

Assessment of cloud vendors using interval-valued probabilistic linguistic information and unknown weights

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Abstract

Cloud vendors (CVs) play an indispensable role in the development of IT sectors and industry 4.0. Many CVs evolve every day, and a systematic selection of these is becoming substantial for organizations. Literature studies have shown that multicriteria decision-making (MCDM) is a powerful tool for systematic selection. However, the major issue with the state-of-the-art models is that they do not effectively represent uncertainty. Moreover, the personalized selection of CVs based on user queries is not prominent in an MCDM context. In this paper, to circumvent these issues, a new decision framework is proposed that utilizes a generalized preference style called interval-valued probabilistic linguistic term set (IVPLTS). This preference style considers occurring probability values as interval numbers instead of a single precise value, which provides flexibility during preference elicitation. Initially, missing values are imputed systematically by using a case-based method. Then, the consistency of these preferences is checked using Cronbach's alpha coefficient, and the inconsistent preferences are repaired rationally by using an iterative method. A programming model is proposed for determining the weights of the evaluation criteria. Furthermore, Maclaurin symmetric mean (MSM) is extended to