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An Integrated Fuzzy Inference System and Technique for Order of Preference by Similarity to Ideal Solution Approach for Evaluation of Lean Healthcare Systems

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Abstract : A decade after the introduction of Lean in Saskatchewan's public healthcare system, its effectiveness remains a controversial subject among health researchers, workers, managers, and politicians. Therefore, developing a framework to quantitatively assess the Lean achievements is significant. This study investigates the success of initiatives across Saskatchewan health regions by recognizing the Lean healthcare criteria, measuring the success levels, comparing the regions, and identifying the areas for improvements. This study proposes an integrated intelligent computing approach by applying Fuzzy Inference System (FIS) and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS). FIS is used as an efficient approach to assess the Lean healthcare criteria, and TOPSIS is applied for ranking the values in regards to the level of leanness. Due to the innate uncertainty in decision maker judgments on criteria, principals of the fuzzy theory are applied. Finally, FIS-TOPSIS was established as an efficient technique in determining the lean merit in healthcare systems.

Keywords : lean healthcare, intelligent computing, fuzzy inference system, healthcare evaluation, technique for order of preference by similarity to ideal solution, multi-criteria decision making, MCDM
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