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Structured analogies in forecasting

Abstract
When people forecast, they often use analogies but in an unstructured manner. We propose a structured judgmental procedure that involves asking experts to list as many analogies as they can, rate how similar the analogies are to the target situation, and match the outcomes of the analogies with possible outcomes of the target. An administrator would then derive a forecast from the experts' information. We compared structured analogies with unaided judgments for predicting the decisions made in eight conflict situations. These were difficult forecasting problems; the 32% accuracy of the unaided experts was only slightly better than chance. In contrast, 46% of structured analogies forecasts were accurate. Among experts who were independently able to think of two or more analogies and who had direct experience with their closest analogy, 60% of forecasts were accurate. Collaboration did not improve accuracy.

accuracy, analogies, collaboration, conflict, expert, forecasting, judgment

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Structured Analogies for Forecasting

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Structured Analogies for Forecasting

When people forecast, they often use analogies but in an unstructured manner. We propose a structured judgmental procedure that involves asking experts to list as many analogies as they can, rate how similar the analogies are to the target situation, and match the outcomes of the analogies with possible outcomes of the target. An administrator would then derive a forecast from the experts' information. We compared structured analogies with unaided judgments for predicting the decisions made in eight conflict situations. These were difficult forecasting problems; the 32% accuracy of the unaided experts was only slightly better than chance. In contrast, 46% of structured analogies forecasts were accurate. Among experts who were independently able to think of two or more analogies and who had direct experience with their closest analogy, 60% of forecasts were accurate. Collaboration did not improve accuracy.

Key words: accuracy, analogies, collaboration, conflict, expert, forecasting, judgment.

It seems natural to use analogies when making decisions or forecasts as, by definition, they contain information about how people have behaved in similar situations in the past. For example, Breuning (2003) found that one-third of testimony at the Senate hearing on proposals for the first U.S. program for development aid was based on analogies. Khong (1992) concluded that most of the decisions made early in the Vietnam War were based on forecasts derived from analogies. Indeed, Kokinov (2003, p. 168) asserts "…we may explain human behavior by assuming that decisions are made by analogy with previous cases…" In the belief that such information is useful, MIT professor Lincoln P. Bloomfield has developed a historical database of post-World War II conflicts (web.mit.edu/cascon) in order to help policy analysts and others identify appropriate analogies.

We agree that information about analogies should be useful for forecasting, but we suspect that without structure people rush to forecast. To the extent that they think about analogies, they will find one that supports their forecast and then stop their search. For example, when the U.S. Environmental Protection Agency approved a new oil refinery in Eastport, Maine, decision makers relied on the analogy of Milford Haven in the U.K (Stewart and Leschine, 1986). The EPA decision makers considered Milford Haven was the most comparable site, and looked no further, but Stewart and Leschine observed that Milford Haven had not been in operation long enough to provide evidence that it was safe. They were right. The supertanker Sea Empress ran aground near Milford Haven on 15 February, 1996, spilling 70,000 tonnes of crude oil (Canada Centre for Remote Sensing, 1996). Neustadt and May (1986) described how inappropriate selection and inadequate analysis of analogies led U.S. government decision makers to make poor forecasts of the decisions of other governments' leaders. Drawing on their litany of poor decisions by political leaders, they described an elaborate structured approach to analyzing current and historical information that they suggested should lead to a more effective use of experts' knowledge and hence to improved prediction.

Many areas of judgmental decision making and forecasting have shown that structured judgmental processes make more effective use of the information people possess. This occurs, for example, when people are asked explicitly to decompose a problem (MacGregor, 2001). More generally, Armstrong (1985, Chapter 6) summarizes evidence that structured methods of judgmental forecasting are more accurate than unstructured ones. A structured approach to

forecasting with analogies, then, might encourage experts to consider more information on analogies, and to process it in an effective way.

Kahneman and Lovallo (1993) report an anecdote that illustrates how inducing an expert to use analogies in a structured way can affect predictions. Kahneman had worked with a small team of academics to design a new judgmental decision making curriculum for Israeli high schools. He asked each team member to predict the number of months it would take them to prepare a proposal for the Ministry of Education. Predictions ranged from 18 to 30 months. Kahneman then turned to a member of the team who had considerable experience developing new curricula and asked him to think of analogous projects. After some consideration, the man stated that, among the many analogous situations he could recall, about 40% of the teams eventually gave up. Of those that completed the task, he said, none did so in less than seven years. Furthermore, he thought that the present team was probably below average in terms of resources and potential. In the event, the project took eight years to complete.

Procedure for forecasting with structured analogies

Because the literature provides no evidence on how to structure forecasting with analogies, we started with a simple procedure. If analogies are useful, it is because they are similar to a target. Imposing structure on experts' assessments of similarity should encourage more complete processing of information and reduction of biases. We also wanted a procedure that would be easy for experts to use. At a minimum then, a structured approach to using analogies for forecasting requires experts to identify analogies and the outcomes they imply for the target, and to assess the analogies' similarity to the target in a structured way. Our structured analogies procedure involves five steps, two of which involve experts analyzing analogies. The administrator (1) describes the target situation, and (2) selects experts; the experts each (3) identify and describe analogies, and (4) rate similarity; the administrator (5) derives forecasts.

(1) Describe the target situation

The administrator prepares an accurate, comprehensive, and brief description. To do so, the administrator should seek advice either from unbiased experts or from experts with opposing biases. When feasible, include a list of possible outcomes for the target situation to make coding easier.

(2) Select experts

The administrator recruits experts who are likely to know about situations that are similar to the target situation. The administrator should decide how many experts to recruit based on how much knowledge they have about analogous situations, the variability in responses among experts, and the importance of obtaining accurate forecasts. Drawing upon the research on the desirable number of forecasts to combine, we suggest enlisting the help of at least five experts (Armstrong, 2001).

(3) Identify and describe analogies

Ask the experts to describe as many analogies as they can without considering the extent of the similarity to the target situation.

(4) Rate similarity

Ask the experts to list similarities and differences between their analogies and the target situation, and then to rate the similarity of each analogy to the target. We suggest providing a scale against which the experts can rate the similarity of their analogies. Ask them to match their analogies' outcomes with target outcomes.

(5) Derive forecasts

To promote logical consistency and replicability, the administrator should decide on the rules to derive a forecast from experts' analogies. Many rules are reasonable to use. For example, one could select the analogy that the expert rated as most similar to the target and adopt the outcome implied by that analogy as the forecast.

Hypotheses

We examined predictive validity using conflicts. Prior research has shown that the method currently used for making predictions for conflicts, unaided judgment, produces inaccurate forecasts (see, for example, Green 2002). We hypothesized that forecasts derived from experts' structured analysis of analogies would be more accurate than forecasts by experts who used their unaided judgment.

Our structured analogies procedure is based on the assumption that while unaided experts can provide useful information, they are not good at processing complex information reliably. For that reason, we did not rely on the experts to make forecasts but instead used a rule. On the other hand, perhaps experts' understanding of their own analogies might enable them to forecast more accurately than we could by using rules. To test this aspect of our procedure, we asked our experts to predict the decision made in the target situation after they had described and rated their analogies.

Does it help if experts collaborate and discuss analogies with others? Collaboration could help experts to produce more analogies and flesh out the details, or it could hinder them by suppressing their creativity and search. Both positions are reasonable, so we had no prior hypothesis on collaboration. We asked some experts to collaborate with others and all experts were asked to report the number of people they discussed the forecasting problem with.

Prior evidence

We searched for evidence on methods for forecasting with analogies. Schrodt (2002) searched for empirical evidence on the accuracy of forecasts for decisions in conflicts in the foreign policy arena. He found no evidence on the accuracy of forecasts based on analogies relative to that of forecasts based on any other method.

In a marketing study, McIntyre, Achabal and Miller (1993) tested a procedure called case-based reasoning, which is a way to structure analogies, for forecasting sales during sales promotions. When tested on two products, the forecasts were no more accurate than those of an expert buyer.

We conducted a further search for evidence by using the *Social Sciences Citation Index* (SSCI) for the period 1978 to August 24, 2004 using the terms “analogies” and “forecasting,” and then “analogies” and “prediction.” We searched the Internet on August 24, 2004 using Google™ and the terms “comparative”, “forecasting,” “prediction,” “accuracy,” and “analogies”. We conducted similar searches on JSTOR. In November 2001, we sent e-mail appeals to the 278 members of the International Institute of Forecasters list server and to the 579 members of the Judgment and Decision Making mailing list. We also contacted key researchers. The only relevant study we uncovered was Buehler, Griffin, and Ross’s (1994). The authors asked 123 participants to estimate how long it would take to complete a computer assignment. Their predictions, made using unaided judgment, were inaccurate as they were overly optimistic. Participants who had been asked to think of analogous situations were less biased, especially when they described how the analogies related to the assignment. As a consequence, proportionately twice as many of those who recalled analogies finished their assignments before their estimated completion times.

In sum, prior to the research we describe here, little evidence was available on the accuracy of forecasts based on the use of analogies relative to the accuracy of forecasts made using other methods. Furthermore, no prior evidence exists on the use of structured analogies.

Procedures used for the study

Preparing materials

We compiled descriptions of conflicts, including brief descriptions of the roles of the parties involved in the conflict. The conflict descriptions were accounts of real situations. We abstracted all but one (Personal Grievance) from mass media reports or experts’ accounts. The lead author developed the Personal Grievance from information collected in interviews and from exchanges of e-mail messages with the parties involved in the dispute. In the case of Nurses Dispute, he gathered information from published sources (Langdon, 2000a; 2000b; 2000c; *Radio New Zealand*, 2000a; 2000b; 2000c) and by interviewing representatives of the two disputant parties. When we considered it necessary, we disguised the conflicts that had already occurred to reduce the chance that our participants would know the outcomes. As a precaution, we asked our experts whether they recognized the situations. In eight cases, experts correctly identified a conflict, and their responses were eliminated.

In all, we used eight conflict situations in our research. We provided between three and six possible outcome options for each of them (Table 1). Our descriptions were short, running to no more than two pages. The full descriptions are provided at conflictforecasting.com. [For reviewers, descriptions are attached as Reviewer Appendix 1 and outcome options as Reviewer Appendix 2.] The materials, identity of the disguised conflicts, and descriptions of actual outcomes are available to researchers on request.

Table 1

Conflict Situations

Artists protest: Members of a rich nation's artists' union occupied a major gallery and demanded generous financial support from their government. What will be the final resolution of the artists' sit-in? (6 options)

Distribution channel: An appliance manufacturer proposed to a supermarket chain a novel arrangement for retailing its wares. Will the management of the supermarket chain agree to the plan? (3 options)

55% Pay plan: Professional sports players demanded a 55 percent share of gross revenues and threatened to go on strike if the owners didn't concede. Will there be a strike and, if so, how long will it last? (4 options)

Nurses dispute: Angry nurses increased their pay demand and threatened more strike action after specialist nurses and junior doctors received big increases. What will the outcome of their negotiations be? (3 options)

Personal grievance: An employee demanded a meeting with a mediator when her job was downgraded after her new manager re-evaluated it. What will the outcome of the meeting with the mediator be? (4 options)

Telco takeover: An acquisitive telecommunications provider, after rejecting a seller's mobile business offer, made a hostile bid for the whole corporation. How will the standoff between the companies be resolved? (4 options)

Water dispute: Troops from neighboring nations moved to their common border, and the downstream nation threatened to bomb the upstream nation's new dam. Will the upstream neighbor agree to release additional water and, if not, how will the downstream nation's government respond? (3 options)

Zenith investment: Under political pressure, a large manufacturer evaluated an investment in expensive new technology. How many new manufacturing plants will it decide to commission? (3 options)

Selecting experts

To select experts, we sent e-mail messages to ten public list servers, two organizations' e-mail lists, the faculty of a university political science department, and a convenience sample of 15 experts. We chose lists that were likely to include high proportions of experts on conflicts or on judgmental forecasting. We took additional steps to ensure people were suitably qualified for these tasks. In our appeals, which were personalized when possible, the lead author wrote "I am writing to you because you are an expert…" and "I am engaged in a research project on the accuracy of different methods for predicting the outcomes of conflicts…" (Appendix A). We sent only descriptions of conflicts that were likely to be relevant to the particular recipients. For example, we did not send a situation dealing with a proposed new marketing channel to experts in employment relationship disputes. Most importantly, we counted on people to recognize when they had expertise on a topic.

