Technology Management and American Culture: Implications for Business Process Redesign

Seeing beyond corporate cultural boundaries is a necessary first step toward effective process integration and corporate transformation. But to ignore national culture is to invite failure.

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OVERVIEW: *Culture creates barriers to business process reengineering. Three distinctive levels of culture must be recognized in process redesign—national, corporate and work group culture. American national culture has the most profound influence. Individualism and autonomy are key features of American culture that work against the logic of process integration and commonization by rewarding individuals for pursuing their own self-interests. This tendency also generates a lack of trust, which in turn creates barriers to sharing electronic data. Reengineering difficulties are exacerbated by an American fascination with technological solutions, and a view of new technology as a "silver bullet" that yields benefits automatically. Often, process redesign cannot be implemented without culture change. Culture can be influenced by exposing internal groups to external pressures, ensuring employee participation in reengineering, recognizing that training alone does not achieve culture change, redefining group boundaries, managing anti-champions, building trust, and leveraging the strengths of national and corporate culture.*

To compete effectively in world markets, many American corporations are attempting to redesign basic processes in ways that enable closer collaboration or *integration* of

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internal functions and/or external relationships. Integration of business processes often is equated with the introduction of new information technology (IT). Investing in IT, however, does not guarantee benefits. In a review of several recent studies, Majchrzak reported failure rates for the implementation of computer-automated technology in American industry that ranged from 30 to 75 percent (*1*).

One explanation for these difficulties is that IT is *only* an enabler of better business processes; as an enabler, it cannot of itself achieve process improvement. Adler and others have reviewed in detail changes in workforce skills, work procedures, organizational structure, strategy, and culture that must accompany the introduction of advanced computer-automation if corporations are to realize the full benefits of IT (*2–4*). *Culture* in particular is mentioned frequently as an important factor affecting redesign efforts, but its nature and implications typically are not understood sufficiently to provide a base of knowledge for planned culture change.

In this article, we address this need by exploring the role of culture in business process-redesign, and by providing suggestions for managers who are engaged in implementing new information technology aimed at process change. Although cultural factors may affect virtually any element of a process redesign initiation (e.g., integration, streamlining, decentralization), our discussion will focus primarily on efforts to *integrate* the corporation, or to forge closer collaboration between internal functions and/or external partners.

We define culture as an historically grounded system of shared assumptions, ideas, beliefs, and related patterns of behavior learned by a group of people over time as a result of their collective experiences. Three interrelated forms of culture influence the way corporations think about and use information technology: national, corporate and work culture. *National culture* is the distinctive pattern of ideas and behaviors of the peoples residing within the territory of a nation state. *Corporate cultures*

are subcultures within a nation state that derive from the corporate founders, and evolve through the learning experiences of the corporation. *Work cultures*—often dominated by the perspective of a particular discipline such as engineering or accounting—take shape below the apex of the corporation, where work group members share common tasks over relatively long periods of time. Of these three forms of culture, national culture has the most profound and pervasive influence on behaviors and beliefs.

Individualism and Autonomy

One of the most important national culture barriers to process integration in American enterprise is the axiom of *individualism,* and its organizational extension, *autonomy.* Individualism holds that "all values, rights and duties originate in the individual, and that the community or society has no value or ethical significance not derived from the individual constituents" (5). Americans recognize no *a priori* allegiance to any higher authority, secular or sacred, above the authority of the individual to determine his/her own destiny. There is "no logic of interdependence," apart from enlightened self-interest, which admits only a temporary need for conditional alliance (6). The heterogeneity of our society—traceable to our history as a nation of immigrants—both contributes to, and is a product of, our inability to find reasons beyond self-interest for sharing with others. With no common set of traditional values that unify all Americans, our agreements to cooperate extend only so far as they serve *our* interests, no farther. Individualism in America grew stronger during the 20th century, as industrialization broke up small farming communities where shared values and norms were more common.

Inside a corporation, individualism is expressed in the quest for *autonomy*—the right of discretion over one's actions—by individual employees, managers and organizational sub-units. Independence is both a measure of, and a reward for, organizational status. Autonomy is reflected in the tendency for individual organizational units to view their mission as paramount to the achievement of organizational goals, and to assert their prerogative to determine the one best way that their work should be carried out. This belief in the right of self-determination generates many well-known maladies, such as suboptimization, "not-invented-here" syndrome, and the inability to transfer organizational learning across units. It also gives rise to a profusion of different work processes and work tools for doing the same type of work within a single corporation.

One large American firm we observed used nearly one dozen different major computer systems in its pre-production processes; a comparable Japanese company used only one. Being able to design your own work process, and hence choose your own computer-based system, are key perquisites of American

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management. We have seen newly appointed managers dismantling work processes and/or computer systems implemented by their predecessors in order to stamp their own identity on their organization.

