

A Selection Approach for Optimized Problem-solving Process by Grey
Relational Utility Model and Multicriteria Decision Analysis

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Abstract

In business enterprises, especially the manufacturing industry, various problem situations may occur during the production process. A situation denotes an evaluation point to determine the status of a production process. A problem may occur if there is a discrepancy between the actual situation and the desired one. Thus, a problem-solving process is often initiated to achieve the desired situation. In the process, how to determine an action needs to be taken to resolve the situation becoming an important issue. Therefore, this work uses a selection approach for optimized problem-solving process to assist workers in taking a reasonable action. A grey relational utility model and a multi-criteria decision analysis are used to determine the optimal selection order of candidate actions. The selection order is presented to the worker as an adaptive recommended solution. The worker chooses a reasonable problem-solving action based on the selection order. This work uses a high-tech company's knowledge base log as the analysis data. Experimental results demonstrate that the proposed selection approach is effective.

Keyword : Problem-solving process; Adaptive knowledge support; Grey relational utility function; Multi-criteria decision analysis; ELECTRE