A Survey of the Use of Computer Support for Negotiation

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Abstract

A survey was taken of negotiation practices in business and industry. Of particular interest was the extent to which computer technology is being used to enhance and support negotiation. The most widely used types of computer support were costing of anticipated demands, mathematical models and contract analysis. Pre-negotiation and post-negotiation activities had been more widely supported by computers than had actual negotiation sessions. A large number of organizations expressed a willingness to use computer support for future negotiations, and the consensus was that pre-negotiation activities could most benefit from such support. Those who had not yet used computer support for negotiations felt that costing and contract analysis could cost benefit from such support. The survey identified areas in need of improvement in the negotiation process and provided the basis for identifying solutions to these problems which could be provided by the use of innovative computerized negotiation support.

Introduction

Interest is growing in the possibility of using computer technology and information systems to support negotiators in a collaborative, integrative bargaining process, and to help them alleviate the negative impact of their cognitive limitations, cognitive biases, and socio-emotional problems. One of the most recent developments is the concept of Negotiation Support Systems (NSS), a special type of Group Decision Support Systems (GDSS) which uses a combination of GDSS and Decision Support Systems technologies to support negotiating parties in reaching an agreement (Jarke et al., 1987; DeSanctis and Gallupe, 1987; Kersten, 1985; Dennis et al., 1988; Lim and Benbasat, 1992).

Computer support for negotiation has already been employed in many fields such as international affairs, labor law, labor/management disputes, and environmental and safety disputes during the past decade (Nyhart and Goeltner, 1987; Jelassi and Foroughi, 1989; Eden, 1992). Those reporting the use of NSS for real-life negotiating have been enthusiastic, presenting generally positive results, both in negotiation outcomes and post-negotiator attitudes. But, NSS empirical research is still very sparse. A few briefly documented case studies of real-life implementations of NSS have provided positive evaluations of the outcomes obtained with NSS (Nyhart and Goeltner, 1987; Jelassi and Foroughi, 1989; Eden, 1992). Only a handful of NSS laboratory studies have been conducted, and only one of them used a full-features NSS (Balke et al., 1973; Sainfort et al., 1987; Jones, 1988; Sheffield, 1992; Foroughi and Perkins, 1989; Foroughi et al., 1992). NSS is still a relatively new

field, and most "true" NSS--incorporating both GDSS and DSS technology--are still in the conceptual stage. Rigorous experimental research using these systems is needed to provide evidence of the usefulness of this technology (Kersten et al., 1991; Carmel and Herniter, 1989; Carmel et al., 1993; Jelassi and Foroughi, 1989; Jones, 1988; Lim and Benbasat, 1992; Sheffield, 1992; Foroughi et al., 1992). Also, NSS researchers need to work more closely with practitioners in business and industry to ensure that their needs in the area of computer support for negotiation can be met.

This survey was conducted to help improve the interface between theory and practice in the field of negotiation support systems. The purpose of the project was to conduct a thorough survey of negotiation and bargaining practices in organizations in an area in the Midwest which would provide information about the techniques and procedures presently being used in business and industry and how effective they have been. Of particular interest was the extent to which computer technology such as that mentioned above is being used to enhance and support negotiation. The survey was intended to 1) help identify specific problems encountered by negotiators, 2) determine if computer support has been used to support negotiations, what types of support have been used and for which stages in the negotiation process, as well as how effective it has been, 3) provide information about the willingness of organizations to try such computer support in the future, the types of computer support which might be helpful, and the negotiation stages at which computer support

might be most useful.

The results of the survey indicated that the most widely used types of computer support were costing of anticipated demands, mathematical models and contract analysis. A majority of the surveyed organizations expressed a willingness to use computer support for future negotiations, and the consensus was that pre-negotiation activities could most benefit from support. Those organizations who had not yet used computer support for negotiation identified costing and contract analysis as the negotiation tasks which could most benefit from computer support.

Background

Since the 1960s the concept of computerized negotiation support has evolved from the idea of using computer models as "backroom processors" to support individual negotiators or negotiating teams to the idea of combining GDSS and DSS technology to support the entire negotiation process. NSS researchers have suggested how NSS can help alleviate major cognitive and socio-emotional stumbling blocks to successful negotiation (see Table 1).

