Too often decisions are made in a manner that excludes the public. Could it be that democracy and technology are incompatible?

RICHARD SCLOVE

Decision-making in a democracy

A central dilemma of our time arises from the need to reconcile democratic processes and values with the complexity introduced into human societies by modern technology. How can we keep technocratic elites from subverting the traditional political functions of ordinary citizens and their representatives? One answer is so simple—or so threatening—that it is hardly ever mentioned: Throw the experts out. That, in a polite and restricted sense, is what I propose.

The word “assessment” captures and evokes nicely the manner in which our society imagines that it does and should practice technological politics. An “assessment model” of technological politics—described below—accords privileged political status to experts, while ordinary citizens play little or no active political role. Against this I pose an “interpretation model.” My claim is that an interpretation model better describes and explains existing technological politics and, if we genuinely value democracy, points the route toward political progress.

My intent is to clear away some common confusion about the nature of socio-technological controversies and, in the process, reveal that a more democratic form of technological politics than presently exists is possible. Unfortunately, I must also suggest several reasons why this form of politics is unlikely to materialize. The argument is in three parts:

- a brief account of what is meant by democratic values and a democratic society;
- a description of the assessment model of technological politics and its shortcomings; and
- a sketch of an interpretation model, exploring its strengths as well as some of the obstacles to its acceptance.

A necessary, but not necessarily sufficient, condition for a democratic society is that its political institutions and processes foster among citizens a respect for self and others as free and equal members of a common polity. To ensure its survival through time, a democratic society must also engender respect for its basic institutions and a concern for the maintenance of life-sustaining ecological and technological background conditions.¹

Consider the assessment model of technological politics. The term “assessment” is chosen in recognition of the prestige currently accorded techniques of rational analysis such as technology assessment and risk assessment. But it is intended also to encompass cost-benefit analysis and other species of systematic policy analysis—along with the shared epistemological premises and broader political processes that these techniques each entail and presuppose. The assessment model assumes that technological politics does, or at least should, work something as in Fig. 1.

This model has serious explanatory and normative weaknesses, of which I shall give two examples.

- An assessment model is constantly embarrassed by the observed fact that in socio-technological disputes the experts—generally presumed to be natural scientists, engineers, economists or systems analysts—are never all on the same side. The model assumes that it is possible to give an objective account of the characteristics of a socio-technological problem, determine possible solutions, and perhaps issue policy recommendations.

Yet experts have always contested each other’s claims.¹ In terms of an assessment model of technological politics, this phenomenon can be explained only by concluding that at least one of the assessors is incompetent or dishonest. Given the pervasiveness of disagreements, that leaves our world presumptively inhabited by a distressingly (if not implausibly) large number of crooked or inept “experts.”

- A crucial normative defect of an assessment model is that it leaves most people out. Decisions concerning the future of our society—decisions that can be recognized as critical by the very fact that experts are so eager to participate in them—are made in a fashion that acknowledges no need for, and effectively discourages, participation by the vast majority of citizens. Because it shows no respect for ordinary citizens and demands of them no informed or responsible action, the process tends to produce a disrespectful, uninformed and nonresponsible citizenry. This feature of the assessment model challenges core democratic values and indeed the very possibility of a democratic society.

The assessment model takes as given the existence of a well-defined technological system or problem of which an assessment is to be made. But what is a technological system? There is no definitive answer, but I suggest that two general properties of such systems are that they are both unbounded and polyvalent in mean-
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functions of any given technology is a difficult and often controversial task. “Polyvalent in meaning” (as opposed to function) signifies that technologies unavoidably acquire and bear a host of private and social meanings. Cultural anthropology teaches that apart from their diverse instrumental functions, technologies—and styles of technological design and performance—constitute elaborate systems of non-verbal communication.4 As such, they play an integral role in the maintenance and production of culture. The most obvious example in our own society is the automobile. No one believes that cars are merely a means of private transportation. We understand that they are variously symbols of mastery, control, sexual drive, social status and personal autonomy. Not without reason has the automobile often been used as the governing metaphor for twentieth century American culture.

In socio-technical controversies it is a common tactic to denigrate one’s opponents by asserting that their motives are symbolic—that, for example, they oppose nuclear power because it is a symbol of unbridled technological expansionism; or they support an otherwise worthless Clinch River Breeder Reactor as a symbol of the United States’ ongoing commitment to an eventual breeder reactor economy.5 The lesson from anthropology is that such debaters’ tactics are misguided, not in attributing symbolic motives to opponents but in denying their own symbolic motives, in failing to appreciate the universality of the phenomenon of technological symbolism, and in facilely denigrating the constitutive role of technology within the larger cultural project of creating a world of private and shared meanings.

