

VIII. Eight Basic Pitfalls: A checklist

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"New technological knowledge creates new ignorance."
Joseph F. Coates

A significant new approach inevitably spawns criticism. If it serves a constructive purpose the criticism is healthy indeed; if it inspires literary talent (e.g., Hoos and Adams on Systems Analysis¹) it can even be entertaining. The most extensive critique of Delphi available at present, the Sackman Report^{2a}, fails both tests. Ironically this study from the RAND Corporation raises its voice in righteous indignation at the offspring of its own seed:

"The future is far too important for the human species to be left to fortune tellers using new versions of old crystal balls. It is time for the oracle to move out and science to move in."^{2a}

Science to Sackman means psychometrically trained social scientists. His tradition-bound attitude is not uncommon; it is in the same vein as the illusion that science is "objective", that only Lockean or Leibnizian inquiring systems are legitimate, and that subjective or Bayesian probability is heretical. Orthodoxy faced with new paradigms often responds with sweeping condemnations and unwitting distortions. Poorly executed applications are brought forth to censure the entire method, quotations are taken out of context, the basis for criticism is left vague, significant supportive research and new directions are ignored, and irrelevant "standards" are applied. A case in point is Sackman's comparison of Delphi with standards for psychological testing developed by the American Psychological Association: procedures designed to evaluate the testing of individuals are assumed to be meant for evaluation of opinion questionnaires.^{2b}

Coates offers the view that Delphi is a method of last resort in dealing with extremely complex problems for which there are no adequate models. As such,

"...one should expect very little of it compared to applicable analytical techniques. One should expect a great deal of it as a technique of last resort in laying bare some crucial issues on a subject for which a last resort technique is required... .
If one believes that the Delphi technique is of value not in the search for public knowledge but in the search for public wisdom; not in the search for individual data

¹ I. Hoos, "Systems Analysis in Public Policy: A Critique," University of California Press, Berkeley, California, 1972. J. G. U. Adams, "You're Never Alone with Schizophrenia," *Industrial Marketing Management*, 4 (1972), P. 441, Elsevier Publishing Co., Amsterdam.

^{2a} H. Sackman, "Delphi Assessment: Expert Opinion, Forecasting, and Group Process," The RAND Corporation, R-1283-PR, April 1974.

^{2b} P. G. Goldschmidt, Review of Sackman Report, *Technological Forecasting and Social Change*, Vol. 7, No. 2 (1975), American Elsevier Publishing Co., New York.

but in the search for deliberative judgment, one can only conclude that Sackman missed the point.^{2c}

In this chapter we shall attempt to set criticism of Delphi in a constructive key. In particular we draw the problems together in a checklist of pitfalls to serve as a reminder which the Delphi designer should keep in clear view.

1. Discounting the Future³

If Delphi is used to elicit value judgments or other subjective opinions involving the future, a unique difficulty arises: the universal practice of intuitively applying a discount rate to the future.

A bitter lesson which every forecaster and planner learns is that the vast majority of his clientele has a very short planning horizon as well as a short memory. Most people are really only concerned with their immediate neighborhood in space and time. Occurrences which appear to be far removed from the present position are heavily discounted. Uncertainty increases as we move progressively further from the present and it is uncomfortable: Fear of the unknown generates resistance to change; in Hamlet's words, we "rather bear those ills we have than fly to others that we know not of". We shy away from considerations which might endanger our individual or group status (i.e., our economic security" social prestige, peace of mind).

Decision making becomes more difficult as uncertainty grows. First, the range of alternatives becomes large and cumbersome. Second, the possibility of accidents (low probability events) and "irrational" actions increases. Consider the large impact of the assassinations of the Archduke Franz Ferdinand and John Kennedy, the discovery of the Watergate burglars, and the decision to bomb North Vietnam in the face of massive evidence of the ineffectiveness of such a strategy in preceding wars.

