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THE CHALLENGE OF INNOVATION IMPLEMENTATION

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Implementation is the process of gaining targeted organizational members' appropriate and committed use of an innovation. Our model suggests that implementation effectiveness—the consistency and quality of targeted organizational members' use of an innovation—is a function of (a) the strength of an organization's climate for the implementation of that innovation and (b) the fit of that innovation to targeted users' values. The model specifies a range of implementation outcomes (including resistance, avoidance, compliance, and commitment); highlights the equifinality of an organization's climate for implementation; describes within- and between-organizational differences in innovation-values fit; and suggests new topics and strategies for implementation research.

Innovation implementation within an organization is the process of gaining targeted employees' appropriate and committed use of an innovation. Innovation implementation presupposes innovation adoption, that is, a decision, typically made by senior organizational managers, that employees within the organization will use the innovation in their work. Implementation failure occurs when, despite this decision, employees use the innovation less frequently, less consistently, or less assiduously than required for the potential benefits of the innovation to be realized.

An organization's failure to achieve the intended benefits of an innovation it has adopted may thus reflect either a failure of implementation or a failure of the innovation itself. Increasingly, organizational analysts identify implementation failure, not innovation failure, as the cause of many organizations' inability to achieve the intended benefits of the innovations they adopt. Quality circles, total quality management, statistical process control, and computerized technologies often yield little or no benefit to adopting organizations, not because the innovations are ineffective, analysts suggest, but because their implementation is unsuccessful

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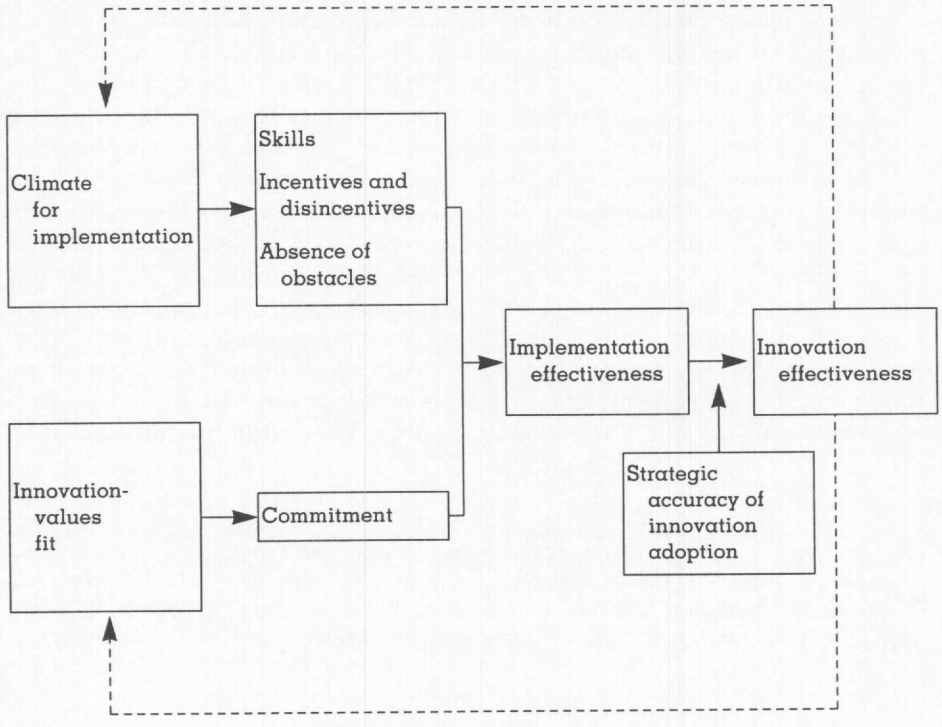
(e.g., Bushe, 1988; Hackman & Wageman, 1995; Klein & Ralls, 1995; Reger, Gustafson, DeMarie, & Mullane, 1994).

Innovation scholars have long bemoaned the paucity of research on innovation implementation (Beyer & Trice, 1978; Hage, 1980; Roberts-Gray & Gray, 1983; Tornatzky & Klein, 1982). Although cross-organizational studies of the determinants of innovation adoption are abundant (see Damanpour, 1991; Tornatzky & Klein, 1982, for reviews), cross-organizational studies of innovation implementation (e.g., Nord & Tucker, 1987) are extremely rare. More common are single-site, qualitative case studies of innovation implementation. Each of these studies describes pieces of the implementation story. Largely missing, however, are integrative models that capture and clarify the multidetermined, multilevel phenomenon of innovation implementation.

In this article, we present an integrative model of the determinants of the effectiveness of organizational implementation. The primary premise of the model, depicted in Figure 1, is that implementation effectiveness—the quality and consistency of targeted organizational members' use of an adopted innovation—is a function of (a) an organization's climate for the implementation of a given innovation and (b) targeted organizational members' perceptions of the fit of the innovation to their values.

FIGURE 1
Determinants and Consequences of Implementation Effectiveness



We begin by defining several key terms and outlining our levels of theory. We then present the model. We focus first on the organization as a whole, examining instances, determinants, and consequences of homogeneous innovation use within an organization. We then explore between-group differences, examining instances, determinants, and consequences of varying levels of innovation use by groups within an organization. Next, we consider the feedback processes suggested by the model: the influences of implementation and innovation outcomes on an organization's subsequent climate for implementation and on employees' values. We illustrate the model with examples from our own and others' implementation research, and we conclude with a discussion of the implications that the model may have for implementation researchers.

KEY TERMS

Two types of stage models are commonly used to describe the innovation process. The first, source-based stage models, are based on the perspective of the innovation developer or source. They trace the creation of new products or services from the gestation of the idea to the marketing of the final product (e.g., research, development, testing, manufacturing or packaging, dissemination) (Amabile, 1988; Kanter, 1988; Tornatzky & Fleischer, 1990). Within source-based stage models, an innovation is a new product or service that an organization, developer, or inventor has created for market.

