

ABSTRACT

In the increasingly advanced digital era, the application of Internet of Things (IoT) technology in the healthcare field offers significant potential to enhance active lifestyles. This research focuses on the design and implementation of an IoT-based monitoring system for stationary bike activity. The system utilizes Hall effect sensors to measure the distance traveled and estimate the calories burned during exercise, while also integrating Radio Frequency Identification (RFID) technology for automatic user identification. Based on the evaluation results, this system successfully calculates calories burned and distance traveled with good accuracy, although there are slight differences compared to the reference devices. The accuracy for distance measurement is 99.15% and for calories is 95.29%. The usability evaluation using the System Usability Scale (SUS) showed an average score of 82.38, indicating a high level of user satisfaction. Based on these findings, it is recommended to further refine the formulas for calculating calories and distance, as well as improve the user interface (UI) design. Additionally, integrating with other devices and testing on a more diverse population are also suggested to enhance accuracy and broaden the system's applicability.

Keyword: *Internet of Things, Hall effect, Radio Frequency Identification, Stationary Bike, System Usability Scale*