# Chapter 1

# INTRODUCTION

*Our faulty representations of some immense communicational and computer network are themselves but a distorted figuration of something even deeper, namely the whole world system of present-day multinational capitalism.*

—*Frederick Jameson,* Postmodernism

The post-World War II period has witnessed a fundamental restructuring of work organizations and labor markets around the world. Empirical social science has described and documented these trends and has begun to understand some of the causal factors implicated in the changes: the internationalization of the division of labor, implementation of computerized technology and advanced information systems, intensified worldwide competition among firms and a corresponding emphasis on innovation, expanded need (and capacity) to manage complex economic systems and perfect long-range planning. However, a comprehensive reconceptualization of the ways in which technological, organizational, and ideological changes are intertwined with one another and with the broader socioeconomic context has remained elusive.

This book attempts such a reconceptualization, deriving a new theory of work organization and organizational control from the ample empirical documentation of the past few decades. Organizational control structures include structural characteristics and corresponding ideologies that work together to insure managerial control of the labor

process, subordination of the work force, and legitimation of this subordination.[1] In recent years, a new type of organizational control structure has become apparent in production workplaces, corporations, and professional organizations, which I propose to call *technocracy*.[2]

Different forms of organizational control have evolved through a dialectical process of rationalization: precapitalist craft/guild control, simple control, structural forms of control (technical control, bureaucracy, professionalism), and technocratic control. Technocracy is a synthetic type of organizational control, one that integrates certain aspects of the previous forms of structural control: technical control, bureaucracy, and professionalism. Although technocratic control currently coexists with earlier forms of organizational control, it has become sufficiently prevalent to allow comprehensive analysis.

Technocratic organization is currently most apparent in workplaces centered around computerized technology: highly automated production workplaces, "high-tech" research and development corporations, and service corporations that are heavily reliant on computerized systems, such as telecommunications and finance. As certain factories, bureaucracies, and professional organizations are restructured around advanced technology and technical experts, similar changes in structure have become apparent. The central features of technocratic organization include a polarization into expert and nonexpert sectors,[3] a flattening of bureaucratic hierarchies, an erosion of internal job ladders and increased emphasis on credentialing and credential barriers, increased salience of technical expertise as the primary source of legitimate authority, and flexible configurations of centralization/decentralization. (See chapter 6 for a fuller discussion of these features of technocratic organizations.)

## Prior Definitions of Technocracy

My usage of the term *technocracy* is a departure from previous definitions. The most general definition of technocracy has been "rule by experts," and given the increased salience and centrality of experts within work organizations, this usage is not inconsistent with my own, although technocracies have other important structural characteristics, and the rule of the experts is by no means absolute or unproblematic, as we shall see.

Some have used the term *technocracy* to imply not only the power

of experts, but also the desirability and/or inevitability of such rule. Such defenses of expert rule go back at least to Saint-Simon and became the basis for a political movement in the 1920s and 1930s (see chapter 2). The general line of argument here is that, given the increasingly scientific nature of advanced industrial society, only those with technical expertise are qualified to govern and manage, and such rule would enhance meritocracy and industrial productivity.[4] This usage of *technocracy* is diametrically opposed to my own, as I believe both that the evidence challenges the view that technocracy implies meritocracy, and that the polarization into expert and nonexpert sectors within work organizations raises more problems than it solves.

*Technocracy* has also been used to imply technological determinism, in that advanced industrial technology is viewed as a powerful independent variable, shaping society in such a way that technical experts must be in positions of power.[5] I am not a technological determinist, although I do emphasize technological change as *one* important causal variable.[6] I see technology as embedded in a nexus of other variables: political, economic, and social variables that shape the development of technology and how a given technology is designed and implemented, even as the form of technological systems reciprocally affects these variables. My approach is therefore more dialectical, emphasizing embeddedness and reciprocal causation. However, I do see technological change as one dynamic and important dimension of organizational change, and one with real effects. The design and implementation of technology are shaped by many social variables, but once designed and implemented, the technology becomes an important causal variable, and one with lasting effects; technology is therefore *flexible* but not *neutral*.

The final connotation of technocracy that must be discussed is the idea that technocracy implies that technical considerations have displaced political ones, effectively rendering politics obsolete. This, in fact, is the central thrust of technocratic ideology: the idea that there is "one best way" to accomplish any task, that this way can be found and implemented only by technical experts, and that political concerns are therefore no longer operative. Conversely, I argue that technical considerations interact with political ones in diverse ways, and that politics, although different in technocratic systems, is by no means obsolete.