User-based stage models, in contrast, are based on the perspective of the user. They trace the innovation process from the user's awareness of a need or opportunity for change to the incorporation of the innovation in the user's behavioral repertoire (e.g., awareness, selection, adoption, implementation, routinization) (Beyer & Trice, 1978; Nord & Tucker, 1987; Tornatzky & Fleischer, 1990). Within user-based stage models (and within our model), an *innovation* is a technology or a practice "being used for the first time by members of an organization, whether or not other organizations have used it previously" (Nord & Tucker, 1987: 6).

We focus on innovations that require the active and coordinated use of multiple organizational members to benefit the organization. Because innovations of this type by definition affect numerous organizational members, they are typically implemented within an organization only following a formal decision on the part of senior managers to adopt the innovation. Examples of innovations of this kind include total quality management (TQM), statistical process control (SPC), computer-aided design and manufacturing (CAD/CAM), and manufacturing resource planning (MRP).

Implementation is the transition period during which targeted organizational members ideally become increasingly skillful, consistent, and committed in their use of an innovation. Implementation is the critical gateway between the decision to adopt the innovation and the routine use of the innovation within an organization. We conceptualize innovation

use as a continuum, ranging from avoidance of the innovation (nonuse) to meager and unenthusiastic use (compliant use) to skilled, enthusiastic, and consistent use (committed use). *Implementation effectiveness* refers to the consistency and quality of targeted organizational members' use of a specific innovation. *Targeted organizational members* (or targeted users) are individuals who are expected either to use the innovation directly (e.g., production workers) or to support the innovation's use (e.g., information technology specialists, production supervisors).

Innovation effectiveness describes the benefits an organization receives as a result of its implementation of a given innovation (e.g., improvements in profitability, productivity, customer service, and employee morale). Implementation effectiveness is a necessary but not sufficient condition for innovation effectiveness: Although an innovation is extremely unlikely to yield significant benefits to an adopting organization unless the innovation is used consistently and well, effective implementation does not guarantee that the innovation will, in fact, prove beneficial for the organization.

LEVELS OF THEORY

Klein, Dansereau, and Hall (1994: 206) urged organizational scholars to specify and explicate the level(s) of their theories and their "attendant assumptions of homogeneity, independence, or heterogeneity." We begin to do so here, weaving further discussion of the levels of the model throughout the article.

The fundamental organizational challenge of innovation implementation is to gain targeted organizational members' use of an innovation: to change individuals' behavior. However, for the innovations on which we focus, the benefits of innovation implementation are dependent on the use of the innovation not by individuals but by all, or a critical group of organizational members (Tornatzky & Fleischer, 1990). Thus, although we acknowledge that innovation use may vary between individuals and between groups within an organization, we conceptualize implementation effectiveness as an organization-level construct, describing the overall, pooled or aggregate consistency and quality of targeted organizational members' innovation use. An organization in which all targeted employees use a given innovation consistently and well is more effective in its implementation effort than is an organization in which only some of the targeted employees use the innovation consistently and well. Futher, because the benefits of innovation implementation depend (again, in the case of the innovations we describe) on the integrated and coordinated use of the innovation, an organization in which all or most targeted employees' innovation use is moderate in consistency and quality shows greater implementation effectiveness than an organization in which some targeted members use the innovation consistently and well while others use it inconsistently and poorly. Thus, to use Klein and colleagues' (1994) termi-

nology, implementation effectiveness is a homogeneous construct, describing the quality and consistency of the use of a specific innovation within an organization as a whole.

Implementation effectiveness results, we argue in the following section, from the dual influence of an organization's climate for the implementation of a given innovation and the perceived fit of that innovation to targeted users' values. We posit that implementation climate, too, is a homogeneous construct, describing a facet of targeted users' collective, perceived work environment. Innovation-values fit, in contrast, may vary between individuals, between groups, or between organizations. We focus on between-organization and between-group differences in innovation-values fit, thus conceptualizing innovation-values fit primarily as a homogeneous construct that may characterize the shared values of either an organization's targeted users as a whole or distinct groups of targeted users within an organization.

CLIMATE FOR IMPLEMENTATION

The empirical literature on the implementation of workplace innovations is dominated, as we noted previously, by qualitative, single-site studies (e.g., Markus, 1987; Roitman, Liker, & Roskies, 1988; Sproull & Hofmeister, 1986). In rich detail, the authors of these studies have described a variety of innovation, implementation, organizational, and managerial policies, practices, and characteristics that may influence innovation use. These include training in innovation use (Fleischer, Liker, & Arnsdorf, 1988), user support services (Rousseau, 1989), time to experiment with the innovation (Zuboff, 1988), praise from supervisors for innovation use (Klein, Hall, & Laliberte, 1990), financial incentives for innovation use (Lawler & Mohrman, 1991), job reassignment or job elimination for those who do not learn to use the innovation (Klein et al., 1990), budgetary constraints on implementation expenses (Nord & Tucker, 1987), and the user-friendliness of the innovation (Rivard, 1987). (We will use the shorthand phrase "implementation policies and practices" to refer to the array of innovation, implementation, organizational, and managerial policies, practices, and characteristics that may influence innovation use.)

Because each implementation case study highlights a different subset of one or more implementation policies and practices, the determinants of implementation effectiveness may appear to be a blur, a hodge-podge lacking organization and parsimony. If multiple authors, studying multiple organizations, identify differing sources of implementation failure and success, what overarching conclusion is a reader to reach? The implementation literature offers, unfortunately, little guidance. To highlight the collective influence of an organization's multiple implementation policies and practices, we introduce the construct of an organization's climate for the implementation of an innovation.

