ABSTRACT

The bathroom is the main need in the house. The current bathroom system still uses the conventional method, namely by turning on the lamp and fan by pressing the switch, knowing the condition of the bathtub the user must look directly and wait to fully fill the bathtub and find out the condition of the shampoo the user must look directly at the shampoo container. The existing bathroom system only turns on the lights when the user enters the bathroom but when the condition of the bathtub and shampoo runs out, the user still has to look and fill the water in the tub and shampoo in the container.

In this final project, an Internet of Things based bathroom system was built. With the title "Design and Implementation of Smart Bathroom based on IoT". When the PIR (Passive Infra Red) sensor detects a movement, the lights and exhaust fan are on. Then when the Ultrasonic sensor in the tub calculates the water level and the condition of the water is empty, the solenoid valve is on and fills the tub to full. Then when the Ultrasonic sensor in the shampoo container calculates the height of the shampoo content and the condition of the shampoo is empty, then the alarm goes on and notifies the user. Then the data on the device is connected with Firebase so that all data received by the tool can be displayed in realtime.

From the results of the tests carried out shows that the system functionality tests all functions are running well. Then testing the sensor functionality has an average value of 100% accuracy. Then this system has a delay for sending data from the PIR (Passive Infra Red) sensor with an average of 1.18 seconds for the incoming PIR sensor and an average of 60.32 seconds for the PIR sensor to move out, an Ultrasonic sensor in a bathtub with an average of 2,38 seconds and an Ultrasonic sensor in a shampoo container with an average of 2,5 seconds.

Keywords: Bathroom, *Internet of Things*, PIR Sensor, Ultrasonik Sensor, Firebase, *Realtime Database*