

Labor-Management Contract Negotiations in an Electronic Meeting Room: A Case Study

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Abstract

We present perhaps the first case study of labor-management contract talks conducted in an electronic meeting room supported by a computer Negotiation Support System (NSS). The organization's union and management representatives spent a total of 57 hours (13 sessions) in the electronic meeting room; their efforts resulted successfully in a contract ratified by both sides. The NSS described comprised three tools from the *GroupSystems* electronic meeting system and three ad hoc tools. Besides the NSS, three other intervention factors were introduced in tandem with the NSS: new negotiation process techniques, the active involvement of third party mediators, and a unique negotiation setting. The new process techniques were introduced based on the goals of integrative bargaining and the Win-Win techniques. The negotiation process was divided into three distinct stages: strategy, issues, and bargaining.

Key words: contract, Electronic Meeting Systems (EMS), Group Decision Support Systems (GDSS), Group Support Systems (GSS), integrative bargaining, labor-management, negotiation, negotiation support system (NSS), Win-Win, labor relations

Conflict resolution techniques have been applied to such diverse situations as playground fights and international conflicts (Lovenheim 1989; Allison 1990). The periodic (often annual) event of labor-management contract negotiations is of particular interest. Here, too, novel negotiation approaches (Barrett 1990) are making headway, albeit slowly. In parallel, recent years have seen rising interest in the use of so-called Negotiations Support Systems (NSS) to support negotiations. The goal of NSS is to give negotiators a better, more comprehensive approach with which to deal with bargaining issues. Thus far, NSS has had very limited impact in the practice of labor-management contract talks. We present perhaps the first case study of contract talks conducted in an electronic meeting room and supported by both computers and third party mediators.

Our approach in this article is to examine the important theories and paradigms in the fields of negotiation, NSS, EMS (Electronic Meeting Systems), and GDSS (Group Decision Support Systems) through the lens of this novel case study.¹

1. Literature review

Foroughi and Jelassi (1990, p. 2) offer a definition of a Negotiation Support System. They define NSS as “a special type of GDSS intended to support negotiation parties (and possibly a human mediator) in reaching an agreement.” We offer a more comprehensive definition:

A Negotiation Support System (NSS) is a system consisting of hardware, software, people, procedures, and data that assists the individual negotiator, negotiation team, and third-party. The NSS advises, provides a solution, or facilitates the process of negotiation.

The definition of NSS, though, is insufficient as a model for rigorous analysis of a case study. Negotiation takes place in a milieu of static and dynamic factors: personalities, history, politics, and the economic and social environment. These factors combine, over the course of the dialogue, to produce an outcome (Figure 1). This simple model of input–process–outcome may change when one or more *process intervention factors* are introduced. NSS is but *one* process intervention factor, all of which are closely intertwined:

1. Process techniques (e.g., Integrative Bargaining, Win-Win)
2. Third parties (i.e., mediators, arbitrators)
3. Negotiation Support Systems
4. Setting

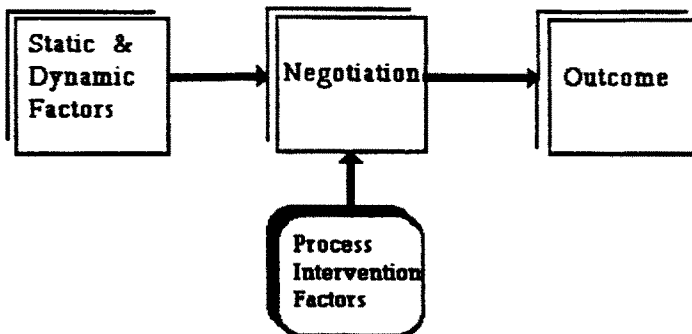


Figure 1. Research model.

We will discuss a myriad of issues, and subfactors within each of these four intervention groupings, but place emphasis on the concepts that relate to the case study. We also note that some of the distinctions between the four intervention groupings are rather arbitrary; in fact, the factors are often mutually dependent. For example, the process depends on the third party enforcement of the agenda, the NSS reinforces the agenda, and the setting must be able to accommodate the technology needed to run the NSS. The remainder of this section will discuss the four intervention factors.

1.1. Process techniques

The introduction of process techniques is consistent with the prescription (Kochan and Katz 1990) that a new system be introduced for resolving conflicts—one which includes team-building, trust-building, issues sensitization, and greater time horizons for problem solving. We will begin with a consideration of Integrative Bargaining, proceed to discuss the principles that guide negotiations [based largely on Fisher and Ury's (1981) "principled negotiation"], and end with frameworks that offer specific, step-by-step prescriptions for negotiation, which we refer to as "stage models of negotiations."

1.1.1. Integrative Bargaining (IB). There are several approaches to the classification of negotiations (Murray 1986). Most define negotiation as being of two extremes: the common practices which the majority of negotiations follow on the one hand, and the ideals that few negotiations have attained on the other. Many researchers postulate these extremes on a spectrum. This article makes use of Walton and McKersie's (1965) concept of a distributive-integrative spectrum. The idea of *distributive bargaining* (also see Raiffa 1982; Lewicki and Litterer 1985) is most familiar in the form of a single-issue negotiation, such as bargaining for a used car. Any reduction in the price of the car removes money from the pocket of the salesman, while any increase in the price paid removes money from the pocket of the buyer. This is also known as a "Win-Lose" situation. The common result of distributive bargaining is not always the "best" solution. Distributive bargaining can also be applied to multi-issue negotiations wherein each issue is handled singularly. Walton and McKersie (1965) consider distributive bargaining to be "'bargaining' in the strictest sense of the word" (p. 4). Issues are assumed to be areas in which the parties are in conflict. As a technique, the function of distributive bargaining is to resolve "pure conflicts of interest" (p. 4) in a fixed-sum negotiation. In contrast, IB is "the system of activities which is instrumental to the attainment of objectives which are *not* in fundamental conflict with those of the other party and which therefore can be integrated to some degree" (p. 5). Problems are assumed to be areas of common concern in which objectives are *not* in fundamental conflict. As a technique, the function of IB is to resolve conflicts

in whose solutions the gains of one side do not require equal sacrifices by the other. IB *may* occur in a multi-issue negotiation; however, negotiators in multi-issue negotiations often bargain in a distributive manner.

There is consensus that negotiations, particularly labor–management contract talks, need to move in the direction of IB: toward innovative conflict resolution processes and techniques. The integrative bargaining approach attempts to steer the parties toward problem solving and away from the traditional zero-sum horse trading. These innovative approaches have been popularized under the rubric of “Win-Win” (cf. Barrett 1990) and are slowly entering the mainstream of labor–management negotiations.

Principled negotiation is a set of four fundamental guidelines proposed by Fisher and Ury (1981) to which other NSS researchers frequently refer (Anson and Jelassi 1990; Carmel and Herniter 1989; Foroughi and Jelassi 1990; Jelassi and Foroughi 1989; Shakun 1988). Since any NSS needs to be evaluated on how well it enforces or encourages these principles, we will discuss each of these four principles next.

1. *Separate the people from the problem.* Separating the people from the problem helps reduce the negative impacts of misperceptions and emotion. Fisher and Ury (1981) suggest negotiators consciously adopt the following policies to avoid misconceptions: negotiators should strive to see the issues from the other side’s perspective (i.e., they should put themselves in the shoes of the other side); negotiators should *not* assume that their worst fears are the other side’s intentions; and negotiators should *not* blame the other side for the problems they face. Furthermore, dealing with emotion is a matter of emphasizing rational discussion and evaluation, while simultaneously acknowledging the emotions of the other side as legitimate.

Jelassi and Foroughi (1989) suggest that NSS can separate the people from the problem in several ways: introducing rules of negotiations, commitments, role reversal, order and timetables, and anonymous group techniques (such as Nominal Group Technique).

2. *Identify the parties’ real interests.* Negotiators often confuse their position on an issue with their fundamental interests. Parties do not correctly assess their own goals, objectives, and values; if they did, the parties in a negotiation might find that some of their interests coincide.

Escalation of positions is one of the confusing dynamics during negotiation. Bazerman and Carroll (1987) point to this phenomenon as a behavioral problem: negotiators often nonrationally escalate their commitment to a previously selected course of action. Therefore, it is equally important to rationally assess their opponent’s interests and their own.

3. *Generate options for mutual gains.* Compromises which split the difference between positions (e.g., slicing the “pie” down the middle so two hungry people can eat) are not always optimal. Often, alternative solutions are not readily obvious. Bazerman (1983) points out that one of the behavioral problems of negotiators is the “mythical fixed pie” (p. 215). Continuing the metaphor, compromise

is assumed to mean both hungry people get half the pie, while winning means one person gets the whole pie. Negotiators are often blind to creative solutions *because* they have assumed that all possible solutions involve splitting the pie.

Fisher and Ury offer a four-part prescription for inventing options. First, they suggest that negotiators separate the generation and evaluation of options; brainstorming, specifically, is suggested for the generation of options. Second, negotiators should work to broaden their options. Third, negotiators should focus on mutual gain, consciously trying to overcome the assumption that the negotiation is over a fixed pie in which whatever one side gains, the other loses. Fourth, Fisher and Ury suggest presenting options for the other side to consider. When doing so the negotiator should try to make the process of choosing among the options as easy and painless as possible for the other side.

