Gert-Jan de Vreede (Editor)

Group Decision and Negotiation 2010

Proceedings of the 11th Group Decision & Negotiation Conference
Delft, The Netherlands, 21-23 June 2010

Group Decision & Negotiation 2010 is organized by:

TU Delft Delft University of Technology

University of Nebraska Omaha

The Center for Collaboration Science

Colofon

Published by:

The Center for Collaboration Science
University of Nebraska at Omaha
6001 Dodge Street
Omaha, NE 68182

Phone: (402) 554-3010

The organizers acknowledge the support from the Netherlands Research School for Information and Knowledge Systems (SIKS), Delft University of Technology, and the University of Nebraska at Omaha.

ISBN 9789056382360

Printed in the Netherlands

Acceptance and Evaluation of Automated Mediation in e-Negotiation

Daniel Druckman[1], Sabine Koeszegi[2], Mareike Schoop[3], Per van der Wijst[4], Rudolf Vetschera[5], Alexander Dannemann[3], Katja Duckek[3], Michael Filzmoser[2], Johannes Gettinger[2], Ronald Mitterhofer[2], and Andreas Reiser[3]

[1]Department of Public and International Affairs, George Mason University
[2]Institute of Management Science, Vienna University of Technology
[3]Department of Business Administration, University of Hohenheim
[4]Department of Communications and Information Science, Tilburg University
[5]Department of Business Administration, University of Vienna

DanDruckman@yahoo.com,
Koeszegi, Filzmoser, Gettinger, Mitterhofer@imw.tuwien.ac.at,
Mareike.Schoop, Alexander.Dannemann, Andreas.Reiser@w1.uni-hohenheim.de,
Per.Vanderwijst@uvt.nl, Rudolf.Vetschera@univie.ac.at

Keywords: electronic mediation, electronic negotiations, empirical study

1 Introduction

Mediation is a method to overcome impasse situations in negotiations by increasing the negotiating parties' flexibility, i.e. their willingness to move away from initial positions or the discovery of new solutions to the dividing issues (Druckman et al., 2002, Druckman et al., 2004). It is considered as an important extension of the traditional negotiation procedure for conflict resolution and defined as an `extension and elaboration of the negotiation process' (Moore, 1996, p. 8), an `informal accompanist of negotiation' (Wall and Blum, 1991, p. 284) or `assisted negotiation' (Susskind and Cruikshank, 1987, p. 136). Empirical research indicates that mediation influences negotiation outcomes. For example 60% of mediated negotiations achieve agreements and 75% of negotiators are satisfied with the outcomes of mediation (Kressel and Pruitt, 1989). Therefore, it is surprising that mediation functions were not integrated in electronic negotiation support systems (eNS) -- i.e. in form of e-mediation -- before. We define e-mediation analogously to eNS viz. that at least one of the two main functions, decision and communication support (Lim and Benbasat, 1992-93), is implemented by means of electronic media. The two major approaches to make e-mediation available to traditional negotiations focus either (i) on the integration of human mediators by means of electronic media like chat, e-mail, forums, etc. -- electronic communication support for mediation in e.g. online mediation -- or (ii) the provision of mediation expert systems that assume the functions human mediators normally perform -- electronic decision support for mediation in e.g. *Negotiator Assistant*.

This study aims at gaining first insights into possibilities and opportunities of the integration of eNS and e-mediation. This is an intermediate goal of the e- *Nego*-motion project[1] with the objective to propose 'best-of' eNS design suggestions by a

[1] funded by the Austrian Research Fund

selection of the most promising features of existent approaches. We therefore combine the eNS *Negoisst* and an asynchronized version of the e-mediation expert system *Negotiator Assistant* in an empirical pilot study.

2 Support Systems

Negoisst is an eNS that provides integrated communication, decision and documentation support (Schoop et al., 2003). Users negotiate via electronic message exchange similar to email. To reduce ambiguities in communication, the system offers semantic and pragmatic enrichment. *Negoisst* automatically deduces a contract version from each exchanged message. Consequently, the system stores a document thread of all decisions made and the respective contract versions, as well as a message thread that illustrates the reasons for these decisions. Additionally decision support is provided in form of preference elicitation (in the preparation phase) as well as numerical and graphical presentation of the utility of offers (during the negotiation phase).

The e-mediation expert system *Negotiator Assistant* aims at providing functions usually performed by a mediator in face-to-face negotiations (Druckman et al., 2004): (i) Diagnosis (monitoring of the progress of the negotiation towards or away from an agreement), (ii) analysis (analysis of the causes of impasse), and (iii) advice (recommendations to overcome impasses based on diagnosis and analysis). These tasks are accomplished in order to increase negotiators' flexibility and thereby the prospects of finding an agreement. Information on the parties' flexibility with regard to the issues under dispute and the negotiation process is collected by means of questionnaires. A knowledge base, derived from a meta analysis of existent literature, experiments and case studies on the factors that influence negotiators' flexibility (Druckman, 1994), is applied to evaluate the answers. The thereby generated flexibility measures are graphically represented in an analysis grid that forecasts the outcome of the negotiation based on its current status. The system identifies the causes for unfavorable outcomes, and in an advice phase provides solutions to these problems.

