Prioritized induced probabilistic operator and its application in group decision making

Pérez-Arellano, Luis Alessandri

León-Castro, Ernesto

Avilés-Ochoa, Ezequiel

Merigó, José M.

A new extension of the ordered weighted average (OWA) operator is presented. This new operator includes the characteristics of three other operators: the prioritized, induced and probabilistic. The name is the prioritized induced probabilistic ordered weighted average (PIPOWA) operator. This operator can be used in a group decision-making process for selection of an alternative, taking into account three aspects: (1) not all of the decision-makers are equally important, (2) the probability of success of each alternative, and (3) an induced weighted vector. In the paper, some families of this operator are presented such as the prioritized probabilistic weighted average (PPOWA) operator and the prioritized induced ordered weighted average (PIOWA) operator. Additionally, some of the parameterized family of the aggregation operators, such as the minimum, maximum and total operator, are presented as special cases. The article also generalizes the PIPOWA