A variety of NSS systems is available in terms of the amount of support they give as well as the negotiation stage for which they are to be used. However, most NSS are computer models used for quantitative analysis during part of the negotiation process. A few interactive systems have been developed which use computerized multicriteria techniques, DSS for eliciting preferences, and electronic communication (Foroughi and Jelassi, 1990b). The most recent trend in NSS design is toward session-oriented NSS which combine GDSS and DSS technology to provide interactive support for the entire negotiation, electronic communication, group process structuring techniques, and quantitative analysis of preferences and alternatives. In recent years, significant work has been undertaken to build interactive, session-oriented NSS which would support the entire negotiation process (Anson and Jelassi, 1990; Carmel and Herniter, 1989; Carmel et al., 1993; Foroughi and Perkins, 1989; Foroughi and Jelassi, 1990a, 1990b; Foroughi et al., 1992). These NSS are session-oriented in that they are designed to be used in a single negotiating session with both parties present; further, they are designed to support the entire negotiation process from an initial statement of interests, through the generation and analysis of alternatives, to the documentation of a final agreement.

Project Description and Methodology

Designing the Questionnaire:

The first step in this project involved the design of

the survey questionnaire. It was important to devise a questionnaire which did not merely ask "haphazard" questions and which would be a valid measuring instrument capable of producing worthwhile findings which would be respected and used by other scholars in the field. In order to do this, it was important to find a theoretical basis for the items included in the questionnaire. Relevant literature in the area of negotiation and computer support for negotiation was consulted.

Of particular interest was the extent to which the participating organizations had been affected by cognitive and socio-emotional factors which typically impact on negotiations (see Table 1). These factors include the cognitive difficulty of evaluating contract alternatives and determining optimal solutions, cognitive biases of negotiators (consideration of issues one at a time, negative framing of the negotiation, the fixed-pie mentality, premature closure, and preference for salient solutions), and socio-emotional aspects of negotiator behavior (face-saving behavior, ineffective communication, negotiator overconfidence, and nonrational escalation of conflict).

After the original questionnaire had been designed, interviews were arranged with individuals at several corporations who are in charge of negotiation activities in their companies. These individuals were asked to read the questionnaire and give their input about the appropriateness of the items in the questionnaire. These interviews were extremely valuable in terms of getting an idea of some major concerns about bargaining and negotiation and helped in the revision and refinement of the questionnaire.

The survey forms consisted of three sections: Section A provided background information about the negotiation activities of the participating organizations. Section B provided information about the experience of the participating organizations with negotiation, in terms of cognitive and socio-emotional factors which may have impacted on the effectiveness of past negotiations. Section C provided information about the use of computer support for negotiation, including 1) whether it had been used, 2) the types of computer support which had been used, 3) the amount of satisfaction with the type of support used, 4) the willingness of the organization to use computer support for negotiations in the future, and 5) the types of support which would be beneficial, and the stages of negotiation which would benefit from such support.

This project was intended to provide information about three types of negotiations: sales contract negotiations, purchasing contract negotiations, and labor/management negotiations. Therefore, three different survey forms were written, to be distributed to the human relations department, sales division, and purchas-

Table 1**Major Stumbling Blocks To Successful Negotiation & Possible NSS Solutions**

