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# Fuzzy group decision-making for facility location selection

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## Abstract

The selection of a facility location among alternative locations is a multicriteria decision-making problem including both quantitative and qualitative criteria. The conventional approaches to facility location problem tend to be less effective in dealing with the imprecise or vagueness nature of the linguistic assessment. Under many situations, the values of the qualitative criteria are often imprecisely defined for the decision-makers. The aim of the paper is to solve facility location problems using different solution approaches of fuzzy multi-attribute group decision-making. The paper includes four different fuzzy multi-attribute group decision-making approaches. The first one is a fuzzy model of group decision proposed by Blin. The second is the fuzzy synthetic evaluation. The third is Yager's weighted goals method and the last one is fuzzy analytic hierarchy process. Although four approaches have the same objective of selecting the best facility location alternative, they come from different theoretic backgrounds and relate differently to the discipline of multi-attribute group decision-making. These approaches are extended to select the best facility location alternative by taking into

approaches are extended to select the best facility location alternative by taking into account quantitative and qualitative criteria. A short comparative analysis among the approaches and a numeric example to each approach are given.



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## Keywords

Facility location; Fuzzy sets; Synthetic evaluation; Weighted goals; Group decision; AHP

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