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SYSTEMS ANALYSIS AS A TECHNIQUE FOR SOLVING SOCIAL PROBLEMS -- A REALISTIC OVERVIEW

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An era characterized by bigness--big budgets, big business, big government, big explosions--of population, information, and technology--provides an environment hospitable to the growth and development of the big, total approach. Such is systems analysis, with its components and companions, cost/effectiveness measures and program planning/budgeting. These methods, utilized and refined in military and space missions, have gained favor for the apparent tidiness with which they have achieved management marvels. For this and other reasons to be mentioned later, systems analysis has come to be accepted as a nostrum for all manner of social ailments, and the market for socio-economic systems is booming. At present receiving one dollar out of every five in the U. S. Budget, socio-economic programs, by 1975, will account for one or perhaps two out of every four dollars. With the federal investment in urban renewal for 1968-78 amounting to $250 billion, predictions that the market for urban civil systems will reach somewhere between $210 and $298 billion by 1980 may prove accurate.[1]

The prospect of so bountiful a market is enticing, and prospectors of remarkable diversity as to discipline, background, and competence are converging on it. There are aerospace and aviation firms, computer manufacturers and their multifarious subsidiaries, electronics companies, management consultants, appliance makers, directory publishers, and university-based entrepreneurs. Prominent among the contenders for contracts are the nonprofit but highly profitable "think tanks," with their inhouse experts and on tap consultants and their proliferating satellites with unpronounceable acronyms. They are all competing energetically to bring what journalists enthusiastically hail as "the powerful tools of technology" to bear on matters concerning the commonweal.

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[1] Finance Magazine, January 1968. Staff, V-P. Marketing, North American Aviation, The Economic Business Spectrum as Related to National Goals--Identification of New Business Opportunities, 1967.

The forensic, oft repeated, is familiar. Senator Gaylord Nelson summed it up in a nutshell: "... why can not the same specialist who can figure out a way to put a man in space figure out a way to keep him out of jail? Why can not the engineers who can move a rocket to Mars figure out a way to move people through our streets and across the country without the horrors of modern traffic and the concrete desert of our highway system? Why can not the scientists who can cleanse instruments to spend germ-free years in space devise a method to end the present pollution of air and water here on earth? Why can not highly trained manpower which can calculate a way to transmit pictures for millions of miles in space, also show us a way to transmit enough simple information to keep track of our criminals? The answer is we can--if we have the wit to apply our scientific know-how to the analysis and solution of social problems with the same creativity we have applied to space problems."[2]

This type of argument is persuasive on several counts: first, the prestigious origin and logical, scientific aura of systems analysis, and second, the growing recognition of the need for better planning, organization, and management of social affairs. A brief review of the genealogy and current conception of the systems approach will adequately illustrate the first point. Dr. Charles J. Hitch,[3] whose imprint on this methodology is so great that it is sometimes called "Hitchcraft," described systems analysis as a direct lineal descendant of World War II operational research. O.R. was used to solve tactical and strategic problems of a military nature; systems analysis uses the same principles but has wider range and scope. It encompasses (1)

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[2] Statement by Senator Gaylord P. Nelson, Congressional Record. Proceedings and Debates of the 89th Congress, First Session, October 18, 1965, No. 194.

[3] Charles J. Hitch, Royal Society Nuffield Lecture, London, October 25, 1966.

a more distant future environment, (2) more interdependent variables, (3) greater uncertainties, (4) less obvious objectives and rules of choice.[4] Impressive as to historical background, systems analysis, with its heavy reliance on models and mathematical computations and manipulations, has special appeal in an era characterized by a universal craving for certainty and orderliness.

This yearning underlies the present impatience with traditional approaches. Juxtaposing the duplication, confusion, and disarray of current public administration with the rationality and neatness of program management to be realized from application of the "revolutionary concepts," proponents of systems analysis make a strong case for their wares. And there is no gainsaying the fact that social problems beset us: urban blight deepens and spreads; pollution of air, water, and land proceed at an awesome pace; crime rates soar; arteries and facilities for air and ground travel are dangerously clogged. In one way or another, these problems ultimately become the business of government, already regarded by many as too big to be potent and too trapped in a bureaucratic maze to respond effectively.