We sent as many as three reminders. Details of the lists and participation are provided at conflictforecasting.com. [For the purpose of review, the details are attached as Reviewer Appendix 3.]

Using the methods

In our e-mail appeal, we gave experts instructions on how to participate (Appendix A). For structured-analogies participants, our one-page questionnaires asked the experts to (1) describe each analogous situation; (2) describe their source of knowledge about it; (3) list similarities and differences compared to the target conflict; and (4) provide an overall similarity rating (where 0 = no similarity… 5 = similar…10 = high similarity). Finally, we asked the experts to select (from a list of possible outcomes that we prepared for each target conflict) the outcome closest to the outcome of their analogy. To illustrate, a completed structured-analogies treatment questionnaire for one of the conflicts, Telco Takeover is provided as Appendix B.

Questionnaires for unaided-judgment participants first asked them to select the outcome they thought would occur. We gave them the same lists of possible outcomes that we gave to the structured-analogies participants.

We varied the order in which we attached the conflict documents to our e-mail appeals. To test our hypotheses, with our appeals we sought responses for each of the following treatments:

1. unaided judgment (no instructions on how to forecast) without collaboration,
2. unaided judgment with collaboration,
3. structured analogies without collaboration,
4. structured analogies with collaboration.

For our first appeal, we sent equal numbers of each treatment to members of the International Association of Conflict Management mailing list. The structured-analogy and collaboration treatments were more onerous for participants than unaided judgment, so we obtained relatively few responses for those treatments. As a consequence, in most of our subsequent appeals we sought responses for structured analogies with collaboration. Finally, we sought responses for combinations of conflict and treatment for which we needed more forecasts. Because we were seeking participants for their expertise, rather than as part of a representative sample of some larger group, random assignment to treatments was unnecessary. The form of collaboration was at the discretion of the participants.

Coding responses

We obtained two groups of unaided-judgment forecasts from experts. One was from the unaided-judgment treatment (62 forecasts), and the other from experts who were asked to use structured analogies but could think of no analogies (44 forecasts). We analyzed results separately for each group and the forecasts were similar; the latter group's being somewhat more accurate. We combined the two groups under the title "unaided judgment" for our analyses, reasoning that neither of these groups used structured analyses and that our action favored unaided judgment relative to the structured analogies method.

For each conflict, we derived a structured-analogies forecast from each expert's analogy information, where the information was available. It is trivial to derive a forecast from analogies information when an expert provides a single analogy. On the other hand, many mechanical schemes could be used to derive a forecast when an expert provides information on more than one analogy. To obtain a forecast, we selected the target conflict outcome implied by the analogy given the highest similarity rating by the expert. Our reasoning was that predictive validity

should increase with relative similarity. Where there was a tie, we selected the outcome that had the most support from the expert's analysis of analogies. (Details on the rules for determining support are provided at conflictforecasting.com). [For the purpose of review, details of the rules are attached as Reviewer Appendix 4.] Given our uncertainties about the best procedure, we subsequently analyzed other mechanical schemes.

We asked a convenience sample of five people who knew the actual outcomes of the conflicts to rate the outcome options we provided to the research participants. The raters were told that an option that matched the actual outcome of a conflict should be given a rating of 10. Forecasts were counted as accurate if the outcome option chosen by our rule was the option that had been given the highest median rating by our raters. Outcome options were unconditional statements of decisions and did not specify timing, for example, "Expander's takeover succeeded at, or close to, their August 14 offer price of $43-per-share."

Results

As Tetlock (1999) demonstrated, it is difficult for experts to forecast decisions made in conflicts situations. He found that forecasts by 20 experts of the outcomes of foreign-policy conflicts were no more accurate than could be expected from chance. Our results were similar. Our 66 unaided experts were correct for 32% of predictions in an unweighted average across the eight conflicts (Table 2).

As hypothesized, forecasts from structured analogies were more accurate. They were more accurate for seven of the eight conflicts. Averaging the accuracy figures across the conflicts, structured-analogies forecasts were 46% accurate ($P = 0.04$, one-tailed permutation test for paired replicates; Siegel and Castellan, 1988). We used the permutation test for paired replicates to compare the differences in the percentage of correct forecasts between the two methods for each conflict (e.g., for Artists Protest, the difference between structured analogies and unaided judgment was 17%). Viewed another way, structured analogies reduced the average forecast error by 21% (where forecast error is the percentage of forecasts that were wrong)[1].

1 We calculate average error reduction figures as $\{(100 - A_C) - (100 - A_X)\} / (100 - A_C) * 100$, where A_C is the unweighted average percentage accuracy across conflicts of the comparison forecasts (or chance) and A_X is the corresponding figure for the forecasts of interest.

Table 2

Accuracy of structured-analogies

and unaided-judgment forecasts by experts

Percent correct forecasts [a] (number of forecasts)

	Chance	**Unaided judgment**		**Structured analogies**	
Telco Takeover	25	0	(8)	**8**	(12)
Artists Protest	17	10	(20)	**27**	(11)
55% Pay Plan	25	18	(11)	**57**	(14)
Personal Grievance	25	31	(13)	**36**	(14)
Zenith Investment	33	36	(14)	**38**	(8)
Distribution Channel	33	38	(17)	**50**	(12)
Water Dispute	33	50	(8)	**92**	(12)
Nurses Dispute	33	**73**	(15)	57	(14)
Averages (unweighted)	28	32	(106)	**46**	(97)

a Bold figures denote the most accurate forecasts for each conflict, and overall.

Value of experts' experience

We tested whether structured-analogies forecasts were more accurate when they came from experts with more experience than when from those with less. We used two measures: (1) we asked our experts how many years experience they had as "a conflict management specialist," and (2) we asked them to rate their experience (on a scale from 0 to 10) with situations similar to the target conflict.

Structured-analogies forecasts from experts with five or more years experience as conflict management specialists were *less accurate* (average across conflicts) with 21% error reduction compared to chance, than those with less experience (26% error reduction). Furthermore, where experts gave high ratings to their experience with similar

conflicts their forecasts were *less accurate* (16% error reduction) than where they gave themselves lower ratings (31%).

Effect of number of analogies

We found that forecasts based on data from experts who could think of two or more (plural) analogies were more accurate than those based on data from experts who recalled a single analogy for six of the eight conflicts. Accuracy averaged 38% for forecasts derived from single-analogy data, but 56% for those derived from plural-analogy data ($P = 0.02$, one-tailed permutation test for paired replicates).

All else being equal, conflicts with more outcome options are more difficult to forecast than those with fewer options. To control for this, we examined the reduction in error versus chance. Forecasts based on recall of a single analogy reduced error by an average of 15% compared to chance, while forecasts derived from plural analogies reduced error by 39% (Table 3). The difference in error between single-analogy forecasts and plural-analogy forecasts is $P = 0.02$ using the one-tailed permutation test for paired replicates. The error was reduced by 42% versus chance by accepting data only from experts who described three or more analogies. Thus the usefulness of an individual expert was related to the number of analogies he described.

Table 3

Accuracy of forecasts by number of analogies

Percent error reduction versus chance [a] (number of forecasts)

	None [b]		**One only**		**Two or more**	
Telco Takeover	-33	(8)	-33	(5)	**-14**	(7)
55% Pay Plan	-33	(2)	26	(9)	**73**	(5)
Distribution Channel	-19	(5)	0	(6)	**50**	(6)
Artists Protest	-3	(7)	-3	(7)	**40**	(4)
Personal Grievance	20	(5)	0	(8)	**33**	(6)
Water Dispute	25	(8)	**100**	(4)	81	(8)
Zenith Investment	**25**	(6)	-12	(4)	**25**	(4)
Nurses Dispute	**100**	(3)	40	(10)	25	(4)
Average error reduction (unweighted)	10	(44)	15	(53)	**39**	(44)
Average % correct (unweighted)	34		38		**56**	

a Bold figures denote the most accurate forecasts for each conflict, and overall.

b Forecasts from experts we asked to use the structured analogies method, who were unable to think of analogies. We classified these forecasts as unaided judgment forecasts in all our other analyses.

Effect of experts' familiarity with their analogies

We expected that the information experts provided would be more useful the more closely involved they had been in the analogous situations they identified, because they would be likely to know more about the situations. For example, someone who was an adult during the Vietnam War is likely to know more about that situation than someone born since, and someone who fought in the war is likely to know more again. To examine this, we identified forecasts that had been based on analogies from either experts' own experiences (45) or that of close others (5 forecasts based on the experiences of, for example, a wife or brother-in-law). In an unweighted averaged across the eight conflicts, these direct-experience forecasts were more accurate (49%) than the 45 forecasts based on analogies from third-party accounts (37%); $P = 0.07$, one-tailed permutation test for paired replicates. Viewed another way, the forecasts based on analogies from experiences close to experts reduced the average error across conflicts by 31% (compared to chance) while forecasts that were based on indirect experience provided only 13% error reduction.

Familiarity and plural analogies

The ideal situation when forecasting with structured analogies is to find experts who can think of many analogies with which they have had direct experience. When our experts were able to think of two or more analogies and they had direct experience with the analogy that was most similar to the target, structured analogies forecasts were 60% accurate (23 forecasts). In other cases, 72 forecasts were 39% accurate ($P = 0.04$, one-tailed permutation test for paired replicates).

Mechanical schemes to derive forecasts

We wondered whether experts who had used the structured analogies process then provided forecasts that were more accurate than unaided experts. They did. Their predictions were on average 42% accurate (94 forecasts) compared to 32% for unaided-judgment forecasts ($P = 0.06$, one-tailed permutation test for paired replicates). As we anticipated, however, a structured mechanical process was more effective for deriving forecasts from the experts' analogies information than experts' own judgments. As we have seen, structured-analogies forecasts were 46% accurate. Why the difference when experts derived their own forecasts? Analogies are only useful if they are used. In 22 cases,

experts made forecasts that were inconsistent with the outcomes of their own analogies; of these, 25% were accurate. When the mechanical rule was used to derive forecasts from these experts' analogies, 45% were accurate.

When experts thought of more that one analogy, our mechanical scheme did not use all of the analogical information to make predictions. We tested four alternative approaches in order to determine whether we would improve accuracy further if we derived combined forecasts from all of the 210 analogies with similarity ratings and implied decisions. For example, if an expert provided information on three analogies, for the purpose of testing our four combining alternatives we effectively derived three forecasts instead of the one we would have derived using the structured analogies method.

