

ABSTRACT

FACP components collaborate to detect and alert occupants during fire emergencies, and IoT connectivity allows seamless integration into larger networks for real-time data access. Standardization in IoT implementation in FACP systems is key to ensuring interoperability, security, and adequate data availability. Standardization is necessary to meet regulatory requirements and norms related to security. Until now, there are no international standards, as well as national standards in Indonesia, or specific technical recommendations for the selection and configuration of IoT systems in FACP systems. This research aims to recommend IoT standardization for FACP based on the results of technical tests for implementing the IoT system on FACP in terms of IoT Device, IoT Network, IoT Platform protocol, and IoT Application. Based on the test results, it explores the connectivity options of IoT gateways, emphasizing their ability to interface with FACP via third-party interfaces with a validation rate of 100% within a maximum distance of 40 meters. Secondly, it discusses the power supply requirements for IoT gateways, highlighting the necessity of dual power sources—direct power supply and battery backup—to comply with NFPA 72 standards. Additionally, it recommends increasing the battery capacity margin by at least 10% to ensure a backup duration of 5-15 minutes. Thirdly, the study delves into the internet connectivity and network redundancy features of IoT gateways, stressing the importance of utilizing dual internet sources and seamless network devices to ensure robustness and reliability in IoT systems. Furthermore, it presents findings regarding the prioritization of cable-based networks over wireless networks based on Quality of Service (QoS) measurements, which indicate lower delay values for Ethernet connections compared to mobile connections. Moreover, the study evaluates the suitability of MQTT and HTTP protocols for data transmission, recommending MQTT due to its superior Quality of Service (QoS) performance. Lastly, it examines IoT application functionalities for FACP, focusing on providing real-time status updates of the fire alarm system, including fire location, alarm type, and detector status. The study validates these recommendations through usability testing, achieving high scores in validation values, SEQ, SUS, and NPS metrics.

Keyword – *FACP, IoT, Standarization, QoS, Fire Alarm*