For NSS, Jelassi and Foroughi (1989) suggest a variety of idea generation techniques such as brainstorming, interactive brainwriting, and Nominal Group Technique. Nunamaker and associates (1991a) write of EMS as a proven way to generate negotiation options. They point to the documented benefits of anonymity, parallel processing, and larger-sized groups as being particularly helpful when generating alternatives.

4. *Use objective criteria.* Negotiators need a common measure, metric, or evaluation criterion. Focusing on fair standards and fair procedures is one way of developing objective criteria. For NSS, Jelassi and Foroughi (1989) suggest access to both local and external databases for the purpose of comparing contracts and economic circumstances within an industry and across different economic sectors.

1.1.2. Stage models of negotiation. All negotiations go through stages, either inadvertently or by design. In a simple case of bargaining (e.g., bargaining for a used car), it is called a “dance” (Raiffa 1982). In conflict resolution centers all over the country, mediation is taught using a structured, stage-based process. As Sheppard (1978) points out, there is an increased awareness of the numerous stage-related similarities in resolving conflicts ranging from marital to industrial relations. Because practitioners believe that structure is beneficial, they propose numerous negotiation stage models, both descriptive and prescriptive. Use of EMS also involves structuring and implicit stages. Groups are shepherded through sequences of tools and techniques to achieve their objectives. There has been little work, however, on the effects of the type of structure and agenda introduced by EMS (with the exception of Watson, DeSanctis, and Poole 1988).

The negotiation literature offers several stage models of negotiation: Creative Conflict Resolution (Kessler 1978), Principled Negotiation (Fisher and Ury 1981), Negotiated Investment Strategy (Kettering Foundation 1982, 1984), Sheppard’s synthesis model (Sheppard 1978), and PAST (Barrett 1990). The stage models exist to create conditions for innovative solutions in the mold of Integrative Bargaining. All the stage models overlap, in their prescriptions for success, in that

they all include preparation steps, followed by an exchange of information with discussions, and conclude with reconciliation or agreement.

We have been influenced by Kessler's (1978) Creative Conflict Resolution model and the work of Jelassi, Foroughi, and Anson (Jelassi and Foroughi 1989; Anson and Jelassi 1990). We will elaborate on stage models through the lens of Kessler's work. Kessler is a professional mediator whose model of negotiation is a result of observation, experience, and interviews with 30 mediators around the United States.

Kessler's model begins with a "pre-session" for preparation and strategy, which precedes the onset of negotiation, but is not considered part of the formal negotiation. The first formal step is to *set the stage*. Kessler separates this preparatory step into four parts: establishing rules, setting the tone, obtaining commitment, and foreshadowing.

First, ground rules are established. These rules are used to set a tone of cooperation between the sides and to get them to commit to dealing with each other openly and fairly. This stage is also used to commit the sides to an actual dialogue. Kessler's final purpose for this stage is to foreshadow the problems that will be discussed later.

The second step is to *define the issues*. This involves exploring assumptions, gathering facts, and discovering the underlying issues. This is a joint process; both sides are involved. Although it predates their work, this step conforms closely to Fisher and Ury's (1981, p. 11) admonition to "focus on issues, not positions."

The third step is to *process the issues*. Negotiators are encouraged to question each other and avoid nonverbal signals that might inflame the situation and create impasses. Empathy between the negotiators helps them to understand each other's styles, needs, and issues.

Resolving the issues is the fourth and final stage in Kessler's model. Again, the guidelines here foreshadow Fisher and Ury's later recommendations. Negotiators try to be creative in generating alternatives and to expand the boundaries by exploring different means and ends. The end goal is that everyone should be satisfied with the agreement. Finally, specific agreements to monitor results are set.

The "Development Framework for Computer-Supported Conflict Resolution" by Anson and Jelassi (1990) was the first to address the design requirements for a GDSS aimed specifically at structured negotiation. Anson and Jelassi align their ideas with Kessler's four-stage process model (described above) and match activities to each stage. They then show which activities are supported by the GDSS systems of the University of Arizona (GroupSystems) and the University of Minnesota (SAMM).

1.2. Third parties: facilitators and mediators

Pruitt and Rubin (1986) state that "third parties have been in business since the dawn of humanity" (p. 166). The novel intervention factors in negotiations involve

a combination of process techniques and the active involvement of a third party, usually a mediator (Lovenheim 1989; Sheppard 1978).

Honeyman (1988) writes of a typical dilemma: it is not clear what makes an effective mediator. It is clear, though, that a mediator's role in negotiations is multifaceted and involves at least some of the following: getting the sides to communicate; carrying messages; helping set an agenda; helping sides understand the process, problems, and objectives; suggesting solutions; persuading; maintaining order and agenda (Allison 1990); facilitating learning; enhancing ingenuity; defusing tension and deadlocks; easing the cost of movement; blunting conflict escalation (Lax and Sebenius 1986); saving the sides from embarrassment (Volkema 1988); helping the parties explore what would happen if they move from their bottom positions; and preventing the sides from holding back concessions (Kochan and Katz 1990).

Although mediators need to know how to use the process techniques discussed in the previous section, ultimately there is consensus that a good mediator is one who is, first of all, experienced; second, is one who can develop the trust of those with whom he or she works; and finally, has a sense of humor. All these qualities are somewhat intangible, which may help explain mediators' reluctance to make use of computer support (a very tangible artifact) in *any* fashion.

The mediator is a *process* leader in much the same way as the facilitator is in Electronic Meeting Systems (EMS). Although both mediators and EMS facilitators are concerned with process, mediators may aggressively encourage certain outcomes and bring direct pressure to bear on the participants to follow certain procedures. EMS facilitation has developed in a technical environment in which a major concern has been introducing and managing the technology. EMS facilitators themselves recognize that they play a key role that is perhaps more important than the technology they support (cf. McGoff et al. 1990). Recently, researchers have begun to examine EMS facilitation (George, Dennis, and Nunamaker 1992; Lewis and Whitely 1992; Bostrom, Anson, and Clawson 1992).

1.3. Negotiation support systems

While we refer the reader to other surveys of NSS for background (Jelassi and Foroughi 1989; Anson and Jelassi 1990), we introduce two theoretical dichotomies of NSS which serve as the point of departure from other research: solution-driven versus process support, and dyadic versus group support.

Solution-driven versus process support. The common denominator in most NSS to date is that the computer makes suggestions using one of a number of possible models: Social Judgment Theory Models (Mumpower, Schuman, and Zumbolo 1988; Darling and Mumpower 1990), Hypergame Decision Models (Fraser and Hipel 1984; Fraser and Hipel 1989), Bargaining Models (Nyhart and Samarasan 1989), Multiobjective Linear Programming (Kersten 1985, 1988), and Expert Systems (Kersten et al. 1988; Matwin, Szpakowicz, and Koperczak 1989). The com-

puter calculates a proposal, indicates an equitable agreement, or suggests negotiation strategies. We categorize these NSS as *solution-driven* since they *suggest agreements*. Solution-driven NSS are a subset of DSS.

Contrast the solution-driven approach with *process support* systems, which are not quantitative in nature [also called *session systems* in Carmel and Herniter (1989)]. Process support NSS address two dimensions that the above-mentioned NSS do not: enriched communications channels and cooperative work. The need for better communication between negotiating teams is widely recognized. Fisher and Ury state that better communications between negotiators are necessary because: (1) negotiators often speak to their own constituencies, rather than to the other side; (2) negotiators often do not hear the other side; and (3) negotiators often misinterpret the other side. Channels of communication include common, informal means such as body language, hallway chats (Bazerman and Carroll 1982), jokes, voices raised in anger, walkouts, and expletives.

The issue of communication provided the original rationale to separate Group Decision Support Systems (GDSS) from ordinary Decision Support Systems (DSS) (Sprague 1980; Turoff and Hiltz 1982; Bui and Jarke 1986; DeSanctis and Gallupe 1987). While DSS is a data analysis and presentation tool, the group aspect (the "G" in GDSS) indicates group work and enhanced group communications. More recently, Lim and Benbasat (1992) separated the components of NSS into "ordinary" DSS and electronic communication channels. All of these sources suggest the electronic channel augments rather than replaces or impedes the verbal and informal flows of communication.

In the negotiation task, communication between individuals is tightly controlled and meant to be impeded. Two well-defined sides, bargaining carefully over a dispute, do not want inadvertently to reveal their cards. Although they may break into smaller teams to work on subareas, individuals are largely limited to communication within their own group. By fusing EMS and negotiation, Bui and Jarke (1986) suggest that NSS must adapt to changing patterns of communications.

Process support includes a cooperative work dimension. The negotiation process is lengthy and detail intensive, and therefore requires structured documenting techniques and repositories for storing "group memory" which can be updated in real time and accessed by all members of the group. Both dimensions of process support NSS (communications and cooperative work) fit well within the framework of EMS.

Dyadic versus group paradigm of EMS. While recognizing negotiation as a bona fide group task, EMS conceptual works (Huber 1984; DeSanctis and Gallupe 1987; Dennis et al. 1988) do not address some implications of the negotiation task. Dennis and associates (p. 608) maintain the group paradigm by recognizing only differences in group proximity in EMS use: dispersed, one group, and several subgroups.

