Optimism has abounded in the discussion of the relationship of information technology (IT) to organization theory and organization behavior. Vannevar Bush, science advisor to Franklin Delano Roosevelt, was one of the early utopians. His 1945 *Atlantic Monthly* article, “As We May Think,” envisioned a desk-sized “memex” which would give access to vast archives of books. In the 1960s, Marshall McLuhan (1964) popularized computer technology and telecommunications as forces that were creating a “global village” unifying everyone, everywhere, to everything. By 1980, when Alvin Toffler wrote *The Third Wave* about how telecommunications was creating an “infosphere,” the utopian vision of computing as a democratizing and empowering force was well established. The vision of a “democratic information society” or “electronic democracy” has since been set forth for three decades by many other writers.

Matching democratic theses about the role of IT has been critical theory. This perspective could be traced back to fears about how totalitarian societies might consolidate their power through technology, as in George Orwell’s famous novel, 1984. More recently, Manuel Castells (1996, 1997, 1998) has presented a grand theory, backed by an enormous diversity of historical and empirical research. He wrote, “The rise of informationalism in this end of the millennium is intertwined with rising inequality and social exclusion throughout the world” (Castells, 1998, p. 70). International inequalities grow, particularly at the extremes, and groups are systematically denied the resources for meaningful survival of their cultural identity. “Black holes of information capitalism” appear, from which there is no empirically evident means to escape poverty and deidentification. Castells’ theory is not far from those of Marxist and critical thinkers collected in McChesney, Wood, and Foster (1998), where the argument is made that the contradictions of capitalism are revealed in the growing tension between the democratic potential of...
info-tech and economic demands for profit that ultimately override their potential.

In this chapter we attempt to find a middle ground between optimism and pessimism by approaching organization theory and organization behavior empirically, first looking at the alleged effects of IT on organization structure and then on organization behavior. Does IT truly flatten organization structures by shrinking middle management? Does IT deterritorialize organizations through remote work? Is its long-run tendency centralizing or decentralizing? And perhaps most important, does IT tend to reinforce or erode existing organizational power structures? On terms of organization behavior, does IT intensify social networking and thus build social capital? Does IT really improve managerial decision making? In terms of organizational change, does IT promote the diffusion of innovation? Is IT linked to organizational evolution toward the consolidation of control? After investigating these key questions that relate IT to organization theory and organization behavior, the summary to this chapter relates the answers to these questions to the four theories that have been a theme to this book: technological determinism, reinforcement theory, sociotechnical theory, and systems theory.

EFFECTS OF IT ON ORGANIZATIONAL STRUCTURE

Flattening Organizational Structures by Shrinking Middle Management?

One of the most common structural predictions regarding IT is that it would have the effect of flattening organizations by cutting the ranks of middle management. This effect would come about because by using IT, top management could oversee lower ranks more easily. Automated feedback from the bottom would support top-level resource decisions without the need for middle echelons of supervisory interpreters of data from the rank and file. At the same time, it was argued, IT would facilitate increased decision-making authority among lower-level employees, eroding middle management from the bottom.

Flattening of organization structures has been reported to have been central to American private-sector productivity increases in the 1990s—increases fed by IT investment. A similar trend toward flatter organizational structures has been reported in the nonprofit sector (Clolery, 2000). What often happened was not so much wholesale elimination of a middle management layer but rather the absorption of some middle management tasks by IT and the reconstruction of new job descriptions and positions for tasks not automated. Command and control layers in the old structure became replaced by problem-oriented teams in the new, more flexible structure. Lower-level employees and teams took on added responsibilities, accounting for an estimated 25% decrease in the
number of layers between chief executive officers and the shop floor (Ellis, 2003). While there is no doubt that organizational flattening has become a central reform strategy in the private sector and that IT enabled greater decision making at lower levels, what occurred was not a simple IT investment-organizational flattening cause and effect. Rather, regression analysis of private-sector organizational flattening data suggests that, if anything, flattening was tied to private-sector organizations becoming more human capital intensive and elevating the role of the human resource director (Ellis, 2003), with IT serving as a facilitating factor.

The private sector model of organizational flattening envisions that engineers, technicians, factory employees, and members of the sales force would work together in teams to develop new products in response to changing consumer demand. In doing so, these teams would organize themselves, assign work responsibilities, make decisions, and set goals in ways formerly the responsibility of a bygone layer of middle managers. Each point of this model is difficult to translate into the public sector. Consumer demand is much less volatile and is expressed more indirectly. Expert staff and operational managers are not empowered to do things in new ways on their own authority. Work responsibilities are usually circumscribed by civil service systems. Lower-level goal setting conflicts with the principles of democratic accountability embedded in legislation. In the public sector, the traditional layer of middle managers remains in place. And even were some agency to implement the private-sector model of organizational flattening, the reward structure providing incentive to do so is generally absent in the public sector.

Thus it is unsurprising that overall in the public sector there is little evidence that IT is changing organizational structure in the same way. Heintz and Bretschneider (2000) studied the use of IT in relation to restructuring in public organizations, asking if adoption of IT affected organizational structures, communications, and decision making. They found there was little empirical relationship between IT adoption and subsequent agency restructuring in the public sector. In the cases where restructuring occurred, managers reported only minimal effects on performance. While IT may improve performance directly, it is far less clear whether IT alters public organizational structure.

Public-sector research has supported the idea that IT is indeed associated with the downsizing of middle management—but only for centralized structures. If management is decentralist, IT may not reduce the ranks of middle management (Kraemer & Dedrick, 1997). Thus, in the centralized environment of the U.S. military, when the North American Defense Command installed the SAGE system of computer-controlled warning functions, the number of levels of management was reduced.
from five to four. More recently, the Coast Guard has made an organizational commitment to a flatter organizational structure, in part enabled by improved IT (Moody, 2004). Indeed, much of the strategic thinking about the modern "electronic battlefield" is based on Department of Defense (DOD) plans to combine highly centralized IT-based command and control with highly flexible combat teams having greater information and greater discretion to use it.

The popularity of imitating the supposed private-sector model recently led under the Bush Administration to top-down quota-like mandates to reduce manager-to-employee ratios, as in the administration of the EPA Superfund. However, these sometimes successful efforts at organizational flattening are only peripherally driven by IT. The driver seems more to be the political power of myths and symbols drawn from the private sector, providing a rationale for governmental outsourcing and downsizing as a way of imitating the productivity gains of the private sector in the 1990s.

**Deterritorializing Organizations Through Telework?**

Early proponents of telecommuting believed IT would radically alter organizational structures in the future, creating "boundaryless organizations" that would have flatter hierarchies and operate in more flexible and reconfigurable ways no longer dependent on brick-and-mortar locations or even geographic territories.

Again, the private sector has provided the inspiration. Telework has proliferated in the private sector. By 1998, the Bureau of Labor Statistics reported that some 21 million Americans worked at home, though about half of these were merely bringing unpaid office work home. Using different measures, the International Telework Association and Council (ITAC) estimated 23.5 million Americans teleworked in 2003 (Joch, 2004). The progress of telework in the public sector has been slower. A 2002 Department of Labor report put private-sector telecommuting at 10% of the private-sector work force, compared to a 2% rate in the public sector.

Nonetheless, almost from the start, Congress has been sympathetic to the concept of telework, believing its spread would reduce the sizable costs of capital construction of office space. Congress had established the federal telecenter program in 1993. Initially there had been three telecenters (used by the Equal Employment Opportunity Commission, Interior, and Agriculture), all confined to the DC area. By 2002 there were 17 telecenters in the DC area and a few more elsewhere. Also in 2002, Congress appropriated $5.8 million to fund the Telework Consortium, which worked with General Services Administration (GSA) telecenters to test teleworking technology and with the Treasury Department to develop evaluation and measurement tools for telework projects.
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Congress mandated that by 2003, 50% of federal workers be given the opportunity to telework. In response to a 2003 General Accounting Office (GAO) report criticizing federal agency telework plans as uncoordinated and inconsistent (GAO, 2003c), the Office of Personnel Management (OPM) and the GSA in 2003 launched a $500,000 effort to promote telework in 20 federal agencies. The Web portal www.telework.gov was redesigned as part of this promotional effort. A 2003 OPM survey of 77 federal agencies found an increase, with 5% of the federal civilian work force teleworking. Teleworking ranged from 40.6% in the OPM, 31.7% in the Federal Deposit Insurance Corporation, and 30.6% in the Department of Education, down to 8% in Energy, only 1.4% in the State Department and 1.2% in the Department of Justice (Miller, 2003r). A GAO report found only about half of agencies would meet the 2003 deadline of offering telework to half their employees.

