ABSTRACT

This study was conducted to determine the effectiveness of implementing a gate-based quality control system to improve the efficiency of turnaround times in engine maintenance processes at PT. GMF AeroAsia. In the MRO (maintenance, repair, and overhaul) sector, TAT is a critical indicator for determining operational efficiency in a process and a key factor in customer satisfaction. The problem identified was that TAT for the 2022-2024 period frequently fell short of the service level agreement target. Gates 4-5 in the gate system were the largest contributors due to supply chain process constraints.

The objectives of this study were to analyze delays at gates 4-5 as the primary cause of the failure to achieve TAT, identify the impact of limited working capital on supply chain process efficiency, disseminate the application of the six sigma DMAIC method to improve gate 4-5 performance, and assess the effectiveness of integrating characteristic chain project management and centralized reliability maintenance to support continuous improvement. A literature review indicated that these three approaches complement each other in improving operational effectiveness and service quality in the MRO industry.

The methods used in this study were quantitative and descriptive qualitative. Data collection was conducted by calculating quantitative analysis scores and observing operational documentation. This study also utilized interviews to support the data analysis. The analysis was conducted using the DMAIC steps to identify root causes, followed by cross-variable testing and mapping of the main causes of delays at gates 4-5.

The research results indicated that the main root causes lay in the absence of SLAs per gate, limited front-loading working capital, weak coordination between units, and non-compliance with the approval and purchasing process system. The implementation of DMAIC resulted in several improvement strategies, such as planning system integration, a reserve fund policy, and digitalization of the procurement process. CCPM was proven to manage time and resources through buffer management, while RCM contributed to maintaining the reliability of critical components to prevent technical delays.

The study concluded that the application of Six Sigma DMAIC, CCPM, and RCM provided a comprehensive solution to the delay problem at gates 4-5. This approach not only increased process efficiency but also established a foundation for continuous improvement in the project's machine maintenance. However, the analysis was limited to gates 4-5, which did not encompass the entire gate system. Future research is expected to encompass the entire gate system's machine maintenance process.

keyword : *Turnaround Time, Gate system, Engine maintenance, Six Sigma DMAIC, CCPM, RCM*