In California, the now-famous four aerospace contracts for systems studies can be attributed substantially and generally but not exclusively and particularly to the above-mentioned reasons. Here, political and economic considerations played a crucial role, for the year was 1964, and Edmund G. Brown, in the middle of a battle for re-election, wanted to bolster the state's economy and his own image. Anticipating a cutback in defense and aerospace employment, he launched his experiment as a means for diversification of product and redeployment of talent, as well as for improving governance. Although he was unseated, the California experience has been apotheosized.

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[4] This comparison was made by Albert Wohlstetter in "Scientiests, Seers, and Strategy," Columbia University, Council for Atomic Age Studies, 1962, pp 36-7 (unpublished paper).

The strategy has won favor from county to Congress. For public officials wanting to improve their ways and ambitious problem-solvers wishing to augment their means, systems analysis has proved to be a promising vehicle on the high road to grants and contracts.

Can we assume from the vast expenditure of public funds and mobilization of motley systems experts that we will now witness a diminution of the inefficiency, ineptness, and uncertainty that plague planners of public programs?--The question is important; it is one about which the California and subsequent experiences have produced more caveats than conclusions. And, interesting to note, these caveats stem from many of the same factors that fostered the introduction of systems analysis into the social arena.

As you may recall, I mentioned four: historical antecedents, scientific attributes, and political and economic circumstances. Just as association with defense and space achievements endowed systems analysis with an enviable escutcheon, it also blunted the critical evaluation to which some other, less distinguished, methodology might have been subjected. To judge from recent discussion,[5] the DOD model may not be optimal for military, let alone other kinds of, decisions. The circumstances governing and criteria for judging effectiveness in defense and aerospace missions bear little resemblance to those prevailing in other orders of social accounting. Nevertheless, acceptance of the methodology spreads unchecked, and carried over into the civil sphere are the same assumptions, rules, and courses of action that appeared so logical and scientific in their earlier context.

First and foremost, there is the assumption that by virtue of a semantic impoverishment that allows us to use the word system for everything from atomic

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[5] James R. Schlesinger, Systems Analysis and the Political Process, RAND Paper P-3464, June, 1967, pp 14 ff. See also Hearings before the Committee on Foreign Relations, U. S. Senate, 90th Congress, Second Session, Part 2, May 28, 1968.

weapons delivery to anthropotomy, the same analytic tools can aid in understanding all of them and the same remedies can be applied to their malfunctioning. There is the related assumption that since large scale, complex systems have been "managed" by use of certain techniques, then social systems, which are often large and always complex, can be "managed" in like fashion. This presupposes similarity of structure, with social systems reducible to measurable, controllable components, all of whose relationships are fully recognized, appreciated, and amenable to manipulation. The very characteristics which distinguish social from other species of systems render them resistant to treatment that tries to force them into analytically tractable shape.

(1) They defy definition as to objective, philosophy, and scope. What kind of definition of a welfare system can be regarded as valid--that which encompasses the shortcomings of other systems, such as health, education, employment, or the one which focuses on individual inadequacy? A definition of welfare as an entity without explicit reference to and perturbation of other systems of society would be meaningless. Moreover, the definition depends on the point of view and the ideological posture. The system looks very different to the administrator, the recipient, the Black Power monger, the social critic, and the politician.

(2) "Solution" of social problems is never achieved. You do not "solve" the problems of health or transportation. Consequently, where you start and where you stop is purely arbitrary, and usually a reflection of the amount of money the government has to fund the particular analysis.

(3) Despite the semblance of precision, there are no right or wrong, true or false solutions. Consequently, it is presumptuous to label as wrong anything being done now and right that which looks good on paper. By

concentrating on miniscule portions or isolated variables simply because they are quantifiable, the technique may actually lead to results which are irrelevant and inappropriate. Social costs and social benefits can never be calculated by a computer, and even dollar cost/benefit comparison is a matter of interpretation. There are no ground rules for identifying the Peter being robbed and the Paul getting paid.