Major Stumbling Blocks	Possible NSS Solutions
I. Cognitive Limitations the cognitive difficulty of evaluating the utility of alternative settlements and determining trade-offs (Lewicki and Litter, 1985).	Analytical processing of subjective preference and/or external objective data and identification of high joint benefit solutions or strategies (UNISYS, 1987; Jelassi and Foroughi, 1989).
II. Cognitive Biases A. Consideration of Issues in Isolation the failure to integrate single issues into a single package so that potential trade-offs can be recognized (Kelley, 1966; Erickson et al., 1974). B. Negative Framing of the Negotiation evaluation of potential losses instead of potential gains, which can lead to risk-seeking behavior (Tversky and Kahnemen, 1981; Bazerman and Neale, 1983). C. Fixed-Pie Mentality the assumption that their interests are in direct conflict with the other party, and that one side will win at the expense of the other (Pruitt, 1983). D. Premature Closure or Finalizing of Positions tendency to prematurely finalize positions before considering all possible solution alternatives (Kelley, 1966). E. Preference for Available, Salient Information or Solutions tendency to recall and value most that information which is most salient or familiar (Tversky and Kahneman, 1981).	Display of entire contract for discussion to enable "logrolling" among issues (Jelassi and Jones, 1988). Establishment of interaction rules and use of pre-negotiation modules requiring parties to identify their interests (Anson and Jelassi, 1990). Public display of conflicting views, pairing of related items (Anson and Jelassi, 1990). Analytical methods to identify alternative solutions. Presentation of a negotiation text (SNT) (Fisher, 1978) of equivalent value to both sides as a starting point (Jelassi and Jones, 1988), rules requiring consideration of all issues (Jelassi and Jones, 1988). Rules requiring consideration of all issues (Jelassi and Jones, 1988), NSS suggestions of possible concessions, solutions and trade-offs (Jelassi and Foroughi, 1989).
III. Socio-Emotional Aspects of Negotiator Behavior A. Face-Saving Behavior avoidance of agreements in which they feel they are giving in (Hiltrop and Rubin, 1981). B. Ineffective Communication distraction due to physical appearance of opposing parties, semantic differences, and status and power differences (Lewicki and Litterer, 1985). C. Negotiator Overconfidence overrating of their own judgments (Einhorn and Hogarth, 1978), belief that neutral parties will judge in their favor (Farber, 1981). D. Nonrational Escalation of Conflict tendency to escalate the level of conflict irrationally (Lewicki and Litterer, 1985), "locking in" on often hostile opening moves (Pilisuk and Skolnick, 1978).	Suggestion of possible concessions to help achieve optimal joint outcomes and permit negotiators to compromise while still saving face (Anson and Jelassi, 1990). Participation rules, display of organized feedback, (DeSanctis and Gallupe, 1987), written wording to focus group attention, encourage preciseness, and document the agreement (Jarke and Jelassi, 1986). Sense of rationality brought by analytical processing of subjective preference and/or external objective data and the determination of possible solutions (DeSanctis and Gallupe, 1987). Focus of attention away from personalities and on issues which results from use of electronic communication (DeSanctis and Gallupe, 1987), participation rules (Anson and Jelassi, 1990).

Table 2
Summary of Background Information

Table 2 - a
General Information

Type of companies surveyed: manufacturing and processing companies
Average number of employees: 534
Percentage of companies with plants in several locations: 62% (43 out of 69 companies)
Percentage of companies who conduct negotiations at local level: 33% (23 out of 69 companies)
Percentage of companies who monitor changed labor/management contracts: 70% (16 out of 23 companies)

Table 2 - b
Duration of Contracts for Different Types of Negotiations

Type of Negotiation:	Length of contracts in months:
Purchasing contracts	11 months
Sales contract	14 months
Labor/Management negotiations	26 months

Table 2 - c
Number of Negotiators from Each Company

Type of Negotiation:	# Negotiators from home company	# Negotiators from other company
Purchasing contracts	2	2
Sales contracts	2	2
Labor/management	4	6

Table 2 - d
Average Number of Days Spent in Different Negotiation Activities:

Negotiation Stage	PC	SC	L/M
Pre-negotiation Activities	8	8	16
Actual Negotiation Sessions	3.5	3.5	11
Post-negotiation Activities	4	4	5.3

Table 2 - e
Contract Issues Included in Sales and Purchasing Contracts:

Negotiation Issue	Percentage of Companies who include it
Price	95% (44 out of 46 companies)
Quantity	85% (39 out of 46 companies)
Delivery time	85% (39 out of 46 companies)
Duration of blanket orders	59% (19 out of 46 companies)
Discounts	50% (23 out of 46 compqanies)
Warranty period	42% (27 out of 46 companies)
Firmness of price	37% (17 out of 46 companies)
Penalties	30% (14 out of 46 companies)

Table 2 - f
Types of Assistance Sought for Labor/Management Negotiations:

Type of Assistance (Positive Responses/Total # Responses)	Percentage of Companies Who Have Used It.
Outside attorneys	48% (11 out of 23)
In-house attorneys	26% (6 out of 23)
Mediators	17% (4 out of 23)
Professional arbitrator	1% (1 out of 23)

Table 2 - g
Location of Sales and Purchasing Contract Negotiations:

Location	Percentage of Companies
Company's own offices	80% (37 out of 46)
Other Company's offices	54% (25 out of 46)
Over telephone	67%(30 out of 46)
Fax	52% (24 out of 46)
Videoconferencing	1% (24 out of 46)

ing divisions in each participating company. The only difference in the three forms was Section A, which contained questions which were appropriate for the negotiation activities of each of the three departments mentioned above. Sections B and C were identical in all three forms.

