

Instance-based comparative assessment with application in manufacturing

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The management of **make-to-order (MTO)** based production involves multiple **decisions** needing to be taken. They concern all stages of manufacturing activity – order acceptance, products design, processes planning, machine programming, and operations scheduling. Such a decision consists in selecting, at a given moment, the most suitable alternative among the potential ones. This means that comparative assessment of potential alternatives is required.

In the analysis we suggest a different approach in performing the comparative assessment, based on assigning **rankings** to potential alternatives, by referring them to past cases recorded in an instances database. Ranking criteria such as cost, time span, energy consumption etc. The selection decision further results by comparison of potential alternatives rankings.

The comparative assessment means to establish rankings for two or more alternatives to proceed, after a given criterion.

The enounce of comparative assessment problem addressed here is “being given a set of potential alternatives and a criterion, alternatives rankings are required”.

Key-issue:

- The definition of the nearness between two cases, which should be assessed starting from the values of cases known descriptors.
- The form of nearness function should be actually determined by modeling a set of cases from instances database, appropriately chosen.
- The ranking of a certain potential case results by analyzing the nearness between it and the ones from instances dataset (sorted after the targeted criterion).
- Potential case neighborhoods can be delimited and iteratively narrowed, until the resulted ranking becomes precise enough to distinguish between it and the other(s) potential cases in competition.

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