

## **A framework for prioritizing customer requirements in product design: incorporation of FAHP with AHP**

### **ABSTRACT**

Prioritizing customer requirements in product design requires a tool that could help design engineers make the right decisions at the early stages of the design process. In this paper, a framework incorporating the fuzzy analytic hierarchy process (FAHP) with extent analysis with the analytic hierarchy process (AHP) has been proposed in order to overcome the problems of consistent judgement in FAHP and solve conventional AHP problems in dealing with subjective judgement, especially in prioritizing customer requirements. Based on the case study presented, by incorporating FAHP with AHP, the results are not very different from each other where the ranking of the customer requirements is similar, which implies the validity of FAHP in evaluating customer requirements. The consistency ratio obtained is as much as 8.51%, which is less than 10%. Thus, the consistency of the judgement can be evaluated, while the proposed framework is able to judge imprecise and vague information. Moreover, the incorporation of both methods is applicable and analysis of the consistency ratio from a fuzzy environment is possible.

**Keyword:** Customer requirements; Fuzzy analytic hierarchy process; Analytic hierarchy process; Design process