For our first alternative, we used the outcome implied by the most analogies, and obtained an average accuracy of 40% across all conflicts, compared to 46% for the approach we had adopted. For the second, instead of assuming that the analogies were all of equal value as we did for the first alternative, for each conflict we chose the option with the highest aggregate similarity rating as the forecast (39% accurate). For the third alternative, we reallocated each expert's total number of analogies for a conflict to outcome options in proportion to each option's share of the expert's similarity ratings (40%). For the fourth alternative, we calculated each expert's average similarity rating for each option; we then allocated all of each expert's analogies to each option in proportion to the average similarity rating for the decision as a fraction of the sum of the expert's average similarity ratings (39%). In sum, all of these alternatives provided forecasts that were less accurate than those derived by applying the mechanical scheme that we had specified prior to the testing the accuracy of structured analogies.

Effect of collaboration

While we had no directional hypothesis about collaboration, we analyzed the data to see whether collaboration among experts was useful. When experts using structured analogies collaborated with others, their median working time was 45 minutes compared to 30 minutes for those who worked alone. (We do not know how much time the collaborators spent on the task, nor do we know the nature of their collaboration.) As it happened, those who collaborated claimed to have had much more experience with conflict-management (median of 14 years versus 5 years) and experience with similar conflicts (a median self-rating of 4.0 out of 10, versus 2.8). Despite the greater

investment of resources by more knowledgeable experts, collaboration produced no gain in accuracy: Forecasts from solo experts were on average 44% accurate across conflicts (75 forecasts), compared to 42% for forecasts by collaborating experts (22 forecasts).

Given our findings, we saw no need to distinguish between solo and collaborative forecasts in our analysis. In view of the time savings, we recommend that structured analogies be done by individuals.

Limitations

The structured analogies method is useful only in cases in which experts can think of analogies. This limitation can be overcome in many situations by identifying people with relevant expertise. While this may be difficult to know in advance, one can gauge people's expertise from their responses – that is, did they provide analogies, if so, how many, and did they have direct experience?

Using structured analogies is more costly than using unaided judgment. However, relative to the costs of making bad decisions in many conflict situations, such as selecting strategies to achieve peace in the Middle East or to deal with threatening behavior by the North Korean government, the costs are negligible.

Further research

Research on additional situations would help to better assess the improvements that might be expected, and the conditions under which structured analogies is most effective. Our conclusions are based on a sample of only eight situations.

This is the first published study on the use of structured analogies. More research needs to be done to develop the operational procedures for the method. For example, what is the best way to frame the issues for the experts so that they provide more and better analogies? Would a more structured approach to rating analogies' similarity to a target help administrators derive more accurate forecasts? To what extent might improvements in accuracy be obtained, in the case of well-documented analogies, by checking the facts of the situation and correcting any errors in experts' matching of analogy outcomes with potential target outcomes.

It seems plausible that the Delphi technique could be used to improve assessments of analogies' similarity to a target, potentially increasing accuracy further at a low cost. Rowe and Wright (2001) provide evidence on the value of Delphi, and software for implementing of Delphi is provided at forecastingprinciples.com. Experts' confidence ratings may be useful for weighting structured-analogies forecasts in a combination (Arkes, 2001).

We have examined conflict situations because of their importance and the difficulty of obtaining useful forecasts. Structured analogies might also improve forecasting for situations other than conflicts. We expect that it would be most useful where situations are complex and where there are plural analogies.

Research is needed on how to encourage adoption of structured analogies. Currently, people use unaided judgment, a method that is little better than chance, to decide whether to go to war, get a divorce, make a hostile takeover bid, go on strike, or mount a competitive pricing campaign. Better forecasts would aid decision making in such situations.

Conclusions

It is difficult to forecast decisions made in conflict situations. On average, unaided experts were correct for only 32% of their predictions. This was little better than chance at 28%.

For our structured analogies method, the two key criteria for identifying an expert were the number of analogies generated, and the presence of direct knowledge about those analogies. When experts produced two or more analogies from experience, forecasts from structured analogies were correct for 60% of the predictions. Given the importance of forecasts in conflict situations and in other arenas, such improvement could have considerable benefits.

Appendix A

E-mail message appeal and instructions: Structured analogies / collaboration treatment

Subject: Using analogies to predict the outcomes of conflicts

Dear Dr _____

I am writing to you because you are an expert on _____. I am engaged on a research project on the accuracy of different methods for predicting decisions made in conflicts. At this stage, I'm investigating the formal use of "analogies" for forecasting. That is, forecasting on the basis of the outcomes of similar conflicts that are known to the forecaster.

What I would like you to do is to read the attached descriptions of some real (but disguised) conflict situations and to predict the outcome of each conflict. If you can't read the attachments, please let me know and I'll send the material in your preferred format if I'm able.

Each attached file contains a conflict description and a short questionnaire. Please follow these steps for each conflict:

1/ Read the description and
2/ try to think of several analogous situations and
3/ about how similar your analogies are to the conflict.
4/ Fill-in the questionnaire (electronically if you can)

a) describe your analogies
b) rate your analogies
c) make your prediction (either pick an outcome or assign probabilities)
d) record the total time you spent on all tasks
e) return the questionnaire.

One of the objectives of this research is to assess the effect of collaboration on forecast accuracy. You have been allocated to the collaboration treatment, so please *do* discuss these forecasting problems with colleagues. Do *not*, however, discuss them with other people who have received this material as I want independent responses from participants.

Although I intend to acknowledge the help of all of the people who assist with this research, my report will not associate any prediction with any individual.

Your prompt response is very important to the successful completion of my project. Please help me to prove the sceptics wrong about the level of cooperation I get!

Best regards,
…

Appendix B

Telco Takeover Bid

1) (A) In the table below, please briefly describe
(i) your analogies,
(ii) their source (e.g. your own experience, media reports, history, literature, etc.), and
(iii) the main similarities and differences between your analogies and this situation.
(B) Rate analogies out of 10 (0 = no similarity… 5 = similar… 10 = high similarity).
(C) Enter the responses from question 2 (below) closest to the outcomes of your analogies.

(A) (i) description,	(ii) source,	(iii) similarities & differences	(B) Rate	(C) Q2
a. Bank takeover	**Personal**	**Issue same, industry different**	**8**	**C**
b. Govt Agency merger	**Personal**	**Takeover same, government, but ordered takeover**	**4**	**D**
c. Facility Merger	**Personal/family**	**Combine similar operations**	**3**	**B**
d.				
e.				

2) How was the standoff between Localville and Expander resolved? *(check one ✓, or %)*

a. Expander's takeover bid failed completely [__]
b. Expander purchased Localville's mobile operation only [__]
c. Expander's takeover succeeded at, or close to, their August 14 offer price of $43-per-share [X_]
d. Expander's takeover succeeded at a substantial premium over the August 14 offer price [__]

3) If you have *not* given a prediction, please state your reasons:

4) Roughly, how long did you spend on this task?
{include the time you spent reading the description and instructions} [_1__] hours

5) How likely is it that taking more time would change your forecast?
{ 0 = almost no chance (1/100) … 10 = practically certain (99/100) } [_0_] 0-10

6) Do you recognise the actual conflict described in this file? Yes [__] No [X__]
If so, please identify it: **[_____]**

7) How many people did you discuss this forecasting problem with? [_2___] people

8) Roughly, how many years experience do you have as a conflict management specialist? [20+] years

9) Please rate your experience (out of 10) with conflicts <u>similar to this one</u> [6____] 0-10

When you have completed this questionnaire, please return
<u>either</u> this document as an email attachment to…
<u>or</u> this questionnaire (with your initials at right) by fax to… **Your initials:** [_XYZ_]

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Note to reviewers: The following materials will be placed on www.conflictforecasting.com as part of full-disclosure to aid replication and extensions. Our paper is self-contained; there will be no need for other readers to access these materials.

Reviewer Appendix 1

ARTISTS' REPRIEVE

The Country

Histavia is a relatively small country which is also one of the most densely populated nations in the world. It has some energy resources (mostly gas) but very few other natural resources. Farming, fishing and trading have always been important parts of this country's economy. More recently the country has become quite involved in manufacturing with over 40% of the people employed in various industries. The government is renowned for its bureaucracy and for the extravagant systems it puts together. For example, in order to help with the population problem and overcrowding, the government subsidised emigration.

The government is a constitutional monarchy. Executive power lies in a cabinet selected by the majority in Parliament. Histavia's parliament has two houses. The 1st House contains appointed representatives from each province's legislative body. The 2nd House is elected by direct vote and develops all legislation. A bill passed by the 2nd House is sent to the 1st House for a vote.

Artistic Problems

Visual art has always been a very important part of Histavian culture. Three hundred years ago, Histavia's seaports and rivers made it a major trading hub for the surrounding nations. Histavians became relatively wealthy and wanted to chronicle the times. They wanted pictures of themselves, their families, homes, and the countryside. Demand was so great that an artist could specialise in whatever subject she wanted to paint. Out of this environment came some of the world's greatest artists. The Histavian people thus developed a special regard for art and artists.

This prosperity didn't last. The private market for art has been very weak for a long time. There are currently sufficient jobs available for artists but there isn't enough demand for many artists to make a living selling their works. The government feels a compelling need to do something about this problem. Since the private market isn't there, the government feels obliged to protect the artists' financial freedom and thereby to preserve art for the sake of art. Partially to reward artists for their contribution to Histavia's culture and partially because the main artists' union has made a big fuss over the continuing conditions for art, the government has developed a simple programme to keep artists from having to drive taxi cabs. An artist will sign up on the programme for up to a year. During that time the government will buy the artist's wares. Once the artist's time period is up, the artist must sell his works on his own or find another occupation. During the government purchase period, if the artist begins to sell her works in the private market, the government will end its assistance early.

Counterculture

The programme was accepted and seemed to work well for about twenty years. In the late 1960's the counterculture boomed worldwide. Artists in Histavia were particularly upset with the continuing conditions for artists. They felt anyone who said they were an artist was one, and that the programme's length wasn't sufficient time for an artist to get established given the continuing weak demand for art. To press their point, members of the main artists' union occupied the most valuable room of Histavia's primary art museum. They refused to leave until entrance requirements were relaxed and artists were allowed to remain in the programme indefinitely.

Additional Information

- The conflict occurs in the late-1960's
- This is a developed, industrialised country (i.e.; not Third World)
- Not all artists are members of the main union, but union leaders feel they speak for and represent all of Histavia's artists. They also believe they can gain public support for their cause fairly easily.

Current entrance requirements to the programme involve acceptance by the government on the basis of some criteria.

Roles: Histavian Bureaucrats

You are two Histavian bureaucrats responsible for administering the government's programme for purchasing art. You report directly to the executive cabinet, which represents the majority in both Houses and the view of the Queen. The cabinet has given you negotiating power to resolve the artists' sit-in and feels confident it can win support for whatever agreement you reach with the artists. The government and the people are very concerned for the well being of art and artists. The majority party, as always, is concerned with negative public opinion affecting the outcome of the next election. Additionally, the room the artists are holding contains some of the country's most treasured art works. It's your job to negotiate and resolve the issue.

All facts and impressions that are available are given. Extrapolate as necessary.

Roles: Artists' Union Leaders

You are two leaders of the main artists' union and have taken it upon yourselves to represent not only your fellow union members in the room, but all Histavian artists. You know one of the most important things to Histavian people is their art. Still the private demand for art isn't sufficient to support all the artists Histavia's rich culture has inspired. You're meeting with two government agents responsible for administering the current programme. They are influential people who have been sent to resolve the sit-in and have the backing of the majority party in power. Right now you occupy the room in the art museum which contains the country's most treasured art works. You want exit and entrance requirements to the programme relaxed before you'll leave. You feel strongly you represent the viewpoint of all artists and it will be easy to gain public support for your cause.