By ignoring the longer time horizon we may hope that additional options or solutions to currently unsolved problems will materialize" that the need to make a decision will vanish, or that the responsibility for a decision will be in other hands. Furthermore, the Western incentive and reward system strongly favors discounting of the future. The politician's chances of re-election depend on his near term achievements ("But what have you done for me lately?") and long term federal debts are blissfully ignored. Americans, in particular, are nurtured on immediate material gratification through installment buying and "fly-now-pay-later" exhortations which discount future costs. Corporate management is judged by near term sales growth or profits to its stockholders and its long range planning activity is a ritual with little substance. Donald Michael quotes Ewing: "Reward systems generally favor the man who turns in a good *current* showing ... salary, bonus, and promotion rewards tend to be based on this month's, this season's, this year's performance-not contributions to goals three, four, or more years off". And Michael

^{2c} J. F. Coates, Review of Sackman Report" Technological Forecasting and Social Change" Vol. 7" No. 2 (1975)" American Elsevier Publishing Co., New York.

³ H. Linstone, "On Discounting the Future"" Technological Forecasting and Social Change" Vol. 4 (1973)" pp. 335-338, American Elsevier Publishing Co., New York.

adds that "rewarding *present* payoff makes it impossible by any known means to simultaneously reward concern with a future that would interfere with immediate payoff."⁴

The degree of discounting may well vary with the individual's cultural and social status. A person at the bottom of Maslow's human values pyramid will discount environmental pollution much more heavily than someone near the top. The poor, for whom survival is a daily challenge, are hardly going to lose much sleep over a pollution or population crisis twenty years in the future. A similar difference applies to the spatial dimension: a slum dweller worries about rats he can see, the jet set worries about depletion of wild game in distant Africa. To further complicate matters we should note that discounting operates in both directions—past as well as future. The former also impacts on forecasting in a number of ways. Disregard of the past is evident in the rare use of historical analogy (see Pitfall 4 below). In the context of Delphi we see that evaluation of subjective probability of likelihood by a Delphi participant (or any forecaster) is influenced more strongly by recent events than those in his more distant past. The phenomenon is the same as that observed by Tversky in his experiments: drivers who have just passed the scene of an accident forecast a higher likelihood of being themselves involved in an accident than those who have not had this experience (and hence they reduce their speed temporarily).^{5a} Thus the individual's time perception distorts his own data base as he integrates it to develop an "intuitive" judgment or forecast.

The massive impact of such a personal discounting process is vividly illustrated by reference to the Forrester-Meadows World Dynamics model.^{5b} Application of an annual discount rate equal to, or greater than, 5 percent reduces the future population and pollution crises in Meadows' "standard" case to minor significance, i.e., no dramatic worsening of the current situation is perceived by today's observer (Fig. 1). It is not surprising, therefore, that cries of crises fall on deaf ears and questioning involving future goals or values can prove exceedingly frustrating. Alternatively, use of a small elite group may lead to gross misconceptions since the differences in planning horizon between such a group and a truly representative population spectrum may cause major distortions of Delphi results.

Unfortunately this space-time discounting phenomenon is usually poorly understood by both the futures researcher and the Delphi designer. Rarely do they try to come to grips with the basic perception difficulty. Ultimately the pitfall may be avoided in two ways (schematically shown in Figure 2): (a) moving the distant crisis or opportunity well within the participant's current field of perception or planning horizon, or (b) extending the participant's field of perception or planning horizon.

Communications have been successful in drastically foreshortening the space dimension (e.g., bringing the distant Apollo landing and the Kennedy assassination events vividly into the living room). Technology has been far less effective in foreshortening the

⁴ D. Michael, "On Learning to Plan-and Planning to Learn", Jossey-Bass Publishers, San Francisco, 1973, p. 99. D. Ewing, "The Human Side of Planning: Tool or Tyrant?", Macmillan, N.Y., 1969, p. 47.

^{5a} A. Tversky and D. Kahneman, "Judgment under Uncertainty: Heuristics and Biases," Science, Ser. 2, 1974, pp. 1124-1131.

^{5b} J. W. Forrester, "World Dynamics", Wright-Allen Press, Cambridge, Mass., 1971. D. H. Meadows et al., "The Limits of Growth", Universe Books, New York, 1972.

