

EXPERT SYSTEMS IN ALTERNATIVE DISPUTE RESOLUTION

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ABSTRACT

Interest in improving dispute resolution has risen steadily in recent years. Several U.S. government agencies have begun experimenting with alternative means of dispute resolution, such as the mini-trial used by the U.S. Army Corps of Engineers. This paper reviews uses of Alternative Dispute Resolution (ADR) and discusses innovative techniques for solving contract disputes. Specifically, suggestions are made as to how an expert system can be utilized effectively to aid in dispute resolution without losing the substantial values and benefits of current, accepted ADR practices.

Introduction

Flaws exist in our current litigation system. Contractors, agency officials, government attorneys, and administrative judges agree that contract appeals have become too complicated, too expensive, and too time-consuming. Within the government contracts¹ community, a promising movement has begun away from the trend of red tape, proceduralism, and delay.

Interest in improving resolution of disputes has risen steadily in recent years.² In this spirit, several government agencies have begun experimenting with alternative means of dispute resolution. The thesis of this article is that overallegiance to traditional methods of dispute resolution can create substantial barriers to resolution of disputes. It is time for contracting agencies, and those individuals who deal with them, to

explore seriously the potential uses of alternative dispute resolution (ADR), to begin creating an atmosphere in which ADR can be readily employed, and to develop innovative techniques for solving contract disputes. The issue raised here is whether and how an expert computer system can be utilized effectively to aid in dispute resolution without losing the substantial values and benefits of current, accepted ADR practices.

This paper begins with reviewing advantages of ADR. It will describe an actual case where a method of ADR, mini-trial, was found to be quick, inexpensive, and effective. A description of the Claims Guidance System, an expert system developed at the U.S. Army Construction Engineering Research Lab, along with suggestions on how to utilize an expert system effectively as an ADR device will follow.

Alternative Dispute Resolution (ADR)

While ADR has no generally accepted definition, it does have a fundamental premise: to reduce the costs of resolving disputes and to improve the quality of the final outcome.³ For discussion purposes, a working definition of ADR could be: "ADR is a set of practices and techniques that aim (1) to permit legal disputes to be resolved outside the courts for the benefit of all disputants; (2) to reduce the cost of conventional litigation and the delays to which it is ordinarily subject; or (3) to prevent legal disputes that would otherwise likely be brought to the courts."

The adversary process, upon which the current system of justice operates, is based on a theory of fundamental distrust.⁴ In contrast, ADR fosters trust-building for several reasons. First, the very process of negotiating the procedural rules tends to foster trust. The presence of a neutral advisor enhances the prospect of negotiation, as

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well as providing an advisory opinion on which to begin negotiation. The presence of the neutral third party's input provides an initial workable solution. Thus, the ADR process is designed to restore and build trust to overcome the suspicion and mutual hostility fostered by the adversary system.

The conclusion that ADR results are often superior to court judgments is supported by several considerations. First, adjudication is characterized as a "winner-take-all" outcome.⁵ The fundamental issue of liability is resolved only by holding for the plaintiff or the defendant. This cannot be wholly true of an optimal solution. ADR, by contrast, is not bound by the zero-sum game of adjudication. ADR permits the parties to search for solutions to their dispute which go beyond the possible solutions dictated by litigation. These solutions may be more novel and case-specific than any remedy a court could provide. Moreover, such solutions may permit both parties to claim a net gain. Second, properly designed ADR processes make it more likely that settlement decisions will be based on the merits of disputes. Finally, a reason that ADR may lead to better outcomes is that the use of a private neutral permits the parties to submit their dispute to one with a greater expertise in the particular subject. Many disputes, such as in the construction industry, require special knowledge of the industry or customs of a trade. Such concepts often lie beyond the knowledge of generalist judges and juries. An ADR neutral may be an expert, thus saving the parties the cost of educating the fact-finder and reducing the risk of inequitable decisions. Moreover, if the parties have personally selected the neutral, they may be psychologically disposed to accept his binding decision (as in arbitration) or advisory opinion (as in a mini-trial).

