and TDS), a web server and database, as well as for the user interface using an android application to facilitate aquaponics users by utilizing IoT (Internet of Things). And with this system, users do not need to directly monitor and control water quality manually or by conventional. For this final project, the author focuses more on designing and testing mobile applications android-based.

The results of functionality testing, all the features contained in the mobile application can be run properly. For non-functionality testing, the application can be run on various androids that have different smartphone specifications. For the delay test results, the average value for the database read process is 290.05 ms and for the database write process is 247.81 ms, so the delay obtained is good. For the results of availability and reliability testing, a value of 99.58% was obtained which was tested for 8 hours.

**Keywords :** Aquaponics, Water Quality, IoT, Mobile Application, Android, Smartphone.