Given the fact that *technocracy* is such a value-laden term, the question arises: Why use it at all? I use it first of all to suggest that we have experienced a fundamental break with bureaucratic organization, that we need a new theoretical paradigm in order to understand contempo-

rary work organizations. Second, the various connotations and previous definitions, while often ideological in their most extreme versions, are not without a grain of truth: Technocracy does involve a new centrality of experts, the increased importance of technology as a causal variable, and a complex interweaving of technical and political concerns. Only through a more thorough and sustained analysis of contemporary changes in work organizations can we go beyond the partial (and hence ideological) definitions of the past and achieve a more comprehensive understanding.

## The Dialectical Rationalization of Organizational Control

Because technocratic organization and ideology are synthetic forms, adequate understanding of them is dependent on historical analysis of the evolution of organizational control. Organizational control structures have evolved through a dialectical process of rationalization. A rough chronological sequence can be traced, although uneven development and the coexistence of different forms of control is the norm. The different control structures, from precapitalist craft/guild control, to simple control, to structural forms of control (technical control, bureaucracy, professionalism), and finally to technocratic control, have superseded one another as the contradictions within and between control structures have become manifest, leading to crises that were addressed with alternative forms of control.

Organizational ideology plays a central role in this pattern of dialectical rationalization as well. Michael Urban defines organizational ideology in the following way:

> The question of a struggle over power and position within human organizations raises with it the issue of ideology . . . understood here as a more or less coherent set of ideas generated by conditions of conflict or contradiction obtaining in society. Such ideas reflect this conflict, but in a refracted manner, so as to render it resolvable at the level of symbols. Consequently, ideologies simultaneously reveal and conceal something about the conditions in which they are born, and by concealing, they tend to perpetuate these conditions.[7]

Ideologies are inherently related to the types of conflict and contradiction emerging from different types of societal and organizational

inequality, and they have changed in accordance with the development of different forms of organizational control. Technocratic control is only the most recent stage of rationalization and continues to embody contradictions that point toward further change. Table 1 provides a summary of the discussion of the evolution of organizational control structures that follows.[8]

*Precapitalist Control and Ideology*

Precapitalist workplace control centered around family-based production and craft/guild control, both of which were buttressed by ideologies of traditionalism and religion. Theocratic ideology promoted powerful ideologies of the necessity of occupational inequality, submission to "the authorities, particularly the Highest authority,"[9] patriarchal domination, and hard work in one's "calling," however lowly.[10] Traditional ideology held that "the rich should be *in loco parentis* to the poor, guiding and restraining them like children,"[11] that paternalism should include noblesse oblige and responsibility for the poor, that work should be performed in accordance with norms of craftsmanship, and that poverty was useful in that it encouraged industriousness.

The stringency of traditional ideology made possible considerable organizational flexibility within families and guilds: The hierarchical relationship among masters, journeymen, and apprentices, like the division of labor within the family, was relatively collegial and fluid.[12] Skilled craftsmen were exclusionary and elitist toward unskilled workers outside the trade, but the actual craft labor process, although personalized and variable, tended to be collegial. Within the family, production was organized according to a clear division of labor according to sex, but these sex-role boundaries were seen as practical rather than psychological in nature and were routinely crossed when necessary.[13] The ideological framework, however, was quite stringent and specific about one's place in the hierarchy and the moral imperative to work diligently, making role transgressions less threatening to the status quo.

*Simple Control and Ideology*

With the emergence of capitalism, precapitalist organization of work was perceived as insufficiently stringent in terms of control of both the work process and the product.[14] Transitional forms of work organization served to ease the abrupt shift from home-based production to factory