Autonomy is directly relevant to the issue of process redesign. A major reason for redesign in the first place is the undisciplined proliferation of methods, procedures and tools that characterize American organizations. The effort to redesign and integrate processes often requires *commonization;* that is, the design of processes that share common principles and utilize common hardware and software. The high value placed on autonomy, however, runs counter to the basic mission of process integration and commonization, which require or assume *interdependence* across activities. Employees and managers alike may be disturbed by changes in work practices that require them to shape their actions in response to the needs or interests of others.

The Issue of Trust

Trust is another dimension of national culture that affects both relationships between employees in different sub-units of the same corporation, and relations between corporations. The trust issue is salient in efforts to integrate the corporation with its external customers and suppliers. Unlike individual employees, corporate entities in the United States are legally required to pursue their own interests. Partnership has a nice sound, but everyone at the "partner" firm knows that the guys/gals in the other company are legally required to pursue their own interests. Distrust, even paranoia, abounds. Since we are all quite familiar with self-serving behavior in ourselves, we are quick to spot it in others. Given our expectations about others, partnership agreements always contain provisions for termination. None lasts forever.

The problem is that process integration requires trust. Integration implies *sharing* information—being *open.* Sharing and being open require trust, trust that the other party will not take advantage of you. The use of information technology to access data within another company heightens the trust issue. The discomfort is exacerbated when the exchange process is automated and thus not under direct human control. When the other party is known to have interests that diverge from your own, and when that party may break an alliance at any

American Culture and Technology: Historically Grounded Biases

Culture embodies the past learning of a social group. Behavior patterns that have been more or less successful in meeting the historical challenges experienced by a group are the source of current ideas about the way the world works. These ideas provide daily guidance on the way one ought to behave in the present, and constrain the range of deviance that will be tolerated.

The tendency for culture to reflect historical experience is illustrated in the American fascination with technology. Many writers have noted the tendency of Americans, perhaps more than any other people, to view technology as our most likely salvation in the face of a serious threat. Whether the threat emanates from disease, enemy aggression or international competition, Americans are more likely than others to look for technological solutions, and to pay breathtaking sums in doing so. Huge investments in technology by American corporations (some estimate more than $185 billion spent on computer hardware, software and services in 1993 alone) are but one manifestation. These sums are dwarfed by parallel investments in medicine and national defense. Other industrialized nations do not follow this pattern.

Our national obsession with technological solutions reflects a system of thought and behavior that grows out of the American experience. As "a civilized people . . . in the midst of an uncivilized continent" (16) the founders and pioneers of this nation forged a unique philosophy that combined pragmatism and realism with a stubborn determination to overcome all obstacles. The pragmatic approach was to "do whatever works."

Especially in the frontier environment where dangers were plentiful, labor scarce and the comforts of civilization frequently nonexistent, machinery and weapons "worked"—they gave the pioneer a means of survival and control over a hostile environment. The rapid diffusion of innovative farm machinery during the 18th century exemplifies Americans' long-standing reliance on technological solutions. Rapid technological diffusion, stimulated by a scarcity of labor, points to the historical roots of a fundamental axiom in American industrial thinking about technology; namely, technology is a substitute for people.

American historical experience with technology has fostered several misconceptions that impact technology management today. For example, when faced with a serious problem, Americans often reach for the technology first, viewing it as a "silver bullet" that can be "thrown (shot) at" problems without regard for other elements of the work environment, particularly human and cultural factors (17). Americans have a tendency to conceive of technological systems as foolproof—to believe that they will not fail, will work easily and immediately, and be able to stand alone without human intervention or support systems (18). Technology also is believed to be an effective solution to many kinds of industrial problems, including "people problems," generally through the use of technology to replace people or reduce skill levels (19). These culture-bound beliefs can lead to the expectation that information technology will automatically generate the benefits of business process redesign without the need for other significant organizational and cultural changes.—**M.B., D.F. and D.H.**

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time, there is often the uncomfortable suspicion that open access could be abused. Such discomfort often lies behind managers' reluctance to establish electronic data interchange.

While the United States is not the poorest nation in terms of trust (7), trust is nonetheless a scarce resource in this country (8). Distrust in the United States is profound. It is linked not only to individualism, but to our short-term time horizons and the heterogeneous nature of our society. Long-term mutual interest, and a sharing of basic concepts and values, is needed to promote trust, but a short time horizon does not enable us to conceive of a long-term need. Further, given the enormous variability of value systems within our society, we can never be certain that others share our values. Lacking knowledge of the other, we cannot trust them, setting up a vicious cycle of distrust.

Japanese organizations are so well-integrated partly because they do not have our problem of distrust, and hence are more willing to collaborate in process improvement. In a closed, homogeneous society centuries old, values of the other party are shared. Bonds of mutual

obligation between parties, and the long-term development of *ningen kankei* (translated roughly as the degree of closeness and cooperation that exists in a relationship), foster an expectation that partners will "do the right thing." Japanese corporations do not readily admit outsiders to their inner circles precisely because of the trust issue; they know that they cannot rely on outsiders to the same extent that they can rely on each other.

