Three
IMPLEMENTATION

Contents

A Framework for Implementation ... 25
Finding Problems ..................... 28
Agreeing on Problems ................. 31
Proposing Alternative Solutions ..... 32
Gaining Commitment ................. 32
  Experimentation ..................... 33
  Participation ....................... 34
  Feedback .......................... 36
When Commitment Fails ............. 37
Gaining Acceptance of the
  Forecast ........................... 38
  Prior Commitment ................. 39
  Scenarios ......................... 40
  Presenting the Forecast .......... 45
Summary ............................. 49
A youth group at a church was asked to participate in a study (Batson, 1975). As part of this study, they were asked to indicate how strongly they believed Jesus Christ to be God. They were then told that some documents had recently been discovered by archeologists. The documents were said to be correspondence that took place among the apostles after Christ died. The basic theme was similar to a Watergate cover-up: now that Christ has died, people will realize that he is not God; what can we do to fool them? The apostles concluded that people want to believe Christ is God, so the deception could be carried on.

The members of the church youth group were told that *The New York Times*, under pressure from the World Council of Churches, was withholding the story. Their reactions were being studied to see what would happen should *The New York Times* release the story. After learning about the documents, the youth group members completed a second questionnaire that asked how strongly they now believed that Christ was God.

What happened? In general, this disconfirming evidence led the believers to increase their belief that Christ was God. Furthermore, the increase was greatest for members who had initially felt most strongly that Christ was God. Finally, the increase was strongest for the people who believed that the information was authentic!

Readers who are familiar with cognitive dissonance studies may not find these results surprising. There have been other studies with similar findings. People who believe in the rational man may, however, be surprised.

Even a person who is familiar with cognitive dissonance studies will find that the above results are depressing. In every organization that I have worked for, the official approach to change is based on the assumption that man is rational. "If you present evidence that the new way is better than the old, then people will accept the new way." This works for unimportant changes, but not for changes that are important to people. So we cling to the model of rational man and go around saying things like "People are resistant to change." Dramatic examples of such resistance are provided in MOSTELLER and TUKEY [1977] and ROGERS [1983]. For example, in 1601, lemons were found to be
an effective way to prevent scurvy, but it was 264 years before this finding was adopted by the British Merchant Marine.

Fortunately, there has been much research on how to implement change. The research is not new; it has been going on for half a century. It is extensive and offers clear guidelines on how to implement change. A summary of the research is included in this chapter.

Unfortunately, the answer does not lie in the presentation of empirical evidence. People's attitudes toward change are analogous to the attitudes of the youth group members that Christ is God. Thrusting disconfirming evidence upon them will only strengthen their present beliefs.

If you already know how to implement change, you have just finished this chapter. If, on the other hand, you are interested in improving your techniques you may be able to make this chapter work for you.

Although you can branch around this chapter without losing the train of thought, you should recognize one thing: surveys of problems in the use of forecasting methods (e.g., Wheelwright and Clarke, 1976) indicate that implementation problems are probably the most important reasons for failure. The surveys are right.

If you want to branch around this section, go to Chapter 4, p. 51.

Chapter 3 presents a framework for implementing changes in forecasting methods. The framework builds upon the discussion of the systems approach in the preceding chapter. Consideration is also given to the way people use forecasts.

A FRAMEWORK FOR IMPLEMENTATION

Let's start with a problem—the COMPU-HEART Case. A description is presented here. As you read it, write out the strategy that you would use to solve it. As motivation, I can tell you that this problem has been used often as a role-playing case. Although people are sometimes given a few days to think about the case, it is a rare individual who produces a strategy that is successful in the role play.
The COMPU-HEART Case

To provide space for its outpatient facilities, Rosemont Hospital had examined its inpatient program. When considering the whole system, they concluded that there were clear-cut benefits for reducing the space allotted to patients with heart problems. In fact, they were excited about a program called COMPU-HEART, that provided home treatment for heart patients. This could be done by paramedics who visit the patient, perform some simple tests, and ask questions of the patient. The paramedics then call a time-sharing computer system that suggests what steps should be taken (e.g., “do nothing,” “send patient to hospital,” “contact personal physician,” “eliminate drug X” …). This program was developed by modeling the decisions used by a committee composed of 10 of the best heart specialists in the world. The computer is already used by Rosemont for other purposes, so the startup costs would not be large.

An experimental study run at a hospital in Los Angeles found that use of COMPU-HEART resulted in:

1. Fewer fatalities,
2. Faster recovery rate for patients,
3. More satisfaction among patients, and
4. Much lower costs.

However, you realize that when previous suggestions of a similar nature had been made, the doctors were skeptical. So, even though the doctors are currently overworked and this proposal would save time for them, you expect them to resist this change. The doctors prefer to have the patients in the hospital where they can see them and talk with them. They do not trust paramedics or computers to handle the situation.

You have scheduled a meeting with the doctors’ decision-making committee. You would like to convince them to accept the COMPU-HEART program.

STOP!! Write out your strategy before proceeding.