Congress turned the heat up in the FY 2005 appropriations bills, specifying that if Commerce, Justice, State, the Small Business Administration, the Securities and Exchange Commission, and the federal judiciary appropriations bills did not offer every eligible worker the opportunity to telecommute by mid-to-late January, 2005, they would lose $5 million under a provision passed as part of the fiscal 2005 Omnibus spending bill (Miller, 2004i). A subsequent study by CDW Government Inc. found only 1% more federal employees became involved in telework as a result, however (Miller, 2005h). Hoping to move telework into the fast lane in spite of mediocre progress, in 2005 federal and private-sector officials established the Telework Exchange to promote the benefits of teleworking. The exchange was endorsed by the Office of Management and Budget (OMB), the OPM, and the chairman of the House Government Reform Committee, and was sponsored by Intel, Citrix Systems, CDW-G, and other industries.

From a management viewpoint, telework promises increased productivity, greater ability to attract and maintain personnel who may value the flexibility of telecommuting, and when telework is implemented on a large scale, management may reap lower costs of office space. When telework is implemented through decentralized telecenters in various regions or neighborhoods, citizens may also perceive agencies to be “closer to the people.” ITAC has estimated that organizations sponsoring telework cut turnover 30%, increased productivity 22%, and cut absenteeism 60%. Moreover, ITAC also estimated a well-equipped home office costs $3500 and setting up a telework program costs $25,000 in consulting and training—very modest investment costs compared to capital construction of office space (Joch, 2004).

However, telework has unattractive as well as attractive features. Historically, “cottage industries,” where workers labored at home on piece work, constituted a system that oppressed workers and that was fought by
labor unions. Unions remain skeptical toward such systems, including telework. Feminists also have critiqued telework as a form of return to the home for women (Zimmerman, 1990). Employees fear that working from home or even remotely can lead to isolation from the organization (Forster, 1989). Also, employees may feel that they will lose social interactions with other employees, which is generally a source of job satisfaction. Particularly for individuals with children, role conflict and role ambiguity may increase. For individuals suffering from workaholism, telework exacerbates the tendency to sacrifice normal dimensions of life for work tasks (Kaplan, 1996).

For their part, managers often feel telework eliminates direct "line of sight" supervision and requires the rethinking of supervisory roles, which can be threatening (Ellison, 2000). Telework poses much greater security problems for managers as well as networking issues. Sometimes it is a cost, not a savings, and agencies may resent paying "double overhead" for slots at federal telework centers. Moreover, in the public sector, managers may well find that any productivity savings revert to the department level, not the agency level, giving agency managers little incentive to promote telework.

In summary, the powerful forces for and against deterritorialization of organizational structures through telework mean that one may expect this to be a continuing trend, but one slow to spread and far from the revolution earlier predicted.

Centralizing or Decentralizing Organizational Structure?

The microcomputer revolution of the 1980s led many social scientists to associate IT with decentralization. Democratization and decentralization theories of IT foresaw a dramatic broadening of the span of control, shrinkage of middle management, and overthrow of Fordist hierarchy in favor of problem-centered teams. Workers, citizens, and consumers would gain control due to vastly increased access to information. Increased information would lead to greater market efficiency. Passive television viewing would yield to interactive and participatory forms of media. More time would be spent in online communication and groups, rebuilding social capital (Cohill & Kavanaugh, 1997), and education would become more accessible, widespread, and appropriate when delivered online. Nations that wanted to compete would democratize because information societies thrive in democratic settings. Even more idealistically, increased information would lead to greater international harmony in the global village while domestically, electronic communication would reinvigorate democracy and increase social capital, reversing, among other things, the long-time decline in voting levels. In a fast-changing world, the future would lie with multidisciplinary problem-oriented
team organization designed to be rapidly responsive and operating by
and through IT (Tapscott & Caston, 1992).

In the field of public administration, G. N. Reschenthaler and Fred
Thompson (1996) applied democratization and decentralization theory
to their concept of "new public management." If increased levels of in-
formation made markets more efficient, they reasoned, then increased
information would lessen the need to regulate the economy. For in-
stance, regulation of airlines and other industries would become unnec-
essary because such things as landing rights (or pollution rights in
industry) could be securitized and government regulation could be
replaced by the self-regulation of the market. This "new public manage-
ment" perspective believed that IT could make New Zealand-type gov-
ernment possible, where the public sector shrank and was handled more
by electronic markets.

Early IT offices were centralized. Centralization was seen as bringing
economies of scale, less redundancy, more integration of databases, and
better ability to serve strategic goals. However, the personal computing
revolution in the 1980s and early 1990s was marked by the rise of "end-
user computing" and reliance on distributed networks. A 1993 public-
sector survey by Danziger, Kraemer, Dunkle, and King (1993) showed end
users to be just as happy with decentralized department-level computing
services as with centralized IT units that had hitherto been dominant. By
the late 1990s, however, the pendulum swung back toward recentraliza-
tion (Kraemer & Dedrick, 1997), which in the 2000s flowered under the
banners of "enterprise architecture" and "standardization."

Illustrative of centralization trends was the decision of the e-Rulemaking
project for all federal agencies to opt for a centralized docket system for
regulations rather than a decentralized agency-centric one. The project
team estimated the centralized system would cost $20 million whereas
the decentralized one would cost $30 million. They also estimated it
would take one year to build the centralized system but three years to
build a decentralized one (Miller, 2004j). Likewise, in 2005 the GSA was
calling for the centralization of all government purchases except weapons
systems, based on new IT capacities for central purchasing and based
explicitly on the OMB's "enterprise" strategy for government-wide appli-
cations (Miller, 2005b). In 2005, the Defense Intelligence Agency (DIA)
moved to centralize and take over operational and budgetary control of 10
unified combatant commands, making some 800 military and civilian
workers across the military services DIA employees (Onley, 2005a). Even
the National Aeronautics and Space Administration, usually a poster
child for IT matters, was criticized by its Inspector General for "frag-
mented organization" of its IT organizational structure, prompting calls
for centralization (Wait, 2005). Throughout the federal government, the
central OMB and DOD agendas for IT was similar: achieve economies through centralized, federal-wide (or at least consolidated) IT initiatives.

The federal drive toward centralization was paralleled at the state level. In the late 1990s and into the 2000s, financial austerity led states to transfer IT personnel from operating departments back into the central IT office, reversing some of the earlier decentralization. For instance, in 2002 the state of Virginia created the Virginia Information Technologies Agency, which consolidated state IT functions in a single agency, eliminating three prior IT agencies and two IT oversight boards, all prompted by that state’s $6 billion budget shortfall. In 2003, the state of New Hampshire transferred 315 IT employees from nine state agencies into its new Office of Information Technology, with the goal of saving money through standardization of operating systems, software, and purchasing. Also in 2003, the state of Texas, as part of its health and human services consolidation, also consolidated IT functions (McKeith, 2004).

Although it is true that recent centralization is consistent with some degree of distributed processing, from the viewpoint of bureaucratic structure, the centralization was real. Power really did shift from department chief information officers (CIOs) to central IT authorities in the OMB. Departments were taxed in real dollars shifted from other objectives to support centralized Quicksilver e-government and security initiatives. Agencies had to give up custom applications in favor of one-size-fits-all enterprise applications. Lower-level IT investment priorities increasingly had to follow central priorities, shifting, for example, from e-government toward IT security after 9/11. Throughout the federal government, any new large-scale investment in IT had to be justified in business plans that demonstrated conformity to centralized federal-wide enterprise planning.