Corollary to the assumption that systems analysis can improve the state of the art of public program planning is the notion that the "systems expert" is a past master of advanced concepts on all fronts. He ascribes to himself a clairvoyance denied specialists in the subject area, for, with the greatest of ease, he hurdles 1984 and designs year 2000 plans. As though his own original discovery, he brands present practices as fragmentary and duplicatory. This situation he corrects by an unfurling of flip charts, a dubbing of labels in blank boxes, and an affixing of arrows on the flow diagrams. He deplores the lack of information and proposes a data bank to capture every last bit. After an exercise in present-day serendipity now known as "playing around with some models" and a series of optimistically-called "progress reports," time and money will have run out. The air may be no safer to breathe, urban ills no less crucial, but conclusions and recommendations, like campaign speeches, will ring with truisms and promises. (1) Present planning is wasteful and ineffective; (2) the prescribed course of action is more systems studies which will harness huge reservoirs of talent and put to use the "powerful tools of technology" and produce knowledge and understanding.

Anyone who has reviewed systems reports cannot fail to recognize the pervasiveness of the "Perils of Pauline" feature. It begins to appear that this phenomenon is intrinsic to the nature of the technique. One cannot but wonder why the fountain of knowledge and understanding waited until the experts

had vacated their high government posts and founded or joined think tanks before they started gushing. Accorded a carte blanche never permitted professionals grappling with the real-life problems, the experts approach problems without regard to jurisdictional boundaries and constraints and in a timespan that plays leapfrog into the next century with but scant regard for the intervening years. It should be noted that anyone can join the popular sport of knocking bureaucracy, and playing utopian games is easy. Systems experts justify their activities by the former and proceed blithely to the latter.

If this hard look has fallen on the technicians as much as the technique, it is necessarily so, for the two are inextricably intertwined. What the analyst conceives as the system is reflected in its definition, its objectives, its interfaces, its significant variables, its relevant data. The methodology of systems analysis supplies the form; the analyst, the content. The inputs which he selects become determinative. That he chooses to omit certain phenomena because of his own bias or because they resist quantitative treatment may be far more crucial to society than his model, but neither the technique nor the technician has use for them. Especially impatient with the incalculable aspects and implications are the systems experts whose background is in engineering and whose assumptions about talent transferability and competence in social matters are exceeded only by their presumptions. To judge by their performance, I suspect that many of them became "social engineers" because of expendability in their own line; I know that they made capital out of any exposure, however brief, to the social sciences. Like the Puritan who marched around the fort in a succession of different hats so as to fool the Indians, they appropriate titles to suit the contract in hand. A typical sample: "Specialist in Demography," "Manager of Socio-Economic Systems," "Director of Advanced Concepts," "Consultant in Educational Systems." The new look which

they were supposed to bring is not only unfettered by doctrinaire restraints, as hoped; it is also lacking in orientation and devoid of an appropriate frame of reference. Thus, ignorance passes for objectivity, and banal generalization for total system comprehension.

If anyone is surprised to learn that the emperor, for all his multi-million-dollar wardrobe, goes naked, this is due to the economic and political circumstances surrounding the growth and development of systems analysis in the public arena. You may recall the point I made earlier that these considerations fostered the process but at the same time created caveats. Let me now explain what I meant.

Systems business is booming; even the most conservative estimate can envision continued growth here and abroad. And no one with sufficient claim to systems expertness to preach or practice the technique would be so rash as to shoot down the goose that lays all the eggs, especially when they are golden! The community of problem-solvers seems more concerned with obtaining another contract than with improving the state of the art or of the nation. With no adequate review or evaluation of systems analyses performed, the objective is not to do better, but to do more. Government agencies sometimes try to ensure a worthwhile product by hiring another expert to serve as consultant or monitor, but this, from my observations, does not work. He is likely to be a member of the fraternity, and his loyalties lie with theirs. He shows great empathy with them; his "critique" harps on the difficulties of achieving the promises contained in the proposal. Underscoring the magnitude and complexity of the task, he recommends more generous allocation of funds for more systems studies. Conceding that the methodology may have shortcomings, he nonetheless urges us not to throw the baby out with the bath water, or, to return to the goose analogy, the egg with the eggshells! And this makes good sense economically,

for, with the growing trend toward government by contract, there is no telling what side of the table the expert may occupy. Undersecretary of a government agency yesterday, director of an institute seeking grants today, adviser to contracting agencies tomorrow, and always a salesman in disguise, he testifies at Congressional hearings and delivers keynote addresses at meetings of all kinds of professional groups. Inviting his presence at the latter is strictly like putting a fox in a henhouse , for he invariably predicts great problems ahead in the particular field and promulgates the notion that nothing short of the powerful tools of his technology will be able to handle them.