Distributing the Survey Forms

642 questionnaire forms were sent to 214 organizations with forty or more employees in a 12 county area in the Midwest.

A survey packet was sent to the major executive in each organization with a cover letter explaining the purpose of the study and requesting their cooperation in sending back the survey forms. The survey instrument consisted of three questionnaire forms, which examined labor-management negotiations, procurement/purchasing negotiations, and sales negotiations. The executive was asked to distribute each of the three survey forms to the appropriate person(s) or departments responsible for each of these three different types of negotiation activities. Attached to each of the three forms was a stamped, pre-addressed envelope which could be used to return it to the researcher.

The cover letter also stated that the results of the survey would be published in summary form and distributed to the participants and that the confidentiality of respondents was guaranteed.

A total of 69 completed survey forms were returned, 24 for purchasing contract negotiations, 22 for sales contract negotiations, and 23 for labor/management negotiations.

Statistical Analysis

Statistical Analysis of Background Information (Section A)

Section A. of the questionnaire consisted of 8 items, which were answered by providing a one or two-word short answer or by placing a check mark in the appropriate space. For the purpose of the statistical analysis, 1 was used for "yes" responses and 0 for "No" responses. The data from items 2, 7, and 8, which were responded to by checking the appropriate answers, were analyzed by determining how many companies checked each response and calculating the percentage of companies which responded to each. For the other items (1, 3, 3a, 4 and 6) the background information for all three types of negotiations was analyzed together by determining the statistical mean for each item.

Statistical Analysis of Experience with Negotiations (Section B)

Section B. of the questionnaire consisted of 22 items. The first 20 items were responded to by circling a number from 1 to 7 on a 7-point Likert scale. The scale ranged from 1 (Never) to 3 (Seldom) to 5 (Often) to 7 (Always). Factor analysis (varimax rotation) was performed on the data collected from the responses to these 20 items in order to condense the factors measured by these items into a smaller set of factors (Hair et al., 1979).

The results of this factor analysis showed that the 20 items loaded onto seven factors, which are listed below, along with the items which measured each factor:

Concern with Appearances/Losing Face

We are unwilling to compromise if it might make our company "lose face". We are affected by the physical appearance and/or the personality of the other party. Our performance is affected by any differences in status and position of power between us and the other party.

Thorough Consideration of Alternatives

We try to reveal as little information as possible to the other party. We try to consider many different alternative solutions before finalizing our position and/or reaching a solution. We are willing reconsider "fixed" positions we have on the issues.

Collaborative Attitude

We are willing to compromise on less crucial issues. We are considerate of the interests of the other party. We try to be cooperative and flexible in trying to find a solution which is agreeable to both sides.

Negative Climate

We are suspicious of what the other party proposes. We feel that our loss is the other party's gain. We encounter difficulty in coming up with various contract alternatives.

Information Exchange/Satisfaction

We consider all of the issues simultaneously as a "package". We and the other party exchange information about our preferences and needs. We get what we want from a negotiation settlement. We have trouble understanding the other party's words and/or expressions.

Positive Frame of the Negotiation

We feel confident that we will be able to achieve an

outcome that is good for our company. We focus on what we have to gain from the negotiation rather than on what we have to lose.

Competitive Attitude

We maintain focus on the most important issues and resist compromising on them. We do our best to influence the outcome for our side.

The data obtained from the responses to these items were analyzed for each type of negotiation separately. The statistical means for the items in each of the seven factors were calculated, and then the statistical mean for the items in each factor was determined, thus providing a composite result for each factor.

The last two items in Section B were responded to by checking "Yes" or "No" and describing any existing problems. Again, for the purpose of statistical analysis, a 1 was given to "Yes" responses and a 0 to "No" responses.