All facts and impressions that are available are given. Extrapolate as necessary.

DISTRIBUTION PLAN

Background

The year is 1961. The Ace Company has been in business over seventy years and has become a major producer of home appliances. The home appliance industry has had a terrible start this decade. Sales have been weak, inventories are high, dealers are demoralised, and mass merchandisers and foreign competitors have entered the market slashing margins. While the recession seems to have bottomed out by mid-1961, Ace's operating deficit is approaching $6 million for the year. The company, however, feels the fall introduction of the colour TV set might recover some the loss.

Ace's problems seem to be short term. Some existing new products in the development cycle are draining funds and the year's poor sales has created a cash flow crisis. Now that consumer purchases are picking up, funds aren't available for heavy promotion and prices are still soft due to foreign competition and excess inventories. One component of the marketing mix can be attacked – distribution.

Appliance Discount Plan

Competition between supermarkets for customers has always been heavy. Discount houses are opening up and every store seems to be giving trading stamps or running some kind of promotion. Ace feels it has come up with an excellent new distribution plan that will make everyone involved happy and return much needed appliance sales. It's called the Cash Register Tape Plan (CRTP). An Ace dealer will link up with an area supermarket. The supermarket will be given an exclusive contract in return for floor space to display some major appliances. The dealer will supply a sales person to explain the appliances and show pictures of items not on display. A shopper accepted by Ace Financing receives a 12-36 month, no down payment instalment plan and has the item immediately delivered by the dealer. Each month the purchasers bring in their cash register tapes from that supermarket. Five and a half percent of the tape total is taken off the monthly instalment (up to 75% of the payment). The payment of the monthly discount is split between Ace and the supermarket based on a sliding scale. If a shopper purchases less than $50, Ace pays the full 5½%. If she purchases more than $120, then Ace pays 2½% and the supermarket 3%.

The CRTP is designed to benefit all those involved. Naturally Ace and their dealers expect to enjoy increased sales. The shopper will get a reduced price on a major appliance by altering purchasing habits. The supermarket should be able to reduce split market shopping, increase purchases by regular customers of items often purchased elsewhere, obtain new customers, and generally build traffic. There are, however, costs to the plan. Ace receives a lower price, the dealer has a salesperson at a remote location, the customer won't be able to "shop around" for the lowest prices and the supermarket has to give up floor space and pay part of the discount.

Selection Process

Ace wants to deal with regional chains. This strategy will require getting agreement from only one source (per regional market) before they're able to start up the CRTP in the metropolitan areas they've selected. Expansion to additional cities will also be easily accommodated. Ace will select the dealers who will participate based on their proximity to the individual stores selected to participate from the supermarket chains. Both the dealer and the supermarket must be approved by Ace Financing before they can join the CRTP. Dealers not near a selected supermarket or in a region not selected for the plan won't participate. If dealerships overlap a supermarket's territory they will sell in the stores on alternate days.

Additional Information

- Ace carries a full line of major household appliances and is a well-known national manufacturer.
- Small appliances (like toasters) have been sold through supermarkets as promotion items
- Assume Ace can present some attractive return figures for the supermarket based on the given sliding scale discount payment procedure
- No actual test of the CRTP has been conducted

Roles: ACE Executives

You are the ACE marketing vice-president and the marketing director of the appliance division. You are preparing to meet with the management of BIG VALUE supermarkets (a mid-West grocery store chain). They have been approached about the CRTP, received an outline of the plan, and have agreed to meet with you. In addition, you've sent a market analysis your division pulled together indicating how much a chain like BIG VALUE should profit by participating in the CRTP.

It's your job to sell the CRTP! You see it as a potential saviour for ACE's current problems and a unique distribution tool. You are particularly worried about other stores, dealers, and/or manufacturers copying the CRTP. You want to move as quickly as possible once the programme starts. Obviously the continued sales slump and cash flow problems will negatively reflect on your careers.

All facts and impressions that are available are given. Extrapolate as necessary.

Roles: BIG VALUE Vice-Presidents

You are the two top vice-presidents of BIG VALUE supermarkets, a mid-West, regional grocery store chain. You have agreed to meet with the marketing v-p and marketing director of ACE's appliance division after having received information on ACE's CRTP and a market analysis (from ACE) which projects favourable returns for a store chain like yours. You have also heard about ACE's current problems.

It's your job to discuss the pros and cons of the CRTP for your chain and be prepared to react to the ACE personnel. Ultimately you must decide whether or not to accept the CRTP and in what form. BIG VALUE's top management is aware of the plan and will accept your decision. Positive or negative results of your decision will obviously impact on your career.

All facts and impressions that are available are given. Extrapolate as necessary.

THE 55% PLAN

The collective bargaining agreement between the National Football League (NFL) Management Council and the NFL Players' Association (NFLPA) expires on July 15, 1982. The payers' number one demand is for a fixed percentage of the football clubs' gross revenue. Ed Garvey, the executive director of the NFLPA since 1971, says that 55% of the gross revenue is the players' "bottom line" demand. Jack Dolan, executive director of the Management Council since 1980, rejects the union's demand for a percentage of the gross revenue regardless of what the percentage is.

NFLPA

The players' last contract ended in 1974. The players struck for six weeks during the '74 season but returned to work without a contract to begin playing regular season games. The major issue then was free agency. A free agent is a player who doesn't sign a new contract with his team when the current one expires. Once the contract ends, any team can bid for his services. The owners refused to agree to a free agent system so the NFLPA took the case to federal court and won most of their demands. This decree, however, didn't come until 1976. The final contract was signed in 1977, three years after the last contract expired.

Unrestricted free agency in most sports has caused players' salaries to increase substantially, however this has not happened in football. Of the five hundred players who became free agents since 1977, only six have changed teams. The average salary in the NFL was $78,000 in 1980 compared with $108,000 in hockey, $143,000 in baseball, and $186,000 in basketball. Garvey insists the poor performance of the free agent system in football occurs because the NFL clubs practice "corporate socialism". All clubs share equally in TV revenues and playoff monies. This ensures even a team with a terrible record will be financially sound. There is, therefore, economic incentive to replace more expensive veterans with less expensive rookies. Others feel Garvey, at least in part, is to blame for the slow movement of free agents. In the '77 contract, the union agreed to compensation procedures for a team losing a free agent. Many feel the nature and magnitude of the compensation restricts free agency to the point where no club is willing to sign a good free agent. They point to the case when one of the best running backs became a free agent and not one club made him an offer.

The 55% plan is designed to increase all players' salaries and provide incentive bonuses for excellent playing. Some of the higher paid players, however, may not benefit very much under the proposed method for distributing the wages. This plan will also eliminate the individual contracts negotiated by the teams with each player and, in effect, make the players' agents obsolete. As for the players' unity and their resolve to attain the 55% plan, Garvey feels virtually every player is ready to strike and there is no comparison between the situations in 1974 and 1982.

All players now belong to the NFLPA. Communication with the dispersed membership is vastly improved—players and their wives have been thoroughly briefed on the 55% plan, and there will be a union meeting in mid-March to iron out all the details of the wage distribution. The AFL-CIO has been asked to provide assistance from the entire labour community and a battle cry is being sounded in a 20 minute film featuring popular sports and entertainment personalities.

NFL Management Council

While Dolan is the new kid on the block, he's no rookie. As a senior vice-president of industrial relations for nine years with National Airlines, he negotiated contracts with eight unions and went through four strikes. Dolan consults with six owners who make up the council's executive committee. All, except one, are described as "hard liners".

To the owners, a fixed percentage is equated with control and the owners "are not going to let the union run their business". They deny Garvey's contention they have no incentive to win because of the leagues financial structure. Besides being successful businesspeople who want their clubs to do the best they can, the team's won-lost record effects the price owners can charge for tickets, the demand for luxury boxes, and the amount of money lost from concessions because of no shows. From the union's own estimates, the LA Rams had $7.7 million in profits for 1980 while the Denver Broncos had $2.5 million.

The council feels Garvey will have trouble gaining public sentiment and maintaining rank and file support for such an unorthodox plan. In addition, their pre-contract strategy appears to be to build a lack of confidence in Garvey, so it will be difficult for him to maintain players' support for a strike. People either love Garvey or hate him. His shoot from the hip, wisecracking style often leaves a trail of damning quotes. The NFL Management Council uses a monthly newsletter to "their employees" and the sports press to present Garvey's quotes and actions in the worst light. Dolan is intent on using these weaknesses to stop any attempt to have a fixed percentage of gross revenues as the collective bargaining agreement's wage clause. Estimates of the percentage of gross revenues currently going to the players are between 25% and 45%. Naturally the NFLPA claims the figure is between 25-30% and the NFL Management Council places it near 45%.

Additional Information

- Current compensation losing a free agent is by way of draft choices, i.e. if the player's salary is greater than $x, the team signing the free agent loses two 1st round draft choices. A draft choice is a team's right to select a player from a list of all available college players. Teams take turns to pick, with the weakest team choosing first and so on.
- The percentage of gross revenues will go into one pool, which the NFLPA will distribute based on a base salary plus incentive bonuses.

Roles: Management & Owner Representatives

You are the executive director and the head owner representative of the NFL Management Council. You are about to meet with the NFLPA to decide the 55% issue. You both hold very strongly to the statements attributed to the owners and view the NFLPA comments as "hogwash" and propaganda. Prepare and defend your position for the upcoming negotiation.

All facts and impressions that are available are given. Extrapolate as necessary.

Roles: Player Representatives

You are the executive director and the head player representative of the NFLPA. You are about to meet with the Management Council to negotiate and decide the 55% issues. You both hold very strongly to the statements attributed to the NFLPA and view the owners' comments as "hogwash" and propaganda. Prepare and defend your position.

All facts and impressions that are available are given. Extrapolate as necessary.

A Pay Dispute Between City Wide Health and Nursing Staff

City Wide Health Ltd is a government-owned Hospital and Health Service.

The Government funds CWH primarily by purchasing a set level of health services, for example so many hip operations. The level of funding is based on what the Health Funding Authority has calculated are reasonable prices to pay for the services the Government wishes to purchase.

It is the responsibility of the CWH Chief Executive, Hillary Strong, to manage the company's affairs so that it can deliver the services it has contracted to provide while remaining financially viable. CWH's 2000/2001 contract with the HFA is worth $258 million, an increase of nearly 10% over the previous year's contract; this reflects both some price increases and some increase in services provided. There are more than 3,000 staff, and payroll costs are more than $140 million per year – over half of the value of the HFA contract. CWH employs nearly 1300 full time equivalent nurses; their pay costs roughly $55 million per year. The collective employment contract many of the nurses are party to has expired and the nurses and management are currently involved in a dispute over their pay.

The National Nurses Organisation (NNO) represents more than half of the nurses employed by CWH. The nurses are angry. They consider that they have borne the brunt of budget constraints over the years and that their dedication to their profession has been exploited. Perhaps as a consequence of this, the turnover of nurses is high – as many as one-third of nurses leave CWH during the course of a year, often taking up highly paid nursing jobs overseas.

Some specialist nurses are more difficult to replace than others. Earlier this year, Intensive Care nurses obtained a 7% pay increase from CWH. Junior doctors also obtained a large pay increase in separate negotiations. With these precedents, nurses instructed NNO to retract the bid they made in February for a 5% pay increase and instead seek 7% on all salaries and allowances for the 12 months from 1 October. In addition, the NNO are seeking substantial increases in penal rate multipliers, meal, night and weekend allowances, study and long-service leave provisions, and reimbursement of professional association costs.