ADR is essentially what the parties make it. The process may be informal or may incorporate certain features of formal litigation. Parties may choose an informal process to avoid lengthy prehearing motions and discovery. Formal rules of evidence and procedure may be avoided. Also, ADR has considerable flexibility in the formulation of remedies. Relief may be tailored to fit the circumstances, unbound by general legal or equitable principles.⁶

Litigation is less efficient than ADR. For example, abbreviated discovery practices and shorter hearing time may

result in smaller expenditures for legal services than in litigation. Likewise, ADR provides economic savings by diverting fewer internal resources. Particularly in small companies which depend on only a few key personnel, a lengthy litigation may seriously impact company business. The use of consensual ADR techniques may also represent a cost saving to the public. Cases which would burden the court system are effectively channeled into the private ADR process. The costs of ADR are borne by the parties.

ADR methods are regarded by many people within the government contracts community as a particularly appropriate means of resolving many questions that arise in government contract claims.⁷ The Administrative Conference of the United States, for instance, has repeatedly recommended that government agencies make greater use of negotiation, mini-trials, and similar means to reduce the delay and contentiousness which accompany many government agency decisions.⁸ Moreover, some empirical evidence of ADR's effectiveness in contract cases does exist. In 1984, the Army Corps of Engineers conducted its first mini-trial. The result was the settlement of a \$630,570 claim for \$380,000.⁹ Six months later, the Corps conducted another mini-trial to settle a \$55.6 million claim involving a contract to excavate 11 miles of the Tennessee-Tombigbee waterway ("Tenn-Tom"). The parties settled for \$17.2 million after 4 days of hearings and 2 days of negotiation.¹⁰ The Inspector General investigated the results of the Tenn-Tom mini-trial because the claim had been vehemently opposed by the Corps district level personnel. The Inspector General's report endorsed the Tenn-Tom mini-trial process, noted that the third-party neutral had helped the parties identify the relevant issues, and concluded that the claim had been reasonably settled in the Government's best interest. The report, however, also recommended that the Corps document its procedures and findings better in the future. The Corp's North Atlantic division has employed ADR in a recent mini-trial involving a \$1.8 million claim by Granite Construction Company. The government's and contractor's cases were presented by technical experts, rather than lawyers, to a neutral technical expert chosen by the two parties. The neutral expert prepared a nonbinding written recommendation. After reading the neutral's report and engaging in a 4 hour negotiating session, the principals agreed to settle for \$725,630, the amount

recommended by the neutral. Those who participated in the Corps' ADR experiment expressed pleasure with its success to date, and the Corps is seeking to expand its use of ADR.¹¹ The Corps has stated that the key consideration in the use of ADR is the desire to save time and money. To date the Corps has found the mini-trial procedure to be particularly quick, inexpensive, and effective. The expedited ADR procedures also tie up key personnel for a much shorter period of time.

The Expert System as an ADR Assistant CLAIMS GUIDANCE SYSTEM FOR CHANGES CLAUSE

Analysis of contract claims requires technical knowledge, factual knowledge and legal knowledge. Field engineers have the required technical and factual knowledge but many young inexperienced engineers lack the legal knowledge necessary to analyze claims. In an ideal world, the field engineer would have ready access to timely, low cost legal advice. In the real world, however, the engineer is often compelled to make judgements having legal ramifications without the benefit of professional legal advice. As a result of the lack of training in basic contract law, field engineers might be unaware of accepted legal bases or the resultant consequences of their decisions.

The Changes clause in Government construction contracts (Federal Acquisition Regulation [FAR] 52.243-2) provides a legal mechanism under which the Government may make unilateral contract changes to suit the contract requirements, circumstances, or specifications; take advantage of improved techniques and methods; or adapt to unanticipated physical conditions that develop after award of the contract (directed changes). Additionally, the Changes clause permits the contractor to obtain an "equitable adjustment" for the changes or actions of the government which the contractor considers as a change in the contract requirements (constructive changes).¹² The clause provides assurance that if changes in the work occur and such changes add to the contract's cost or time of performance, the contractor will be compensated therefor. A changes clause claim is an attempt by the contractor to recover the additional cost or time of performance that it has incurred or will incur in order to comply with a directed or constructive change.