Ironically, the present era of IT centralization is rooted in antibureaucratic ideas about managing by results and about reengineering government processes to achieve those results. In the United States, the concept of results-oriented government has morphed into an elaborate OMB system for performance tracking and forcing agencies to develop OMB-sanctioned business plans. Innate to this process is the transfer of discretion from departmental CIOs in the periphery to OMB administrators at the center. There is a direct link from the concepts of managing by results, eliminating duplication, and leveraging IT to the contemporary reality of recentralization, enterprise architecture, and other forms of large-scale IT-based consolidation. The National Performance Review under Clinton in the 1990s started with the rejection of traditional bureaucracy, but in the 2000s the emergent centralized IT reality strayed very far from this starting point—yet was connected to it by the inner logic that results must be embedded in information systems designed and enforced from the center.
Reinforcing or Eroding Organizational Power Structures?

The power structure issue is, of course, the focus of reinforcement theory. With many exceptions, most research on the effect of IT on power structure has suggested that IT reinforces existing power arrangements, whether they be centralized or decentralized, authoritarian or autocratic (Coyne & Wiszniewski, 1999; Kolleck, 1993; Kraemer & King, 1986). Hood (2000), for instance, found that IT was unlikely to change organizational control patterns, except insofar as different cultures use IT differently. Agre (2002) found reinforcement (amplification) theory to be a better explanatory model than technological determinism, concluding that the Internet is rapidly amplifying existing political relationships, not overthrowing them. This research is in line with that of other researchers going back to the 1970s, including the noted work of Kraemer and his associates, which consisted of a study of local governments that found that information and communication technologies' (ICT) decisions tended to amplify the political power of the dominant coalition within the organization (Danziger, Dutton, Kling, & Kraemer, 1982; Kraemer & Dedrick, 1997).

Some have gone beyond reinforcement theory to argue that IT confers power not on the powers-that-be, but on a new class of technocrats. Illustrative of this argument is the work of Steven Vallas (2000), who studied how automation of a paper pulp plant altered organizational power structure. Sensors and statistical quality control replaced human judgment and workers' upward mobility in the organization became closed as engineering credentials became necessary even for foremanlike positions. Process rules became embedded in computer programs that regulated work and that workers could not alter. Vallas thus found automation was a control strategy for process engineers, who used IT to restrict the role of skilled workers to ensure the supremacy of technocratic control over craftsmanship in regulating processes within the plant. Whereas some (Zuboff, 1988) had argued that IT would be a democratizing force that would overturn the hierarchical, Fordist pattern of work, Vallas found that IT was used to consolidate the power and privilege of professional, technical, and managerial employees at the expense of less educated workers.

By supporting Rifkin (1995) and other critical theorists in this way, Vallas was arguing that in the process of IT implementation, technocrats wield cultural capital that is socially defined as legitimate, and they could use this to invoke a technical vocabulary whose power reflected its symbolic value in achieving power. Vallas's thesis was that IT systems have to do with the construction of subculture boundaries within an organization. In the case he studied, technocrats wanted to define manual workers as illegitimate and backward and also wanted to show that engineering knowledge was essential and that they alone could supply it. This thesis
was supportive of the “power-process approach” articulated by Robert Thomas (1994). Power-process theory, a variant of control theory, argued that while on the surface IT interventions are based on rational efficiency/effectiveness factors, in reality, process innovations are driven by underlying patterns of conflict and struggle for power.

Some research emphasizes how information access can confer power on new participants in the decision-making process (Innes, 1988) and open up organizational power structures (Kraemer & Dedrick, 1997, p. 106) even to nontechnocrats. In the private sector it is clear that e-commerce based on IT has brought major challenges to traditional brick-and-mortar firms (Gereffi, 2001). In the public sector, however, even for technocrats the trend has been for increased outsourcing of IT functions, diminished control by CIOs, and increased centralized power through the OMB. While some efforts toward organizational flattening do increase lower-level discretion (the Army platoon in the “electronic battlefield” for instance), this has been accompanied by an increased centralization of command and control and, indeed, that is integral to the very concept of organizational flattening. Lower-level team discretion rarely represents an erosion of top-level control and may very well reflect consolidation of traditional power structure under new forms.

In terms of historical precedent, writers such as Mosco (1998, p. 58) have drawn analogies to radio, which in its early days was also touted as a two-way technological revolution destined to bring radical democratization through creation of virtual communities in the ether—but which, in fact, saw the market forces of commercialism become overwhelmingly dominant, leaving the vision of democratic community through amateur radio a socially peripheral curiosity. Critical theory emphasizes that the boundaries of information openness can be controlled from the top down and can be circumscribed in ways inconsistent with democratization/empowerment visions of the future “information society.” As Singapore demonstrates, and Northrop and Kraemer (2000) acknowledge, it is entirely possible to “leap into the Information Age” while suppressing civil liberties, freedom of the press, and democratization. Kraemer’s study of the Internet in eight nations comes to the conclusion, “Computers and information technology actually reinforce the existing power structure. The Internet may increase the ‘digital divide,’ not decrease it” (Kraemer, 2004). Power may be defined, as the famous political scientist, Harold Lasswell, did, in terms of “who gets what.” By this criterion, the Gini index of wealth and income inequality has grown markedly more unequal in the United States and elsewhere during the last quarter century of massive IT investment, suggesting reinforcement rather than erosion of traditional power structures (Parayil, 2005). This finding supports the conclusions of May (2002), who found IT was not particularly associated with new labor conditions or new social relations.
EFFECTS OF IT ON ORGANIZATIONAL BEHAVIOR

Does IT Weaken Organizational Norms Through Deindividuation?

Deindividuation is the process of alienation of the individual from social norms. It has been linked to IT through the argument that the absence of visual and social cues and absence of close physical proximity in computer-mediated communication (CMC) undermines processes of identification with social norms (Lea & Spears, 1991). Also, from a control viewpoint, when employees are not observable, it is difficult for managers to hold them accountable for their contributions to team tasks. This in turn can lead to peer perceptions of effort inequality and to further undermining of group cohesion. In this argument, if social order rests on cultural enchantment, computer use is said to lead to disenchantment in the Weberian sense. Kiesler, Siegel, and McGuire (1991), for instance, found that CMC removed the contextual salience of social norms, weakening conformity to them. Likewise, Loch and Conger (1996) linked computer use to deindividuation and degradation of social norms pertaining to computer use.

It should be noted, however, that much of the research on deindividuation and alienation from social norms has been conducted not on employees using CMC, but rather has focused on groups such as computer hackers, whose aggression is seen to be facilitated by anonymity and by social distance from their victims (Kabay, 1998) or on similar groups, such as “flamers” in anonymous group support networks (Reinig & Mejias, 2004). Nonetheless, workplace deindividuation can exist. In a study for the RAND Corporation, Wainfan and Davis (2004) observed increased polarization, deindividuation, and disinhibition in CMC environments, with individuals becoming more extreme, less sensitive to interpersonal aspects of their messages, but more honest and candid. Overall, Wainfan and Davis found that CMC can reduce efficiency (as measured in time to solution) of work processes even as it broadens the range of inputs and ideas.

In the workplace, CMC is apt to supplement face-to-face interactions, not replace them, and anonymity is typically not present, greatly lessening the possibility of deindividuation. While there is some research demonstrating the existence of deindividuation in workgroup settings (Clarke, 2002), research suggests that even in CMC environments, proper design of virtual spaces can eliminate problems suggested by early deindividuation theory (Shachaf & Hara, 2002). This corroborates earlier sociotechnical theory research that suggested that deindividuation depends upon the specific manner of implementation of IT within the organization and is not intrinsic to IT per se (Mantovani, 1994).
Does IT Intensify Social Networking and Thus Build Social Capital?

Social capital may be defined as those resources inherent in social relations that facilitate collective action. Social capital resources include trust, norms, and networks of association representing any group that gathers consistently for a common purpose. A norm of a culture high in social capital is reciprocity, which encourages bargaining, compromise, and pluralistic politics. Another norm is belief in the equality of citizens, which encourages the formation of cross-cutting groups.

