Project Title: Adaptive Process Optimization Strategies --- Sustaining the Best-in-class Performance of Spare Parts Services
研究項目: 演變式的流程優化策略 --- 維持國際一流零件服務水平
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-Abstract-

演變式的流程優化策略 --- 維持國際一流零件服務水平

Adaptive Process Optimization Strategies: Sustaining the Best-in-class Performance of Spare Parts Services

With the advanced logistics developments in recent decades, various manufacturers are able to profit from the spare parts service for systems maintenance and to enhance product sustainability by managing the express delivery and the reverse logistics. These advanced logistics developments have driven the evolution of traditional spare parts management into a new service model. Apart from the on-site spare parts management, manufacturers and authorised service providers must offer more customised services and the collection of repairable items from users in the reverse logistics process. However, these evolutionary service requirements introduce procedural complexities and extends the service scope.

In this research, we aim to optimise the process of service parts management through a holistic and adaptive approach. The whole process scope includes logistics network design, inventory and warehouse management, and reverse logistics operations. To identify the numerous factors and parameters during the process optimisation, we will start by standardising a generic process flow of service parts operations that align with companies' strategic objectives. Then, we will perform data collection to investigate the effects of these factors and their correlations. After identifying the critical factors, we will formulate them into a generic decision model for deriving optimal adaptive policies with a data-driven process control mechanism. A simulation platform will be developed to verify and monitor the proposed solutions. The performance of the optimal adaptive policies will be finally benchmarked with the optimal static policy, which is commonly applied in various industries. These results will provide effective guidelines for the implementation of adaptive process optimisation of service parts operations.