E-Negotiation Support Systems Overview

Zhen Wang
National University of Singapore, Singapore

John Lim
National University of Singapore, Singapore

Elizabeth Koh
National University of Singapore, Singapore

INTRODUCTION

In this fast moving global working environment, negotiators are benefiting from the pervasive application of computers and networks in the workplace. There is an increasing usage of E-negotiation Support Systems (ENS) in both internal and external negotiations. ENS are computer systems that help negotiators achieve better agreements by enhancing their information processing capabilities and communication with other parties. Recent empirical research on ENS has shown that the employment of ENS facilitates the improvement of the negotiation process and outcome (e.g., Delaney, Foroughi, & Perkins, 1997; Goh, Teo, Wu, & Wei, 2000; Rangaswamy & Shell, 1997). This article identifies the key areas of ENS research, the corresponding constructs, findings and challenges. Finally, it proposes an integrative framework of ENS research for future research.

BACKGROUND

Negotiation

Despite being a common task for managers, negotiation is challenging, complex and effort demanding. Negotiations have been studied from many perspectives including sociology, psychology, political science, economics, applied mathematics, computer science and artificial intelligence. Negotiation is "a process in the public domain where two parties, with supporters of various kinds, attempt to reach a joint decision on issues in dispute" (Gulliver, 1979, p. 79). It is a special form of communication that centers on perceived incompatibilities and focuses on reaching mutually acceptable agreements (Putnam & Roloff, 1992). Through a negotiation, two or more parties can resolve conflicts and enter into contracts (Walters, Stuhlmacher, & Meyer, 1998).

Theoretical Perspectives of Negotiation

In the literature of negotiation research, the descriptive model and the prescriptive model form two major schools. While the descriptive model focuses on the process of negotiation, the prescriptive model emphasizes the outcomes of negotiation.

The descriptive model of negotiation is widely studied in social behavior science, sociology, and psychology. Based on sociological and psychological theories of learning and joint decision-making, the descriptive model seeks to describe what actually happens in a negotiation process (Weigand, Schoop, de Moor, & Dignum, 2003). Researchers within this stream focus on individual differences (Hausken, 1997), contextual characteristics of negotiation, situational determinants (Pruitt & Rubin, 1986), and cognitive processes of judgment, behavior, and outcomes in negotiation (Thompson, 1990).

The prescriptive model of negotiation, in contrast, stems from the studies of Game Theory, social psychology and organizational behavior. Its fundamental assumption is axiomatic rationality, where participants will always choose the options that are in their best interests according to the particular quality measurement instrument chosen. It is normative in the sense that it prescribes what negotiators should do to achieve the desired results (Weigand et al., 2003). While the theoretical objective of the prescriptive model is to predict the processes and outcomes of negotiation, the practical goal is to help people negotiate more effectively (Raiffa, 1982).

E-Negotiation Support Systems

Since the 1960s, when computer models were first employed for the support of individual negotiation, interest has been growing on the possibility of using computer technology and information systems to support negotiations (DeSanctis & Gallupe 1987). Today, a number of decision-aiding techniques

are employed by the decision support component, such as information control component for data storage and retrieval, representational aids, decision aiding techniques and models, and inference capabilities. The development of the Internet and multimedia benefited ENS as various communication channels could be deployed to enhance information exchange in the negotiation.

The types of ENS vary from no computer mediation assistance at all to fully automated computer arbitration. Based on the fundamental differences in the design and functionality of ENS, ENS can be classified into two categories (Rangaswamy & Starke, 2000): (1) preparation and evaluation systems, which provide negotiation decision support before or during a negotiation; (2) process support systems, which provide the negotiators with the means to communicate with each other, and computer mediation or arbitration mechanisms.

KEY AREAS OF ENS RESEARCH

To guide future research, there is a need to build a broader theoretical framework of ENS (Bui, 1994). In order to formulate the ENS research framework, this article reviews the following four major research areas:

1. The *e-negotiation support systems*; specifically, the system components.
2. The negotiation *process*; specifically, the interaction and cognition process.
3. The negotiation *outcomes*; specifically, the contract-related outcomes and process-related outcomes.
4. The *context* of ENS negotiation; specifically, the negotiator characteristics, the task nature and the culture.

E-Negotiation Support Systems

Conceptually, ENS consist of two subcomponents (Lim & Benbasat, 1993): the decision support systems (DSS) component and the electronic communication component. *DSS* help to refine the negotiators' objectives and enhance the capability of information processing and complex problem analyses, so that more efficient and balanced outcomes may be achieved. The use of the *electronic communication channel* increases the level of perceived commitment and trust in the other party. As a consequence, agreements may be reached with less time and effort spent.

In addition to the traditional ENS mentioned above, the autonomous *negotiation agent* is becoming popular (Beam & Segev, 1997). Instead of human negotiators, negotiation agents prepare and negotiate on behalf of their human "clients," especially in cases where the negotiation tasks are well-structured. Governed by computational rules, these agents may include a concession model with general strategies of concession in multiple-issue negotiations (Matwin, Szapiro, & Haigh, 1991), a case-based reasoning to plan and support negotiations (Sycara, 1990), and a genetic algorithm-based learning technique (Oliver, 1997). Negotiation agents could bring significant benefits, such as time savings, avoiding unnecessary cognitive limitations, lowering transaction costs, and increasing the efficiency of settlements (Rangaswamy & Starke, 2000).

Negotiation Process

Interaction Process-Communication

Negotiation, after all, is a special kind of communication (Putnam & Roloff, 1992). It is a dynamic process characterized by information exchange, persuasion, and joint problem solving. Communication in negotiation serves four primary functions (Tutzauer, 1989): (1) a vehicle for transmitting and accepting offers; (2) a means for conveying information; (3) a mechanism for shaping the relationship between the bargainers via argumentations; and (4) a lens for uncovering outcomes.

Research on communication in negotiation has followed two lines (Neale & Northcraft, 1991). One group studies the effects of communication on outcomes, specifically the content and style; while the other group investigates the determinants of communication tactical choices. In the context of facilitated negotiation using ENS, visual and audio channels are proposed to support the communication process. Media richness, synchronicity of the communication channels, and multilingual support are popular research areas.

Interaction Process-Negotiation Strategies

One of the important findings in negotiation strategy research is the Dual Concern Model (Pruitt & Rubin, 1986). This predicts that bargaining outcomes depend on the negotiator's concern for self profits (assertiveness) and concern for the opponent's welfares (cooperativeness). Table 1 presents the summary of the negotiation strategy and outcome predicted by this model.

The Dual Concern Model provides insights to the question of how to achieve a more effective negotiating tactic. This model suggests that successful integrative bargaining requires both high concerns for the value of one's own outcome as well as for the other's welfare. However, in real life, negotiators may fail to achieve that due to human limitations and resource constraints. These potential problems could be solved with the assistance of ENS.

Cognitive Process

Negotiator cognitions research focuses on what goes on in the mind of a negotiator. Negotiator cognitions can be classified into three classes (Neale & Northcraft, 1991):