For our study we combined these two systems by asynchronizing *Negotiator Assistant*, which made it accessible for eNS supported negotiations. This was done by splitting the formerly combined 'issue' and 'process' questionnaires into distinct parts for each negotiator. The answers were saved in a database which allowed asynchronous processing of the questionnaire by the parties. Furthermore, the usage of a database enabled to generate advice automatically and link it to the respective sources of impasse as well as to track the history of the mediation process. A further modification and improvement was the dynamically handling of conditional questions in the questionnaires. Users could access *Negotiator Assistant* through a link provided by *Negoisst*, which additionally reminded its users of the e-mediation system if they were about to break-off the negotiations.

3 Experiment

A total of 130 undergraduate students of negotiation courses from four universities -- Tilburg University (53), University of Vienna (34), Vienna University of Technology (25) and University of Hohenheim (18) -- participated in the study conducted in

December 2009. Subjects were paired to achieve mixed university dyads (see Table 1).

Table 1. Subject matching

Mettalurg	n		Mihalits	n
Tilburg	24		TU Vienna	24
Tilburg	23		Vienna	23
Tilburg	6	negotiated with	Hohenheim	6
Hohenheim	11		Vienna	11
Hohenheim	1		TU Vienna	1
	65			65

The case used in the experiment described joint venture set-up negotiations between two companies. The case description consisted of general and private information (available only to either of the two parties -- Metallurg or Mihalits). Subjects had to discuss seven issues and the case was designed to be very conflicting.

Before the actual start of the negotiations, the instructors presented the systems to the participants of their negotiation courses and students received test accounts for *Negoisst* to become familiar with the systems. The case description was sent to the participants via email the day before the start of negotiations. At the beginning of the negotiation experiment subjects received their *Negoisst* login information via email. Subjects had two weeks to conduct negotiations, however, they could terminate negotiations at anytime if they wished to do so. At the end of the negotiations, a post-negotiation questionnaire had to be answered.

4 Preliminary Results

First results indicate that in total 33 dyads reached an agreement, while 20 negotiators rejected the last offer by their counterpart and another twelve negotiations were not finished within the predefined time period. However, the focus of this study is on the acceptance of e-mediation, which was observed to be quite low in the experiments. With the exception of one early participant, all e-mediations were started in the second half of the two weeks time-frame for conducting the negotiations. Interestingly the issues being in the focus of the mediation function shifted over time. A fifth of the sample, i.e. 26 subjects, entered *Negotiator Assistant* and completed in total 19 questionnaires. In 14 cases subjects belong to the same negotiation dyad, so that we have seven observations where both parties passed through the entire e-mediation procedure.

Besides this brief description of the acceptance and use of e-mediation, our interest lies with its predictive accuracy, its effect on the negotiation process and outcome, as well as the derivation of suggestions for e-mediation system design. The forecasted outcome of the seven completed e-mediations was a fair agreement in four cases, impasse in two cases and a mixed outcome in one case. Ongoing research compares these forecasts with the actual outcomes of the negotiation experiments. The effect of e-mediation is investigated by qualitatively comparing the negotiation processes and outcomes of dyads which made use of the provided e-mediation functionalities with those dyads that did not. Finally, for the derivation of design suggestions for e-mediation systems we do not only consider the feedback of the users, but also study the effects of mediation timing and proposed advice on the mediated negotiations.

References

Druckman, D. (1994) Determinants of Compromising Behavior in Negotiation - A Meta Analysis. Journal of Conflict Resolution 38, 507 - 556.

Druckman, D., Druckman, J. N., Arai, T. (2004) E-Mediation: Evaluating the impacts of an Electronic Mediator on negotiation behavior. Group Decision and Negotiation 13, 481-511.

Druckman, D., Harris, R., Ramberg, B. (2002) Computer-Assisted International Negotiation: A Tool for Research and Practice. Group Decision and Negotiation 11, 231-256.

Kressel, K., Pruitt, D. G. (1989) Mediation Research. Jossey-Bass, San Francisco.

Lim, L.-H., Benbasat, I. (1992-93) A Theoretical Perspective of Negotiation Support Systems. Journal of Management Information Systems 9, 27-44.

Moore, C. (1996) The Mediation Process: Practical Strategies for Resolving Conflicts. Jossey-Bass, San Francisco.

Schoop, M., Jertila, A., List, T. (2003) Negoisst: A Negotiation Support System for Electronic Business-to-Business Negotiations in E-Commerce. Data and Knowledge Engineering 47, 371-401.

Susskind, L., Cruikshank, J. (1987) Breaking the Impasse: Consensual Approaches to resolving Conflicts. New York.

Wall, J. A., Blum, M. W. (1991) Negotiations. Journal of Management 17, 273-303.