That’s the problem—and we’ll solve it before the chapter ends. (Fortunately, I have heard Chekhov’s advice to writers. As I remember, he said, “If you describe a house, and within that house you describe the living room, and within the living room you describe the fireplace, and
then you go into detail about the gun that hangs over the fireplace, be sure the gun fires before the story ends!”)

The framework for implementing changes in forecasting methods (actually, you can use it for implementing any type of change) is illustrated in Exhibit 3-1. This framework draws heavily upon the systems approach. The four rectangles follow the four-step procedure of the systems approach, but the approach is translated into one that is useful for implementation. The rules for application also follow those for the systems approach:

1. Write your analysis!
2. Use separate time periods for each step.
3. Omit references to steps that come later.
4. Objectives come first and programs come last.

In practice, some iteration is generally necessary. The two way arrows in Exhibit 3-1 indicate where iteration is needed most often. Note that the research, for example, the development of new forecasting methods, does not start until after commitment has been reached. This

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**Exhibit 3-1 FRAMEWORK FOR IMPLEMENTING NEW METHODS**

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Find the problems (Objectives)

Agree on problems (Objectives and indicators of success)

Generate alternative strategies

Gain commitment

Yes
  Do research

No
  ?
  Use confrontation

Stop
```
procedure will cause a bit of stress in the organization because man-agers will be reluctant to commit themselves before they have "all the facts."

The following discussion is organized according to the steps in the four rectangles in Exhibit 3-1. Consideration is also given to the choices involved when one fails to reach commitment.

**FINDING PROBLEMS**

This section examines the procedure for finding problems. First, consider what not to do. Do not think about solutions at this point. Be problem-minded rather than solution-minded. This is easier said than done; what is needed are some positive steps.

The first step in finding the problem is to meet with the client and listen to her viewpoint. Unfortunately, the identity of the client is not always obvious. Let me tell you about one of my failures. My colleagues and I were asked by a large food processor to evaluate some forecasting models and to recommend improvements. The man who requested the study said that he would make the decision. He was backed up by a sign in his office saying "The Buck Stops Here." After we were well into the analysis, we learned that a decision had already been made in this case, and it had been made by someone other than our buck-stopper. (How did the story end? Our analysis conflicted with the decision. We were given the option of changing our conclusion to keep the dollars rolling in to us. Instead, we presented our analysis as we saw it, . . . becoming poorer but happier in the process.)

One technique for identifying the client is the stakeholder analysis. As described in the preceding chapter, this involves listing all the groups that will be affected by a proposed change. For new forecasting methods, the affected groups will typically include users and producers such as those listed in Exhibit 3-2. It is a good idea to start off assuming that all groups are interested in being clients. In my work, I have occasionally ignored some of these groups because I assumed they would have no interest, and I have often regretted the omissions.

After the various clients have been identified, the question then arises of how to obtain their viewpoints. You do this by listening. But listening is difficult, and skills for listening are not intuitively obvious. One helpful set of rules is called **nondirective interviewing**. According to LEE (1980), the basic principle was described by King Issi of Egypt about 4700 years ago. A summary of the rules is provided in Exhibit 3-3. People have told me that with these rules, a **learning partner** and a tape recorder, they have been able to master nondi-
rective interviewing in about one day. If you do not want to do that, you can hire an expert in nondirective interviewing (available at your local marketing research firm). It is much more practical to learn how to use nondirective interviewing yourself. There are two key ideas behind the rules for nondirective interviewing. First, your role is to listen, and second, you should not evaluate what is said. More is said about each of the rules in the following paragraphs.

*Describe the purpose of the meeting.* There’s nothing devious here. You tell the clients why you are meeting with them. You are there primarily to listen during this meeting. You want to find out how they

<table>
<thead>
<tr>
<th>Exhibit 3-3  RULES FOR NONDIRECTIVE INTERVIEWING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Do</strong></td>
</tr>
<tr>
<td>Describe purpose of meeting</td>
</tr>
<tr>
<td>Check your understanding</td>
</tr>
<tr>
<td>Follow up on areas of interest</td>
</tr>
<tr>
<td>Take notes</td>
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</tbody>
</table>

Exhibit 3-2 A CHECKLIST OF STAKEHOLDERS IN FORECASTING PROBLEMS

**Users**

Accounting
Finance
Management
Marketing
Personnel
Production
Research and development

**Producers**

Analysts with competing proposals
Computer and software groups
Developers of the current method
Groups responsible for new methods
Preparers of the forecasts
Suppliers of data
Implementation

view the problem (e.g., "Because you are a user of this forest products forecast, I'm interested in finding out what problems you see with it").

Problems can also be viewed as the difference between where one is now and where one would like to be. Thus you can ask the client to describe her objectives and where she feels she is now. The problems are later inferred by the analyst from the equation: \( \text{problems} = \text{objectives} - \text{current situation} \).

People often have difficulty in discussing objectives. Try to probe at this point by asking why, or by asking what measures would define an ideal state for them. Your aim is to develop some indicators of success from this interview.