Social capital theory points almost in the opposite direction from deindividuation theory. Because IT increases the level of horizontal and vertical communication within organizations, it is argued that social networking is also intensified. These arguments are all part of a broader argument that interactive networking leads to the accumulation of social capital, which has been declining in the face of technologies such as passive television (Putnam, 1995a, 1995b), but which may be rebuilt through new interactive information media (Calabrese & Borchert, 1996). Thus Blanchard and Horan (2000) surveyed a California community and found citizen interest by at least two out of three respondents in developing virtual communities around education, community activities, and government and politics. They interpreted this as an indication that technology may be leading people into an era that reverses the decline of social capital as represented by lower levels of civic interest. Numerous other studies emphasize the capacity of the Internet to promote political organizing and mobilization, even when organizers have few resources by traditional standards (Bimber, 1998).

Of course, as Kraemer and Dedrick (1997, pp. 103–104) observe, the increased communication can have both positive (more information sharing) and negative (more performance monitoring) effects from the point of view of the individual employee. Moreover, other scholars (Alexander & Pal, 1998) have reasoned that the Internet could actually increase levels of civic disinterest and accelerate social fragmentation and the decline of social capital. The substitution of Internet and cable news consumption for readership of locally owned newspapers, the replacement of face-to-face public hearings with e-mail feedback under e-regulation, and the substitution of mass Internet mobilization of political contributions for traditional ward organization of neighborhoods are all strong arguments that local-level social capital may be diminished in the modern information age.

The role of IT with respect to social capital is bidirectional. High levels of social capital, such as preexisting strong nonelectronic networks, constitute a success factor in establishment of electronic-based networks (Fukuyama, 1995). At the same time, the spread of IT creates networking infrastructure that encourages the formation of social cap-
Effects of IT on Organizational Behavior

Does IT Improve Managerial Decision Making?

Because IT increases the level of information in the organization, one could conjecture that it would improve managerial decision making. Many information systems are designed for just this purpose, such as executive information systems (EIS), decision support systems, expert systems, computer models, and performance tracking systems. These uses of IT force managers to be explicit about goals and objectives, and goal clarity has been thought to be a prerequisite to effective managerial decision making.

In spite of potential benefits to managerial decision making, there is little evidence that such an effect actually occurs. Kraemer and Dedrick speculate that there may be more effect at the operational level than at the managerial level because operating management deals more directly with information systems (Kraemer & Dedrick, 1997, pp. 104–105). Use of IT to improve decision making is reflected in the spread of expert systems and their use to displace time spent by human managers. Expert systems have spread most where processes are stable and predictable, involve quantitative inputs and outputs, and answers to management decisions can be reduced to agreed-upon algorithms. For instance, expert systems have reduced some management positions in the insurance industry. Without reducing the ranks of management, expert systems have become common in such arenas as agricultural allocation of fertilizers and medical diagnosis of symptoms. However, expert systems are rare in the corporate boardroom or in meetings of agency policy boards.

At times, greater information can reduce the quality of managerial decision making. Research on “groupthink” and “decision by committee” suggests that judgments made after group discussion will be more extreme in the same direction as the average of individual judgments made prior to discussion, due to the tendency of participants to conform to perceived group orientations. Greater IT-facilitated group discussion can intensify attitudes, beliefs, attitudes, polarizing judgments. To the extent that e-mail and other forms of IT communicate average judgments more quickly, a premature consensus may emerge that squelches the innovative as well as the deviant, yet may itself represent polarized thinking. Improved group decision making is associated with a nonjudgmental leadership that encourages all views to be made known, lessens the pressure for social conformity, and reduces the risks of expressing innovative views. These factors are independent of use or nonuse of IT.
There is a large literature on IT and decision making, reflected for instance in the *International Journal of Information Technology and Decision Making*, but almost all of it focuses on research and case studies on specific IT-based decision-making techniques without ever assessing the larger question of whether IT has actually improved the overall level and quality of managerial decision making. IT may provide greater and better information at higher levels of decision making, but whether qualitatively different and better decisions emerge as outcomes is simply uncharted research territory.

**IT AND THEORIES OF ORGANIZATIONAL CHANGE**

**Does IT Promote the Diffusion of Innovation?**

Organization members' acceptance of innovations can be associated with a variety of motives. Managerial desire for control can lead to seeking out innovations that augment control, as many information systems do (Bugler & Bretschneider, 1993). Likewise, the organization’s need for information sharing, aided by IT, can lead to innovation as managers seek to fulfill their missions in an increasingly interdependent world (Bugler & Bretschneider, 1993). Then too, there is the tendency of middle managers to push technology if only as a way to demonstrate new contributions to the organization, contributions that may be recognized through advancement (Caudle, 1990). Innovation is also encouraged through force of example and peer learning as managers encounter innovations at professional gatherings and in peer networks (Kraemer & Dedrick, 1997, pp. 91–93). Finally, simple training transmits innovations from academia and best practices from the field, making these innovations seem to be part of professionalization for the manager and professional status for the organization (Northrop, Dunkle, Kraemer, & King, 1994).

Innovation is change, and IT has a disruptive aspect that has promoted change on a large scale. As Lyytinen and Rose (2003) have shown with regard to private-sector systems development organizations, at times the advent of IT in forms such as the Internet can have pervasive, radical, disruptive effects on organizational processes. Disruption itself creates necessary but not sufficient conditions for subsequent innovation. The rise of the international New Economy is based on an IT-driven sharp drop in communications costs, which in turn has promoted specialized production networks involving producers in many countries. The ensuing intense competition in quality, price, and delivery has disrupted traditional patterns of commerce and forced a rapid pace of innovation among multinational firms.

Not all strategies for linking IT to innovation are equally effective. Research on IT's role in diffusion of innovation has included study of
technology push versus market pull patterns. In general, it has been found that projects that seek to promote innovation through top-down introduction of technology are less likely to be successful than bottom-up strategies that are driven by local demand. Jansen (1995) found, for instance, that a Norwegian program for introducing technology to rural areas had little impact because it did not tie general development strategies to local market forces. Market-pull forces, Jansen found, could be more easily be adapted to local conditions and needs and lay a better basis for implementation success. Baark and Heeks (1998) similarly found inattention to market pull forces underlay limited impact of technology diffusion projects they studied in China. In contrast, market pull dynamics characterize the rise of the New Economy discussed above. The New Economy innovation system is led by large retailing superstores that group central facilities to meet consumer demand, reaching out to final consumers, constantly monitoring the level and nature of demand, and converting this into demand on their own suppliers and ultimately into online transactions and delivery to the market.

IT does not always lead to innovation. For instance, expectations in the late 1990s that e-government would lead federal agencies to “reinvent” themselves are now acknowledged to have fallen far short (Gerin, 2005). Likewise, Mossberger’s (2000) study of an IT innovation in the educational sector led to the finding that IT-driven ease of access to best practices information may not lead to innovation diffusion but may instead increase information overload decision-making paralysis. Information systems development may be thwarted by cultural differences among the parties to implementation, as in the failure of an automated record retrieval system at the U.S. Bureau of Land Management (Rivera & Casias, 2001; Rivera & Rogers, 2004). Moore and Benbasat (1991), based on the work of Everette Rogers (1962), identified eight factors that condition the diffusion of innovations. These are relative advantage of an innovation compared to present processes, compatibility with the prevailing organization, ease of use, result demonstrability, image (potential to increase the status of the organization and system users), visibility, trialability (opportunity to experiment), and voluntariness. In fact, all of the factors discussed in Chapter 13 on success and failure factors could mean IT will not lead to innovation in a specific setting.

