

COMPUTER-AIDED FUZZY-AHP DECISION MODEL AND ITS APPLICATION TO SCHOOL FOOD SERVICE PROBLEM

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ABSTRACT. *This paper presents an integrated decision analysis model using multi-criteria decision making for evaluating and selecting the food service strategy. In practical environments, managers face a variety of information types that are vague. For the difficulties in determining the decision alternatives, we used the brainstorming and fuzzy-AHP (analytic hierarchy process) methods to determine the weighted values for evaluation among decision criteria selection. In this research, we developed a three-step decision support system which can be described as: 1) brainstorming for the idea and the decision alternative generation, 2) fuzzy-AHP as a multi-criteria decision analysis method, and 3) aggregating priority method to integrate the results of individual analysis. Also we developed a computer program and applied it to the make-or-buy decision problem for school food service strategy considering the multi-attribute decision making. A numerical example illustrates the computational process of the proposed model. In addition to the school food service system example, we can conclude the proposed model could be applied to other extensive decision problems.*

Keywords: Fuzzy-AHP, Multi-criteria decision analysis, School food service system

1. Introduction. There are a number of papers discussing multi-criteria decision analysis with various applications for example, operations research, mathematical models and decision theory, but less attention has been given to the research to develop both decision theories and the computer programs together to integrate the decision theory and the information system. Interestingly, in a survey of published decision analysis applications over a 20-year period, the work of [4] concluded that 2/3 of applications used just expected values at the decision criterion and most of applications did not use multi-structured and multi-attributed assessment analysis [19]. Recently, multi-criteria decision analysis method [2,7,8] is applied to the scores and weights of multi-level structures of decision system [1,13,17]. Most of these methods do not seem to be appropriate for modeling the decision problems based on information system.