We are not arguing here that trust relationships do not happen in the United States, only that they are more difficult, and must be built over time through experience. Given our individualistic assumptions and practices, trust is not a given. Trust is a hard-won competitive advantage.

In the remainder of this article, we draw upon comparative case study material to illustrate the impact of culture on business process redesign as mediated by information technology. The case study data presented below are drawn from our experience in researching, managing and consulting on technology-enabled process change in the automotive and aerospace industries, and from the relevant literatures. After each case, we will

discuss the general (i.e., American) and specific (i.e., subcultural) issues that are pertinent to an understanding of the case, thereby setting the stage for an outline of management implications and recommendations.

Corporate Culture: MDC and Its Suppliers

American corporations exist in a national context that shapes the thinking and action of leaders long before they become affiliated with the corporation, and provides a framework of values and practices within which most businesses operate. This suggests that national culture exerts a commonizing influence on corporate cultures. Notwithstanding, several factors combine to make each firm distinctive, including: a unique group of founders (and employees), who bring particular sets of experiences, expectations and values to the company; a particular operational environment (e.g., the specific industry, region and time period of founding); and a unique history. The last factor is crucial. The spontaneous responses of social groups to critical historical incidents, whether shaped by design or by chance, test "native" paradigms, either reinforcing or modifying them.

Learning associated with a firm's experiences can have a significant impact on its ability to change. We have studied a number of firms engaged in process redesign efforts aimed at linking suppliers and/or customers more closely through the use of information technology. An examination of one such effort illustrates some of the ways in which corporate experiences and learning interact on an American cultural backdrop to yield distinctive responses.

One of our field studies was commissioned by a large, multidivisional manufacturing corporation (which we will call MDC) facing severe pressure for improved international competitiveness. In order to speed the introduction of new products, the corporation launched a major redesign of its product development process. This initiative had as its cornerstone the need to integrate and commonize product development across a wide range of internal functions and external suppliers. Commonization was to be achieved both by process redesign and by deployment of a common set of CAD/CAM/CAE technologies that would share data through a common product database.

MDC's effort to achieve process redesign reflects certain aspects of national culture that we suspect are widespread in American industry. To begin with, although the leadership of this effort was explicit in pointing out the need to redesign processes and introduce technology in unison, implementation took quite a different path. The internal divisions and external suppliers of the corporation, accustomed to operational autonomy, balked at the notion of a common product development process, insisting that differences in their products required unique developmental steps and decisions. So strong were the

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objections that implementation of process redesign was stalled for months. In frustration, the leadership concentrated increasingly on new IT deployment. They urged internal divisions and external suppliers to adopt a common set of computer-aided tools, which, they argued, would improve communication, even if core processes were to remain heterogeneous.

Unfortunately, even this more limited approach did not quell objections. Some divisional leaders and members argued successfully that effective decision-making about technology had to be made at the local level, and that corporate-wide selection of common tools would penalize their operations. A survey we administered illustrates the nature of the problem. While roughly 75 percent agreed with the statement, "The fast-to-market program's strategic technology will contribute strongly to the success of MDC," only 5 percent agreed with a second statement, "The fast-to-market program is providing the technology I need to do my job." Organizational members understood the value of commonized processes and technologies, but when it came to *their* tools, only they were qualified to make technological choices.

In the face of heavy resistance, the fast-to-market program adopted a "hands-off" stance. Each internal and external unit was to make its own decisions regarding whether and how new technology was to be adopted. The fast-to-market program developed and selected a common technology, but offered minimum guidance and support in implementation. Each unit was free to do its own thing—deploy new technology as quickly or slowly as they chose, redesign their product development process if they wanted to (or not).

Culture of Innovation vs. Speed

We also studied two component suppliers of MDC that shared several key features. Each employed several hundred people and had a corporate history dating back several decades. Each was a major employer in medium-size cities located 100–150 miles from MDC's headquarters. Each provided critical core components to MDC, their long-standing and most important customer, and each used computer-based tools extensively.

In spite of these similarities, the responses of the two organizations to the fast-to-market program were dramatically different. Supplier A responded with enthusiasm, launching almost immediately into the task of process analysis, redesign and new technology implementation. This organization became the first unit—

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inside or outside the company—to complete a full conversion to the new common system. Within one year after the announcement of the program, they had implemented solid modeling in design areas and tool rooms, and were heavily engaged in process reengineering. Hands-on users were positive about the solid modeling technology and new work system, and noted no major problems during implementation.

Supplier B presented a vastly different picture. By the third year following program announcement, this organization still had not converted. When we arrived, the site was polarized into two camps: The process change champion and his protégés favored conversion to the new common system, while a group of middle managers, several engineers and one powerful design supervisor resisted doggedly. Resistance took the form of time and cost studies "proving" conversion would be harmful, repeated delays of implementation dates, and subtle interference with ongoing pilot tests of the solid modeling technology. Hands-on users polarized; users affiliated with the change champion were 65-percent positive, while those associated with the anti-implementation group registered a 40-percent positive response. Differences between Supplier A and Supplier B can be accounted for in part by their corporate cultures, described below.

