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以 Fuzzy TOPSIS 方法應用於產品概念評選之研究

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摘要

概念設計評選對整產品設計程序而言是相當重要的—其在整個產品設計過程中，扮演著承接顧客需求，並為開啟具體設計的重要角色。概念評選在本質上屬於多屬性決策問題，決策者必須由多個設計屬性所組成之多個設計概念中選出較佳的方案，而這些屬性具主觀性、模糊性，且可能相互衝突。本研究運用模糊品質機能展開（Quality function development, QFD）將顧客需求轉化成工程規格或設計屬性的重要度，並以 fuzzy TOPSIS（Technique for Order Performance by Similarity to Ideal Solution）方法進行概念設計選擇方案的排序，構建一個結構化且有效的評估模式，以協助設計決策者進行概念設計評選。

關鍵字：產品設計；概念設計；品質機能展開法；

模糊理論；概念評選

Fuzzy TOPSIS Approach for Evaluating the Conceptual Design

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Abstract

Conceptual design evaluation, by which the customer needs could be transformed to specific design, is an important stage in the product design process. Essentially, conceptual design evaluation is a multiple attribute decision making problem (MADM). The decision maker should select one or more better concepts by contemporarily considering multiple attributes, which could be subjective, uncertain, and contradicting each other. The study developed a structural model to solve this problem. A fuzzy QFD was adopted to convert the customer needs to the weights of design/manufacturing attributes; then, these concepts alternative were sorting by a fuzzy TOPSIS. The sorting results could be a useful reference for decision maker of concept design evaluation.

Key words: Product design;Conceptual design;
Quality function development (QFD);Fuzzy theory;
Concept selection;Fuzzy TOPSIS