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Computer-assisted negotiations : a systems study and analysis

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San Jose State University, 1989

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**COMPUTER-ASSISTED NEGOTIATIONS:
A SYSTEMS STUDY AND ANALYSIS**

A Thesis

Presented to

The Faculty of the Department of Anthropology
and Cybernetic Systems
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

By

Ellen Christiana Campbell

August, 1989

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ABSTRACT

**COMPUTER-ASSISTED NEGOTIATIONS:
A SYSTEMS STUDY AND ANALYSIS**

by Ellen Christiana Campbell

Computer systems and models offer great promise to support negotiators in managing the complexity that is involved in reaching decisions on large-scale issues.

Various negotiating models are discussed and contrasted. William Lincoln's (1986) Collaborative Negotiations approach is used as the operative model.

The systems approach is used as a tool to analyze the negotiation process and structure. The analysis provides original perspectives and supports explanatory models. The structural analysis results can be used as a model to organize the data flow of a negotiation. The Cognitive-Behavior model examines the cognitive and communication processes during conflict and negotiation.

Issues of resistance, misuse of computers in negotiation, and recommendations for developers are discussed. When used appropriately, computers and computer models can positively affect the negotiation process and outcome. They can encourage learning, facilitate communication, and aid in defining issues and agendas.

Key words: Systems, Collaborative Negotiations, Negotiation, Computers, Conflict, Consensus Building, Structural Analysis, William Lincoln

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CHAPTER 1

INTRODUCTION

Problem Statement

The world grows smaller as advancements in transportation and communication make no major human activity stand in isolation. The world's increasing socio-political and economic interdependence quickens the rate of multiple cultural contacts and exchanges. Accompanying this interdependence is the continuing emergence of a global community. Whether this global community is "officially" recognized or not, few can deny that this large scale connectedness exists and has far reaching implications for the future. Adjustments to growth and its pressures create competition of interests and for resources, which is the major factor causing new conflicts and exacerbating existing ones. The rate of our becoming globally interdependent is even out-pacing our abilities to understand and deal with the reality of global concepts.

Large scale complex problems have great impact in a world that is becoming so interconnected. Frequently, these problems are controversial, fraught with conflict, and intertwined with other problems. Attempts to find solutions are no longer the sole concern of one country,

corporation, or political group, and certainly not of one person. Therefore, decisions and solutions must be made collectively, by many people usually representing a variety of interest groups, organizations, and constituencies.

The policy and decision makers engaged in dealing with these complex problems more often than not take on the role of negotiators. Frequently their approach to negotiation is with premature adversarial attitudes. Traditional adversarial approaches tend to reap short-term rewards while setting "time bombs" for future, and often more intense, conflicts. These same strategies, tactics, and concepts of winning and losing, which can be successful in small scale problems, are woefully inadequate in larger scale problems.

As a consequence, there is a need to investigate various ways to approach solving complex "messy" problems with multiple constituencies in a world that is increasingly interconnected.

...[A] first priority is to learn as much as we can about such systems [the complex problems] before entering into adversarial negotiation. This has led me, quite logically, to a search for improved collaborative procedures for managing and analyzing issues of great complexity both to reach improved decisions and to avoid disputes (Straus 1986a).

These large scale problems tend to be characterized by scientific and technological complexity. Even in this so-

called information age, negotiators and decision makers work in areas of uncertainty and constant change. Rather than increasing a negotiator's efficiency, the immense amount of information available is overburdening. A great amount of effort must be spent on organization and management to provide adequate, timely, and relevant information. In addition to improving problem-solving techniques with collaborative approaches, there is a need to manage massive amounts of information. Therefore the negotiator requires means and tools to support complex, highly technical negotiations. Computer systems and models are tools that offer great promise in managing the huge complexity that is involved in reaching decisions on large scale issues.

The Thesis

Recently in response to these difficulties, scientists and researchers from a variety of disciplines have contributed to the study of negotiation and to the development of tools that would support and aid the negotiator.

The thesis discusses and defines negotiation in a framework of problem solving and decision making. In addition, this thesis discusses and contrasts several negotiation styles and indicates how the negotiators using those styles view conflicts, conduct negotiations, and choose strategies and tactics. From among those negotiat-

ing styles, William Lincoln's (1986) Collaborative Negotiations will be used as the operative approach for this thesis for several reasons: 1) it seems to be most descriptive of successful negotiating behavior; 2) it has a systemic approach to conflict resolution; and 3) it is easily enhanced by computer systems and computer modeling.

To further develop research in negotiation, especially computer-assisted negotiation, it has become increasingly apparent that we need new models to describe the negotiation process (Jarke 1988; in conversations with Samarasan). Negotiation is an extremely complex process and as such may defy most, if not all, modeling efforts except at the most aggregated and abstract levels where their usefulness becomes limited (Straus 1986b). However, each new modeling attempt provides an opportunity to describe at least a portion of the process which might prove to be helpful both to negotiators and to those who would develop tools to support negotiators.

This thesis analyzes the Collaborative Negotiations' process and structure as a system. The author's system analysis produced some original work. For example, the Cognitive-Behavior model was created while examining some of the cognitive and communication processes that occur in conflict and negotiation. Also, several viewpoints or

"maps" were developed on the structural aspects of the negotiation process, which may prove to be useful to researchers and developers in computer-assisted negotiation.

The little work that has been done in computer-assisted negotiation has been excellent. Because this field is so new, and much of its work is still unpublished, part of this thesis will be devoted to heralding and chronicling some of the beginnings of the research and development efforts of computer-assisted negotiation. The majority of the computer models presented in the thesis already have been developed and are currently being field tested or used in actual negotiations. The only computer model (Collaborative Negotiation Support System) which is still in the design stage is the author's own work.

Using computers in negotiations can greatly support and enhance a negotiator. However, computers are not necessarily a panacea for the negotiator; there are certain disadvantages and some potential for misuse. This thesis also presents some recommendations and considerations for developers who would design and/or develop applications for computer-assisted negotiation.

An Approach: Systems Science

As negotiation is a vital means to resolve complex problems, it warrants serious and rigorous study with as many approaches as possible. Systems science is one such approach. The systems approach provides a means to formally model multi-variable dynamic systems, and offers additional perspectives on systems which might otherwise prove too complex to analyze with more traditional approaches.

The systems approach is used in this thesis as a tool to analyze the negotiation process and structure. The analysis has provided original perspectives and explanatory models that might prove to contribute to the field of negotiation and help its practitioners.

CHAPTER 2

WHAT IS NEGOTIATION?

Introduction

Definitions of negotiation and the descriptions of the process are varied and yet there exist similarities. Authors categorize human endeavors differently and emphasize or highlight various aspects of the same process. In part, this is due to their particular interests and purpose of investigations; also educational background and training give rise to various "systems of inquiry and multiple perspectives" (Linstone 1984).

Gerstein and Reagan (1986) succinctly and simply define negotiation as a communication process. For all authors, communication is the requisite element with which a negotiation is conducted. Communication is an essential part of negotiation as a way of conveying messages and ideas to bring about settlements.

Frameworks and Definitions

Some view negotiation as a part of larger frameworks of human activity or social interactions:

Decision making Negotiation is employed when consensus and/or coalitions are deemed expedient or more desirable than coercion or authoritative rulings (Zartman 1978). "To

negotiate is to make a set of decisions in a competitive context" (Bazerman and Lewicki 1985).

Social order The way people manage to "get things done" and to make changes in social order and rules is through negotiation (Raiffa 1982; Strauss 1978).

Conflict Resolution/Management For a diplomat, ombudsman, politician, manager, etc., negotiation is one choice in conflict management or its resolution. Alternative means might be mediation, arbitration, etc. (for specific definitions of these terms, see the glossary). Negotiation may be seen as an alternative to conflict (Rangarajan 1985) and an act of peacemaking (Kahn 1988).

Other authors supply definitions that are functional or utilitarian in nature and occasionally outline a negotiator's actions:

Cross's (1969) definition of bargaining is "the voluntary process of distributing the proceeds from cooperation."

Fisher and Ury (1981) write "Negotiation is a basic means of getting what you want from others. It is back-and-forth communication designed to reach an agreement when you and the other side have some interests that are shared and others that are opposed."

Ikle (1964) defines negotiation as "a process in which explicit proposals are put forward ostensibly for the purpose of reaching agreement on an exchange or on the realization of a common interest where conflicting interests are present."

Wall (1985) states "Negotiation is a process through which two or more parties coordinate an exchange of goods or services and attempt to agree upon the rate of exchange for them."

Zartman and Berman (1982) outline the process: "Negotiators begin by groping for a jointly agreeable formula that will serve as a referent, provide a notion of justice, and define a common perception on which implementing details can be based. Power makes the values fit together in the package and timing is important to making the formula stick."

Three Negotiation Approaches

The process of negotiation is neutral. Whether it will be used for 'good' or 'bad' purposes is up to the disputants and stakeholders. The negotiators are not neutral; they represent one side and take an active part in resolving a dispute. All negotiators do essentially the same thing because the overall negotiation process is the same. The difference lies in how conflict and the negoti-

ation process are viewed, which in turn affects how the negotiation will be conducted. From these attitudes and paradigms, which are created and reinforced by culture, education, experiences, affiliations, society, etc., various negotiating styles or approaches are developed. From those paradigms, either consciously or unconsciously, negotiators develop and employ a repertoire of behavioral skills, tactics, and techniques.

The first two negotiating styles, distributive and integrative, are often considered opposites, in the sense of how negotiators will view the conflict, conduct the negotiation, and choose their ethical and tactical behavior. Many see these two as extremes on a spectrum. Some argue that a negotiator's actual behavior will mix the two styles, that is, the negotiation will be "mixed-motive" in nature. This is a statement reflecting the negotiator's "cognitive tendency" and generally accepted paradigm of conflicts (Bazerman and Lewicki 1985).

The third style is William Lincoln's Collaborative Negotiations approach, which will be the operational definition of negotiation for this thesis. Collaborative Negotiations is similar to integrative bargaining; however, positional bargaining is not rejected, but modified based on interest satisfaction.

1. Distributive bargaining is also known as a "zero-sum game." This approach to negotiation reflects, or encourages, the belief that one's gain will have to be another's loss. This approach to bargaining stems from a perceived lack of resources; somehow the world is "a pie," or there is a fixed pool of resources, that must be divided up. Distributive bargaining approach encourages a negotiator to adopt tactics and strategies that tend to be adversarial. In distributive bargaining "the issues clearly are what should be distributed, how much should be distributed, to whom should such be distributed, and perhaps when should such be distributed" (Lincoln et al. 1986). Any emotional motivations for conflict are not considered important in distributive bargaining; in fact, they may be seen as something that would "muddy up the waters."

2. Integrative bargaining is an approach that attempts to integrate the interests of all disputants throughout the complete negotiation process. A negotiator using integrative bargaining views negotiation as a set of behaviors that lead the parties to make trade-offs among alternatives, or jointly solve problems in such a way that the size of the pool of resources to be distributed is increased. In the integrative approach, "positions are proposals as to how to resolve issues in order that

interests may be satisfied thus dissolving the dispute or making it more manageable in an equitable sense through the exchange of durable promises" (Lincoln et al. 1986).

3. Collaborative Negotiations: is a process composed of a set of complex and effective communication techniques, educational efforts, and the appropriate uses of varying forms and degrees of power as disputants attempt to satisfy their own essential self-interests while simultaneously attempting to satisfy the interests of others as all collectively, consciously, and deliberately strive to develop and exchange equitable, practical, and durable promises which satisfy identifiable interests which may have been jeopardized, threatened, taken away, diminished or unsatisfied had not collaborative negotiations occurred. In contrast to conflict (which is a real, perceived, feared or possible process of interest jeopardy or dissatisfaction) the process which constitutes collaborative negotiations integrates (sometimes by substitution) the disputants' interests to reach mutual satisfaction, i.e., procedural, substantive, and psychological, in order to dissolve the conflict or to convert it into an equitable manageable dispute (Lincoln et al. 1986).

Interests and Issues

There is a significant difference between issues and interests. Collaborative Negotiations clearly define interests and issues as separate concerns. Not all practitioners, even those who advocate an integrative negotiation approach, make a clear distinction between the two, and occasionally they can become blurred. True resolution of issues occurs only when the interests, the motivating factors of the conflict, are satisfied. Success of a negotiation can be measured or evaluated on how, and to

what degree, the outcome addressed all disputants' interests. If interests of all or any disputants are not satisfied there will be conflict aftermath (see glossary for definition of conflict aftermath).

The following are definitions of interests and issues: Interests are the "whys" of a negotiation. They are the principles, values, or belief systems that when impinged upon, jeopardized, or threatened will cause conflict. If the interests are not appropriately addressed, any resolution of conflict will not be lasting (Fisher and Ury 1981; Gerstein and Reagan 1986; Lincoln et al. 1986; Rangarajan 1985).

Abraham Maslow's (1954) hierarchy of needs provides a succinct model outlining basic human needs, which are the motivations of behavior. Maslow's model is useful in understanding people's interests. Examples of interests are physical security, basic human rights, self-esteem, financial security, time, freedom, and nourishment.

An individual's own interests are based on the situation's context, influences (past and present), and the environment. As these factors change, the priority of the interests may also change. Shared interests are binding forces for members within various cultures, families, or groups. That is, some cultures value certain principles,

beliefs, and/or needs more than other cultures do. This too is an important factor for a negotiator to remember.

Interests are non-divisible and non-negotiable. The ranking of interests can be changed depending on the context of the situation, and which interest has been satisfied and at which level of Maslow's hierarchy. Interests are usually intangible and are qualitative in nature. This makes discovering interests difficult, both one's own as well as other's. Having a clear understanding of the disputants' real interests is the key to effective negotiation.

Issues are the whats, the tangible, measurable items, that need to be addressed to satisfy interests. "Therefore, issues are without exception rooted in interests" (Lincoln et al. 1986).

Issues are tangible and are usually easier to identify and describe than interests. However, it is the threatened interests that create and control an issue. Only when the threatened interest is adequately satisfied is the issue truly resolved.

For example: Due to a rise in the cost of living, employees request a 5% increase to be paid over a period of six months. The interest in this case is financial security, which is being threatened by changes in the

environment. The threatened interest creates the issue, which is a pay raise. The interests control the issue; if the interest is not satisfied, the issue will not be resolved. The employees develop a proposal (5% increase paid over six months), to satisfy their interest (financial security) and to resolve the issue (pay raise). Therefore, issues are negotiable, not for themselves per se, but for what they represent--the interests.

Procedural, Substantive, and Psychological Satisfaction

Three types of satisfaction are identified in the Collaborative Negotiations style: procedural, substantive, and psychological. For a settlement to be durable, all three types must be satisfied to a high degree for all parties. Procedural satisfaction is the "Working agreements which assure order, equity, and ownership of the dispute resolution process and the settlement agreement" (Lincoln et al. 1986). (For definitions of equity and ownership see glossary.) Substantive satisfaction is when the issues (and the interests underlying the issues) have been adequately resolved. "Psychological satisfaction is achieved if within the context of all things considered the disputants 'feel better' after the conflict is resolved..." (Lincoln et al. 1986).

In sum, using the Collaborative Negotiations model the negotiator: 1) consciously looks for the real interests and issues (noting the difference between the two); 2) constructs proposals and settlements, based on identified interests, which satisfy all disputants; 3) uses consensus methodologies to facilitate the sense of equity and ownership among all players; 4) works to make proposals and settlement agreements durable, equitable, and practical. "...Collaborative Negotiations is neither synonymous with easy, pleasant or quick, nor absent of emotions" (Lincoln et al. 1986).

Economic Negotiation Approaches

Economic approaches to negotiation (Axelrod 1984; Heckathorn 1978; Nash 1950; Raiffa 1982; Rapoport 1974b; Saraydar 1984; Winham and Bovis 1979) have been reviewed for the thesis. These approaches may be useful in developing some computer models/systems for negotiations; to that extent they will serve as references. However, there are too many limitations to use them as an operational definition in this thesis.

These approaches provide elegant and succinct mathematical models, often using game theory methods, of negotiations and provide ways to determine their outcomes. "Economists assume that individual behavior will be con-

gruent with theories of economic rationality--i.e., maximizing economic outcome or minimizing cost under all conditions" (Bazerman and Lewicki 1985). However, as an approach that describes actual human behavior they are limited.

One of the most critical limitations is "...that decision-makers do not always behave according to the 'rules' of economic rationality" (Bazerman and Lewicki 1985). Raiffa, (1982) whose background is game theory, finds the concepts and ideas helpful in negotiations but he never uses the techniques. He writes, "Secretly I thought that if I could really know their [the negotiating parties] true values, judgments, and political constraints, I would be doubly convinced that they were not acting in a coherent, rational way. They certainly weren't satisfying the prescriptive ideal of 'rational economic man'" (Raiffa 1982).

The following are some (not an exhaustive list) additional limitations in the economic bargaining models. In some games no communication is allowed between players, e.g., the Prisoner's Dilemma. This, by definition, is not negotiation. Also in this game (and in others) the variables and choices are limited: rarely is there an actual negotiation with only one or two possible outcomes. Games

frequently are conducted so that each playing session is discrete and not related to previous plays. Human memory (thus motives of revenge or reward) is not accounted for; this would be a very dangerous omission indeed in actual negotiations (Bazerman and Lewicki 1985; Raiffa 1982; Rangarajan 1985; Rapoport 1974b).

Summary

This chapter discussed negotiation in various frame works and presented different approaches. Some, such as economic bargaining, are not adequate for the thesis. The Collaborative Negotiations style was chosen for this thesis for four reasons: 1) it seems to be the most descriptive of successful negotiating behavior; 2) it makes interest satisfaction a primary focus of the negotiating effort, without sacrificing negotiators' own self-interest; 3) it has a systemic approach to conflict resolution; and 4) it seems easily enhanced by computers and computer modeling.