Army Corps of Engineers' studies have shown that Changes claims are

relatively frequent and costly in government construction contracts. These Changes clause disputes are particularly appropriate for ADR.¹³ Field engineers, contracting officers, and contractors, who are faced with such claims need to understand the legal issues involved so they can supply the appropriate information to legal counsel and avoid lengthy litigation caused by uninformed decisions. Automating the analysis of potential Changes claims through an expert system will aid government employees, other owners, and contractors in handling Changes claims more efficiently and consistently. To aid in evaluating Changes claims, the Corps, in conjunction with the U.S. Environmental Protection Agency (EPA), has developed the Claims Guidance Expert System (CGS). One module of CGS analyzes Changes clause claims (CGS-Changes). The objective in developing CGS was to create an expert system which insures that a rigorous claim evaluation is performed consistently. To meet this objective, CGS: (1) provides the user with pre-legal assistance in the analysis of DSC claims; (2) provides a tool for documenting all necessary information of the potential claim; and (3) serves as a training device for personnel, familiarizing them with the legal reasoning process and potential issues involved in a Changes claim.

The Changes clause specifies a number of requirements for a change to be valid, thereby entitling the contractor to an equitable adjustment. Changes must be within the scope of the work of the contract. Also, the contractor must comply with the requirements of providing adequate notice, within time limits set by the clause. Established contract interpretation guidelines are usually applied to evaluate the contents as well as the quality of the claim. These guidelines can be classified into three groups: language analysis, surrounding circumstances, and post-interpretation dispute resolution principles.¹⁴ Apart from these guidelines, the contractor must satisfy several implied duties. The contractor has an implied duty to proceed with the changed work, as well as a duty to clarify patent ambiguities before submitting a bid. The contractor must have made a reasonable site inspection before bid and failure to do so may, in some circumstances, invalidate the contractor's claim. Superior knowledge (prior knowledge) on the part of either the Government or the contractor can also tilt the case in favor of the other party. Given this summary background it is apparent that judging the quality and

validity of a Changes claim is a difficult undertaking for those field engineers who have insufficient legal training. The following sections describe how an expert system is structured to allow it to make this proximate evaluation.

CGS PROXIMATE ANALYSIS

The knowledge base used in CGS has been obtained in a number of ways; from past research, literature, case law and actual experts, such as experienced Corps attorneys and claims analysts, and engineers. The knowledge for the system is organized into production rule groups and the rule groups are organized into inference trees. The purpose of the group trees is to organize the knowledge and to direct the analysis along a reasonable inferencing path. As a result of our knowledge acquisition efforts we identified the following 20 different legal issues which were potentially applicable to Changes claim analysis:

1. Scope of work
2. Read contract as a whole
3. Implied warranty
4. Impossibility
5. prior course of dealing
6. Explanation prior to Disputes
7. Interpretation different than intention
8. Silence as approval
9. Normal vs. technical meaning
10. Enumerated list
11. Trade practice
12. Omissions
13. Order of precedence
14. Parole Evidence
15. Duty to clarify
16. Contra preferentum
17. Site inspection
18. Superior knowledge
19. Final payment
20. Notice requirements

No single issue is determinative of the outcome of a claim. Evaluation is based on all of the facts and circumstances of each case.

Because the Changes clause is so broad, claims can be made based on a number of different legal theories. Some of the legal issues are appropriate for some claims and not appropriate for others. One question confronted early in the design of CGS was whether a claim would need to navigate all of the potential issues or just the subset pertinent to that particular claim. A system which forced each candidate claim to negotiate all of the issues was easier to develop. However, such a system would be wasteful of the user's time and it

could lead to inappropriate reliance on irrelevant issues. The decision was taken to design an expert system within the CGS expert system whose only job is to select the appropriate legal issues for the claim to negotiate. This expert sub-system was called SELECTOR.