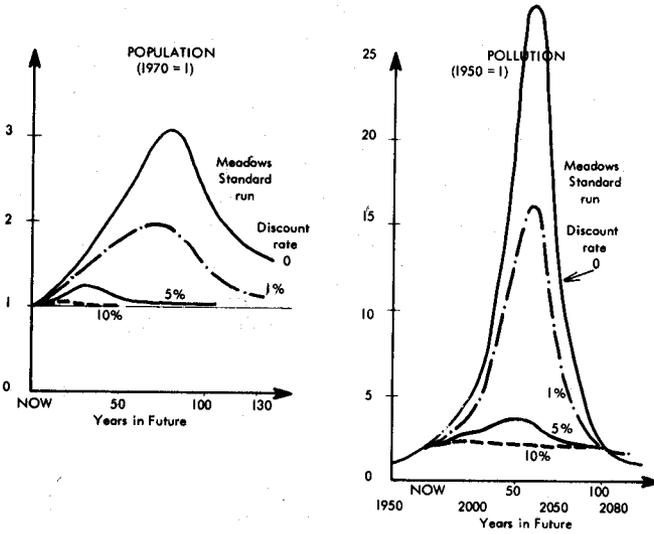


Fig. 1. The discounting effect in crisis perception.

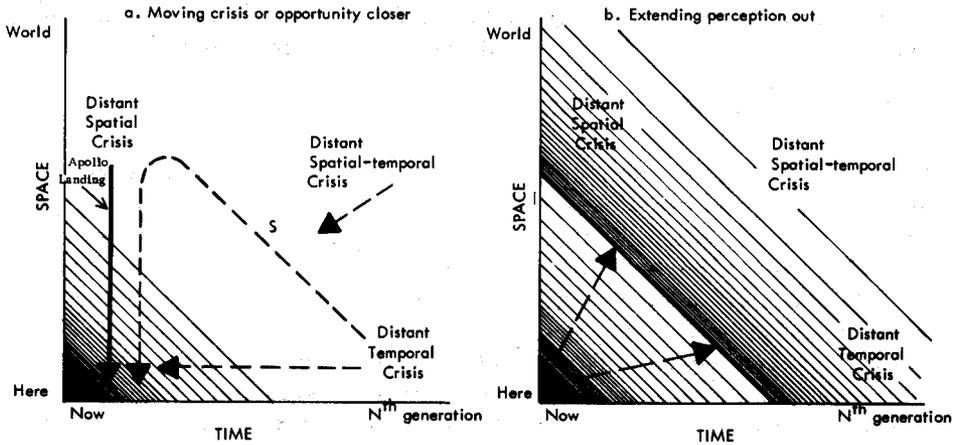


Fig. 2. Space-time perception.

time dimension (Orson Welles' broadcast of H. G. Wells' *War of the Worlds* is a rare example). In some instances it may be possible to substitute space for time and then compress the time dimension (see arrow S in Fig. 2a). A future crisis or lifestyle for us may already exist somewhere on the earth today (e.g., overcrowded India, communal living in the Kibbutz). Communications can then bring such "scenarios"

within our planning horizon. The arts also have great potential, as Orwell, Kafka, and Burgess / Kubrick have demonstrated.

The other approach, extension of the planning horizon, suggests the exploration of altered states of consciousness to facilitate the imaging capability of the individual. Masters and Houston have been experimenting with this concept (without the use of drugs). They point out that:

[time distortion] is a very common phenomenon that we all experience, at least to some extent. We've all known five minutes to pass as if they were an hour or vice versa. ... There's no known limit to the amount of subjective experience that can occur within just an instant of clock-measured time.⁶

Following some of Scheele's concepts in Chapter II, C, above, one way of overcoming this problem is for the Delphi designer to attempt, in his design, to bring the respondents into the future by taking on or playing roles in the future - a Delphi with overtones of psychodrama and other role-playing techniques.

These approaches do not suggest a "quick fix." But they provide clues and may suggest some modest and practical steps to the Delphi designer.

