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AN APPRAISAL OF FACILITIES LAYOUTS USING FUZZY TOPSIS METHODOLOGY

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ABSTRACT

Evaluation of Facilities Layout alternatives to choose the best suited one for a particular type of production process is a challenging task that too when layouts involve Flexible Manufacturing System(FMS)s. The high capital outlay needed for such a layout further accentuates the seriousness of the layout making work. But moderate risk is involved in establishing it. In today's manufacturing world of JIT simple economic justification techniques are insufficient by themselves since they will have to cope with the benefits such as flexibility, higher quality, reliability and tight delivery schedules. Hence, a robust decision-making procedure for appraising Facilities Layout (FL) design alternatives urges the consideration of both economic and strategic issues. In this paper a ***Fuzzy Technique for Order Performance by Similarity to Ideal Solution (Fuzzy TOPSIS)*** *for the Multi-criteria Decision Making (MCDM) problem when there is a group of decision makers is proposed. A Fuzzy TOPSIS Approach that bases itself on the concepts of the distance measure that calculates the distance of each FL from both Fuzzy Positive Ideal Solution (FPIS) and Fuzzy negative Ideal Solution (FNIS) and that consequently establishes the Separation Measure(SM). The approach presented here enables us to incorporate subjective or qualitative data in the forms of Fuzzy Linguistic Variable (FLV)s. Trapezoidal Fuzzy Number (TRFN)s as well as crisp numbers in this FL alternatives' appraisal process. A comprehensive example illustrates the application of this method of analysis.*

KEYWORDS: *Fuzzy Linguistic Variables, Facilities Layout Selection, TOPSIS, Fuzzy Numbers.*