TABLE 1
Organizational Control Structures

| *Control structure* | *Period (approx.)* | *Characteristics* | *Contradictions* |
|---|---|---|---|
| Craft/guild, family production | Precapitalist (pre-18th C.) | -Apprenticeships<br>-Decentralization<br>-Fluid, collegial<br>-Theocratic ideology of gender, class inequality | -Labor process and product insufficiently controlled |
| Simple control | 18th C. to present | -Direct supervision<br>-Coercive authority<br>-Time discipline | -Transparent coercion<br>-Worker resistance<br>-Impractical in large enterprises |
| Technical control | 19th C. to present | -Control embedded in machine system<br>-Machine sets pace<br>-Worker isolation<br>-Deskilling | -Visible pacing, control<br>-Worker resistance<br>-Inflexibility of production systems |
| Bureaucratic control | 19th C. to present | -Differentiation of structure<br>-Specialized job tasks<br>-Promotion from within based on objective criteria | -Professional/bureaucratic conflicts<br>-Favoritism vs. alleged objectivity<br>-Inefficiency and inflexibility with atypical cases |
| Professional control | 19th C. to present | -Status groups<br>-Self-regulation<br>-Ethical codes<br>-Formalization of training<br>-Esoteric skills | -Professional/bureaucratic conflicts<br>-Vested interests vs. ethics, self-regulation |
| Technocratic control | 1960s to present | -Polarization into expert and nonexpert<br>-Erosion of internal job ladders<br>-Technical expertise as basis of authority<br>-Credential barriers<br>-Team organization, mostly in expert sector<br>-Skill restructuring<br>-Centralization/ decentralization<br>-Ideology of technical imperatives and system maintenance | -Productive potential of advanced technology thwarted<br>-Increased reliance on nonexpert workers<br>-Alleged neutrality vs. race and sex segregation |

life: the putting-out system and the system of internal subcontracting.[15] Workers had to shift from working in accordance with natural rhythms, an emphasis on completion of tasks, and alternating periods of industry and idleness to time discipline and regularized work schedules—a major shift in work habits and work culture.[16]

The factory system ultimately relied on simple, direct control and its corresponding ideology of capitalist ownership as conferring control prerogatives. Both entrepreneurial control of entire enterprises and the control exercised by foremen were legitimated by this ideology of property rights:

> Hierarchical control was based on the concept that each boss—whether a foreman, supervisor, or manager—would re-create in his shop the situation of the capitalist under entrepreneurial control. . . . "the foreman's empire." Each boss would have full rights to fire and hire, intervene in production, direct workers as to what to do and what not to do, evaluate and promote or demote, discipline workers, arrange rewards, and so on; in short, each boss would be able to act in the same arbitrary, idiosyncratic, unencumbered way that entrepreneurs had acted.[17]

Simple control would therefore not have been possible without the corresponding legitimating ideology of entrepreneurial prerogative.

Storey discusses this early entrepreneurial ideology as comprised of several aspects.[18] First, ownership rights and responsibility. Second, the belief that "there are persons naturally identifiable as 'leaders,' and others who perform best when led,"[19] an outgrowth of social Darwinist ideas of the survival of the fittest. Given the Darwinian struggle for capital, capitalists were thought to have proven themselves to be superior individuals by accumulating capital. Third, the idea that because of this natural superiority and ability to lead, capitalists can best serve the *general* interest by exercising workplace control and making their enterprises profitable.[20]

As the size of capitalist enterprises grew and the hierarchical distance between owner and supervisor increased, simple control became less effective, because the overt coercion of foremen and direct supervisors was transparent and poorly legitimated by entrepreneurial ideology. By the midnineteenth century, then, industrialization and the consolidation of capital created both structural and ideological changes and a "crisis of control."[21] Three separate types of control emerged as alternatives and adjuncts to simple control: technical control (in blue-collar production workplaces), bureaucratic control (in white-collar,

corporate settings), and professional control (in nonroutinized, skilled work settings). All three of these organizational innovations represent more *structural* types of control, as compared with the personalized supervision characteristic of simple (and precapitalist) control: "Rather than being exercised openly by the foreman or supervisor, *power was made invisible in the structure of work.*"[22]

*Technical Control and Ideology*

Technical control is embedded in the design of machines and mechanical systems, so that they set the pace and form of work. In contrast to the overt coercion characteristic of simple control, workers are constrained by the design of the machine technology to work at a certain pace and in specific ways. Although the technology is designed and implemented by industrial engineers with political as well as technical motives in mind, control motives are less apparent to workers because they are not involved in the design process, and the technology thus tends to appear to them as a fait accompli.

The clearest manifestation of technical control is continuous-flow production, for instance, as used by the early textile industry and (most famously) the automobile assembly line. Early forms of mechanization typically relied more on simple control than on technical control, but as worker challenges to simple control became more frequent and the technology more sophisticated, mechanized assembly lines became increasingly common by the late nineteenth and early twentieth centuries. Driven by the desire to increase efficiency in order to meet consumer demand, Ford created an assembly line that perfected earlier forms and dramatically reduced the need for foremen. In diverse workplaces, workers were deskilled and isolated, as craft skills were rapidly eroded.[23]