Hillary Strong and the CWH negotiation team, led by Mark Jensen, have now offered the nurses a 5% pay rise with no new contract for 2 years and have stated that this is most the company can afford. At a stop-work meeting nurses rejected the 5% offer and voted almost unanimously in support of holding a 16 hour strike on Sunday, October the 1st. Nurses at the meeting criticised NNO negotiators for being too willing to compromise. The nurses gave NNO negotiators Jack Naylor, Fergus Black, and the rest of the team clear instructions "not to come back" without an agreement for at least a 7% increase.

The two sides are at odds in their interpretation of CWH's ability to afford a 7% increase. CWH has been struggling to reduce debt levels by reducing costs, increasing efficiency, and only providing services it is funded to provide. The Government requires CWH to break-even, and the CWH negotiators claim that even a 5% pay increase would result in a deficit if cost savings cannot be found elsewhere. The NNO, on the other hand, maintains that CWH is effectively receiving a bonus from the HFA when they are paid for additional procedures. This is because providing an *additional* procedure of a type CWH is already providing does not cost as much as the standard price per procedure the HFA pays. Moreover, NNO claims that a 2.5% "creep" in salaries that CWH has budgeted for will not occur due to the current composition of the nursing workforce and the high attrition rate. Creep occurs when staff receive increases in salary that are related to their length of service. The NNO position is that the "bonus" revenue that will accrue from payments for additional procedures and the absence of creep are sufficient to meet the $1.1m difference between CWH's 5% offer and the nurses' 7% claim.

Both parties have a lot at stake. Hillary Strong's performance is assessed, in part, on her financial management of CWH, while the nurses are prepared to go on strike in support of their strongly held belief that they deserve a 7% pay increase. Meanwhile, the Minister of Health has been sending mixed signals to the two parties about what might be an appropriate settlement and has also stated that the Government will *not* become involved in the dispute.

Assume it is now Monday the 2nd of October. The Sunday strike is over and the two parties are about to recommence negotiations for a settlement of the dispute. If in impasse in negotiations is reached Stephen Worley, an independent mediator from the Government's new Mediation Service, will be appointed. Stephen will briefly interview each party separately and will then endeavour to mediate an agreement. The dispute will be resolved, but after how long and with what terms?

Hillary Strong, Chief Executive of City Wide Health

Hillary Strong trained and worked as a nurse, but has an MBA and has for some years held senior management positions. Most recently, before taking up the appointment at CWH, she was the Chief Executive of another health provider. It was her success in that position that made her a strong candidate for the position she currently holds.

Her role is not easy, and probably rather thankless. Government expects her to run CWH as a business in many ways but, in reality, it is neither fish nor fowl. She is faced with political pressures and with the fact that many people, including many nurses, do not believe that hospitals really are, or should be, businesses. In this ambiguous environment, she is obliged to keep within her budget while ensuring that the hospitals continue to run as smoothly as possible.

Hillary has a good working relationship with Mark Jensen, her chief negotiator. She has used him and his company for advice with labour relations and human resource matters for many years.

Mark Jensen, City Wide Health Negotiator

Mark Jensen is a seasoned industrial negotiator and human resources expert with his own successful business. He has a lot of experience in the health sector. Mark has a direct and pragmatic style and, like Hillary, has quite a lot of sympathy for the nurses. He is, however, employed by CWH and his role is to help Hillary Strong by negotiating an agreement with the nurses' representatives that is consistent with achieving a healthy financial position for CWH without undermining CWH's role as a health services provider.

Jack Naylor, New Zealand Nurses Organisation Organiser

Jack Naylor is a seasoned industrial negotiator and union organiser. Before taking up his present job, he worked for a major public sector employees union. Jack's current role is to represent the interests and wishes of the nurses employed by CWH who are members of the NNO, the nurses' union. This includes organising the nurses to take effective protest and strike action. Jack and his team negotiate on their behalf in order to get the best possible deal for them. Because he is dealing with the CWH managers and negotiators a lot, he understands their point of view, perhaps better than most members, and has developed a good working relationship with them. At the end of the day, however, he can only make recommendations to the nurses. It is they who will decide whether to accept or reject a pay offer and whether or not they will go on strike or take other action. Feelings are running high in this dispute and there is every sign that the nurses are determined to take further action if necessary.

Jack has an open style and believes in the cause of his members. He is being assisted in the current round of negotiations by Fergus Black. Fergus is a senior nurse, and a real asset to the negotiating team.

Fergus Black, Nurse and Negotiator

Fergus is an experienced nurse who has relatively recently returned home after a number of years abroad. He was very well paid working as a nurse overseas. The contrast with the poor situation of nurses locally is marked.

As well as working as a nurse for City Wide Health, Fergus is currently helping the NNO, as a negotiator in the pay dispute. He represents the interests and wishes of the nurses employed by CWH who are members of the union.

Stephen Worley, independent mediator, Mediation Service

Stephen Worley may be asked to act as mediator in the dispute.

His role as mediator would be to:

- control the process
- ensure that each party states their case
- help the parties to identify issues and options for settlement
- look for a solution that will satisfy the needs & interests of both parties
- record the agreement in writing

The Mediation Service web-site includes the following information on mediation:

"Mediators will help the parties decide on the process that is most likely to resolve problems as quickly and fairly as possible." *and*

"If the employer and employee cannot reach agreement in mediation, they can agree, in writing, to the mediator making a final and binding decision. The mediator will explain to the parties that once he or she makes a decision, that decision cannot be challenged. The mediator's decision is enforceable…"

What's the job worth?

In New Zealand universities most students belong to a students association to which they contribute financially. The University of Nelson Students Association (UNSA) is one such association. Each year, students elect fellow students to form the UNSA Executive. The Executive is responsible for the representation of students' collective and individual interests (services), and for operating the facilities such as venues, recreation centre, book shop, cafes, and bars that are owned by UNSA (trading). Day-to-day, services and trading activities are carried out by the 150 staff employed by UNSA. The members of the Executive are not professional managers. This had caused problems with the management of UNSA's permanent staff in the past. Wishing to avoid such problems in future, the Executive decided to restructure the organisation and employ a professional general manager to take primary responsibility for UNSA trading and services.

The young new General Manager, Dave Sanders, started work on 3 May 2000. Dave's background was in large private sector corporations. On top of learning a new job, he was responsible for restructuring the organisation and renegotiating contracts with major suppliers and the University. He was also straight away involved in pay negotiations with nearly half of the UNSA staff. Some of the staff (five of the eight services staff) belonged to the university staff union — the Association of University Staff or AUS. Services staff contracts had expired in 1998 and Arty Cruickshank, the local AUS representative had written to Dave the day before he started work at UNSA seeking a meeting to discuss renegotiation of the five AUS members' contracts. Dave telephoned Arty on 4 May and they arranged to meet on 9 May.

At the meeting, Arty proposed that his members' salary bands be reviewed. He suggested that either UNSA adopt the University's general staff job evaluation process and the associated salary bands or that UNSA undertake a formal review of the positions. Dave asked for time to consider this matter and to familiarise himself with the roles of the services staff. After further consideration Dave decided that the University's process and salary bands were not appropriate for UNSA staff and, besides, the University HR department weren't prepared to do the evaluation for UNSA. Arty was informed of this by 23 May, and the possibility of getting an independent assessment was discussed by Dave and Arty. Arty wrote that staff were keen on the idea, but suggested that both they and the AUS should be allowed to examine the proposed process in order to assess its fairness.

In early June, Dave gave *all* salaried staff a backdated 2% pay increase in recognition of the delays that had occurred in pay negotiations prior to his arrival. A memo to this effect was circulated on 20 June. The memo told staff to update their position descriptions and forward them to Dave before 30 June 2000 so that a formal review of the positions and performance of staff could be conducted. Arty phoned Dave wondering about progress with the independent assessment and was informed by Dave that he had spoken to an independent HR consultant who had advised him that UNSA first needed to make sure the position descriptions were consistent with the current needs of the organisation. In the event, the full set of position descriptions was not available until mid-August at which point Dave informed Arty that he and UNSA President Gerald Sullivan were in the process of reviewing the descriptions. In late-August, Dave and Gerald met with each staff member individually to discuss their position descriptions before finalising them.

On 19 October, Dave advised Arty that Gerald had undertaken the evaluation by comparing positions and salary bands with those of other student associations. The resulting bands were higher than those of other associations reflecting management's ambition that UNSA should be the top association in NZ. Dave presented the salary bands to Arty and the staff on 9 November and it was agreed that Dave would explain the bands to individual staff. He did this on 23 November and the parties met again on 21 December. Arty told Dave that the staff considered comparison with the other associations was inappropriate and that the salary bands should be wider. Arty proposed comparisons with positions that the staff considered to be more relevant. Dave agreed to consider these submissions.

Dave, Arty, and services staff met again on 8 February 2001 to discuss the comparisons. Some changes were agreed to. Arty complained on behalf of staff over the time taken to deal with this matter and Dave responded by reminding Arty that he had considerable demands on his time, had given a backdated pay increase soon after taking on the job and that he would make a final decision on salary bands within one week. He said that UNSA could not afford to move substantially on salaries. On 14 February, Dave wrote to Arty informing him of the new salary bands that UNSA had decided on. The letter stated the bands had been set after careful deliberation that included consideration of the arguments put forward by Arty as well as UNSA's ability to pay and ability to recruit. Dave's letter noted that the salary band for one position had been increased and the upper limit of all bands had been increased by $2,000 from the figures presented to Arty on 9 November the previous year. Dave met with staff and informed them of the outcome of the review.

Despite the increases, the new upper salary limit for the position held by one senior and very experienced staff member, Education Co-ordinator Freda Thornley, was less than she was currently being paid. Freda's role is to ensure that students' education interests are represented to the university. The role involves advice, advocacy, communication, counselling, liaison, organisation, and research. Freda has held the position for 12 years and has a great deal of institutional knowledge as well as established relationships with the academic staff of the University. Dave did not propose reducing Freda's (or any other employee's) salary, but it was clear that she should not expect any pay rise in future.

Nearly one month later, Arty informed Dave that Freda and her assistant did not consider that the evaluation of their positions had been conducted properly and, consequently, had been undervalued. Arty raised the matter with the Employment Relations Authority. The Authority directed the parties to meet with the Mediation Service's Mel Morrissey on 24 April with the purpose of resolving differences over the position evaluation process. For equity reasons, any new evaluation would need to include all services staff. Dave Sanders will attend the meeting with employment lawyer Linda Lachlan and Freda Thornley will attend with AUS representative Arty Cruickshank.

Dave Sanders, General Manager

You were appointed to the new position of General Manager of the University of Nelson Students Association (UNSA) 18 months ago in May 2000. You have previously worked as a manager in large private sector corporations. You had taken on quite a challenge as, on top of familiarising yourself with a very different organisation to the ones you were used to, you were faced with restructuring the organisation, with building relationships with your board (the student Executive), with staff, with the University, and with suppliers.

UNSA's revenue comes partly from trading activities and partly from student fees. Before you took up your new position, the University had negotiated with an earlier student Executive to reduce the fee per student that was paid to UNSA. As a result, when you took on UNSA it had just made its first ever annual loss. You are determined to return UNSA to profitability, and establish it as a model student association run in a professional manner for the benefit of University of Nelson students. You must balance the limitations of a tight budget with the need to pay salaries that will be attractive to capable people. After conducting an evaluation, UNSA is offering salary bands that are higher than other associations. Despite this, a handful of staff want more. You believe this group's bands are generous not only relative to similar positions in other organisations, but also relative to those of other UNSA employees who have more important roles with responsibility for more staff and bigger budgets. You aren't prepared to make exceptions for this group, as that would leave other staff feeling cheated.