What is not considered by the EMS paradigm is the idea of a dyad: two adversarial groups meeting together. In fact, a single negotiation may involve three modes of interaction: each side meeting at separate times and/or locations to plan

strategy or caucus; the two sides acting as a single group to discuss issues and gain understanding (the weak dyad); and, finally, the two sides meeting to bargain (the strong dyad).

The major differences between the paradigm of group decision making and the negotiation paradigm include the lack of common goals and the level of antagonism that might be present. In response to this, the procedures of an NSS must provide ways to align goals and diffuse antagonism. Role reversal (Carmel and Herniter 1989), as an example of one such technique, forces each side to explain the other's point of view.

The EMS adaptation process to NSS is two-tiered. The first tier is a "technical" adaptation: new software tools may be needed to fully support the dyadic approach. The second tier involves process techniques, facilitation modes, and usage of the tools. NSS may also have a data(base) component (although most still do not) which supports the fact-finding role of either the negotiating parties or of the third party.

1.4. Setting

The final intervention factor—the physical setting—is often somewhat unintentional, but is nevertheless of great importance. Any kind of NSS changes the traditional physical elements of the negotiating environment. Typical prescriptions call for a negotiation setting that is neutral and congenial to both sides. Although there are many reasons not to choose a neutral site (Salacuse and Rubin 1990), when a third party introduces a new bargaining process model, there seems little doubt that a neutral site is advantageous as long as it provides the amenities of communications. The shape of the physical bargaining table is a subject that gained infamy at the beginning of the Vietnam peace talks. The shape should not reinforce adversarial relations (Mills 1989), and therefore should perhaps be round.

2. Methodology

The case study methodology was used because of its flexibility and its emphasis on studying phenomena in their natural setting (cf. Benbasat, Goldstein, and Mead 1987). Our research is defined as *action research*, where the researchers are actively involved in the subject of research (Mansell 1991). The first two authors acted as the mediators described in this case. Case selection was opportunistic: the groups were chosen based on proximity to the researchers and interest on the part of both sides in conducting negotiations in the electronic meeting room for a token fee.

There is no precedent for electronically supporting labor-management contract talks from beginning to end. The EMS used in this case study is the *University of Arizona GroupSystems* (Nunamaker et al. 1991b; Dennis et al. 1988). Group-

Systems, as it is called for short, is described in section 3.3. The GroupSystems tools used were all previously untried under these circumstances.

Two complete contract talks which used an EMS were mediated back to back. The purpose of the first case was to learn about using EMS for labor–management negotiations; the prototype computer tools described later were developed during this period. Because the first case had more limited use of the computer system, particularly in the more interesting early stages, that case will not be described here further. Where there is a particular interest, we mention a few events of our first experience in this article. However, we note no significant departures between the two cases on aspects of process or outcome. For a full description of the first case see Carmel, Herniter, and Nunamaker (1990) and Herniter (1991). The second case, unlike the first, involves the full “Win-Win” process embedded in an EMS. The situation we analyze is *HealthCenter’s* annual labor contract negotiations. We believe that analysis of this case yields the most insight into NSS use in actual settings.

Data collection for the HealthCenter study included numerous casual conversations, direct observation, a post-negotiation questionnaire, pre- and post-negotiation interviews with team members, and document collection (the expiring contract, written proposals, letters of intent, and miscellaneous written materials).

3. The case study

The HealthCenter contract talks described in detail cover four subsections: the process model, the facility, the computer tools, and the case background.

3.1. *The process model*

The approach to computer and noncomputer intervention in the HealthCenter case was an amalgamation of influences from Anson and Jelassi (1990), Barrett (1990), Carmel and Herniter (1989), Kessler (1978), and GroupSystems’ traditions and norms as developed at the University of Arizona. The basic approach consisted of a multistep framework shown in Figure 2.

3.2. *The facility*

The contract talks were held in the electronic meeting room, shown in Figure 3. The University site of the room afforded a neutral location with additional amenities: telephone, facsimile, office support, photocopiers, coffee, and refrigerator. Intrateam discussions (i.e., caucuses) were held in the breakout rooms which surround the meeting room. Each breakout room has a small table and chairs, a telephone, and a whiteboard.

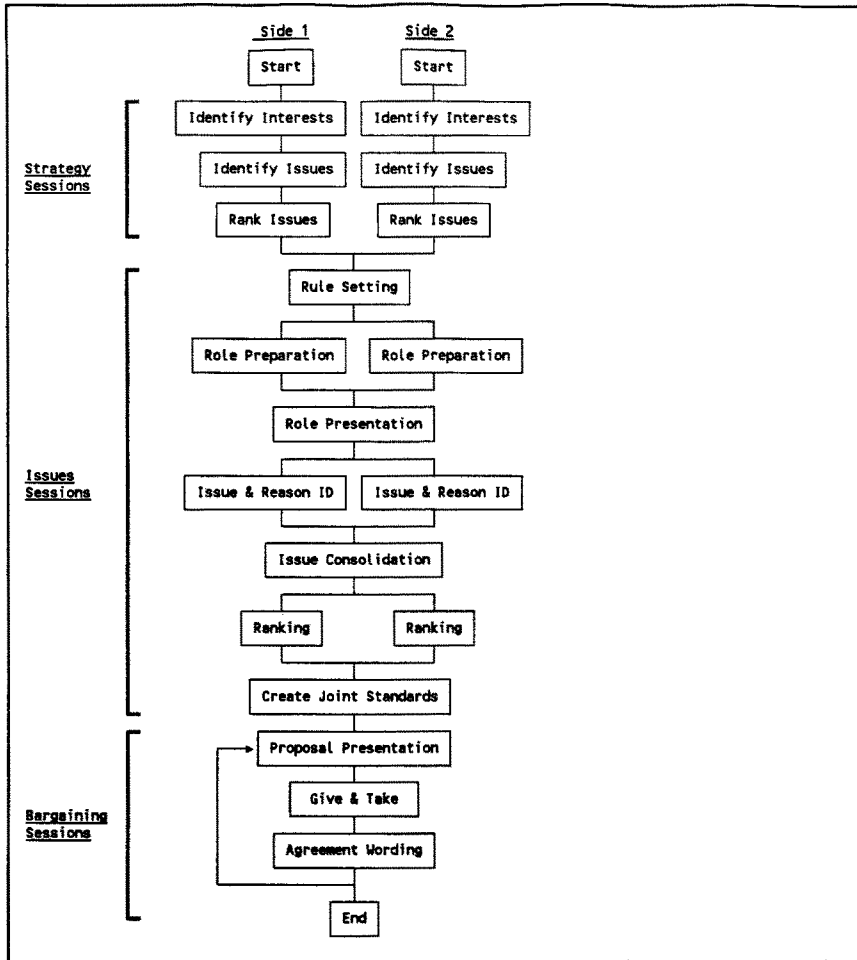


Figure 2. The negotiation process followed in the HealthCenter negotiations.

The electronic meeting room is equipped with networked, AT-class personal computers arrayed around a U-shaped table. A local-area network allows the computers to share information and run the GroupSystems tools. One computer at the front of the room is reserved for the mediator. A video projector shows the mediator's display to the whole group.

Labor-management negotiators are used to sitting across from each other at a rectangle table, not the electronic meeting room's U-shaped table. During the negotiation case previous to HealthCenter the parties initially sat down at opposite ends of the U and expressed that they felt uncomfortable with the set-up of the room, until they moved closer together by sitting in an L-configuration. By the time the HealthCenter talks began, the mediators introduced the new seating ar-

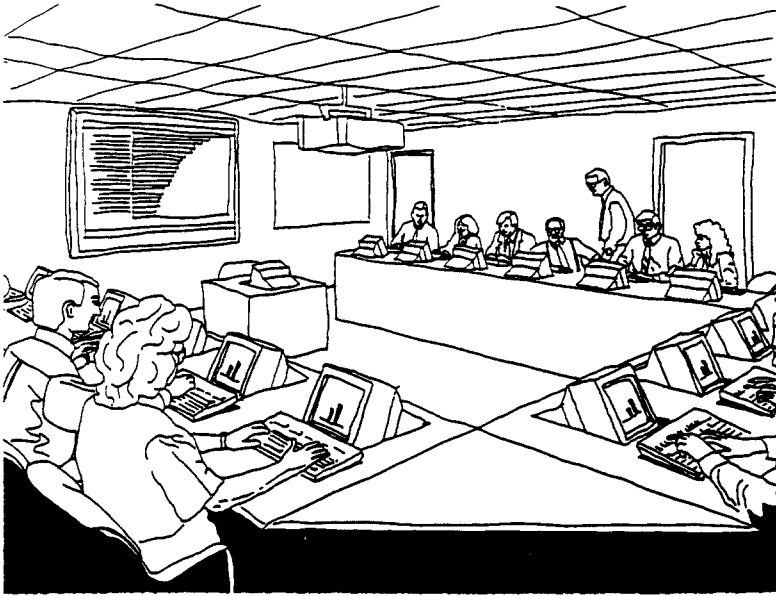


Figure 3. The electronic meeting room used for the HealthCenter contract talks

rangement (The L-configuration) as a *fait accompli*. No complaints were heard about the shape of the table from the HealthCenter teams.