Technical control depends on three corresponding legitimating ideologies: technological autonomy/neutrality, technological determinism, and technological progress. Workplace technology, like technology in general, is presented as driven by its own dynamic rather than by particular interests. As Alvin Gouldner put it: "What 'technology' does is to present itself as a universal, all-purpose praxis, as a practice fit for the pursuit of any and all goals and as available to all and every group."[24] The particular form that technology takes is therefore assumed to be a function of the general state of technological progress; to challenge technology is assumed to be irrational, as contrary to both

technological and societal progress. Technological advances are assumed to be inherently progressive due to a "cult of productivity and expertise."[25] Technological choices have been presented as the inevitable manifestations of science/engineering and as inherently humane and liberating. Typically, technological innovation *does* involve some improvements in efficiency and performance, a fact that has contributed to the obscuring of technical control as well as the decreased likelihood of conceptualizing alternative forms of technological design or implementation.

Technical control was not without its contradictions, however. Although control was less personalized than simple control, the workplace technology was nonetheless concrete and visible, and certain aspects of technical control were quite transparent (e.g., the variable speed of the assembly line). In some workplaces, the contradiction between the expense of, and care given to, the technology, and the low wages of, and disregard for, workers, was pronounced. Moreover, because the technology was both expensive and deskilling, the ongoing reliance on deskilled and often disgruntled workers became problematic for some owners.[26] Technical control eroded craft traditions and created a more homogeneous group of semiskilled workers, which promoted solidarity among workers but reduced worker motivation from the capitalist point of view. Unionization and other forms of resistance among workers were common.[27] In response to these limitations of technical control, owners turned to auxiliary, more bureaucratic, forms of control such as the development of internal job ladders (despite the homogenization of skill) and piece rate systems.[28]

*Bureaucratic Control and Ideology*

In contrast to technical control, bureaucracy rests on an expansion of formal/legal rationality within work organizations: the reliance on specified formal rules and their structural manifestations. Bureaucracy structures white-collar, administrative work in ways analogous to the ways in which mechanization structures material production. James Beniger argues that industrialization initiated control crises in other domains of society, particularly administration, distribution, and communication, and that bureaucracy emerged as a "critical new machinery . . . for control of the societal forces unleashed by the Industrial Revolution."[29]

Unlike the personalized work culture of both craft work and simple control, bureaucratic rules purport to constrain workers at all levels

of the organization, even as they protect workers from arbitrary exercises of power.[30] Moreover, bureaucratic procedures streamline information processing by reducing the amount of relevant information to delimited "cases" and by moving "from the government of men to the administration of things." Such rationalization makes possible the emergence of larger and more complex social systems.[31]

Bureaucratic organization involves task specification and differentiation, a hierarchy of offices separate from their incumbents, promotion upward through the ranks, centralized and specified authority channels, and objective criteria for evaluating promotion and remuneration.[32] In a bureaucracy, the division of labor is expanded to include not only production tasks but also supervisory/administrative tasks; clearly delimited spheres of responsibility and distinct supervisory levels are part of the effort to rationalize administration. The pyramidal structuring of these layers and a body of rules governing workplace functioning became characteristic of burgeoning corporations during the late nineteenth century.

Bureaucratic ideologies are several. As with technical control, bureaucracy is legitimated on the grounds of impartiality and neutrality: clearly defined rules that apply to everyone, allowing all to compete equally and fairly. Moreover, as Reinhard Bendix points out, the promotion from within upward through the ranks is related to the ideology of "rags to riches," a central ideology of capitalist culture.[33] Seniority and competence are assumed to lead to elevated rank authority, so that the bureaucratic organization will be meritocratic. Like technical control, bureaucracies are also presumed to increase efficiency and productivity.

Managerial ideology is another way in which bureaucratic power is legitimated. Managerialism emphasizes the managerial function as separate from and more important than any other job in the bureaucracy, as a difficult art that can be performed only by certain types of individuals who have "rare qualities . . . and unique competence."[34] In addition to the formal rationality of bureaucracy, certain charismatic qualities of leadership are emphasized: "Rather than only specifying rules and regulations to govern various work situations, managerial ideologies function to promote an atmosphere or attitude of loyalty."[35] Moreover, managers are assumed to be altruistic, working for the good of the organization rather than for self-interest.

As with earlier forms of capitalist control, dysfunctions and contradictions of bureaucracy have emerged. The relative inflexibility of bureaucratic structure has implied inefficiency with atypical cases. As

size and complexity have led to more layers of bureaucratic organizations, communication between the top and the bottom has become problematic.[36] Despite the ideology of objectivity and neutrality, favoritism and personalized identification with positions are common. The personalized nature of managerial ideology implies a corresponding vulnerability to perceptions of personal failure. Due to the emphasis on seniority, promotion from within, and centralized rank authority, technical experts and professionals have resided uneasily within bureaucratic organizations, leading to "professional/bureaucratic conflicts" and a less innovative work organization.[37] Both worker and client resistance to these limitations of bureaucracy have been common.