2. The Prediction Urge

Most human beings have a strong predilection for certainty and a dislike of uncertainty. The oracle at Delphi, Nostradamus, Jeanne Dixon, and Edgar Cayce have all been popular because, in effect, they dispelled uncertainty about the future. The intellectual establishment may be startled to learn that "in 1967 the most widely read view of the year 2000 was that of [fundamentalist prophet] Edgar Cayce as popularized in Jess Stearn's best-seller, *The Sleeping Prophet*," and not Kahn and Wiener's *The Year 2000*, which was published in the same year.⁷ Most people would prefer, a precise prediction ("California' will sink into the ocean at 6:34 A.M. on August 14, 1988") to descriptions of alternative scenarios of the future.⁸ The striving for certainty has been strongly reflected in the dogmatism of the Judeo-Christian religious heritage (e.g., exclusivity, infallibility) and to some extent in the orthodoxy of much traditional science (e.g., search for the "truth," the single "best" model).

The same tendency is often seen in the interpretation and use of Delphi studies. A probability distribution of the date of occurrence of an event, together with reasons for panel disagreement, is transformed into a statement that "there is a 50-50 chance that X will occur in Year Y," or, even more blatantly, into the statement that "X will occur in year Y." Results which exhibit a high degree of convergence are often accepted, while those which involve wide differences after the final iteration are considered unusable.

⁶ Interview in *Intellectual Digest*, March 1973, p. 18. See also R. Masters and J. Houston, *Mind Games*, Viking Press, New York, 1972.

⁷ W. I. Thompson, *At the Edge of History*, Harper & Row, New York, p. 123.

⁸ There are some clues to suggest that tolerance of uncertainty, like the degree of discounting, is correlated to an individual's position on Maslow's scale of human values.

Such suppression of uncertainty can mask the real significance of the Delphi results. As shown in Goldstein's paper (Chapter III) the ability to expose uncertainty and divergent views is an inherent strength of the Delphi process. Her Delphi, laying bare the uncertainties, gave a much different picture than the conventional homogenized panel report produced by another group for the same user.

Maruyama projects a societal change from a homogenistic to a heterogenistic logic.^{9a} Jantsch and Ozbekhan are stressing the growing significance of normative planning. In both cases prediction is far less important than alternatives and differences in views of the future. Several of the articles in this volume have stressed that exploration of differences through Delphi is feasible. If the technique is viewed as a two-way communication system rather than a device to produce consensus it fits this evolving culture admirably.

3. The Simplification Urge

As certainty is preferred to uncertainty, so simplicity is preferred to complexity. Flushed by the triumphs of science and technology we expect to use the same reductionist approach on social/behavioral systems as we have applied to technological ones. We are convinced that the complexity of social systems can be reduced for purposes of analysis without sacrificing realism.^{9b} It is often a quixotic quest. The mathematics may look elegant, the models meaningful, yet, in actuality we may be developing "superficial caricatures".

Complex systems frequently exhibit strongly counter-intuitive behavior. Forrester has noted that "intuition, judgment, and argument are not reliable guides to the consequences of an intervention into [complex social] systems behavior".¹⁰ The secondary effects which are ignored often prove determinative (and highly undesirable) in the long run.

Holling finds that in urban systems all policies considered "have 'unexpected consequences'... The basic trap is that people conceive of a small fragment of a whole and the very best policy for that fragment can produce the reverse through interaction with other parts of the system".^{11a}

In other words, everything interacts with everything and the tools of the classical hard sciences are usually inadequate. And certainly most of us cannot deal mentally with such a multitude of interactions. *Typically we forecast by taking one or a few innovations and fitting them in a mental image into an environment set in the familiar structure context of*

^{9a} M. Maruyama, "Symbiotization of Cultural Heterogeneity: Scientific, Epistemological, and Esthetic Bases". Paper presented to American Anthropological Association Conference, 1972.

^{9b} Reductionism inevitably leads to success in the eyes of the traditional researcher, as reflected in Heinz Von Foerster's Theorem Number One: "The more profound the problem that is ignored, the greater are the chances for fame and success". (Cf. "Responsibilities of Competence", *Journal of Cybernetics*, 1972, 2, 2, p. 1)

¹⁰ J. W. Forrester, op. cit., p. 97. Also see J. Wilkinson, R. Bellman, and R. Garaudy, "The Dynamic Programming of Human Systems", The Center for the Study of Democratic Institutions, *MSS Information Corp.*, New York, 1973, pp. 22',29.

