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THE NEED FOR MULTIPLE PERSPECTIVES IN PLANNING

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1. Introduction

The use of analysis in the public sector during the 1970s presented the planner with impressive global computer models - from "The Limits to Growth" to "Global 2000". As Jay Forrester (1971: 18) observed in his influential "World Dynamics",

All systems that change through time can be represented by using only levels and rates. The two kinds of variables are necessary but at the same time sufficient for representing any system.

In the private sector corporate planning groups flourished and strategic planning focused on econometric forecasts, business unit models, growth and market share matrices, and experience curves.

A decade later disillusionment is widespread. Consider the following headlines on strategic planning in the private sector:

The Real World Strikes Back: Corporate Strategists under Fire.

Fortune, Dec. 27, 1982

The (Economic) Forecasters Flunk: Poor predictions give once prestigious pundits a dismal reputation.

Time, Aug. 27, 1984

The New Breed of Strategic Planner: Number crunching professionals are giving way to line managers.

Business Week, Sept. 17, 1984

And in the public sector we read:

The more ambitious the model, the more likely is the fraternity of futurists to ignore fatal flaws and defer to it as a landmark.

(Hoos; 1983:236)

In World Dynamics and The Limits to Growth the scope is unbounded but the insights are slight.

(Berlinski; 1976:85)

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There is recognition that real-life planning must deal with ill-structured or "wicked" problems, rather than with well-structured or "tame" ones. As a result, a recent UN-supported study

reject(s) the "grand design" approach to development. "Grand design" solutions are appropriate only when there is a shared understanding of "the problem" and complete knowledge of the causes of "the problem".

(Thompson and Warburton; 1985:10)

We shall first examine the familiar analytic approach and then propose a means to cope with its weaknesses, indeed to bridge the gap between the modeler and the real world, between analysis and action.

2. The Traditional Perspective

Let us consider some of the familiar characteristics of science and technology-based analysis methodology and set them in the context of development planning:

a) Shared understanding of the "problem"

There is a single definition of the problem to be "solved". There is agreement on the objectives or goals. In fact, a cultural homogeneity must be assumed which does not exist in development planning problems encountered in the real world. Each interested party may define the "problem" differently and have conflicting objectives.

b) Search for the "best" or optimal solution

Cost-benefit analysis and linear programming are typical of this search. Organizations do not usually seek optimal solutions; they have an agenda and seek a workable solution to the top problem so they can move on to the next one.

c) Abstraction or reductionism; reliance on models

Forrester's world dynamics model offers an example of this process. His model contains only five levels - population, pollution, natural resources, capital investment, and capital investment in agriculture. Assuming only one interaction between any two subsets of these five elements, we have almost a thousand possible interactions. (The formula is $(2^n - 1)^2$, where n is the number of elements; in this case the formula gives 961.) In reality there are, of course, multiple interactions possible between any two subsets, so the number given

here is a lower limit. The simplifying assumptions that (1) $n = 5$ yields a meaningful image of the world and (2) the structure of the model remains invariant over the 200-year model run, stretch the bounds of credulity. Indeed, the superficially impressive number of equations used in the world model gives a misleading aura of model sophistication and masks the 'ineffable innocence' of the analysis (Berlinski; 1976:83).

Econometric models may contain 1000 equations but executives using their intuition usually beat the models in short-term forecasting. As Ascher's examination (1978) concluded, the core assumptions are much more crucial to forecast accuracy than the model sophistication.

Economic journals are filled with mathematical formulas leading the reader from sets of more or less plausible but entirely arbitrary assumptions to precisely stated but irrelevant theoretical conclusions.

W. Leontief, 1973 Nobel Laureate in Economics, quoted in Time, Aug. 27, 1984;43

d) Reliance on data

The urge for quantification, a hallmark of science and technology, has also become pervasive in planning. The principle: If it cannot be quantified, it cannot be very important and may be neglected. Even when experts do present quantified facts, there may be enormous variation. Per capita fuel consumption rate estimates developed by experts for one recent UN-supported study varied by a factor of 67 (Thompson and Warburton; 1985:5).

Measures are used for the future because they were appropriate in the past. Gross national product is a suitable measure for an industrial society; it is of questionable value for a pre-industrial as well as a post-industrial society. The concept of the 'job' may need to be redefined in an information era.

e) Predictability

Prigogine et.al. (1977) find that a system shifting from one stable phase to another experiences temporary "macroscopic indeterminacy". The new state may depend on one fluctuation that is itself of no significance.

