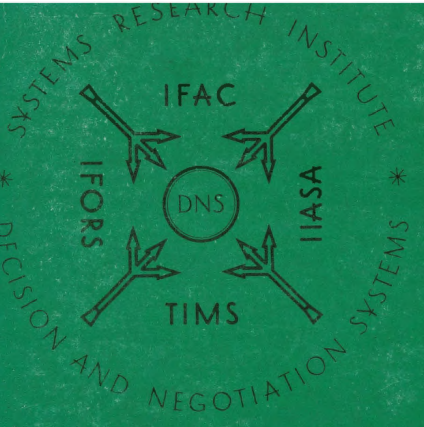


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# SUPPORT SYSTEMS FOR DECISION AND NEGOTIATION PROCESSES

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# SUPER-OPTIMUM MEDIATION IN RULE-MAKING CONTROVERSIES

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## I. BASIC CONCEPTS

The kind of dispute resolution with which this article is especially concerned is disputes over public policies for dealing with various social problems. For example, in the controversy over how to provide legal services for the poor, liberals and Congress advocate salaried government lawyers by way of the Legal Services Corporation. Conservatives and the Reagan White House advocate a program of volunteer lawyers serving the poor. Both sides agree that the key criteria for deciding among the alternative delivery systems are (1) inexpensiveness, (2) accessibility, (3) political feasibility, and (4) competence. There is also rough agreement that volunteers are better on inexpensiveness and political feasibility, whereas salaried government lawyers are better on accessibility and competence. The big dispute as to the inputs for arriving at a conclusion is over the relative weights of the goals. The liberals place a higher weight on accessibility and competence, whereas the conservatives place a higher weight on inexpensiveness and political feasibility.

Disputes like that and disputes in general can often be resolved by (1) changing the alternatives being considered, (2) changing the criteria for evaluating the alternatives, or (3) changing the relations between alternatives and criteria. Microcomputer software can be helpful in determining the effects of any of those changes.

That kind of dispute resolution is facilitated by spreadsheet-based software that makes use of multi-criteria decision-making. Such software can process a set of goals to be achieved, alternatives available for achieving them, and relations between goals and alternatives in order to choose or explain the best alternative, combination, allocation, or predictive decision rule. That kind of software is referred to as decision-aiding or information-processing software. It can be contrasted with information retrieval software. Retrieval of information can sometimes be relevant to resolving disputes. More important, however, is the need to systematically process information that has already been obtained, including information in one's head.

The most useful aspect of such software is its ability to indicate what it would take to bring a second-place or other-place alternative up to first place. Such software can also do other kinds of what-if analysis whereby the goals, alternatives, relations, and other inputs can be quickly changed in order to see what effect the changes have on the willingness of each side to agree to a settlement. Spreadsheet software is especially relevant, partly because it allows for so many criteria or goals to be considered simultaneously. That enables each side to make concessions on some criteria that are not so important to it, but are important to the other side, and vice versa. That kind of interaction can lead to super-optimum solutions, whereby each side comes out ahead of its original best expectations.

## II. CHANGING THE ALTERNATIVES BEING CONSIDERED

Perhaps the best way to resolve disputes over the relative weights of the goals (or for that

matter over any disputed policy problem is to try to find a new alternative that will please both sides in light of their differing weights, goals, perceptions, constraints, or other inputs. An example is working with the existing Legal Services Corporation, but requiring all Legal Services Agencies to use 10% of their budgets to improve the accessibility and competence of volunteer lawyers. Accessibility can be improved by bringing the volunteer lawyers to the agency offices to meet with relevant clients. Competence can be improved through training manuals, training workshops, and matching specialist lawyers with clients who relate to their specialties.. Such a 10% system may be better than a pure Legal Services Corporation even for those with liberal weights, because it provides a better benefit/cost ratio and greater political feasibility without decreasing accessibility or competence. Such a system is also better than the existing Legal Services Corporation from a perspective with conservative weights, because it represents an improvement on all four goals over the existing system. Also if volunteering becomes mandatory for license renewal, then the volunteers are likely to dominate the system.

Computer output for the legal service example is given in Table 1. The first part of the Table shows how the two original alternatives and the new alternative score on the four criteria on a scale of 1-2, corresponding to "relatively no" and "relatively yes." The second part of the Table shows the same data, but with the scores on inexpensiveness and political feasibility doubled to reflect conservative values. The third part shows the same data as the first part, but with the scores doubled on accessibility and competence to reflect the liberal emphasis. The key item to note is that the optimizing compromise scores better than the favored alternative of either side using each side's own value system. Finding such optimizing compromises is facilitated by this kind of analysis.