Our discussion of this construct builds on Schneider's conceptualization of climate (e.g., Schneider, 1975, 1990). Schneider (1990: 384) defined *climate* as employees' "perceptions of the events, practices, and procedures and the kinds of behaviors that are rewarded, supported, and expected in a setting." Three distinctive features of Schneider's conceptualization of climate bear note here. First, Schneider's conceptualization highlights employees' perceptions—not their evaluations—of their work environment. Second, Schneider's conceptualization draws attention to employees' shared perceptions, not employees' individual and idiosyncratic views. And, third, Schneider's conceptualization focuses on employees' shared perceptions of the extent to which work unit practices, procedures, and rewards promote behaviors consistent with a specific strategic outcome of interest. Schneider's conceptualization does not focus on employees' perceptions of generic work unit characteristics—such as socioemotional supportiveness (e.g., Kopelman, Brief, & Guzzo, 1990)—that are generalizable to any work unit.

An organization's *climate for the implementation of a given innovation* refers to targeted employees' shared summary perceptions of the extent to which their use of a specific innovation is rewarded, supported, and expected within their organization. Employees' perceptions of their organization's climate for the implementation of a given innovation are the result of employees' shared experiences and observations of, and their information and discussions about, their organization's implementation policies and practices. Climate for implementation, we emphasize, does not refer to employees' satisfaction with the innovation, the organization, or their jobs; it also does not refer to employees' perceptions of their organization's openness to change or general innovativeness.

The Influence of Climate for Implementation

The more comprehensively and consistently implementation policies and practices are perceived by targeted employees to encourage, cultivate, and reward their use of a given innovation, the stronger the climate for implementation of that innovation. A strong implementation climate fosters innovation use by (a) ensuring employee skill in innovation use, (b) providing incentives for innovation use and disincentives for innovation avoidance, and (c) removing obstacles to innovation use. An organization has a strong climate for the implementation of a given innovation if, for example, training regarding innovation use is readily and broadly available to targeted employees (ensuring skill); additional assistance in innovation use is available to employees following training (ensuring skill); ample time is given to employees so they can both learn about the innovation and use it on an ongoing basis (ensuring skill, removing obstacles); employees' concerns and complaints regarding innovation use are responded to by those in charge of the innovation implementation (removing obstacles); the innovation itself can be easily accessed by the employees (e.g., TQM meetings scheduled at convenient times, user-

friendly computerized technology) (removing obstacles); and employees' use of the innovation is monitored and praised by managers and supervisors (providing incentives for use and disincentives for innovation avoidance).

Research on climates for specific strategic outcomes reveals the influence that an organization's climate for a specific outcome has on employees' behaviors regarding that outcome. Researchers have found, for example, that climate for safety is related to factory safety (Zohar, 1980), that climate for innovation in R&D subsystems is related to technological breakthroughs (Abbey & Dickson, 1983), that climate for technical updating is related to engineers' performance (Kozlowski & Hults, 1987), and that climate for service is related to customers' perceptions of the quality of service received (Schneider & Bowen, 1985; Schneider, Parkington, & Buxton, 1980). Thus, we posit that the stronger an organization's climate for the implementation of a given innovation, the greater will be the employees' use of that innovation, provided employees are committed to innovation use.

The Limits of Climate for Implementation

Our caveat—"provided employees are committed to innovation use"—indicates the limits of climate. Psychological theories and research on conformity and commitment (Kelman, 1961; O'Reilly & Chatman, 1986; Sussman & Vecchio, 1991) have been used to distinguish between *compliance*, "the acceptance of influence in order to gain specific rewards and to avoid punishments," and *internalization*, "the acceptance of influence because it is congruent with a worker's values" (Sussman & Vecchio, 1991: 214).[1] Applied to innovation implementation, these works suggest that employees who perceive innovation use to be congruent with their values are likely to be internalized—committed and enthusiastic—in their innovation use, whereas individuals who perceive innovation use merely as a means to obtain and avoid punishments are likely to be compliant—pro forma and uninvested—in their innovation use.

Because a strong implementation climate provides incentives and disincentives for innovation use, it may, in and of itself, foster compliant innovation use. Climate for implementation does not, however, ensure either the congruence of an innovation to targeted users' values or internalized and committed innovation use. Skillful, internalized, and commited innovation use takes more: a strong climate for the implementation of an innovation *and* a good fit of the innovation to targeted users' values.

We discuss the combined effects of implementation climate and innovation-values fit in greater detail in a subsequent section, but an

[1] Also mentioned in these theories is *identification*, the acceptance of influence "in order to engage in a satisfying role-relationship with another person or group" (Sussman & Vecchio, 1991: 214). Identification seemed to us to have relatively little relevance to innovation implementation.

example—close to many readers' academic homes—may be helpful here. Imagine a university that has historically valued, rewarded, and supported teaching far more than research. If the university adopts a new emphasis on research, the university can surely create—through its policies and practices—a strong climate for research. But how will professors, drawn to the university for its teaching emphasis, respond to such a change? Will they not simultaneously recognize the new climate for research and resist it because it is incongruent with their values?

An Example of Climate for Implementation: Buildco, Inc.

Buildco, Inc. (a pseudonym) is a large engineering and construction company that experienced great difficulty in implementing three-dimensional computer-aided design and drafting (3-D CADD), a sophisticated computer graphics program used to design and test computerized representations of products (in this case, buildings and plants). Buildco's senior managers complained of "employee resistance to change," yet researchers (Klein, 1986; Klein et al., 1990) found, in their interviews with 26 targeted users and their supervisors, that targeted users were, in fact, very enthusiastic about 3-D CADD, per se. For example, one employee raved, "I think CADD is the greatest thing since sliced bread. I like the whole concept, the speed, the accuracy, [and] the uniformity of the drawings."

Targeted users complained vociferously, however, about many aspects of the implementation process. Targeted users were satisfied with the content of the company's 60-hour 3-D CADD training program, but often they had little opportunity to use their 3-D CADD training on the job. As a result, employee skill in 3-D CADD often decayed sharply following training. Targeted users complained, too, that managers and supervisors offered few rewards for 3-D CADD use: "Supervisors fall short of letting people know when they're doing a good job," one employee commented. "From what I hear, CADD's made a lot of money for the company, but how many people who use CADD know it?" In addition, users complained about a variety of obstacles to their use of 3-D CADD: "The system is designed to handle 6 or 7 terminals at once, but now there are 17 terminals. . . . It takes a long time for the computer to do a simple placement, and this disrupts your train of thought and creativity. It kills your efficiency."