In Rogers’ (2003) influential theory of the diffusion of innovation, emphasis is placed on the role of early adopters in promoting imitation and eventually leading to a “tipping point,” after which innovation spreads rapidly, following an S-shaped curve. A succession of groups make the innovation decision, starting with the innovators and followed in turn by early adopters, the early majority, the late majority, and laggards. In Rogers’ description, a critical group is the early adopters, who include opinion leaders who gain status because of their reputation for making
careful decisions based on assessment of costs and benefits. While not itself based on the study of information systems, an implication of Rogers' theory of innovation is that for the diffusion of innovation to occur in any large-scale IT undertaking, emphasis must be placed on reaching out to organizational and community opinion leaders. Innovation diffusion efforts must be carefully targeted toward separate adopter groups, not undertaken in a sweeping one-size-fits-all marketing effort (Jurison, 2000). The literatures on market-pull forces and on success factors in IT implementation both link successful diffusion of innovation to what sociotechnical theorists have long emphasized—participative involvement of leading stakeholders in the proposed technology project.

Is IT Linked to Organizational Evolution Toward the Consolidation of Control?

Systems are created for control. Current trends toward centralization and enterprise architecture have given renewed plausibility to control theories of IT and organizational change. At the heart of control theory is the belief that the inner telos of information technology is a drive toward ever more effective systems control. In control theory, systems are selected primarily for their control functionality and only secondarily for efficiency. Translated into practical terms, control theory predicts that business, government, the military, and other elites will use IT to increase surveillance and control over employees and internal processes, and to regulate their external environments as well. Thanks to IT, surveillance is at an unprecedented level not accessible in the past even to totalitarian societies, albeit in a more benign manner. Control theory finds democratization theory simply wrong: Singapore demonstrates it is entirely possible to be an “information society” while suppressing free speech and free press and not being democratic.

The core tenets of control theory may be supplemented with optional, more controversial corollaries:

1. Within the workplace, technocratic elites displace unions of workers. Systems knowledge replaces craft knowledge. The counterbalancing of management and union within the organization is replaced by the alliance of management and technocracy.

2. In each sphere of activity, IT leads interactions to become depersonalized. Social workers treat clients categorically rather than individually. Doctors become driven by computerized scheduling and cost-accounting. Military officers are distanced from destruction and death, and so on.

3. IT supports a global economy of multinational corporations able to shift resources across borders to defeat unions, smaller competitors, and even governments.
4. Between nations, the international digital divide reinforces a form of permanent technological apartheid, supporting unequal terms of trade between rich and poor nations.

In the more far-reaching version of control theory, John Kenneth Galbraith's mid-20th century notion of 'countervailing powers' is replaced by a 21st-century monism of 'private government' by multinationals in what Manuel Castells (1996, 1997, 1998) has called 'informational capitalism.' Global politics ceases to be about competing national economies and becomes about national and subnational pockets of resistance, where local and regional struggles attempt to preserve cultural identity by resisting multinationalization (Barber, 1992).

The literature supporting control theory is extensive. For example, a study of the use of EIS by Vandenbosch (1999) found that control and power largely drive the perceptions of benefits associated with using management information in organizations. Similarly, Henman and Adler (2003) studied the Social Security Administration and found that computerization had generally increased management control over both staff and claimants, contrary to democratization theory notions about how IT empowers employees.

The central argument against the concept of IT leading to consolidation of control comes from the sociotechnical systems school, whose advocates believe that IT projects often fail precisely due to top-down methods of implementation. What is needed, they say, are participative approaches that seek to adapt technology to human relationships and patterns of interaction (Trist, 1973; Trist & Murray, 1990; Trist, Emery, Murray, & Trist (1997). Sociotechnical theory predicted that in the long run, genuinely participatory IT design processes would win out over centralized planning. The Tavistock Institute and other centers of sociotechnical systems (STS) consulting prescribed meaningful user involvement in system design, planning for skills upgrading rather than deskilling, having an incentive system that rewarded stakeholders, and in general avoiding top-down implementation (Emery & Trist, 1960).

However, as centralization overrides agency control, any forms of participation in systems design become subservient to rationalization of enterprise architecture. The course of centralization of IT in the last decade has shown the ability of implementation principles antithetical to STS to move ahead quite effectively.

A recent version of sociotechnical theory is the "technology enactment theory" put forward by Jane Fountain (2001) in her book, *Building the Virtual State*. As Carl Grafton (2003) has observed, this is a restatement and updating of the sociotechnical viewpoint. Technology enactment theory holds that technological possibilities are enacted into technological
realities in ways strongly affected by organizational, political, and cultural environments, with nondeterministic results that cannot be predicted from technological considerations alone. Technology enactment theory is consistent with the fact that large-scale public sector IT projects often fail, with neglect of human factors commonly found to be at the root of the problem (Garson, 1995).

The relative importance of human factors over narrowly technological factors had been the central thrust of sociotechnical theory since the 1960s (Emery & Trist, 1965) and subsequently of Ken Kraemer and his associates on the urban information system (URBIS) studies (Kraemer & King, 1986), which focused on the relative importance of political factors over narrowly technological factors in public information systems. Similar concepts of the embeddedness of technology decisions in the group culture are at the heart of the theory of the social construction of technology, developed by Bijker and his associates (Bijker, 1995; Bijker, Hughes, & Pinch, 1987; Pinch & Bijker, 1986). Gasco (2003) similarly has developed "new institutionalism" theory, explicitly following Fountain, arguing that technology creates perceived win-win situations for all actors, prompting organizational change, but the direction of change may be positive or negative, depending on technological, managerial, and political variables. "Governance theory" likewise is a loose, currently popular constellation of ideas in the sociotechnical tradition, holding that the process of governing transcends the institutions of government and that the enhancement of democratic governance rests in part on leveraging ICT choices in creative ways that are not technologically determined.

At the global level, the drive toward control and centralization takes the form of what has sometimes gone under the label of "global integration theory" (Garson, 2000, pp. 601–603). Northrop and Kraemer (2000) have demonstrated the close link between computerization in a society and its level of socioeconomic development. Broad diffusion of computing is associated not only with advanced industrialization, but also with provision of mass education, the permeation of all forms of "information society," such as widespread use of telephones and television, and with provision of open access to information. Some go so far as to argue that information society requires information openness, for which democratization is a prerequisite (Kedzie, 1995). The clear implication is that nations that want to compete must democratize as well as computerize, and that democratization and computerization are mutually reinforcing processes.

Somewhat along the lines of Fountain's technology enactment theory, global integration view emphasizes that if the powers that be do not take purposeful remedial actions, the global digital divide will become per-
manent (Ferguson, 1998). Without government regulatory actions, world financial markets will become dangerously susceptible to manipulation of multinational corporations (Soros, 1998). Without government protocols on technology, multinational corporations will monopolize technology to create worldwide dependencies. Without affirmative steps by government to protect cultural identities, multinational (but heavily American) domination of media and information flow will overwhelm local cultures. And of course, in the military sector, the U.S. government itself (not multinationals) is well along the road to monopolizing the means of global military integration (Golden, 1998).

As infrastructure becomes more complicated and resources become more interdependent, communication levels increase exponentially. In such an environment, organizations respond by seeking to implement information systems that will restore reliability, integration, and control with respect to the flow of information. For instance, in the private sector, leading Japanese and U.S. software firms have largely rejected reengineering corporate organization and have avoided large-scale outsourcing. Instead their strategy has emphasized maintaining control over purchasing and development (Rapp, 2002). Management is forced to reinvent structure as the organization’s size and complexity increase. Managers seek new structures that will allow delegation of decision making without abdicating control of the organization (Fletcher & Taplin, 2001).

The consolidation of control is about integration, not about centralization. Based on a study of 70 global corporations, Beaman and Guy (2005) found that both organizations that start centralized (often due to applying a domestic organizational model to the global environment) and those that start decentralized (often due to acquisitions), over time evolve toward distributed networks that are optimal for efficiency and effectiveness. In the public sector, the evolution of strategic planning for IT, discussed in Chapter 11, is all about government-wide integration and control, yet distributed networks are promoted for purposes of access to data and to computer tools. The discussion of centralization versus decentralization that was so prominent in the 1980s and early 1990s has given way to a realization that distributed integration is the synthesis that allows organizations to pursue control over their internal and external environments.