Instead of adding an alternative, subtracting one might be helpful where more than two alternatives are involved. For example, by reducing three alternatives to two, we may have a clear-cut runoff where one of the two alternatives in effect gets an especially large portion of the votes or points that would otherwise go to the third alternative. Related to adding an alternative is the idea of consolidating two or more alternatives. Doing so in effect creates a new alternative. That new alternative may be a good compromise if there were only two alternatives at the time of the consolidation. If there were more than two alternatives, then consolidating can have the beneficial effect of reducing the number of alternatives. Related to consolidating (although in the opposite direction) is subdividing one alternative into two or more alternatives. Perhaps one of those newly created alternatives may be a compromise alternative on which the disputants can agree. If not, some of the newly-created alternatives might be quickly eliminated as clearly inferior, thereby clarifying the situation although not reducing the number of alternatives. Each time there is an addition, subtraction, consolidation, or subdivision, the P/G% program can quickly show how the new alternatives compare in terms of their overall or summation scores on the criteria, with regard to either raw scores or percentaging scores.

## III. CHANGING THE CRITERIA

All of the above approaches to making changes in the alternatives can also apply to making changes in the criteria. For example, a dispute might be more capable of being resolved by adding a criterion which brings out that Alternative B is clearly the winner, even though the two alternatives were originally tied. Likewise, subtracting a criterion could make Alternative B clearly the winner. The same effect in terms of clarifying the winner can also occur as a result

of consolidating two or more criterion as a result of subdividing a criterion.

Unlike the alternatives, the criteria are subject to different weights to indicate their relative importance, although the alternatives are subject to different overall scores to indicate their relative importance. The overall scores of the alternatives, however, are outputs of the analysis, whereas the weights of the criteria are inputs of the analysis. By changing those criterion weights, Alternative B may become the clear winner. Working with different weights when all the weights were originally the same can help resolve many disputes. Along related lines, one can work with the weights and criteria of just the first disputant, and then just the second disputant. Doing so generates two sets of overall or summation scores for the alternatives. One can average those overall scores in order to see which alternative might be the winner, or one can average the weights that the disputants assign to the criteria. The averaging can be a weighted average if one side of the dispute is considered to have more weight or to be entitled to more votes than the other sides or other disputants.

Working with minimum and maximum constraints is another approach that especially applies to the criteria, although it could apply to the alternatives. For example, the subject matter of a given dispute may cause the disputants to agree that a certain criterion is desirable such as the age of the person to be hired, but only up to 70 years because of a relevant retirement rule. That could eliminate some alternatives as could a minimum requirement of age 21. Likewise, the subject matter of a given dispute may make it meaningful to have a maximum and/or a minimum constraint on an alternative. Perhaps, for example, the original alternatives are (1) spending $100 on Activity P and $10 on Activity Q versus (2) spending $90 on Activity P and $30 on Activity Q. The alternatives under consideration may be reduced if there is a maximum budget of no more than $115, a maximum expenditure on an activity of no more than $95, or a minimum expenditure on an activity of no less than $20. The P/G% program allows one to determine quickly the effects of changing minimum and maximum constraints on criteria and alternatives, as well as changing the criteria and the alternatives themselves.

## IV. CHANGING THE RELATIONS BETWEEN ALTERNATIVES AND CRITERIA

In resolving disputes, the third big area of change involves the relations between the alternatives and the criteria. What begins as a tie could possibly be resolved by changing the scores for some of the relations. One could also show the overall summation scores for the alternatives when all the relations are scored from a conservative perspective and a liberal or other perspective. One can then average those two or more sets of overall scores in order to arrive at a super-overall winner as was discussed in talking about conservative and liberal weights and criteria.

Along related lines, one can change the relations by providing for more refined measurement as when one goes from a 1-2 scale to a 1-5 scale, or less refined but clearer measurement as when one goes from a 1-5 scale to a 1-2 scale. One could change the measurement units from a 1-5 scale to a scale measured in dollars, years, miles, or another dimension. Changing the measurement scale may require shifting from a raw sore approach to a percentaging approach if multi-dimensionality is introduced. For example, although one can add the raw scores on two criteria, both of which are measured on 1-5 scales, one cannot so meaningfully add the raw scores from a 1-5 scale to the scores from a scale measured in miles. It may, however, be meaningful to indicate how each alternative scores on each criterion in terms of the percentage

relation of each raw score to the maximum raw score possible or to the total of the raw scores on a criterion. The P/G% program works especially well with such multi-dimensionality in view of the program's emphasis on working with part\whole percentages or raw scores converted into percentages of the total points on a criterion.