*Professional Control and Ideology*

Professionalism arose simultaneously with technical and bureaucratic control during the latter half of the nineteenth century, but largely in reaction to these alternative forms of structural control. Professional control differs from technical and bureaucratic control in that it allows for more worker discretion in dealing with clients and more autonomous and collegial forms of work organization. Professionals are alleged to possess esoteric skill and knowledge, which necessitates self-regulation and collegial control rather than the external control characteristic of bureaucracy or technical control.[38] In direct contrast to the bureaucratic processing of delimited cases, professionals are expected to deal with clients as unique individuals, utilizing formalized knowledge and skill to formulate professional judgments about personalistic situations. Indeed, professional work is often viewed as the antithesis of bureaucracy, as creating "professional/bureaucratic conflict" unless alternative forms of work organization are found (see below).

Professional control has two main dimensions: collegial self-regulation and professional control of client relations.[39] Collegial self-regulation centers around the formalization of professional training (including entrance requirements, curriculum, exit requirements, and credentialing) and the monitoring of professional conduct through collegial organization and professional associations.[40] Another aspect of self-regulation concerns norms of service and professional conduct: objective, impersonal, nondiscriminatory, and quality work, guided by the service ideal. Such norms, although usually embodied in codes of ethics, are largely enforced informally.[41] These norms and codes of ethics

also influence professional/client relations by creating social distance and respect. Professional/client relations are also influenced by the broad-based nature of professional competence—esoteric and yet practical, involving both formalized and tacit knowledge—and the typical context of crisis or client need—both of which imply status inequality and professional control of the situation.[42]

Professionalism has certain affinities with craft work: conceptions of work as intrinsically interesting and valuable, collegial working conditions, antimarket ethics of "good work" and a general service orientation, and noblesse oblige, or the sense that professional privilege implies duties and norms of behavior.[43] Unlike traditional craft work, however, professional training has become more and more formalized and institutionalized, and professional knowledge has become commodified into a "special kind of property."[44] Legitimation of the professional credentialing process (and of professional competence in general) is more and more dependent upon the operation of the educational system and, in particular, the degree of perceived equality of educational opportunity. The structural and hidden aspect of professional control concerns the process of professional training and certification; the degree to which professionals are accorded legitimacy rests to a large extent on the perceived legitimacy of this system of professional training and credentialing: "The university is the center from which ideological legitimation radiates."[45]

Professional ideology, then, rests on client perceptions of the legitimacy of the selection and training process, as well as generalized beliefs concerning the degree of efficacy of professional codes of ethics, particularly norms of service and absence of self-interest. Skepticism regarding professional ideology has been commonplace, however: the sense that self-interest and mercenary motives are not incompatible with professional codes of ethics, that professional review boards are often insufficient to provide adequate regulation, and that professional privilege is derived not only from the nature of professional work but also from professional interest-group politics.[46]

### *The Contradictions of Control*

As we have seen, all three forms of structural control were from the beginning plagued by contradictions of control and by worker/client resistance. Because two or more control structures typically coexist, there are also contradictions *between* these various control structures.

The persistence of internal subcontracting within factories in some industries (e.g., steel, coal mining, machining) implied an uneasy coexistence of craft control and simple control. The polarization into workers versus management, which is pronounced in workplaces under technical control, implies reduced or nonexistent mobility prospects for workers, which contradicts the ethos of individual opportunity and upward mobility, characteristic of both professional and bureaucratic models and of American society in general. In enterprises that combine a technical production sector with a more bureaucratic administrative sector, the different mobility prospects of each sector may be highlighted.

The most fully analyzed set of inter-control-structure contradictions has been "professional/bureaucratic conflicts."[47] Particularly in organizational contexts where professionals are working within a bureaucracy, a situation that has become more prevalent during the last century, the autonomy and self-regulation characteristic of professional control can come into contradiction with bureaucratic rules and authority structures. The central contradiction here is between authority based on knowledge and authority based on seniority and rank position, which sets the stage for conflict over the locus of authority. A corollary is that professionals working within bureaucracies may find that their allegiance to their profession can conflict with their loyalty to the organization. Moreover, the bureaucratic ethos of efficiency and corporate profit maximization can contradict the professional ethos of competence, status, and client orientation.