CHAPTER 3
SYSTEMS CONCEPTS

Introduction

Systems are wholes with interacting parts, embedded in an environment. Problems arise from dysfunctional behavior or structure of a system, or the discordant relationship between interacting systems. The players of a system perpetuate and/or create the conflict. Players may choose negotiation as one alternative with which to resolve conflict. Negotiation is a patterned, complex set of behaviors, designed to resolve problems or to manage conflicts. It is a process and as such can be studied as a dynamic system. In systems science we find that dynamic systems behave according to principles of feedback, information theory, and control and communication. When studying a negotiation (sub)system we analyze these various principles, model the process, and develop theories on how negotiations work (Kahn 1988; Ran garajan 1985).

The following four sections are: 1) The Observer; 2) Structure; 3) Function and Goals; 4) Causality and Feedback. Within these four categories, only those systems concepts that can be most appropriately applied to the negotiation process and contexts will be discussed.

The Observer

No two people see the same thing quite the same way. Perceptions, attitudes, and conclusions vary between individuals who are observing and who are involved with the same problem. Negotiators intuitively know this, as evidenced by all the literature on negotiations. In recent years, cybernetics has focused on the role of the observer and observing systems, or subjectivist epistemologies. Clemson sometimes refers to this work as second-order cybernetics. He "asserts that the observation is very generally dependent upon the observer, and that the process of observing typically influences the reality observed, and that objectivity in the naive sense is a pernicious myth" (Clemson 1984). (For further discussion, see Boulding 1956 and Von Foerster 1985.)

Much can be said about second-order cybernetics and how it relates to negotiations. It is not the purpose of this thesis to expound upon this fascinating subject. It is mentioned here for two reasons: 1) primarily to expose the author's assumptions about the observer's role in negotiations; and 2) to lay groundwork about perceptions for the systems analysis in chapter four.

This philosophical stance on the nature of reality and the observer has some very practical implications. There

are as many "realities" as there are observers; therefore, there are at least as many possible solutions to any given problem. There is no monopoly on truth, and no one right solution. This mind-set lends itself to the use of methodologies developing consensus and creativity in problem solving. It frees up the negotiator to analyze and judge proposals using the criteria of interest satisfaction, discouraging a more traditional adversarial approach to negotiation--"our position against theirs."

Structure

Structure is the elements of a system and their relationships. Structure consists of the elements of a system which do not change (or which change very slowly) over time. It connects the parts of a system, either physically or conceptually. The structure denotes the system's boundary and the configuration of the subsystems within the system. The pathways or networks are also parts of the system's structure through which matter, energy, and information move. Tracing these flows and observing their transformations, i.e., timing, bottlenecks, and flooding reveal possible weaknesses and dysfunctions in the structure.

Boundary

The boundary separates the system from its environment. Bounding any system is dependent on many factors, the most important of which is the observer, that is, the one who is defining the system and the problem situation (see glossary). Some questions that might be posed while bounding a system are: What is the purpose of the system? Who are the primary decision makers and what are their constraints and the extent of their influence? What are the relevant boundaries considering the context of the problem and the environment?

An integral part of any negotiation is carving out the bargaining space from the environment. This must include all the relevant issues and interests of the disputants. Zartman's and Berman's (1982) formula and Lincoln's (1986) conceptual agreement are steps or approaches that are designed explicitly to guide the parties in bounding the negotiation. Creating conceptual agreements, deciding what will be on the agenda, identifying real issues versus non-issues, and agreeing to the procedures are all part of the bounding process. In some cases, negotiators bound the problem and create a conceptual agreement rather quickly. In other cases, much of a negotiation effort may be spent in deciding what the bargaining space will be. The situ-

ation between the Israelis and Palestinians illustrates this; any chance to negotiate is bogged down because neither side will agree on who is to represent the Palestinians. That is, the difficulty is in how the primary players bound the problem and the bargaining space.

Negotiations are dynamic systems. They are not isolated events separated from the problems and conflicts which they are designed to resolve or manage. Therefore, a negotiation system is a subsystem in a larger system. In large systems it might be tempting to push (at least, conceptually) the negotiating subsystem outside the system's boundary. Even if the negotiators are temporary outside consultants, the negotiation is still within a system. Negotiations should never be viewed as an outside activity. Such a separation is artificial and dangerous. Attempting to remove the negotiation from the larger system, can make it easy for the primary players (i.e., owners of the problem, perpetrators of the conflict, and/or contributors to the solution) to disown any responsibility for the conflict and/or the negotiated outcome.

If the negotiating subsystem is somewhat autonomous or physically removed from the other subsystems, negotiations between the players in other subsystems becomes necessary. This type of negotiation is known as vertical bargaining

(see glossary). In a complex negotiation, vertical bargaining is almost always necessary; as a negotiating subsystem becomes further removed from other subsystems, more efforts in vertical bargaining are required.

Structural-based vs. Issue-based conflict

There are times when the conflict is not due to overlapping or conflicting interests, but is solely embedded in the structure of the system. Rapoport (1974a) gives a lucid example in the slavery issue: "Thus, a revolt of slaves against their status as slaves cannot be 'settled' by a compromise, whereby the slaves are accorded better treatment, or whatever." The structure of the system perpetuates the conflict; the structure is the real issue. The issue of slavery "...touch[es] upon the very existence of the challenged institutions, not the way they function" (Rapoport 1974a). This is a timely observation when one considers problems in South Africa, Middle East, and even economic issues such as the US deficit, etc.

During the conflict assessment stage, a negotiator should examine a system's structure. This would include such elements as its subsystems, its pathways, and how the participants in the system view their own system's structure. Identifying dysfunctions in the structure will help

negotiators to find possible solutions and to develop proposals for implementation.

Goals and Function

"One ought to be cautious in dismissing any characteristic of a living system, whether structural or functional, as superfluous or useless" (Rapoport 1974a). This also includes conflict, which may very well support the needs of the system or a significant part of the system. In conflict assessment a negotiator needs to discover why certain behaviors exist in a system. Under what conditions does the conflict exist and what (and whose) purpose does it serve? In this way the real interests and issues can be uncovered. Poignant examples of conflict functioning to support a system can be found in family systems therapy. A therapist might look deeper into the reason why a child continually returns to drug use after being "cured." The therapist might discover that the child's involvement in drugs is viewed as an issue of concern and source of conflict for the whole family system. However, it also serves to distract the parents from their own marital problems, thus keeping the family together. The real interest is family unity, not drug abuse.

If a conflict is supporting a significant need in the system and is deemed disruptive, then a negotiator should

suggest alternative behaviors that eliminate the destructive aspects without threatening the underlying needs or interests. In the case of the therapist, his answer would be to treat the parent's marital problems, thus eliminating the need for the child's substance abuse. In more complex situations, with many behaviors and needs all of which are closely intertwined and connected, finding causal relationships between functions and conflicts may not be easy, and may perhaps be impossible.

Three Goals of a System: Stated, Actual, Rewarded

Assessing a system in terms of its three goals can quickly reveal some interesting system dynamics. This method can be used during the conflict assessment phase to better understand the system and to discover interests and issues.

A system's stated goal would be for example the preamble of a constitution, a corporation's public relations statement, a governmental press release, the advertised features and benefits of a product, etc. The actual goal is what the system actually does or is observed doing; that is, the end results and the system's real outputs. For example, the manufactured product, whether or not it resembles the advertisement. The rewarded goal is the

purpose or behavior that is encouraged, or compensated for in the system. For example an employee's behavior that aids in his/her promotion, but is not necessarily part of the job description. Another example is a contractor's actions which land the contract, but might not be part of the company's stated instructions or procedures for its contractors. (The idea of 3 purposes [goals] of the system comes from Clemson 1984.)

When a system's three goals are not closely aligned, there is potential for conflict. For example: the stated goal: a software house advertises a quality "high-tech" product, that will be delivered on time, and made to user specifications. The actual goal: the output is a product riddled with bugs. The quality assurance department is understaffed, no engineers are doing software maintenance or documentation, and marketing is selling faster than manufacturing can produce. The rewarded goal: the engineers are given bonuses for new ideas, whether or not they are implemented or feasible. The culture of software engineers glorifies writing new code, not documentation. Marketing gets commissions when sales are written up, not when the product gets delivered or paid for.

Not much imagination is needed to predict that the above system will exhibit conflict. Such a system is ripe

for labor/management problems, and even litigation between the company and its customers.

There are some systems that appear to have all three goals closely aligned--one such system is the San Francisco Forty-niners. All three goals and almost all the system's behavior are aligned and directed toward making profit and winning the Super Bowl.

In sum, analyzing the system's structure and the various goals can be an effective way to ferret out the real issues and interests in a conflict. Discovering the exact nature of the conflict and its functions, and how it may benefit the system or certain players within it, is the first step in conflict resolution or management.

Causality and Feedback

Focusing on systems thinking moves one from statics, form, and one-way causality to dynamics, process, and complex mutual interactions and feedback cycles. It is the relationships, or the circular causality, of the parts that create the organization, characteristics, and overall behavior of the system.

Circular causal processes are commonly known as feedback. The term feedback has a very specific and technical meaning in systems and cybernetics. Feedback is output of a system or any sub-system that is returned as

part of the input to affect succeeding processes and outputs. Therefore, feedback is part of the mechanism(s) that control system's behavior. "...systems which include [sic] feedback loops are capable of very complex behavior and ... quite subtle changes in the relationships at one point in the system can have very large scale effects in changing system behavior" (Clemson 1984). (For more discussion on the types of feedback, see the glossary.)

For a negotiator, identifying the primary feedback loops in a system is a very important means to understand the system's dynamics and what controls its behavior. Once the major circular causal processes are known, proposed changes can be more accurately evaluated for what effects they will have on the entire system and how the changes will alter the system's behavior.

Summary

By analyzing negotiations and the conflicts as systems the negotiator discovers helpful perspectives that might be overlooked.

Earlier, this chapter discussed two key systems concepts: the role of the observer and the illusion of objectivity. Negotiators recognize that their actions directly influence the problem by attempting to create

settlements. Moreover, negotiators need to recognize that, however indirectly, they greatly affect how the entire system will be influenced by the paradigms and biases they bring to a negotiation.

Other system concepts, such as the functions, the various goals, and the structure of a system were presented and discussed in a negotiation context. Using these concepts and identifying the system's major feedback loops are not only important methods for a negotiator to use when analyzing a complex problem, but they are also helpful when analyzing a negotiation's structure and process. This chapter has provided a foundation for following chapter, which will analyze Lincoln's (1986) Collaborative Negotiations approach as a system.

CHAPTER 4

A SYSTEMS ANALYSIS

Introduction

Doing systems analysis is an iterative process. A systems scientist will describe the system in many ways and with a variety of viewpoints. Each slice of the system yields new information, adding to an increasingly rich picture of the system.

In this thesis, the systems analysis focuses on the structural aspects of the Collaborative Negotiations approach at three levels of resolution. Following the structural analysis, some of the communication processes of conflict and negotiation are analyzed and feedback loops linking conflict and negotiation are identified. The Cognitive-Behavioral model depicts these processes. The Cognitive-Behavior model and the results of the structural analysis are intuitively coupled and connected; the exact point-to-point mapping will not be explored.

Structural Analysis

The goal of this analysis is to provide a conceptual map for Collaborative Negotiations. For that purpose, this section isolates and describes system's structure, rather than the system's process, behavior, etc. Structure refers

to those elements of a system (whether they are disputants' roles, interests, perceptions, a type approach, strategy, outcomes, etc.) that remain unchanged over a period of time. If an element is always in the system, then it may be labeled part of the system's structure. It is assumed that the Collaborative Negotiations approach is patterned in its usage, and as such has similar structure and contains the same type of elements, independent of the negotiation's content.

The following analysis organizes the negotiation's structure into three levels of resolution (resolution refers to the degree of abstraction or the amount of detail presented at each level). Level zero is an abstract working definition of Collaborative Negotiations. Level one presents a conceptual diagram of the different types of bargaining and their relationships. Level one also adds a temporal dimension (thereby introducing process) by depicting the negotiation's structure progressing through phases. Level two analyzes at an even more detailed resolution, the negotiation structure in terms of interest, issues, positions, etc.

Resolution Level Zero: Working Definition

Collaborative Negotiation as a process is composed of bargaining sub-processes to reach a settlement.

Collaborative Negotiation as structure is composed of two classes of elements: bargaining sub-processes and settlement.

Resolution Level One: Bargaining Hierarchy

The negotiation system is a hierarchical structure of elements called bargaining processes (see figure 1). Using negotiation terminology, the elements associated with bargaining processes are: vertical bargaining, horizontal bargaining, joint session, settlements, agreements, and constraints (see glossary for horizontal bargaining).

The terminal nodes (at level A in the diagram) are called vertical bargaining, each of which produces a Vertical Bargaining Agreement (VBA). As indicated by figure 1, there can be more than one vertical bargaining and therefore there are as many VBAs. Terminal nodes process data generated inside the node.

At level A, each vertical bargaining node produces a VBA, which are their outputs. At level B, the VBAs are inputs to the horizontal bargaining node. The VBAs act as constraints or guidelines for the horizontal bargaining node. The horizontal bargaining node may start generating its own HBA only when all of the corresponding VBAs have been produced and received as inputs.

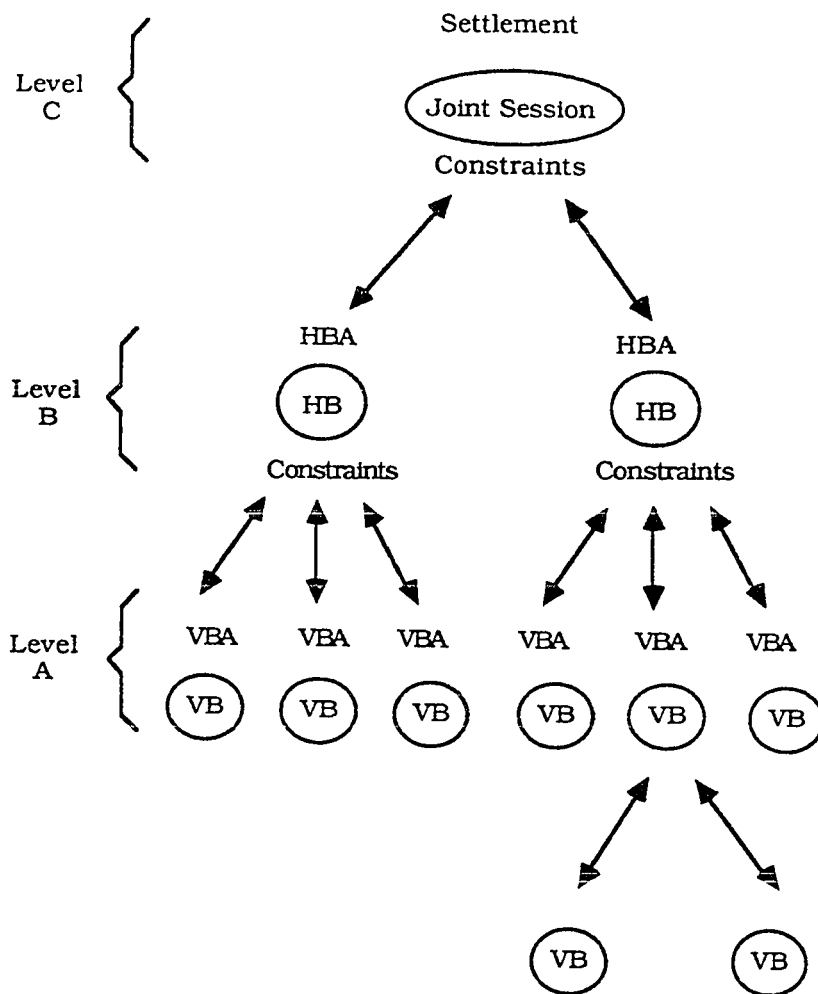


Fig. 1. Structural Bargaining Hierarchy
Resolution Level One

A Horizontal Bargaining Agreement (HBA) is produced as output from the horizontal bargaining node. At level C, the HBAs act as constraints for the joint session node. The same condition at level B holds true at level C, the joint session node may start generating its own output only when input from corresponding HBAs have been received.

The joint session node at the top of the hierarchy produces an agreement called a settlement, which is associated with the overall goal (or purpose) of the negotiation.

As depicted by figure 1, a negotiation need not be symmetrical, that is, there can be more elements on one side than on the other. Figure 1 shows one possible configuration of such a tree structure. Any variation in the elements' configuration will not alter the hierarchical relationship. Depending on the particular negotiation context, it is possible to have layers within a vertical or horizontal bargaining levels for one or more sides. Under these circumstances, the HBAs and VBAs do not change their roles as constraints to the next level. The hierarchy of bargaining may accommodate more than two horizontal bargaining elements at level B.