Despite users' appreciation of 3-D CADD and the appropriateness of the content of the company's training program, the overall climate for the implementation of 3-D CADD at Buildco was weak: Targeted users' CADD skills often grew rusty, rewards for using CADD were slim, and obstacles to using CADD were many.

INNOVATION-VALUES FIT

Building on psychological theories of conformity, we posit that employees' commitment to the use of an innovation is a function of the per-

ceived fit of the innovation to employees' values. *Values* are "generalized, enduring beliefs about the personal and social desirability of modes of conduct or 'end-states' of existence" (Kabanoff, Waldersee, & Cohen, 1995: 1076). Individuals have values, as do groups, organizations, societies, and national cultures (Kabanoff et al., 1995).

We focus on organizational and group values in our analysis of innovation-values fit. Organizational values are implicit or explicit views, shared to a considerable extent by organizational members, about both the external adaptation of the organization (i.e., how the organization should relate to external customers, constituencies, and competitors) and the internal integration of the organization (i.e., how members of the organization should relate to and work with one another) (Schein, 1992). Organizational members come to share values as a result of their common experiences and personal characteristics (Holland, 1985; Schein, 1992; Schneider, 1987). Organizational values are stable, but not fixed, and may evolve in response to changing organizational and environmental events and circumstances. Organizational values vary in intensity. High-intensity organizational values encapsulate strong, fervent views and sharp strictures regarding desirable and undersirable actions on the part of the organization and its members. Low-intensity organizational values describe matters of relatively little importance and passion for organizational members.

Group values are implicit or explicit views, shared to a considerable extent by the members of a group within an organization, about the external adaptation and internal integration of the organization and of the group itself. Group values vary among groups in an organization, and they often reflect the self-interests of the group (cf. Guth & MacMillan, 1986). Functional and hierarchical groups (e.g., senior managers, supervisors, technicians) are likely to differ in their values as a function of (a) their roles in the organization (Dougherty, 1992), (b) their common interactions and experiences (Rentsch, 1990), and (c) their distinctive backgrounds and traits (Holland, 1985). Like organizational values, group values vary in their intensity and may evolve over time.

We highlight the fit of innovations to organizational and group values, rather than individual values, because our aim is to explain organizational implementation effectiveness, not individual differences in innovation use. A poor fit between an innovation and organizational or group values affects relatively large numbers of organizational members, and it is thus more likely to derail innovation implementation than is a poor fit between an innovation and any one organizational member's values.

Innovation-values fit describes the extent to which targeted users perceive that use of the innovation will foster (or, conversely, inhibit) the fulfillment of their values. Targeted users assess the objective characteristics of an innovation and its socially constructed meaning (e.g., Barley, 1986; Goodman & Griffith, 1991; Hattrup & Kozlowski, 1993; Zuboff, 1988) to judge the fit of the innovation to their values. Because senior managers

adopt innovations to alter production, service, or management, innovations often represent an imperfect fit with organizational members' values. Innovation-values fit is *good* when targeted innovation users regard the innovation as highly congruent with their high-intensity values. Innovation-values fit is *poor* when targeted users regard the innovation as highly incongruent with their high-intensity values. Innovation-values fit is *neutral* when targeted users regard the innovation as either moderately congruent or moderately incongruent with their low-intensity values.

Innovation-Values Fit: Some Examples of Poor Fit

Innovation-values fit has not, to our knowledge, been the object of researchers' explicit attention. However, several scholars have commented implicitly on the topic. In a case study of the implementation of statistical process control in a manufacturing plant, for example, Bushe (1988: 25) suggested that because members of manufacturing plants value performance (i.e., production) more than change and learning, "both the implementation of SPC and the nature of the technique are countercultural, in that learning must be as highly valued as performing for SPC to be used successfully." In a similar vein, Schein (1992: 140) has commented,

> One of the major dilemmas that leaders encounter when they attempt to change the way organizations function is how to get something going that is basically countercultural. . . . For example, the use of quality circles, self-managed teams, autonomous work teams, and other kinds of organizational devices that rely heavily on commitment to groups may be so countercultural in the typical U.S. individualistic competitive organization as to be virtually impossible to make work unless they are presented pragmatically as the only way to get something done.

Further, Schein (1992) and others (e.g., March & Sproull, 1990) documented the poor fit between top managers' and information technology (IT) specialists' values. For example, top managers' assumption that "hierarchy is intrinsic to organizations and necessary for coordination" (Schein, 1992: 291) clashes with the IT specialists' assumptions that "a flatter organization will be a better one" and "a more fully connected organization with open channels in every direction will be a better one" (Schein, 1992: 286).

A last example of poor innovation-values fit comes from a case study of the implementation of a computerized inventory control system in a wire manufacturing company with the pseudonym Wireco (Klein, Ralls, & Carter, 1989). (The conclusions we make are based on interviews with 37 employees: managers, supervisors, and targeted users.) When the decision to adopt the computerized inventory control system was mandated by corporate headquarters, Wireco's manufacturing procedures were unstructured, fluid, and disorganized. If Customer A placed a rush order for one kind of wire, preliminary work on Customer B's order for a different kind of wire was either put aside (and often lost) or transformed and used to

meet Customer A's order. Employees at Wireco believed that customers were well served by the flexibility of their production procedures. The new computerized inventory control system, however, required employees (a) to track each customer's order throughout the production process and (b) to maintain accurate inventory records. Employees could no longer use preliminary work on one customer's order to complete a different customer's order. The inventory control system represented a poor fit with the employees' values supporting flexible, if disorganized, production procedures.