One way in which these intra- and interorganizational contradictions were initially addressed was through the attempt to professionalize management and administration so as to rationalize factories, bureaucracies, and professional organizations. Taylorism and its search for the scientific basis of management was an early attempt to increase managerial control and organizational efficiency by expanding management's technical understanding of the labor process.[48] Professional managers were assumed to occupy a stronger position vis-à-vis both workers (whose craft knowledge had been appropriated) and professionals (who were presumed to accord more respect to fellow professionals). Although Taylorism relied on only the most rudimentary science and technical understanding (time and motion studies, combined with cost accounting), the attempt to rationalize and legitimate bureaucratic administration by giving it a surer basis in scientific and technical expertise was an important precursor of technocratic control.

Taylor emphasized the capability of engineering science to dis-

cover the "one best way" to solve administrative problems and make production decisions. Diverse workplaces could be rationalized by turning them over to professional engineers, who would insure progress in the form of material development, greater efficiency, and technological advance. However, although Taylorists brought religious fervor, as well as certain technical innovations,[49] to their reform efforts, the scientific basis of scientific management was too weak to provide sufficient rationalization or legitimation. Time and motion studies were conducted publicly, and assembly lines were overtly speeded up—both of which were transparent control strategies. Worker resistance, particularly from the craft unions and professionals, was considerable.[50]

One way in which the contradictions of Taylorism were initially dealt with was through the human relations approach. As Frank Fischer put it:

> From management's point of view, Taylorites had properly identified the issue of workplace authority, but as Richard Edwards put it, they "had not found quite the right mechanism." The human relations movement can be understood as the culmination of a series of interrelated attempts to find the "right mechanism." Early interest in human relations by industrialists can, in fact, be interpreted as a response to the upsurge of organized labor, significantly facilitated by hostilities toward Taylorism itself.[51]

Human relations approaches therefore sought to supplement Taylorist policies with psychological techniques that acknowledged the importance of primary work groups and workers' feelings and motivation. As an ideology, human relations promoted a more insidious form of managerial control, because it obscured this control: Management is presented in paternalistic terms, and the work organization as "one big family."[52]

The search for the one best way to organize production so as to minimize worker/management conflict and increase productivity has grown more intense in recent years, as the scientific and technological basis of workplace rationalization has expanded. In recent years we have seen a "transition from scientific management to the scientific-technical revolution."[53] As David Stark points out, the long-term significance of Taylorism was to begin to legitimate and institutionalize a new class division between manual and mental workers.

> The period of the transformation of the labor process during the early decades of this century was also an important period of class formation

> with significant consequences for the contemporary constellation of class relations. . . .What the reorganization of work did accomplish was to provide the basic conditions for the ideologically sharp division between "mental" and "manual" labor. . . . The creed of specialized knowledge and expertise became the formative basis of a new and more complex ideology around which a class could cohere.[54]

Technocratic control is, in effect, a more sophisticated contemporary alternative to Taylorism. During the post-World War II period, and particularly since the 1960s, a set of interrelated socioeconomic changes has fueled the quest for more extensive workplace rationalization. Rising educational levels and more intense competition for commensurate jobs, equal employment opportunity pressures, the development of computerized technology and advanced information systems, the increasing size of the state sector, the emergence of multinational corporations and worldwide competition among them, and the increased need to manage the economic system and perfect long-range planning—these developments necessitated and facilitated subsequent rationalization. Certain aspects of professionalism, bureaucracy, and technical control have become integrated into a more complex and heavily legitimated form of technocratic control.

## Contemporary Conceptualizations of Changing Work Organizations

Many have attempted to understand and conceptualize the dramatic changes that have occurred in the occupational sector. Just as the Industrial Revolution spawned diverse theories, so the "second industrial divide" has generated varied theories of contemporary socioeconomic change. Both in scholarly publications and in the popular press, new theories of work organizations have been abundant. Although I believe that none of these theories is adequate, many of them are instructive and worth examining.