The SELECTOR program was developed to conduct a pre-analysis of constructive Changes claims. The reasoning used in SELECTOR initially focuses on the primary basis of the dispute. SELECTOR suggests three primary bases:

BASIS 1: The contractor has encountered difficulty in completing the work either due to a design defect (for design specs) or due to unforeseen circumstances (for performance specs).

BASIS 2: The contractor and the owner disagree on what work is called for under the contract due to some discrepancies in, or different interpretation of, the contract requirements.

BASIS 3: The contractor claims that the owner, by its action or inaction, caused the problem.

Depending upon the basis, SELECTOR then identifies the appropriate theory of recovery and chooses the appropriate contract issues to test the validity of the theory. For example, if the basis of the dispute is an alleged defect in the specification (BASIS 1- Design Spec) then the theory of recovery is "Implied Warranty of Specification". In contrast, if the dispute is based on an alleged unforeseen difficulty (BASIS 1- Performance Spec) then the theory of recovery is "Impossibility of Performance". The theory available under BASIS 2 is "Contract Interpretation" with various sets of issues being used for different types of disagreements. Typical issues for "Contract Interpretation" are: Read as a Whole, Order of Precedence, Trade Practice, Normal vs. Technical Meaning, Omission, and Enumerated List of Items. Additionally, if there is pre-dispute evidence, then some of the following issues are also checked: Prior Course of Dealing, Interpretation Different than Intent, Parol Evidence, Site Inspection, Superior Knowledge. Finally, if the basis of the dispute is "Owner Actions" (BASIS 3), then the guideline is "Silence as Approval" or "Superior Knowledge". Clearly, SELECTOR is more complex than the preceding paragraphs suggest, by

using SELECTOR the user avoids the need to check all of the guidelines shown above.

CGS INFERENCE MECHANISMS AND UNCERTAIN REASONING

The advantages of SELECTOR notwithstanding, a comprehensive analysis of a Changes clause claim could involve five or six different issues. Some of those guidelines might point to a valid claim; others might indicate an invalid claim. The next challenge in developing CGS was developing a suitable inference mechanism. Several alternatives were tried before the final scheme was selected. CGS draws a conclusion from the sub-conclusions of each of the issues selected by SELECTOR. The task of the inference mechanism is to combine the various sub-conclusions into a rational overall conclusion. The approach finally used in CGS is based on two primary variables, GP and CI:

GP: For each legal issue, a variable called GP (Government Position) is defined. GP measures the strength of the owner's (i.e., government's) position on a given issue on a scale of -100 (strongly against) to +100 (strongly for).

CI: For each legal issue, a variable called CI (Certainty Indicator) is defined which is measured on a scale of 0 to 1.0. CI is the sole carrier of uncertainty in the system. Uncertainty accumulates locally (in each issue) for each CI when the user indicates some level of uncertainty regarding the input to the systems. The system allows most questions to be answered on a scale of Definitely No - Probably No - Possibly No - Unknown - Possibly Yes - Probably Yes - Definitely Yes. If the user ever chooses the Probably or Unknown responses, the CI (the level of certainty in the conclusion) is reduced.

The product of the GP and the CI values are found and tested to ensure that they pass a threshold value. The threshold serves to remove any GP values which have been so diminished by low confidence (i.e., low CI values) as to become suspect. The system potentially contains 20 GP-CI products which are then weighted and combined to form a final conclusion. The weights for each issue are chosen to reflect the relative importance most courts and Boards of Contract Appeal (BCA) allocate each issue in reaching their judgments.

The system uses the product of the

negative GP/CI values to determine the strength of the contractor's position and the product of the positive GP/CI values to determine the strength of the owner's (government's) position. Conclusions about the results of the claim are constructed depending upon whether the respective positions are Weak, Moderate or Strong. In close cases, i.e., where both parties have cases of similar strength, the system issues a caution to that effect. Otherwise, the system concludes for the strongest party using appropriately weak or strong language, as well as language indicating the confidence of that conclusion.