Statistical Analysis of Computer Support for Negotiations (Section C)

The first 12 items in Section C were responded to by circling a number from 1 (Very Dissatisfied) to 7 (Very Satisfied) on a Likert Scale. The next item was responded to by circling a number from 1 (Highly Unlikely) to 7 (Quite Likely) on a Likert Scale. The means for each item were determined. The last two items were responded to by placing checks in the appropriate spaces. The data from these items were analyzed by determining how many companies checked each response and calculating the percentage of companies which responded to each.

Survey Results

The survey results are contained in Tables 1-8 in the Appendix. The following sections highlight the significant findings for Sections B and C of the survey.

Results for Section B (Experience with Negotiations)

The results in Table 3-a yielded much interesting information about cognitive and socio-emotional factors which had impacted on past negotiations conducted by the participating organizations. Overall, collaborative attitude, positive frame of the negotiation, and competitive attitude had occurred significantly more often than the other factors. For purchasing contract negotiations, competitive attitude and positive frame of the negotiation occurred significantly more often than the other factors. For sales contract negotiations, collaborative attitude and competitive attitudes occurred significantly more than the other factors. For labor/management

negotiations, collaborative and negative climate were significantly more prevalent than the other factors.

The write-in section of the questionnaire provided space in which respondents could describe specific problems which they had encountered during past negotiations. The results are contained in Table 3-b. Inflexibility and intractability of the other negotiating party on certain issues were difficulties encountered by both sales contract and purchasing contract negotiators. Another problem mentioned by both sales and purchasing contract negotiators was the impact of individuals not directly involved in the negotiation on the actual process of the negotiation as well as its outcome. For instance, a negotiator can sometimes feel uncertain about how to deal with a vendor whom he/she knows has a special relationship with his/her superior. Should he/she make special allowances for this vendor? Such a situation puts a great deal of stress on the negotiator, and his/her superior should anticipate and clarify such a situation prior to negotiations.

A third problem was the lack of consistent standards for negotiations, and the same vendors sometimes react differently, according to the market place, whether it is a buyer's or a seller's market. To help avoid this problem, rules and procedures for a negotiation should always be spelled out and agreed upon by both parties ahead of time. A fourth problem common to both sales contract and purchasing contract negotiations was the unwillingness of vendors to guarantee pricing over time, which can often stall negotiations or cause purchasers to seek other vendors.

Major problems encountered in labor/management negotiations included fluctuating employment costs and rising health care costs. Such costs are for the most part external and out of the hands of management, but unions often question management's facts and figures. Another problem for smaller firms was trying to compete with wage-benefit patterns already established by large, more prosperous competitors, who can afford to be more generous.

Results for Section C (Previous Use of Computer Support for Negotiations)

Tables 4-a and 4-b present results obtained concerning previous use of computer support for negotiation. Costing stands out as having been used significantly more than the other types, followed by mathematical models/simulations. Costing had also been used by more companies for both purchasing contract negotiations and sales contract negotiations than had the other types of computer support. Labor/management negotiators had used costing and mathematical models/simulations more. No significant differences were found in the amount of satisfaction with the various

Note: In all of the following tables,
 PC = Purchasing Contract Negotiations
 SC = Sales Contract Negotiations
 L/M = Labor/Management Negotiations

Willingness to use computer support in future negotiation was expressed most by labor/management negotiators (Table 6), and significantly more companies felt that computer support would be helpful for pre-negotiation activities than for the other stages (Table 7). Costing and contract analysis were identified as more potentially beneficial than were the other types of support, with costing highly rated for labor/management negotiations (Table 8).

Table 3-a
Experience with Negotiations

Experience with Negotiation:	PC	SC	L/M	Average	Level of Signif.
Concern with Appearances/Losing Face	3.1	3.0	3.1	3.0	No Signif.
Thorough Consideration of Alternatives	4.5	4.6	4.4	4.5	No Signif.
Collaborative Attitude	5.0	5.9	5.9	5.6	No Signif.
Negative Climate	3.6	3.5	3.7	3.6	Signif. P < =0.002
Information Exchange/Satisfaction	4.6	4.7	4.3	4.5	No Signif.
Positive Frame of the Negotiation	5.5	5.1	5.1	5.3	No Signif.
Competitive Attitude	5.9	5.6	5.9	5.8	No Signif.
Average.	4.6	4.6	4.6	4.6	
Level of Significance	Signif. P < =0.00	Signif. P < =0.00	Signif. P < =0.00	Signif. P < =0.00	

types of computer support.