^{11a} C. S. Holling and M. A. Goldberg, "Resource Science Workshop", University of British Columbia, Vancouver, B.C., p. 20.

the past and present. We do not visualize a future situation in its own holistic pattern. Cross-impact analysis (Chapter V) should be of some help, although it does not by any means eliminate the problem. Unless the components of the system are autonomous we should never expect to forecast the behavior of the whole by forecasting the behavior of its parts.

The weakness in visualizing future situations also applies to the past. Oversimplification of the future matches oversimplification of the past. Only now are attempts being made to develop complex interactive dynamic simulations – retrospective futurology – in historic human systems such as Athens and other city-states. What Forrester and Meadows have done through systems dynamics to economics, Bellman, Wilkinson, and Zadeh may do to the study of history.¹⁰

There are other psychological difficulties. An individual asked to list his preferences on a sheet of paper may well develop responses significantly different from those he would actually give in a real-life/real-time setting. His preferences in an artificial setting may indicate the characteristics of a bold risk-taker; however, in an actual situation ("when the chips are down") the same person may be quite conservative.

Intuitive procedures such as Delphi usually lean heavily on subjective probability assessments. And most human beings exhibit a tenacious tendency to simplistic misjudgments and biases in dealing with such probabilities. We are all familiar with the common preference to bet on a coin coming up Tails after along string of Heads. Tversky^{11b} notes that prior probabilities are blissfully ignored when worthless or irrelevant information is added, sample size is casually disregarded in favor of probability data, and representativeness or desirability is confused with predictability. Example: a reasonable sounding (e.g., surprise-free) scenario is judged to be "more likely" to occur than an unfamiliar one even if there is no evidence to support such a differential forecast evaluation.

The simplification urge is also evident in the frequent effort to suppress conflict (see Section 2, above). Dialectic inquiry with confrontation between conflicting theories is still relatively rare, although it may prove exceedingly fruitful for an understanding of ill-structured systems.

The means of communication present another facet of oversimplification. Language itself can be a major pitfall! Just as a linear progression of words fails to communicate a Rembrandt painting, so a panelist may be unable to communicate his views or insights by means of a concise sentence or even by diagrams. We also observe that different cultural groups communicate in diverse ways; forcing them into a conventional Delphi format may destroy their message. New means to communicate the gestalt of complex systems and to deal with patterns are needed for all aspects of Delphi.¹²

^{11b} A. Tversky and D. Kahneman, op. cit.

¹² Techniques such as multidimensional scaling, time-lapse-oriented displays, and multimedia concepts appear to have considerable potential. See also the work of Adelson et al. (Chapter VI, D).

Furthermore, as W. T. Weaver has noted, "persons with different kinds of 'self-structures' (needs, attitudes, beliefs, etc.) would hold different perceptions about the present as well as the future, and thus produce different kinds of forecasts about the future."¹³

Finally we are confronted with a problem here which arises also in the use of subjective weightings and utility theory. Luce and Raiffa note that "since neither the zero nor the unit of a utility scale is determined, it is not meaningful in this theory to compare utilities between two people."¹⁴ In an analogous manner it is dangerous to compare two persons' estimates of a future event when each views the past, present, and future in his own subjective way.

4. Illusory Expertise

In the application of Delphi to forecasting, reliance is almost invariably placed on panels of experts or specialists. As those familiar with forecasting have learned, the specialist is not necessarily the best forecaster. He focuses on a subsystem and frequently takes no account of the larger system. Reciprocating-engine experts in the 1930s forecast that propeller aircraft would be standard up to 1980. Military aircraft experts forecast a succession of manned bombers beyond the B-52 as primary weapon systems and for many years did not consider the replacement of manned bombers by missiles. These experts concentrate on a single logistic curve rather than on the envelope of a series of such curves.