The discussion of the current situation for forecasting problems involves such things as the methods presently used, the current level of accuracy, the cost, and the purposes for which the forecasts are now being used. A good analysis at this stage will help you to avoid reinventing the current solutions.

Don't evaluate. The analyst should not evaluate what is said. You should avoid positive as well as negative evaluation.

Don't interrupt. Your job is to listen. It helps when the clients talk, so don't stop them.

Don't introduce your ideas. Thinking about your own ideas will make it harder for you to listen. Talking about your own ideas will make it difficult for the client to speak.

Don't worry about pauses. There seems to be a Parkinson's law of conversations: words expand to fill the time allowed. Silence embarrasses people. The problem is especially severe with only two people in a meeting; one talks and one listens with the result that neither one has much time to think. In any event, with some practice, you will find that pauses do not bother you. In fact, they often occur when the client is thinking or when she is mulling over the possibility of telling you something important. You will be able to tell whether she is thinking or whether it is time for you to talk.

Check your understanding. As the interview proceeds, summarize what you have heard to see whether you have understood correctly. This does two things: it helps you to listen and it lets the speaker know that you are interested in what she says.
Agreeing on Problems

Follow up on areas of interest. If the client mentions an area that is of particular interest and you would like to know more, ask! For example, “You say that you’ve been having trouble understanding the assumptions behind the forecasts. Could you say more about that?” This also does two things: it helps you to listen, and it lets the speaker know that you are interested in what she says.

Take notes. Again, this does two things: it helps you remember important points, and it lets the speaker know that you are interested in what she says.

Thank the respondent. She is helping you.

Be sure to allow ample time for the interview. I generally prefer to allocate 2 hours; 1½ hours is sometimes adequate; 1 hour is often too short. Nobody said finding problems was cheap.

AGREEING ON PROBLEMS

Consider the following problem (adapted from Maier and Solem, 1952). “A man bought a horse for $60 and sold it for $70. Then he bought it back again for $80 and sold it for $90. How much money did he make in the horse business?” (STOP! Record your answer here unless your library “cautions the careless reader against the marking of books.”)

Now consider another problem. “A man bought a horse for $60 and sold it for $70. Then he bought a pig for $80 and sold it for $90. How much money did he make in the animal business?” Record your answer here _______.

For a number of people, the two answers above will be different. In fact, Maier and Solem found that fewer than half the people who were asked the horse question got the right answer (see Appendix F for the answer). I have used the animal question and found that almost everyone gets the correct answer.

Here we have a simple problem in arithmetic. Yet the way the problem is stated affects the answer. The statement of the problem would be expected to be even more important in complex situations.

Problem statements can mislead us in many ways. The problem can be intentionally disguised to make the client look good (I learned this as an industrial engineer); the problem statement may be constrained because it has to be acceptable to the organization; or the problem may
Implementation

carry emotional overtones. Probably the most serious difficulty is that the statement of the problem often implies a solution.

A useful technique for avoiding difficulties in the statement of the problem is to state it in different ways. This can be done by obtaining viewpoints of the problem from different people. It can be done by having a brainstorming session on "stating the problem."

These statements of the problem should be reported to the clients. This allows them to see the problem as viewed by different people. At this point, you can also present your own views on the problem. The clients should then reach a consensus on the problems to be examined. One approach to reaching a consensus is provided in the glossary. You may have your own style for running meetings in order to gain a consensus. (My own style follows Maier, (1963), a highly pragmatic and useful book.) Whatever your style, avoid voting and, instead, work toward a consensus.

A good job of identifying the problems will reduce the likelihood of Type III errors. (Type III errors are good solutions to the wrong problems.)

PROPOSING ALTERNATIVE SOLUTIONS

The clients will generally be interested in making proposals about possible solutions. You can get them to generate ideas here by using brainstorming. The brainstorming sessions will not only help to discover ideas but will also allow the clients to keep control of the change process. This is an important part of what Kurt Lewin referred to as the unfreezing phase in his unfreezing, change, and refreezing model. Evidence on the importance of unfreezing is provided in Ginzberg [1979] and Zand and Sorenson [1975].

For the part of the problem relating to specific forecasting methods, the clients will probably rely on you as the analyst. You can use the methodology tree (Exhibit 5-2, page 77) as a checklist. Specific techniques are described in Chapters 6 through 10.

GAINING COMMITMENT

Commitment is aided by use of the problem identification stages. If the client defines the problem and suggests possible methods, she will be more interested in the solution. Returning to the "COMPU-HEART Case", the assumptions the role players make about how the problem
was defined are important. When a person proposes a new technique, he may refer to “our previous meeting, where you stated that we should look into ways of solving our problem of the shortage of space.”

