

ABSTRACT

The process of data collection and maintenance documentation for heavy equipment at PT Perwita has previously relied on conventional physical paper media, which is prone to damage and loss, thereby complicating accurate unit maintenance track record analysis. This study aims to design and develop a web-based digital maintenance information system for a Komatsu WA350 wheel loader operating in an Asphalt Mixing Plant (AMP), as well as to analyze the unit's reliability using the Weibull distribution method with a Maximum Likelihood Estimation (MLE) approach. The information system was developed using the PHP programming language with a MySQL database and was uploaded online via the Hostinger cloud hosting service. Based on 24 failure data points obtained from January 2025 to March 2026, a total of 23 Time To Failure (TTF) data points were derived. From the available TTF data, the system automatically calculated a Shape Parameter (β) of 3.5847 and a Scale Parameter (η) of 90.47 hours. These calculation results indicate that the type of failure experienced is an increasing failure rate caused by mechanical wear, with a median value of 81.68 subsequent operational hours. The implementation of this maintenance information system successfully integrates the monitoring, recording, and calculation analysis of heavy equipment unit maintenance.

Keyword : Digitalitation of Maintenance, Wheel Loader, Website, Weibull, Maximum Likelihood Estimation.

INTISARI

Proses pendataan dan dokumentasi *maintenance* alat berat pada PT Perwita selama ini masih menggunakan media konvensional berupa kertas fisik yang rentan rusak dan hilang, sehingga menyulitkan analisis rekam jejak perawatan unit secara akurat. Penelitian ini bertujuan untuk mendesain dan membangun sistem informasi *maintenance* digital berbasis *website* untuk unit *wheel loader* merek Komatsu tipe WA350 pada pekerjaan *Asphalt Mixing Plant* (AMP) serta menganalisis keandalan unit menggunakan metode distribusi *Weibull* dengan pendekatan *Maximum Likelihood Estimation* (MLE). Sistem informasi ini dikembangkan menggunakan bahasa pemrograman PHP dengan *database* yang digunakan adalah MySQL, dan diunggah secara daring melalui layanan *cloud hosting* bernama Hostinger. Berdasarkan 24 data kerusakan yang diperoleh pada periode bulan Januari 2025 hingga Maret 2026, diperoleh data *Time To Failure* (TTF) sejumlah 23 data. Dari jumlah data TTF yang ada, sistem membuat perhitungan otomatis nilai *Shape Parameter* (β) sebesar 3,5847 dan *Scale Parameter* (η) sebesar 90,47 jam. Hasil perhitungan tersebut mendandakan jenis kerusakan yang dialami yaitu *increasing failure rate* akibat keausan mekanis, dengan nilai median sebesar 81,68 jam operasional kedepan. Implementasi sistem informasi *maintenance* ini mengintegrasikan *monitoring*, pencatatan dan analisis kalkulasi *maintenance* pada unit alat berat.

Kata Kunci: Digitalisasi *Maintenance*, *Wheel Loader*, *Website*, *Weibull*, *Maximum Likelihood Estimation*.