A panel consisting of experts on the various body subsystems (e.g., circulation, respiration, reproduction) does not constitute expertise on human behavior and group dynamics. Similarly, a group of experts, each knowledgeable about one aspect of a complex system, does not necessarily comprise expertise about the total system.

We have seen many examples in recent years of the failure of group expertise. Economists have misjudged the impact of fiscal policies on inflation. Moynihan has noted that the warriors in the war on poverty of the 1960s mistook hypotheses for scientific answers.¹⁵

Technologists have consistently underestimated the complexity and cost of new aircraft and electronics equipment. S. H. Browne has shown that, based on about fifty recent military programs, cost overrun has averaged nearly 50 percent.¹⁶

United States military experts have for years grossly miscalculated the enemy's capability to fight in Vietnam.¹⁷ Despite the sobering experience of World War II, the effectiveness of strategic conventional bombing was again vastly overrated. The use of

¹³ W. T. Weaver, "The Delphi Forecasting Method," *Phi Delta Kappan*, January 1971, p.270.

¹⁴ R. D. Luce and H. Raiffa, *Games and Decisions*, J. Wiley & Sons, New York, 1957, p.38.

¹⁵ D. Moynihan, *Maximum Feasible Misunderstanding: Community Action in the War on Poverty*, Free Press, Glencoe, Ill., 1968.

¹⁶ S. H. Browne, "Cost Growth in Military Development and Production Programs," December 1971, unpublished.

¹⁷ Cf. D. Halberstam, *The Best and the Brightest*, Random House, New York, 1972; and C. Fair, *From the Jaws of Victory*, Weidenfeld and Nicolson, London, 1971.

Delphi to elicit judgments from such experts would only have systematically reproduced error.

There is a remarkable degree of ahistoricity in the outlook of most scientists and technologists. This is reflected in the rarity with which historical analogy is used in forecasting as well as the lack of interaction with historians. The tremendous value of such interactions is clearly seen in the superb address by Lynn White on "Technology Assessment from the Stance of a Medieval Historian."¹⁸

Conversely, historians and archaeologists traditionally take a nonsystematic view of their subject. In the words of John Wilkinson, "most historical accounts of the year 2000 B.C. seem as implausible as the pseudo-scientific auguries and 'scenarios' that all of us read nearly everyday concerning the year 2000."¹⁹ He cites the German historian Mommsen as an example: he was a great historian of Rome, but his account of Rome resembled his contemporary Berlin more than ancient Rome.

A dogmatic drive for conformity, the "tyranny of the majority," sometimes threatens to swamp the single maverick who may actually have better insight than the rest of the "experts" who all agree with each other. This is not unknown in science; it is, in fact, a normal situation in the arduous process of creating new paradigms, i.e., scientific revolutions. In short, a consensus of experts does not assure good judgment or superior estimates.

There are, of course, uses of Delphi for which it is obvious that no experts exist. Consider quality-of-life criteria as a subject for Delphi. The panel selections must be made to ensure representation of all relevant social and cultural groups. But the analysts who carry out the study themselves constitute a highly select group (middle class, college educated, urban, young or middle aged, mobile, etc.). They may thus find it difficult, if not impossible, to enlist the multitudes who are suspicious of intellectuals, hostile to the establishment, or fearful of disclosing their views to "investigators." Sometimes the analysts attempt to solve the problem by having other analysts play the role of the poor or the old. This inbreeding is a dangerous practice and can yield highly misleading results. In terms of the Singerian mode, we cannot hope to divorce the exercise from the psychology and experience of either respondent or designer.

Complete objectivity is an illusion in the eye of the beholder. Neither layman nor expert should be expected to be free of bias. Robert Machol recalls that more than a generation ago Morse and Kimball, the godfathers of operations research, stressed the limitations of "expert opinion" and asserted that such opinion is "nearly always unconsciously biased." Or, as Rufus Miles has put it, "where you stand depends on where you sit."

5. Sloppy Execution

The blame for this occurrence may lie with either analyst or participant. First, the analyst. Poor selection of participants (e.g., friends recommending each other for panel

¹⁸ L. White, Jr., "Technology Assessment from the Stance of a Medieval Historian," *American Historical Review*, January 1974.