Bargaining hierarchy provides a practical way to map or to represent conceptually negotiation's progress. It

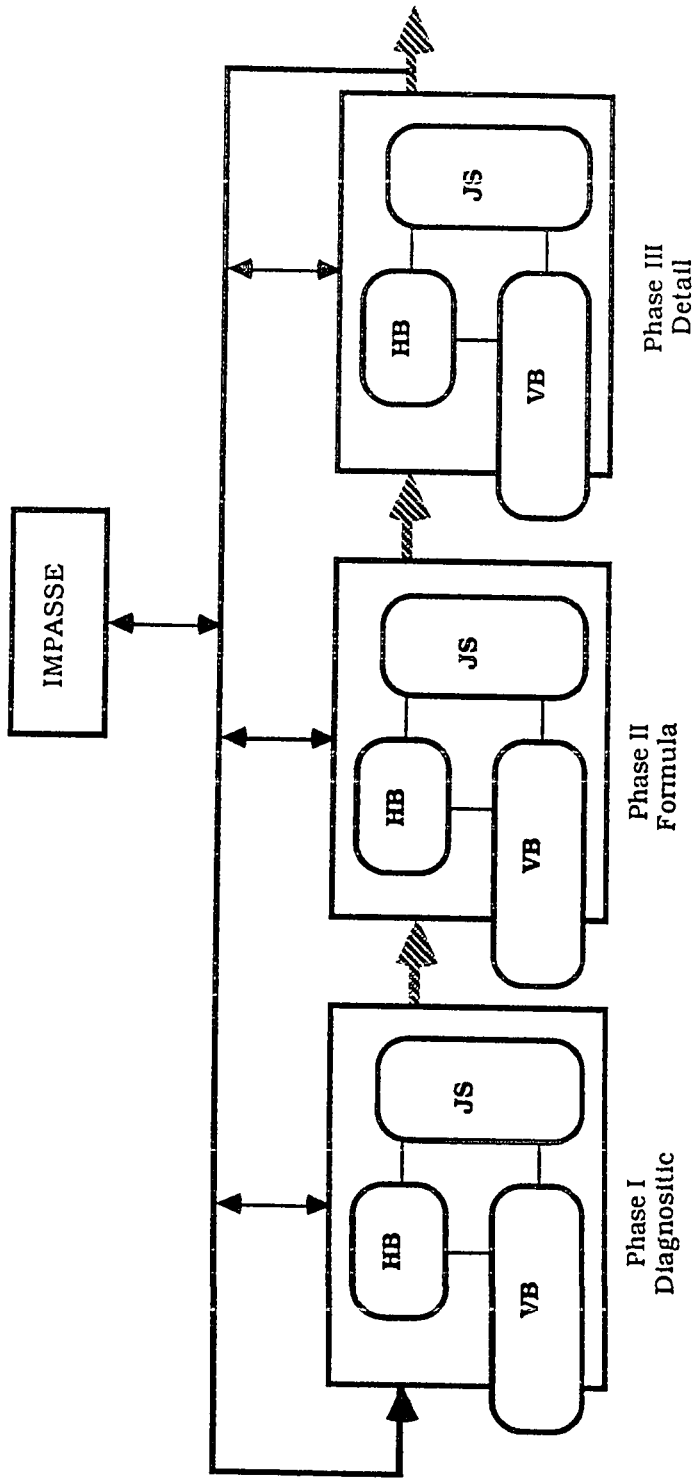
can provide a basis for organizing and/or cataloging documentation associated with the process and agreements produced at various bargaining levels.

Resolution Level One: Negotiation Phases

In this structure, there are four elements: vertical bargaining, horizontal bargaining, joint session, and impasse. Vertical bargaining, horizontal bargaining, and joint session elements are in each of the three temporal phases, with the impasse element by itself (figure 2). At any time in the negotiation, one side, or both, might decide that the negotiation can not continue, thus actuating the impasse element.

When certain given conditions or the purpose of an element are fulfilled, then another element becomes active. For example, in the horizontal bargaining consensus is achieved and a HBA is created, then with that agreement, joint session (or even the vertical bargaining) element becomes actuated.

The negotiation's progress from one element to the other (or for that matter, from one phase to another) depends on, or is controlled by: which phase the negotiation is in, what type of input is being received, what agreements have already been achieved, etc.



VB= Vertical bargaining
 HB= Horizontal bargaining
 JS= Joint session

Fig. 2. Three Negotiation Phases
 Resolution Level One

At resolution level one, three phases are introduced to the structure to depict process and behavior. The negotiation process can be divided into diagnostic, formula, and detail phases (Zartman and Berman 1982). The same phases are employed in the system analysis so as to convey some passage of time and progress through the negotiation (figure 2). "Phases, like ages, are organizing concepts that help us understand reality; unlike gears, for example, they are not part of the reality itself" (Zartman and Berman 1982). Therefore, it is very likely that a negotiation will proceed through all three phases several times as depicted by the arrows. Each phase is not discrete. For example, conflict assessment is performed primarily in the diagnostic phase, however it is also done through the succeeding phases. Less time and effort might be spent on conflict assessment in the last two phases, but a negotiator should never cease to reevaluate the conflict and the negotiation's progression. Because phases are not discrete, movement from one to the other is not always a nice orderly progression from left to right.

The following are descriptions of these phases in negotiation terminology:

The diagnostic phase is the time in the negotiation devoted to deciding whether to negotiate or not. To arrive

at the decision to negotiate the negotiators and their constituencies will: assess the conflict, define the interests and issues, decide who will be or will not be included, and meet with the other side to carve out a bargaining space.

During the formula phase the major objective is to create a conceptual agreement (Lincoln et al. 1986), a formula, (Zartman and Berman 1982) and/or an agenda (see glossary for conceptual agreement and formula). All the parties will recognize that the problem needs to be addressed, and that they all want a resolution to the situation. At this time positions are presented and some proposals for resolving the problems are brought forth.

During the detail phase the negotiation proposals are submitted and those deemed feasible are worked on. The objective of the detail phase is to create durable settlement agreements (see glossary).

Resolution Level Two for the Diagnostic Phase

Every element in resolution level one (in each of the three phases) has structure and its own set of elements. Figures 3 through 5, show the detailed structural diagrams of the vertical bargaining, horizontal bargaining, and joint session for the diagnostic phase. (For the remaining structural diagrams of the formula and the detail phases, see the appendix).

Vertical Bargaining

The vertical bargaining in the diagnostic phase (figure 3) has eight elements and two inputs. The elements are: Constituent1 (Const1), Perception of Conflict, Constituent2 (Const2), Negotiator (Nego), Interests, Positions, Issues, and VBA. The inputs are: Information about the Conflict and Anticipated Action.

There are two elements which represent constituents: Const1 and Const2. Even if the same people are involved in each element, the elements are distinctly separate structurally, because their roles are different. In the Const1 element, the constituents are involved with the problem and/or conflict. Const1 produces the perceptions of the conflict based on information and anticipated actions from the environment. The Const2 element, along with the negotiator (Nego), is involved with the problem solving and the bargaining process.

Interests are generated from three elements: Nego, Const2, and Perceptions of the Conflict. From the interests, the issues are produced, and then positions are created. Based on the interests and positions, the VBA is created, resulting in a decision on whether to negotiate.

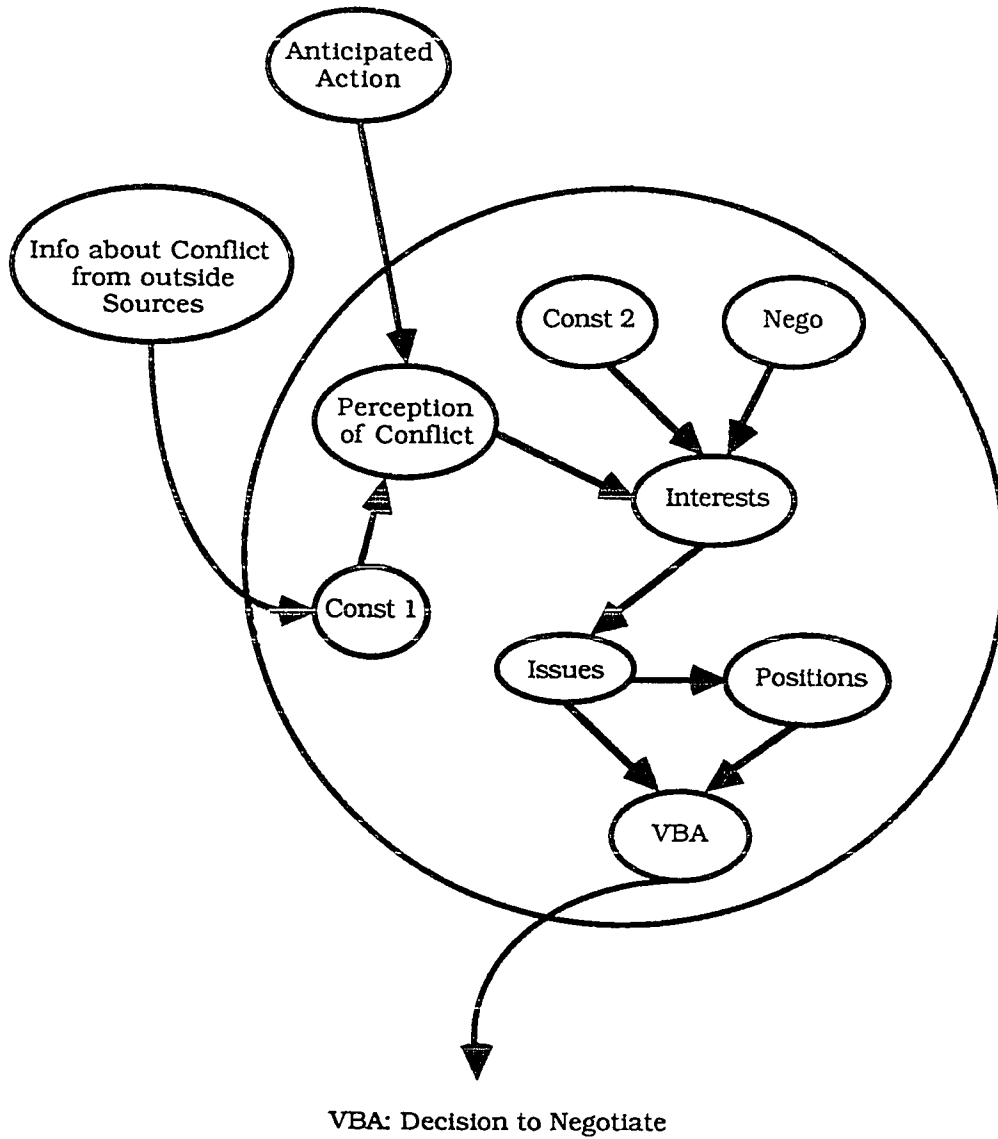


Fig. 3. Phase I Diagnostic: Vertical Bargaining Resolution Level Two

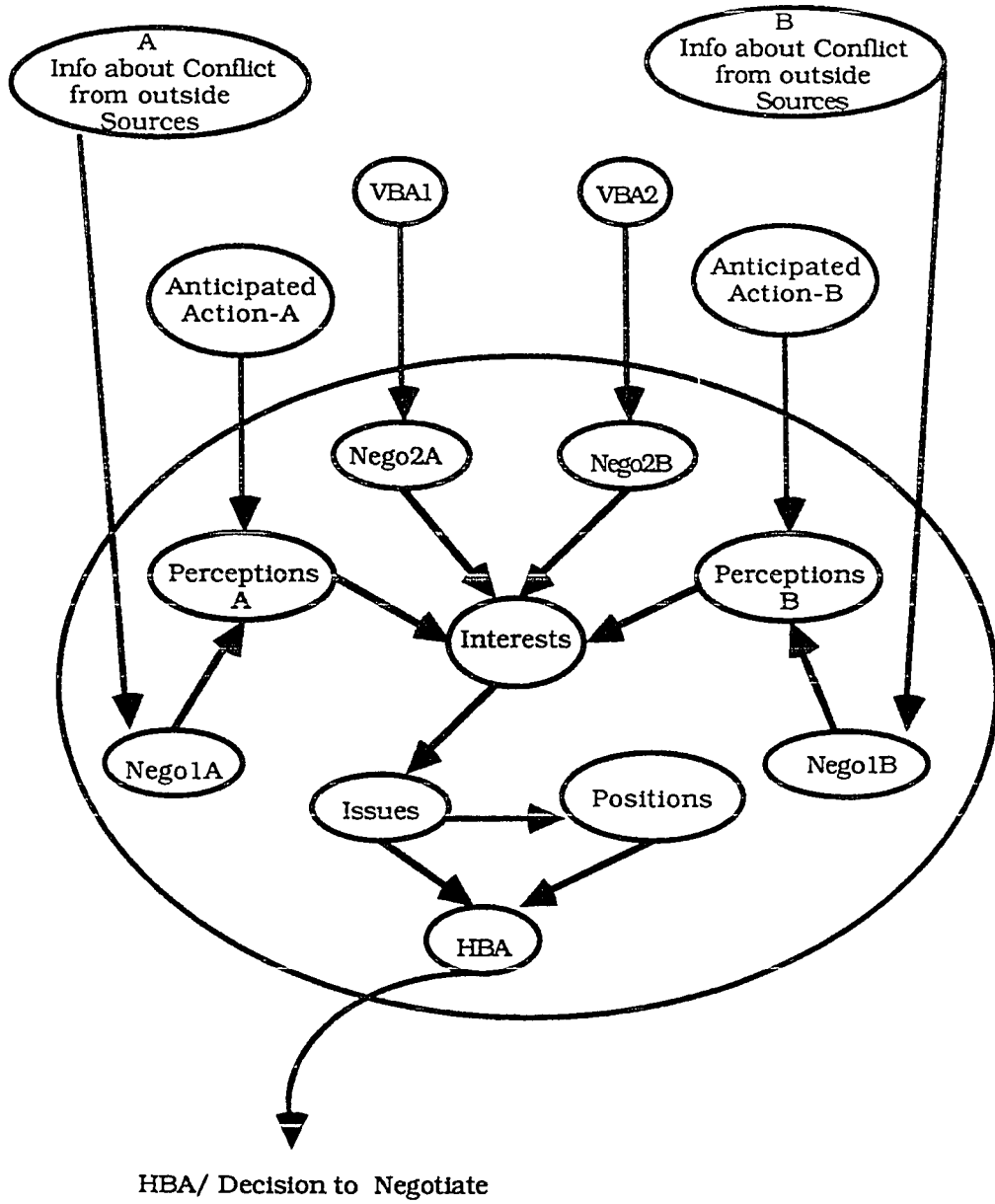


Fig. 4. Phase I Diagnostic: Horizontal Bargaining Resolution Level Two

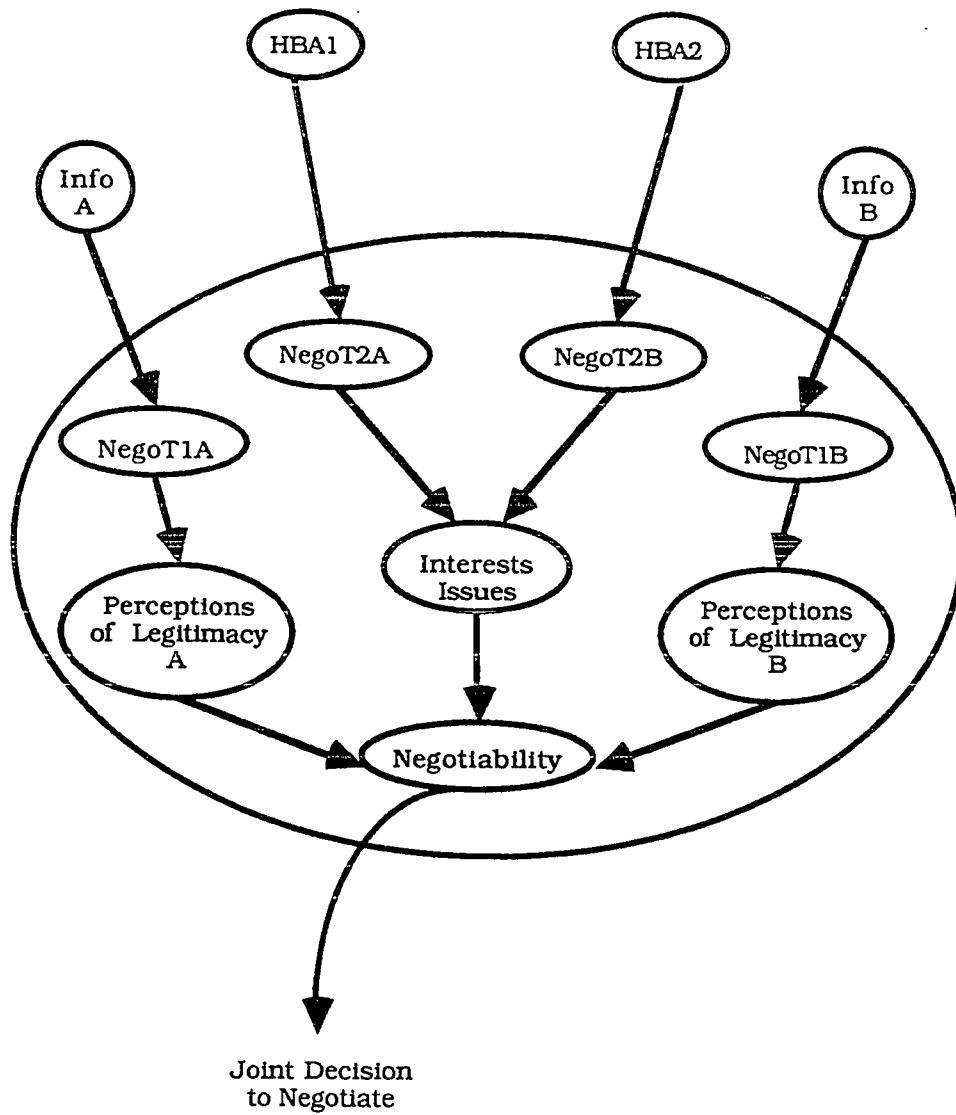


Fig. 5. Phase I Diagnostic: Joint Session Resolution Level Two

The vertical bargaining element during phase one is a terminal element. That is, it does not require input from other structural elements to be actuated. However, this element does need anticipated actions from the environment and information about conflict. Information about the conflict from the outside can be from any number of sources, e.g., other constituents, media, previous conflicts, etc. Another input directly affecting the Perception of the Conflict is Anticipated Action. This input depicts the perceived and/or anticipated reactions and action of the opponents involved in the conflict.

Horizontal Bargaining

The structural elements in horizontal bargaining can be divided into three groups (figure 4). The elements on left side are: Nego1A, PerceptionsA, Nego2A. Each of these elements have their own corresponding inputs, Information about Conflict-A, Anticipated Actions-A, and VBA-A. The elements on the right side mirror the ones on the left, they are: Nego1B, PerceptionsB, and Nego2B. Each of these elements have their own inputs similar to the left side. The third group of elements consists of: Interests, Issues, Positions, and HBA.