Another aspect has to do with increasing technological complexity and is directly related to the discussion in c). A system which consists of many elements, and therefore many interactions, also has

many possibilities of failure. Proper design can reduce the possibilities of failure, but cannot eliminate them. The situation is particularly serious when the coupling or linkage between its subsystems is tight, so that subunits cannot be separated in an accident (Perrow, 1984).

In the event that the consequence of failure is catastrophic and unacceptable to the society, the traditional probability calculus is irrelevant. An event with a small likelihood, say, 10^{-5} , but resulting in 10^7 fatalities if it does occur, has a calculated expected value of 10^2 deaths. Such prediction is clearly meaningless. The evolving world has an increasing number of such complex systems with the potential of catastrophic failure - Three Mile Island, Bhopal, and Chernobyl are recent examples.

Impact assessment has proven to be more difficult than forecasting. The technology of the spinning wheel had an impact on mass communications; the technology of the chimney had an impact on social stratification (White, 1974). Today we ponder the impact of information technology. Will it mean more centralization or decentralization? Will it worsen the handicap of illiteracy or move us back to audiovisual learning?

f) Objectivity

The planner is assumed to be an objective observer and truth is observer-invariant. In the complex real world virtually everything interacts with everything, and this includes the planner. The individual is unique and makes a difference.

To be able to see the world globally, which you are going to have to be able to do, and to see it as a world of unique individuals ... that is really complexity.

(Churchman; 1977:90)

g) Time

Time is assumed to move linearly at a universally accepted pace, with no consideration of differential time perceptions, planning horizons, and discount rates. The experiments of Tversky and Kahneman (1974) demonstrate how human beings apply a psychological discount rate to their own past and thus distort the integration of their own experience, that is, their subjective probability. Recent events tend to be overstressed in comparison to more remote ones. Similarly, we look at the future as if through the wrong end of a telescope: distant crises or opportunities appear smaller than they actually are. Such discounting of the future drastically affects the choice between project alternatives.

The planner often exhibits a discounting tendency in focusing on the analysis and neglecting the subsequent implementation of his or her plan. It is a fatal flaw.

Having briefly described the inadequacies of the traditional perspective - which we shall label the technical (or T) perspective - we propose the use of multiple perspectives to overcome its limitations.

3. Multiple Perspectives

Graham Allison's probing study of the Cuban missile crisis (1971) provided the stimulus for the introduction and development of the multiple perspective concept. We use three types of perspective: the technical (or T) sketched in Section 2, the organizational/societal (or O), and the personal/individual (or P). Table 1 compares the main characteristics. Any complex system can be viewed from diverse perspectives. For example, an organization can be viewed from the T perspective, as Forrester (1961) did in analyzing the firm using his system dynamics, or from the O perspective, as Machiavelli did in his guidelines for rulers (more recently adapted to the modern corporation by Jay (1968)). Physical risk may be viewed from a T perspective (probabilistic risk analysis) or a P perspective (perceived risk). Each perspective yields insights not provided by the others.

There are usually several important O and P perspectives, representing affected and affecting organizational and individual actors. The decision maker has his own process of integration of the perspectives. Searching for a weighting formula would be as futile as asking an executive how he weighs the input he receives from his staff, his department heads, and his personal friends in reaching a major decision on a new line of business. Presentation of the different perspectives together with a prototype integration (analogous to the courtroom trial witness testimonies plus the summation by the prosecutor and defense attorney) is usually desirable. A most important task is the probing of the interplay of perspectives, some supporting, others conflicting in nature.

It should be noted that individuals who are excellent in pursuing the T perspective are not necessarily appropriate in developing O or P perspectives. The hard or soft science training that usually forms a solid base for T is by no means ideal for O or P. The modes of inquiry (Churchman; 1971) are quite different: the data and model based modes of T give way to the dialectic/adversary and negotiated-reality/consensual modes of O, and the intuitive, experiential, and learning modes of P. Input for O and P is obtained in personal, in-depth interviews, not drawn from written reports.

In planning activities the T perspective plays the dominant role in looking at alternative directions for the decision maker, but the O and P perspectives become crucial for effective implementation. The analyst's preoccupation with T readily explains his or her frequent disinterest in implementation of the plan. We also note that O and P must deal with people, either in groups or as individuals - an aspect often uncomfortable for the ivory-tower planner.

