

ABSTRAK

RANCANG BANGUN SISTEM POIN LOYALITAS BERBASIS RFID DAN WEBSITE (STUDI KASUS KANTIN SMPN 21 PALEMBANG)

(Muhammad Adiel Ramadhan 2025:65 halaman)

Kantin sekolah SMPN 21 Palembang belum menerapkan sistem loyalitas pelanggan, sehingga loyalitas dan frekuensi kunjungan siswa relatif rendah. Untuk mengatasi hal tersebut, dirancanglah sistem poin loyalitas berbasis kartu RFID yang terintegrasi dengan aplikasi *web* menggunakan metode *Research and Development* (R&D). Sistem melibatkan ESP32 sebagai pengendali, RFID RC522 untuk identifikasi kartu, keypad sebagai input, dan LCD sebagai antarmuka, serta *Firestore* untuk penyimpanan data secara *real-time*. Hasil pengujian menunjukkan jarak baca RFID stabil hingga 3 cm, logika penambahan dan penukaran poin berfungsi akurat sesuai skenario, sinkronisasi data pelanggan dan transaksi berjalan baik, serta antarmuka *web* responsif dan fungsional di berbagai perangkat. Sistem ini memiliki potensi untuk meningkatkan efisiensi operasional, transparansi transaksi, dan loyalitas siswa melalui skema poin yang mudah digunakan.

Kata kunci: Loyalitas pelanggan, RFID, *Firestore*, ESP32, RC522, *Website*

ABSTRACT

DESIGN AND DEVELOPMENT OF AN RFID BASED LOYALTY POINT SYSTEM INTEGRATED WITH A WEBSITE (CASE STUDY: SMPN 21 PALEMBANG CANTEEN)

(Muhammad Adiel Ramadhan 2025:65 Pages)

The school canteen at SMPN 21 Palembang has not yet implemented a customer loyalty system, resulting in relatively low student engagement and visit frequency. To address this issue, a loyalty point system was designed using RFID cards integrated with a responsive web application through a Research and Development (R&D) approach. The system incorporates an ESP32 microcontroller as the central unit, an RFID RC522 module for card identification, a keypad for input, an LCD for interaction, and Firebase Cloud Firestore for real-time data storage. Test results indicate that RFID reading remains stable up to a distance of 3 cm, point accumulation and redemption logic performs accurately according to predefined scenarios, and customer data and transaction synchronization works reliably. Additionally, the web interface is responsive and functions effectively across multiple devices. The system has proven potential to enhance operational efficiency, transaction transparency, and student loyalty through an easy-to-use point-based mechanism.

Keywords: *Customer loyalty, RFID, Firebase Cloud Firestore, ESP32, RC522, Website*