

應用模糊多目標競局理論求解供應商選擇問題-以航太產業為例

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摘要

供應商的選擇對一個企業來說，可算是相當重要的致勝關鍵。在本研究中假設企業與供應商之間的關係為一種模糊狀態。又因為多屬性決策問題(Multiple Attribute Decision Making)為處理在許多屬性影響下之方案排序與評選之問題。所以供應商選擇也可視為一個複雜的多屬性決策問題。但是在國內航太產業中，企業常因為訂單的不足，而無法維持企業與供應商之間的長期且穩定關係。且企業在選擇供應商時通常只單純以價格競標的方式作為選擇依據。因此經常發生供應商因產能負荷不足而造成無法準時達交的情形。基於上述原因，本研究欲以一決策支援系統來建構一個適合於航太產業的供應商選擇架構。而這個決策支援系統為結合模糊多目標規劃和競局理論所設計的一個簡易的供應商選評模型。

關鍵詞：多屬性決策問題；模糊多目標規劃；競局理論

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參考文獻

中文部分 【1】王文科，民79，教育研究法，五南圖書出版公司。【2】李又樸，民82，「模糊綜合評估在最佳供應商選擇之應用」，國立台灣工業技術學院管理技術研究所，工業管理學程碩士論文。【3】郭生玉，民82，心理與教育研究法，第十一版，精華書局。【4】范麗娟，民83，「深度訪談簡介」，戶外遊憩研究，第七卷，第25-35頁。【5】胡幼慧，民85，質性研究：理論、方法及本土女性研究實例，巨流圖書公司。【6】陳曉琪，民90，供應商遴選之決策支援系統之研究，義守大學工業工程研究所碩士論文。【7】徐村和，民86年，「運輸計劃評估 模糊量度AHP法」，國家科學委員會，人文及社會科學，第七冊，頁26-34。【8】徐村和，民82年，「模糊決策理論應用在大眾捷運系統與公車整合營運計劃之研究」，國立成功大學交通管理科學研究所博士論文。【9】黃瑞琴，民80，質的教育研究方法，心理出版社。【10】馮正民、江俊良，民77年，計畫評估方法之評述，規劃學報，第十五期，頁65-86。英文部分【1】Anderson, E. L. Jr., 1994, "Evaluate Critical Suppliers," Purchasing, Vol. 117, pp. 53-56.【2】Azis, I. J., 1990, "Analytic Hierarchy Process in The Benefit-Cost Framework:A Post-Evaluation of The Trans-Sumatra Highway Project," European of Operational Research, Vol. 48, pp. 38-48.【3】Barbarosoglu, G., Yazgac, T., 1997, "An Application of the Analytic Hierarchy Process to the supplier Selection Problem," Production and Inventory Management Journal, Vol. 38, pp. 14-21.【4】Belton, V., 1986, "A Comparison of The Analytic Hierarchy Process and a Simple Multi-attribute Value function," European Journal of Operational Research, Vol. 26, pp. 7-21.【5】Briggs, T., Kunsch, P. and Marechaal, B., 1990, "Nuclear Waste Management : An Application of the Multicriteria Promethee Methods," European Journal of Operational Research, Vol. 4, pp. 1-10.【6】Chaudhry, S.S., Forst, F. G. and Zydiak, J. L., 1993, "Vendor Selection With Price Breaks" , European Journal of Operational Research, Vol. 70, pp. 52-56.【7】Chen, C. T., 2000, "Extensions of the TOPSIS for group decision-making under fuzzy environment" , Fuzzy Sets and Systems, Vol. 114, pp. 1-9.【8】Dickson, Gray W., 1966, "An Analysis of Supplier Selection System and Decision," Journal of Purchasing, Vol. 2, pp. 5-17.【9】Dubois, D. and Prade. H., 1978, "Operations on Fuzzy Numbers," International Journal of System Sciences, Vol. 9, pp. 357-360.【10】Dyer, J. S., 1990, "Remarks on The Analytic Hierarchy Process," Management Science, Vol. 36, pp. 249-258.【11】Goffin, K., Szwejczewski, M. and New, C., 1997, Managing Suppliers: When Fewer Can Mean More, International

