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خلاصه مقاله:

As one of the main infrastructures of the air transportation system, the air fleet has a significant effect on the operation at a reasonable cost. Deciding on the commensurate airplane to renovate the fleet falls into the multi-criteria decision-making (MCDM) problems. Airplane comparison criteria are very diverse, and no airplane is the best based on all criteria. In this study, selecting commensurate airplanes for airlines that meet domestic air transportation demand was investigated. The alternatives considered were Airbus airplanes, which were evaluated and compared based on six indices: price, maximum takeoff weight, passenger capacity, fuel capacity, the volume of passengers' space, and volume of the cargo compartment. Also, several MCDM techniques require different levels of computational and maybe produce different outputs. The results of the different methods are not the same. To ensure consistency, accuracy and increase the reliability of the results, several methods were applied. Four different MCDM methods were used to make a comprehensive comparison, including analytic hierarchy process (AHP), simple additive weighting (SAW), and technique for order of preference by similarity to ideal solution (TOPSIS), and elimination et choice translating reality (ELECTRE). The results showed that the Airbus A۳۱۸ airplane is selected as the top alternative based on these indices and using all four methods. The difference between the results of each method revealed for ranks ۲-۶. Based on AHP, TOPSIS and SAW, the second rank was designated to Airbus ۳۱۹. However, ELECTRE had a different rank for this airplane.

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