THE BOEING COMPANY

Levers for Quality Transformation

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The scope of the **Quality Transformation** Tauber Boeing project was to understand the impact that Quality Levers have on the Boeing production system and their effect on stability and quality. The project focused on quality and manufacturing data from the 787 program when analyzing quality levers and creating the defect prediction model.

The project delivered three main items to the Boeing team. First, an analysis of quantitative and qualitative impact of quality levers on the magnitude of defects. The key Quality Levers identified were categorized into three groups: Program Maturity, Complexity, and Performance Metrics. Second, a Bayesian Machine Learning model predicting the level of future quality from mathematical relationships between key drivers and the magnitude of defects. Third, are report of findings and recommendations based on the key Quality Levers.

There were 3 main recommendations presented in this report. First, continue building out the Bayesian Machine Learning Model by adding more Quality Levers and creating a tool for users to learn the relationships between Quality Levers and future defects. The second main recommendation is to leverage the Quality Lever findings to work towards preventing defects over reducing defects. The third recommendation is to capitalize on the specificity of defects predicted based on customer expectation calculations to assist teams working on increasing customer satisfaction.

The exact impact of this project is not calculable because it depends on implementation schedule, implementation range and adoption rate across the organization. What can be estimated is the average number of defects expected on future airplanes. Boeing should expect to naturally obtain $32M from 2021 through 2023 in cost avoidance due to their current learning rates. That corresponds to 2% of the combined Total Cost of Quality (TCOQ) for those years. Implementing the recommendations included here would serve to increase cost avoidance from these projected levels up to $185M or more in the next 3 years. It can be expected that TCOQ under values actual costs, and that the potential impact of this project is higher than the estimated TCOQ cost avoidance calculations.