The likelihood of gaining the client’s commitment to solutions can be increased by use of the three guidelines outlined in Exhibit 3-4. Some participants in the COMPU-HEART Case were given 10-minutes of instruction in these rules; these participants were generally successful in gaining management’s agreement to run an experiment. Additional support is found in the results of tests reported in ARMSTRONG [1982a]. This strategy also worked in the study from which the problem was drawn (Marrow and French, 1945). Management did try an experiment, and it led to change.

Exhibit 3-4 GUIDELINES FOR GAINING COMMITMENT TO SOLUTIONS

1. Don’t sell the change; sell an experiment
2. Stakeholders should participate in the experiment:
   (a) Setting criteria
   (b) Describing constraints
3. Provide feedback to stakeholders

The guidelines for commitment are based on a simple philosophy: people who are affected by a change should have control over the change process whenever feasible (and it is usually feasible). The control should be real, not merely an illusion of control. (It is seldom that clients can be tricked in this respect, and then only once.) Techniques for implementing these guidelines are described in the following section. For want of a better name, I refer to this as the Delta Technique.

Experimentation

The resistance to experimentation is lower than the resistance to change. Most people like to view themselves as being open to new ideas.

The experiment should allow for a comparison between the proposed methods and the method that is currently being used; this will give the various stakeholders a chance to examine the new method in a factual way. The experiment should also be small scale in order to reduce risk for the stakeholders. They can experience the new method without having to make a substantial investment.

In addition to giving clients control over the change, the experiment
may lead to revisions that improve the proposed method. These revisions can be made before everyone gets committed to doing things in a particular way. Also, what if the proposal doesn't work the way everyone expected that it would? The experiment allows the proposal to be dropped in a graceful and face-saving way, and it saves the organization from making an ineffective change.

The term “experiment” is used in a general sense here. We need an answer to this question: “What information do you need to convince you that the current methods should be replaced by the proposed methods?” In most circumstances, this question would imply the need for an experiment. Sometimes, however, it may call for an analysis of historical data, a summary of evidence from analogous situations, results from laboratory experiments, or a trial run.

Participation

The role of the analyst (the one proposing a new forecasting method) is that of a helper to the clients. The experiment should be under the control of the clients. More specifically, it should be under the control of the stakeholders who feel that they have an interest and a legitimate right to participate in running the experiment. Many people will not want to participate, but a few will.

The obvious way to find out who is interested is to review the proposal with the various stakeholders. Sometimes, however, this is not wise. You may not have time or money for such a review; you may wish to avoid early commitment or a quick dismissal of a proposal; groups may not know how they would react, or they may be unwilling to disclose their true feelings; or competitive secrets may be involved. Role playing offers an alternative technique for situations where one or more of the above problems exist. The proposed method can be presented to subjects, who are asked to play the role of selected stakeholders and to act as they would act in the given situation. This procedure will help to identify areas of resistance which, in turn, may lead to modifications in the proposed method, in the experiment, or in the approach used with various stakeholders. Role playing identifies areas for participation and helps one to understand the viewpoints of other stakeholders. It does not, however, substitute for participation.

The critical area for participation lies in setting criteria for the experiment. A prior commitment should be made by the clients as to what constitutes success and what constitutes failure for a proposed method. This prior commitment should be worked out in detail so that agreement exists on what decisions will be made, given various out-
comes from the experiment. For example, it might be specified that a new forecasting method will be adopted if it leads to a statistically significant reduction in error, if this reduction in error is at least 10%, and if the cost does not exceed that of the current method.

It may be difficult for the clients to propose criteria because they do not fully understand their own criteria. One solution to this problem is to present hypothetical outcomes to the experiment. The clients may then be asked what decision they would make, given each outcome.

The clients should also describe any constraints on the experiment. There may be certain beliefs that the clients are unwilling to change, no matter what the outcome (as in the Jesus Christ study). It is a good idea to get a list of these before starting the experiment.

The clients may also have suggestions on how the experiment should be run. A serious attempt should be made to incorporate all suggestions.

Much of the earlier advice in this chapter was based on folklore and personal experience. The evidence on participation, however, is well documented. Most of this research was done on changes in work procedures for blue-collar workers; occasionally it involved managerial people [Carter (1971) and WEDLEY and FERRIE (1978) present some examples.] The conclusion is fairly clear cut: most people want to participate in changes that affect them (see Blumberg, 1968). Some of the early studies are described here:

**Lewin (1947)** compared lecture vs. group decision in trying to introduce change in the use of various foods by housewives. Group decision was superior. Similar results were obtained by Levine and Butler (1952) with factory workers, and by Bennett (1955) with college students.

**Coch and French (1948)** varied the amount of participation among groups of factory workers when a change in work procedure was to be made. When no participation was allowed, group productivity initially dropped to about 70% of its previous rate. Much hostility was also encountered; for example, grievances increased and employee turnover rose. When total participation was allowed, there was a small drop in productivity, but it rapidly recovered and exceeded the previous rate. There were no signs of hostility.
French, Kay, and Meyer (1966) found that participation in goal setting by a subordinate manager increased the likelihood that the subordinate would achieve these goals. Improvements were found only when specific goals were established with time deadlines and when the criteria had been agreed upon. The change was also more successful if the subordinate did not feel threatened. Similar results were obtained by Bass and Leavitt (1963) in a laboratory study.

Lawler and Hackman (1969) found that part-time building cleaners were willing to adopt a new incentive pay plan when they participated in the design of the plan. Resistance occurred during the first two meetings, but after that the change went smoothly. Productivity in this experimental group was higher than that in another group where an identical pay plan was imposed by management. A follow-up of this study is reported in Scheflen, Lawler, and Hackman (1971).

More recent evidence is provided by Lonnstedt [1975], Zand and Sorensen [1975], Bass [1977], Rosenberg and Rosenstein [1980], and Armstrong [1982a].

Participation is often resisted initially; thus at first it looks like a failure. This initial resistance may occur because the people involved have not previously participated in this type of decision and they have some initial doubts as to whether the persons proposing participation can be trusted.

Feedback

Successful managers need to learn about the success or failure of their actions. Therefore it is important that they be kept informed of the progress of the experiment. Do not let anyone be “surprised;” prepare an explicit project plan that includes regularly scheduled reports.

Feedback helps the managers maintain control over the experiment. In other words, the feedback reinforces the principle of participation. If the managers really are in control of the project step by step, they
will remain committed to the original guidelines of the experiment. Wouldn't it seem strange for them to agree step by step, and then fail to act according to the plan?

Feedback should be provided frequently because early results may be dramatic enough to allow for a quicker decision or for necessary changes to be made in the experimental design.

Finally, feedback to all parties who are affected helps to reduce the unfounded fears that people may falsely associate with the change (assuming that there are no grounds for fears). Although the provision of feedback can be time-consuming and costly, it is an important step in the introduction of important changes.

“Knowledge of results” has been found to lead to better performance in laboratory experiments and in experiments done with factory workers. The following study is also relevant:

Mann (1957) examined the introduction of an attitude survey for employees in six accounting departments of a company. Much feedback from the survey was provided to those involved in four of the departments. The resulting changes in these departments proved to be favorable in comparison to those in the other two departments, where the feedback was more limited.

Additional studies on the value of feedback are provided in Harris and Chaney (1969), McFall (1970), and BECKER [1978].

WHEN COMMITMENT FAILS

The discussion so far has assumed that the clients are interested in change. Of course, sometimes they are not willing to consider changes, and as a result commitment is not reached. There are three basic options at this point: (1) to terminate the project, (2) to try to redefine the problem, or (3) to use confrontation.

The strategy of termination when commitment fails has its disadvantages: for consultants it means no further income and for the client it means no improvements. On the other hand, there are advantages: the consultant avoids frustration and a sense of failure and the client saves time and money. In my opinion, termination, though often desirable, is used too rarely. Many consultants and staff members are
Implementation

willing to plunge ahead without commitment, armed with vague state-
ments by the clients such as “We certainly are interested in obtaining
more information on this problem,” or “We are entirely willing to
change if that is what the study suggests.” Such remarks are the kiss
death for projects involving important changes.

Often a failure to reach commitment occurs because the clients feel
threatened. This is easy to understand; they selected the current meth-
ods because they felt that they were the best ones for the circumstances.
The proposal of a new method could be interpreted as, “You dummies!
You are using X, while the best method is Y.” Such a reaction is likely
to occur if clients do not feel that they are fully in control of the change
process. Because the conflict usually is focused on methods, it may be
helpful at this point to redefine the problem and to start over. In other
words, rather than argue about methods, discuss problems.

If commitment cannot be reached even after an attempt to redefine
the problem, and if the problem is too important to terminate, then it
may be fruitful to create a confrontation. Some of the most beneficial
changes in this world have been achieved through confrontation. It is
a last-ditch effort, and it is frequently successful. It is also hard on the
change agent (for examples, see Nader, Petkas, and Blackwell, 1972). Usu-
ally you get the chance to make only one big change in an organ-
ization, so choose wisely.

Because LRF is a friendly book, I will not discuss strategies for
confrontation. Furthermore, use of the procedures in this chapter gen-
erally eliminates any need for confrontation. If you decide on such a
route, however, consult Saul Alinsky’s work. His strategy is simple
and effective. One of the reasons it worked was that the target groups
were unaware of Alinsky’s strategy. For a description of this strategy,
see Bailey (1974) and Alinsky (1971).

GAINING ACCEPTANCE OF THE FORECAST