The structural relationship or pattern of the horizontal bargaining elements is similar to the structural pattern of the vertical bargaining. Instead of constituents and negotiators as there are in vertical bargaining, horizontal bargaining involves only negotiators.

The horizontal bargaining element has three types of input: Information about the conflict, Anticipated actions, and the VBA. The output is a Horizontal bargaining agreement (HBA).

Joint Session

The elements in joint session (figure 5) are: NegoT1A Perceptions of Legitimacy-A, NegoT2A, NegoT1B, Perceptions of Legitimacy-B, Negot2B, Interests-Issues, and Negotiability. The inputs are: Information-A (Info-A), HBA1, Information-B (Info-B), and HBA2. The goal of joint session in phase one is for the opposing parties to jointly agree to negotiate. There is similar structure in joint session as in the horizontal bargaining element, except the interests and issues are not necessarily generated during this time. Using the HBAs as guidelines, the NegoT1B and NegoT2B present and define the interests and issues. From the interests and issues element negotiability of the issues is produced. Based on whether enough of the issues

are deemed negotiable, the negotiators will decide to continue to negotiate, go into an impasse, or cease the negotiation process entirely, ideally as joint decision.

The elements NegoT1A and NegoT1A represent the negotiation team (similar to Nego1 and Nego2). They continue to receive information about the conflict. This in turn produces perceptions about legitimacy of the interests, issues, and the involvement in the conflict itself. Perceptions of legitimacy affect whether the issues are considered negotiable or not.

The Cognitive-Behavioral Model

This model is descriptive of the cognitive communication, and behavioral processes during conflict and negotiation. The dimensions of anxiety, paradigm shifts, and learning are incorporated, which are often neglected in other types of analysis (for a definition of learning, see glossary). The model attempts to represent how turning points and impasses might occur, and show causal relationships between certain behaviors and interest satisfaction.

Conflict can last for a long time; the intensities and levels of dissatisfaction or anxieties will have basins of stability and thresholds of instability. Negotiation is a process that countervails and/or resolves a conflict. The

two loops indicate cognitive processes. The left loop indicates what occurs during conflict, and the right loop represents processes during negotiation.

The precondition of any negotiation is some sort of conflict; that is, the self-interest of one is perceived to be threatened, jeopardized, or compromised by another. "The competition of interest satisfaction..." (Lincoln et al. 1986) can easily set off a series of behavioral reactions that can be mapped in a positive feedback loop (see figure 6; for positive feedback, look under feedback in the glossary).

Threatened interests promote uncertainty, anxiety, and insecurity, natural consequences of conflict. Uncertainty affects (even distorts) one's perception of the conflict and of others who are involved. Uncertainty also affects how accurately one can predict the behavior of others. Being unable to predict accurately (such as, what the outcome of the conflict will be, what the "other side" will do, how to interpret the situation, what are the choices of actions) heightens anxiety, distrust, and interest dissatisfaction. When one is unable to predict another's behavior with any assurance then the anxiety and dis-ease of the conflict will continue. This, in turn, increases

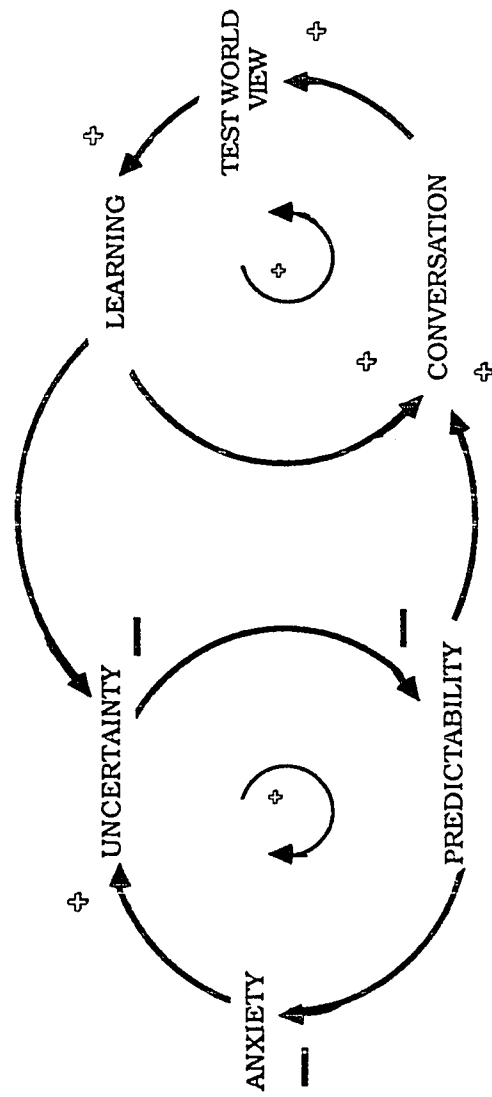


Fig. 6. Cognitive-Behavioral Model

uncertainty (Rangarajan 1985). Axelrod (1984) advises against intentionally cultivating unpredictability as a strategy. "If you are using a strategy which appears random, then you also appear unresponsive to the other player. If you are unresponsive, then the other player has no incentive to cooperate with you. So being so complex as to be incomprehensible is very dangerous" (Axelrod 1984).

We are always more comfortable with those whose behavior we can predict. If others are unpredictable enough then social contact and communication are undesirable. This keeps the feedback loop on the left activated and exacerbates the conflict. At some point negotiation might be deemed as the appropriate response to the conflict. This turning point can be triggered by conciliatory efforts from outside the system, or participants within the system deciding that the problem situation needs to change. We now can map the feedback loop on the right.

Uncertainty is reduced and predictability increased by conversation. Defined cybernetically, conversation is:

...a series of verbal or non verbal exchanges between two distinguishable entities, during the course of which understanding is reached about the definition of any of the series of concepts which make up the subject matter domain of the conversation. In order to qualify for this definition, the conversation must refer to a possibly evolving context and the participants must agree to honour this constraint....[Elizabeth Pask] (Von Foerster 1974).

Conversation promotes the opportunity to examine and understand other's world views, or paradigms. With continued conversation, the testing of world views, and formulating and reformulating one's understanding of another's world view are almost unconscious process of social interactions. Negotiators need to make a conscious effort to test and examine other's paradigms. This is done by active listening, consensus methodologies (Warfield 1982), monitoring the feedback in the conversation, and study and investigation.

The testing of world views results in learning, which in turn is positively connected to conversation. Changes in learning affect conversation in the same direction, i.e., positively. Learning has another stronger connection, an inverse relationship to uncertainty. As more learning occurs, some levels of uncertainty are reduced.

The two positive feedback loops are interconnected, at the same time giving and receiving input from each other. The loop on the right is a positive feedback loop which receives input from the predictability element, at the same time it drives the loop on the left from the learning connection.

One should note that in causal-loop diagrams, connections indicate directions of relations, not quantity or

quality of the relationships. The learning may mean a convergence of ideas--"the other side is not so different after all." Sometimes the learning only "reaffirms" the rationale for the conflict. In both cases some learning has occurred and uncertainty has been reduced. In the latter case, however, the connection going to conversation may not be made--"Now I know why I don't want to talk to them."

It is not possible to measure an exact amount of one's own anxiety or dissatisfaction. One might make relative comparisons: anxiety about X is greater than Y. The elimination or reduction of an anxiety is notable, and even tolerance levels can be known. If quantification of one's own anxiety is difficult, it is even more difficult to know someone else's. Perceptions of another's anxiety and the testing of world views must always be filtered through one's own perceptions. A negotiator needs to remember the nature of the observer as an observing system and how that might affect the negotiating process. To say with absolute confidence that one completely enters into another's world view is a falsehood.

Consensual domain (see glossary) can be obtained, such that disputants' behavior will become predictable and uncertainty will be reduced to a level that dispels some,

if not most, anxiety. Reduced anxiety, due to predictability and conversation, paves the way for negotiations to progress to a successful settlement, i.e., interest satisfaction. Conversation, predictability, and reduced uncertainty need to be present for a successful negotiation; however their presence will not assure resolution of the conflict. The outcome might merely be a better understanding of a more predictable opponent.

When the right loop continues to be more active and its influence stronger than the left loop, then the affected negotiations will be more like a problem solving session; with an atmosphere more like the ideal win-win negotiations (Fisher and Ury 1983; Gerstein and Reagan 1986; Warfield 1982). If the uncertainty remains high, and predictability low, the positive feedback loop on the left could cause a temporary impasse in the negotiation, or lead to a complete stoppage with unresolved conflict and continued competition of interests between disputants.

The model is primarily constructed with positive feedback loops because conflict and negotiations are processes of change and growth which have potential for explosive reconstruction or destruction. The connections (arrows) in a causal loop diagram show relationships and feedback. Some feedback loops might be stronger than

others, depending on the particular problem situation, players, and environmental influences. Some connections behave as thresholds where an element must be at a certain level in order for the connection to be actuated. For example, in figure 6 the connections between predictability and conversation and between learning and uncertainty can act as thresholds.

Summary

One of the powerful tools of systems science is the use of analogies to create formal models of two or more systems that are materially different, yet the processes and dynamic interactions of the parts are similar (Bertalanffy 1962). All negotiations are substantively different, yet one of the premises of this thesis is that there are similarities in patterns, processes, and structure.

CHAPTER 5
COMPUTER-ASSISTED NEGOTIATION

Introduction

Negotiators grapple with a great diversity of conflicts of varying degrees of complexity. As these problems and conflicts become more complex, the tools and methods employed by negotiators must also improve to keep pace. The technology of computers and techniques of computer modeling are still underutilized in dispute resolution. There is a growing need for negotiators to recognize what a boon computer assistance could be for them, as well as a need for more computer models to be developed to answer the special requirements of negotiators.

The approaches that set the Collaborative Negotiations style apart from most other styles are the use of: communication techniques, educational efforts, separation of issues and interests, and joint problem solving using consensus methodologies. These are also the very approaches that can best be enhanced by computers and computer models.

There are certain negotiation contexts where computer assistance is very helpful. The following is a partial list of such negotiation contexts where:

- 1) disputes involve a large amount of scientific and technical data;

- 2) elements of uncertainty require what-if and risks analyses;
- 3) negotiators and technical experts are spatially and/or temporally remote;
- 4) disputes have numerous parties and constituencies;
- 5) "real-time" testing of solutions is limited by time, resources, or safety considerations.

There are two major categories of computer-assisted negotiation models: one category deals with the substance of the negotiation and the other addresses the process. Most of the computer models discussed in this chapter are substantive in nature; that is, they aid the negotiator in modeling the negotiation's substance. The example in the fourth section is an exception; ODINE II takes on the role of a third party facilitator, much like a mediator would. Thus, the computer model is viewed as assisting the negotiators with the process of the negotiation.

This chapter will be organized from the perspective of the user or the negotiator. The first two sections describe a certain negotiation behavior or task, then give examples of computer models that would assist in that task. The computer models are very flexible and can be appropriately used in more than one type of task. Because a model is discussed in one context does not imply that it could not be used in another function. In the third and fourth sections, the use of telecommunication and the

computer as a neutral third party in negotiations are presented.

Conflict Assessment

Conflict assessment is the continual updating and information gathering process that all negotiators do. In conflict assessment, the primary goal is to understand the causes and specific characteristics of the conflict. Assessing a conflict systemically would involve such questions and considerations as: What aspects of the conflict might be structural or issue based? What is the boundary of the problem situation? What and where are the significant positive and negative feedback loops? What are the stated, actual, and rewarded goal? And so on. From this body of information, the method of conflict resolution is chosen; interests, issues, and positions are identified; proposals are created; and strategies and tactics are selected.

After the initial conflict assessment, it is necessary to continue updating the entire problem situation. New information and disputants' behaviors (and inactions) can alter: 1) the negotiation's progress and/or course; 2) the disputants' and the stakeholders' perceptions and positions; and 3) the negotiation's outcome.

Interest-Issue-Position Development Instrument

In the Collaborative Negotiations style, the Interest-Issue-Position Development Instrument (IIPD) (figure 7) is used as a conflict assessment guide to organize information and prepare for a negotiation (Lincoln et al. 1986). The IIPD encourages the negotiator to consciously identify: essential self-interests and the interests of others; substantive issues that are related to the interests; various positions, including the fallback and bottom line positions; and consequences of impasse. The instrument is designed merely to be a guide, not a negotiation script. When necessary, IIPDs should be revised as learning and updating of information occur during the negotiating process.

It is very important to note that IIPD significantly differs from other interest/issue charts in the process by which an IIPD is created. The chart encourages a step-by-step procedure, each column is numbered (see figure 7). All interests are identified and listed first. The issues list is generated, based solely on the interests; in other words, no issue is included without a related interest. Interests, not issues, are the foundation for every column in the IIPD chart. The IIPD is also iterative. As more information becomes available, e.g., more interests are

THE COURSE in COLLABORATIVE NEGOTIATIONS

INTEREST - ISSUE - POSITION DEVELOPMENT INSTRUMENT

Own Interests	Issues	Initial Position	Secondary Position	Subsequent Position	Fallback Position	Bottom Line	Consequences of Impasse
# 1	# 2	# 6	# 7	# 8	# 5	# 4	# 3

The flow of this INTEREST-ISSUE-POSITION DEVELOPMENT INSTRUMENT reads from left to right. However, when completing the instrument you should complete the columns in the order indicated by the numbers at the bottom of each column. Your instructor will define and explain the purpose and functions of each term and item listed.

Fig. 7. Interests-Issues-Position Development Chart

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discovered, then they too must also be included in the chart.

Many IIPDs might be created during the conflict assessment stages. An IIPD is developed by each individual, with his/her own interests, in preparing to unite a negotiation team via horizontal bargaining. The team as a whole, during the horizontal bargaining process, will develop IIPDs before any joint sessions with the other side. Concurrently, IIPDs are made for the vertical bargaining situation to ensure accountability and consensus. If there is enough time, hypothetical IIPDs will be made for the other side, to aid in understanding their interests, to better anticipate problems, and to develop positions to encompass all disputants' interests.

This instrument is very helpful because it provides the essential categories to organize conflict assessment information. When the IIPD is used properly the negotiation team's focus is on interest satisfaction. The IIPD is, however, a static representation of a very dynamic process. Even with the aid of a word processor, creating each IIPD chart can be time consuming and cumbersome. In complex negotiations, IIPDs can not store all needed information. Although the data could be condensed, that usually reduces the quality of much-needed information.

Therefore, supporting data and documents, as well as IIPDs from related negotiations must be stored separately from the main IIPD. As a consequence, negotiators may find themselves using short-cut methods with IIPD or sometimes neglecting to employ the instrument.

Collaborative Negotiation Support System (CNSS)

CNSS is designed to support the negotiator in conflict assessment using the IIPD chart as the core design principle. Combining hypertext capabilities with a database for information storage, IIPD charts are generated and connected to all relevant and supporting information.

This computer model, unlike all other examples in this thesis, is merely in the design stage. The designers of the CNSS are Campbell and Greenblatt (1988). Although CNSS is completely based on, and its design principles support, the Collaborative Negotiations style and Lincoln's IIPD Instrument, CNSS is not National Center Associates' property.

The user may create (or break) connections between the columns in one IIPD chart or between many charts. Inherent in the design are "interests checks," that is, the model will not allow an issue or a position to be listed without an associated interest(s) in an IIPD chart.

From any place in the model, users can immediately access historical, supporting, and other related information in various forms (e.g., newspaper articles, other settlement documents, personnel histories, numerical analyses, etc.). The user can form connections between and/or flag relevant, supporting, or contradictory information.

CNSS can perform a similar pattern-matching function as CASCON II (see below); however, it is more adaptable and flexible. CNSS information can be structured, stored, and retrieved in different formats, and organized in ways that are meaningful to the negotiator.

Some negotiations are related to others, either historically with the same disputing parties, or structurally with similar characteristics and issues. Examples of related negotiations would be annual labor disputes, international trade agreements, or strategic arms talks. In mass tort litigations, the negotiations are a part of a series of similar cases, where uniform treatment of each case is desirable.

Precedent analysis, is a part of the conflict assessment stage. Precedent analysis is done to find patterns in previous and related cases, in order to develop plans and strategies for the current negotiation. Several com-

puter models have been developed to support negotiators and policy makers in precedent analysis. Two examples are CASCON II and Mass Tort Management.

CASCON II

Information on previous local conflicts (i.e., small wars or potential military clashes) is organized into a database. This computer model allows the analyst to compare already known conflicts with new developing ones. It provides a systematic way to gather and organize the various factors affecting the situation, such as economic and ethnic factors, great power involvement, previous policy decisions and actions, etc.

The analyst can query CASCON II and retrieve information about any and all conflicts using the various dimensions of the conflict(s). Not only does CASCON II provide a way to pattern-seek, it aids the user's imagination in generating important questions and action plans for timely policy decision making. Officials in governmental and international organizations have already shown interest in this computer model (Bloomfield and Beattie 1971).

Mass Tort Management

In at least two mass tort litigations, the Dalkon Shield (an intrauterine birth control device) and asbestos,

computer modeling was used to do case analysis. These cases involved up to billions of dollars and hundreds of thousands of plaintiffs. To fairly assess punitive damages within legal time limits, for each case, would have been impossible without a computer's help (Nyhart and Goeltner 1987; Jones, interviewed with McGovern 1988).

The computer models analyzed all previously settled cases and the data from pending cases. This analysis was then used to derive statistically the most likely award for each plaintiff. The plaintiff could choose whether to settle out of court and accept the computer-derived settlement, or to continue with the litigation.

The key to the successful use of mass tort management was in the equal participation from all parties in developing the database's structure and content. Due to the cooperative effort by all disputants, the model was accepted as being credible and treated as a neutral source of information (Nyhart and Goeltner 1987; Jones, interviewed with McGovern 1988).

