ABSTRACT

Body Mass Index (BMI) can be one of method to measuring obesity. Body weight information can be some privacy information for a few people. These are the reasons to make a BMI instrument that can displayed on smartphone. Voltage divider circuit to measure battery status, ultrasonic sensor to measure body height, and load cell to measure body weight. The data from these sensors are procesed in microcontroller ATMega328 (Arduino Nano) and transmitted via Bluetooth Low Energy (BLE) communication to the smartphone. After data received, smartphone application calculating and processing the data and shown it to the screen. Ultrasonic sensor has 99.71% of accuracy and 0.29% of error. Loadcell has 99.38% of accuracy and 0.62% of error. BLE performance to do data transmitting is about 28~33 ms. After integration, it has 0.12% of body weight measuring error, 0.2% of body height measuring error, and 0.48% of BMI measuring error. Android application needs 3,22 s to search, found, and connect to instrument and 4.89 s to send, receive, and calcute the data. 89.5% of user have a good feel of their privacy if it just displayed on their smartphone. 94.7% of user agreed result of measuring is correct, it has user-friendly interface, and more aware about their body shape. 100% of user agree that it's very informative. It can be developed into a data analysis and nutritionist can receive this data to discuss in more detail.

Keywords: Bluetooth Low Energy, Body Mass Index, Smartphone, Obesity, Xamarin, Firebase