

Innovation Implementation

Overcoming the Challenge

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ABSTRACT—*In changing work environments, innovation is imperative. Yet, many teams and organizations fail to realize the expected benefits of innovations that they adopt. A key reason is not innovation failure but implementation failure—the failure to gain targeted employees' skilled, consistent, and committed use of the innovation in question. We review research on the implementation process, outlining the reasons why implementation is so challenging for many teams and organizations. We then describe the organizational characteristics that together enhance the likelihood of successful implementation, including a strong, positive climate for implementation; management support for innovation implementation; financial resource availability; and a learning orientation.*

KEYWORDS—*innovation; implementation; learning*

In the life of an individual, a family, a team, an organization, or a community, innovation is critical. Individuals, families, teams, organizations, and communities must grow and change—adopting and implementing innovations—if they are to survive and thrive in a changing environment.

In the language of innovation researchers, an *innovation* is a product or practice that is new to its developers and/or to its potential users. Innovation *adoption* is the decision to use an innovation. Innovation *implementation*, in contrast, is “the transition period during which [individuals] 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” (Klein & Sorra, 1996, p. 1057). The difference between adoption and implementation is fundamental: Individuals, teams, organizations, and communities often adopt innovations but fail to implement them successfully.

Consider an example that is as mundane as it is close to home: Do you own an exercise machine of some kind? If so, that's innovation adoption. When you bought the machine, you adopted it. If you own a machine, did you in fact use it in the past week? That's innovation implementation. If you use the exercise machine regularly, in a skilled, consistent, and committed manner, you've excelled at implementation.

As a general rule, adoption is much easier—although sometimes more expensive—than implementation. Many innovations, like exercise machines, are implemented ineffectively. Thus, innovation failure—the failure of an innovation to achieve the gains expected by the adopting individual or individuals—often reflects not the ineffectiveness of the innovation per se but the ineffectiveness of the implementation process (Klein & Sorra, 1996). In short, the innovation fails because it is not used with the consistency, skill, and care required to achieve its expected benefits.

In this article, we focus on the implementation of innovations that require the active and coordinated use of multiple organizational members. Examples include computerized manufacturing automation and organizational quality-improvement programs such as total-quality management. Although research on the implementation of such innovations is limited, the topic is of great interest to organizational psychologists, to other organizational scholars, and to managers. But, innovation implementation is an issue that transcends psychological sub-disciplines. Psychologists who hope that their research will inform the design of, say, school-based prevention programs, drug-treatment programs, or training systems must grapple, ultimately, with implementation: If adopted, will the interventions they recommend be implemented? Even the family therapist who suggests to a family that they eat dinner together more regularly faces the challenge of implementation: A family may “adopt” the idea, but will they implement it?

We begin with a brief overview of the state of innovation-implementation research. We then draw on research findings to describe (a) the obstacles that organizations face during innovation implementation and (b) organizational factors that may allow organizations to overcome these obstacles. We conclude with a brief discussion of the practical implications of the research and of new directions for implementation research.

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STUDYING INNOVATION IMPLEMENTATION

Research on the implementation of organizational innovations is both labor intensive and rare. The ideal study of team or organizational innovation implementation, we believe, is one that examines the implementation of a single innovation, or a common set of innovations, across a sample of adopting organizations or teams over time. For example, Edmondson, Bohmer, and Pisano (2001) combined qualitative and quantitative data collection in a longitudinal study of 16 surgical teams' efforts to implement a new technique—minimally invasive cardiac surgery—in the operating room. Klein, Conn, and Sorra (2001) conducted a multilevel, longitudinal study of the implementation of a single type of computerized manufacturing technology (manufacturing resource planning or MRP II) across 39 manufacturing plants. And Holahan, Aronson, Jurkat, and Schoorman (2004) examined the implementation of computer technology in science education in 69 schools. The findings of these studies, and of in-depth qualitative case studies of organizational innovation implementation (e.g., Nutt, 1986; Nord & Tucker, 1987; Repenning & Sterman, 2002), illuminate stumbling blocks and best practices in innovation implementation.

STUMBLING BLOCKS ON THE ROAD TO INNOVATION IMPLEMENTATION

The implementation of team and organizational innovations is difficult for numerous reasons. Six interrelated reasons figure prominently in the implementation literature.

First, many innovations—particularly technological innovations—are unreliable and imperfectly designed. The newer the technology, the more likely it is to have bugs, break down, and be awkward to use. This “hassle factor” can render even the most enthusiastic technophile frustrated and annoyed. In their review of the literature on computerized-technology implementation, Klein and Ralls (1995) reported that 61% of the qualitative studies they reviewed documented the negative consequences of low technology quality and availability on employee satisfaction and innovation use.