THE EFFECTS OF IMPLEMENTATION CLIMATE AND INNOVATION-VALUES FIT ON INNOVATION USE: WHEN FIT IS HOMOGENEOUS

To predict innovation use, we consider the combined influence of implementation climate and innovation-values fit. We first describe the implications of a strong or weak climate for implementation and good, neutral, or poor innovation-values fit, when innovation-values fit is homogeneous (i.e., when there are few within-organization, between-group differences in innovation-values fit).

The six cells in Table 1 summarize the predicted influence of varying levels of implementation climate and innovation-values fit on employees' affective responses and innovation use. When innovation-values fit is good and the organization's implementation climate is strong, employees are skilled in innovation use, incentives for innovation use and disincentives for innovation avoidance are ample, obstacles to innovation use are few, and employees are likely to be highly committed to their innovation use. This is the ideal scenario for innovation implementation. Employees are enthusiastic about the innovation, and they are skilled, consistent, and committed in their innovation use.

When innovation-values fit is good, yet the organization's implementation climate is weak, targeted users are committed to innovation use, but they lack skills in and experience few incentives for and many obstacles to innovation use. Thus, employees' use of the innovation is likely to be sporadic and inadequate. Committed to the idea of innovation use, users are likely to be disappointed and frustrated by their organization's weak implementation climate and by their own and their fellow employees' poor use of the innovation. Good innovation-values fit, in the absence of a strong implementation climate, is not sufficient to produce skillful and consistent innovation use.

When innovation-values fit is poor, yet the organization's implementation climate is strong, employee resistance is likely. A strong implementation climate creates an imperative for employees to use an innovation that, given poor innovation-values fit, employees oppose. If innovation-values fit is very poor, targeted innovation users may opt to leave the organization if they can find alternative employment. Those who cannot

TABLE 1
Implementation Climate and Innovation-Values Fit: Effects on Employees' Affective Responses and Innovation Use

	Innovation-Values Fit		
	Poor	**Neutral**	**Good**
Strong implementation climate	Employee opposition and resistance	Employee indifference	Employee enthusiasm
	Compliant innovation use, at best	Adequate innovation use	Committed, consistent, and creative innovation use
Weak implementation climate	Employee relief	Employee disregard	Employee frustration and disappointment
	Essentially no innovation use	Essentially no innovation use	Sporadic and inadequate innovation use

leave the organization are likely to engage in compliant innovation use, at best.

When innovation-values fit is poor and implementation climate is weak, targeted innovation users are likely to regard their organization's weak implementation climate—its anemic and erratic implementation policies and practices—with some relief. Targeted users are likely to be pleased to face little pressure to use the innovation. Unskilled, unmotivated, and opposed to innovation use, targeted users are unlikely to use the innovation at all.

Between these extremes of enthusiasm and frustration (when innovation-values fit is good) and resistance and relief (when innovation-values fit is poor) lies a middle group defined by neutral innovation-values fit. In this middle ground are innovations that are perceived to be neither highly congruent nor highly incongruent with organizational values that are of low intensity. When fit is neutral and the implementation climate is strong, targeted users are indifferent to the prospect of innovation implementation, and they face a strong imperative in favor of innovation use. In this case, we predict adequate innovation use—more than compliant innovation use but less than committed use. When fit is neutral and the implementation climate is weak, employees are not likely to use the innovation at all.

We note that employee resistance to innovation implementation is predicted in only one of the six cases that are depicted in Table 1, that is, when an organization's implementation climate is strong and innovation-values fit is poor. The term *resistance* connotes protest and defiance against an opposing pressure or force. A strong implementation climate is such a force. However, when an organization's implementation climate is weak, employees need not "resist" innovation use; there is, by definition, little pressure on employees to use the innovation. In sum, when an organization's climate for innovation implementation is weak, the organization's failure to create an imperative for innovation use, not employee resistance, is the likely cause of employees' lackluster innovation use.

Implementation Climate and Innovation-Values Fit: Two Examples

Buildco represents a case of a weak implementation climate and good innovation-values fit. Targeted users complained about many aspects of the implementation process, but they liked 3-D CADD. They valued their own and their company's technical expertise and use of cutting-edge technologies. They strived to create economical, creative, and fail-safe designs, and these users believed that 3-D CADD enhanced their efforts. As suggested in Table 1, targeted users were frustrated and disappointed by their company's weak implementation policies and practices (its weak implementation climate) and by employees' resultant inability to use 3-D CADD as much or as well as they would have liked to use it.

Markus's (1987) case study of one company's attempted implementation of a computerized financial information system (FIS) provides an

example of a strong climate for innovation implementation and poor innovation-values fit.[2] Championed by corporate headquarters, FIS allowed corporate accountants new access to divisional performance data. Corporate headquarters fostered a strong climate for the implementation of FIS in the divisions of the corporation by (a) ensuring divisional accountants knew how to use the system, (b) fixing technical problems regarding FIS, and (c) instituting policies that virtually necessitated the divisions' use of FIS. Nevertheless, divisional accountants actively resisted using FIS. They valued their financial authority and autonomy and perceived FIS to be an affront and a threat to these values.

THE EFFECTS OF IMPLEMENTATION CLIMATE AND INNOVATION-VALUES FIT ON INNOVATION USE: WHEN FIT DIFFERS BETWEEN GROUPS

In an organization characterized by between-group differences in high-intensity values, the same innovation may be regarded by the members of one group as highly congruent with their values (good fit) and by the members of a second group as highly incongruent with their values (poor fit). Such a situation is, of course, ripe for conflict if the effective implementation of the innovation requires innovation use (or at least support for innovation use) across both groups. Next, we explore the consequences of between-group differences in innovation-values fit: (a) when neither of the opposing groups has formal power over the other (horizontal groups) and (b) when one of the opposing groups does have formal power over the other (vertical groups).