Consensus Building

In practically every stage of Collaborative Negotiations, some form of consensus building is present. Consensus unifies the internal negotiating team and gives each person the sense of equity and ownership. Consensus

must be obtained in both horizontal and vertical bargaining.

Consensus building ensures that all participants' skills, ideas, and knowledge are tapped; thus a synergistic knowledge base is developed. Consensus building techniques encourage communication and active listening among disputants; resistance to others' ideas, beliefs, and needs is lowered. When consensus building is done well, participants feel that they may change or alter opinions without loss of face.

Consensus building is the process by which the team prepares for a negotiation--defining interests, issues, and positions. This process is also used to create and test solutions and proposals in such a way as to maintain equity and ownership.

Many methods and techniques have been developed to manage small group process and consensus building. For an excellent review of "low-tech" methodologies, see Olsen (1982) and Warfield (1982). Recently, some computer models have been developed in what can be generically called group decision support systems (Kraemer and King 1988). Many computer models that assist negotiations fit into the category of supporting consensus building; these models will be discussed below.

Simulation Modeling

Simulation modeling of the negotiation's substance has been extremely successful in consensus building and in the joint negotiation sessions. How this type of modeling has been used and why it has been helpful will be reviewed. Before the examples, a discussion of this type of modeling is warranted.

Simulations are considered descriptive models which represent the substance of the negotiation. They are used to ask what-if questions and to make sensitivity analyses. Simulation modeling is of great value in situations where every solution is a "one-shot deal" or when learning by trial-and-error is neither possible nor feasible due to time, resources, or safety considerations.

System dynamics modeling, using computer tools such as STELLA and DYNAMO, is a methodology frequently used in simulations. Systems dynamics modeling is designed to be intuitive for nontechnical users, yet powerful enough to capture the dynamics of very complex systems with feedback and causal relationships.

Simulation models, as with all models, "...do not represent truth but the beliefs of the designers or experts, which in turn are based on their subjective

assumptions and goals" (Jarke 1986). In a negotiation context, inconsistencies based on subjective factors should be neither avoided nor interpreted as design errors. The purpose of the modeling process is to ferret out the inconsistencies and use them as a basis for discussion.

Samarasan (1988) suggests two ways to employ simulation modeling:

- 1) As an adjunct to the negotiation process. Simulation modeling can be utilized in the internal team bargaining process, both horizontal and vertical bargaining, to coalesce and define the interests and issues, and then perhaps to present model(s) and the findings in joint session in an educational mode.

- 2) Using the modeling process as a single negotiating text (see glossary). The computer model, like the single negotiating text, is used as a device for concentrating the attention of the parties on the same text or issues (Samarasan 1988). This technique structures the process of diffuse and complex negotiations.

Clearly the process of building a computer model is useful in negotiations, particularly when both sides build the model together. The mere act of modeling collaboratively assists in consensus building by: 1) revealing hidden assumptions and interests; 2) separating issues and

interests; 3) identifying areas of uncertainty; and 4) increasing communication (Antrim 1987; Jones 1988; Samarasan 1988; Sebenius 1981; Raiffa 1982).

MIT Deep Seabed Mining Model

One of the most successful examples of computer modeling helping to bring order and break impasses in an international negotiation is the Deep Seabed Mining Model.

Abundant manganese nodules on the ocean floors are valuable commercial sources of much needed minerals. Most of the potential mining sites are in international waters. In 1970, the United Nations adopted the notion "...that the seabed beyond the limits of national jurisdictions be declared the 'common heritage of mankind' and nodule exploitation be undertaken on behalf of the international community" (Raiffa 1982). Furthermore, the UN suggested that an international regime be created to harvest the resources by an equitable means.

In 1973, the Third United Nations Conference on the Law of the Sea (LOS) was convened to address many of the oceanic laws and rights issues--the deep seabed mining being just one of many on the agenda. The "common heritage" principle became part of the negotiation's conceptual agreement (Raiffa 1982; Sebenius 1981).

By 1978, agreements had been reached on the majority of the issues. A few unresolved issues remained. "Prominent among these intractable issues was a system of financial payments to the international community to be required of future miners in return for the right to mine" (Sebenius 1981). The situation was viewed as a zero-sum game: perceived gains (or losses) for industrialized countries were losses (or gains) for developing ones (Antrim 1987).

A group of MIT researchers under J. D. Nyhart developed a model to compare the economic performance of proposed deep seabed mining systems under various conditions. This model was designed and financially supported independent of the LOS negotiations. This, among other factors, was the basis for the model's acceptance by a majority of the LOS conferees. Unlike the Mass Tort Management (MTM) models, the MIT model was seen as neutral because it was completely developed by outside parties whereas the MTM models' acceptance was based on the principles of equity and ownership by all parties.

The MIT model's flexibility allowed the various parties to test any proposal according to their own interests. Iterative testing revealed the financially extreme proposals, either overly optimistic or pessimistic.

The authors could revise them without having to accept other proposals or openly admit theirs as unfeasible.

In sum, the model provided: a common economic language for discussion, a means to evaluate the economic outcomes and choose the most efficient alternatives, and ways to discuss the economic issues in a nonideological manner. "The model also assisted the negotiators by leaving the political judgment of deciding among efficient solutions, or deciding to reject all solutions, to the negotiators themselves" (Antrim 1987; see also Nyhart and Goeltner 1987; Sebenius 1981; Raiffa 1982).

The Obergurgl Experience

At times, more is gained by the collaborative modeling efforts than from the model's analytical output. The following example illustrates this notion.

Obergurgl is an alpine region in Austria, which, due to "progress," had grown rather haphazardly. Over a long period of time, conflicts had developed over how to utilize the region economically and ecologically.

In 1974, several workshops involving ecological modelers, computer scientists, various experts, local businessmen and officials, and "some plain village folk" were set up to jointly build a model (Raiffa 1982). The

communication problem was monumental; "...and I'm not referring to the English-German divide. The innkeeper's idea of a model, for example, was one that had bumps and curves, not mathematical variables" (Raiffa 1982).

After several workshops and many attempts, the model improved, however slightly. During the modeling process, the experts elicited concerns, perceptions, and knowledge from the Obergurglians. Groups that had long ceased speaking to each other started to communicate, gaining insight into each other's problems. "They began to communicate not via the model but around the model" (Raiffa 1982). As a result, the local Obergurglians started to solve their own problems.

Not every modeling effort is analytically successful. "...[T]he modeling of physical systems is not the final aim of analysis: those modeling efforts have to be conveyed meaningfully to practitioners" (Raiffa 1982). Usually the most valuable results come from the modeling process itself. In other words, if the negotiators do not take part, to some degree, in the modeling process, then much of the learning can be lost. An involved negotiator learns more about the substance being modeled, develops better means to communicate, and gains insights into other disputants' world views.

Decision Support Systems

Simulation modeling is descriptive of the negotiation substance and can be a vehicle to generate various options and solutions. Prescriptive models are used to assist in evaluating and testing proposals and solutions. Two categories of prescriptive decision support computer models are described below.

1. Assessment models support decision making in contexts that are characterized by uncertainty and where probabilistic analysis is required. Uncertainty, in this context, relates to situations where there is incomplete information about variables that are perceived to be deterministic in nature. These models involve the assignment of probability to the choices by prioritizing, weighting, and/or ranking preferences.

2. Optimization Modeling takes assessment modeling one step further. The models assign probability through logical or mathematically constructed rules. With these rules, the possible outcomes that best fit stated solution criteria are analyzed (Antrim 1987).

Communications

Negotiations that are dispersed, either spatially and/or temporally, can be greatly facilitated by communication technology. Conceivably, an entire negotiation could be conducted remotely; more likely, however, a mix of face-to-face meetings with telecommunication systems would be employed for expedience and cost effectiveness. Network Groups, audio/video teleconferences, computer conferences, and remote databases are some of the computer systems and software available to the negotiator. This section gives brief definitions and descriptions of some types of computer communication, followed by a discussion of how they assist (or could assist) negotiations.

Video/Audio Teleconferencing

This facility generally is conducted in specially prepared conference rooms with communications software (for digital transmissions of voice, data, and pictures) and audio-visual equipment. This facility is designed to facilitate meetings between groups in two or more locations, mimicking face-to-face meetings. It is synchronous, and needs to have some form of centralized mediation to control transmissions and procedures (Kraemer and King 1988).

Computer Conferencing

Computer conferencing is asynchronous; that is, the "meetings" are held over a specified period of time. A particular topic will be chosen and introduced by a chairperson, usually with text or a statement framing the conference, requesting information, debate, etc., which is then broadcast on a telecommunications network. The network is not limited by distance or number of participants; it might be private, within an organization, or between two or more groups. Also, the network could be open to the public, or only to network subscribers. Participants may access the network at any time, read messages and contributions by other participants, and broadcast their own responses and messages. The meeting would normally end with the chair summarizing and closing the conference (Sarin and Greif 1985).

Group Network

This model supports small meetings between groups in different, but generally local, sites. For example, the group network model links participants from different offices and/or buildings together. Unlike a computer conference, a group network is synchronous, facilitating meetings interactively in real time. Users typically meet via workstations, communicating by voice and data trans-

missions. "Each workstation has public and shared spaces, terminal linking, meeting scheduling, bit-map sharing, and shared applications, such as graphics, word processing, and spreadsheets, which permit all participants to create, edit, or simply exchange graphics, text, or numbers" (Kraemer and King 1988). The meetings are conducted by a chair, similar to a computer conference, using a meeting scheduler (much like an agenda).

Remote Experts

In some negotiations the expert's presence is required; s/he might need to participate in most of the sessions. At other times, an expert might be needed for a short period of time. In this case it may be more efficient to access the expert remotely. Sources of expertise need not be human only; there are many databases situated world-wide that can be accessed by telecommunication.

It is very costly to retain a delegation during a negotiation which is technically complex, lengthy, and/or conducted off-site. Parties capable of supporting a delegation will have certain advantages over others; they will be able to ensure that their interests are met by their experts. However, if the disparity is too great, parties

without their own sources of expertise will tend to reject any or all results and recommendations (Antrim 1987).

Conducting some, if not all, of the negotiations remotely has the advantage of being cost and time efficient. Most communication technology is comparatively inexpensive, certainly more cost-effective than travel, lodgings, on-site consulting expenses, etc. The capabilities of telecommunications can be viewed as an economic equalizer; more disputing parties would be able to access needed experts and consultants.

Remote Negotiations

For spatially and temporally dispersed negotiations, the ability to carry out the more routine aspects of a negotiation through automated communication may also be desirable and efficient. When issues are emotional, remote communication may sometimes facilitate the negotiation's progress by allowing time and space to cool down tempers (Samarasan 1988).

Antrim (1987) reports that teleconference systems have already been developed for contractual types of negotiation between legal offices using a single negotiation text approach. He further suggests that the same type of system can be applied to negotiations involving protocol, agendas, and drafting settlements.

Third Party Facilitator

As previously mentioned, computer modeling need not merely support the substantive aspects of the negotiations. Giving computer models a more active role in the negotiation process can enhance both the progress and outcome, and support disputants in creating and evaluating the efficiency of potential agreements.

The following is a promising example of how computer models would assist in the negotiation process. ODINE II is a model that takes on some of a mediator's or arbitrator's role. In situations where there is a high degree of distrust and a perceived need for privacy or secrecy, disputants may be reluctant to employ a third party facilitator, or any type of outside expert, but the use of a computer system may be viewed as less objectionable (Goeltner 1987).

The ODINE II computer model by Goeltner (1987) assists in the decision making by acting like a mediator/arbitrator. The basic design allows the two parties to enter information about their utility preferences for each issue. This information is held in reserve and not shown to the other side. Then, for the ensuing exchange of solutions or offers, ODINE II will evaluate, according to an agreed-upon rule base, the two offers using the given utility prefer-

ences. That is, party 1 will be shown party 2's offer, in terms of party 1's own utility preference. Simultaneously, party 2 views the other side's offer in the same manner. After several rounds, it is assumed that an intermediate agreement will eventually be found. In the next stage, using the given utility measures, ODINE II "calculates the set of solutions which have a higher utility (Pareto efficient solutions) than the outcome reached so far (intermediate agreement)" (Goeltner 1987). If an outcome is found that is deemed better than the intermediate agreement, the computer will notify each side and will ask if they would like to continue negotiating using the model's own calculated knowledge.

At the time of Goeltner's report, the computer model was considered ideal as a teaching supplement for negotiation classes. Many problems have been addressed since the first report, and new directions in the use of the computer model have been explored. Since then, there have been revisions and improvements, and the model's applicability is now being tested in an actual negotiation setting.

Goeltner recognizes that the model is based on an assumption that the negotiators will be consistent with their preliminary utility assessment during the entire course of the negotiation. This, in fact, is rarely the

case in a real dispute. However, he suggests that in a case where there is a high degree of consistency ODINE II could be very useful.

Summary

This chapter proposed the use of computers and computer models as tools to enhance and assist negotiators' capabilities in various problem solving, decision making, and conflict resolution contexts.

Computer models lend themselves well to support Collaborative Negotiations' approaches and techniques, especially in conflict assessment and consensus building. Negotiators who collaboratively employ the process of computer modeling learn more about the substance being modeled, develop better means to communicate, and gain insights into their own and others' assumptions and interests.

Computer assistance in negotiations is still in its infancy, and it is not without its fair share of stumbling blocks. Much research still needs to be done in this field, however what has been done so far has been excellent and very promising.

CHAPTER 6
DISADVANTAGES OF AND RESISTANCE
TO COMPUTER MODELS

Introduction

No tool is universal; it is important to know when the use of a tool is appropriate and when it is not. The computer is no exception to this rule. There are certain criteria one can use to evaluate whether computer assistance would be of value in the negotiation context. These criteria will be discussed in the first section. In any type of problem solving situation, there exist potential pitfalls in employing computers. Some of the disadvantages and possible misuses in computer-assisted negotiations are discussed in the second section. The third section presents some ideas on the possible effects of computer-phobia (or computer illiteracy) on the adoption/acceptance process of computer technology by negotiators.

Acceptance Criteria

For computer assistance to positively impact the negotiation's progress and outcome, certain criteria must be met. The MIT project on Modeling for Negotiation Management has compiled a useful list of criteria for acceptance of computer tools (Antrim 1987; Jones 1988).

Applicability The computer model must address the negotiation's main issues and interests. If other models already adequately explain the problem, then further modeling would be redundant.

Veracity The degree of acceptance is directly related to the perceived accuracy of the model. The model must be testable, that is, the model and its assumptions must, to some degree, be transparent to all parties. The deep sea bed model was accepted because the model's assumptions and the structure were open for review by all disputants (Jones, interview with Antrim 1988). The Mass Tort Management models were considered transparent because all parties jointly built the models.

Adaptability A computer modeling technique should be able to reflect changes made in the negotiation context and/or problem situation. It should support new and innovative approaches to the problem at hand, and be able to test and evaluate solutions and proposals.

Accessibility The negotiators themselves must have ready access to either the computers or the technical experts or "model managers." For example, the MIT group made themselves available at certain times during the LOS conference, and outside of those times, any conferee

could contact the MIT group by telephone to test their mining proposals.

Integrity Faith in the computer operators and modelers is necessary for acceptance. There might be prior opportunity for outside neutral evaluation of the computer model. For the model and/or the modelers, as for any negotiator, confidence in integrity is gained by reputation and confirmed by appropriate conduct during negotiation. It is important not to oversell a computer model, and to remember that no model will answer all questions. A model manager and developer must be able to convey accurately the model's limitations and to guide negotiators in appropriate use of the model.

Misuse of Computer Modeling in the Negotiation Process

Computers and computer modeling can be used either collaboratively or competitively. They can enhance negotiation models that emphasize communication, joint problem solving, and interest-based resolution of conflict. Just as easily, this type of technology can be used in such traditional approaches to negotiation as distributive or zero-sum.

The benefits and advantages of computer-assisted negotiations as described in chapter four can quickly turn to misuse. When a traditional approach to bargaining is

followed, there is no perceived need to share information and knowledge since withholding information and exploiting uncertainty is a primary tactic to gain advantage over an opponent. When computers are used adversarially and models are pitted against each other, conflict tends to increase, rather than be defused (Samarasan 1988). The negotiation process can get bogged down in the "battle of the print-outs" (Jones, interview with Straus 1988). Each side models their perceptions of the issues, and presents each model as persuasively as possible, further entrenching each party in its own world view.

When the modeling process is misunderstood and/or misused by the negotiators there are several possible pitfalls:

- 1) The negotiation's progress can be bogged down by arguments about the assumptions and reliability of the data with which the models were built.

- 2) Just as the underlying interests can be ignored for issues, the assumptions and questions that are the foundations of models and the modeling process can also be ignored.

- 3) Discussion over the basis of the models is substituted for argument over the substantive issues.

4) It may be tempting for some negotiators to use computer models and their results to further confuse perceptions of the problem situation.

In chapter four, negotiators' involvement in the model building process was encouraged. However, there are times when the substantive issues are extremely complex; to adequately model them, to the appropriate degree of aggregation and detail, requires technically-oriented experts. Negotiators can begin to feel alienated, having to rely on technocrats and experts to create the models and supply information. This can promote grave consequences for the negotiation's process and its outcome. Some of these consequences might be:

1) The entire negotiation could shift into a distributive style, which tends to lay a foundation for future conflict.

2) The sense of alienation creates a loss of equity and ownership of the process, solutions, and/or problem. This could build resistance to any suggested proposals by the other side, or even those presented by one's own experts.

3) Negotiators might become over-awed by the computer models and trust the results at face value. They could forget that all models, whether computer generated or not,

do not represent truth, but are an approximation influenced by the modeler's bias and world views.

4) Straus suggests an additional problem which is related to the preceding point:

Those who are computerphiles tend to rely on them to the exclusion of human imagination and judgment. Once you have built a computer model, there is a tendency to be hemmed in by it. It removes some flexibility and openness to new ideas (Jones 1988).