The history of Supplier A is recounted in a book-length publication read by many employees and proudly shown to visitors. The book portrays Supplier A as a technology leader involved in the happenings of a global community. As a World War II munitions supplier, this company achieved worldwide recognition for its product technology. During the company's formative decades, a *culture of innovation* emerged, in which a set of management policies and practices (e.g., financial support for high-risk technology ventures) stimulated and encouraged technological change.

This culture of innovation spread to the process arena, encouraged by a top management that linked product and process innovation. Supplier A stayed abreast of the state-of-the-art process tools, and absorbed new process technology as soon as practicable. Early in the 1980s, a "factory of the future" was showcased. Managers and new employees with strong technical backgrounds were recruited to "push the process technology envelope." Managers and employees alike were eager to get their hands on the latest process tools. Newly hired engineers were required to learn to use product design tools and to work for several months as designers. A cadre of young CAD designers with a passion for state-of-the-art work tools was recruited. This cadre often piloted new systems, giving less experienced employees more time to learn.

Supplier A had a substantial number of other important customers all over the world. It was not a "captive" of MDC. In order to attract and retain a diversified base of customers, product and process innovation played a key

role. Supplier A recognized early that solid modeling technology for product design and manufacturing was necessary to maintaining its technological leadership and customer base. The firm also understood that closer collaboration with key customers would be necessary to meet customer requirements for cost, quality and timing. When MDC announced its intention to integrate the product development process, Supplier A saw an opportunity to improve its relationship with MDC, and attract other customers as well.

Supplier B had a very different heritage. This organization had a reputation for designing and delivering components quickly with minimal staffing requirements. Its members saw its competitive advantage to be based on a *culture of speed.* Rules and regulations were bent to enable rapid delivery on schedule. This culture had developed during the 1950s and '60s under a strong autocratic leader who ran a "lean and mean" organization for more than two decades. He insisted that the organization deliver products to the customer exactly on schedule without costly staffing build-ups. Managers and workers learned ways to speed their work, some of which had a questionable impact on product quality.

When MDC announced its fast-to-market program, many managers and design engineers concluded that a common work process and technology would ruin their organization's reputation for speed. Design supervisors were adamant that extra time and cost would result because some designers were two generations behind the strategic solid modeling technology selected by MDC. Instead of pushing their designers to stay abreast of technology change, supervisors had declined earlier opportunities to update design tools (fearing that change would slow their speed). Consequently, the change being requested by the customer was doubly difficult to absorb.

Although ordered to comply with MDC's fast-to-market program, middle managers and supervisors generated an effective "underground," urging others to block implementation of the new system. One talented and powerful design supervisor, convinced that the customer's deadlines could not otherwise be met, started a major new product development program using the old process and technology. This single action delayed the new work system for six months.

Supplier B's relationship with MDC allowed its culture of speed to flourish, despite its negative implication for

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product quality. Unlike its counterpart, Supplier B was a "captive" of MDC, its largest and only major customer. MDC had tolerated the supplier's practices for a long time. Because Supplier B did not compete in the global marketplace, it was not exposed to the same competitive pressures as Supplier A. Supplier B was insular. Undisturbed by external pressure, local leaders remained in place for decades, handing down time-honored traditions across generations of managers. MDC's shift represented an abrupt break with tradition, neither understood nor accepted by those heroes of the past.

MDC and American Culture

These brief case histories add to our understanding of the role of culture in technology-enabled integration. Each of the three organizations discussed in the case excerpts— MDC and Suppliers A and B—display characteristics of American national culture, but do so in ways that reflect unique experiential pathways. Below, we briefly highlight the interplay between American national culture and corporate culture for each of the three organizations.

MDC represents the classic case of a "culture of autonomy," the organizational manifestation of American individualism. For decades, each internal division had been allowed—even encouraged—to define its own policies and processes; the only common discipline had been that of financial performance. If MDC had an overarching culture, one of its core axioms was that divisions were operationally independent (i.e., a *culture of autonomy*).

Divisional autonomy was a deeply held belief across the corporation; managers made their careers by developing products and processes that made their divisions *stand out* from all others. Under such conditions, each division had created its own distinctive patterns of behavior and belief (i.e., its own culture), reflecting unique experiences and understandings. Given that culture embodies shared learning, it is no wonder that these divisions were extremely reluctant to abandon what experience had taught them was correct practice. Even though the strategic apex of the corporation understood that commonized processes were critical to competitiveness, they could not convince many in the management ranks that this strategy was not absolutely wrong. Such resistance is predictable—MDC divisional managers had grown up learning that, in order to succeed, each division had to be distinctive.

Unable to surmount the culture of autonomy within their organization, fast-to-market program leaders fell back on that old American standby—technology (see "American Culture and Technology," page 46). Even if people would not cooperate, they reasoned, technology was an alternative means to knit together divergent processes. Unfortunately, over-reliance on new IT meant that other dimensions of change were neglected. Divisions and

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suppliers were provided with little or no guidance in *how* to implement the new technology; they were left to their own devices.