Horizontal Groups

When innovation-values fit is good for one group within an organization and poor for another group, and when neither of the groups has power over the other, the strength of the organization's implementation climate determines the "winner" of the conflict over innovation use. If the organization's climate for implementation is strong, the group in favor of innovation implementation (whose members find the innovation congruent with their group's values) is likely to win for two reasons. First, a strong implementation climate creates an imperative for innovation use for all targeted users. Second, a strong implementation climate indicates to targeted innovation users that managers, who are senior to both groups, support implementation, thus throwing the weight of management behind the group favoring implementation. Ultimately, all targeted users are likely to use the innovation. Conflict may be drawn out, however, and implementation may be slow, as those opposed to innovation implementation actively or passively resist using the innovation.

[2] Because we did not conduct this case study, our knowledge of it is more limited than our knowledge of the Buildco and Wireco case studies.

Conversely, if the climate is weak, those opposed to implementation are likely to win, for the same reasons. A weak implementation climate discourages innovation use and indicates managers' ambivalence or antipathy toward implementation (and thus their tacit support of those who oppose innovation). Under these circumstances, employees' use of the innovation is likely to be limited at best, after a period of perhaps high but then declining use of the innovation by those who support innovation implementation.

An Example of Horizontal Groups: Production Operators and IT Specialists

We have described Wireco as an example of poor innovation-values fit. Although the fit of the computerized inventory control system to production operators' values *was* poor, the fit of the system to the company's IT specialists was good. Wireco's IT specialists valued the computerized system, believing it to be modern, efficient, organized, and beneficial. (Recall Schein's, 1992, description of IT values.) Further, the IT specialists saw in the prospective implementation of the system an opportunity to increase their own influence and status in the company.

Wireco's managers and supervisors, however, tacitly supported production operators' views of the system. As a result, the company's resulting implementation climate was very weak. For example, operators experienced few rewards for using the system and few punishments for neglecting it. One operator commented, "Are there any rewards or recognition for effective use of the system? No. I pet my dog at home more than I get petted here, and I don't pet my dog very often."

Given the poor fit of the inventory control system to production operators' values and the weak implementation climate, implementation of the system was not successful. Operators' and their managers' and supervisors' use of and support for the system declined, and Wireco's IT specialists lost the battle for implementation.

Vertical Groups

When innovation-values fit is good for one group within an organization and poor for another group and when one group does have power over the other, the strength of the organization's implementation climate again determines the "winner" of conflict over innovation use, yet the dynamic is a little different than the one just described. If innovation-values fit is good for the higher authority group and poor for the lower authority group, then the higher authority group (e.g., supervisors) will strengthen and augment the organization's climate for the implementation of the innovation. For example, the higher authority group may establish additional incentives or training for innovation use. Under these circumstances, lower authority group members—experiencing a strong implementation climate and poor innovation-values fit—will resist innovation use and/or engage in compliant innovation use.

Conversely, if innovation-values fit is poor for the higher authority group and good for the lower authority group, then the higher authority group is likely to undermine the organization's implementation climate. Higher authority group members may diminish or constrain lower authority group members' innovation use by, for example, minimizing the time available to use the innovation. Under such circumstances, lower authority group members—experiencing good-innovation values fit and a weak implementation climate—feel frustrated and disappointed, and they engage in only sporadic and inadequate innovation use.

Examples of Vertical Groups: Supervisors and Their Subordinates

In a study of employee-involvement programs in eight manufacturing plants, Klein (1984) found that employees generally welcomed opportunities for greater involvement in plant decision making (good fit). Supervisors, however, often resisted the implementation of employee-involvement programs, believing that these programs limited their authority and threatened their job security (bad fit). For example, in one plant (Klein, 1984: 88),

> the foremen saw [team meetings among employees] as a threat to their control and authority, which they tried to regain by bad-mouthing the program. This bad-mouthing, in turn, discouraged many of their subordinates from participating. In the end, the whole effort just faded away for lack of interest.

In sum, supervisors created impediments to workers' involvement, weakening the climate for implementation that their subordinates experienced and thereby undermining innovation implementation.

THE OUTCOMES OF INNOVATION IMPLEMENTATION: EXPLORING CONSEQUENCES FOR IMPLEMENTATION CLIMATE AND VALUES

Prior to the 1980s, most researchers who studied the determinants of innovation adoption did not study its aftermath: implementation (Tornatzky & Klein, 1982). Although research on implementation is now more prevalent, research on *its* aftermath is, to our knowledge, nonexistent. In this section, we consider briefly the aftermath of implementation: the effects (depicted by dashed lines in Figure 1) of varying implementation outcomes on an organization's subsequent implementation climate and values.

Innovation implementation may result in one of three outcomes: (a) implementation is effective, and use of the innovation enhances the organization's performance; (b) implementation is effective, but use of the innovation does not enhance the organization's performance; and (c) implementation fails. Each of these three outcomes may influence an organization's subsequent implementation climate and organizational members' values.

When Implementation Is Effective and Innovation Use Enhances Performance

When innovation implementation succeeds and enhances an organization's performance, the organization's implementation climate is strengthened. Managers' and supervisors' support for innovation implementation increases, yielding likely improvements in implementation policies and practices (e.g., innovation training for additional employees, more praise for targeted employees' innovation use). Further, when innovation implementation enhances an organization's performance, organizational values may be affected. If the innovation is largely congruent with the organizational members' homogeneous values, these values are reinforced and organizational members' confidence in the fit of the innovation to their values is strengthened. If the innovation is incongruent with organizational members' homogeneous values, members' values may shift. Organizational members' confidence in new values congruent with use of the innovation increases, as does the perceived efficacy of innovation adoption and implementation in general. As a result of such changes in organizational members' values, the fit of future innovations to organizational values is improved. If the innovation fits well with the values of one group of targeted users and it fits poorly with the values of a second group of targeted users', the "good-fit" group that encouraged innovation implementation is vindicated. Support for this group and its values may grow, whereas support for the "poor-fit" group and its values declines.