¹⁹ J. Wilkinson, R. Bellman, and R. Garaudy, *op. cit.*, p. 20.

membership) can produce a cozy group of like-thinking individuals which excludes mavericks and becomes a vehicle for inbreeding. Poor interaction between participant and analyst can give the former the impression that he is in a poll or will receive nothing of value to him from the process. He also resents being "used" to educate the analyst. It is incumbent upon the analyst that he provide the atmosphere of a fruitful communication process among peers, that time is not wasted on obvious aspects, that subtleties in responses are appreciated and understood.

In Chapter IV we have pointed to the importance of the proper formulation of Delphi statements. Excessive specification or vagueness in the statement reduces the information produced by the respondents.

Superficial analysis of responses is a most common weakness. Agreement about a recommendation, future event, or potential decision does not disclose whether the individuals agreeing did so for the same underlying reasons. Failure to pursue these reasons can lead to dangerously false results. Group agreement can be based on differing, or even opposing, assumptions; they might also be subject to sudden changes with the passage of time. In this case, an individual attempting to utilize the results later will not be aware that the results are now invalid. It is clearly essential that the potential user be able to examine the underlying assumptions for their current validity. In particular, forecasting as a professional endeavor is defined by many practitioners not as the formulation of predictions but of conditional statements about the future, i.e., if A, then B.

Perhaps the most serious problem associated with execution for which we can offer no remedies is a basic lack of imagination by the designer. A good designer must be able to conceptualize different structures for examining the problem. He must be able to perceive how different individuals may view the same problem differently and he must develop corresponding designs which allow these individuals the opportunity to make their inputs. Whatever it is, imagination and/or creativity, it is the rare quantity we cannot formulate for you in concrete terms and which represents the artistic component of Delphi design.

Sloppy execution on the part of the respondents often takes the form of impatience to "get the job over with." Answers are hastily given without adequate thought. Obvious contradictions are permitted to creep into the responses and possible cross-impacts are ignored. But here, too, the fault may lie with the designer. He may have used little discretion, and created a seemingly endless questionnaire weighted down with trivial, superficially unrelated, or repetitious statements.

We are really past the stage in the evolution of Delphi where an excuse exists for this pitfall. Most of the common errors have been amply demonstrated in a significant number of poorly conducted Delphis.

6. Optimism - Pessimism Bias

A common occurrence is a bias toward overpessimism in long-range forecasts and overoptimism in short-range forecasts.²⁰ Our brains are filled with experiential data. As already noted (see section 3 above) we tend to project selectively, superimposing the new

²⁰ R. Buschmann, "Balanced Grand-Scale Forecasting," *Technological Forecasting*, 1 (1969), p. 221.

elements onto the vast experiential data base. Thus we fail to recognize entirely new approaches to achieving a solution and consequently tend to be overly pessimistic. Tied too much to our experience, we suffer a failure of imagination.

For the near term, the bias is often in the opposite direction, particularly in the area of technological achievements. A new system may be at hand "in principle" when the applied research on all components is completed. The Delphi respondent assumes that system development, production, and marketing present no major stumbling blocks. The fact that complexity of a system is not a linear function of its subsystems is ignored. It is assumed that if each subsystem is made more complex by a factor of 2, then the total system increases in complexity by the same factor. But, in fact, the interactions greatly compound the complexity.

These tendencies are complicated by individual characteristics -some participants are inherently optimistic, others pessimistic.²¹ However, insight into this type of bias can minimize its intrusion into the Delphi process through selective adjustments.

7. Overselling

In their enthusiasm some analysts have urged Delphi for practically every use except cure of the common cold. The first major Delphi study was published only ten years ago. Much progress has been made but improper applications have also mushroomed. We seem unable to resist faddism and it gets in the way of solid progress.

Inbreeding is one consequence of overuse. Repeated Delphi studies on the same subject quickly achieve a point of diminishing returns.²² Either the same experts are used or the respondents are familiar with the earlier studies and regurgitate the same ideas.