Supplier A clearly displayed the American passion for new technology. Technology helped America win The War (their corporate history was proof), and it would help the corporation win its economic battles. Interestingly, although Supplier A was high on technology, it did not experience many of the major problems that often are associated with this passion (i.e., "throwing" technology at a problem, expecting technology to stand alone and be foolproof, using technology to replace people).

The historical experience of the organization suggests how they *learned* to do the right thing. Supplier A first became proficient in product innovation. This experience taught them that successful innovation requires a substantial human and organizational infrastructure, including top management support, commitment of resources, non-punishment of failure, healthy internal competition, and human resource policies (e.g., recruitment, selection, rewards) that stimulate technology change. In other words, Supplier A displayed many of the features of a culture of innovation (9). Later on, when their experience in the global marketplace showed them that process innovation also would be critical to success, they were able to *transfer their learning* from product innovation to the process arena. One of the important features of organizational culture is its tendency to be transferred from the area in which it was invented into other areas of the company (10). Since many of the ingredients of a culture of innovation already were present in the organization, it was not difficult to apply them to a new area of activity.

It is important to note that this transfer of learning was achieved under conditions of intense competitive pressure. It was in benchmarking foreign competitors that Supplier A first learned about the importance of process redesign. Without exposure to a larger environment *beyond the United States,* the organization might not have been stimulated to pursue a new strategic direction (i.e., process innovation). In a sense, global competition enabled Supplier A to *transcend* some of the limitations of American culture (i.e., over-reliance on technology), and to become a world-class product/process innovator.

Supplier B did not display the American passion for new technology. However, its case reveals other classic

American traits, including the elevation of individual interests above those of the group, the importance of strong individual heroes, and the autonomy of such heroes (i.e., their right to assert their own view of truth, even when ordered in another direction).

The culture of speed displayed by Supplier B had developed over many decades of relative isolation from the larger marketplace, and close association with a major customer that encouraged operational autonomy among its affiliates. These conditions fostered in Supplier B an atmosphere of protected insularity and parochialism. Middle managers in the design area of the organization, who had been in place for decades, had come to believe that speed was the organization's principal core competence. That speed up-front in product design created quality problems downstream in manufacturing was of little concern to these managers; they were willing to suboptimize the performance of the organization overall in order to achieve their own performance goals. These individualistic beliefs run counter to the requirements of process integration, which demands that all participants accommodate the needs of the *whole* process.

To enable the culture of speed to survive in spite of quality problems, the managers of the design area nurtured and rewarded individual heroes who were adept at putting out fires caused by the very process they had created. These heroes were allowed to be mavericks; they could break the rules of best practice (e.g., not finish computer-based designs) if it saved time for their unit. It is hardly surprising that threats to the culture of speed were met with strong resistance from anti-champions, even though they had been directed to commonize by their top management. Breaking the rules was what the hero/anti-champions did best; it was how they played the game. Even though it would be easy to blame the anti-champions for implementation delays (their self-interests certainly were at stake), they were in fact a product of their culture, acting in the manner that had brought them respect and rewards for many years. So long as Supplier B did not face external competition, and its major customer allowed it freedom of operation, there was little real pressure for culture change, and anti-champions continued to roam at large.

The foregoing discussion has illustrated some of the ways in which American cultural patterns (i.e., individualism, over-reliance on technology) are played out in different organizations. These national tendencies were manifested differently in each organization, contingent on their histories and on the effective environment in which each organization operated. Environment played an especially important role in shaping different pathways for Suppliers A and B. Exposure to global competition enabled Supplier A to transcend some of the limitations of American culture, while Supplier B's insularity exacerbated the individualism of its sub-units.

Exposure to global competition enabled Supplier A to transcend some of the limitations of American culture . . .

Organizational culture thus is subject to powerful influences from the larger cultural environment in which it is positioned. An orientation toward the global marketplace appears to shift the level of external influence from national to international, meaning that the cultures of global corporations probably will reflect a wider range of different national cultural influences.

Internal Work Groups

The cultural adaptations of work groups to *internal* corporate environments have many consequences for the effective use of IT as an enabler of integration. Below, we discuss some of these consequences, and the ways they reflect both larger American patterns and the culture of the corporation.

Work groups on the ground floor of the company form their own miniature societies, based on distinctive work practices and experiences. Empirical research suggests that sociocultural differences between work groups can facilitate or frustrate information flow (whether or not such flow is enabled by IT). To illustrate this, work group relationships *inside* MDC are examined.