3.3. The computer tools

The computer negotiation tools described here fall into two categories. The first category supports the Win-Win techniques and includes tools applied to the strategy and issues sessions. Ideas, alternatives, and solutions were elicited from negotiators with software that implements brainstorming, organizing, and ranking techniques. The second software category creates a *group memory*: all information shared by the sides (e.g., proposals, current contract, letters of agreement) is stored in the system and available during the bargaining sessions.

3.3.1. Tools supporting win-win techniques. All three of these tool are standard GroupSystems tools from the GroupSystems toolkit (cf. Nunamaker et al. 1991b).

Electronic Brainstorming (EBS). Brainstorming is a structured group technique that fosters creativity. When applied anonymously, it can overcome domineering personalities and encourage reluctant participants to express their thoughts. *Electronic* brainstorming implements this technique on a microcomputer network by having users exchange electronic “sheets of paper” with one another. Each

“sheet” (really a computer file) has the same question printed on top. Participants can answer the question, comment on responses already written on that “sheet” by others, or bring up an entirely new topic (see Figure 4). Groups typically spend 25 to 45 minutes on each brainstorming question.

Topic Commenter allows participants to address several issues at once (unlike EBS, which restricts participants to only one issue). Participants are presented with a set of multicolored “cards” on their screens. Each “card” has a topic, category, or issue inscribed. A participant can comment on an issue by selecting a “card” and adding commentaries and ideas at will. Other people’s comments can also be read. Like the EBS, this step usually takes somewhat under an hour.

Vote Selection is a tool that offers several ways for a group to indicate its priorities or opinions (Yes/no, multiple choice, 10-point rating scale, and ranking). The HealthCenter negotiation used the *ranking* process. Ranking aggregates the relative preferences of the individual participants. Each individual sorts a list in order of importance. The results are displayed on the public screen and always stimulate much verbal discussion among participants.

3.3.2. Tools for group memory. The second set of tools are nonstandard GroupSystems tools designed for the bargaining sessions. These tools originated by fusing the desires of the negotiators with the suggestions and technical understanding of the researchers. They evolved during the first negotiation case and were available fully formed to the HealthCenter negotiators. The first two tools described below break the GroupSystems paradigm in one important way: they are com-

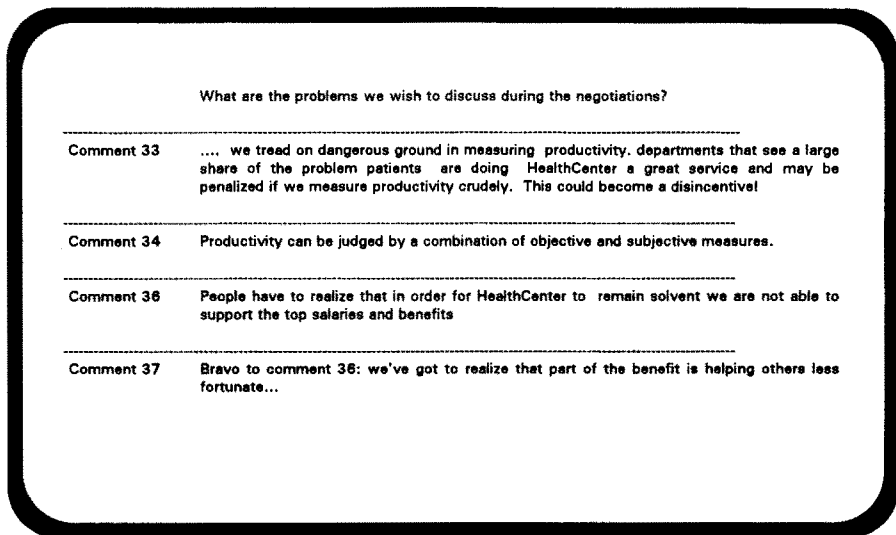


Figure 4. Electronic Brainstorming: excerpt from the HealthCenter contract talks.

pletely *chauffeured*. This means that the mediators had to input manually and format most of the information available with the tools before they were accessible to the negotiators.

3.3.3. Contract log. A computerized audit trail (to borrow an accounting term) became the definitive document of the negotiation. The Contract Log (Figure 5) included the entire then-current contract (with all of its articles and sections) and the proposals. The respective proposals were inserted within the contract text, near the article and section to be modified by the mediators. The proposal originating team (management or union) was noted in the text, as well as the date and time of the insertion. As the talks progressed, conventions developed for marking different areas of language within the Contract Log. As the need arose, various addenda were also generated, printed, and initialed by the two sides on the spot. At the conclusion of both sets of talks, the mediators pruned the Contract Log to produce the new agreement. The leaders of both sides received hard (paper-based) and soft (diskette-based) copies of the new contract. From the onset of the talks, the Contract Log was presented on the public screen (in the front of the room) at *all* times and edited using a word processor on the mediator's workstation.

The mediators had complete control over writing or changing the Contract Log. Both sides put trust in the mediators, as scribes, to ensure correct and fair language. The mediators made all entries to the log in the presence of the negotiators and with their approval. This removed from the negotiators the onus of taking copious notes, and removed an element of mistrust between the sides: they no

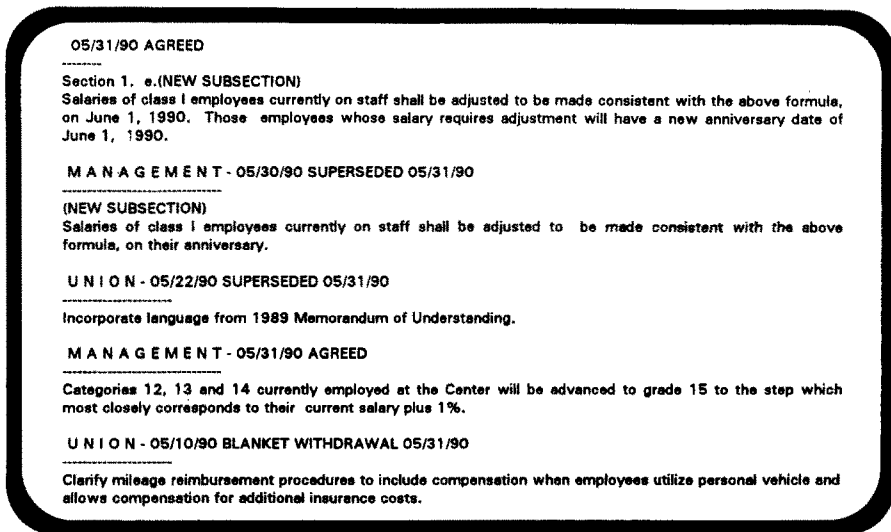


Figure 5. Contract Log: excerpt from the HealthCenter contract talks showing notations.

longer had to rely on each other for capturing the exact language. Instead, the mediators captured the wording immediately.

3.3.4. Electronic bargaining book. Participants extensively used the *Electronic Bargaining Book* (EBB) (Figure 6) which created by means of a GroupSystems utility program. The EBB is a computer-based public notebook of the negotiation and, like the Contract Log described above, is controlled by the mediator. It is analogous to a notebook that a negotiator might carry to the talks. The EBB contains the article list, current contract, letters of agreement, proposals, addenda, and anything else pertinent to the talks—essentially the “group memory.” The articles and proposals were copied directly from the Contract Log.

An article *checklist* was also introduced to the Electronic Bargaining Book. As the parties considered contract articles and sections, the mediator kept the checklist up to date. Although the first set of negotiators thought that this was a wonderful innovation, the HealthCenter negotiators saw little use for it. The first group made steady, measured progress throughout their talks, but the HealthCenter group was not as time-structured and did not need an electronic device for this purpose.

3.3.5. Proposal editor. This is a simple editor available to each team in their respective, private caucus rooms. The teams fashioned and submitted proposal language on a networked workstation in the privacy of the caucus rooms. Once complete, the proposal could be displayed on the public screen for discussion and inserted into both the Electronic Bargaining Book and the Contract Log.

Article List: Economic, Non-Economic, & No Change	
Ground Rules	05/01/90
Issues List	05/08/90
Management Issues & Interests	05/03/90
Union Issues & Interests	05/03/90
Costs Brainstorming	05/08/90
Wages Brainstorming	05/08/90
.	.
.	.
PROPOSALS: Union	05/30/90 1:30 PM
PROPOSALS: Management	05/30/90 7:00 PM
PROPOSALS: Union	05/30/90 9:00 PM
CONTRACT: Title Page	
CONTRACT: Purpose	
I.	Recognition of the Union
II.	Management Rights
III.	Employee Rights
IV.	Union Rights
V.	Salaries & Wages - Sections 1 - 2
V.	Salaries & Wages - Sections 3 - 13, Incentive
VI.	Benefits
VII.	Education/Benefits & Leave
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Figure 6. Electronic Bargaining Book (EBB): partial menu from the HealthCenter contract talks.

3.4. Background of the healthcenter negotiations

HealthCenter is a nonprofit health facility that has a bargaining unit comprised of 120 people. A pseudonym is used for the organization and a few details have been disguised. The bargaining unit is unusual in its range of employees in that it includes almost everyone in the clinic, ranging from blue collar workers to medical professionals.

