

Past efforts in determining suitable normalization methods for multi-criteria decision-making: A short survey

ABSTRACT

The use of a multi-criteria decision-making (MCDM) technique mostly begins with normalizing the incommensurable data values in the decision matrix. Numerous normalization methods are available in the literature and applying different normalization methods to an MCDM technique is proven to deliver varying results. As such, selecting suitable normalization methods for an MCDM technique has emerged as an intriguing research topic, especially with the advent of big data. Several efforts have been made to compare the suitability of various normalization methods, but regrettably, no paper provides an updated review of these crucial efforts. This study, therefore, aimed to trace articles reporting such efforts and review them based on the following three perspectives: (1) the normalization methods considered, (2) the MCDM methods considered, and (3) the comparison metrics used to determine the suitable normalization methods. The relevant articles were extracted with the aid of Google Scholar using the keywords of "normalization" and "MCDM," and Tableau software was used to analyze further the data gathered through the articles. A total of five limitations were uncovered based on the current state of literature, and potential future works to address those limitations were offered. This paper is the first to compile and review the previous investigations that compared and determined the ideal normalization methods for an MCDM technique.