Tables 5-a and 5-b present the results for the negotiation stages for which computer support had been used. The pre-negotiation and post negotiation stages had been supported by computers at a significantly higher rate than had actual negotiation sessions. There were no significant differences in the various stages of negotiation as to the rate of satisfaction with computer support used.

Conclusions

This survey provided interesting information about negotiation practices in the surveyed organizations as well as information about the amount of use of computer support for negotiation, the types of computer support which have been used and at which negotiations stages, and the degree to which organizations have been satisfied with various types of computer support. In addition, information was obtained as to the willingness

Table 3 - b
Results of Write-In Section

Specific Problems Mentioned

For Purchasing Contract Negotiations

"The same vendors will react differently, depending on the market place (buyers' market vs. sellers' market). We only deal with 'reliable companies' : Due to dishonest sales people, it is not worth the risk."

"Supplier was unmoving on their original proposal, which was unreasonable. It was not a "win-win" situation, but a take-all by supplier. "

"Uncertainty due to special relationships between my superior and the vendor."

"Unwillingness to guarantee pricing for 12 months."

For Sales Contract Negotiations

"Customers steadfast on certain price points."

"An ever-changing set of 'rules'. Every company has a different style that must be understood."

"Negotiations must include participating dealer, who carried out terms of agreement. Sometimes this complicates negotiations."

For Labor/Management Contract Negotiations

"Drastic change in competitive situations causing increased differences in total employment costs."

"Health care costs have dramatically increased, putting strain on continuing present level of Health Care benefits."

"During the 70s and early 80s, several work stoppages occurred due to wage and benefit differences."

"Credibility of FMCS staff."

"Could not reach a settlement . Union was on strike approximately 6 weeks. They returned to work under out proposed agreement since 1984."

"Resistance of union on health care concessions and their failure to recognize these costs are for the most part beyond the control of management."

"Trying to negotiate against an industry-wide pattern established by our larger competitors."

Table 4 - a
Previous Use of Computer Support
Percentage of Companies Who Have Used Computer Support

Type of Computer Support	PC	SC	L/M	Average
Costing	38%	73%	35%	49%
Contract Analysis	25%	23%	9%	19%
Math. Models/Simulations	21%	32%	35%	29%
Decision Support System	16%	9%	13%	12%
Electronic Communication	16%	23%	13%	17%
Computer Display of Contracts	8%	18%	17%	13%
Multi-Criteria Decision Making	8%	5%	9%	7%
Group Process Structuring	4%	5%	9%	6%
Game Theoretical Models	4%	0%	9%	4%

Table 4 - b
Satisfaction Rating with Previous Use of Computer Support

Type of Computer Support	PC	SC	L/M	Average	Level of Signif.
Costing	5.2	5.2	4.0	4.8	No Signif.
Contract Analysis	5.2	5.2	5.9	5.5	No Signif.
Math. Models/Simulations	6.2	5.7	5.9	5.9	No Signif.
Decision Support System	5.5	6.0	5.0	5.5	No Signif.
Electronic Communication	4.5	6.0	3.5	4.7	No Signif.
Computer Display of Contracts	5.0	0	2.5	2.5	No Signif.
Multi-Criteria Decision Making	4.5	5.5	4.5	4.8	No Signif.
Group Process Structuring	6.9	6.0	3.5	5.2	No Signif.
Game Theoretical Models	5.5	5.7	4.3	5.2	No Signif.

Table 5 - a
Use of Computer Support at Various Stages of Negotiation
Percentage of Companies Who Have Used Computer Support

Negotiation Stage	PC	SC	L/M	Average
Pre-negotiation Activities	38%	45%	30%	38%
Actual Negotiation Sessions	25%	23%	22%	22%
Post-negotiation Activities	33%	45%	26%	35%

Table 5 - b
Use of Computer Support at Various Stages of Negotiation
Satisfaction Rating with Computer Support at Various Negotiation Stages

Negotiation Stage	PC	SC	L/M	Average	Level of Significance
Pre-negotiation Activities	5.2	5.3	5.3	5.3	No Signif.
Actual Negotiation Sessions	5.3	5.0	5.0	5.1	No Signif.
Post-negotiation Activities	5.6	5.1	5.2	5.3	No Signif.

of the organizations to use computer support to support future negotiations, the negotiation stages which might benefit from such support, and the types of computer support which might be beneficial.