Freda Thornley, Education Co-ordinator

You are the Education Co-ordinator of the University of Nelson Students Association (UNSA), a position you have held for many years. You represent students' education interests to the University and provide advice and support to students. Few people in UNSA seem to know or care what it is that you and your assistant do, and yet you perform a key function of UNSA very well with limited resources. You have developed a broad network of relationships with people in the University and a comprehensive institutional knowledge. The better the job you do the more in demand you are and, consequently, the more pressure you are under. You seldom have time for lunch breaks and never for morning or afternoon tea. You do not believe that you are paid adequately for the role you perform.

In the past you reported directly to an elected student President and Executive. This relationship often involved a lot of hand-holding by you as the student representatives are typically inexperienced. This situation changed recently with the appointment of a professional manager.

Arty Cruickshank, union organiser

You are an organiser for the Association of University Staff (AUS). You role is to look after the interests of members working at the University of Nelson. You are also responsible for five members who work for the University of Nelson Students Association, which is on campus but independent of the University.

You represent AUS members in the negotiation of collective agreements with their employer, and you also represent individual members if they have a grievance or become involved in a dispute. **Mediation:** You are aware from previous experience that the objective of mediation is to provide each party with the opportunity to state their case, identify the issues behind their employment relationship problem, identify options for settlement and to attempt to reach a solution that satisfies the needs and interests of both parties. A mediator will control the mediation process to ensure that each party is able to participate, and will record the outcome of the mediation if the parties reach a settlement.

Linda Lachlan, employment lawyer

You are an employment lawyer with the local employers association. Your role is to advise member employers on their rights and obligations under the law and, if requested, to advise and represent members should they become involved in a dispute with an employee. You have formed the view that the employer has conducted a fair process.

Mediation: You are aware from previous experience …

Mel Morrissey, Mediator

You are a mediator with the Department of Labour's Mediation Service. Your role is to: control the mediation process, ensure that each party states their case, help the parties to identify issues and options for settlement, look for a solution that will satisfy the needs & interests of both parties, record the agreement in writing.

Telco Takeover Bid

In mid-August 2001, the Localville Telco board rejected an unsolicited $6 billion offer for the company from rival telecommunications operator, Expander Telco. The companies are relatively small but profitable players in the huge US market. Both companies specialize in providing services to rural areas that have so far avoided the attentions of the giants. Localville's rejection of the offer is not the end of the matter. Expander's $43-per-share offer is more than 40% above Localville's pre-bid share price of around $30.

Localville grew from small beginnings under the care of current Chairman, Augustus Lovett, who has headed the company for several decades and remains a substantial shareholder. The company's managers and employees (including Chairman Lovett) between them own 30% of Localville's voting stock and, of the 14 board members, five are current or former employees. Localville is based in a small rural town and many of its 7,000 employees live in the area and take pride in participating in community affairs. Chairman Lovett has served as mayor and has sat on local community boards over the years. A takeover by Expander would lead to major layoffs in a community that has benefited from several generations of employment at Localville.

Expander's annual turnover of $7.5 billion is three times that of Localville at $2.5 billion. Although the companies both offer local (landline or wireline) and mobile (wireless or cell-phone) phone services, their service mixes are quite different. Expander has 6.7 million mobile and 2.6 million landline customers, while Localville has 0.8 million mobile and 1.8 million landline customers. Through an arrangement with one of the industry giants, Expander provides national roaming (mobile customers can make and receive calls from anywhere in the US) and can provide flat-rate national calling to mobile customers at cost. Expander has mobile penetration averaging 13% across its territories, and achieves a 61% margin on its mobile operations. Localville does not have a national roaming arrangement, its penetration is less than 10%, its margin is 54%, and its mobile revenues are flat — falling nearly 1.5% in the second quarter. In fact, shortly before Expander made its offer to buy Localville, Localville had approached Expander to assess the rival company's interest in purchasing Localville's mobile operation. Expander rejected the proposition, as company policy is to offer a comprehensive service, including local calls, when moving into a new territory.

Expander's father and son team, Chairman Al Exley and CEO Brad Exley, have acquired more than 250 companies over the last 15 years, and have spent $12 billion on acquisitions during the last three. Localville's footprint (the geographical spread of its customers and potential customers) complements Expander's. Expander's analysis suggests that economies of scale resulting from the purchase of Localville should amount to $100 million (1%) on combined revenue of $10 billion. There would be further gains from lifting the financial performance of Localville operations to the levels achieved by the current Expander operations. As well as these advantages, in the longer term the enlarged Expander may present an attractive acquisition for a major operator willing to pay a premium in order to gain a regional customer base.

Localville has told analysts that the company doesn't need to sell-out to Expander in order to provide a good return to shareholders. Localville maintains that revenue growth from the company's landline business will exceed that of Expander. Nevertheless, the prospects for the mobile side of Localville's business — responsible for roughly 20% of revenue — concerns shareholders. Without national roaming agreements, Localville can't offer the cheap flat-rate national calling deals that customers are increasingly demanding. Localville's strategy of selling the mobile operation and expanding the business as a landline operator is considered by some analysts to offer the best deal for shareholders. The Localville board are adamant that the company is happy to talk to Expander only about selling its mobile operation. It is unlikely that the board could be forced to change its stance by non-employee shareholders who are keen to accept Expander's offer: Localville doesn't have to hold a shareholder meeting for another three months and company rules make it impossible to oust the whole board at one time. Although it is possible under US law to bypass the company board and make an offer directly to shareholders, the process is restricted by regulation and, even if Expander acquired more than 50% of Localville stock, the current board could remain in effective control of the company for some time. Localville released the following statement on mobile services: "...divestiture efforts have been adversely affected by a hostile takeover attempt... and a recent sharp decline in the general mobile market... we continue to believe that divestiture makes strategic sense and we continue to pursue that goal. Nevertheless, mobile generates strong cash flows for Localville and so we do not feel compelled to divest until we are presented with the right offer".

It is now September, 2001. Despite Localville's rejection, Expander hasn't given up on buying the Localville company. Expander knew that the Localville board was not interested in selling the whole company when it first made its bid. Institutional investors and other non-employee shareholders of Localville are not happy with the board's rejection of Expander's offer and this has put pressure on Localville management to find a credible solution to the companies current performance woes. The stand-off between Expander and Localville must be resolved. In which one of the following four ways will this happen?

1. Expander's takeover bid fails completely
2. Expander purchases Localville's mobile operation only
3. Expander's takeover succeeds at, or close to, their August 14 offer price of $43-per-share
4. Expander's takeover succeeds at a substantial premium over the August 14 offer price

Role of Localville Telco Chairman – Augustus Lovett

Several decades ago you became Chairman of Localville, a small telephone company founded by your grandfather. Since then you have built the company into a $US 2.5 billion business. Despite the substantial size of the business, the company head office and many employees remain in the small town where you live and where the company had its beginnings.

Although Localville offers both local and mobile telephone services, mobile users have come to expect to be able to use their phones anywhere in the US for the same (cheap) rate. Localville has not been able to obtain a roaming agreement with one of the major telecommunications companies that would allow the company to offer this service. Recently, Localville approached Expander Telco to explore the possibility of selling Localville's mobile business to Expander. Expander rejected this idea, and offered to buy the whole of Localville. You and the board do not wish to sell the whole business as you believe Localville can do better for shareholders as a provider of local telephone services and, at the same time, protect your employees and the local community. Not all shareholders agree, however, and you and your CEO, Bill Lowe, have a tough fight on your hands to keep Localville safe from Expander's hostile takeover bid.

Role of Localville Telco CEO – Bill Lowe

Localville is small (by US standards) telephone company with a turnover of $US 2.5 billion. Localville offers both local and mobile telephone services, but mobile users have come to expect to be able to use their phones anywhere in the US for the same (cheap) rate. Localville has not been able to obtain a roaming agreement with one of the major telecommunications companies that would allow the company to offer this service. Recently, Localville approached Expander Telco to explore the possibility of selling Localville's mobile business to Expander. Expander rejected this idea, and instead offered to buy the whole of Localville. The Localville board does not wish to sell the whole business as the directors believe Localville can do better for shareholders as a provider of local telephone services and, at the same time, protect Localville employees and the local community. Not all shareholders agree, however, and you and your Chairman, Augustus Lovett, have a tough fight on your hands to keep Localville safe from Expander's hostile takeover bid. In common with many employees, you own shares in Localville.

Role of Expander Telco Chairman – Al Exley

Under you leadership for the past 15 years, telephone company Expander has grown rapidly with the acquisition of more than 250 companies. Recently, Expander was approached by Localville Telco. Localville wished to explore the possibility of selling its mobile phone business to Expander. You rejected the proposition, as Expander's policy is to be able to offer local telephone services as well as mobile when it moves into a new territory. Localville as a whole, however, would be an attractive acquisition (the companies' territories are complementary) and Expander has offered to buy Localville at a price-per-share that was 40% higher than the price prevailing at the time of the offer. So far, the Localville board has rejected this offer, but you and your son (Expander CEO, Brad Exley) believe Localville is a prize worth fighting for.

Role of Expander Telco CEO – Brad Exley

Under the leadership of your father (Chairman Al Exley) for the past 15 years, telephone company Expander has grown rapidly with the acquisition of more than 250 companies. Recently, Expander was approached by Localville Telco. Localville wished to explore the possibility of selling its mobile phone business to Expander. Expander rejected the proposition, as company policy is to be able to offer local telephone services as well as mobile when it moves into a new territory. Localville as a whole, however, would be an attractive acquisition (the companies' territories are complementary) and Expander has offered to buy Localville at a price-per-share that was 40% higher than the price prevailing at the time of the offer. So far, the Localville board has rejected this offer, but you and your father believe Localville is a prize worth fighting for.

International Water Dispute

Today is June 3, 1975. Two poor and arid Asian countries, Midistan and Deltaland, are in dispute over access to the waters of the River Fluvium. The river rises in Uplandia, whose plentiful rain contributes at least 90% of the flow. It then runs through Midistan — where the scanty rainfall makes up the rest of the flow — and then on through Deltaland to the sea. Relations between the two disputants have deteriorated badly, and the Government of Concordia has stepped in, in an attempt to mediate an agreement. Uplandia is not involved in this dispute.

Background

Both Midistan and Deltaland depend heavily on Fluvium water for irrigation. Midistan also uses the river for generating electricity. Deltaland has exploited the waters of the Fluvium since ancient times. Uplandia and Midistan, on the other hand, started to make substantial use of the river's water only about ten years ago. Eighteen months ago, Uplandia began filling its new dam at Updama. A few months later the new Soviet-constructed dam at Mididam in Midistan became operational.

Midistan and Deltaland are ruled by leaders who came to power after military coups. They are loosely aligned to the Soviet Union. Their armed forces are similar in size — both are large and battle-hardened.

Recent developments

On April 7, Deltaland accused Midistan of putting at risk the lives of the three million Deltaland farmers dependent on the water of the Fluvium by diverting excessive volumes from the river. The Deltaland News Agency reported the protest came "as a result of the lack of response by the Midistani Government to all efforts exerted by the Deltaland Government for years to reach an agreement...". Two days later, the Deltaland Government issued a statement saying it would take whatever steps were necessary to ensure access to the waters of the Fluvium and would hold Midistan responsible for any harm to Deltalandish farmers. A congress of Midistani political leaders, on the same day, condemned the Deltaland regime for plotting with enemies of Midistan and betraying the common heritage of the two countries. There were reports that 200 military and civilian leaders had been arrested, in the lead-up to the conference, on charges of plotting against the Midistani Government. Those arrested included the director of a news agency and a former director of Midistani television.