One salient feature of many recent analyses of changes in work organizations is their optimism, particularly with regard to the impact and potential impact of computerization on the workplace. In the literature on contemporary organizations, for instance, one finds such conceptualizations as "post-bureaucratic organizations," "post-industrial organizations," "postmodern organizations," "adhocracies," etc.[55] While some of these analyses are more cognizant of the complexity of recent

changes than others, the general thrust of all of them is toward optimism concerning the impact of computerization and related changes in work organizations. In a useful review of this literature, for instance, Wolf Heydebrand concludes that postbureaucratic organizations tend to open up new democratic possibilities by undermining both bureaucracy and professional dominance, and that these new organizations are characterized by informalism, universalism rather than special interests, loosely coupled subunits, extraorganizational networking, and enhanced corporate culture.[56] In a similar vein, the literature on postmodernist organizations has affirmed "de-differentiation," difference, challenges to binary oppositions and grand narratives, and an emphasis on "pluralism of cultures, communal traditions, ideologies, forms of life or language games."[57]

The sociology-of-work literature in this field often exhibits a similarly optimistic tone. Larry Hirschhorn, for instance, concludes from his case studies of advanced technological settings that successful computerization depends upon expanding and enhancing workers' skill and knowledge: that workers need a more comprehensive understanding of workplace operations in order to be able to effectively monitor computerized operations.[58] In Hirschhorn's view, this necessary expansion of knowledge leads to very beneficial effects:

> As knowledge is incorporated into machines, workers can reinvolve themselves at a wider and more comprehensive level of production. Through a developmental process, machines and workers together increase the store of practical and theoretical knowledge. . . . As we move from preindustrial to postindustrial conditions, the relationship between work and consciousness is dramatically transformed . . . the worker becomes more aware of his work environment, but he also begins to reflect self-consciously on his own actions and becomes aware of how he learns and develops.[59]

For Hirschhorn, this expansion of worker knowledge and consciousness implies a corresponding expansion of worker power and control in contemporary workplaces. Fred Block has built on this postindustrial optimism concerning the impact of computerized technology, showing how technological change has created the preconditions for genuine workplace democracy.[60]

Shoshana Zuboff reaches similarly optimistic conclusions about the *potential* impact of "the smart machine."[61] For Zuboff, computerization points toward a duality: The technology can either automate or

informate. By informate she means that the technology can be used to generate and disseminate information about underlying administrative and production processes. When the informating capacity is realized, workers gain more abstract and comprehensive knowledge of the workplace. However, according to Zuboff, whether the informating potential is realized depends upon managerial choices: "Managers can choose to exploit the emergent informating capacity and explore the organizational innovations required to sustain and develop it. Alternatively, they can choose to ignore or suppress the informating process."[62] For Zuboff, however, unless informating is encouraged, the potential benefits of computerized technology cannot be realized.

Rosabeth Kanter's analysis of the organizational prerequisites of innovation expresses a similar duality between organizations that are progressive, both technically and socially, and organizations that are more traditional: *integrative* versus *segmentalist* organizations.[63] The integrative organizations, which tended to be high-tech workplaces, were characterized by a more holistic approach to problem solving, utilization of a team structure, a more cooperative style, less specialization, a matrix style of organization, and a general flexibility that encourages innovation. In a more recent analysis, she discusses "post-bureaucratic" organizations as being more centered on the individual worker and his or her expertise, as "results oriented" rather than rule oriented, as focused on creativity and innovation, and as emphasizing fluid groupings and turnover as positive renewal of expertise and synergistic creativity.[64]

In contrast to these generally optimistic accounts of the effects of computerization and related socioeconomic changes, the neo-Marxist work on computerization has focused on the negative effects of technological change.[65] The general thrust of neo-Marxist work on computerization has been to emphasize its capacity to enhance control of the labor of the nonexpert sector, diminishing autonomy, deskilling the actual labor process, and creating an "electronic sweatshop."[66] Professional work is also seen as being adversely affected by computerization: as "proletarianized."[67] We will examine some of the evidence for these trends in chapters 3 and 4.

Some social scientists have attempted to conceptualize more macrosocial and global political and economic changes. In an influential work, Michael Piore and Charles Sabel have analyzed the "second industrial divide" that computerization represents, and the possibilities for socioeconomic change that it affords.[68] Essentially they see the

options as either a continuation of Fordism (mass production techniques) and international Keynesianism, (techniques more appropriate to the technology of the industrial revolution) or a return to "flexible specialization" and craft methods of production, methods that Piore and Sabel see not only as possibilities, but as "essential to prosperity."[69] Computerization is seen as promoting flexible specialization:

> The connection . . . between flexibility and computers is supported by ethnographic studies of computer users—ranging from schoolchildren to sophisticated programmers. . . . Whereas most machines have an independent structure to which the user must conform, the fascination of the computer . . . is that the user can adapt it to his or her own purposes and habits of thought. The computer is thus a machine that meets Marx's own definition of an artisan's tool: it is an instrument that responds to and extends the productive capacities of the user . . . technology has ended the dominion of specialized machines over un- and semi-skilled workers, and redirected progress down the path of craft production. The advent of the computer restores human control over the production process; machinery again is subordinated to the operator.[70]