The relationships among a technology’s many social functions and meanings are complex and demand serious study and discussion—in a word, interpretation. Meaning can engender function as well as the reverse, and any tendency—as is the wont of practitioners of assessment—to reduce the meanings of technologies to their instrumental functions should be understood to risk the radical impoverishment of culture itself.6

Having suggested how technological systems are polyvalent, I now explore ways in which they are unbounded. The assessment model assumes that the boundaries of any given technological system are well-defined, self-evident and unproblematic. There are at least four important respects in which that view is misleading:

* A technological system includes all those persons and institutions that make possible its construction and use, and who can, within certain constraints, modify and influence its functions and meanings.

* Technological systems are part of, and in a sense comprise, the entire

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**Figure 1**

**An Assessment Model of Technological Politics**

- Technological system or problem
- Experts
- Objective analysis and policy recommendations

- Media
- Formal hearing
- Public acceptance
- Government decision and implementation

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cultural and environmental context within which they are located. In this regard, it is useful to view a technological artifact as a black box that conceals a predetermined set of propensities for restructuring events in the outside world. The artifact may intrinsically entail or preclude a certain range of effects, but its specific properties emerge and become evident only within a given cultural and environmental setting.

- A technological system is temporarily unbounded. Technological systems do not mysteriously “appear.” Each is the product of a prior social process. The extent to which its history forms part of the system—and must be known in order to understand it—is always an open question.

- Perhaps most importantly, a technological system includes its assessors. By the process of assessment we may, for example, influence the behavior of system components, that is, of people, things, or their environment; induce design modifications; or alter social understanding and symbolic meanings of the system and thus, perhaps indirectly, its social functions as well. Reflective awareness of one’s own role within the system is thus essential to the process of understanding it. From this perspective, it appears that the assessment model’s first mistake is to assume uncritically that technological systems exist as finite, well-defined “objects” that are available for assessment.

A second mistake is to suppose that, even if such an object existed, fixed techniques of rational analysis could, in principle, objectively characterize their pertinent social attributes. The assessment model presumes that practitioners’ various analytical tools are each complete, fully specified and value-neutral. Accordingly, the predominant mode of socio-technological controversy takes evaluative criteria for granted. Expert combatants invest their energy in preparing elaborate arguments and rebuttals concerning judgments formed on the basis of criteria that are themselves hardly ever the subject of serious discussion. But there is no social consensus concerning legitimate evaluative criteria—nor is there consensus on a process by which such criteria could conceivably be chosen.

Despite grandiose claims for the universal applicability of a cost-benefit framework, there are no well-specified criteria by which to determine what shall count as a cost and what as a benefit. Let us look again at the example of the nuclear reactor. A routine result of proposing the construction of a reactor is the spontaneous generation of grass-roots political activism. Should that activism be considered a wasteful and obstructive social cost or a participatory democratic social good? Or is activism simply not a legitimate candidate for inclusion in cost-benefit analysis? If we assume that activism is a good, how should it be weighed against competing goods? How can we possibly decide these questions? And who are the appropriate “we”? As it now stands, “we” are none other than the individual assessor, choosing by a process generally closed to public discourse.

Evaluative criteria represent values, prescribe social objectives, and legitimate issues within a controversy. Latent disagreements among experts concerning the legitimacy of competing sets of evaluative criteria constitute an all-important “hidden debate” that underlies and energizes the public number-slinging and name-calling that meanwhile masquerade as the essence of socio-technological controversy. In modern industrial societies, socio-technological disputes have thus become forums for the tacit negotiation of social norms, objectives, precedents, taboos, meanings and power relationships—matters so vital to the interests of all citizens that they ought, in a democracy, to be decided democratically.

It appears that the process represented in the assessment model of technological politics is entirely mythical. Analytic techniques that in principle can be neither well-specified nor value-neutral are used to assess “objects” that are unbounded and polyvalent. The “assessment” activity of experts can thus be characterized more accurately as a form of interpretation. Hence the grounds for introducing an interpretation model of technological politics. But what is interpretation? And can the interpretive process be made more enlightening and democratic?

Consider the words “assessment” and “interpretation.” Assessment connotes a relationship between an impartial observer and a fixed object. Thus the idea of two valid but different assessments of the same object is a contradiction in terms—one that invites polarization and adversarial confrontation. A dictionary definition perhaps reveals its underlying political philosophy: “Assess: to make an official valuation of property for the purposes of taxation.” Assessment thus suggests power, authority and an interest in appropriation and possession.