Labor was led by two core members: the union field representative and the chairperson of the HealthCenter union chapter; both were present at all sessions, while other representatives attended on a revolving basis. The management team comprised a core of four negotiators, including the director, personnel manager, financial officer, and medical director; others participated on an intermittent basis. The former three had MBA degrees, while the medical director was an MD.

3.4.1. History of HealthCenter. HealthCenter started out as an antipoverty program in the 1960s. Its board of directors was originally elected by the local community in a general meeting. It is now a large neighborhood nonprofit clinic with approximately 28,000 active patients. Historically, HealthCenter's medical personnel accepted lower wages as the price for the satisfaction of helping an underprivileged community. Different interpretations of this legacy were a major source of conflict between management and labor. Although relations are generally comfortable, there were some deep feelings of mistrust directed toward management dating from the mid-1980s when the clinic reorganized under bankruptcy protection. One union member and one manager, in particular, were adversarial. Both sides recognized that relationships were imperfect and past bargaining practices could use improvement.

The major issues were viewed differently by the two sides. Management's highest priorities were competitiveness, recruitment and retention of professional staff, and malpractice insurance; the focus was on the doctors. The union's highest priorities were wages and benefits, morale, and job security. Unlike management, the union's focus was on the medical support staff, primarily the nurses. Their proposals dealt with increasing wages and professional education. We refer the reader to Appendix A for background on the history, tradition, and legal framework of collective bargaining in the United States.

4. Chronology and description of the contract talks

The parties met for 13 separate sessions for a total of 57 hours in the electronic meeting room. The talks took place in the spring of 1990 and were spread over a month.² All contract-related sessions took place in the electronic meeting room and are summarized in Table 1.

We had anticipated that some participants would not take easily to the use of computers and that some might even be computer-phobic. Several union negoti-

Table 1. Chronology of the HealthCenter talks.

Stage	Session number	Days to contract expiration	Events/milestones	Stage duration (in hours)
Strategy	1	40	Union strategy meeting	7
	2	32	Management strategy meeting	
Issues	3	30	Opening remarks, ground rules,	15
	4	28	role reversal	
	5	23	Issue & reason identification	
Bargaining	6	21	Ranking issues	35
	7	16	Proposal presentations	
	8	14		
	9	9		
	10	7	Serious horse trading begins	
	11	2	Serious agreement wording begins	
	12	1		
	13	0	Agreement at 2:40 a.m.	
Total hours				57

ators with limited computer experience feared that management would manipulate the computers to their detriment. They were particularly concerned about maintaining the confidentiality and integrity of their conversations and proposals. The fears and suspicions disappeared after the first session during which all of the negotiators were given brief private tutoring by the mediators. From observation and post-negotiation analysis it became apparent that computer anxiety was not an issue. "Ease of use" was consistently one of the highest rated qualities in the post-session questionnaires.

The contract talks were originally scheduled to begin on the first of the month. In the past, HealthCenter parties exchanged proposals as the customary first step. The mediators conditioned their participation on a new structure, one that used the win-win techniques. This was clearly a break with tradition. The mediators requested that the parties present their proposals *after* discussing the issues jointly. Hence, the groups devoted the first three face-to-face sessions (sessions 3, 4, and 5 of Table 1) exclusively to discussing the underlying issues and problems. These were referred to as the "issues sessions."

The union representatives were particularly enthusiastic about one aspect of the electronic meeting room not anticipated by the mediators. The set-up in the electronic meeting room allows a "live" document (usually the Contract Log, but often other documents as well) to be displayed on the public screen and selected workstations at all times. The parties understood that they could update the contract as the talks progressed. Both sides commented that their ability to do this changed the traditional pattern of the negotiations. Previously, the procedure was for the sides to discuss contract language, and then one side (usually management)

would draft a new contract section overnight and bring it to the next session, where they would reargue the issues and begin the process again. Using the NSS, the parties discussed the language, drafted new sections, and approved them within the *same* session. The leaders felt that the new procedure meant they spent more time in face-to-face bargaining sessions but consumed less time overall (including extra-session time). In addition, a printed copy of the final contract was available immediately after the talks were concluded, while it is not uncommon for the final contract to take several weeks.

We now describe the chronology of events in three stages: strategy sessions, issues sessions, and finally bargaining sessions.

4.1. Strategy sessions

The sessions in the electronic meeting room began with one strategy session for each negotiating team. Management and labor used the electronic meeting room on *separate* days. The primary intent of the strategy session was to enable the negotiators to explore the underlying issues. The secondary intent was to present the electronic meeting room to the participants in a situation in which they did not have to fear making mistakes in the presence of the opposite side. Both teams became intensely involved in the tasks of the computer-supported strategy sessions, even though both teams met on their *own* time for several hours. They used three GroupSystems tools: Electronic Brainstorming (EBS), Topic Commenter, and Vote Selection/Ranking.

The integrative bargaining framework calls for discussion to commence by exploring the underlying interests (an interest is a statement of one party's concerns about an issue) and issues (e.g., "wages" is an issue). Each strategy session consisted of two Electronic Brainstorming questions. The first was: "What are the fundamental long-term interests of HealthCenter?" (See Figure 5 for an excerpt from this electronic dialogue.) The second brainstorming question was: "What are the problems which we wish to discuss in the negotiations?"

The problems identified in the second brainstorming question were all combined into one computer file through which the negotiators could browse. Using this file as a reference, the mediators instructed the negotiators to list their *issues* (e.g., work conditions, pension plan). Eventually, with the help of the computerized list on the public display and a bit of cajoling by the mediators, the parties pared down the number of issues for both labor and management to a manageable number (which coincidentally totaled 17 for both sides).

Each side then used the ranking tool to order the issues by importance. The results of the union team vote, as would be expected, showed issues such as wages and benefits as most important, but underscored some differences among the members on nonmonetary items. The arithmetic measure of union concordance was fairly low and, as it turned out, improved in the following weeks. Sim-

ilarly, management team’s measurement of concordance was fairly low, prompting the director of HealthCenter to call for a pep session to bring everyone together.

4.2. Issues sessions

Typical IB techniques call for the parties to agree on a list of issues early in the process. This was the focal point of the issues sessions and hence the name. The goals of the issues sessions were: agreement to basic procedures, the open discussion of concerns, and the creation of understanding between the two teams. The first step was setting ground rules—a step which required some mediator intervention to help resolve differences on the subjects of team size and confidentiality (Figure 7).

The intent of the second step, role reversal, was to encourage each side to understand the negotiation from the other’s point of view. Fisher and Ury (1981) tell the negotiator to “put yourself in their shoes” (p. 23). It should be noted, however, that role reversal is not a magical cure to antipathy between sides. It may heighten the sense of incompatibility and is not necessarily effective at inducing agreement (Lewicki and Litterer 1985).

Ground Rules for HealthCenter - Union Negotiation 1990	
The parties agree...	
<ul style="list-style-type: none"> • to work toward a mutually beneficial solution. • to deal with the issues in a fair manner unblinded by anger or other emotional response. • to make honest and open evaluations of the proposals. • to exchange all information pertinent to the negotiation. • to follow the procedures explained to them by the mediator. • to limit the bargaining team members present to not more than five (5) on Thursdays and six (6) on Tuesdays. • that to the best of their ability they will abide by the attached schedule for representation. • to keep all circumstances of the mediation confidential. • to abide by the final agreements as the agreements are jointly consented to and signed. 	
_____ Senior Field Representative Union Council XX	_____ Executive Director HealthCenter
_____ Mediator 1	_____ Mediator 2
_____ Date	

Figure 7. Ground rules for HealthCenter talks compiled in session 3.

First, each team member was assigned to take the point of view of a member of the opposite team. Second, the teams retired to the caucus rooms, each with one mediator. Third, the mediators led the entire team through each assigned role, asking them to speculate on the responsibilities and problems of each, and to create a document. In the fourth and last step, the teams reconvened in the electronic meeting room and each member described publicly the role assigned to him/her. The entire role reversal process took four hours. The effect of role reversal seemed minor (at best) because there was a lack of reference to this exercise at any subsequent stage.

In later oral remarks, Management indicated their view that they had been through a more comprehensive role reversal than labor and that labor did not take the exercise seriously. In addition, management was truly concerned over various misunderstandings. For example, the union believed the management was co-equal to labor in the eyes of the HealthCenter board of directors: they thought the purpose of the board was to mediate disputes between them, while management knew itself to be legally an agent of the board. Management viewed this misunderstanding as a failure of the process, even though role reversal uncovered and corrected the misconception.