In their analysis of political forecasting, Ascher and Overholt sweep in both O and P perspectives. They make clear distinctions between the policy maker's "rational information needs" (that is, the meaning of information, the degree of certainty) and his or her political needs. They explain the political needs as follows: (1) to be a convincing advocate of preferred policies, (2) whenever possible, to choose policies which, if implemented, produce positive results, (3) when wrong, not to be desastrously so, (4) when wrong, to minimize the blame focused on the policy maker, and (5) to maintain his decision-making discretion (1983:45). They recognize that quantitative indices are deceptively hazardous, that the law of large numbers, aggregate statistical techniques, and linear relationships are inappropriate. The O perspective is their "central metaphor" and concern for the P perspective is reflected in statements such as the following:

long-range strategic thinking is qualitatively different from short-range tactical thinking - frequently to the extent of requiring different personalities ...

for the analyst the use of sophisticated methods brings several rewards: personal feelings of mastery, ... peer approval, (and) persuasiveness to the extent that the scientific aura of complex methods makes the results seem `scientific`

(Ascher and Overholt; 1983:40,52)

Thompson and Warburton (1985:17) analyze development planning in the Himalayas and conclude:

The classic development approach has been to sound the alarm and then, confident that the country's attention has been gained, to tell it what will have to be done if it is to avoid losing its resource base. It has not worked. It has not because it has ignored (as if it were some mere detail of implementation) the deep political, economic and cultural structure that is, in fact, what determines the country's attention and lack of attention. What is needed is a more sensitive approach; an approach that places the `mere details` - the institutions that constitute this deep structure - at the very centre of the stage and relegates to the wings the alarm bellringers and their immaculate prescriptions.

	TECHNICAL (T)	ORGANIZATIONAL (O)	PERSONAL (P)
World view Ethical basis	Science-technology Rationality	Social infrastructure Hierarchical (caste) ... Egalitarian (sect) Justice/fairness	Individuation—the self Morality
Goal	Problem solving Product (study, design, explanation)	Stability and continuity Process Action and implementation	Power, influence, prestige Status maintenance or improvement
Modes of inquiry	Abstraction and modeling Data and analysis	Dialectic/adversary Negotiated reality/consensual	Intuition, persona, individual reality Experience, learning
Time concept	Technological time	Social time	Personal time
Planning horizon	Far Often little breadth	Intermediate distance Intermediate breadth	Short distance Variable breadth
Discount rate	Minimal	Moderate	High (with rare exceptions)
Constraints	Problem simplification by limiting variables, relations Cause and effect Need for validation, replicability (or "audit trail") Objectivity emphasized	Fractionating/factoring problems Problem delegation to others or avoidance if possible Agenda ("problem of the moment") Bureaucracy often pervasive Political sensitivity and expediency Loyalties, credentials Restricted access by outsiders (caste) or recruits members (sect) Reasonableness, common advantage	Hierarchy of individual needs (security, acceptance, self- fulfillment) Challenge and response Each construes attributes of others Inner world (subjectivity)
Characteristics	Prediction Optimization (best solution) Feedback loops recognized Quantification Use of averages, probabilities Trade-offs Uncertainties noted: many caveats ("on one hand ...")	Recognition of partial unpredictability Long-range planning often ritualized Satisficing (first acceptable, rather than best, solution) Incremental change, slow adaptation Parochial priorities Standard operating procedures Compromise and bargaining Monitoring and correction Uncertainties avoided Fear of error	Need for certainty, beliefs Creativity and vision of the few Cope with few alternatives or variables only Filter out images inconsistent with past experience Game playing ("homo ludens") Focus on simplistic hypotheses rather than scanning many Leaders and followers, mystique Fear of change and unknown
Communication	Technical report, briefing	Directive, conference, interview Private language with insiders Hortatory language with public	Narrative (story), discussion, speech Importance of personality

Table 1: Multiple perspectives.

In their case, the traditional T perspective - the biophysical analysis - must yield the spotlight to the O perspective:

(O₁) micro-social

The framework of land tenure within the village and the patterns of local social relationships lead to a differentiation in strategies between the cautious cultivators (for whom land is wealth) and the adventurous traders (for whom individualized exchange is wealth).

