ABSTRAK

Penelitian ini bertujuan mengatasi kendala teknis sistem absensi *fingerprint* di PERUMDA Tirta Musi Unit Rambutan Palembang, di mana kondisi fisik tangan pegawai yang sering basah atau kotor akibat aktivitas lapangan kerap memicu kegagalan sensor. Solusi yang ditawarkan adalah pengembangan Sistem Absensi Berbasis Web menggunakan metode *Rapid Application Development* (RAD) dengan dukungan framework Laravel dan pustaka *Face*-api.js. Sistem ini mengintegrasikan teknologi *Face Recognition* yang dilengkapi fitur *Liveness Detection* (deteksi kedipan mata) untuk mencegah kecurangan, serta *Geofencing* untuk memvalidasi koordinat GPS pegawai sesuai radius kerja. Dilengkapi dengan modul *Rolling Shift Management* untuk fleksibilitas jadwal operator, hasil pengujian blackbox testing menunjukkan bahwa seluruh fungsi sistem,termasuk pencocokan wajah dengan ambang batas *Euclidean distance* kurang dari 0.6 berjalan dengan tingkat akurasi tinggi. Implementasi ini mentransformasi manajemen kehadiran menjadi lebih higienis, transparan, dan akurat secara *real-time* guna meningkatkan efisiensi administrasi kepegawaian.

Kata Kunci: Absensi Berbasis Web, *Face Recognition*, *Geofencing*, *Liveness Detection*, Laravel, *Rapid Application Development* (RAD).

ABSTRACT

This research aims to overcome the technical constraints of the fingerprint attendance system at PERUMDA Tirta Musi Rambutan Unit Palembang, where the physical condition of employees' hands, which are often wet or dirty due to field activities, often triggers sensor failure. The solution offered is the development of a Web-Based Attendance System using the Rapid Application Development (RAD) method with the support of the Laravel framework and the Face-api.js library. This system integrates Face Recognition technology equipped with Liveness Detection (eye blink detection) features to prevent fraud, as well as Geofencing to validate employee GPS coordinates according to the work radius. Equipped with a Rolling *Shift* Management module for operator schedule flexibility, blackbox testing results show that all system functions, including face matching with a Euclidean distance threshold of less than 0.6, run with a high level of accuracy. This implementation transforms attendance management to be more hygienic, transparent, and accurate in real-time to improve the efficiency of personnel administration.

Keywords: Web Based Attendance, Face Recognition, Geofencing, Liveness Detection, Laravel, Rapid Application Development (RAD).