ABSTRACT

The cause of death due to heart disease is a problem in the spotlight in various countries, especially Indonesia. Data from the World Health Organization (WHO) states that 17 million people in all parts of the country have died due to heart disease. Methods used to measure heart rate according to medical experts include stethoscopes, electrocardiograms (ECG), and phonocardiograms (PCG), but these methods are often only used in clinics and are expensive. As a result, the research aims to develop a system that detects heart rate and oxygen saturation based on the Internet of Things with the Telegram platform using the MAX30102 sensor. Because heart rate and oxygen saturation can be monitored remotely via the Telegram application, when Telegram and the tool are connected to the internet, this system will become easier. The research was carried out using the Research and Development (RnD) research and development method, the first step was literature study, system design, system testing, and data retrieval and collection. Photoplethysmography (PPG) or non-invasive methods are also used to collect data by placing the fingertip on the sensor. This tool is equipped with a NodeMCU ESP8266 as a microcontroller and an I2C 16x2 LCD as an output to display the results from the MAX30102 sensor. The research results show that the level of accuracy of the heart rate and oxygen saturation monitoring device using the MAX30102 sensor has an error rate in BPM of 0.8% and SpO_2 of 0.6% compared to the pulse oximeter. This difference shows the accuracy level of the tool is 99.2% for BPM and 99.4% for SpO_2. The analysis results show that heart rate and oxygen saturation are influenced by body condition. The Quality of Service (QoS) test results obtained a throughput value of 6,711 kbps, packet loss of 0.6% and delay of 163.4 ms.

Keywords: *Heart rate, MAX30102 Sensor, NodeMCU ESP8266, Oxygen saturation, Telegram*