**SUMMARY**

Systems theory focuses on the drive toward ever more comprehensive and integrated systems involving greater control for decision makers but
also better feedback from the bottom. Systems theorists often believe that IT can allow a wider span of control at the top, allowing the flattening of organizational structures and working to undergird a telework revolution. System theorists focus on the integrating effects of IT, which are seen to transcend centralization and decentralization. Their analysis tends to be apolitical, but systems analysts in practical administration see their role as consulting to and for top management. They are not uncomfortable with the concept that their work reinforces the goals, values, and mission articulated by powers at the top. They tend to see employee resistance as irrational and temporary. They see IT ultimately as a force to strengthen organizational norms, not weaken them. Systems theorists emphasize networking and see networking as a primary way to build up organizational resources, consistent with social capital theory. Improving management decision making is a prime goal of systems theories and analysts, who also see IT as the carrier of innovation. They are more apt to see successful systems implementations as increasing control at all levels than consolidating control at the top. They prefer apolitical descriptions of information systems that minimize broader social, political, and international impacts of information systems on society.

Though technological determinist theory tends to be scorned in the academic literature, it is alive and well among popularizers and detractors of the potential of IT. Technological determinists predict more and more IT, marching forward with little resistance, carried by force of example. Though both utopian and dystopian varieties of technological determinism exist, they unite in predicting sweeping impacts of IT. They agree that IT will flatten organizational structures, but utopians focus on this leading to greater efficiency while dystopians focus on it leading to greater employee surveillance and control. Technological determinists agree telework will deterritorialize organizations, but utopians see this as a new era of employee choice and freedom whereas dystopians see it as a revival of nineteenth-century piecework, characterized by worker isolation and exploitation. With regard to effects on power structure, the utopian determinists are polar opposites of their dystopian colleagues. The former believe IT will usher in a revolution of democratization and decentralization and the latter foresee new forms of electronic serfdom. Both the utopians and dystopians tend to agree IT will reinforce organizational norms, and both believe information networking will become the ubiquitous basis for economic and governmental activity. The utopian determinists are inclined to believe that more information will translate more or less directly into better managerial decision making, whereas the dystopians are apt to see IT making the same old decision-making machinery run better, perhaps using the symbolic power of IT to legitimate what would have been done anyway. It follows that the utopians see innovation spreading everywhere, and the dystopians see instead
the consolidation of information capitalism with the primary innovation being the deepening of social control over rank-and-file employees and over citizens at large.

The central message of sociotechnical theorists is that without participatory attention to human factors, information systems will fail to fulfill their promise. They emphasize the free will of systems designers. Will middle management be eliminated? Will telework displace conventional work? Will the organization centralize? Decentralize? Alter in its power structure? It is all open for choice. Enlightened managers will choose to invest heavily in human capital and make technology subservient to human factors. Through participatory, enlightened management of IT projects, employee identification with the organization will become much stronger. Through the good experiences with IT that sociotechnical planning brings, networks will fulfill human needs and the social capital of the organization will increase. By delegating great discretion to the bottom, where the factors of operation are better known, operational decision making will improve while at the same time top management decisions, freed from excessive operational detail, will also be better targeted and will become more effective. The role of top management is to unleash the creativity of the bottom, letting innovation proliferate, often with the aid of IT. The evolution of the organization is not so much toward ever more integrated control from the top as it is toward ever more dynamic and creative marshaling of the organization’s human resources to utilize technology to better fulfill the mission of the organization.

Reinforcement theory, finally, operates under the premise that organizational conflict and the struggle for power are the natural focus of organizational life. IT is a tool and like all tools may be used by the power structure “ins” and as well as by the “outs,” by top management and by unions, by technocrats and by rank-and-file employees. However, the power structure “ins” are in a better position to have more IT tools, more resources to deploy IT operations, more ability to make technocrats their “hired guns,” and, often, more experience in playing the game of power. Reinforcement theorists are most at home in discussing how IT reinforces organizational power structures and how IT serves in the process of organizational evolution toward the consolidation of control (which is not necessarily centralization). They agree with the sociotechnical theorists that whether organizational structures are flattened or organizations are deterritorialized through telework are matters of choice. They predict the choices will be made that increase or at least preserve control from the top, and managers’ perceptions of what is in the interest of their own power may vary from setting to setting. Top management will disagree, for instance, on whether telework increases or decreases their control. Top management will not assume.
as technological determinists often seem to do, that IT is an automatic engine of innovation and progress. Rather they will require proposed IT innovations to submit business plans that prove their advantage to those who control the reins of organizational power. Top managers, recognizing the power implications of proposed IT systems and at the end of the day, they choose systems that reinforce their own power advantage.

Each of these four theoretical viewpoints (systems theory, technological determinism, sociotechnical theory, reinforcement theory) arose and remain popular to this day because each contains truths. Each is able to explain certain aspects of the topics covered in this book. Systems theory is at its best in understanding the logic of and drive for integration illustrated, for instance, in the IT guidance provided by the OMBC, which draws explicitly from systems analysis. Technological determinism is most compelling in its predictions about the spread of IT in the public sector, in e-government for example, and in accounting for the fact that managers frequently feel they do not have the freedom of choice other theories emphasize but instead in the long run feel compelled to follow the path of technology. The central contribution of sociotechnical theory is emphasizing that information systems first and foremost rest on human resources, not technology, and thus IT failures are generally traced to human factors problems and IT success rests on prior investment in human capital. Reinforcement theory extends this recognition of the importance of human factors to bring into the explanation an appreciation of the role of conflict over control and power, seeing IT efforts not as sanitized technical systems but rather as organizational moves in a strategic chess game centered on winning power.

Likewise, each of these four theoretical perspectives has difficulty explaining some aspects of IT. Systems theorists attempt to incorporate human factors but on the whole, its central logic of rational integration leads in the direction of one-size-fits-all implementation from the top. Technological determinists are not very good at explaining why superior technologies may lose out to inferior ones (beta to VHS, for instance) or at explaining the slow growth of superior technologies (Linux versus Windows), or for that matter, why technology spreads more rapidly in one setting than in another. Sociotechnical theorists have much to contribute about IT implementation, but their common assumption that there is a consensual basis for all stakeholders to an IT effort sometimes is less useful than reinforcement theory's understanding that different stakeholders may have different interests and are locked in a struggle for power. Finally, reinforcement theory has difficulty accounting for the fact that IT does lead to substantial changes in organizational structure (the New Economy for instance) that are not well explained by notions that IT reinforces existing power arrangements.
In this chapter we have discussed the relative lack of correlation between IT investment on the one hand and organizational restructuring on the other. While not highly correlated with IT investment, nonetheless we are seeing some of the predictions of IT development, such as organizational flattening and teleworking, make slow inroads into the public sector. These developments are clearly dependent upon IT investment. Although the research is not conclusive, it appears likely that investment in human capital and the development of social capital may explain these facts and both play much larger roles than either systems theory or technological determinism have suggested but which have been pointed to by sociotechnical theory. It also appears that reinforcement theory has much to contribute in emphasizing control considerations in explaining the course of telework: the slowness of its spreading does seem due in large part to managerial fears of loss of control, while at the same time addressing these concerns seems key to successful implementation.

This chapter has also discussed the recentralization of IT operations, the tendency of IT to reinforce structures of power, and the tendency of organizations to evolve toward consolidation of control, albeit using distributed networks. Networks do seem to develop social and organizational capital, but to what end? If one theorizes that that end is in support of the mission, goals, and values of those who hold power in organizations, one would expect the outcome to be a form of elite cultural hegemony. A melding of social capital theory, network theory, and reinforcement theory would explain the relative absence of deindividuation, the technocratic drive toward centralization of IT operations on an enterprise-wide basis, and the fact that outcomes such as e-government are implemented in ways that generally do not enact the radical and participatory potential of information and communications systems.

