Design Evaluation Method for Design Engineer in Manufacturing Industries Using Integrated Rough-Grey Analysis Approach

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ABSTRACT

In order to remain competitive in today's technologically driven world, the faster and more efficient development of innovative products has become the focus for manufacturing companies. In tandem with this, design evaluation plays a critical role in the early phases of product development, because it has significant impact on the downstream development processes as well as on the success of the product being developed. Owing to the pressure of primary factors, such as customer expectations, technical specifications and cost and time constraints, designers have to adopt various techniques for evaluating design alternatives in order to make the right decisions as early as possible. In this work, a new methodology for design evaluation has been developed. The preliminary stage quantifies all the criteria from different viewpoints through the process of scale of "Weighting criteria". The next stage uses a modified Rough-Grey Analysis to obtain the alternatives weighting or ranking of the alternatives. This method will enable designers to make better-informed decisions before finalising their choice. Case example from industry is presented to demonstrate the efficacy of the proposed methodology. The result of the example shows that this new method provides an alternative to existing methods of design evaluation.

KEYWORDS: Design Evaluation, Making Decision, Rough-Grey Analysis

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