Resistance and Acceptance of Computers

Despite the ubiquitous presence of computers, there remains resistance to their acceptance. Perceived limitations in available technology, misconceptions about computers, and computer-phobia are factors that restrict computer use and slow their rate of adoption.

Many people believe that computers have restricted data processing capabilities and can only be mastered by or useful to highly trained experts, usually in disciplines requiring a great amount of numerical calculations. At one time, computers were difficult to operate and their applications were in very specialized areas. However, computers have moved from their air conditioned rooms, and have become very versatile and accessible to many people in a variety of functions. Advances in technology, such as development of the microprocessors and "user-friendly"

software, have produced personal computers that have economical, powerful computational abilities.

The use of computers is no longer restricted merely to "number crunching." There are two main ways to represent information, numerically and symbolically, and computers are able to do both. Computers are obviously useful where intensive numeric calculation is required; where there is no purely numeric structure, symbolic manipulation can also be utilized. The examples in chapter four, process simulation and precedent analysis, mainly utilize symbolic manipulation (Samarasan 1988; Winograd and Flores 1986).

In addition to the limited understanding of computers' technical abilities and functions, computer-phobia greatly influences the acceptance and utilization of computers. Inexperienced non-users tend to perceive computers as complex, depersonalizing, and smarter and more powerful than most humans (Gilroy and Desai 1986). Studies which investigate computer-phobics' responses to computers have shown that positive attitudes and/or perception of efficacy in regard to computer use is an important factor in their adoption. Previous experiences (successful or not) and perceived usefulness play a less important role in the

adoption process (Hill, Smith, and Mann 1986; Hill, Smith, and Mann 1987).

Gilroy and Desai (1986) suggest two approaches to reducing "computer illiteracy" (thus increasing the likelihood of adoption); one is to offer instruction in computer programming; the other is a functional approach, focusing on applications and computer usage as a tool. For those who are very computer-phobic, the second approach tends to be more successful in reducing their anxiety.

If there is an interest in adopting computer technology to support a negotiator's work, one of the first steps is to educate the negotiator on what a computer can and cannot do, and to give him/her a sense of self-confidence about using the devices. Gaining a sense of efficacy and a positive attitude toward computer use further underscores the need for negotiators to become appropriately involved in the modeling process, and even to become involved in the designing of their computer systems and models.

Consumer Research

Since many of the computer model examples in chapter four were designed to run on personal computers, research on the adoption process of personal computers could be helpful to advocates of computer-assisted negotiation. One

need only turn to consumer research, a relatively new area of study, to find interesting perspectives on personal computer adoption.

Consumer research assumes that an innovation adoption process is a function of the innovation's characteristics and the personality traits of the consumer. In surveys conducted by Dickerson and Gentry (1983), personal computers were considered complex and functional innovations requiring the establishment of new behavioral patterns, promoting change in ways of work and communication. Although computers and software have become increasingly more user-friendly, the perceived complexity and difficulty in using this innovation, coupled with its relatively high cost, tend to slow down the consumer adoption process. On the other hand, advantages, functionality, and status of a home computer will positively affect the adoption process. Previous experiences with similar types of complex and technical innovations also prove to quicken the adoption rate of home computers.

There is a time lag between perceived difficulty in using personal computers and actual difficulty. The trends in software and hardware development are increasingly geared for the nontechnical user. As the availability of new user-friendly hardware and software becomes known, and

as more computer novices start to use personal computers, the adoption rate will quicken. Frequently, a non-users' first introduction to a personal computer is in the work place, where they are most likely to acquire some knowledge of and confidence in the innovation.

According to consumer research, certain personalities will have a tendency to adopt different types of innovations. For personal computers, Dickerson and Gentry (1983) state that

...to some extent, the adopter profile is similar to that of the adopter of many other types of innovations: middle-aged, higher income, more education, opinion leader, information seeker, and so on. On the other hand, the profile also suggests that the adopter is a 'logical introvert'...rational, quantitatively oriented, [and] unsocial.

Although these types of personalities easily adopt home computers, they are less likely to adopt technical devices that facilitate communication, thus increasing human interaction (such as speed dialing and innovative telephone services). Weinberg (1971) observes that "If asked, most programmers would probably say they preferred to work alone in a place where they wouldn't be disturbed by other people."

One would assume that the socially-oriented person would be less likely to adopt computers, but more likely to use communication devices. By extension, professions, such

as conflict resolution, which require social interaction and good interpersonal skills would also resist using computers. If the increase in the adoption rate among consumers least likely to use computers is desirable, then the innovation's characteristics must be altered to match and support that personality type. The innovation must be designed to support the user's qualitative aspects and needs.

Matching the characteristics of an innovation with the characteristics of potential adopters yields an understanding of why certain innovations are adopted and, to a lesser degree, the expected rate of adoption. This type of research can also be helpful in directing developers to create tools that match the characteristics of the users.

Summary

Blind acceptance and complete rejection of computers and computer models are spawned from ignorance and fear. Both of these factors, along with misunderstanding and misuse of computer modeling, can be disruptive to the negotiation process and negatively affect its outcome.

At times, the tool itself may be inappropriate for the problem, that is, there may be no match between the negotiator's need and the tool's capabilities. Computer

assistance in mass tort litigations would be appropriate due to the massive amount of information to be processed. On the other hand, according to McGovern (in Jones 1988), "in child custody cases I doubt if you can quantify elements of the dispute in ways that could assist in determining who gets custody."

Some disadvantages are not a function of the tool's characteristics and capabilities; instead they reflect how responsibly the negotiators employ computers and models. Such types of misuses can have a negative impact on the negotiation's progress, as outlined in section two.

Using computers in negotiations can greatly support and enhance a negotiator. There are disadvantages, however many can be overcome or avoided when the negotiator matches the right tools to the right job, and then utilize them in an appropriate manner that will assist rather than hinder the negotiation process.

CHAPTER 7

RECOMMENDATIONS AND CONCLUSIONS

Part One

Introduction

Warfield (1982) and others have examined how problems are viewed and how strategies are developed to manage intractable problems. It is not an uncommon phenomenon that the complexity of a problem requires an increase in the complexity of the tools needed to deal with it. This solution, though it may be the optimal one, instead of quickly resolving the problem, frequently creates yet another level of complexity (Warfield 1982). When developing computer systems for negotiators, this phenomenon must be considered. In doing so, the author recommends that the process and implicit assumptions of design and tool building be examined by both the intended end-user and the development team. Also the systemic goals (stated, actual, and rewarded) of the development project, the supporting organizations, and the individuals should be considered. Investigating these and other systemic aspects of computer development can help practitioners create a system that is responsive and supportive to the end-users' needs.

Tool Building: Assumptions and Considerations

Changes by Tool Designers

Tool designers are both affected by and create changes in their environment. The design process consists of interlocking and mutual causality--a complex system of feedback. A new tool that is developed to support work will alter the way of work; and over time it can change perceptions of the problem and the environment in which the tool is used. This, in turn, will affect the tool designer's perceived need for new and different tools, or suggest alterations in the existing tools (Hirschheim 1985; Winograd and Flores 1986; Zmud 1983).

It is not the purpose of this chapter to go into an in-depth discussion on this complex social-technical feedback system. However, what needs to be remembered by all computer system developers is that in the usage of their tools lies the potential for greater changes that reach beyond the immediate programmed task. These changes may indeed increase the level of complexity of the problem or can simplify and make an intractable problem more manageable. As a simple example, when computer systems and models are employed in negotiations, they are likely to alter the timing and flow of the negotiation's progress. This might be a desirable thing; valuable time and money

can be saved. On the other hand, it can be argued that people need time to go through the negotiation process. There is a certain expected pace and timing. If the expected pace is rushed or impeded, impasses can occur and the sense of equity and ownership can be lost.

Evolving Knowledge

Collections of data and knowledge in most computer systems (e.g., databases, expert systems, etc.) are like snapshots--static in nature. Changes, both short- and long-range, due to economic, social, and technological forces will cause an evolution in knowledge and world views, which will not always be reflected in existing computer systems (Sridharan 1985). For computer systems and models which are to be used over a long period of time and/or in more than one negotiation, the developers should consider designs that are capable of adapting to the continual flux of our social matrix.

Single user vs. Multiple user

Many applications are designed with the implicit assumption that there will be a single user. Until recently, it was appropriate for programmers and developers to work with this assumption and design systems for the

single user. Even in a time-share system, where there are multiple users, work is not done collaboratively.

The role of computers in a negotiation context is not only to support certain tasks, but (in a more fundamental sense) to enhance socially organized work. These systems need to be for multiple users. Rarely are complex problems, involving many people, solved by one person. This means that the designers need to alter their basic design assumption that the system(s) will have only a single user.

GOALS (Stated, Actual, and Rewarded)

In chapter three, a method was discussed to analyze conflict by examining the system's three types of goals: stated, actual, and rewarded. The same method can be employed by developers during the design stages of a computer system. The following is an outline of some questions that a developer might ask in order to create a better and more responsive system.

- 1) What are the three goals of the organization(s), negotiator(s), and/or the constituents with regard to the conflict and problem situation, both for the present and for the long-term? What are some anticipated and desired long-term and short-term changes that would affect the goals and the problem situation? The same basic questions a negotiator would consider during the conflict assessment

stage are what a designer should ask. By asking these questions, a developer gains a sense of the stakeholders, the problem situation, and the environment in which his/her system will operate.

2) What are the disputants' goals for the negotiation? Are they any different from the above goals? If so, why are they different? What outcomes are expected from the negotiations?

3) What is expected of the new computer system or model to help meet those goals? What changes are anticipated by using the new system?

4) Who controls or sets the goals? Who has responsibility or authority to judge when they have been met?

The Development Team

Software projects have a needs assessment phase where the users' requirements and specifications are identified. Unfortunately, this phase is usually short-lived and sometimes done only once, and feedback and suggestions from the intended users are not always solicited during the remainder of the project. This usually has a negative impact on the quality and ultimately the usability of the newly developed product.

Negotiators' involvement in the model building process, during the negotiation, has been emphasized in this thesis as a way to build consensus and to understand and accept computers and the world view of others. The author further recommends that at least one negotiator be included as part of the development team to provide expertise. Negotiators should participate in every stage of development, or at the very least, be readily accessible to the team. There are two reasons for negotiators to participate during the development of a computer-based negotiations system or model. First, the end-user input is critical to a good and usable product. The technical team members will have experts on hand to give them the required perspective about how a negotiator works and thinks. Suchman and Trigg (1986) emphasize this point: "To design technology that supports collaborative practices requires that we uncover the largely unarticulated detail of what people actually do when they work together." Concomitantly, a negotiator's presence could encourage more "up-front" planning and "walk-throughs," which promote product quality (Brooks 1978; Weinberg 1971; Yourdon 1986).

Second, if computer systems and models are developed that match the personal characteristics, work styles, and needs of the negotiators, then the resistance to "high

tech" innovations is lowered and there could be an increase in the adoption rate.

If feasible, the developing team could consider having representatives from the relevant disputing parties also be involved in the design process. This could facilitate and encourage joint problem solving and the use of computer assistance during the actual negotiations.

Figure 8 presents two flow charts; the one on the left is the proposed schedule for a computer software project. What would normally be a needs assessment stage is disaggregated and expanded to incorporate the recommendations above. The flow chart asks the developers to consider characteristics of collaborative work, end-user needs, work styles, etc. Brooks' (1978) rule of thumb for scheduling a successful project's software tasks is to allow 30% for planning. This rule for software planning coincides with the proposed flow chart on the left. Conventional scheduling (on the right) differs in that less of the project's time is devoted to planning, and the needs assessment is short-lived and usually done only once.

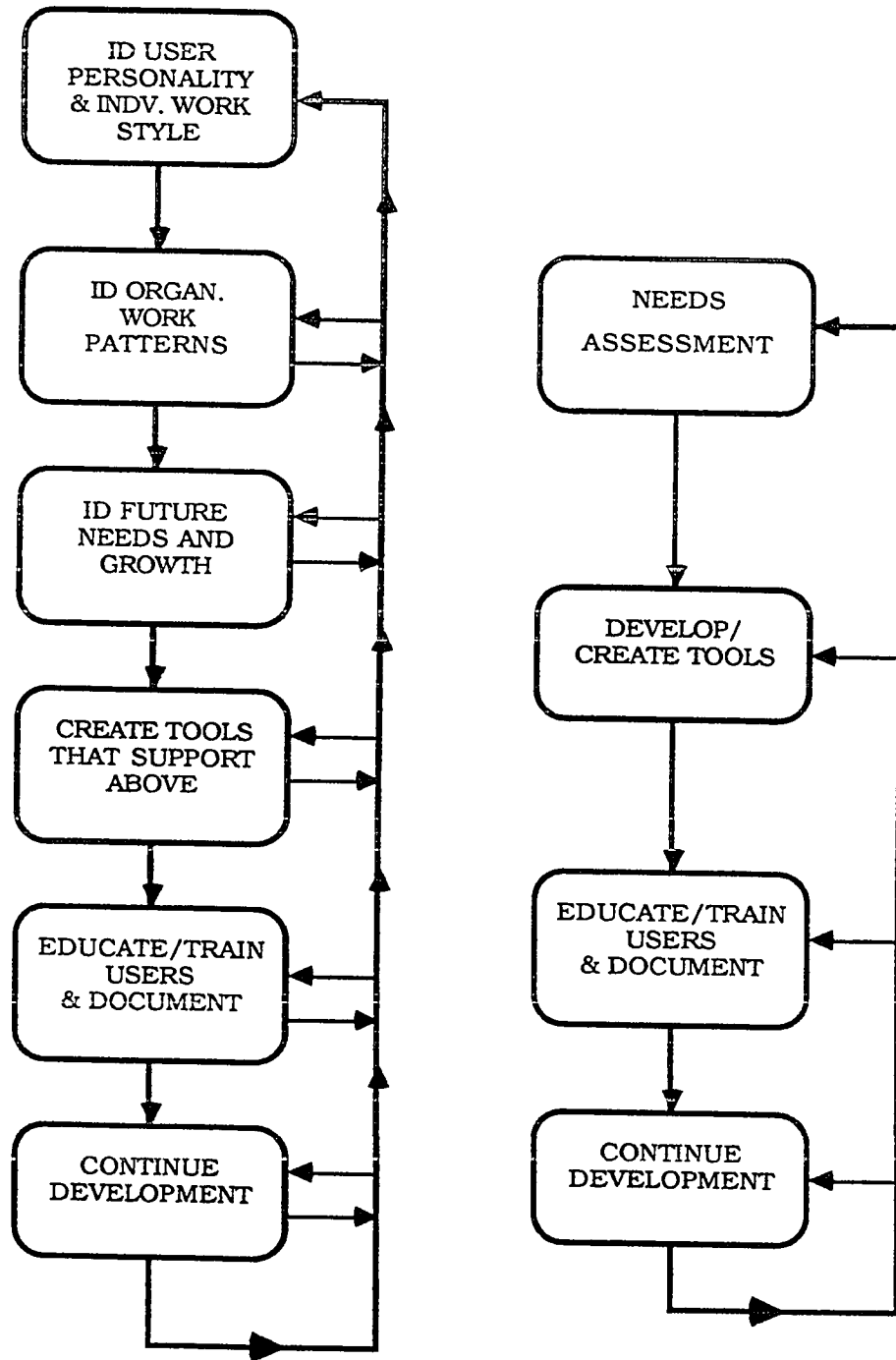


Fig. 8. Software Project Flow Charts

Summary

Recommendations presented in this chapter have been directed to both the developer of computer-assisted negotiations systems and to negotiators who will be the systems' users. Negotiators and representatives for the disputing parties should participate in every stage of model development, or at the very least, be readily accessible to the development team.

A developer's objective is to create a tool that is a good "fit", in other words, a tool which meets the intended users' needs, works easily in the appropriate environment, and meets the constraint requirements. A designer must also be conscious of the need to create software for non-technical users because negotiators will not necessarily be technically oriented. Ideally, in order for any computer model or system to be employed optimally, the modeler, the user, and the decision maker should all be the same person. Therefore, the systems **must** be designed so that modeling of the negotiation process, how the computer operates, and its output are intuitive, transparent, and usable by the non-technical user.

Negotiators interested in these devices should be aware of their benefits and disadvantages. They also should be able to evaluate the usefulness of the computer

systems and the model and chose the appropriate technical support.

Part Two

Conclusion

Problems and conflicts are becoming increasingly technical, complex, and intertwined with other related conflicts. Practitioners, namely negotiators, involved with these types of problems must find new collaborative efforts for their resolution or management are required. Consequently, negotiators need to acquire innovative tools and methods to analyze problems and conflicts, and to support negotiations. As reviewed and demonstrated in chapter five, researchers and scientists are making contributions to the new field of computer-assisted negotiations. Powerful and useful computer models are already being field tested and/or field tested.

Many challenges remain for those who wish the field of computer-assisted negotiations to grow and develop. This thesis does not presume to completely address all of these challenges, but hopes in some way to shed light on the problems and offer different, useful perspectives and direction. Two general problems areas, which must be met and eventually be overcome, are identified below.

1) Negotiation sources and literature reveal a dichotomy: on one side the literature is anecdotal in nature, and the other side is (more or less) game-theory based (Zartman and Berman 1982). Neither type of information reveals what a negotiator actually does when preparing for and conducting a negotiation. What is challenging researchers is finding a formalized, frequently utilized, and generally accepted negotiation style from which to develop and design tools. This negotiation style needs to be both successful in real negotiations, and able to be organized and analyzed.