Expert system programs have a unique capability to provide explanations of their behavior to their users. In the design of CGS we tried to capitalize on this explanation capability to provide the field engineer with a construction claims decision support environment. The importance of the training aspect of this claims guidance was best described in a treatise on legal reasoning in expert systems.¹⁵ According to Gardner, easy cases are settled by rules established by statutory and case law. When the accepted rules conflict with each other, then cases (the difficult cases) are settled by application of principles. CGS, like most current expert systems, is a rule based system and therefore, it is relatively adept at reaching correct "rule based" decisions for the easy cases. CGS is implemented on IBM compatible microcomputers which are readily available at all Corps and EPA field offices. The system's knowledge was programmed using the KnowledgePro™ environment (expert system shell). It permits the legal knowledge of contract interpretation rules and Changes clause claims to be represented in the computer by rules. Uncertain information is handled by certainty factors, which quantify the confidence associated with an answer the user provides to a question.¹⁶ When CGS is faced with a case with conflicting rules the system must rely on some automated inferencing scheme to arbitrate between the conflicting rules. The current version of CGS uses the previously described system of weights, thresholds and certainty indicators. There are many other artificially intelligent approaches to uncertain reasoning and conflicting evidence. We investigated several advanced approaches to automated reasoning in the course of this project and we concluded that a better long term goal was to let the people do the difficult reasoning and let the computer support the process of difficult

reasoning. That is, it is very important to educate the users as to the principles involved when rules conflict so that the system queries can be answered correctly. To that end we provided the users with a continuously accessible decision support system. The support system was implemented using the "hypertext" facility of the expert system shell.

Five major features have been provided for decision support to aid the field engineer: General Information on specific legal issues, Explanation, Citation, Quotation, and Examples. All five decision support features are designed to help the system user gain a better understanding of the principles involved at a given point of a consultation. The General Information screen appears at the beginning of the analysis of each of the 20 issues to explain the nature of the issues and how it relates to the other issues of the analysis. The Explanation feature provides additional explanation about each question being asked as part of an issue. Explanations can include elaborations, definitions, clarifications of "legalese" and jargon, further information on the issue, and help in responding to the question. The Example feature provides hypothetical examples of the application of the principle or legal rule involved. Often these examples are taken from BCA cases. Quotations provide pertinent explanatory text found in BCA or appellate court rulings where the case provides an exceptionally lucid description of the principle or legal rule involved. The Citations feature provides a list of citation on which the other help screens are based.

These decision support features are designed to help the field engineer understand the important principles. Additionally, the questions, knowledge base, and presentation of the substantive legal rules, principles, and standards have been designed and implemented in an objective manner. Moreover, the questions asked of the user take account of each parties perspective, and opposing parties are asked to assess the opposition's factual knowledge and ability to establish those facts. However, it is essential that the system not instill over confidence in the field engineer. We have taken great care to provide sufficient cautions in the system regarding the benefits of professional advice.¹⁷ Even so, there are those who criticize this work saying that it impinges on the domain of attorneys and that engineers should not make legal or quasi-legal determinations. Yet,

engineers do make such determinations every day at construction projects. In developing this system, we are not trying to require engineers to make legal judgments; rather, we are attempting to improve the quality of the judgments which engineers are already required to make.

At the end of the consultation session, the system generates a report which includes general information about the case at hand, all questions asked and their responses, all relevant information such as dates, which was provided by the user. In addition, the report includes any clarification or further information requested by the system, all intermediate conclusions on specific legal issues and the final advisory conclusion provided by the system, and all the additional information provided by the user during the session. The final report can be saved as an ASCII text file or as a printed report. It can be used for documentation of the consultation, or it may be sent from the field office to a central claims office for review before further action by the field.

The Objectives of the CGS Expert System and the Advantages of ADR Are Comparable

Expert systems appear conducive to use as an aid to ADR. Expert systems, such as CGS, are programs designed to represent and apply factual knowledge of specific areas of expertise to solve problems and provide the problem-solving capabilities of recognized human experts. These systems generally enhance accuracy, problem-solving ability, and job performance. Therefore, the premise in developing an expert system, as with any ADR technique currently in use, is to save both time and money in problem-solving, while insuring an accurate and equitable outcome.¹⁸ For example, The Federal District Court for the Northern District of Illinois, under the direction of Judge Marvin Aspen, has utilized computer-aided mediation to aid in resolving a large products liability case to the mutual benefit of both parties.¹⁹ Another example is "The Latent Damage System" by R.E. Susskind.²⁰ Similarly, an analysis of CGS shows that an expert system can provide all the benefits of an ADR technique. CGS begins evaluating a claim by prompting the user with a set of questions that indicate the information necessary for the program to complete its legal analysis. The questions asked depend, in part, on the user's answers to previous questions. After the user completes a small segment in the legal reasoning process (a single

