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An optimal design for process quality improvement: modelling and application

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Abstract

Existing research works on process quality improvement focus largely on the linkages between quality improvement cost and production economics such as set-up cost and defect rate reduction. This paper deals with the optimal design problem for process improvement by balancing the sunk investment cost and revenue increments due to the process improvement. We develop an optimal model based on Taguchi cost functions. The model is validated through a real case study in automotive industry where the 6-sigma DMAIC methodology has been applied. According to this research, the management can adjust the investment on prevention and appraisal costs on quality improvement that enhances process capability, reduces product defect rate and, as a result, generates remarkable financial return.

Keywords:

process quality improvement | 6-sigma | Taguchi cost function | case study | revenue management

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