A person who wants to introduce a new communication system, such as Delphi, into a group setting must also ascertain that he is not acting under false premises concerning the psychology of the potential user community.

Possible fallacy a: The user really wants a more effective and different system than he now employs.

Do the user's statements reflect mere lip service to progress? Does he know what benefits to expect from Delphi other than the "prestige" of having done it?

The typical successful executive experienced in running conferences which culminate in decisions may expect the same result from a Delphi. The conscientious Delphi manager thus senses great pressure to assure a consensus to satisfy such a client.

Anonymity may be a disadvantage in certain organizational settings. In diplomatic communications the source of a statement may be far more significant than its substance. Consensus of several participants may be of less value than knowledge of their identity. Credibility of the response may hinge on the identification of the respondent (see IIIBI).

Possible fallacy b: The more individuals are involved with a Delphi as users, the more effective it will be.

²¹ See J. Martino, "The Optimism/Pessimism Consistency of Delphi Panelists," *Technological Forecasting and Social Change*, 2, No. 2 (1970).

²² J. M. Goodman, "Delphi and the Law of Diminishing Returns," *Technological Forecasting and Social Change*, 2, No. 2 (1970).

An unfamiliar and anonymous communication system can develop into a threat to established individuals and intraorganizational relationships. Like other analytical tools, it can serve in an advocacy role as well as in an inquiry role.

Possible fallacy c: The goals of the organization are the same as those of the individuals in the organization.

The Delphi designer is always faced with the problem of understanding the user and his organization. It is the same problem that has confronted efforts in all aspects of management science-operations research, systems analysis, cost benefit studies, etc. The presuppositions on the part of the analyst about the utility and correctness of his methods and their 'good' goals may be entirely unwarranted. The possible advantage of Delphi in a circumstance of this sort is that it can be oriented, if allowed, to expose the existence of the fallacies. If an organization is to function over the long run, misconceptions must at least be held within reasonable bounds and their exposure can serve to sharpen those boundaries.

8. Deception

Today the least acknowledged hazard in connection with Delphi is its potential use for deceptive, manipulative purposes. Welty reaches back to the Greek myth of Ino, the wife of King Athamus of Orchomenus.²³ When the King dispatched a messenger to the Oracle of Delphi, Ino bribed him to return with a falsified story. In a second round of consultation at Delphi the Oracle based its pronouncements on the false version of the first utterances. In other words, the Oracle did not recognize the deception.

Cyphert and Gant have conducted a Delphi experiment²⁴ where false information was introduced during the analysis of the first round responses and sent out in the second round. The participants did not ignore the false information but distorted their own subsequent responses, to reflect acceptance of this new input.

There is a vital lesson here. The Delphi process is not immune to manipulation or propaganda use. The anonymity in such a situation may even facilitate the deception process: how can the participants in a Policy Delphi possibly detect distortion of the feedback they receive? One answer can be inferred from our earlier discussion of holistic experimentation (Chapter VII, A) based on the work of Mitroff and Blankenship. The "subjects" themselves can insist on taking a major role in the staff activities, including monitoring and analysis of the responses in each round.

All of these pitfalls exist to greater or lesser degree no matter what communication process we choose to utilize in approaching a problem. However, since an honestly executed Delphi makes the communication process and its structure explicit, most pitfalls assume greater clarity to the observer than if the process proceeds in a less structured manner. While the Delphi designer in the context of his application may not be able to deal with, or eliminate, all these problems, it is his responsibility to recognize the degree of impact which each has on his application and to minimize any that might invalidate his exercise. The strength of Delphi is, therefore, the ability to make explicit the limitations on

²³ G. Welty, "Plato and Delphi", *FUTURES*, Vol. 5, No. 3, June 1973.

²⁴ F. Cyphert and W. Gant, "The Delphi Technique", *Journal of Teacher Education*, Vol. 21, No. 3, 1970, p. 422.

the particular design and its application. The Delphi designer who understands the philosophy of his approach and the resulting boundaries of validity is engaged in the practice of a potent communication process. The designer who applies the technique without this insight or without clarifying these boundaries for the clients or observers is engaged in the practice of mythology.