ABSTRACT

This study aims to design and implement a QR Code-based automated ticket gate system for use in sports arenas, with the goal of enhancing the efficiency and security of visitor entry processes. The system utilizes a Raspberry Pi as the control center, a barcode scanner to read QR Codes, and an internet connection to validate tickets in real time through a server. The automated access system is designed with two authentication models: an OTP (One-Time Password) model, where the OTP is sent to the user after ticket scanning via the application, and a non-OTP model that uses ticket data-based verification. This system has been directly integrated with the JTV application, allowing users who purchase tickets via the app to access the gate. Additionally, the system includes a web-based dashboard for real-time monitoring of gate status, managing user and ticket data, and recording access logs.Testing results show that the system achieves a 98% QR Code reading accuracy and can open the gate with an average time of 0.567 seconds without OTP and 4.25 seconds with OTP. The system was tested by the author through simulations of real field conditions. Evaluation focused on the validity of the authentication process and the gate's response speed in granting access. Moreover, system resource usage remained within reasonable limits and demonstrated stable performance. Therefore, this system is deemed suitable as a modern solution for managing access to public areas that require high levels of security and efficiency.

Keywords: *QR Code, OTP, Raspberry Pi, Ticket Validation, Automated Gate.*