Development of IoT-based Smart Traffic Light (Internet Of Things) with Mobile Backend as a Service (MbaaS) as a form of Smart City in the field of transportation

by Muhammad Munir M.Pd, Muhammad Izzuddin Mahali M.Cs, Satriyo Agung Dewanto M.Pd, Nur Hasanah M.Cs, Bekti Wulandari MPd

ABSTRACT

This study aims to develop IoT-based Smart Traffic Light with MbaaS. The target of this product development is focused on expedite Ambulance vehicle travel when bringing emergency patients through smart traffic light using Internet of Things, MbaaS and Android system. This research uses Rational Unified Process (RUP) method. RUP consists of stages of Inception, Elaboration, Construction, and Transition. IOT-based Smart Traffic Light with MbaaS incorporates systems such as NodeMCU, Firebase and android apps. The Firebase service used in Smart Traffic Light is the authentication and realtime database. The NodeMCU module connects to Firebase via internet communication. The android app uses authentication and realtime database services. The reference of route search and distance prediction of rider with traffic light use Google Map API (Application Program Interface) service. Smart Traffic Light application based on android update location by utilizing GPS feature then save data update location of trip to Firebase. The NodeMCU contained in Smart Traffic Light at the intersection takes data from Firebase using an internet connection. When the application is run, the light traffic light is unidirectional turn green before the vehicle crossing the intersection. The average time the application needs to change the light traffic light is 3.39 seconds with the fastest time of 1.2 seconds.

Kata Kunci: *Smart Traffic Light, IoT, Firebase, Android*