Within a complex organization, work groups often exist within a *status hierarchy* in which certain groups have greater prestige, access to resources and/or power than others. Typically, information flow within such hierarchies is asymmetrical; i.e., higher-ranked groups send directives downward, and those lower in the hierarchy send reports on their actions upward. Integration efforts often attempt to introduce symmetry. For example, integration of product development through CAD/CAM requires that designers act on feedback from manufacturing groups, even though (in America) manufacturing often has lower prestige than design. Unfortunately, management directives to integrate, and the attendant installation of CAD/CAM, does not mean that effective two-way information flow will occur. Cultural boundaries generate negative stereotypes, miscommunication and distrust that is difficult to dissolve.

In one division of MDC, implementation of CAD/CAM had been going on without much success for ten years. Although design and manufacturing groups used fully compatible CAD/CAM technology, 80 percent of the work flowing from design to manufacturing traveled via blueprints (versus electronic files). Hence, NC machines

usually were programmed manually. Investigation revealed a history of misunderstandings that were responsible for the failure of the two groups to integrate electronically. Although designers occasionally sent electronic files downstream, the machinists and NC programmers did not trust the electronic data. Distrust was based on the fact that electronic design files sometimes contained minute data gaps between surfaces that would cause NC machines to destroy the part being creating and/or the tool. Because the NC programmers in the machine shop were held responsible, they protected themselves by re-entering all of the data manually. The design engineers saw this as reflecting negatively upon the skill of the NC programmers, and began sending their more complex jobs outside the division. Having only simple jobs to do, the NC programmers had little incentive to use advanced graphic technology.

This case reveals two significant cultural issues. First, differential status influenced the manner in which different work groups responded to problems. Rather than explaining their predicament to the design engineers, the NC programmers simply *adapted* to the situation using the resources at their disposal. Groups low in status often adjust quietly to whatever conditions are presented to them. Secondly, the engineers—rather than explore why the programmers were not using graphic programming tools—made the *ethnocentric assumption* that it was due to lack of skill (blaming the lower status group for the problem). Sending complex jobs outside met the engineers' needs, but deprived the programmers of further learning opportunities. No one in management ever became aware of the cultural factors underlying the ineffective utilization of CAD/CAM.

This case illustrates the ineffectiveness of technology alone as a means of integrating work functions. *Cultural discontinuities* between work groups inhibit the flow of electronic information just as surely as technological incompatibility. Process integration across cultural boundaries requires nothing less than culture change.

What Management Can Do

While cultures resist change in a variety of ways, they are open systems that respond to environmental stimuli. Cultures continuously adjust. For example, the role of middle-class women in American culture has undergone substantial change in the past half-century. Can such change be planned, controlled and accelerated? The answer depends upon the culture targeted for change. It would be difficult to argue that change can be planned or controlled at the national level. There is abundant evidence that this is beyond conscious human control.

Corporation managers are not much interested in changing national culture, but they are concerned with change in corporate, occupational and work group cultures, especially as these affect corporate objectives

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. . . while Supplier B's insularity exacerbated the individualism of its sub-units.

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such as process integration. To ignore the backdrop of national culture and its consequences, however, is to invite failure. The case illustrations show that the leadership plays a pivotal role in shaping culture within a company. Consciously or not, leadership is responsible for selecting among the many cultural configurations available from our diverse national heritage, and for constructing a unique cultural environment inside the company. Internal policy and reward structures create an environment that encourages innovative behavior within and between work groups (as in the case of Supplier A). In other cases, however, internal cultures of autonomy and/or insularity encourage work groups to construct their own identities. The main point here is that management is truly influential in shaping organizational culture and the internal environments to which work group cultures respond and adapt.

To effectively stimulate and guide internal cultural change, while simultaneously recognizing and leveraging national culture, managers must: 1) Be cognizant of the cultures existing both inside and outside the corporation, and the links between these cultural forms; 2) recognize shifts in the external environment and leverage them as a means to motivate internal cultural change; and 3) understand the dynamics of the culture change process and deal with them appropriately. Following are eight specific suggestions for the fulfillment of these requirements.

1. *Expose Internal Groups to External Environments.*— Culture responds to immutable environmental pressures—a shift in natural resources, changing economic forces, technological (r)evolution, or changes in demographic structures (*11*). While the strategic leadership of a company, particularly in a crisis, may be acutely aware of the environmental pressures that are forcing the need for change, work groups and managers deep inside the corporation may not be. Work groups are cultures in a microcosm whose external environment is the *inside* of the company. It is this internal environment that motivates change at the ground floor of an organization. In the case of Supplier B, top management's requests for compliance with MDC's fast-to-market program were not effective with middle managers and work groups insulated from external competition. Work groups should be exposed to the same information sources and external pressures that drive the company as a whole. This may mean benchmarking specific operations, bidding by internal units against outside suppliers, pressuring employees and managers to interact

with external customers, or providing access to financial information about the company and its competitors. When everyone in a corporation faces the same environmental realities, they are more likely to move in the same direction.