The Midistani Government explained their position on the disagreement over access to Fluvium water in an official statement released on April 19. In the statement, Midistan blamed the current crisis on the Deltaland Government's unwillingness to enter in good faith into tripartite negotiations with Midistan and Uplandia for a permanent agreement over sharing the water. Deltaland instead had conducted secret negotiations with Uplandia. Midistan claimed to have reached provisional agreement with Deltaland two years before for the flow of water during the winter just gone, but had stipulated that the agreed volume would have to be revised when the Updama dam began to fill. Midistan accused Deltaland of avoiding negotiations over this issue when Uplandia had commenced filling the Updama dam in January of last year.

The statement also claimed that, despite substantial reductions in, and interruptions of, the flow of water out of Uplandia, Midistan had allowed 70% of the water received to flow on into Deltaland, had released an additional 200 million m^3 (0.7% of the usual annual inflow) during the middle of last year in response to a request by Deltaland and, during last winter had let 75% of water from Uplandia flow on to Deltaland. Further, Midistan accused Deltaland of failing to modernise its irrigation methods in order to make more effective use of the water it does receive.

In response, Deltaland maintained its claims that more water than was required for electricity generation had been withheld and that only half of the water to which Deltaland was entitled had been received.

Claims and counter-claims by Midistan and Deltaland continued through April and May, as did mediation efforts by neighbouring countries including the wealthy regional leader, Concordia. Midistan accused Deltaland of assassinations and mass executions of dissidents on May 7 and, a week later, closed its airspace to Deltalandish aircraft in response to mistreatment of Midistani airline personnel employed in Deltaland. On May 25, Midistan ordered the immediate closure of one of Deltaland's consulates in Midistan. On May 28 a Midistani military official in Deltaland was stabbed and, on May 29, Midistan accused the Deltalandish government of executing 80 government opponents. By June 2, there were reports that both sides had moved troops to the border between the countries and that Deltaland had threatened to bomb the Mididam dam. In response to the deteriorating situation, Concordia renewed its efforts at mediation and a meeting between ministers from the three countries is to be held.

The meeting

Today, Government ministers and officials from the Midistan, Deltaland, and Concordia will meet to try to resolve the dispute. Those present at the meeting will be a senior Minister from the Kingdom of Concordia, and the Foreign Ministers of the Republics of Midistan and Deltaland each accompanied by a military adviser. A statement will be issued at the end of the meeting. The statement may be one of three alternatives. The gist of these statements are as follows:

(a) Midistan has decided to release additional water in order to meet the needs of the Deltalandish people
(b) Deltaland has ordered the bombing of the dam at Mididam to release water for the needy Deltalandish people
(c) Deltaland has declared war on Midistan.

Role of Republic of Midistan Foreign Minister – Mohammad Fareed

A crisis over access to water is brewing between the poor Asian nation, Midistan, and the neighbouring Republic of Deltaland. As Midistan's Foreign Minister, you are attending a meeting with your Deltaland counterpart (Daud Fawaz) and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides. Before joining the meeting you will discuss objectives and strategy with the military adviser who has accompanied you – General Mustafa Ahmad.

As far as you and your government are concerned, Midistan has acted responsibly in a difficult situation that is not of Midistan's making. You are directly responsible to your President who, along with you and the rest of the Midistan government, came to power after a military coup.

Role of Republic of Midistan Military Adviser – General Mustafa Ahmad

A crisis over access to water is brewing between the poor Asian nation, Midistan, and the neighbouring Republic of Deltaland. You are attending a meeting with Deltaland government representatives and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides – troops have been moved to the vicinity of the common border. Your role is to support and advise your Foreign Minister (Mohammad Fareed) with whom you will discuss objectives and strategy before you both join the meeting.

As far as you and your government are concerned, Midistan has acted responsibly in a difficult situation that is not of Midistan's making. You are directly responsible to your Foreign Minister who, along with you and the rest of the Midistan government, came to power after a military coup.

Role of Republic of Deltaland Foreign Minister – Daud Fawaz

A crisis over access to water is brewing between the poor Asian nation, Deltaland, and the neighbouring Republic of Midistan. Deltaland has a long history of using the waters of the River Fluvium and is heavily dependent on the river for agriculture and drinking water. Midistan has recently built a large dam and the Fluvium's flow into Deltaland has been curtailed. As Deltaland's Foreign Minister, you are attending a meeting with your Midistan counterpart (Mohammad Fareed) and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides. Before joining the meeting you will discuss objectives and strategy with the military adviser (General Dirwar Ali) who has accompanied you.

You are directly responsible to your President who, along with you and the rest of the Deltaland government, came to power after a military coup.

Role of Republic of Deltaland Military Adviser – General Dirwar Ali

A crisis over access to water is brewing between the poor Asian nation, Deltaland, and the neighbouring Republic of Midistan. Deltaland has a long history of using the waters of the River Fluvium and is heavily dependent on the river for agriculture and drinking water. Midistan has recently built a large dam and the Fluvium's flow into Deltaland has been curtailed. You are attending a meeting with Midistan government representatives and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides – troops have been moved to the vicinity of the common border. Your role is to support and advise your Foreign Minister (Daud Fawaz) with whom you will discuss objectives and strategy before you both join the meeting.

You are directly responsible to your Foreign Minister who, along with you and the rest of the Deltaland government, came to power after a military coup.

Role of Kingdom of Concordia Senior Minister – Karim Khalid

Two poor neighbours of the wealthy Kingdom of Concordia appear to be edging closer to war in a dispute over access to the waters of a river that flows from one (Midistan) to the other (Deltaland). Your Kingdom has a traditionally played a paternal role in the region, and has an interest in preserving peace. To that end, you have called a meeting, which is being attended by Midistan and Deltaland representatives, with the hope that your mediation will lead to a peaceful solution to the crisis. Midistan is represented by Foreign Minister Mohammad Fareed and Military Adviser General Mustafa Ahmad. Deltaland is represented by Foreign Minister Daud Fawaz and Military Adviser General Dirwar Ali.

ZENITH INDUSTRIAL CORPORATION INVESTMENT DECISION

Zenith is a large manufacturing business based in a populous developed country. Zenith manufactures “product”.

The year is 1975, and Zenith has recently been nationalised by a new left-leaning government. Under its previous owners, Zenith had begun to lag behind international competitors as a consequence of disruptions caused by a supplier´s ongoing industrial conflicts and the Zenith owners´ reluctance to invest in the business. The new government regard Zenith as important because of its size and the widespread use of product by other manufacturers. Unfortunately for the Government, Zenith must reduce costs in order to regain international competitiveness -- the corporation is currently suffering losses of $US 10 million per week. A $US 10 billion dollar redevelopment project is underway that will see older plants retired and new plants commissioned. Efficiency gains as a result of the project will result in a net loss of 50,000 jobs, and will have a major impact on a region (Naggaland) that traditionally provides much support for the party that is now in government. Unsurprisingly, the government have made political commitments to Naggaland.

Last year (1974) international demand for product was high and Zenith was not able to keep pace with demand. In that year, the chair of Zenith (Sir Archie Stevenson) had discussions with the owner of Acma, a foreign manufacturer of new technology product-making plant. As an outcome of those discussions, the Zenith board gave approval, in principle, for the purchase of one plant from Acma. The price quoted by Acma was $US 26 million. They have subsequently quoted $US 43 million for two plants. The Acma offers remain current until February 15, 1975.

The Acma plant, or plants, would offer some advantages to Zenith. Firstly, the Acma plant uses a different combination of inputs and would therefore somewhat reduce Zenith´s vulnerability to industrial action by a traditional supplier´s union. Secondly, the plant would give Zenith experience with a new technology and, thirdly, the plant could be located in Naggaland. Sir Archie was appointed by the Government with the understanding that he would be sympathetic to the Government´s political commitment to Naggaland. Sir Archie has made it known that he prefers the two-plant option.

Since the board´s original agreement in principle with Acma, the world economy has slid into recession and the demand for product has fallen. Sir Archie has made it known that he wants a $US 50 million reduction in capital spending. With the February 15 deadline looming, and negotiations with Acma underway, Zenith´s Policy Committee asks the company´s planners to assess the merits of the Acma proposals.

On 5 February the planners came back with a surprising assessment. The production costs of product from the Acma plants would be higher than the production costs from conventional technology plants. The existing technology produces product for $US 112 per unit, whereas a single Acma plant would produce product for $US 126 per unit and two Acma plants would produce product for $US 116 per unit. Not only that, the planners´ demand projections indicated that currently planned production capacity would be sufficient to meet demand in all but the first 2 years of the 6 year forecast period. The planners pointed out that this projected slight shortfall in production could be met by delaying the retirement of a number of older plants while their capacity was still required. Sacrificing the Acma plant would also appear to be a sensible way of meeting the Chairman´s expressed desire to cut capital expenditure by $US 50 million. Sir Archie has asked Herbert Lumley (Director of Planning and Capital Development) to present the planners´ findings to the Policy Committee on Tuesday 11 February.

The 11 February meeting is to be chaired by Sir Archie. Herbert Lumley will present the planners´ findings that are outlined above. The purpose of the meeting is to decide whether to commission one Acma plant, two Acma plants, or not to commission any Acma plants. The Committee must reach a decision on this question at the meeting. The Committee´s recommendation (one, two, or zero Acma plants) will almost certainly be accepted by the Board ? most Board members are also on the Committee.

Zenith Policy Committee

Sir Archie Stevenson

(Chairman of Zenith Board and Chairman of Policy Committee)

You were appointed by the Government with the expectation that you would oversee the transformation of Zenith in such a way as to minimise any damage to the Government's reputation, particularly among its natural constituencies. The Government know that their Naggaland constituents will be badly affected by plant closures and staff layoffs by Zenith. You hail from Naggaland yourself, and retain interests there.

You are not averse to using your authority to take control of a meeting. At the same time, as chairman, you must be prepared to let all parties have their say, and prefer to reach a consensus decision. Your responsibilities as the Chairman of the Board of this very large industrial company, are considerable. It is you that must be able to see the ? bigger picture? . You must balance the demands of the various parties that have an interest in a decision that is to be made, and at the same time retain the support of your fellow Committee members and the Board.

You are kept well-informed about developments in the company as they occur -- this gives you something of an advantage over others in the company, as their information is often incomplete.

Mark Stepman QC (Zenith Deputy Chairman)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

Robert Revell (Zenith Company Secretary)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

James Drywall (Zenith Managing Director for Corporate Strategy)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

Lord Gratton

(Zenith Executive Director)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

Lionel Hunt

(Zenith Finance Director & member of Zenith Board)

As Zenith Industrial Corporation's Finance Director it is your responsibility to insure that the company is run a way that is financially sound. You must ensure that new capital investment can be expected to deliver a satisfactory return, either singly or as part of a diversified portfolio. You expect to be presented with a well-argued case for any new expenditure, and are not readily impressed by unsupported rhetoric.

Herbert Lumley

(Zenith Planning & Capital Development Director)

As the Director of Planning and Capital Development for Zenith Industrial Corporation, both the Chief Planner, John Grove-White, and the Manager of Capital Projects, Ron Able, report to you. Ron also has the role of chief negotiator for the purchase of some major new plant for Zenith. Ron has been lobbying you hard to gain your support for the purchase, and emphasises that the company's Chairman, Sir Archie Stevenson, is keen for the purchase to go ahead.