The researchers on the Project on Modeling for Negotiations Management at MIT (where much of the current work is being conducted) shows a decided preference for the integrative bargaining style (an approach much like Collaborative Negotiations). Their primary reason is ethical, and there appears to be an assumption that the integrative style is successful and a "good" way to negotiate. This particular mind-set is appealing and matches the author's own biases. However, it leaves as yet unaddressed questions: Is this style of negotiation truly successful? Do negotiators actually practice this style? Or is it mixed-motive as Bazerman and Lewicki (1985) suggest? To answer these questions, and to continue with the research

and development efforts in computer-assisted negotiations, more empirical evidence is needed about the various approaches to bargaining. In addition, more rigorous (i.e., not anecdotal) documentation or recording of successful negotiations is required.

Collaborative Negotiation was created and is employed by a successful practitioner. This approach was developed and organized into a comprehensive usable model and is used to train other practitioners. Collaborative Negotiations answers some of the questions and requirements mentioned above and, as such, is an appropriate point of departure for future studies.

2) Computer systems and models show great promise in assisting negotiators. Much work has been done; however, there are certain limitations that are challenging research scientists, one appears to be the inadequacies of their models of the negotiation process. How does one model such a dynamic, complex set of behaviors that largely are considered to be more an art than a science? As discussed in chapter two, modeling decision-making behavior using economic approaches depicts a limited picture of the process. So far, economic approaches are the easiest to use in developing computer-assisted negotiations models, and have achieved a certain amount of success.

The systems approach is used in this thesis as a tool to analyze negotiation as a system to reveal its process and its structure. A Cognitive-Behavior model was developed while examining the cognitive and communication processes that occur in conflict and negotiation. Also, a structural analysis was done on Collaborative Negotiations. The coupling of the two is not addressed in this thesis. Exactly where they bridge is as yet intuitive. The point-to-point mapping would no doubt occur at higher levels of resolution in the structural diagrams.

The structural analysis shows strong promise to be a foundation for computer-assisted negotiation. The structural analysis, as presented in chapter four, can be used to organize the data flow of a negotiation and to catalog related documents. The structure may also be used as a basis for mapping the progress of the negotiation process. Further work needs to be done, more detailed levels of resolution must be mapped, and the entire analysis must be compared for "goodness of fit" against actual negotiations.

This thesis advocates computers as tools, meant not to supplant human negotiators, but to augment their capabilities. When used appropriately, computers and computer models can positively affect the negotiation process and

outcome. They can facilitate learning and communication, and aid in defining issues and agendas.

APPENDIX

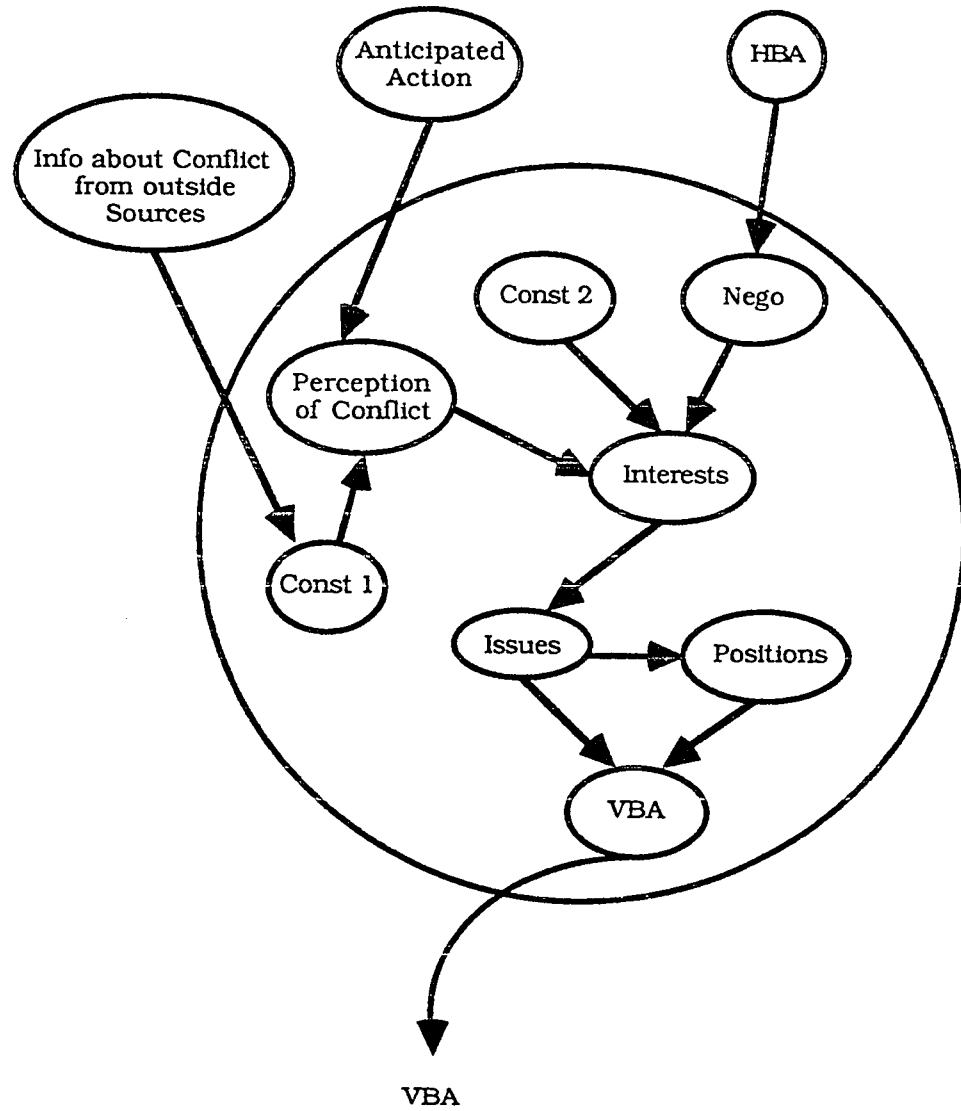
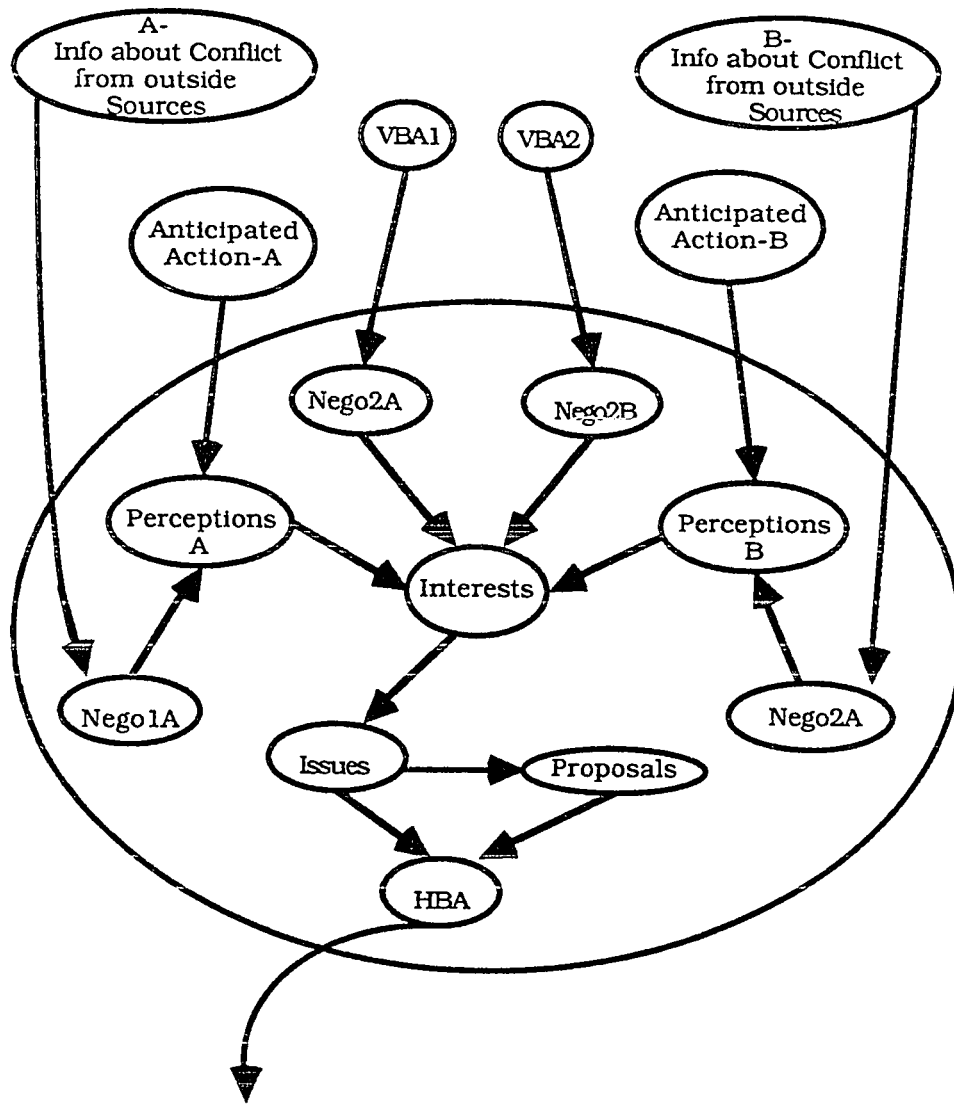