The phenomenon of the oversell is apparent throughout the process of systems analysis, from proposal to final report. Self-perpetuation is the name of the game; its rules are simple: One for the money; two for the show. The winner gets the most follow-on contracts.

And it is the political environment that keeps the game going. Systems analysis is gaining popularity from county to Congress and represents a kind of bandwagon on which many public officials ride for many reasons. Just as in some social circles, one's psychoanalysis is a status symbol, so now is systems analysis in government circles. It is well known that many federal agencies invite proposals for systems analysis at the very time when tight money is causing cutbacks in all other activity. If the California experience proved nothing else, it showed that, regardless of their intrinsic worth, systems studies are a handy political tool. They can justify an ideological position by strategic inclusion or exclusion of pertinent data; they provide simplistic solutions to complex problems. Better than a blue-ribbon committee or a special commission,[6] they convey the impression of high level concern for a politically-sensitive matter. The results are often their own best protection against critical public scrutiny, for they take the form of

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[6] Elizabeth B. Drew, "On Going Oneself a Hotfoot: Government by Commission," The Atlantic Monthly, Vol. 221, No. 4, May, 1968, pp 45-50.

platitudes expressed in "dynamic programming models," designed to impress but not illuminate, commonplaces couched in jargon, and reams of undigested computer printouts, provided as evidence of work busily but not necessarily done. Protection serves the interests of both the contractor and the government agency, for systems analysis involves a sizeable expenditure. No public official is so possessed of the death wish as to admit that the venture was anything less than successful. To insure this, the completed study is assigned to a handpicked task force that can be trusted to bury it decently. In most instances, copies of the final report are not available for scrutiny. In every case, the political environment provides a protective shroud; the undertaking and all parties to it must look good.

Not surprisingly, the mixture of salesmanship and politics which dominates the applications of systems analysis makes one wonder about the extent to which this is an intrinsic part of the technique. Perhaps it is not chance but design that produces "progress reports" too late to be enlightening. This, too, may be part of the technique. But, if so, then, in the final analysis, we may discover that the logic sounds better than it is and that the methodology works better on paper than in practice. The pervasive zeal for self-perpetuation practically guarantees stagnation in the state of the art. With little benefit or feedback from earlier experience, the same level of sophistication remains, with the same shortcomings, the same deficiencies, the same old excuses. Methodological and conceptual mutations are needed in order to create a tool useful in social planning, but these cannot take place unless there are channels of inquiry and assessment free from public relations embellishments.

There is an important role in the process of social accounting and planning to be played by professional persons, whether in the employ of government, industry, universities, or elsewhere. In every systems study, the close and

constant involvement of individuals expert in the relevant disciplines is absolutely essential. Since human and social values are at stake and must be safeguarded as old problem areas are subjected to new modes of treatment, there must be built into the process the active participation of competent behavioral scientists. To be sure, this requirement will probably offend that group's conception of itself and its role for, in their preoccupation with methodological chastity, its members have roosted on a high level of abstraction and concerned themselves with theory construction. Despite all the hazards involved, there is an urgent need for the responsible conduct, handling, and reporting of live research so that models of social systems will be adequate representations of the reality situation and not sketchy distortions produced by inappropriate experts.

Every major problem facing urban society today is multifaceted in nature. Understanding calls for knowledge on many fronts. Economic, political, and social rationality must all contribute to developing a viable model. Highly desirable, indeed, would be a creative synthesis achieved through a genuine multidisciplined approach. It is interesting to speculate the extent to which systems analysis will be the means to and end of such a synthesis.