The Policy Committee must meet to decide whether or not the plant purchase should go ahead, and have asked you to get your planning team, headed by John Grove-White, to assess the merits of the proposal. You expect John and his team to conduct a rigorous and impartial assessment. You are expected to present their findings to the Committee. Both John, and Ron Able will be with you at the meeting.

John Grove-White

(Chief Planner)

Your manager, Herbert Lumley, asked you and your team to assess the merits of a plan to purchase some major new plant. You are aware that there has already been a commitment of sorts to the new plant but, as a matter of personal and professional pride, you and your team will endeavour to conduct a rigorous assessment of the plan. Consequently, you expect your findings to be taken seriously.

Although you might consider yourself a cut above your colleagues, both intellectually and socially, you are decidedly a junior participant in the situation that is unfolding. You are an ambitious young man and, as such, are conscious that your decisions can influence your prospects.

Ron Able

(Capital Projects Manager & Chief Negotiator)

You are the chief negotiator for the purchase of some major new plant for your company. This puts you in a powerful position, as you control the information about the progress of the negotiation that is passed-on to your colleagues. As you are also Capital Projects Manager, you have a vested interest in the purchase going ahead -- the more capital investment, the greater your responsibilities. You believe that the Chairman is strongly supportive of the purchase.

You are a WWII veteran, and a practical no-nonsense sort of man.

Reviewer Appendix 2

Artists protest

What will be the final resolution of the artists' sit-in? *(check one ✓, or %)*

(A) The government will relax entrance rules and allow an artist to remain in the programme for an indefinite period. [ ]
(B) The government will extend an artist's time in the programme to 2 or 3 years [ ]
(C) The government will extend the programme 2 or 3 years and relax entrance rules [ ]
(D) The government will relax the entrance requirements only [ ]
(E) The government will make no change in the programme. [ ]
(F) The government will end the programme completely. [ ]

Distribution channel

Will the management of a supermarket chain accept the CRTP in their stores?

(check one ✓, or %)

(A) Yes, as a long term arrangement (with one month pilot) [ ]
(B) Yes, as a short term promotion [ ]
(C) Yes, either (A) or (B) [ ]
(D) No, they will reject the plan [ ]

55% pay plan

Will there be a strike? *(check one ✓, or %)*

(A) Yes, a long strike (½ or more of the regular season games will be missed) [ ]
(B) Yes, a medium length strike (less than ½ of the regular season games will be affected) [ ]
(C) Yes, a short strike (only preseason games missed) [ ]
(D) No strike will occur [ ]

Nurses dispute

The outcome of the negotiation was that… *(check one ✓, or %)*

a. Nurses' demand for an immediate 7% pay rise and a 1-year term was substantially or entirely met [__]
b. CWH's offer of a 5% pay rise and a 2-year term was substantially or entirely accepted [__]
c. A compromise was reached [__]

Personal grievance

The outcome of the 24 April meeting was? *(check one ✓, or %)*

a. Management agree to a new evaluation being conducted before holding further discussions on salary bands [__]
b. Staff accept the salary bands proposed by management on 14 February with few or any modifications [__]
c. Parties agree to ask a third party (e.g. mediator, independent job-evaluator) to decide on salary bands [__]
d. Parties fail to reach any agreement [__]

Telco takeover

How was the stand-off between Localville and Expander resolved? *(check one ✓, or %)*

a. Expander's takeover bid failed completely [__]
b. Expander purchased Localville's mobile operation only [__]
c. Expander's takeover succeeded at, or close to, their August 14 offer price of $43-per-share [__]
d. Expander's takeover succeeded at a substantial premium over the August 14 offer price [__]

Water dispute

The gist of the statement issued at the end of the meeting was? *(check one ✓, or %)*

a. Midistan has decided to release additional water in order to meet the needs of the Deltalandish people [__]
b. Deltaland has ordered the bombing of the dam at Mididam to release water for the needy Deltalandish people [__]
c. Deltaland has declared war on Midistan [__]

Zenith investment

Which option will the Zenith Policy Committee choose?

(check one ✓, or %)

(A) One ACMA plant [ ]
(B) Two ACMA plants [ ]
(C) No ACMA plants [ ]

Reviewer Appendix 3

Organisation contact lists and email lists that were sent appeals

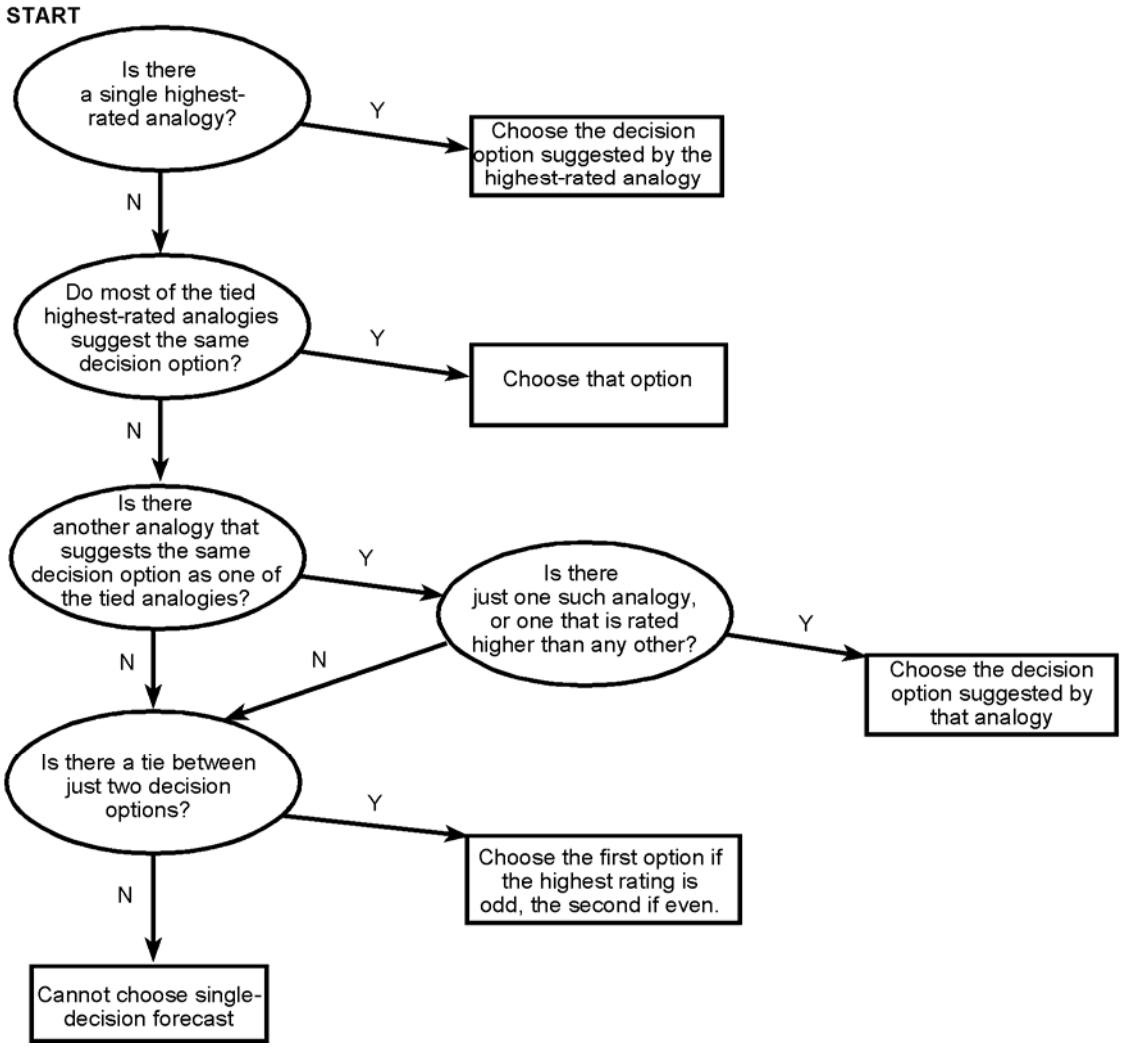
Name	Abbreviation	Owner
International Association of Conflict Management contact list	IACM	International Association of Conflict Management
Judgment and Decision Making Listserver	JDM	Society for Judgment and Decision-Making
Behavioural decision making	DECISION	Risk Decision & Policy, and London Judgement and Decision Making Group
Conflict Management Division Listserver	CMDNET-L	Academy of Management Conflict Management Division
Human Resource Management Listserver	HRNET	Subscribers to former Cornell HRNET ListServ organised this
Pacific Region Industrial Relations Listserver	PRIR-L	Assoc. of Industrial Relations Academics of Australia & NZ
International Employment Relations Network Listserver	IERN-L	IIRA International Industrial Relations Study Group
An electronic mail network for marketing academics	ELMAR	Sponsored by American Marketing Association
International Institute of Forecasters' Research Associates contact list [a]	IIF R.A	International Institute of Forecasters
International Studies Association Foreign Policy Section	ISAFP	International Studies Association
Political Science Research and Teaching List	PSRT-L	Sponsored by the Computers and Multimedia section of the APSA
Scientific Study of International Processes	SSIP	List managed by Richard Tucker of Vanderbilt

a From 1283 mostly current and former members of the IIF who responded to an appeal to become Research Associates. The 147 Research Associates I approached (8, who were familiar with my research or had not provided email addresses, were not approached) were 11 percent of the total IIF list.

Sources of expert participants

Source	Appeal	Conflicts	Participants	Response rate(%)[a]
IACM	Personalised	All	17[b]	4.1[c]
JDM	Impersonal	All	2	0.3
DECISION	Impersonal	All	4	2.0
CMDNET-L	Impersonal	All	1	0.2
HRNET 1	Impersonal	Artists/55%/Grievance/Nurses	3	0.2
PRIR-L	Impersonal	Artists/55%/Grievance/Nurses	-	0.0
IERN-L	Impersonal	Artists/55%/Grievance/Nurses	1	0.3
ELMAR	Impersonal	Distribution / Telco Takeover	5	0.2
IIF R.A	Personalised	All	8	5.8[d]
Conv. samp. [e]	Personalised	All, or Grievance/Telco/Water	7	50
Subtotal to 14 February 2003 (up to 3 reminders; unweighted)			**48**	**1.5**[f]
HRNET 2	Impersonal	Artists/55%/Grievance/Nurses	7	0.5
ISAFP	Impersonal	Water	2	NA
PSRT-L	Impersonal	(Artists) / Water	1	0.1
SSIP	Impersonal	(Artists) / Water	6	2.0
VUW PolSci [g]	Personalised	Water	1	7.0
Conv. samp. [e]	Personalised	Grievance	1	100
Subtotal to 23 June 2003 (no reminders; unweighted)			**18**	**0.9**[h]
Total (unweighted)			**66**	**1.3**[i]

a Number of respondents divided by number of email addresses in original sample
b Includes four graduate students who participated in the place of their IACM-member professor
c Numerator counts the four graduate students as a single participant
d Roughly 0.6 percent of all those on the full IIF list participated
e Convenience sample
f Excludes convenience sample
g Victoria University of Wellington Political Science Department
h Excludes ISAFP, VUW Political Science Department, and convenience sample
i Excludes ISAFP, convenience samples, and VUW Political Science Department.

Reviewer Appendix 4

Rules for choosing a single-decision forecast from a set of up to five analogies that have been rated for similarity to a target conflict