In contrast, interpretation connotes an act of communication. Interpretations are creative and often invite a creative response from their audience. They are open-ended, and we expect them to change with time. Two interpretations can diverge radically without necessarily challenging anyone’s professional honor. Again, dictionary definitions are revealing: “Interpret: to explain or tell the meaning of; to present in understandable terms; [or, finally,] to bring to realization by performance.” If we regard technologies as polyvalent and unbounded, the latter definition—“to bring to realization by performance”—is especially apt, for a technological system is never for
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us a fixed object. Rather, the act of interpretation is an essential part of the social process through which the meanings and functions of a technological system are realized.

What might be some of the political consequences of openly adopting an interpretation model of technological politics? First, at least as much critical attention and public discussion would have to be devoted to alternative interpretive styles, methods and norms as is presently given to experts’ contradictory conclusions and judgments. Thus, while necessarily broadening the normal scope of discussion, such a model would not license irrational or dogmatic procedures. Second, the rationale for according certain types of experts their current privileged political positions would be undermined. Natural scientists, engineers and economists have developed creative and interesting ways of looking at the world, but considered as forms of interpretation these ways appear in no sense to be essentially superior to a number of other perspectives. We might, for instance, become equally interested in hearing from informed historians, anthropologists, psychoanalysts, philosophers, mythologists, art and literary critics, novelists, poets, musicians, dancers, actors and craftsmen.

But why stop there? Since democracy is as concerned with process as it is with outcome there are no “right” political judgments or policies unless they are the result of the right kind of political process—in other words, a process consistent with democratic norms. An assessment model of technological politics challenges even the possibility of such a polity. In contrast, an interpretation model reveals that while democracy is not inevitable, it is at least possible.

Types of institutions legitimated by an assessment model include expert committees, formal regulatory hearings, staged public debates among experts and the proposed “science court.” Experts present “the facts,” while the meaning of those facts, whether they are pertinent, and why one question rather than another has been addressed are matters almost never considered in public.

Examples of democratic interpretive institutions are, on the other hand, rare. An ideal process would presumably engage public interest, be open to public scrutiny, encourage informed public participation and tend to enlarge the proportion of persons competent to participate—all while non-coercively generating consensual interpretations based on shared norms, mutual respect and reasoned discourse. Obviously, embodying all of these features in a single institution may not be feasible.

One promising idea involves using mediation techniques to resolve socio-technological disputes in a less adversarial manner. As so far envisioned, however, mediation proceedings would be relatively closed, do little to advance widespread public understanding, and afford participation primarily to self-selected actors powerful enough to assert a claim to be represented.

Without an obvious supporting example, the idea of a democratic interpretive institution for the resolution of socio-technological controversy remains abstract and unconvincing. Let me therefore sketch one possible example, “mediated public interpretation with random representation.” This approach would use the medium of television, the concepts of participatory democracy and self-education and the technique of mediation to create a new forum for the collective interpretation of socio-technological disputes. Groups of, say, 20 persons would be selected at random from the registry of the U.S. Census and paid to participate. Each group would be assigned to a particular socio-technological issue of national importance. A group’s task would be to try to generate a consensual definition and interpretation of its assigned issue and, if the members wished, to propose policy recommendations. Disagreements within the group would be clarified and, if possible, resolved with the help of trained conflict mediators whose primary commitment would be to ensure the integrity of a non-coercive cooperative process.

In developing its interpretation, each group would be encouraged to design a program of self-education. Interested parties and all manner of experts could, if the group desired, be invited to assist in the process. Periodically—perhaps once a month—each group would host and help produce a national television show summarizing its activities during the previous month, its current understanding of the issues, and any remaining internal disagreements. The last half-hour of the show could be devoted to viewer call-in of questions and opinions. Viewers could also be encouraged to send the group their written opinions.

By choosing group members at ran-
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5. See, for example, the essay by Margaret Mead’s in “A Farmer’s Dream,” April 1980, a advertisement available as a reprint from Smith Kline Corp., Philadelphia, Pennsylvania.


John H. Gibbons comments

Richard E. Selove has raised the legitimate and vexing issue of how we can practice more thoughtfully the art of governance in an increasingly complex world. His concerns echo those of a variety of technology watchers, including Habermas, Mumford, Eltulf, Winner, and the many others found in his references: How can those affected by technology exercise an appropriate voice in designing the political and economic environment that governs the development and use of technology?

