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Production system with process quality control: modelling and application

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Abstract

Over the past decade, there has been a great deal of research dedicated to the study of quality and the economics of production. In this article, we develop a dynamic model which is based on the hypothesis of a traditional economic production quantity model. Taguchi's cost of poor quality is used to evaluate the cost of poor quality in the dynamic production system. A practical case from the automotive industry, which uses the Six-sigma DMAIC methodology, is discussed to verify the proposed model. This study shows that there is an optimal value of quality investment to make the production system reach a reasonable quality level and minimise the production cost. Based on our model, the management can adjust its investment in quality improvement to generate considerable financial return.

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