## V. SOME CONCLUSIONS

In light of the above general principles and specific examples, one can conclude that microcomputers and the P/G% program can help facilitate negotiation and mediation leading to dispute resolution by proceeding in accordance with the following steps or options:

1. Determine the initial alternatives, the criteria, and the relations between the alternatives and the criteria in light of each side's values and perceptions. The P/G% input-format facilitates clarification of those dispute parameters.
2. Determine what it would take each side to convince the other side. The threshold, break-even, or tie-causing analysis of the P/G% program facilitates that determination. If each side could at least partly convince the other side, encourage them to do so, since the result may be a mutually acceptable alternative or compromise.
3. Experiment with a variety of additional alternatives, as contrasted to the original deadlocked alternatives. Use the P/G% program to determine quickly the overall or summation score for each alternative using the criterion weights of each side to the dispute. Look especially for a new alternative that could be endorsed by both sides more strongly than their original first choices. At least find an alternative that could be each side's second choice and thus serve as a compromise winner in a series of paired comparisons.
4. Try changing the alternatives by subtracting some, by consolidating two or more, or by subdividing some. Try doing the same things with the criteria. Use the P/G% program to determine the overall or summation scores of the new set of alternatives.
5. Try changing the criterion weights, or try averaging the alternatives in light of the different sets of weights which the conflicting disputants have.
6. Try working with reasonable minimum and/or maximum constraints on the criteria and/or the alternatives to see what difference that makes.
7. Try changing some of the relation scores and maybe the measurement units on which the scores are based. That may mean experimenting with the procedures in the P/G% program for dealing with criteria measured on multiple dimensions.

Some of the implications of these procedures are as follows:

1. By thinking in terms of super-optimum solutions with the disputants coming out ahead of their original best expectations, there should be a lessening of problems between groups based on economic class, race, sex, religion, ancestral nationality, geography, age, and other demographic characteristics which tend to be divisive.
2. This kind of dispute resolution can result in a higher percentage of disputes being resolved. They should also be resolved at a faster speed and with more satisfaction for the disputants.
3. Super-optimum dispute resolution does not require a mediating third party, although such people can be helpful, especially where the disputants are emotionally involved. Instead of a third party, the disputants themselves can adopt a mediating frame of mind so they can both or all come out ahead, rather then have winners and losers.
4. This kind of alternative dispute resolution does not require going outside the regular court

system. There is no reason why regular judges cannot under appropriate circumstances seek to bring about a super-optimum solutions between plaintiffs and defendants in civil cases.

5. Microcomputers and spreadsheet-based software can be helpful in resolving disputes, but more important than either the hardware or the software is having the disputants think in terms of multiple alternatives and multiple criteria so each side can give a little on criteria that are not o important to it but may be important to the other side.
6. The idea of super-optimum solutions can apply to both rule-making disputes and rule-applying disputes. It can apply to the administrative, legislative, and judicial process. It can also apply in business, family, and other social institutions.

It is hoped that this article will stimulate more use of computer-aided negotiation and mediation for resolving disputes. Those uses should help build a literature of experiences from which other disputants, mediators, and arbitrators can benefit. In no way does a computer take the place of a negotiator, mediator, or arbitrator. Computers can, however, be substantial aids in clarifying the effects of new alternatives, criteria, and relations in resolving legal and other disputes.

## REFERENCES FOR FURTHER RELEVANT READING

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TABLE 1. AN EXAMPLE OF COMPUTER-AIDED MEDIATION

| | Inexpensiveness | Accessibility | Political Feasibility | Competence |
|---|---|---|---|---|
| **A. With unweighted criteria** | | | | |
| Volunteer | 2.00 | 1.00 | 2.00 | 1.00 |
| Salaried | 1.00 | 2.00 | 1.00 | 2.00 |
| Compromise | 1.50 | 2.00 | 2.00 | 2.00 |
| **B. With conservative weights** | | | | |
| Volunteer | 4.00 | 1.00 | 4.00 | 1.00 |
| Salaried | 2.00 | 2.00 | 2.00 | 2.00 |
| Compromise | 3.00 | 2.00 | 4.00 | 2.00 |
| **C. With liberal values** | | | | |
| Volunteer | 2.00 | 2.00 | 2.00 | 2.00 |
| Salaried | 1.00 | 4.00 | 1.00 | 4.00 |
| Compromise | 1.50 | 4.00 | 2.00 | 4.00 |

NOTES:

1. The alternative ways of providing legal counsel to the poor include:
   (1) Volunteer attorneys, favored by the White House
   (2) Salaried government attorneys, favored by the Congress
   (3) A Compromise that involves continuing the salaried system, but requiring that 10 percent of its funding go to making volunteers more accessible and competent.
2. The criteria are inexpensiveness, accessibility, political feasibility, and competence. Each alternative is scored on each criterion on a 1-2 scale.
3. Conservative values involve giving a weight of 2 to inexpensiveness and political feasibility when the other criteria receive a weight of 1. Liberal values involve giving a weight of 2 to accessibility and competence when the other criteria receive a weight of 1.
4. With conservative values, the volunteer system wins over the salaried system 10 points to 8. The compromise is an overall winner with 11 1/2 points.
5. With liberal values, the salaried system wins over the volunteer system 10 points to 8. The compromise is an overall winner with 11 1/2 points.
6. The "10 percent compromise" is thus a super winner in being better than the original best solution of both the conservatives and the liberals.