UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

SELECTION OF SUPPLIER IN INFORMATION TECHNOLOGY INDUSTRY USING FUZZY TOPSIS WITH RATINGS BASED ON BENEFIT AND COST SUB-CRITERIA (P14S22)

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ABSTRACT

Supplier selection depends on human evaluation which is subjective and vague in nature. The selection of a supplier requires significant research and should be taken into consideration by a variety of factors. In order to choose the best Information Technology (IT) supplier based on specific criteria, this study proposes a fuzzy TOPSIS technique for determining the best supplier in IT Industry. The fuzzy TOPSIS method produces a better model that takes into account human judgement and can be utilized in making better judgements. Most fuzzy TOPSIS methods consider the ratings of alternatives for each main criteria, and a lack of studies used the ratings of alternatives based on benefit and cost sub-criteria. This study aims to identify the best criteria in selecting a supplier of IT Industry based on centroid point method with ratings based on benefit and cost sub-criteria. Furthermore, we also want to identify the best supplier that fulfil the criteria in the IT Industry using the fuzzy TOPSIS method. The secondary data taken from the previous study is used with three criteria which are Background of Supplier, Product Performance and Service Performance with four alternative of suppliers and four decision makers. In this study, the methodology is divided into two stages. The first stage involves converting the benefit and cost sub-criteria into the main criteria using the normalization and averaging method. The fuzzy TOPSIS was utilized which has eight phases, for the second stage which involves Closeness Coefficient (CC), Fuzzy Positive Ideal Solution (FPIS), and Fuzzy Negative Ideal Solution (FNIS). The evaluation procedure also included the use of the centroid method to determine the ranking of the main criteria. Based on the results, Supplier 1 is the best option out of the available four providers and the criteria that need to be prioritized are Product Performance and Service Performance. Since fuzzy TOPSIS can enhance future supplier selection decision-making based on the applicability of the suggested method, it can be applied in the future for various case studies. The fuzzy TOPSIS proposed in this study can be generalized to cases with benefit and cost sub-criteria.