It has been outside the scope of this book to do more than point out the relation of prevailing theories (systems theory, technological determinism, sociotechnical theory, reinforcement theory) to major topics and trends in public-sector information systems. No “unified field theory” of public information systems has been presented. However, the practical world of IT does have theoretical implications. One’s theoretical perspective will guide how one goes about interpreting the potential and promise of IT and will inform the choices one makes about its direction. Those who claim to be “practical” and “have no theory” inevitably make assumptions about the nature and direction of IT. Not infrequently these assumptions become those of technological determinism, assuming the inevitable march forward by the force of sheer technology. It is better to be explicit about theoretical assumptions, to examine them critically, and to be open to the synthesis of ideas. That synthesis must be cognizant of certain basic facts about the evolution of IT: that it involves political choices over policy, power, and control.
DISCUSSION QUESTIONS

1. How has IT investment in private and nonprofit organizations affected middle management? What structural changes have occurred? Is this unique to public organizations?

2. What conflicting viewpoints exist with respect to teleworking? What action has Congress taken to promote telework? What is the usual managerial view of telework?

3. What are the organizational benefits of a centralized IT office? What are the costs? How does this relate to an organization's management system?

4. Describe reinforcement theory's traditional view of IT with respect to power structure.

5. How is IT related to deindividuation? Can you think of a firsthand observation or experience?

6. How do you think IT affects social networking? Is IT likely to increase social capital in an agency? Why or why not?

7. How has the process of organizational decision making changed with IT? Is IT likely to improve the quality of decisions? Why or why not?

8. IT and innovation do not always go hand in hand. What attributes enhance the diffusion of IT innovations?

9. An "information society" does not guarantee a democratic society. How might IT be used to reinforce nondemocratic trends in an organization? In a society?

10. Does IT tend to change organizational structure?

GLOSSARY

Countervailing powers: John Kenneth Galbraith, an American economist, set forth this theory to explain how the success of American democracy rested on the balancing relationship among business, government, and organized labor.

Fordist hierarchy: A reference to Henry Ford's system of assembly line system of mass production, which provided greater managerial control over workers' performance.

New economy: The current, highly competitive, global business environment in which the speed of communication has dramatically increased due to technological advancement and an evolving class of technological knowledge-based employees.

Organizational behavior: A field of management studies that emerged in the 1940s, centering on what people do, think, and feel within organizations. Individual, team, and structural characteristics of an organization are important levels of organizational behavior.
Organization theory: Theories of how organizations function in relation to interpersonal relations, processes, politics, power, structure, motivation, organizational culture, leadership style, and environmental factors.

Telecenter: A location, other than an organization's main office, that provides technological, media, or other aid to employees so they may function at a remote location but with all the conveniences of the office where they work.

Telework: Conducting work from some location other than a traditional office setting. This is also known as telecommuting, remote work, work from home, etc.

URBIS: Urban Information Systems; URBIS is a set of research studies conducted under the leadership of Ken Kraemer and others, which investigated the use of IT within local governments, with a focus on political implications.

ENDNOTE

"The archetype of large-scale IT-based consolidation is the creation of the gigantic Department of Homeland Security and its corresponding consolidated information systems. This "mother of all bureaucracies" has been ironically established by a political party ideologically opposed to bureaucracy."
CASE STUDY
Communities of Practice—An Australian Case Study: Leveraging Knowledge by Complementing Technology with Social Participative Learning

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About Communities of Practice

ICT provides multiple opportunities to share—as distinct from discover—explicit (observable) knowledge. Some commentators claim that increased knowledge development and sharing is inherent in the technology itself. McDermott summarizes this succinctly:

"IT... led many companies to imagine a new world of leveraged knowledge—those companies believe that if they could get people to simply document their insights and draw on each other's work they could create a web of global knowledge that would enable their staff to work with greater efficiency and effectiveness (McDermott, 2000, p. 22).

However, the effectiveness by which data is turned into useful knowledge requires greater emphasis on the role played by people in an organization as they participate in the development and sharing of that new knowledge (Davenport & Prusak, 1998). This is particularly important when considering the tacit knowledge or experiences residing within people's minds (Leonard-Barton, 1995; Nonaka, 1998; Nonaka & Takeuchi, 1995).

In this environment, communities of practice are increasingly being seen as a very effective means of knowledge discovery, development, and sharing. They have been defined as "collections of individuals bound by informal relationships that share similar work roles and a common context" (Snyder, 1997, quoted in Lesser & Prusak, 2000, p. 123). Wenger (2000, p. 3) goes further and describes them as "providing the capacity to create and use organizational knowledge through informal learning and mutual engagement." Communities differ in diverse ways from the teams or work groups previously hailed as the best approach to community work. Lesser and Prusak (2000, p. 125) state that teams or work groups "have a task orientation, are often launched for a specific purpose, and have formal requirements for membership...communities of practice, by contrast, have an informal membership that is often fluid and self-organizing in nature. Specifically, such communities are driven by the value of sharing interests or practice to discover new knowledge that evolves from the ongoing collective process, as compared to teams driven under a defined charter, with the value measured by results delivered. The knowledge domain or practice that defines the community may change organically over time with the focus being on making connections between topics...as opposed to teams that are task defined by clear boundaries in which individual contribution is made according to a work plan.

In summary, communities of practice operate more independently than teams or work groups, are less easily managed, and their output is less easy to measure. Consequently, defining a step-by-step approach to establish a community is not an easy task. Wenger, McDermott and Snyder (2002) argue that communities of practice need to be first acknowledged, and then supported and fully integrated into the operation of organizations in a way that does not disrupt the informality, collegiality, self-organization, and internal leadership of these communities. The underpinning need when developing communities, Wenger argues, is to "build capacity through mapping knowledge needs and build a social learning system through developing communities and con..."
Meeting across boundaries” (Wenger, 2000, pp. 5–6). Designing an effective communication strategy requires a communal approach that links technology to people, and nurtures a willingness to share knowledge in a trusting environment.

The Australian Context

The Australian system of government has public sector departments at federal (whole of Australia) and state levels that implement government policy and programs. Both the federal government and public sector recognize that Australia needs an e-government knowledge strategy to produce a knowledge economy. Similarly, the Victorian state government and public sector know that the escalating take-up of ICT in society is having significant impact on the workplace and service delivery. To function effectively in this changing and often ambiguous environment, departments must capitalize on the value of their knowledge repositories. This means not only codifying, storing, and retrieving known explicit information but critically, uncovering, sharing, and applying the tacit knowledge residing within employees’ heads.

It is examining how a community of practice encourages the uncovering, transfer and leverage of tacit knowledge as part of an e-government strategy that sets the purpose for this case study.

Case Study

This first-time-shown case study is set in the Department of Justice, one of 10 departments in the Victoria public sector. Having a budget of AUS$800 million, the Department comprises 43 business units and 53 associated agencies and statutory authorities. One of the three largest state government departments, it deploys 15,500 permanent staff and 5500 volunteers in six core program areas; Police and Emergency Services, Attorney-General (including courts and tribunals), Corrections, Consumer Affairs, Gaming, and Racing.

In 1999, the then Departmental Secretary Peter Harmsworth, saw “Limited cooperation between people, no visible leadership, and poor performance metrics as being significant inhibitors to sharing tacit knowledge.” On analyzing the Australian Quality Council’s Australian Business Excellence Framework (ABEF), Harmsworth embedded its 12 leadership and management principles in the embryonic business improvement strategy emerging on his watch. In launching the strategy, Harmsworth used the ABEF Organizational Self Assessment (OSA), a performance diagnostic tool, to evaluate departmental performance at corporate level. Acting on OSA findings, Harmsworth approved a comprehensive program to design an integrated knowledge management (KM) strategy aligned with organizational goals and focussing on core business practices and processes. The corporate intent was that learning, through collaborative networks and enabling ICT systems, would be part of everyday life.