issue), the system provides an intermediate conclusion regarding that issue. Additionally, upon completion of the entire consultation, CGS will use its internal rules to reach a preliminary, advisory conclusion for the claim, based on the expert knowledge and rules which have been encoded. Like all ADR techniques, CGS is flexible and informal. Rules of evidence and procedure were not considered in developing the legal analysis and rules. The system provides a speedy and inexpensive method of analyzing a potential Changes claim at an early stage of the dispute. The average consultation session with the CGS system takes only about 45 minutes. CGS is also easy for a layperson to understand by utilizing the hypertext facility. This ease in understanding permits a user to feel comfortable with CGS and the claims analysis process. As with all other expert systems, CGS has knowledge built into its program and rules. The system is based on the expertise incorporated in the related decisions of the boards of contract appeals and the knowledge gathered from experienced Corps and EPA lawyers. Additionally, experienced project engineers, contracting officers, and contractors were consulted to supplement the legal knowledge. In addition to providing an advisory conclusion at the completion of a consultation, CGS can also sharpen the focus of a dispute down to the most significant issues. CGS will indicate which issues are most decisive, as well as indicating which party each issue favors. The Claims Guidance System promotes speed and efficiency. No discovery is necessary to run CGS. All that is needed are the contract documents, any additional papers or notes related to the claim, and an understanding of the claim. No formal rules are set out by the system regarding what information can be used in answering the questions. No actual claim need to have been brought because CGS is capable of a "what if" analysis of potential contractor claims. CGS also provides immediate analysis at the end of a consultation. The system is able to set out the weaknesses and strengths (issues for and against) of each party's position.

Moreover, the objective of CGS is consistent with the working definition of ADR. CGS permits a legal dispute to be resolved outside the courts, it reduces the costs and delays associated with litigation of construction contract claims, and it may prevent legal disputes by aiding in training and familiarizing personnel with the potential issues

involved in a construction contract claim. Therefore, an expert system, like CGS, can be utilized effectively to aid in dispute resolution without losing the advantages of current, accepted ADR practices.

Effectively Utilizing CGS as an ADR Aid

The Claims Guidance System (CGS) has two potential ADR uses. CGS may be used to: (1) identify key issues in difficult legal problems, (2) facilitate negotiation.

The most obvious use of CGS as an ADR device is to aid in narrowing the disputed issues. In doing so, each party would independently run the CGS system -- a competitive system. The system will provide the intermediate conclusions and final advisory opinion. From the intermediate conclusions, the user can determine which issues most favor its position. Each user is then able to present its "best" case, as in the typical mini-trial. Additionally, those issue which are not applicable or which do not aid in resolving the dispute will be eliminated from future negotiation. This narrowing of the issues promotes speed and efficiency, and reduces the costs and delays associated with possible future litigation. Utilizing CGS to narrow the issues is similar to the accepted ADR practice of the court using partial summary judgment to facilitate settlement. Partial summary judgment is granted on all issues about which no issue of material fact exists or remains. Similarly, CGS aids in eliminating all issues which are not disputed or not applicable.

CGS may also be utilized to facilitate negotiation between the parties -- a cooperative system. Hypothetically, the parties can run the CGS-Changes system together, answering the questions after thoroughly discussing the possible answers. The negotiation between the parties in order to answer the CGS questions gets the parties thinking about and discussing the merits of the claim. The parties will communicate and assess the legal issues and arguments put forth by each side. This permits the parties to analyze whether offers and counteroffers are fair and in good faith because each party will know how and what the other side is thinking. These discussions will aid in opening the lines of communication. As in the mini-trial example put forth earlier, an early discussion between the parties concerning the claim fosters trust-building and enhances the prospect

of settlement. Settlement decisions reached after both parties run CGS together are also more likely to be based on the merits of the dispute, instead of on hostility or deceit.

