ABSTRACT

The Mandiri Farmers Group's oil palm plantation faces major challenges in human

resource management, electricity availability, and communication network access. The

foreman's manual recording system often results in data errors, inconsistent reports, and

miscommunication between workers and supervisors, which impacts wage distribution and

work efficiency.

Furthermore, infrastructure limitations such as limited electricity supply and poor

cellular signal in the plantation area worsen work coordination and slow down the reporting

process. To address these challenges, this study proposes the implementation of a digital-

based human resource management system integrated with supporting infrastructure in the

form of a solar power plant (PLTS) and LTE-based network devices.

The proposed system is designed to record worker data, job types, working hours,

performance calculations, and wage calculations in real-time with online mode.

Implementation involves developing software in the form of a simple, intuitive web-based

or mobile application equipped with security features in accordance with personal data

protection regulations.

On the hardware side, a PLTS with high-capacity storage batteries, optimally

powered solar panels, and microcontroller-based power management for efficient energy

use was installed. The testing process included verifying application functionality through

blackbox testing and alpha testing, measuring the durability of the solar power plant

system, and testing network signal stability.

Implementation results demonstrated that digitalizing work management

minimizes recording errors, accelerates performance evaluation, increases transparency,

and ensures smooth operations even in remote locations. By integrating information

technology, renewable energy, and an independent network, this system provides an

effective, efficient, and sustainable solution that can be replicated in other plantation sectors

facing similar challenges.

Keywords: human resource management, palm oil, digitalization, solar power plants,

LTE networks, IoT

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