Journal of Physical Distribution and Logistics Management, Vol. 27, pp. 422-436. 【12】 Goicoechea, A., Hansen, D. R. and Duchstein, L., 1982, Multiobjective Decision Analysis with Engineering and Business Applications, John Wiley and Sons, New York. 【13】 Handfield, R. B., Kannan, V. R. and Tan, K. C., 1998, "Supplier Chain Management: Supplier Performance and Firm Performance," International Journal of Purchasing and Material Management, Vol. 34, pp. 2-9. 【14】 Houshyar, A., David, L., 1992, "A systematic Selection Procedure," Computers and Industrial Engineering, Vol. 23, pp. 173-176. 【15】 Hwang, C. L. and Yoon, K., 1981, Multiple Attribute Decision Making Methods and Application, Springer-Verlag ,New York. 【16】 Kasilingam, R. G. and Lee, C. P., 1996, "Selecting of Vendors—A Mixed Integer Programming Approach," Co-mputers and Industrial Engineering, Vol. 31, pp. 347-350. 【17】 Lambert, D. M., Adams, R. J. and Emmelhainz, M. A., 1997, "Supplier Selection Criteria in the Healthcare Industry: A Comparison of Importance and Performance," International Journal of Purchasing and Material Management, Vol. 33, pp. 17-22. 【18】 Mohanty, R. P. and Deshmukh, S. G., 1993, "Using of analytic Hierarchic Process for Evaluating Sources of Supply", International Journal of Physical Distribution & Logistics Management, Vol. 23, pp. 22-28. 【19】 Nydick, R. L. and Hill, R. P., 1992, "Using the Analytic Hierarchy Process to Structure the Supplier Selection Procedure," International Journal of Purchasing and Materials Management, Vol. 28, pp. 31-36. 【20】 Patton, W. E., 1996, "Use of Human Judgment Models in Industrial Buyer: Vender Selection Decisions," Industrial Marketing Management, Vol. 25, pp. 135-139. 【21】 Roy, B., 1971, "Problems and Methods with Multiple Ob-jective Functions", Mathematical Programming, Vol. 1, pp. 239-266. 【22】 Saaty, T. L., 1986, "Axiomatic Foundation of the Analytic Hierarchy Process," Management Science, Vol. 32, pp. 841-855. 【23】 Saaty, T. L., 1994, "How to Make a Decision: The analytic Hierarchy Process," Interfaces, Vol. 24, pp. 19-43. 【24】 Salminen, P., Hokkanen, J. and Lahdelma, R., 1998, "Co-mparing Multicriteria Methods in the Context of Environmental Problems," European Journal of Operational Rese-arch, Vol. 104, pp. 485-496. 【25】 Schoemaker, P. J. H. and Waid, C., 1982, "An Experimental Comparison of Different Approaches to Determining Weights in Additive Utility Models," Management Science, Vol. 28, pp. 182-196. 【26】 Solymosi, T. and Dombi, J., 1986, "A Method for Deter-mining The Weights of Criteria: The Centralized Weights," European Journal of Operational Research, Vol. 26, pp. 35-41. 【27】 Soukup, W. R., 1987, "Supplier Selection Strategies," Journal of Purchasing and Materials Management, Vol. 23, pp. 7-13. 【28】 Stam, A. and Silva, A. P. D., 1997, "Stochastic Judgments in the AHP: The Measurement of Rank Reversal Probabilities," Decision Sciences, Vol. 28, pp. 655-687. 【29】 Swift, C. O., 1995, "Preferences for Single Sourcing and Supplier Selection Criteria," Journal of Business Research, Vol. 32, pp. 105-111. 【30】 Tagaras, G. and Lee, H. L., 1996, "Economic Models for Vender Selection with Quality Cost Analysis," Management Science, Vol. 42, pp. 1531-1543. 【31】 Tanaka , K., 1996, An Introduction To Fuzzy Logic for Practical Applications, Translated by Tak Niimura, Springer Press, New York, pp. 5-46,51-75. 【32】 Teng, J. Y. and Tzeng, G. H., 1996, "Fuzzy Multicriteria Ranking of Urban Transportation Investment Alternatives," Transportation Planning and Technology, Vol. 20, pp. 15-31. 【33】 Thompson, K. N., 1990, "Vendor Profile Analysis," Journal of Purchasing and Materials Management, Vol. 26, pp. 11-19. 【34】 Timmerman, E., 1986, "An Approach to Vendor Performance Evaluation," Journal of Purchasing and Materials Management, Vol. 22, pp. 2-9. 【35】 Tsamboulas, D., Yiotis, G. S. and Panou, K. D., 1999, "Use of Multicriteria Methods for Assessment of Transport Projects," Journal of Transportation Engineering, Vol. 125, pp. 407-414. 【36】 Tzeng, G. H. and Teng, J. Y., 1993, "Transportation In-vestment Project Selection with Fuzzy Multiobjectives," Transportation Investment Project Selection with Fuzzy Multiobjectives, Vol. 17, pp. 91-112. 【37】 Weber, C. A., Current, J. R. and Benton, W. C., 1991, "Vendor Selection Criteria and Methods", European Journal of Operational Research, Vol. 50, pp. 2-18. 【38】 Weber, C. A. and Current, J. R., 1993, "A Multiobjective Approach to Vendor Selection," European Journal of Operational Research, Vol. 68, pp. 173-176. 【39】 Won, J., 1990, "Multicriteria Evaluation Approaches to Urban Transportation Projects," Urban Studies, Vol. 27, pp. 119-138. 【40】 Zadeh, L. A., 1965, "Fuzzy Sets," Information and Control, Vol. 8, pp. 338-353. 【41】 Zahedi, F, 1986, "The Analtic Hierarchy Process - a Survey of The Method and its Applications," Interfaces, Vol. 16, pp. 96-108. 【42】 Zhu, S. H. and Anderson, N. H., 1991, "Self-Estimation of Weight Parameter in Multiattribute Analysis," Organizational Behavior and Human Decision Processes, Vol. 48, pp. 36-54.