Conclusion

Creative utilization of alternative dispute resolution techniques will provide cost-efficient, time-saving methods to resolve disputes. Effective implementation of new and innovative ADR methods will aid in leaving the adjudicative process available for quality processing of high impact cases, without compromising a party's rights. Equally important as the accepted ADR methods is the spirit of experimentation -- a quest to find new methods of resolving disputes to improve the administration of justice. While the use of CGS as an ADR technique would need to be carefully monitored to avoid injustices and constantly updated to reflect changes in the law, such an expert system can be effectively utilized in resolving contract disputes while maintaining the advantages of accepted ADR techniques.

It is planned to implement CGS at various field offices of the Corps and EPA and to collect data on the effectiveness of the system by applying it to actual cases. In particular, we will test the two different potential uses of the system described before: (1) identifying key issues, and (2) facilitating negotiation. It is our belief that the system will demonstrate its capability to aid ADR. It is also hoped that we will be able to expand the system to cover different areas of construction contract claims.

ENDNOTES:

1. This paper will focus principally on government construction contracts and disputes arising from such contracts.

2. 124 Cong. Rec. 36,264 (1978). Senator Byrd explained: "It is still the policy of Congress that contractor claims should be resolved by mutual agreement, in lieu of litigation, to the maximum extent possible. . . ." Id. at 36,267.

3. Lieberman & Henry, Lessons From the Alternative Dispute Resolution Movement, 53 U. Chi. L. Rev. 424, 425 (1986).

4. Frankel, Partisan Justice 3-69 (1981).

5. See Menkel-Meadow, Toward Another View of Legal Negotiation: The Structure of Problem Solving, 31 UCLA L. Rev. 754,

783-89 (1984).

6. See Stipanovich, Punitive Damages in Arbitration, 66 B.U.L. Rev. 953 (1986).

7. E.g. Korthals-Altes, The Applicability of Alternative Dispute Resolution Techniques to Government Defense Contract Disputes, reprinted in Administrative Conference of the United States, Sourcebook 147 (1986) [hereinafter ADR Sourcebook].

8. See 1 C.F.R. § 305.86-3 (1989) ; Id. § 305.84-4; Id. § 305.82-2.

9. Memorandum on Alternative Dispute Resolution Update from Frank Carr, Department of the Army, Corps of Engineers (Mar. 20, 1987), reprinted in ADR Sourcebook, supra note 32, at 587

10. Edelman & Carr, The Mini-Trial: An Alternative Dispute Resolution Procedure, 42 Arb. J. 7, 14 (1987).

11. Corps of Engineers' Mini-Trial Considered Success; Program to be Expanded, 43 Fed. Cont. Rep. (BNA) 259 (Feb. 11, 1985).

12. Cibinic & Nash, Administration of Government Contracts (2d ed.) (1985), at 267.

13. See supra note 47, and accompanying text.

14. Cibinic & Nash, supra note 48, at 267-348.

15. Gardner, Artificial Intelligence and Legal Reasoning, MIT Press, Cambridge, MA, 1987.

16. Berman & Hafner, The Potential of Artificial Intelligence to Help Solve the Crisis in Our Legal System, 32 ACM (No. 8) 928, 930 (Aug. 1989).

17. Id. at 928.

18. See also Nagel & Barczyk, Can Computers Aid the Dispute Resolution Process?, 71 Judicature 253, 294-95 (1988).

19. Nagel, Applying Microcomputers to Dispute Resolution (1987); Nagel & Mills, Microcomputers, P/G%, and Dispute Resolution, 2 Ohio St. J. of Dispute Resolution 187 (Spr. 1987)

20. Susskind, R.E. "The Latent Damage System: A Jurisprudential Analysis" in Proceedings of the second International Conference in Artificial intelligence and Law" Vancouver, BC Canada, June 13-16, 1989, pp 23-32.