In the next step of the issues sessions, the two negotiating teams compiled their own list of issues, which each side would present. The teams moved into the caucus rooms and created their lists (with supporting reasons) using an editor (Figure 8). The negotiators reconvened in the electronic meeting room to consolidate their issues list. Each side alternately presented an issue one at a time. The

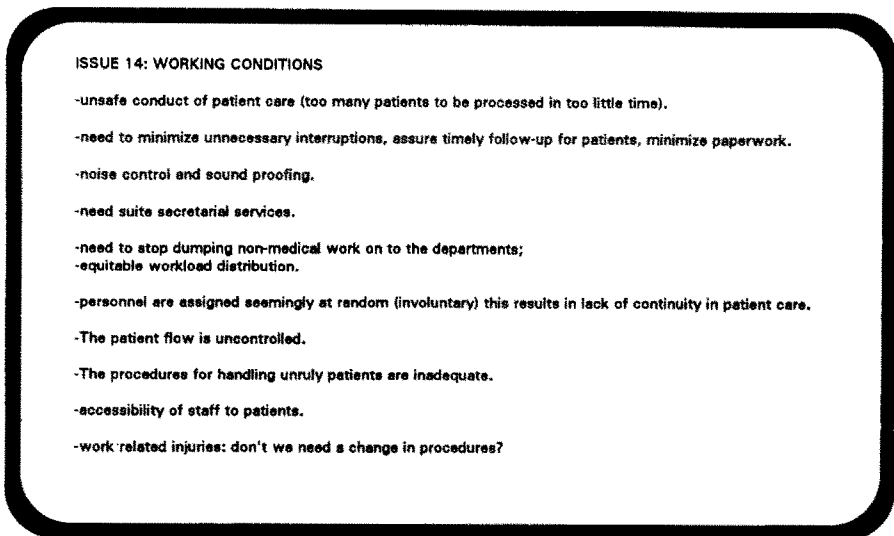


Figure 8. Topic Commenter: excerpt from the HealthCenter contract talks (session 4) showing Issue 14 (contributed by the HealthCenter union) and supporting reasons.

public screen presented the issue and its accompanying reasons while they introduced it verbally. Presenting issues allowed the negotiators to “let off steam” at the beginning of the talks, while clarifying their concerns. As one of the negotiators remarked: “It was like a catharsis; a purging of ugly thoughts in which all the venom came out.” Once both sides presented all the issues, they consolidated and ranked the list using the ranking tool. The fruits of 18 hours of meetings (sessions 1 through 4) were evident here: there was much greater consensus in both teams than there had been in the strategy sessions. Management’s internal concordance was very high by this time.

The final part of the issues sessions was devoted to creating joint standards (again derived from Fisher and Ury) using Electronic Brainstorming. The negotiators discussed two monetary areas: “What process can this contract put in place that will, during the life of the agreement, identify ways to reduce medical costs without compromising medical care?” and “How do we measure fairness of wages and benefits at HealthCenter?” The mediators suggested these to focus on two areas that could be explored by open discussion. A total of 169 comments were entered, and the two sides came away with automatically created reports of all comments.

In conversations with the mediators, the participants did not express as much satisfaction with the issues sessions as with the strategy sessions. All were somewhat anxious to get to the “beef”—the bargaining. But later, the union field representative wrote:

Looking back I can see where management was coming from. At the time we did the issue and strategy sessions it seemed to me like a lot of double talk and bull. After completion of the negotiations I now see their thrust. I am convinced that the brainstorming, issue and strategy sessions are critical in order to more clearly understand the other side and begin the trusting process.

The questionnaire results show that both sides felt that the issues section helped their side to understand the other’s interests and concerns. However, management was discomforted by the role reversal step. From that step onward, management expressed the belief that the process made them more understanding of the union, but that the union was not more understanding of the role of management. Presumably, this gave management an advantage, but they viewed it as a problem and added it to their complaints about the union.

4.3. Bargaining sessions

With the experience gained from the previous contract talks, the mediators introduced the HealthCenter negotiators to the bargaining phase along with two ground rules: (1) all proposals, to the extent possible, will be typed into the workstation in the caucus room using the Proposal Editor (described in section 3.3); and (2)

all verbal agreements will be immediately dictated to the mediator, typed into the Contract Log at the mediator's station, marked "AGREED," and dated. The purpose behind these rules was to encourage full use of the NSS.

The mediators were adamant about using the proposal terminal and introduced this feature, that all proposals must be entered into the computer, as a "protocol" of the bargaining. Often, in order to foster this process, one of the mediators sat in the caucus room and acted as a scribe. The mediator asked for dictation when a proposal seemed to arise and suggested contract language when appropriate. The mediators also put pressure, with keyboard in hand, to be more specific in language.

As is the norm in contract talks, the parties first presented their respective proposals. The proposals were all in the form of changes to the then-current contract. At that point, the proposals were entered in the Contract Log and the Electronic Bargaining Book. All the participants felt comfortable using the Electronic Bargaining Book, as indicated by the results of the post-negotiation questionnaires. As their comfort level with the computer increased, the participants learned new tricks. At one point, one of the union negotiators used two computer terminals: on each screen she had a different document for reference.

One day before the contract was due to expire, the negotiators used a spreadsheet program at the urging of the mediators. The two sides walked through a few simple scenarios of salary computations on the public screen while one mediator updated the numbers as needed. Surprisingly, the initiative to explore the numbers was taken by one of the union members. We had hypothesized that the spreadsheet would be somewhat of a "weapon" in the hands of management, who, after all, had more experience with this technology. The opposite proved to be the case; management was extremely reluctant to reveal financial information and thus unwilling to leverage their superior experience.

Once formal bargaining began in session 6, progress was slow. The two sides spent the first four bargaining sessions dancing around each other, speaking in generalities, and not reaching any agreements. In session 10, the mediators decided to intervene actively and introduce a new protocol. While one mediator sat at the front workstation ready to take dictation, the other coaxed the participants to become specific and suggested wording. The mediator also demanded that the leaders from each side acknowledge that the language appearing on the public screen was acceptable before allowing discussion to move on. As the contract expiration date loomed closer the talks achieved greater momentum. As the pace quickened, the negotiators adjusted to the mode of quickly dictating language and capturing it on the computer screen. But, in the final minutes, late during the night of the last session, as verbal proposals flew back and forth at an accelerated pace, the negotiators simply ignored the dictation of proposals.

At 2:40 a.m., nearly three hours after the contract expired, the two sides shook hands. The complete contract language was safely stored in the Contract Log in the computer. The contract was unanimously ratified by the union membership one week after the talks were completed in the electronic meeting room.

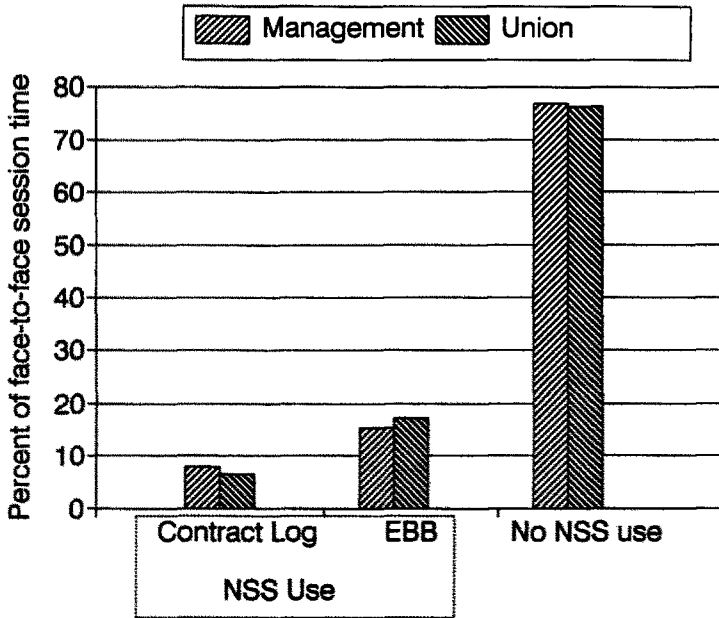


Figure 9. Use of the NSS during HealthCenter bargaining (sessions 6 through 13).

Quantitative data confirm that the negotiators did what they usually do during bargaining sessions: they communicated verbally most of the time. Figure 9 summarizes observations of computer usage made of *each* negotiator at 10-minute intervals during all bargaining sessions. The results indicate that the NSS was used 23 percent of the time (16 percent of the time with the Electronic Bargaining Book and 7 percent of the time viewing the Contract Log on the public display).

5. Discussion

We now revisit the four intervention factors (of section 1) with an eye toward determining how each fared during the negotiation. This section will explore the effects of Integrative Bargaining methods introduced into the process, the presence of the mediators, the role of the computerized support system, and the new setting on the negotiation.

5.1. Process techniques

The process techniques are the heart and soul of the four intervention factors guiding both the NSS and activities of the mediators. We examine the three foundations of process techniques in the same order as we did in section 1.1.

5.1.1. Integrative bargaining. We observed that IB took place only on the so-called “economic issues,” and even then, there was little of it. Economic issues were defined as any issues measured in dollars in the contract. The negotiators spent most of the sessions until the final days working on economic issues such as health insurance, malpractice insurance, professional education, and the wage scales. Each issue was discussed separately. However, as customary in the “eleventh hour,” a sort of IB occurred in the wee hours of the final night as the parties made a flurry of last-minute tradeoffs. Superficially, this could be construed as IB, but actually many of the forfeited demands were bargaining chips. In summary, the intervention techniques seemed to have little effect on moving the negotiations toward the tradeoffs implicit in IB.

5.1.2. Principled negotiation. The four principles of Fisher and Ury (1981) serve as a guide to negotiating on the merits of the issues, not on the basis of personality and emotion. How well did the bargaining meet these principles? We discuss each separately.