2. *Link Top-Down and Bottom-Up Change.*—There are two change processes that must be linked, one top-down, the other bottom-up. Top-down processes operate at the strategic level. Through them, the leadership of the company—those responsible for policy, structure and resource allocation decisions that shape the *organizational culture* as a whole—recognize the need for change, envision a new strategic course for the future and create conditions that foster change throughout the company. Often, this process is triggered by a crisis of the type that could result in serious damage to, or even death of, the company. Such a crisis might cause the company leadership to rethink its fundamental assumptions and core practices. This top-down process is fueled by information regarding the need for change, and is guided by visionaries. The top-down process alone, however, is not sufficient to ensure change. In the case of MDC, for example, strategic leadership "saw the light," but was thwarted by local cultures below the apex.

To effect permanent change at the operating level of the organization, a bottom-up process is needed as well. At the operational level, work cultures grow out of *work practices and experience*—people develop shared beliefs around the experiences they have in getting the work out the door. For shared beliefs and practices to change, people at the operating level must a) learn that what they are doing is no longer effective, and b) that constructive change is possible. The first is met by exposing internal groups to external pressure, showing that the old ways do not work and that change is essential. The second requires that strategic leadership point the way toward the future, and involve employees in reinventing *the way they do their work.*

Top-down and bottom-up change processes are interdependent. Change at the apex of the corporation makes possible change on the ground floor. Conversely, change in cultures on the floor of the firm make it possible to enact new strategies. Thus, redesign on the ground floor must be linked philosophically and temporally to strategic change at the top. Bottom-up change initiatives will be resisted. Those with a stake in the old ways will fight hard against what they perceive as a countercultural movement. Although such resistance probably cannot be nullified entirely, its influence can be lessened by convincing employees that change is necessary, giving employees a stake in the change process, and managing the anti-champions effectively (see No. 6).

3. *Recognize that Training Is Necessary But Not Sufficient.*—What little planning is customary for human and cultural change in organizations often begins and

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Cultural boundaries generate negative stereotypes, miscommunication and distrust that is difficult to dissolve.

ends with training exercises. The quality movement in particular has fostered the misconception that running scores or hundreds of employees through training seminars or workshops changes the way they think, and consequently behave. In fact, the causal arrow of change often points in the opposite direction—from behavior to thought (*12*). What people think often is influenced by what they have experienced. After ideas have developed through experience, it is difficult to change them without different experiential exposure. Thus, training alone (particularly narrow technical training that does not take into account the work environment) is not a sufficient basis for behavioral change. As we saw in the CAD/CAM case, both designers and NC programmers had received technical training and were able to operate the new equipment. But this was ineffective in enabling CAD/CAM integration because the work requirements of the machine shop were missing. Training should be custom-designed to enable specific changes in problem-solving, teamwork and trust relations, and should be rolled out only when those changes are needed.

4. *Redesign a Core Work Process.*—Redesign of core work processes, if pursued in a culturally informed manner, is the most effective way to stimulate and guide culture change at the work group level, and possibly across the organization as a whole. Understanding the *how* of process redesign is critical, however, since certain approaches appear to be more effective than others. First, deciding upon the appropriate scope of change is an important issue. Usually, it is not advisable to attempt too much too fast. As we saw in the case of Supplier A, cultures are built one piece at a time, and this is the way they change as well. Change should proceed by increments, with proven successes at every step. First, focus on the business process in greatest need of overhaul, demonstrate that the change process gets results, and then expand its application.

Strategic leadership must create an atmosphere conducive to change. The most effective way to do so is by involving the members of the culture(s) that are affected. Give the stakeholders who are directly involved in the process being redesigned the responsibility for conceptualizing and prototyping the new process. Set up a broad-based design team involving line managers and supervisors from affected areas, and especially *representatives of the workforce* (among others). Charge them with redesigning the process.

There are several advantages to this approach, all of which enable culture change. First, in analyzing the current work process and considering alternatives, managers and workers will apply their *local knowledge* of the business to critique current practices and design process improvements (*13*). When people use their own ideas and skills, the level of commitment and motivation is heightened. Second, there probably will be a greater chance for success if the new process is invested with much of the tacit knowledge and skill required for robust operation. Finally, when people analyze and redesign their own work processes, they confront and address the issues and barriers that cause resistance to change. Among those discussed in this article are the fear of productivity loss, anti-champions, status barriers to two-way information flow, stereotypes about blue collar workers, professional autonomy, and distrust. When such concerns are addressed, people learn those aspects of the culture that must change and why. They become champions of change, which increases the likelihood that the new process will prevail.

The currently popular notion that old work processes should be "obliterated" fosters the view that current knowledge is a liability. While it may sometimes be appropriate to redesign from a "clean slate," there are many other occasions in which such an approach is neither feasible nor desirable. Obliteration can be wasteful of accumulated human knowledge and skill, and it also can be extremely risky. Empirical research suggests that the overly aggressive destruction of work group knowledge can lead to serious production bottlenecks and delays. The wholesale destruction of old work processes (together with people and local knowledge), and their replacement with IT, is another illustration of American over-reliance on technological solutions to complex problems, and the tendency to replace people with technology.