Fig. 9. Phase II Formula: Vertical Bargaining



HBA: Conceptual Agreement/Formula/Agenda

Fig. 10. Phase II Formula: Horizontal Bargaining

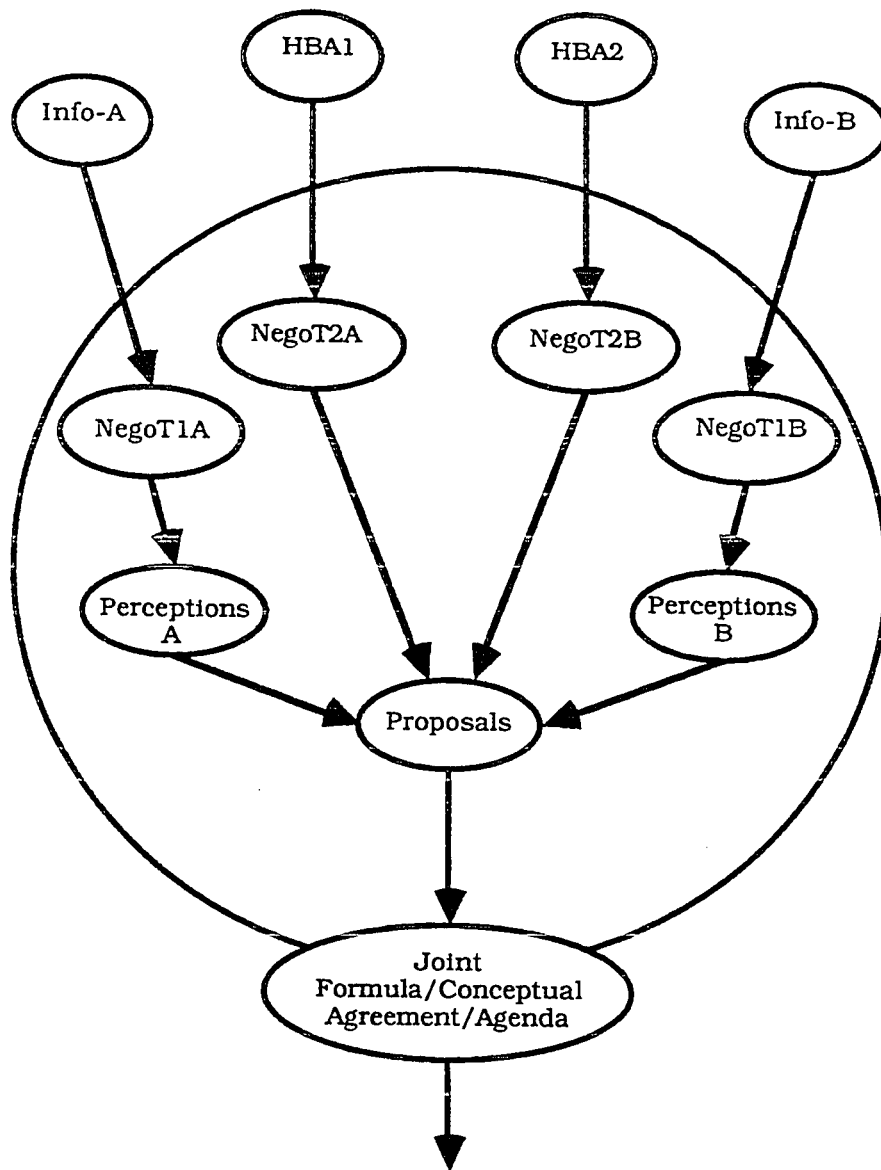


Fig. 11. Phase II Formula: Joint Session

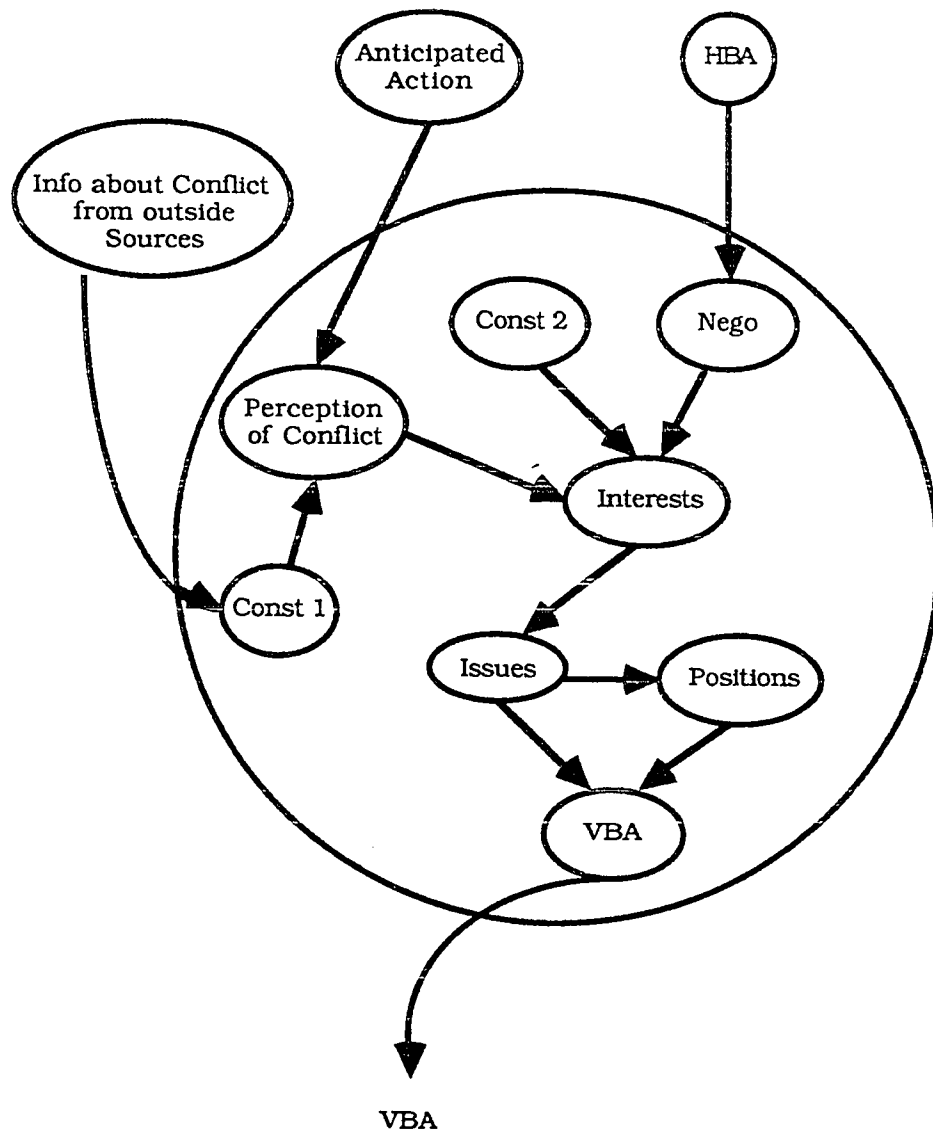


Fig. 12. Phase III Detail: Vertical Bargaining

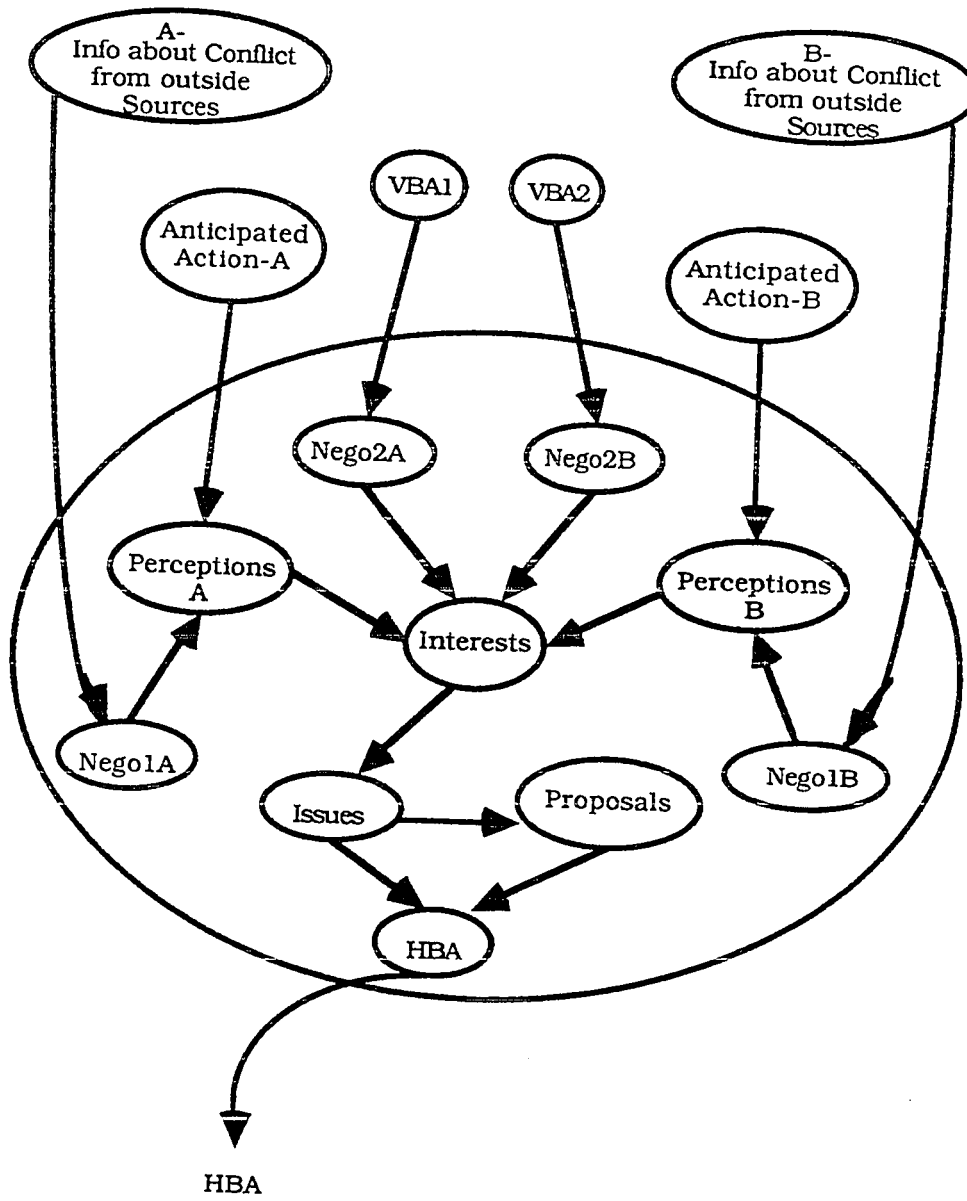


Fig. 13. Phase III Detail: Horizontal Bargaining

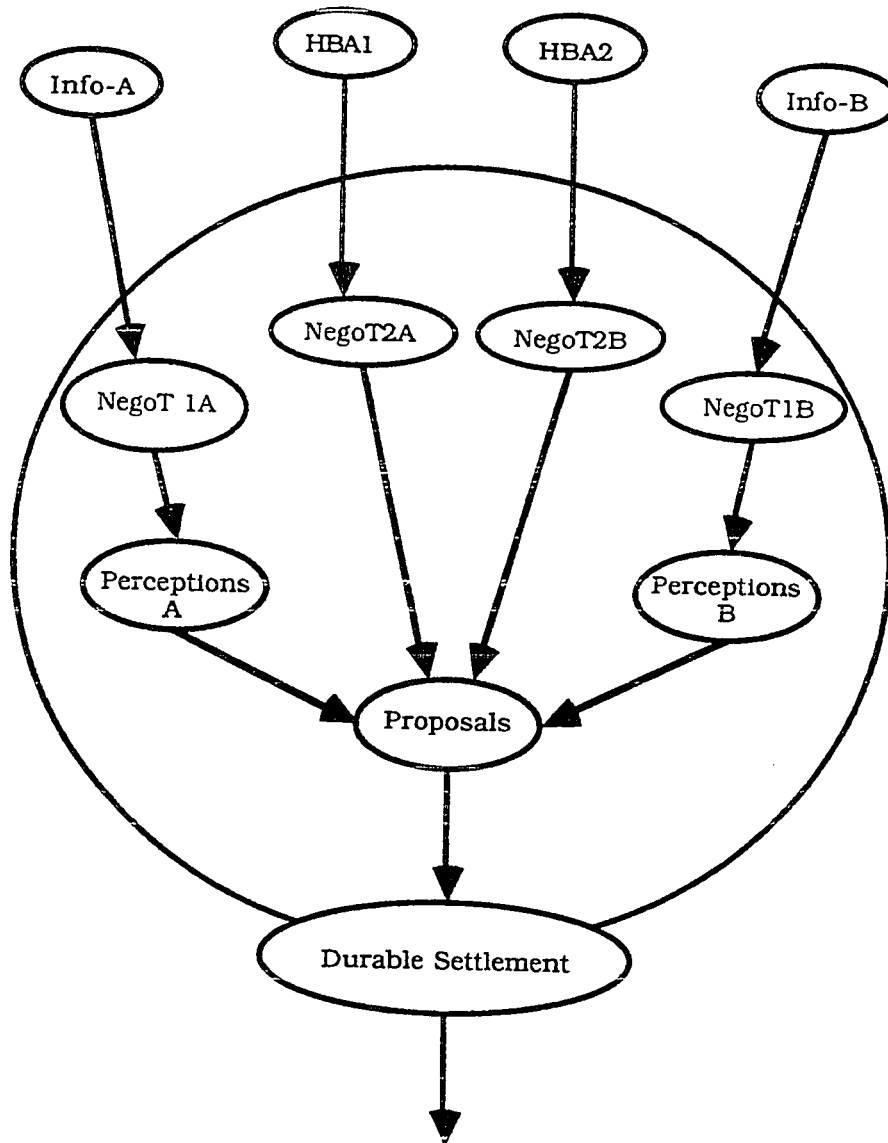


Fig. 14. Phase III Detail: Joint Session

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GLOSSARY

The following terms are used primarily in the Collaborative Negotiations approach. Most entries were written for a certification exam for William Lincoln's negotiation and mediation seminars.

Alternative Forms of Conflict Resolution

Arbitration. A form of conflict resolution which differs significantly from mediation (see below). Arbitration uses a third party, whose function is to hear both sides' arguments and make a decision based upon the law, regulations, precedents, and the relative merits of the cases. The decision of the Arbitrator can be binding upon the parties or it can be appealed to the Courts. Like mediation, arbitration is an alternative to formal court proceedings, but more formal than mediation.

Conciliation. A process of bringing parties together so that they can resolve their own differences. The role of a conciliator is not to deal with the substantive issues, nor is it to determine any settlement.

Litigation. A process of bringing someone to court in order to resolve a dispute by use of the legal system.

Mediation. A (sub-set) form of negotiations that involves a neutral, impartial third party, who helps the parties to develop and reach a settlement. A mediator does not make any decision for the parties, rather s/he can be view as the "guardian of the mediation process" (Lincoln & O'Donnell, 1986).

Mediation is an alternative to litigation, and as such it is a voluntary process, usually being faster and more inexpensive than litigation. In addition, mediation is an informal process compared to other forms of conflict resolution.

Med-Arb. A form of conflict resolution which starts as a mediation process. When the parties do not come to a settlement within a certain predetermined time period, then a neutral third party will make a judgment and resolve the dispute for the parties.

Conflict Aftermath. Conflict aftermath occurs when one or more parties feel dissatisfied with the outcome of the dispute resolution process. The outcome may not have adequately addressed interests and issues that were important to one or more of the disputants. The parties may never have truly resolved the conflict or the resolution may serve merely as a primer for another conflict.

Conflict aftermath is almost always directly or indirectly a result of procedural, substantive, and/or psychological dissatisfaction experienced by the participants of the negotiation process, or any primary or secondary stakeholder(s).

Causes of conflict aftermath as related to procedural satisfaction:

- 1) incomplete, violated, or restrictive ground rules;
- 2) incomplete and/or premature settlement.

Causes of conflict aftermath as related to substantive satisfaction:

- 1) interest dissatisfaction;
- 2) commitment without capabilities and conversely capability without commitment.

Causes of conflict aftermath as related to psychological satisfaction:

- 1) lack of face-saving or face-restoration opportunities;
- 2) feelings of coercion and pressure (Lincoln et al. 1986).

Rangarajan (1985) feels that no resolution is entirely without dissatisfaction, that there is always some residue.

Conceptual Agreement. Conceptual agreement as used in Collaborative Negotiation is an overall agreement that answers the conflict's biggest, overriding issue or purpose. Like fractionation (see below), conceptual agreement building is used in complex situations, but there is often a sense of importance or urgency. A conceptual agreement might merely be a recognition by all parties that a problem needs to be addressed, and that they all want a resolution to the situation. All proposals and actions during the negotiation process will be compared to the conceptual agreement to check for consistency.

With conceptual agreements:

- 1) basic essential interests on all sides are met and acknowledged;
- 2) good faith is extended;
- 3) disputants are given a view of what the world would be like without the problem;
- 4) monitoring the actual dispute resolution process becomes easier.

Zartman and Berman (1982) use a 'Formula' which is very similar: "Formula is best characterized as a shared perception of definition or the conflict that establishes terms of trade, the cognitive structure of referents for a solution, or an applicable criterion of justice."

Concessions and Quid Pro Quos. When something is given away with no expectations of reciprocity, then that is a concession. A concession can be given willingly or begrudgingly. Some reasons for concessions might be:

- 1) giving up something before it is deprived;
- 2) to "cut the losses";
- 3) to break an impasse or to create momentum;
- 4) to demonstrate magnanimity or goodwill;
- 5) to continue a valued relationship.

Quid pro quo translates from Latin as "this for that". Quid pro quo means when something is given, then something is expected in return. Some reasons for granting a quid pro quo are similar to the reason for concessions but they are not the same thing. The reasons for quid pro quo might be:

- 1) to develop compromises;
- 2) to break an impasse;
- 3) to create sweeteners;
- 4) generate creative options;
- 5) gain closure.

The distinction between the two terms is made explicit in the Collaborative Negotiations approach. The terms are usually used synonymously in most other approaches. Much work has been done studying patterns and timing of "concessions" to build predictive outcome models (for example: Jensen 1984; Karras 1970; Saraydar 1984). These "concessions" are really quid pro quos because the purpose is to elicit reciprocity.

Consensual Domain. A term coined by Maturana, a cybernetician and biologist, to describe "mutual orienting behavior". Below is Maturana's definition originally from Biology of language, 1978, quoted in Winograd's and Flores' (1986) book.

When two or more organisms interact recursively as structurally plastic systems,...the result is mutual ontogenic structural coupling.... For an observer, the domain of interactions specified through such ontogenic structural coupling appears as a network of sequences of mutually triggering interlocked conducts.... The various conducts or behaviors are arbitrary because they can have any form as long as they operate as triggering perturbations in the interactions; they are contextual because their participation in the interlocked interactions of the domain is defined only with respect to the interactions that constitute the...I shall call the domain of interlocked conducts... a consensual domain.

Equity and Ownership. Equity has to do with being fair and just--not merely in the sense of a judgment or an agreement which complies with rules, regulations or laws. Something is equitable if everyone involved feels that they are being treated fairly, and that the process is fair and just. When each person in the negotiation process feels that s/he is listened to and encouraged to speak his/her mind on an equal basis with all other participants, then one could say that equity is achieved.

Ownership develops when equity is achieved in the negotiation team. A team has ownership when there is a good sense of group identity and membership; where everyone shares the responsibilities of the problem solving and decision making, the dispute resolution process, and of any eventual settlement agreement, as well as the compliance to it, or the consequences of no resolution.

In a negotiation situation, if a team member or a splinter of the team does not acknowledge ownership, they can potentially hinder the process of reaching agreement.

Feedback. The output of a system or any sub-system that is returned as part of the input to affect succeeding processes and outputs. Whenever A causes a change in B and B causes a change in A and there are numerous repetitions, then there is circular causality (figure 15a).

There are two basic types of feedback: negative and positive. 1) Negative feedback stabilizes the system's behavior by dampening deviation. A change in A causes a change in B in the opposite direction (figure 15b).

2) Positive feedback amplifies deviation thus creating change and encouraging growth and/or explosive instability. A change in A causes a change in B in the same direction, which in turn causes more change in A (in the original direction) and so on (figure 15c).

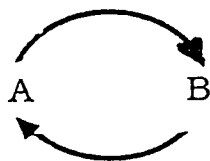
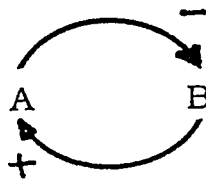
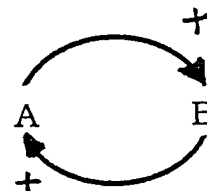


FIG. 15a. Mutual causality



15b. Negative feedback



15c. Postive feedback

Formula. See conceptual agreement.

Fractionation. When a problem is "messy" and complex or when simple solutions will not be helpful, reducing the problem to smaller components sometimes makes the problem more manageable. This is what is meant by fractionation. The components of the larger problem are then negotiated one at a time; tentative agreements on each issue are acquired and then tested for compatibility with the conceptual agreement and with all other tentative settlements of all other issues.

Future Dispute Resolutions Clause. A provision written into the settlement agreement that explains how the parties will handle any disputes that may come up at a later date. Some functions of a future dispute resolution clause might be: to make the settlement durable, to provide procedural rules for future disputes, to maintain means for continued dialog, or to decide who should be involved or who will participate in any future negotiations.

Horizontal Bargaining. A process that occurs within a negotiating team, and which should occur before entering into any joint negotiating session. The team members all represent individual values, interests and beliefs. They all have their own reasons for being on the team and their own perspectives of the negotiation interests and issues. Before this group can become an effective negotiation team horizontal bargaining or internal team negotiations needs to occur. The goal of horizontal bargaining is for the team to gain consensus among the team members.

Learning. In this thesis, the term learning generally correlates with the common usage, with an added cybernetic meaning, which is provided here in the appendix. Learning, as it is used in the cognitive-behavior model, is a process which results in new states of awareness through the categorizing of perceptions and the adapting to and reorganization of world views, so that there is a "goodness of fit" between the internal states and what is observed (Von Foerster 1974).

Ownership. See Equity and Ownership.

Problem Situation. "A nexus of real events and ideas which at least one person perceives as problematic: for him other possibilities concerning the situation are worth investigating" (Checkland 1981). In this thesis,

problem situation is used as a term which includes: the problem(s) from various stakeholder's perceptions and viewpoints, the problem's immediate environment, and its context; all of which change over time. The problem situation is what will create the condition for the negotiation. A problem situation can have a variety of meanings involving uncountable variations of contexts. Some examples of a problem situation are: 1) it can refer to a "simple" thing such as a couple deciding at which of two restaurants to eat; 2) it can involve a complex situation (e.g., a major disaster rescue mission, which could involve federal, state, and/or local officials, etc.) where there might be potential conflict of interests, but the overall goals and objectives may be shared; or 3) it can be very confrontational in nature, (e.g., labor disputes) where the disputants' interests may be in jeopardy (real or perceived).

Settlement Agreements. Settlement agreements are promises. These are developed upon the completion of a successful collaborative negotiation effort. In order for a settlement agreement to be durable (that is, lasting), it must be equitable, legal, practical, and interest satisfying.

Five guidelines to writing an agreement are:

- 1) Be specific on every issue addressed, resolved, and disposed of during negotiation. Avoid vague language.
- 2) Identify all parties by name, address, position, and titles. Confirm accuracy and spelling.
- 3) Identify what must be done and who is responsible. Specify all dates and deadlines.
- 4) Avoid legal or technical terminology not understood by all the parties.
- 5) Describe the method and frequency of payment, and identify who will verify receipt of money, goods, and/or services.

Single Negotiating Text (SNT). A technique for structuring the negotiation process, often used in international, multiple party negotiations. SNT is used as a means of concentrating the attention of all parties on the same composite text, rather than two or more proposals. The technique involves the presentation of an entire proposal to the negotiating parties for their review and criticism. The proposal is written either by a third party or by one of the disputants. The first SNT is not meant to be the final proposal, but to be used as a point of departure for future

revisions and improvements by all of the disputants in an iterative manner (Raiffa 1982).

Sub-committee Negotiation Meetings. A type of meeting when one/some member(s) of one negotiating team meet(s) with some representative(s) of the other team to discuss a specific issue in hopes of making recommendations jointly to both full teams for settlement. These meetings might be called because it could be a more effective use of time, or because certain issues are too complex or technical in nature for everyone on the teams to be useful in sorting through the information.

Summit Meeting. Summit meetings are another authorized dynamic of negotiations that might occur between primary actors from the disputing teams. The summit meetings are held away from the main negotiating table. Similar to sub-committees, a summit meeting brings back recommendations or options for settlement to the full teams. In certain cases the representative at the summit meeting are authorized by their team members to make binding settlement agreements away from the table.

Unilateral Conciliatory Bargaining. Like the two examples above (subcommittee and summit meetings), unilateral conciliatory bargaining occurs away from the table. However, it is unauthorized. These meetings are conducted confidentially and anonymously, while the participants seek to satisfy the interests of the entire team. The gleaned information and any agreements reached during these meetings are brought back to the team for their consideration. The team chairpersons of a conflict would be the most likely to engage in conciliatory bargaining. This type of meeting may be useful in breaking impasses or helping the other side to understand interests that are not being expressed at the table.

Vertical Bargaining. Often members of a negotiation team represent not only themselves but others who are not at the table. Vertical bargaining encompasses the team members and those who are not at the table, but to whom the team members are accountable. These people might be: 1) in positions of authority, i.e., superiors to whom the team member(s) reports; 2) constituencies, for whom the team member(s) is/are the "voice piece"; 3) those who can influence or make an impact on the negotiation process, e.g., the press or public opinion.

The vertical bargaining process can be formal or informal. Like the horizontal bargaining process, vertical bargaining dynamics must also achieve a sense of consensus by developing equity and ownership.

In preparing for negotiations, when consensus is being built horizontally, there should be parallel consensus building vertically so that while the negotiation plans, proposals, and issues are being drafted and hashed out the interests of those not present will not be forgotten or misconstrued.

During the actual negotiations, the dynamics of the vertical bargaining process continue and at times intensify. For one side to forget the "invisible" vertical presence and influence can be dangerous. Any proposal should be couched in such a way so that it is acceptable to not only the other team(s), but also to whom they are accountable. The job of a negotiator can be viewed as educating the other side enough so that they will in turn present his own case to their superiors and/or constituencies.