

Support tools for offer generation in negotiations: Requirements and methods

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ABSTRACT

Offers are a central element in any negotiation process. However, as offers have to serve many different purposes simultaneously, formulating adequate offers is a quite demanding task for negotiators. On one hand, offers have to serve the negotiator's own interest, but on the other hand, they also have to transmit positive signals to the opponent that one is ready to make (some) concessions, and to reciprocate positive movements made by the other side. In integrative bargaining situations, where joint gains are possible, offers should also exploit possibilities for joint value creation. This complex set of requirements becomes even more demanding if negotiations concern multiple issues, and offers have to specify values for all of these issues. In that case, different bundles of issue values might exist which provide the same utility to the focal negotiator and therefore afford the same concession. While the focal negotiator is indifferent between these offers they are possibly quite different for the other party.

Based on a review of existing bargaining models, we formulate a set of requirements which offers should fulfill, and present these requirements formally in a multi-attribute utility framework. Using data from a recent set of negotiation experiments conducted with the negotiation support system (NSS) *Negoisst*, we analyze to what extent actual offers made during the experiments fulfill our requirements, and whether standard methods of decision support used in an NSS like *Negoisst* (for example automatic utility evaluation for offers sent and received, and graphs representing how the utility values of exchanged offers develop over time) improve the quality of offers with respect to our criteria. Results indicate that a considerable part of offers fails to meet plausible requirements. In particular, in the progress of negotiations, parties quite often make offers that destroy, rather than create value. Providing standard decision support modules has only a limited impact on the structure of offers made.

We therefore present models that allow negotiators to determine offers which fulfill the criteria value creation, concession making and reciprocity. Following the decision support approach, our models do not completely determine offers to be made, but leave considerable freedom for negotiators to employ different negotiation tactics by controlling the "toughness" of offers. In contrast to other analytical bargaining models, our approach is not only concerned with modeling the bargaining process in utility space (in which most of our requirements are formulated), but also allows to "translate" desired utility values into actual offers concerning multiple issues. Thereby our models also take into account desired structural properties of offers in issue space.