ABSTRACT

Electric bicycles are two-wheeled vehicles that are often found in frequently visited places and do not require gasoline as fuel. If used in the tourism industry, many electric bike rental companies offer their bikes to be used to get around the location. During its use, the battery has an age limit which causes the battery to need to be replaced periodically. The decline in the quality and age of the battery itself is influenced by various factors, one of which is overcharging and causing damage to the bicycle battery and making the bicycle unusable. Electric bicycle rental service companies not only need in terms of batteries, but electric bicycles that are rented out also need to be monitored for the security of assets owned by the company.

In this final project, an Internet of Things (IoT)-based electric bicycle monitoring design is made. The design of Internet of Things (IoT)-based electric bicycle monitoring aims to remotely monitor the location of electric bicycles, can cut off the power supply of electric bicycles centrally to avoid losing bicycle units, and monitor battery health, and can monitor the battery capacity of electric bicycles to make it easier for electric bicycle renters to maintain and maintain electric bicycles. This Internet of Things (IoT) based electric bicycle monitoring design uses an RC (Remote Control) car as a prototype. This device is divided into two systems, namely the first system BMS node integrated with Arduino UNO, INA219 sensor, DC voltage sensor, GPS NEO 7M, LoRa and single channel relay. The second system is BMS gateway integrated with ESP8266 and LoRa. The method used by the author to obtain battery health or State of Health is a comparison of battery capacity (mAh) obtained from the INA 219 sensor.

From the results of this design, the system can carry out all the specifications that have been determined, namely providing notification of battery health conditions in the form of notifications, can determine the position of the RC car with an average deviation distance of 7.3 meters from the actual position point and can cut off the power current on the prototype through a web application with realtime data transmission communication which has a delay range of 3.2 seconds..

Keywords: electric bicycle, Internet of Things, prototype, monitoring, gateway