Separate people from the problem. Prescriptions for transcending personalities and personal gripes call for a number of process techniques. First, during this negotiation, the mediators formally introduced and enforced bargaining rules. Such rule-writing was without precedent at HealthCenter although the norms of bargaining in and of themselves enforced certain procedures (see Appendix A). Timetables were introduced at a number of points (discussed further in the next subsection “stages of negotiation”). Two techniques which allow anonymity were introduced via GroupSystems—both Electronic Brainstorming and Topic Commenter tools accept text without attribution. Finally, role reversal was introduced in session 3 via the computer.

The success of these techniques can be assessed by judging the *mood*. There were occasional flareups. One union member directly accused a management team member of not searching for a viable health plan. At another point, the management leader read a newspaper while the union team leader responded to his proposal, upon which the union walked out. However, these incidents were rare. Judging from participant feedback, the talks were more pleasant than those of the previous year. Questionnaire results indicated that the tone of these talks had improved over those of the previous year (Table 2). Separate responses for union and management are not reported because there were no significant differences between the two sides as determined by a t-test of significance in the questionnaire results.

Identify the parties' real interests. Identifying the parties' real interests (rather than their demands) was a major goal of the strategy and issues sessions. There were some indications that this intervention had a positive effect. Questionnaire results (Table 2) suggest that the participants thought that the talks were indeed helpful in defining long-term interests, problems, and issues.

However, Win-Win techniques are intended to affect the negotiators' entire approach to proposals, demands, and “solutions.” The impact of this effect can be

Table 2. Selected questionnaire results (union and management combined).

	Avg.	Std. dev.
<i>The tone of the talks</i> (1 = Agree 3 = Neutral 5 = Disagree)		
• Compared to last year's talks, these talks were:		
a. smoother	2.4	1.5
b. friendlier	2.0	1.1
c. <i>better</i> for long-term peace	2.4	1.1
d. more successful	2.0	1.2
e. <i>better</i> for attaining my team's goals	2.1	1.2
<i>The negotiation stages</i> (1 = Agree 3 = Neutral 5 = Disagree)		
• The Strategy Session helped my side to define:		
a. our long-term interests	1.9	0.8
b. the problems that we wanted to solve	1.8	0.8
c. the issues of these negotiations	1.9	0.8
d. the tactics we were to use	3.1	1.1
• The Issues Sessions helped the other side to:		
a. understand us better	2.4	1.4
b. understand our concerns better	2.3	1.2
• The combined list of issues that we came up with does	2.0	0.5
a good job of representing the issues of the talks		
• Our Bargaining Sessions		
a. were more effective than our last talks with the other side	2.3	0.9
b. made extensive use of the computer	2.9	1.1
c. were easier because of the computer	2.4	1.2
d. were faster because of the computer	2.3	1.4
e. better because of the mediation	2.1	1.2
• The Issues Sessions helped my side to:		
a. understand the other side better	1.9	1.2
b. understand the concerns of the other side better	1.8	0.9
<i>Satisfaction</i> (1 = Very dissatisfied 3 = Neutral 5 = Very Satisfied)		
• How do you feel about:		
a. the <i>process</i> of negotiating using GroupSystems?	3.8	1.2
b. the performance of the mediators?	4.7	0.5
c. using GroupSystems during the negotiation?	3.8	1.2
d. the meeting room?	4.2	0.8
e. the caucus room?	3.8	1.2

operationalized by determining whether the learning that occurred during the issues sessions caused the original opening positions to change. The parties were asked to delay presentation of their demands until after the issues sessions. The union made no changes in its opening proposals. The proposals had been in typed form for several weeks and were not substantively changed due to the strategy or issues sessions. Management, however, continuously made changes up until the first bargaining session (session 6). This difference may have been due to logistical difficulties and organizational differences. The union had problems getting all of its team (a total of 11 people) together for meetings. In face of the logistical dif-

faculties, the team leader did not want to redraft the proposals. On the other hand, management was able to devote resources to the negotiation and was more cohesive. It had the luxury of viewing the issues sessions as a resource.

Generate options for mutual gain. This was a step introduced and structured by the mediators based on areas that presented greatest potential (described in section 4 regarding session 5). This was operationalized by introducing an electronic brainstorming question regarding overall cost reduction at HealthCenter. Did this exercise kick off an ongoing process of generating options? No. Both sides eagerly wanted to start bargaining and did not want to spend any more time on preliminaries. Although this brainstorming discussion yielded interesting ideas, its impact was not felt on the formal proposals. As stated above, neither side made substantive changes to their proposals as a result of undergoing the experience.

Joint problem solving was a related prescription that had little effect. Once bargaining started, the mediators suggested creating a working group to work on one particularly sticky issue. Though the team leaders commented that it sounded like a good idea, no working group was formed due to foot dragging.

Use objective criteria. A reoccurring theme of the negotiations was how HealthCenter compared to other area hospitals in wages and benefits. The second brainstorming exercise of the third issues session attempted to create such objective criteria: "How do we measure the fairness of wages and benefits at HealthCenter?" Again, as in the options generation exercise, the attempt to create objective criteria ended with the brainstorming session itself. As previously stated, the sides were not interested in lingering over preliminaries, because of their concern about time constraints.

Lack of agreed-upon objective criteria came back to haunt the negotiators. At one point the management team distributed a survey of malpractice insurance at area hospitals. This was followed by constant references to wages and benefits at other local institutions. However, these studies were presented more as weapons than objective standards and were treated as such by the other side.

Another way to encourage the creation of objective criteria is to allow participants access to outside information via the NSS. Through the Electronic Bargaining Book they achieved access to *internal* information. Any information that a side wanted to post on the EBB was included in the menu. However, the participants did not have access to *external* information, e.g., other labor contracts in other cities. This would indeed have been useful. The question of what health workers of a certain level were paid in other organizations came up several times during negotiations. Instant information would have allowed the talks to move ahead; progress slowed as the two sides argued over "facts" that neither had. In the future this might be facilitated through access to specialized databases such as suggested by Nyhart (1988).

5.1.3. The stage models of negotiation: an evaluation. As a negotiation milieu, the electronic meeting room presents a convenient opportunity to use new methods to settle disputes that require a mediator to enforce a rigid structure. The com-

puter is a natural tool to enforce structure in any kind of activity. The various stage model prescriptions were amalgamated into the stages of Figure 2. Kessler's pre-session concept was elevated into a "strategy session." This was done in order to enhance the importance of strategy as a distinct step in advance of the actual bargaining. Kessler's first, second, and some elements of the third and fourth stages appeared in the so-called "issues" stage.

Table 2 presents the participants' evaluation of each of the stages. (There were no significant differences between management and union.) The negotiators felt that the strategy session was useful. In three of the four goal categories (defining long-term interests, problems to be solved, and negotiation issues) they felt that the strategy session helped; but for the fourth goal (defining tactics) the strategy session had little effect. This last result is not surprising as tactics were not addressed in the strategy session, but it had been hoped that the results of the strategy session would have an effect. Expanding on this, the union leader remarked that although he had known the issues of concern to his constituents beforehand, the strategy session helped convey the *intensity* of the feelings much better.

The negotiators felt that the issues sessions helped them to understand the other side and their concerns better, but only very mildly agreed that this was true for the other side. This may reflect the suspicion with which each side viewed the other. The negotiators only mildly agreed that the joint list of issues accurately reflected the issues of the negotiation. The negotiators felt the bargaining sessions were more effective, easier, and faster than previous talks, but only mildly so.

The limitation of the process model, as implemented in this case study, is the parties' lack of commitment and time for nonbargaining activities (i.e., strategy and issues sessions). First, in spite of the sales pitch for extensive pre-bargaining sessions, and the negotiators' own acknowledgment of their importance, they did not embrace the concept whole-heartedly. Second, following the process model was time consuming: 22 of the 57 negotiation hours were spent in strategy and issues sessions, about 39 percent. The negotiators continually expressed alarm at the time consumed by the initial stages of the process. Third, scheduling was difficult. The union, in particular, had a difficult time getting all 11 of its members together. Getting release time off from work was considered unlikely, so a Saturday morning was used for the strategy session. Even that proved difficult, and only half the union bargaining team appeared. The management team, on the other hand, scheduled their one strategy session during the working week.

5.2. *Third parties: the mediators*

The mediators played an active role in the early stages and later stages of the negotiations. They dominated the first two stages of the talks by introducing and imposing process techniques. As noted, the mediators were instrumental not only in the traditional role of the mediator; they also educated and introduced the Win-Win techniques, and ran the NSS (hence acting as EMS facilitators). Once the

final stage, the bargaining sessions, began, the mediators settled into a less active mode in which they turned on the software and took dictation. However, as the talks neared the contract expiration date, and with the progress slow, the mediators again actively offered alternative solutions, compromises (in at least one case both sides accepted a compromise suggested by a mediator), and served as conduits for information between the sides by shuttling between the caucus rooms. In short, they acted as mediators typically do.

There were two periods of active mediator involvement, at the very beginning and at the end of these negotiations. We note that these activities could not have been performed effectively by just one mediator. One mediator served in the role of "traditional mediator" while the other served as the "EMS facilitator."