When Implementation Is Effective But Innovation Use Does Not Enhance Performance

When implementation succeeds but does not enhance an organization's performance, the organization's climate for implementation is weakened. Managers' and supervisors' support for implementation declines. If innovation-values fit is homogeneous within the organization and poor, preexisting organizational values are reinforced (e.g., "We should have known computerization would never work for us."). If innovation-values fit is homogeneous and good, existing organizational values are challenged. At the same time, however, the perceived value of innovation adoption and implementation in general may be questioned, potentially leading to pessimism regarding the organization's implementation of future innovations. Finally, if innovation-values fit varies between groups, support for the group that advocated innovation use lessens.

When Implementation Is Not Effective

When implementation fails, an implementation climate, which has in all likelihood always been weak, weakens further unless—in response to initial signs of implementation failure—managers demonstrably increase their support for innovation implementation by changing the

organization's implementation policies and practices to better support implementation. If the innovation was largely congruent with organizational members' homogeneous values, organizational members may question not just the merits of change, but the very possibility of change. If the innovation was largely incongruent with organizational members' homogeneous values, organizational members may feel empowered by their thwarting of the innovation's implementation. Finally, if innovation-values fit varies between groups, the influence within the organization of the group that advocated innovation implementation is reduced.

The Outcomes of Innovation Implementation: Two Examples

Buildco provides an interesting example of implementation and innovation outcomes over time. The company's initial climate for the implementation of 3-D CADD was weak, and innovation use was, accordingly, sporadic. However, Buildco's managers stepped in to strengthen the company's climate for implementation. The early organizational benefits of 3-D CADD use further strengthened Buildco's implementation climate. Given an ultimately strong climate for implementation and good fit between 3-D CADD and organizational values, use of 3-D CADD is now routine at Buildco, and the values for computerization appear even stronger than they were prior to the company's adoption of 3-D CADD.

In contrast, Wireco did not succeed in implementing its computerized inventory control system. Respect within Wireco for the company's IT specialists declined. The company has not, in the years since its foiled implementation of the inventory control system, adopted any other computerized technology that would diminish the flexibility of, or change in any other significant way, the company's production procedures.

RESEARCH IMPLICATIONS OF THE MODEL

The subject of relatively little research, implementation is the neglected member of the innovation family. Even the *Academy of Management Review*'s Call for Papers on the Management of Innovation (1994: 617–618) had a distinct, if implicit, focus on the development and adoption—not the implementation—of innovations. Our model brings new attention to implementation and invites new research on the topic. In this section, we underscore key constructs of the model, note additional research topics suggested by the model, and highlight research methods most useful for the study of implementation.

Key Constructs

Climate for implementation. We have proposed that implementation effectiveness is in part a function of the strength of an organization's climate for implementation. The climate construct subsumes and integrates many of the findings of past implementation research. However,

the contributions of the construct go beyond parsimony. The construct suggests that an organization's implementation policies and practices should be conceptualized and evaluated as a comprehensive, interdependent whole that together determines the strength of the organization's climate for implementation. Further, the construct highlights the equifinality of implementation climate. Implementation climates of equal strength may ensue from quite different sets of policies and practices. For example, an organization may ensure employee innovation skill by training employees, by motivating employees through the reward system, by selecting employees skilled in innovation use for hire or promotion, or by shaping the innovation to match employees' existing skills.

The climate for implementation construct thus pushes researchers away from the search for *the* critical determinants of implementation effectiveness—training or rewards or user friendliness—to the documentation of the cumulative influence of all of these on innovation use. Further, the climate construct facilitates the comparison of implementation effectiveness across organizations. The specific implementation policies and practices that facilitate innovation use may vary tremendously from organization to organization. Training may be critical in one organization, rewards in a second organization, and so on. Thus, specific implementation policies and practices may show little consistent relationship to innovation use across organizations. Climate, however, is cumulative and thus, in concert with innovation-values fit, predictive of innovation use across organizations.

Innovation-values fit. The construct of innovation-values fit indicates the limits of implementation climate. In the face of poor innovation-values fit, a strong implementation climate results in only compliant innovation use and/or resistance. Further, innovation-values fit may vary across the groups of an organization, engendering intraorganizational conflict and lessening implementation effectiveness. The construct of innovation-values fit thus directs researchers to look beyond an organization's global (or homogeneous) implementation policies and practices and to consider the extent to which a given innovation is perceived by targeted users to clash or coincide with their organizational and group values.

Implementation effectiveness and innovation effectiveness. The construct of implementation effectiveness helps to focus researchers' attention on the aggregate behavioral phenomenon of innovation use. The construct of innovation effectiveness, in contrast, directs researchers' attention to the benefits that may accrue to an organization as a result of successful innovation implementation. These two distinct constructs, too often blurred in prior innovation research and theory, are critical for implementation research and theory. The first underscores the difficulty of innovation implementation; targeted organizational members' consistent and appropriate innovation use is not guaranteed. The second underscores the varying effects of innovation implementation; even when the implementation

of an innovation is effective, the innovation may fail to yield intended organizational benefits.

Additional Topics for Research

The model invites research not only on the effects of implementation climate and innovation-values fit on implementation and innovation effectiveness, but it also suggests several questions only hinted at in this article, given space limitations. We consider four.

Managers and the creation of a strong implementation climate. The organizational change and innovation literatures (e.g., Angle & Van de Ven, 1989; Beer, 1988; Leonard-Barton & Krauss, 1985; Nadler & Tushman, 1989; Nutt, 1986) suggest that the primary antecedent of an organization's climate for implementation is managers' support for implementation of the innovation. If this is true, why do managers fail to support the implementation of many of the innovations adopted in their organizations? The available literature, although limited, suggests at least two possible answers. First, innovation adoption decisions are often made by executives at corporate headquarters without the participation or input of local, lower level managers (Guth & MacMillan, 1986; Klein, 1984). Left out of this decision-making process, local managers may not be inspired to create a strong climate for innovation implementation. Second, managers may support innovation implementation, but they may lack an in-depth understanding of the innovation. Managers who know little about an innovation are likely to delegate implementation management to subordinates who are more knowledgeable but who lack the authority and resources to create a strong climate for implementation. Although plausible, these explanations for managers' failure to support innovation implementation are tentative and preliminary. The topic warrants further empirical and conceptual analysis.