(O₂) macro-social

The trans-boundary problems are the focus: what happens in one country is seen as having unfortunate downstream effects in another country. Mutually satisfactory national policies and their implementation are of prime concern.

It is the interaction or cross-cuing among T, O₁, and O₂ that is crucial to effective planning for development in this region.

4. Implications of the Use of Multiple Perspectives

In this final section we speculate on the kinds of insights which the perspectives are likely to bring to the surface in the area of development planning. They are based on several of the sources quoted in this paper.

T perspective:

- The dominant technology for the next twenty-five years is information technology. Rapid advances in data processing, storage, and communication will mean that "information is the coin of the realm".

- Information technology can provide the ability to a developing country to leapfrog in its advance. For example, learning through visual means (video cassettes, networks) can overcome lags in literacy and lack of trained teachers.
- Information technology can overcome the discounting problem (Linstone; 1984:350).

- The possibilities of unacceptable technology-based catastrophes are multiplying.

- Identification of complex, tightly coupled systems in which failure results in enormous consequences can make the elimination of such systems more likely (Perrow; 1984).

O perspective:

- Greater process orientation and institutional focus improves planning effectiveness (Linstone; 1984:331-352).
 - More attention is focused on matching technological with social change.
 - The bottom-up development process is matched with the top-down development project (Thompson and Warburton; 1985:29).
 - In industrial development the planner's attention is balanced more equitably between (a) technology and (b) management/manufacturing/marketing. In other words, the gap between planning and implementation is reduced.
 - Adaptability, flexibility, and crisis management are emphasized in the development process.

P perspective:

- There is more focus on the identification and nourishing of individuals with vital talents rather than merely improvement in education and training.
 - Leaders are needed: individuals with a vision, the ability to engage others in its pursuit, and personal staying power.
 - Entrepreneurs are needed: risk takers.
 - Managers are needed (in distinction to bureaucrats).

The multiple perspective concept has proven to be an effective means to bridge the gap between analysis and action, between the modeler and the real world. Its conscious application to development planning holds significant promise.

REFERENCES

- Allison, G. (1971). Essence of Decision: Explaining the Cuban Missile Crisis, Little, Brown and Company, Boston, Massachusetts.
- Ascher, W. (1978). Forecasting: An Appraisal for Policy-Makers and Planners, The Johns Hopkins University Press, Baltimore, Maryland.
- Ascher, W. and Overholt, W.H. (1983). Strategic Planning and Forecasting, John Wiley and Sons, New York.
- Berlinski, D. (1976). On Systems Analysis: An Essay Concerning the Limitations of Some Mathematical Methods in the Social, Political and Biological Sciences, The MIT Press, Cambridge, Massachusetts.
- Churchman, C.W. (1971). The Design of Inquiring Systems, Basic Books, New York.
- Churchman, C.W. (1977). "A Philosophy for Planning", in Futures Research: New Directions, H. A. Linstone and W. H. C. Simmonds, eds., Addison-Wesley Publishing Co., Reading, Massachusetts.
- Forrester, J.W. (1961). Industrial Dynamics, The MIT Press, Cambridge, Massachusetts.
- Forrester, J.W. (1971). World Dynamics, Wright-Allen Press, Cambridge, Massachusetts.
- Hoos, I.R. (1983). Systems Analysis in Public Policy: A Critique, revised ed., University of California Press, Berkeley, California.
- Jay, A. (1968). Management and Machiavelli, Holt, Rinehart, and Winston, New York.
- Linstone, H.A. (1984). Multiple Perspectives for Decision Making, North-Holland, New York.
- Perrow, C. (1984). Normal Accidents, Basic Books, New York.
- Prigogine, I., Allen, P.M., and Herman, R. (1977). "Long Term Trends and the Evolution of Complexity", in Goals in a Global Community, vol. 1, E. Laszlo and J. Bierman, eds., Pergamon Press, New York.
- Thompson, M. and Warburton, M. (1985). "Decision Making Under Contradictory Certainties: How to Save the Himalayas When You Can't Find Out What's Wrong With Them", Journal of Applied Systems Analysis, vol. 12, pp. 3-34.

Tversky A. and Kahneman, D. (1974). "Judgement Under Uncertainty:
Heuristics and Biases:", Science, vol. 185, pp. 1124-1131.

