

ABSTRACT

Information on the number of available parking slot capacity, information on trip routes to the location of the destination parking area and motivation in choosing a parking area location are parameters that can help two-wheeled vehicle users in choosing the right parking area location so that efficiency can be obtained in terms of time and fuel when looking for the location of the designated parking area.

The three parameters that determine the accuracy of selecting a parking area location are implemented in an Internet of Things (IoT) based smart parking system which is integrated with an application based on the Android operating system which can provide information about the maximum number of slot capacities and the number of available slot capacities at the parking area, as well as Two-wheeled riders are given information about which route to take to the destination parking area by utilizing the Location Based Service (LBS). These two features are then supported by the application of the gamification method that can motivate two-wheeled riders to choose the right parking area location.

The results of testing the smart parking system produce Quality of Service (QoS) performance on the Line of Sight (LOS) test, with an average delay of 71.66 ms, average jitter is 107.59 ms and throughput is 23 kbps. Meanwhile, in the non-LOS test, the average delay is 132.88 ms, the average jitter is 200.84 ms and the throughput is 12 kbps. Overall system performance obtained the percentage of reliability is 99.65 % and availability is 99.65 %. In black box testing, LBS and gamification methods can be implemented according to application requirements specifications. LBS can inform the route in the form of a polyline and voice direction. Gamification method can implement point and achievement elements.

Keywords: Internet of Things (IoT), Radio Frequency Identification (RFID) system, Smart Parking, Location Based Service (LBS), Firebase, Gamification