

Sustainable Supplier Selection Using Combined Thinking Process

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Abstract:

This paper aims to propose an integrated methodology based on the theory of constraint (TOC), lean thinking (LT), and six-sigma (SS) into a single evaluation model to select the best supplier under various qualitative and quantitative criteria to maintain its supply chain. Firstly, the study identifies production constraints using combined approaches, thereafter the decision-aiding method namely entropy-based technique for order of preference by similarity to ideal solution (TOPSIS) is used for exploiting the value stream and automate the selection strategy which satisfies the subsequent phases of the integrated methodology. To demonstrate the application feasibility of the proposed integrated methodology an illustrative case of a brake flange manufacturer is considered. The model effectively integrates the expert judgments and skill of each dispersed evaluator, and the quantitative data to select the best supplier for assistance. The methodology can be widely applicable to any of the production house where supplier selection reduces the throughput of the organization.

Keywords: TOC SS LT TOPSIS Supplier selection Sustainability