Several significant findings were made. First, the results from the "Experience with Negotiations" section provided some evidence that negative climate and concern with appearances/losing face have sometimes impacted on the effectiveness of negotiation processes undergone by the surveyed organizations. These two factors are among the major stumbling blocks to effective negotiation which are recognized and discussed by negotiation researchers (See Table 1).

The write-in item which was meant to elicit any other problems which had been encountered also yielded interesting information about important factors which had not been covered in the other questionnaire items. For instance, the responses to the write-in item for purchasing contract negotiations and sales contract negotiations indicated that the negotiator(s) from the other company was sometimes perceived as being unreliable, unyielding, and that it was difficult to

understand the other company's "style". Again, these problems are examples of the recognized stumbling blocks to negotiation (See Table 1). Another difficulty was in getting participating dealers to carry out the terms of negotiations which had been made. Problems identified for labor/management contract negotiations included drastic changes in competitive situations, resistance of unions on health care concessions in the wake of rising health care costs, and the difficulty of negotiating against an industry-wide pattern established by larger competitors.

The most widely used type of computer support was costing of anticipated or proposed demands, followed by mathematical models/simulations and contract analysis. Pre-negotiation and post-negotiation activities had been more widely supported by computers than had actual negotiation sessions. These results are consistent with what is written in NSS literature and under-score the need for researchers and designers to make more effort to reach out to practitioners and offer their advice and assistance about the possibility of using state-of-the-art computer technology which combines GDSS and DSS to provide support during the entire

Table 6
Willingness to Use Computer Support for Negotiation
Percentage of Companies Willing to Use Computer Support for Negotiations:

Type of Negotiation:	Percentage
Purchasing contracts	62%
Sales contracts	50%
Labor/management contracts	65%
Average	59%

negotiation process. An encouraging number of organizations (59% on the average) expressed a willingness to use computer support for future negotiations, and the consensus (68%) was that pre-negotiation activities could most benefit from such support.

Those who had not yet used computer support for negotiations felt that costing of anticipated or proposed demands and contract analysis could most benefit from such support, followed by mathematical models/simulations, decision support systems, and multi-criteria decision making.

This research project provided a means for identifying areas in need of improvement in the negotiation processes presently being used by businesses and industries. The results of the survey provide the basis for identifying solutions to these shortcomings which could possibly be provided by the use of innovative computerized negotiation support. Indeed, the results indicated a significant amount of interest in computer support for negotiation, a willingness to use it in future negotiations, and identified specific types of support which might be beneficial.

Improvement in negotiation effectiveness can potentially enhance the relationships between customers and suppliers and between employees and management, which in the long run should increase productivity, improve the image of US communities as attractive sites for new business and industry, and give US business and industry a competitive edge.

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Table 7
Stages at Which Computer Support Would Be Beneficial
Percentage of Companies Who Feel Computer Support Would be Beneficial

Negotiation Stage	PC	SC	L/M	Average
Pre-negotiation Activities	67%	73%	65%	68%
Actual Negotiation Sessions	50%	32%	35%	39%
Post-negotiation Activities	50%	36%	30%	39%

Table 8
Types of Computer Support Which Would Be Beneficial
Percentage of Companies Who Feel It Would Be Useful

Type of Computer Support	PC	SC	L/M	Average
Costing	30%	32%	61%	41%
Contract Analysis	50%	36%	35%	40%
Math. Models/Simulations	38%	27%	17%	27%
Decision Support System	30%	27%	13%	23%
Computer Display of Contracts	17%	18%	13%	16%
Multi-Criteria Decision Making	8%	41%	17%	22%
Group Process Structuring	8%	14%	9%	22%
Game Theoretical Models	0%	18%	4%	7.3%
Electronic Communication	1%	1%	1%	1%

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