Several negotiators felt strongly that the mere presence of the mediators—as neutral third parties—lessened the degree of acrimony between management and labor. We note for emphasis that it is unusual for a third party to be present in labor-management contract talks unless difficulties are expected. Satisfaction ratings (see Table 2) indicate that the performance of the mediators was rated the highest of several intervention factors.

In sum, the mediators' roles were as multifaceted as suggested by the literature. The NSS did not lessen the role of the third party, just as it did not lessen the role of the verbal and nonverbal (nonelectronic) communications that took place between the negotiators. We suggest that, as with the NSS itself, the mediators served to *enrich* the positive effect of the intervention factors. Consistent with previous EMS research, the facilitator (or mediator) plays a critical role. Given the NSS environment in question, and negotiators' lack of experience with process techniques, it seems likely that mediators/facilitators will continue to be part of future negotiations even as NSS improve.

5.3. *The negotiation support system*

In this section, we discuss the performance of the NSS per se. We note, first, that negotiators rated the NSS environment favorably (see Table 2). The HealthCenter negotiations used three standard GroupSystems tools, a spreadsheet, and a word processor. In addition, with limited lead time and experience, the mediators created three ad hoc tools to support contract talks. This suggests that there may be many tools to support the negotiation process yet to be created.

Participants were also asked to assess whether the NSS *hindered* the negotiators. The complaints about the NSS were minor and did not suggest this. The major complaint offered in post-negotiation questionnaires was that it was difficult to look at the EBB and immediately know if the text on the screen was a proposal or the current contract. Color coding the text was suggested as a way of solving this problem. Another complaint was that the video projection screen was difficult to read. This is a technological problem that can be solved by using a higher quality projection system or a large-screen monitor. We now examine the case study experience in light of the theoretical dichotomies defined in section 1.3.

5.3.1. Solution-driven versus process support. The NSS was not used as a classic solution-driven DSS as it had no quantitative components (save for the brief use of a spreadsheet). There is no evidence that the participants wanted the NSS to hand them a solution. At no time did they ask the computer to negotiate or suggest a compromise. Solution-driven tools were not used because they were not available.

There *is* evidence that the NSS satisfied the two dimensions of process support: enriched communications channels and cooperative work. Several new channels of communication were introduced in this case: Electronic Brainstorming and Topic Commenter were used to exchange ideas and clarify issues, and the Proposal Editor was used to submit proposals formally. Furthermore, there is no evidence to suggest that the NSS hindered the richness of verbal and nonverbal communication in any way.

The NSS made a profound impact on the nature of “cooperative work” in the negotiation process. Documents and proposals were carefully structured and stored in the group memory using the Contract Log and Electronic Bargaining Book. Figure 9 indicates that this group memory was used some 23 percent of the time. Regarding the data(base) component of NSS, this case study did not have the resources to support on-line access and usage fees to these sources. We note that the negotiators required fact-finding several times during the talks. Some of these “facts” could have been retrieved from outside electronic databases (e.g., the typical pay rate of a class of professionals in recent contracts around the state).

5.3.2. Dyadic versus group paradigms. The GroupSystems tools were designed to support one and only one group, yet contract talks require that the system recognize two groups and maintain the confidentiality of at least some of the communication and some of the data. The mainstay of GroupSystems, EBS, was used only when the two sides of HealthCenter met *separately* during the strategy sessions (sessions 1 and 2) and when they brainstormed *together* during the last issue session (session 5). Both these situations fit the standard GroupSystems application because they effectively were applied to *one* group.

The bargaining sessions broke the EMS mold because it was impossible to pretend that the two sides were really one. The new, nonstandard tools had to accommodate the new requirements of limited team-to-team communication. The Proposal Editor effectively transmitted proposals between sides; the EBB shared all nonconfidential information; and the Contract Log recorded all exchanges of proposals and agreements.

5.4. The setting

The choice for the setting of the talks was unambiguously successful. The neutral university site, away from daily interruptions, was within close driving distance for all parties. The electronic meeting room and caucus rooms contained all the

paraphernalia of regular meetings (tables, chairs, and whiteboards) and electronic meetings (personal computers, video projectors). The negotiators listed no problems with the setting and rated the room highly (see Table 2). Neither side was concerned about the increased formality of the negotiation setting and seemed to enjoy the plush surroundings.

The electronic meeting room's U-shaped table is unusual, and we do not know of any other negotiation in which a similar table was used. The HealthCenter negotiating teams occupied the saddle and right stem of the U arrangement, forming an L. The L shape lessens the adversarial dynamics created by the traditional rectangular table and was thus beneficial. The physical distance between negotiators was somewhat greater than they were used to (the lead negotiators were sitting about 10 feet apart), but they quickly found this distance to be useful, since they could frequently avoid a "formal" caucus and simply lean over to whisper to members of their team (which cannot be done safely when negotiators sit face to face). Another benefit was that the public screen may have served to deflect personal differences. During much of the time, the negotiators' eyes were directed to the front screen to review contract wording; hence they focused on the issues and not the personalities.

6. Conclusions

The case study presented here marks the first time the entire *process* of negotiation was supported using computers, specifically a combination of elements termed an NSS. However, the NSS is only one part of a four-way package of intervention factors consisting of the NSS itself, the mediators, the structured process, and the setting—all of which are closely intertwined. No single factor dominated. The mere existence of four (new) intervention factors at the HealthCenter negotiations cannot be interpreted as a causal factor in the successful outcome of the contract talks. Indeed, averting a threatened strike might have suggested a stronger case for intervention techniques, but no strike was threatened in the 1990 HealthCenter talks. Analysis of the intervention factors reveals both a picture of the success of some intervention factors as well as many which did not seem to have an effect. However, there is no evidence that any intervention factors hindered or reversed otherwise positive dynamics.

We note some limited process intervention successes: the mood of the talks improved over the previous year; the perception of understanding the other side improved; the three-stage approach of negotiating worked well (though it needed more time); the mediators were able to play an active role; several software tools were used at various stages of the negotiation; the computer added another communication channel and a group memory component to the talks; and the gadgetry of the electronic meeting room did not stifle the negotiators and was very well received.

Prevailing winds in labor-management relations are slowly shifting the modus operandi closer to the IB mode (cf. Appendix A). Indeed, NSS will demonstrate its utility to the negotiation field in helping to change thinking away from the distributive mode toward the integrative mode once negotiators are convinced of its value. The HealthCenter negotiators had to undergo a culture change before they could follow the prescriptive models. The negotiators were accustomed to bargaining, not problem solving. Still, they continued to think largely in terms of contract language and demands, which is a failure of the implementation of process techniques, though not surprising given the inexperience of the negotiators with this mode of thinking.

It is only a question of time before computer support of labor-management contract talks becomes commonplace. As this case study suggests, there are many avenues to take in implementing computer technology. Some will have little effect, others may have a profound impact on bargaining and labor relations. As researchers, we must identify the latter category.

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Notes

1. We use the term EMS throughout the article. Generally, the reader can replace the term EMS with GDSS or GSS (Group Support Systems).
2. HealthCenter's union and management paid the University several hundred dollars to cover the costs of the electronic meeting room and office services—a nominal fee because of the experimental nature of the process. Actual market costs for electronic meeting rooms can be in the thousands of dollars *per day*. The cost of alternative meeting sites such as a union hall or workplace conference room is essentially zero. Finally, it should be kept in mind that the cost of using electronic meeting rooms is likely to fall in the coming years.

Appendix A: Contract talks in the collective bargaining context

Labor-management contract talks need to be viewed in context of the history, tradition, and legal framework of collective bargaining in the United States (cf. Kochan and Katz 1988). The highly legalistic contract described in this study, and

the adversarial process of bargaining which is its source, is largely a legacy from the 1930s industrial relations era of the New Deal.

One of the set of legacies and procedures is the concept of "bargaining in good faith." The National Labor Relations Board (NLRB) and the federal courts have, through a series of rulings, encouraged this and other procedures used by labor negotiators. Sanctions can be imposed on sides that do not bargain in "good faith." For example, during the negotiations, individuals are careful about remarks they make because they may be considered as valid as any formal proposal. If one side disowns a remark, the other side can claim that the erring side is "bargaining in bad faith." In another example, once an issue is closed, it cannot be reopened and even *bringing it up* again is also considered to be bargaining in bad faith.

Recent trends, for better or worse, challenge the New Deal era legacy, and are particularly of interest to NSS in the labor-management setting. A number of factors have combined: quality-of-work-life demands from labor, the threat of foreign competition, new technologies, employers' demands for greater flexibility in labor relations and contractual restrictions, and new forms of worker participation. All of these provide the potential for greater union involvement in the firm's affairs: from production, through financial affairs, to strategic decisions. NSS, particularly groupware such as GroupSystems, may broaden labor-management dialogue through intervention/communications techniques that support extended long-term relationships through electronic means.

Use of third parties in American collective bargaining is limited to special circumstances. Mediators may be introduced when there is an impasse. Mediation is often conducted by members of the Federal Mediation and Conciliation Service or the National Mediation Board. Public sector disputes often use arbitration where limitations exist on the unions' ability to strike. Arbitration, in contrast to mediation, either suggests a settlement or has the authority to impose a binding settlement that both sides must accept.

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