

What are the negotiation strategies that allow negotiators' to achieve efficient outcomes?

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The underlying principle of Mastenbroek' s behavioural model of negotiation strategies is that the negotiators' strategies and the mixes of tactics they use determine the negotiation outcomes. Furthermore Kersten, Thatcher and Adair prove there are negotiators' intrinsic characteristics resulting from their psychological traits, like culture, education, profession and gender, that determine negotiation outcomes as well. Negotiators' individual characteristics constitute their psychological profiles. Therefore, the problem under consideration is how to support mediator in selection of such a mix of strategies for the negotiators each having a particular psychological profile that allows them to achieve efficient outcomes. The procedures of identifying negotiators psychological profiles need to be proposed first, and then an algorithm for selecting the efficient negotiation strategies for each party has to be constructed.

The process of identification of the negotiator's psychological profile was previously discussed by Wachowicz. The number of different individual psychological profiles depends both on the number of characteristics describing the profile and scale of values assign to each of them. If the number of different psychological profiles is too large, they can be clustered into a few classes of similarity. To obtain a specific number of classes different clustering methods are proposed. The centroid-based clustering is proposed when we know the number of classes and the representatives of each class. The *k*-means clustering is proposed when we know the number of classes but we do not know the representatives of each class. The hierarchical clustering is proposed when we know neither the number of classes nor the representatives of each class. Having identified the mix of negotiators' psychological profiles a game-theoretical model is constructed. This model is used to assign each negotiator the negotiation strategy that yields efficient outcomes. The game strategies can reflect directly the negotiation strategies or the negotiation tactics that constitute the negotiation strategy. In the former one single game is constructed to find an efficient mix of negotiation strategies. In the latter a few games must be constructed each describing different negotiation tactic to find an efficient mixes of tactics. An efficient mix of strategies is derived from the efficient mixes of tactics. The proposed model allows for the consideration of a single outcome (e.g., satisfaction or utility) as well as several different outcomes that need not be the same for each negotiator. Determining the game solution involves the von Neumann and Morgenstern procedure of eliminating individually dominated outcomes for each player and determining the negotiation space of the game. Furthermore, the Zaráś and Martel multi-attribute stochastic dominance is proposed to compare the outcomes, as we consider them as the random variables with known value distributions.

In the paper we consider supporting mediator in the bilateral business negotiation. Therefore, an algorithm of solving the two-person cooperative game with combination of von Neumann and Morgenstern procedure with multi-attribute stochastic dominance will be discussed. The proposed algorithm has been tested with the dataset obtained for the experiments conducted with the Inspire e-negotiation system. The results will be discussed and the conclusions about applying the multi-attribute stochastic dominance in solving two-person game will be presented.

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