Smart E -Ration System: An IoT-Based Approach to Enhance Transparency and Security in Public Distribution

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Abstract: *The traditional Public Distribution System (PDS) faces challenges such as ration pilferage, unauthorized access, and delivery inefficiencies. This project proposes a Smart E-Ration System integrating RFID/Aadhaar-based authentication, IoT-based tamper detection, and GPS-enabled tracking to ensure secure and accountable distribution of subsidized goods. The system employs Node MCU or ESP32 as the central controller, interfacing with sensors to detect unauthorized access and deviations in the ration vehicle's delivery route. A GSM module sends real-time alerts via SMS to the administrator in case of tampering or route anomalies. Additionally, a PHP-based web portal facilitates monitoring and management, featuring three-tier logins for admin, staff, and users. By leveraging IoT hardware and cloud-based data logging, the proposed system enhances transparency, prevents corruption, and ensures that ration reaches the intended recipients efficiently.*

Keywords: GPS Tracking, GSM Alerts, Tamper Detection, ESP32, NodeMCU

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452

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