

ANALISIS OPTIMALISASI *RESPONSE TIME* DALAM LAYANAN PERBAIKAN ALAT BERAT DENGAN METODE *SIX SIGMA* PADA PT. XYZ

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ABSTRAK

Persaingan industri jasa alat berat mendorong PT. XYZ untuk menjaga kualitas layanan, khususnya pada aspek *response time* layanan perbaikan. Perusahaan menargetkan teknisi tiba di lokasi pelanggan di hari yang sama. Namun, pada tahun 2024, dari total 1.459 service order, sebanyak 30,09% mengalami keterlambatan. Penelitian ini bertujuan untuk mengidentifikasi faktor penyebab keterlambatan serta merumuskan solusi perbaikan dengan pendekatan *Six Sigma* melalui metode DMAIC (*Define, Measure, Analyze, Improve, Control*). Analisis dilakukan menggunakan alat bantu seperti SIPOC, CTQ, DPMO, *Business Process Mining* berbasis Petri Net, *Fault Tree Analysis*, dan simulasi Monte Carlo. Hasil analisis menunjukkan bahwa keterlambatan disebabkan oleh ketidakefisienan proses, minimnya koordinasi lintas divisi, dan kendala pada ketersediaan teknisi maupun suku cadang. Rekomendasi perbaikan dalam penelitian ini disusun untuk mengoptimalkan *response time serviceman* agar sesuai dengan target perusahaan. Usulan tersebut mencakup penyusunan SOP perencanaan kebutuhan teknisi berbasis data historis dengan *forecasting Simple Moving Average* (SMA), penerapan sistem digital pemantau SLA, pembuatan form evaluasi keterlambatan teknisi, serta penyusunan *Work Instruction* (WI) yang memastikan *Service Order* hanya dibuat saat *part* tersedia. Seluruh rekomendasi dirancang berdasarkan hasil identifikasi akar masalah dan diuji efektivitasnya pada tahap *Control* menggunakan simulasi Monte Carlo. Hasil simulasi menunjukkan adanya penurunan DPMO dan peningkatan level sigma, yang mencerminkan peningkatan kualitas layanan dan efisiensi operasional.

Kata Kunci: *Response time, Six Sigma, DMAIC, SLA, Layanan perbaikan*

ANALYSIS OF RESPONSE TIME OPTIMIZATION IN HEAVY EQUIPMENT REPAIR SERVICES USING THE SIX SIGMA METHOD AT PT. XYZ

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ABSTRACT

The competitive landscape of the heavy equipment service industry drives PT. XYZ to maintain high service quality, particularly in the response time of repair services. The company targets its technicians to arrive at the customer site on the same day. However, in 2024, out of a total of 1,459 service orders, 30.09% experienced delayed response times. This study aims to identify the root causes of the delays and formulate improvement solutions using the Six Sigma approach through the DMAIC (Define, Measure, Analyze, Improve, Control) methodology. The analysis was conducted using various tools including SIPOC, CTQ, DPMO, Petri Net-based Business Process Mining, Fault Tree Analysis, and Monte Carlo simulation. The results indicate that the delays were caused by process inefficiencies, limited cross-divisional coordination, and issues related to technician and spare part availability. The improvement recommendations proposed in this study aim to optimize serviceman response time to meet the company's targets. These include developing a technician planning SOP based on historical data using Simple Moving Average (SMA) forecasting, implementing a digital SLA monitoring system, creating a technician delay evaluation form, and establishing a Work Instruction (WI) that ensures Service Orders are only created when parts are available. All recommendations were derived from root cause analysis and their effectiveness was validated in the Control phase using Monte Carlo simulation. The simulation results showed a reduction in DPMO and an increase in sigma level, reflecting enhanced service quality and operational efficiency.

Keywords: *Response time, Six Sigma, DMAIC, SLA, Service improvement*