

ABSTRAK

**PERANGKAT LUNAK SISTEM PENGEMBANGAN PROTOTIPE
DETEKSI GANGGUAN PADA (*POINT OF PRESENCE*) POP
MENGUNAKAN MODUL RASBERRY PI DAN KECERDASAN BUATAN
(2026 : xvii + 102 Halaman + 76 gambar + 9 tabel + 9 lampiran)**

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Point of Presence (PoP) merupakan fasilitas penting dalam jaringan telekomunikasi yang harus selalu berada dalam kondisi aman dan terpantau. Gangguan seperti asap, keberadaan manusia yang tidak berkepentingan, maupun objek tertentu di area PoP dapat memengaruhi kinerja perangkat jaringan. Oleh karena itu, penelitian ini bertujuan mengembangkan prototipe sistem deteksi gangguan berbasis Raspberry Pi yang terintegrasi dengan teknologi Internet of Things (IoT) dan kecerdasan buatan. Sistem yang dirancang menggunakan sensor ultrasonik, sensor MQ-2, dan AI Camera untuk mendeteksi berbagai kondisi gangguan. Data hasil deteksi kemudian dikirim dan ditampilkan secara real-time melalui dashboard Node-RED serta dilengkapi buzzer sebagai alarm peringatan. Hasil pengujian menunjukkan bahwa sistem mampu mendeteksi gangguan dan menampilkan informasi pemantauan secara real-time sesuai dengan fungsi yang dirancang. Dengan demikian, prototipe ini dapat menjadi solusi pendukung dalam meningkatkan efektivitas monitoring dan keamanan pada Point of Presence.

Kata kunci: Point of Presence (PoP), Raspberry Pi, Internet of Things (IoT), kecerdasan buatan, Node-RED.

ABSTRACT

DEVELOPMENT OF A PROTOTYPE OF INTERFERENCE DETECTION AT (POINT OF PRESENCE) POP USING RASBERRY PI MODULES AND ARTIFICIAL INTELLIGENCE

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Point of Presence (PoP) is an important facility in a telecommunications network that must always remain secure and continuously monitored. Disturbances such as smoke, the presence of unauthorized individuals, or certain objects within the PoP area can affect the performance of network equipment. Therefore, this study aims to develop a disturbance detection prototype based on Raspberry Pi integrated with Internet of Things (IoT) technology and artificial intelligence. The proposed system utilizes an ultrasonic sensor, an MQ-2 sensor, and an AI Camera to detect various disturbance conditions. Detection data are transmitted and displayed in real-time through a Node-RED dashboard and are supported by a buzzer as a local warning alarm. The testing results show that the system is capable of detecting disturbances and displaying monitoring information in real-time according to the designed functions. Therefore, the developed prototype can serve as a supporting solution to improve monitoring effectiveness and security at Point of Presence facilities.

Keywords: *Point of Presence (PoP), Raspberry Pi, Internet of Things (IoT), Artificial Intelligence, Node-RED*