5. *Redefine "Us" versus "Them."*—Humans have a tendency to draw distinctions between "ourselves" and "others." The people in our group, the ones we know personally and who share our interests, are the good guys. Everyone else is suspect, unless we have learned otherwise, usually through a close working relationship. Breaking down culturally bound barriers to trust requires not only direct exposure of "us" to the "other," but a redefinition of interests such that *their* interests and *ours* become linked. They have to become us.

There are ways to redefine social boundaries, including simulation and role playing, the formation of cross-functional or multiparty teams, worker exchange and cross-training, simultaneous deployment of new technology to two or more linked work groups, and structural realignments. In the CAD/CAM case discussed earlier, the two work groups addressed their cultural barriers through a co-deployment, worker exchange and cross-training scheme that linked their interests, enabled

Cultural discontinuities between work groups inhibit the flow of electronic information just as surely as technological incompatibility.

the sharing of work requirements, and provided an opportunity for personal relationships to develop across group boundaries (thereby fostering trust). The point is to permeate and expand cultural boundaries through helping people to see things from the point of view of others and providing incentives that broaden work group definitions of "self-interest."

6. *Keep the Anti-Champions above Ground.*—Anti-champions stand to lose power and/or prestige as a result of change. They derive their power from positions of authority they attained under the old regime. The authority and power they command gives them opportunity to damage the change effort. Often, anti-champions believe passionately in their cause, and since their interests are at stake, believe they have nothing to lose by fighting. It is not prudent to ignore or underestimate their power, or to expect that they will follow orders. Anti-champions fight change above ground or below ground. They are more dangerous below ground, where their actions may go uncontested. Anti-champions can have legitimate positions that deserve a careful hearing. Mistakes can be avoided by listening carefully to their warnings. Most important is the need to deal with them in a straightforward way. Anti-champions might be coopted by listening and responding to their legitimate concerns, and providing opportunity for direct involvement. Failing this, transferring the anti-champion to another work site, early retirement, or some other more accommodating solution might be appropriate.

7. *Play Tit-for-Tat.*—In a computer simulation of the Prisoner's Dilemma game, Axelrod discovered that the best strategy overall was "tit-for-tat," that is, a strategy in which each player did unto his (her) partner as his partner did unto him (*14*). In tit-for-tat, each player relied on the cooperation of the other until that trust was violated. Then, the one violated paid his partner back in kind, but not in excess. Over many iterations of the game, partners learned that they could gain more overall by "playing fair"; that is, by not betraying their partners' trust or being greedy. Tit-for-tat game rules were summarized nicely by Urban and Star as follows (*15*):

• Do not initiate self-serving moves first in an effort to make unilateral gain.

• Match immediately damaging moves made by a competitor.

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- Do not exceed (i.e., punish) a competitor's damaging actions.
- Focus on your own results, not on whether you bested the competitor.
- Enable competitors to forecast your responses to their actions.

These rules are useful for working with external partners when boundaries cannot be eradicated or permeated effectively. Rules like these offer one practical solution to the trust problem in American society. Such rules encourage close working relationships with potentially trustworthy partners, yet minimize damage should partners prove not so worthy.

8. *Leverage the Strength of American Culture.*—Our passion for technology or our individualism are not all bad. Both have enabled Americans to be the world's master of invention and entrepreneurship, lack of which has caused other nations to stagnate and collapse. Change in business processes should tap the energies released by recognizing and rewarding individuals that innovate. Despite our individualism, we are known the world over for our remarkable capacity to team across all sorts of barriers during times of crisis. This suggests that our culture contains a set of beliefs and behaviors (e.g., volunteerism, generosity, enlightened self-interest) that are manifest when times get tough.

To tap and build upon such strengths—and to ensure that we do not revert to the old ways when the crisis is past—will require creativity, courage and a willingness to experiment. We should be prepared to borrow from other cultures, for there is much that is good in every society. Diffusion of ideas from abroad can compensate for limitations and biases inherent in our own historical experience. We must, however, remain free to modify these ideas and recombine them with our own to create new solutions. Practices lifted uncritically from others can prove a poor fit (as many American manufacturers discovered when blindly adopting Japanese quality circles). Ultimately, our path is one not traveled before.

Seeing beyond Boundaries

As we have shown, parochial leadership that serves only its own interest is not effective in achieving corporate transformation or renewal. Enlightened self-interest moves past parochialism and envisions a community of cooperation beyond the self. Given that enlightened self-interest is an American cultural principle, how is the community of cooperation defined? We believe an antidote to parochialism, and a prerequisite to transformation, is the achievement of a larger vision—to see beyond cultural boundaries and to define a larger

> *Redesign on the ground floor must be linked philosophically and temporally to strategic change at the top*

field of interest where new stimuli promote change. Several of the recommendations we have presented enable reconceptualization and redefinition of corporate cultural boundaries—between inside and outside, top and bottom, us and them. Seeing beyond the boundaries that separate these cultural worlds is a necessary first step toward effective process integration and the lasting cultural change that must accompany corporate transformation. ⊛

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