The dramatic success of technology during World War II and the rapid diffusion of technological advances during the next two decades were heady days. There was a widespread notion that technology could be a ubiquitous source of benefits that would enable us to meet growing needs and solve social ills. Rachel Carson and others largely sobered us again, and we finally began to understand that virtually every powerful new idea—whether it be the printing press, nuclear fission, microprocessors, or recombinant DNA—carries simultaneously the promises of heaven and the perils of hell.

Naturally that realization, underscored by some clear experiences of the rising social and economic cost of mistakes, has led to a variety of activities designed on the one hand to assure that resources are used more thoughtfully, and on the other to think more carefully and systematically about the implications of technological change. The major challenges in designing and carrying out those activities include not only the acquisition of data and the development of methods of analysis but also the structuring of a process that reflects the nature of our democratic society. A more complete democratization of the process of technology policy analysis is easier said than done. It is only one small part of the immense challenge of the democratization of the policy debate and decision process. Of course, the primary locus of debate and decision is—and should be—in the hands of elected representatives of the people.

Many attempts have been—and are

being—made to deal more purposefully with technological change and human values. These have appeared, appropriately, in their most ambitious and comprehensive form in academia. At a different extreme, industry has made parallel efforts in the form of venture analysis and other internal appraisals of technological advance. Government’s attempts have appeared in a variety of forms, including the National Environmental Policy Act, the establishment of the Office of Technology Assessment (OTA) (legislative branch) and the Office of Science and Technology Policy (executive branch).

It strikes me that it is probably a mistake to try to use a single term to describe the distinctly different ways that socio-technical issues are addressed. Perhaps the broadest, most comprehensive studies that are properly found in academia should be identified as technology criticism; those in government, where analysis must be tailored to fit the legislative process might be labeled technology assessment; and the more focused work in industry could be identified as technology evaluation. Ultimately, each will learn and benefit from the other. OTA now keeps a more complete file of its projects from their inception to final utilization and invites the use of these materials by those intent on making the process work better.

Of all federal efforts in technology assessment, OTA represents the most widespread and ambitious effort. As a Congressional agency, OTA must shape its work to be useful to the legislative process, especially to Congressional committees. They, in turn, deal with authorization, appropriation and oversight. In addition, committee jurisdictions are such that OTA must format its analyses and output in a way that enables the committees to utilize the material.

I want to emphasize some features about OTA’s procedures and methods.

- OTA is not a “collection of technological elite” as might be inferred from Selove. About one-third of our professional staff is trained in natural science and engineering but in social science, political science, law and other areas.

- OTA purposefully identifies all the major parties at interest with each assessment and convenes an advisory panel to bring those diverse interests together periodically throughout the project to assure quality, completeness and fairness. By “parties at interest” I mean technical experts, consumers, producers and a variety of potentially affected groups. OTA’s advisory panels have included physicists, but also science fiction writers; wetlands biologists but also developers; nuclear opponents but also nuclear proponents. Our advisory panels, contractors and reviewers totalled more than 2,000 different people who, during 1981, made substantive inputs to OTA’s work. Selove laments that the process of assessments “leaves most people out.” Inescapably, the number of active participants in an analysis must be limited, but that is a common denominator in a decision-making democratic society—people choose their representatives and make them accountable. As servant to the Congress, OTA’s job is not to resolve policy but to prepare a well-reasoned set of options that fairly represent the full range of opinions about the issue. If one constituted the study group with a “randomly-chosen group of people,” the outcome would inevitably be distorted (assuming, perforce, that the group is small).

- OTA does make findings but does not recommend a specific policy; instead, a range of options is identified, characterized, and discussed.

- OTA is quite at home with the reality that there are many situations in socio-technical problem analysis where experts do disagree. Contrary to Selove’s supposition, OTA does not attempt to explain such disagreement by assuming incompetency or dishonesty; rather we recognize that in many, if not most, issues there is a lack of absoluteness. OTA’s focus is to identify critical areas in an issue where important differences of opinion do exist, and then to characterize further the extent of the differences and (if it exists) the weighted judgment of experts.

- Broader public participation in the process of carrying out an assessment as proposed by Selove is laudable but limited by the practicalities of budget and time. In the case of OTA, its meetings are “open”; with public participation in its advisory panels and research methods, OTA would be pleased, for example, if television or radio chose to cover our work. We are delighted when commercial publishers reprint our reports, and also when academic researchers utilize OTA’s records to do retrospective studies of completed assessments.

Ultimately the direct participation of the public in the affairs, decisions and elections of Congress—a long established practice—is where the center of assessment and interpretation activity is and should be.