ABSTRACT

The addition of hazardous substances to food is often found, even increasing in the era of increasingly sophisticated technology. Not a few food producers mix their merchandise with substances that are harmful to the human body, such as borax, formaldehyde, textile dyes and other chemicals. Lack of public knowledge about foods that contain hazardous substances, therefore an automatic device based on the Arduino Uno R3 microcontroller was designed. By utilizing Internet of Things (IoT) technology, a system based on the Arduino Uno R3 microcontroller can test food practically and effectively so that it can show levels of borax, formalin, and textile dyes without taking time to obtain results.

The system is designed using a TCS3200 Color Sensor connected to the Arduino Uno R3 microcontroller. Borax, formaldehyde, and textile dye levels were tested by mixing turmeric extract in the sample. Color changes that occur in the sample will be read by the TCS3200 Color Sensor and sent wirelessly to an application. The IoT tool is able to detect the presence of borax, formalin, and textile dyes in wet food displayed on the Android application. Data classification was carried out using the Tsukamoto Fuzzy Classification Method for classifying data with a total of 50 pieces of data per food ingredient using 4 criteria having an accuracy value of 90%. The results of the QoS measurement from the Tool to Firebase have an average delay of 107.8649ms and throughput of 14Kbps. Meanwhile, the QoS measurement results from Firebase to Android Applications have an average delay of 104,765ms and a throughput of 23Kbps.

Keywords : Internet of Things, Arduino Uno R3, TCS3200 Color Sensor, wireless, Fuzzy Tsukamoto