

ABSTRACT

Hajj is an obligation for all Muslims who are able to carry out the pilgrimage and Indonesia is one of the largest number of pilgrims departing each year. Before the implementation of the pilgrimage begins, the pilgrims will be divided into groups of pilgrims from each region. With the formation of the hajj group, the hajj committee will find it easier to monitor or supervise the pilgrims in the holy land later. But not a few pilgrims who get lost during the pilgrimage. Several factors cause pilgrims to get lost, such as old age who have poor memory, and pilgrims who cannot read Arabic script and speak Arabic.

In this final project, a monitoring system is designed and implemented during the pilgrimage process using the Global Positioning System (GPS) to collect latitude and longitude location data. This final project also integrates a GPS system and a database so that Hajj pilgrims can be monitored in real time through the website using the Internet of Things method. This monitoring system uses ESP32 as the brain of this system and is equipped with a SIM800L Module which functions to transmit data on the location of pilgrims to the database via the GSM network.

The results of testing the pilgrim monitoring system show that the system is functioning and working well. The results of the data from the NEO6 GPS Module compared to Google Maps obtained an average distance difference of 4.24 meters with an average error percentage of 4.71%. The results of the end-to-end test are that the delay in sending data from the device to the website is 6,307s with a reliability value of 98.77% and availability of 98.79%.

Keywords: ES32, Global Positioning System, Internet of Things, Pilgrims, SIM800L Module, Monitoring.