The then chief knowledge officer, Philip Hind, knew ICT as a necessary, but in itself not sufficient, element of an effective KM strategy. In May 2002, following two years of intense knowledge mapping and analysis, Hind, in launching the resulting KM Strategy, Deployment & Change Model emphasized, “We... are drowning in a sea of information and documents... are failing to tap the potential of our people.” An element of the strategy was “The formation and operation of communities of practice where they make appropriate contributions to overall corporate objectives, as well as to personal development goals.” Here was recognition that communities “can play a crucial role in sharing knowledge expertise across functional boundaries.” In this context, Hind defined a community of practice as “A network of people who share an interest in a similar subject area and who agree to work together in sharing knowledge, developing expertise or solving problems.”

continues
Establishing a Business Excellence Community of Practice

Synthesizing and giving practical form to the business improvement and KM strategies, Harmsworth created and sponsored the Business Excellence Network (BEN) as a community of practice which, in 2005, is the exemplar for public-sector participative social learning. Managers across the department nominated interested persons to join the BEN, of which 15 were trained in the OSA diagnostic and tasked with facilitating OSA at business unit level.

Harmsworth describes this organizational development initiative as "giving people permission to group" and recalls his vision for the BEN was:

To stimulate discussion and experimentation of continuous improvement initiatives across the department...to build a new staff empowerment culture...to demonstrate the power of communities of practice, and to spawn other communities.

Importantly, Harmsworth appreciated the ABEF as being more than a business improvement model; he also understood its value in increasing intellectual and social capital.

The framework is a great device for getting people to engage, not just within, but also across boundaries...it helps break up silo behaviors...it is a platform for building trust, and trust is essential to open and willing exchange and transfer of knowledge...it's about making new friendships while exploring new territory.

Realizing Harmsworth's objective of fostering "innovative free thought and comments and open discussion," the BEN was self-organizing, professionally facilitated, methodically initiated dialogue with persons of interest, and shared learning about organizational self-assessment and improvement.

Having a knowledge domain, practice, and community, the BEN was a community of practice as described by Wenzl, McDermott, and Snyder (2002). The domain was business excellence, and the practice was implementation of the ABEF principles, and participation was voluntary. The core element of practice allowed members to openly communicate and explore issues, and to actively promote, initiate, and facilitate business excellence activities within their sphere of influence. To further increase personal learning and knowledge networks, members were encouraged to contribute to a broad spectrum of improvement activities and to recruit and mentor new members.

The rapid, informal success of the BEN is evidenced in part by the fact that, 18 months after forming, increasing interest in the community and demand for its knowledge membership increased by a factor of 4 to more than 43 in 2001. However, it was realized that the BEN had grown too large and the skills of members too diverse for ongoing development and resource to the network to be viable.

Responding to this crisis of expansion, the inaugural 20-person Business Excellence Strategy Group (BESG), community of practice, was created by and from BEN members. This group receives focused training around business excellence disciplines and tools, and is highly involved in business excellence work, while the BEN, having completed its major work of the Departmental OSA, evolved to being a community of interest.

Experience of Business Excellence Communities of Practice

Marie Syrjanen, a BEN BESC foundation member, is the manager of organizational development at the Victorian Institute of Forensic Medicine, part of the Department of
justice. Having for six years been immersed in the business excellence experience, Marie is sure and articulate in describing four factors critical to community success.

First, Syrjanen insists, Peter Harmsworth's belief, vision, and support were absolutely essential, "There must be a high-level champion to clear the way, to inspire, and to provide material support." This ensured managerial backing at lower levels, particularly in releasing members to join organizational improvement activities, in funding members to attend events and study tours, and participation in a peer support learning and development program.

Second, ongoing training is essential as it empowers through knowing the "how to do" as well as the "what to do." Syrjanen's experience is that "When new people with different understandings of business excellence came on board, there is a risk of them being overwhelmed and not continuing." Consequently, community members "would spend valuable social time with new people in introducing them to what it was all about."

Third, nurturing and trust building is vital to the exchange of ideas, information, and knowledge. As Syrjanen explains:

"We observe the Chatham House rule ... frank discussion does not go outside the network and that is a real trust builder, a belief thing ... if the rule was broken, I think it would be the end."

Fourth, there must be open access and flexibility rather than rigid structure — this means focus on the value of community practice and peer support rather than structure. Syrjanen recalls:

"There was a period during which the practice became very structured and adopted a more meeting style. During this time people lost energy ... the group lost momentum ... but people who were committed were not going to be deterred."

**Benefits of Business Excellence Communities**

Syrjanen firmly believes that the business excellence community benefits members, business entities, the Department of Justice, and Victorian government.

First, members gain from developing close relationships within the community. "You grow personally and professionally, develop and bond with these people ... you can share, you understand each other." This leads to leveraging other people's information. Contacts are made across the department that provide quick access to where knowledge resides, and who may have what information is shared between the members as trust develops. "I have never had anyone say I haven’t got time — everyone will help." Trust increases as relationships grow: "You can talk to people confidentially." Finally, Syrjanen comments "To experience this and not come out a different person wouldn’t happen ... it’s only logical to join because of the networks that are created ... and the knowledge gained by being part of the group."

Second, gains to the department are many. Knowledge sharing leads to shorter learning time, quicker problem solving, improved service delivery, reduced costs, and greater employee satisfaction. Syrjanen notes that the shared learning led to "Beliefs in the value of sharing knowledge migrating back into the workplace ... this led to a more holistic framework." This in turn increased promotion of the ABEF principles across the department which increased support for organizational improvement initiatives. This in turn led to enhanced employee relationship practices, and improved planning and project management processes. Harmsworth stated that the benefits he observed were that ideas and learning were traded between people as they became mutually sup-
porting, leading to "fermenting change at the operational level." He described the whole process as "letting one thousand flowers bloom," in which it became normal practice to constantly "scan the environment." Harmsworth also stated that in his view the experience of the business excellence community helped to:

Change the department and improve its ability to develop partnerships, to continually work on improving the justice system, to build an inclusive planning process to achieve a vision and gain staff buy-in, to develop better performance measures, and to develop capabilities to achieve a vision.

Third, there were also benefits for the Victorian government. Both Harmsworth and Syriaan believe that the BEN-BESG experience has increased information and knowledge sharing across departments resulting in greater interdepartmental collaboration. The Department of Justice learning is being used to model a broader Victorian public-sector approach to communities contributing to quality improvement and KM. Furthermore, communities of practice have since been adopted as part of a whole-of-government strategy that aims to "Develop active communities that will be of value to the e-government programs, citizens, departments, e-government projects, and individual members."

**Lessons for Communities of Practice as an E-Government Strategy**

A number of lessons can be learned from this case study in assisting communities of practice to become an effective element of an e-government strategy.

First, ensure that communities have high level sponsorship. This is especially important given that resources are needed to ensure that they are able to function effectively.

Second, and related to the above, members must be able to demonstrate the (often intangible) benefits of communities to senior decision makers and potential members. This is a particular challenge as quantitative measures are not always applicable or appropriate in demonstrating the degree to which community practice benefits the organization. As Syriaan notes, "It is important to make the wins high profile, to communicate them in many ways, provide updates of what is happening to the Secretary and all levels of management."

Third, communities must be very visible to the general work force. For Syriaan this also means "keeping the language simple and not using management jargon."

Fourth, communities must be allowed to grow organically, and although some structure is required, allow members to experiment with new ways of working, to decide on the degree of formality they desire, and not to overformalize engagement.

Fifth, continually focus on keeping the community relevant and fresh to ensure that members see value in participating, and as Harmsworth has it, to "constantly seek ways to embed new learning into mainstream operation." This means having a workplace culture in which innovation and experimentation are encouraged in discovering new ideas and approaches.

Sixth, knowledge sharing by communities is a highly effective, low-cost activity that complements and adds value to ICT systems as knowledge repositories.

**Conclusion**

This case study shows that communities of practice are important to government in improving service delivery to society. Such communities are a means by which trusting personal relationships can grow into reliable and responsive networks in which the discovery, transfer, and leverage of existing and new knowledge—especially tacit knowledge—can occur. It illustrates that very successful e-government strategies provide a useful as well as an ICT vector for change.
References


Correspondence

Dorothy Krajewski, immediate past Manager—Continuous Improvement, Department of Justice, Victoria, e-mail 30.03.05.

Philip Hind, Chief Knowledge Officer—Australian Taxation Office, e-mail 29.03.05.

Endnotes

* Now Inaugural Chairman and CEO of the Victorian State Services Authority.

* New Chief Knowledge Officer—Australian Taxation Office.