In 1872, there was a German invasion of Britain. The British armies
and fleet, it will be remembered, were at that time scattered across the
world—putting down mutiny in India, protecting Canada from the
United States, and guarding Ireland against Emperor Napoleon III.
As a result, the home defenses were minimal on that morning in March
when the German boats set out across the North Sea. What Royal
Navy was left in British waters soon succumbed to the German mines
and torpedoes—weapons that had been developed in secrecy. British
land forces suffered not only from lack of numbers, but also from inadequate training and discipline, combined with an outdated philosophy of warfare. The great stand at the Battle of Dorking failed: the Germans conquered the British.

This story is completely false. It was written by G. T. Chesney, a historian of the future and was published in *Blackwood's Magazine* in 1871. At that time, it was a plausible forecast. The publication of “The Battle of Dorking” created a political sensation. Prime Minister Gladstone attacked both the plausibility of the forecast and the wisdom of publishing such an alarmist view. A wide-ranging debate followed, and some changes took place as a result. (The story has been passed along by Encel, Marstrand, and Page, 1975, pp. 63–64.)

The earlier discussion in this chapter concerned the introduction of new methods into an organization, however, the Battle of Dorking raises a new issue. How does one persuade people to use the forecasts? Three issues are described here: (1) prior commitment, (2) scenarios, and (3) presentation strategies.

**Prior Commitment**

Prior commitment should be used to gain acceptance of forecasts. This advice is simple. The clients are asked (1) what forecasts they expect? and (2) what decisions will be made given various possible forecasts? If the decisions do not vary when the forecasts vary, then there is no need to spend the money on forecasting.

Formal questionnaires can be administered to the clients, asking them to record their forecasts and confidence intervals. Also, the questionnaire could sketch out possible forecasts and ask the clients what decisions they would make. As an alternative to questionnaires, the process might be conducted in structured meetings.

Prior commitment to the forecasting process is also important. If the stakeholders feel that the process is rational and fair, then they are more likely to accept the forecasts.

Forecasts are most likely to be useful when they are surprising. Yet without prior commitment, the forecast is unlikely to be regarded as different or surprising, as shown in the “hindsight studies” (Fischhoff, 1975; Fischhoff and Beyth, 1975; SLOVIC and FISCHHOFF, [1979]; ARKES, [1981]). People rationalize that the forecast provides nothing new and so no action is needed. The rationalization may be that they knew-it-all-along [WOOD, 1978] or it may be that they do not believe the forecast.
Implementation

Scenarios

Forecasts with unpleasant consequences often create problems. Rather than changing the plans, attempts are often made to change the forecasts (as was done by Gladstone in the Battle of Dorking). It is like changing the reading on your thermometer in an attempt to improve the weather. Unfortunately, this type of irrational behavior occurs often. Examples include the U.S. government’s failure to use forecasts that indicated bombing North Vietnam would be ineffective; the Boeing Aerospace Company’s refusal to accept forecasts that the U.S. public would tire of the space program; and the Ford Motor Company’s ignoring unfavorable forecasts of the economy at the time it introduced the Edsel.

Unpleasant forecasts are ignored even though they have potential usefulness. For example, BAKER [1979] found that valid hurricane warnings are frequently ignored. GRIFFITH and WELLMAN [1979] found that hospitals purchased forecasts and then ignored those with pessimistic outcomes.

The scenario technique is useful in helping people to confront unpleasant forecasts. A scenario is a story about the future. It can integrate a number of different forecasts about a situation and present them in an interesting and comprehensible manner. The Battle of Dorking is an example of a scenario.

The scenario-writing process described here calls for an initial suspension of evaluation so that the group members may discuss the unthinkable. It requires a well-defined structure, acceptance by the group, and a group leader. Scenarios may be used not only to examine what will happen, but also to consider what might be done by the organization. The idea may be expressed this way (adapted from George Bernard Shaw):

Some see the world as it is and ask, “Why?”
Some see the world as it could be and ask, “Why not?”

My structure for scenario writing is presented in Exhibit 3-5. This was used extensively by one organization, and it led to worthwhile changes.

The basic building blocks for the scenario process are presented above the dashed line in Exhibit 3-5. Examples are presented below the dashed line. The example was expanded for the least favorable environmental forecast, but a similar process could be used for the most likely environment and for the most favorable environment.
Exhibit 3-5 BUILDING BLOCKS FOR SCENARIO WRITING

**Process**
- Environmental forecasts
- Plan for organization’s capabilities
- Plan for organization’s strategies
- Forecast effect upon organization

**Examples**
- Least favorable environment
  - No change
  - Alternative strategy
  - Improved capabilities
  - Alternative strategy

- Likely environment

- Most favorable environment

- F1: Baseline forecast: unfavorable environment
- F2: New strategy: unfavorable environment
- F3: New capability & strategy: unfavorable environment
Implementation

Considering the forecast of the least favorable environment, the analyst can prepare descriptions of the organization's expected capabilities and expected strategies. From this, a forecast, $F_1$, can be prepared; this is called a "baseline projection" or a "surprise-free projection." Members of the scenario-writing group, which include the major stakeholders, can then brainstorm alternative strategies under the assumption that the organization's capabilities are fixed. They should be encouraged to freewheel and to develop wild and provocative ideas. These changes are then translated by the analyst or by a forecasting model into a revised forecast ($F_2$). The scenario group also brainstorms to consider what changes might be made in the capabilities of the organization. The result can be used to develop new strategies, leading to forecast $F_3$.