Piore and Sabel argue that within the international division of labor "the old mass-production techniques might migrate to the underdeveloped world, leaving behind in the industrialized world the high-tech industries . . . all revitalized through the fusion of traditional skills and high technologies."[71]

Another recent analysis of global economic trends that has been widely influential is Robert Reich's *The Work of Nations*.[72] For Reich, global power has become diffused, and once-powerful multinational corporations have evolved into a web of decentralized international groups. Given the complexities of the international division of labor and foreign ownership, it is no longer meaningful to speak in terms of national corporations; "American" corporations are no longer American in any meaningful sense of the word. Given this fact, it is highly unrealistic to expect that corporate profits will "trickle down" to everyone in a given nation; Reich argues that the actual trend has been for economic assets to "trickle out" to whichever global investment seemed most profitable.[73] Capitalism has become highly "disorganized,"[74] if indeed we can speak of capitalism at all.

Reich goes on to discuss how the militaristic bureaucracies and Fordist production techniques of the 1950s have been superseded by "high-value" firms that emphasize specialized knowledge and innova-

tive ideas. High-value firms cannot be organized bureaucratically, but rather utilize creative teams (including international coalitions), horizontal integration, and high rewards for those who contribute innovative ideas to the global competition. Reich sees three main categories of workers: routine production workers, in-person service workers, and symbolic analysts.[75] Production workers are diminishing; in-person service workers are increasingly in demand but are poorly paid; and symbolic analysts are in an increasingly powerful position, to the extent that their material and nonmaterial rewards are leading to their veritable *secession* from their countries of origin.

What are we to make of these varied conceptualizations? One striking fact is that many of them, particularly those in the postindustrialist tradition, are highly optimistic scenarios of the types of organizational and socioeconomic changes that computerization is facilitating. This optimism is even more apparent in the journalistic media, where a type of technological hubris implies that technological innovation can solve virtually any social problem. In these accounts, technological determinism becomes liberation through technology.

At the opposite extreme, we find those accounts, many inspired by neo-Marxism, that stress the dangers of technological change: enhanced managerial control, deskilling of the labor process, new types of stress and occupational health problems, technological unemployment. The empirical evidence underlying these analyses indicates that working with computers is more oppressive than liberating, although many of these writers see the potential for technology to be implemented in a more humane manner.

Some of the more nuanced analyses have avoided the pitfalls of technological determinism and have sought to clarify the choices that have accompanied computerization: to automate or informate the labor process, Fordism or flexible specialization, integrative or segmentalist organizations. What has generally been lacking in these analyses, however, has been an awareness of the fact that these polar extremes currently coexist within work organizations. Most of these writers have also assumed that the technological imperative is on the side of the more progressive option: that in order for the benefits of computerization to be realized, positive organizational innovation must occur.

These, then, are the perspectives on contemporary socioeconomic reality from which I have learned the most. To go beyond them is an ambitious task. However, I believe that we must transcend the Manichaean dichotomizing of technology and its effects: Computeri-

zation is neither good nor bad, but a complex tool that has the potential to be implemented in diverse ways. Moreover, technological change is embedded in a nexus of social and political variables and must be analyzed in conjunction with them. Only by analyzing, in some detail, the actual patterns of organizational restructuring in various workplaces and their effects on workers and workplaces can we achieve the type of comprehensive reconceptualization that will enable us to make liberating technological and organizational choices for the twenty-first century.

## Synopsis of Chapters

Chapter 2 explores the intellectual history of the concept of technocracy, including its source in Enlightenment theory, the technocratic movement of the 1930s, postindustrialism, new class theories, and postmodernism. Given the fact that technocracy is a synthetic organizational form, derived from a combination of certain aspects of technical, bureaucratic, and professional control, chapters 3 through 5 explore the dynamic changes in blue-collar, white-collar and professional work so as to understand the basis of technocratic control. Chapter 3 analyzes the changing nature of technical control by reviewing recent empirical studies of blue-collar production workplaces and how they have changed as a result of computerization and related socioeconomic developments. Chapter 4 examines the recent literature on bureaucracies, and chapter 5 looks at recent studies of various professions. Chapter 6 extrapolates from chapters 3 through 5 to set forth a theory of emergent technocratic organization and how it differs from previous forms of control. Chapter 7 concludes by looking at the political significance of technocratic organization and control and prospects for further changes in work organizations.