

工程与应用

基于双层规划的供应商选择模型及求解分析

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摘要 从降低整车厂采购费用和提高零部件供应商服务质量两个效益背反的因素出发, 利用双层规划的博弈特点建立模型对汽车零部件供应商选择问题进行定量分析, 其中上层规划以整车厂采购总费用最小为目标, 下层规划以供应商的服务质量最大为目标, 引入“综合表现度”的概念, 运用ANP(网络层次分析法)法计算影响因素的权重, 并乘以供应商各影响因素的取值, 从而确定了供应商的综合表现度。最后, 结合模型的特点设计了遗传算法, 并应用实例验证了模型和算法的有效性, 为汽车零部件供应商的选择提供有益的参考。

关键词 [供应商选择](#) [双层规划](#) [网络层次分析法](#) [遗传算法](#)

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Bi-level programming model and algorithm analysis for supplier selection

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Abstract

In order to reduce the procurement cost of automobile factory and improve the service quality of auto parts supplier, a bi-level programming model is designed to describe the game relationship between automobile factory and supplier. The upper-level objective function determines procurement total cost which should be minimized, and the lower-level objective function is supplier's total service quality which should be maximized. A concept on measuring supplier's service quality is presented as "synthetically expressive degree". Through the method of ANP, the weight of influencing factors is gained, the influencing factors' value of the suppliers is multiplied, and the synthetically expressive degree of each subcontract supplier is gained. Finally, the genetic algorithm is designed for the model, and through a case study, both the model and the algorithm are validated. They can provide valuable support for supplier selection.

Key words [supplier selection](#) [bi-level programming](#) [Analytic Network Process \(ANP\)](#) [genetic algorithm](#)

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