The arrows running from right to left in Exhibit 3-5 suggest another approach: the scenario group can imagine a forecast (e.g., $F_3$) that its members consider to be ideal. They then work backward to brainstorm changes in strategies that could yield such a forecast, and then to brainstorm the changes in capabilities that would be required to carry out these strategies. This use of the scenario process helps the group to forget about constraints in creating the type of future it wants.

The scenario process should help the members to use information that is contrary to their current views of the world. This procedure gives them control over the change process and allows them to discuss the unthinkable in a context that is socially approved by the group.

The difference between the scenario process suggested here and that used in the Battle of Dorking is that the latter stressed confrontation. In my opinion, the participative approach is more effective and less expensive.

The original edition of *LRF* stated that little research had been done on scenarios. Things have changed since then. Some relevant research has been done, and the scenario has been shown to be effective as a technique for gaining acceptance. For example, the research implies that the impact of the scenario can be heightened by the following techniques:

1. Use *concrete examples* [READ, 1983; ANDERSON, 1983b]
2. Make the description *vivid* [HAMILL, WILSON and NISBETT, 1980]
3. Include events that will seem *representative* of the situation, even if they are irrelevant [TVERSKY and KAHNEMAN, 1982]
4. Include events that will make it easy for the decision makers to recall *available supporting evidence* (Tversky and Kahneman, 1973)
5. *Link the events by showing causality* in a plausible manner
6. Include *commensurate measures* across alternative scenarios, even if these measures are irrelevant [SLOVIC and McPHILLAMY, 1974]
7. Ask the decision makers to *project themselves* into the situation [ANDERSON, 1983a]
8. Ask the decision makers to *predict how they would act* in the scenarios [SHERMAN, 1980]

These techniques can make a scenario more plausible, increasing its chances of being taken seriously and perhaps leading the organization to develop contingency plans.

Note the dangers of the scenario, however. Scenarios could seriously distort judgmental forecasts [GREGORY, CIALDINI, and CARPENTER, 1982]. Furthermore, the experiment by ANDERSON [1983b] suggests that the scenario will unduly increase perceived probabilities even in cases where the forecaster is provided with information that the situation is unlikely. It would be easy to "lie with scenarios"—easier, perhaps, than lying with statistics:

GREGORY, CIALDINI, and CARPENTER [1982] conducted four experiments on scenarios. In this context, scenarios meant short stories, written by the experimenters, where the subjects were asked to imagine that the events were actually happening to them. It was hypothesized that subsequent predictions of the likelihood of the event will be increased because knowledge of the event is more easily available. Here is a brief overview of the results of the four experiments where the scenario groups imagined the event happening to them, but the control groups did not:

<table>
<thead>
<tr>
<th>Experiments</th>
<th>Subjects</th>
<th>Predicted Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. “How likely is it that you might someday be arrested for armed robbery regardless of whether you are innocent or guilty?”</td>
<td>48 college psychology students</td>
<td>Control: 9%, Scenario: 18%</td>
</tr>
</tbody>
</table>
Alternative explanations were examined in the four studies, but the "availability" hypothesis held up well. In my opinion, however, experiment four expands the notion of availability to include saliency. This was the only experiment in which the information was the same for both experimental and control groups (thus it was equally available). The experimental group, however, imagined themselves to be experiencing the benefits of cable TV. This increased saliency had a substantial effect. The practical implications are important. By putting information in the form of a plausible story, you can increase a person's perceived probability that the event will occur. The likelihood can be increased even more if the person will imagine that the event is actually happening. The latter implication is relevant not only for planning but for practical marketing problems, as shown by the cable TV study. In that study, the subscription rates were about double those that had been experienced in the area by the cable TV company.
In ANDERSON [1983b], subjects were presented with evidence that a fire fighter trainee's preference for risk is predictive of his subsequent success. Half were told high risk taking leads to success and the other half were told it leads to failure. This “evidence” was presented in two ways, either as two concrete examples, or as abstract statistical data on 20 trainees. The subjects were then told that the evidence was bogus and were asked what they thought to be the true relationship. Interestingly, the bogus information had a strong effect both when asked immediately and when asked a week later. If told that risk aids success, then told to ignore the statement, the subject continued to believe it, and vice versa. The concrete examples (sample of 2 cases) showed a much stronger impact than the statistical data (sample of 20 cases), and this effect was just as strong one week later. The study has implications for the presentation of forecasts. Concrete examples have a stronger impact than do statistical data, apparently because it is easier for readers to construct causal explanations to support the prediction. Perhaps J. B. Watson knew this in the early 1900s. He built his fame as a psychologist with a study on conditioning that used one subject, a baby known as Little Albert. Watson’s fame continued to grow over the years despite evidence that there was no Little Albert study [SAMELSON, 1980]. An interesting extension of Anderson’s study would be to see if the effect holds if the subjects were told in advance (as we do in scenarios) that the predictions are hypothetical.

