

## Challenges in Achieving Profitability for MRO Companies in the Aviation Industry: An Analytical Approach

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**Abstract :** Maintenance, Repair, and Overhaul (MRO) costs are significant in the aviation industry. On the other hand, companies that provide MRO services to the aviation industry but are not dominant in the sector, need to determine the right strategies for sustainable profitability in a competitive environment. This study examined the operational real data of a small medium enterprise (SME) MRO company where analytical methods are not widely applied. The company's customers were divided into two categories: airline companies and non-airline companies, and the variables that best explained profitability were analyzed with Logistic Regression for each category and the results were compared. First, data reduction was applied to the transformed variables that went through the data cleaning and preparation stages, and the variables to be included in the model were decided. The misclassification rates for the logistic regression results concerning both customer categories are similar, indicating consistent model performance across different segments. Less profit margin is obtained from airline customers, which can be explained by the variables part description, time to quotation (TTQ), turnaround time (TAT), manager, part cost, and labour cost. The higher profit margin obtained from non-airline customers is explained only by the variables part description, part cost, and labour cost. Based on the two models, it can be stated that it is significantly more challenging for the MRO company, which is the subject of our study, to achieve profitability from Airline customers. While operational processes and organizational structure also affect the profit from airline customers, only the type of parts and costs determine the profit for non-airlines.

**Keywords :** aircraft, aircraft components, aviation, data analytics, data science, gini index, maintenance, repair, and overhaul, MRO, logistic regression, profit, variable clustering, variable reduction

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