"Upward implementation" of innovations. The preceding paragraph, and much of our model, highlights the roles that managers play in creating a strong implementation climate among targeted users. Are nonmanagers powerless to affect their organization's implementation climate? We know of no research explicitly designed to answer this question. We suspect, however, that in all but the most participative, flat organizations, nonmanagers have relatively little influence in creating a strong implementation climate. Even though nonmanagers can advocate, or champion, their managers' adoption of a given innovation (Dean, 1987; Howell & Higgins, 1990), they lack the authority and resources to institute the policies and practices that yield a strong implementation climate. Yet as organizations strive to become both more innovative and flatter, the role of nonmanagers in fostering implementation becomes an increasingly important topic for research.

Implementing multiple innovations. Can an organization successfully and simultaneously implement multiple innovations? If an organization's multiple innovations necessitate diverse, new, time-consuming, and

difficult-to-learn behaviors of a common group of targeted users, the likelihood of successful simultaneous implementation of the innovations is slim. An organization's climate for the implementation of one such innovation may compete with and undermine its climate for the implementation of another innovation. For example, rewards for the use of one innovation may impose obstacles to the use of the second innovation. More likely to be successful are organizational efforts to implement innovations that require complementary changes in the behavior of distinct groups of users. In such a case, the climate for the implementation of one innovation may indeed enhance the climate for the implementation of a second innovation. However, additional research is needed because relatively little is known about the success or failure of organizations' attempts to implement multiple innovations.

Fostering innovation-values fit. The actions an organization might take to strengthen its climate for the implementation of an innovation are relatively clear, but what can an organization do to foster good innovation-values fit? The available literature suggests three possible strategies. First, an organization may provide opportunities for employees to participate in the decision to adopt the innovation (Kotter & Schlesinger, 1979). Employees' participation in the adoption decision increases the likelihood that the chosen innovation fits their preexisting values. Employees' participation in the adoption decision also may change employees' values, rendering their new values congruent with the adopted innovation. Second, an organization may foster good innovation-values fit by educating employees about the need for (value of) the innovation for organizational performance. Although senior executives may recognize the need for an innovation that is discrepant with organizational members' preexisting values, lower level employees may not understand this (Floyd & Wooldridge, 1992; Guth & MacMillan, 1986; Klein, 1984). Third, employees' values may shift over time, and innovation-values fit may increase if an organization's implementation of an innovation that represents a poor fit with employees' preexisting values yields clear and widely recognized benefits for the organization. This, however, is a risky strategy; employees' use of an innovation that represents a poor fit with their values is likely to be compliant at best, and compliant innovation use is unlikely to yield great benefits to the adopting organization. Given the predicted importance of innovation-values fit in fostering innovation use, the determinants of innovation-values fit warrant focused research attention.

Methods for the Study of Implementation

Multiorganizational research. As we have noted, single-site, qualitative case studies dominate the implementation literature. To verify the sources of between-organization differences in implementation effectiveness proposed in the model, however, researchers must move beyond single-site research to analyze innovation implementation across

organizations. The topic is sufficiently complex to warrant studying the implementation of a single innovation (e.g., a specific computer program), rather than the implementation of diverse innovations, across organizational sites. Ultimately, such studies may provide the groundwork for studies that are used to compare the implementation of different types of innovations across organizations.

Multilevel research. Although designed to capture between-organizational differences in innovation implementation, our model is expressly multilevel. Implementation effectiveness summarizes the innovation use of multiple individuals. Implementation climate describes the shared perceptions of multiple individuals. And innovation-values fit may vary not only between organizations but also between groups and even between individuals. Accordingly, we advocate the collection of data from multiple individuals across multiple groups, if present, within each organization in a multiorganizational sample.

Longitudinal data. Implementation is a process that occurs over time. Ideally, implementation research begins prior to implementation, with analysis and documentation of the decision to adopt an innovation. Research then continues over time to capture increases and decreases in the strength of implementation climate, in the fit of the innovation to employee values, and in innovation use and innovation effectiveness.

Qualitative and quantitative data. To gather data from multiple individuals across multiple groups in multiple organizations over multiple periods, researchers will surely need to use quantitative survey measures. The use of qualitative methods across such a sample would be far too labor intensive, far too time consuming. Further, the use of quantitative measures will allow researchers to conduct needed statistical tests of within- and between-group and within- and between-organization variability in implementation climate, innovation-values fit, innovation use, and innovation effectiveness.

However, qualitative research on implementation is still valuable. Preliminary qualitative research is likely to be essential for a researcher to gain an in-depth understanding of a given innovation and its implementation across organizations. Qualitative research may foster further development of our constructs and may provide the groundwork for the creation of survey instruments that are focused on a specific innovation. Finally, qualitative methods may be used to gather in-depth information about specific organizations that were revealed in surveys to be particularly interesting and important (e.g., organizations characterized by strong implementation climates and poor innovation-values fit).

Few researchers are likely, of course, to collect multiorganizational, multilevel, longitudinal, quantitative and qualitative data within a single study. Yet, studies that follow even two of the four research design recommendations proposed in this section will represent a step in the right

direction—a step toward a deeper, more thorough understanding of innovation implementation.

CONCLUSION

When organizations adopt innovations, they do so with high expectations, anticipating improvements in organizational productivity and performance. However, the adoption of an innovation does not ensure its implementation; adopted policies may never be put into action, and adopted technologies may sit in unopened crates on the factory floor. The organizational challenge is to create the conditions for innovation use: a strong climate for innovation implementation and good innovation-values fit. Only then is an organization likely—but, unfortunately, by no means certain—to achieve the intended benefits of the innovation.

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