Presenting the Forecast

“The forecast should be presented clearly”: ( ) TRUE ( ) FALSE

If you have an important forecast and want to implement change, the answer is “true.” But if your concern is to gain respect as a successful forecaster, the answer is “false.” Or, so it seems if one can generalize from the Dr. Fox studies.

Dr. Fox was an actor who looked distinguished and sounded authoritative. Armed with a fictitious but impressive resume, he lectured on a subject about which he knew nothing. The lecture, “Mathematical Game Theory as Applied to Physician Education,” was delivered on three occasions to a total of 55 psychologists, educators, psychiatrists, social workers, and administrators. The talk lasted an hour and was followed by 30 minutes of questions and answers. It consisted entirely of double talk, meaningless words, false logic, contradictory state-
ments, irrelevant humor, and meaningless references to unrelated topics. According to a questionnaire administered at the end of the session, the audience found the lecture to be clear and stimulating. They had a high regard for Dr. Fox. None of the subjects realized that the lecture was pure nonsense [NAFTULIN, et al. 1973]. In a follow-up study, I found that researchers who write in a style that is difficult to understand are more highly regarded [ARMSTRONG, 1980a].

The Dr. Fox studies yield practical advice to those concerned about personal advancement. I call it bafflegab:

- "If you have nothing to say, make sure you do not say it clearly."
- "If your forecast is unpleasant, make sure no one understands it."

For further advice, see Exhibit 3-6.

Exhibit 3-6 ON PRESENTING BAD NEWS

Source. "THE WIZARD OF ID," by permission of Parker and Hart, and Field Enterprises, Inc.
This advice runs counter to doing an effective job, so I urge you not to use bafflegab. However, recognize that others may use it.

Forecasts should be presented in a clear fashion. The purpose of statistics is to simplify and to aid in understanding—not to create false confidence. Clients often have difficulty in using even the simplest statistical concepts [ROSENBLATT, 1968].

Here are some guidelines for the presentation of forecasts:

1. Eliminate unnecessary information
2. Round numbers to two significant digits
3. Organize numbers in a meaningful way [WAGENAAR and VISSE, 1979]
4. Present current status first [WAGENAAR and VISSE, 1979]
5. Present estimates of uncertainty with the forecasts

Remember that less is more [WAGENAAR and VISSE, 1979].

For additional ideas on presentation see ASCHER and OVERHOLT [1983] and EHRENBERG [1981].

The above rules are not overly expensive. Clarity comes from organization and simplicity. You do not need to mount an elaborate production with expensive visual aids and professional delivery. Consider the weather forecaster, one of America’s highest paid professions. Is it all for entertainment? And what about computer graphics?

Do these wonderful TV shows with maps and TV stars do better at communicating the forecast than is done on radio? No, according to WAGENAAR, SCHREUDER, and VAN DER HEIJDEN [1985]. Low recall of the forecasts occurred (typically about 25\% of the message) for TV as well as for radio. This was true even for highly motivated subjects. Part of the problem seemed due to the large amount of irrelevant information. Reductions in the length of the forecast led to a higher percentage of items recalled (the number of items recalled stayed about the same). Written summary statements helped, as did animated pictograms that emphasized key elements of the forecast.

Computer graphics are becoming increasingly popular. I was quite pleased by this and expected that it would lead to substantially better communication and, consequently, to better forecasting and decision making. Thus, I was surprised when I read the re-
Implementation

search in this area. A comprehensive review of the evidence is provided by DeSANCTIS [1984]. Graphics do not seem to be more effective than tables. There seems to be no question that graphics are more attractive, but features that make a graph visually attractive, such as color, design, complexity, and realism may detract from comprehension. (In addition to DeSANCTIS, see DICKSON, et al. [1977] and LAWRENCE et al. [1985].)

Exhibit 3-7 IMPLEMENTATION PROCESS

- Find Problems
  - Include all stakeholders
  - Use nondirective interviewing

- Agree on Problems
  - Include all stakeholders
  - Brainstorm problem statements

- Propose Alternative Solutions
  - Include all stakeholders
  - Brainstorm solutions

- Gain Commitment
  - Client specifies criteria
  - Experiment
  - Gain participation

- Obtain Feedback
  - Establish a schedule
Implementation is the Achilles' heel of forecasting. Attempts to impose forecasting methods or forecasts upon other people in an organization can be expected to fail, unless the changes are unimportant and the forecasts provide only confirming evidence. To judge by the Jesus Christ study, such attempts are likely to increase people's confidence in their current beliefs rather than to result in change.

An explicit process for the implementation of new methods was presented. It parallels the steps in the systems approach, but is adapted to gain the participation of the stakeholders in the organization. The steps, are summarized in Exhibit 3-7.

A prior commitment to accept the forecasts should be obtained from the stakeholders. This includes a commitment to the forecasting process (is it reasonable?), to the confidence intervals (what forecasts would be surprising?) and to decision making (if the forecast were X, what decision would you make?).

Scenarios were proposed to gain acceptance of forecasts with unfavorable outcomes. Recent research on this topic provided a set of specific rules for heightening the impact of a scenario.

Finally, it was suggested that the forecast be clear and simple. Specific suggestions were made for implementing this useful, often ignored, and potentially dangerous piece of advice.