

ABSTRACT

Parking systems in port areas pose unique challenges in determining fair and efficient rates, particularly due to the large number of vehicles with varying capacities and purposes. This research aims to design an Internet of Things (IoT)-based parking rate determination system that integrates RFID technology, Load Cell sensors, and an ESP8266 microcontroller. This system is designed to automatically detect vehicle identity and measure vehicle weight, thereby determining parking rates based on vehicle class. The system's working method begins with the vehicle registration process using RFID and weight measurement by the Load Cell. The obtained data will be sent to the server via a WiFi connection to be stored in a database. Based on this data, the system automatically calculates parking rates according to vehicle class and weight, and allows for the imposition of additional rates in the event of overloading. This research also accommodates potential future system improvements, such as the integration of license plate recognition cameras, the use of semi-automatic systems when RFID is damaged, and the development of a progressive tariff algorithm. In addition, solutions are prepared to overcome obstacles such as RFID limitations, excessive registration forms, the unavailability of WiFi networks, and potential sensor failures through manual procedures and regular maintenance. Test results show that the system is able to identify vehicles accurately and efficiently, and calculate rates based on the specified parameters. This system is expected to improve the efficiency of port parking management, reduce recording errors, and provide tariff transparency to users.

Keywords: *IoT, RFID, Load Cell, Parking Tariff Determination, Port Parking System*