Second, many innovations require would-be users to acquire new technical knowledge and skills. For many people, this may be tedious or stressful. In an individual-level study of project engineers' implementation of information-technology innovations, Aiman-Smith and Green (2002) found that innovation complexity—the extent to which the new technology was more complicated than the technology it replaced—was significantly negatively related to user satisfaction and the speed required to become competent in using the innovation.

Third, the decision to adopt and implement an innovation is typically made by those higher in the hierarchy than the innovation's targeted users. Targeted users, however, often have great comfort in the status quo and great skepticism regarding the merits of the innovation. Nevertheless, they may be instructed by

upper management to use the innovation against their wishes. Indeed, based on interviews in 91 organizations, Nutt (1986) concluded that managers' most common strategies in guiding innovation implementation are “persuasion” and “edict”—both of which involve little or no user input in decisions regarding adoption and implementation.

Fourth, many team and organizational innovations require individuals to change their roles, routines, and norms. Innovation implementation may require individuals who have previously worked quite independently to coordinate their activities and share information (Klein & Sorra, 1996). It may also disrupt the status hierarchy, requiring individuals who have previously worked as boss and subordinates to now work as peers. In a qualitative study of the implementation of an empowerment-education intervention for diabetes patients, Adolfsson, Smide, Gregeby, Fernström, and Wikblad (2004) found that doctors and nurses struggled with the role changes that the intervention required. Although the doctors and nurses believed that the empowerment approach was beneficial for their patients, they found it difficult to step out of their expert roles to interact with their patients as facilitators.

Fifth, implementation is time consuming, expensive, and, at least initially, a drag on performance. Effective innovation implementation often requires hefty investments of time and money in technology start-up, training, user support, monitoring, meetings, and evaluation. Thus, even the most beneficial innovation is likely to result in poorer team and/or organizational performance in the short run, as Repenning and Sterman (2002) documented in their study of the implementation of two process-improvement innovations—one designed to reduce expensive stores of work-in-progress inventory and one designed to speed new product development—in a division of a major U.S. automaker. Good things—implementation benefits—may come to those who wait, but targeted users and their managers may feel greater pressure to maintain pre-existing levels of performance than to invest in the uncertain and long-term potential of innovation implementation.

And, sixth, organizations are a stabilizing force. Organizational norms and routines foster maintenance of the status quo. Even when organizational members recognize that a specific change would be beneficial, they often fall prey to the “knowing-doing gap” (Pfeffer & Sutton, 2000). That is, they often fail, for a variety of reasons, to actually do the things that they know would enhance performance or morale. Organizational members may adhere rigidly to the past, fear reprisal for suggesting bold changes, or substitute talk for action, for example (Pfeffer & Sutton, 2000). The result, unfortunately, is a failure to adopt, and certainly to implement, potentially beneficial innovations.

Given these challenges to implementation success, it is perhaps no wonder that observers estimate that nearly 50% or more of attempts to implement major technological and administrative changes end in failure (e.g., Aiman-Smith & Green, 2002; Baer & Frese, 2003; Repenning & Sterman, 2002). Indeed, a 2002

report by financial giant Morgan Stanley estimated that, of the \$2.7 trillion that companies pour into technology each year, more than \$500 billion is wasted—in large part due to implementation failure.

ANTECEDENTS OF INNOVATION-IMPLEMENTATION EFFECTIVENESS

Our review of the literature on innovation implementation suggests that six key factors shape the process and outcomes of innovation implementation.

One key factor is the package of implementation policies and practices that an organization establishes (Klein & Ralls, 1995). Implementation policies and practices include, for example, the quality and quantity of training available to teach employees to use the innovation; the provision of technical assistance to innovation users on an as-needed basis; the availability of rewards (e.g., praise, promotions) for innovation use; and the quality, accessibility, and user-friendliness of the technology itself. The influence of such policies and practices is cumulative and compensatory. No single implementation policy or practice seems to be absolutely critical for an organization's innovation-implementation effectiveness. But, the overall quality of an organization's implementation policies and practices is predictive. Klein et al. (2001) found that manufacturing plants that established numerous high-quality implementation policies and practices were more successful in implementing manufacturing-resource planning, a major technological innovation, than were manufacturing plants whose implementation policies and practices were meager and of lesser quality.

The second critical factor is the team's or organization's climate for innovation implementation—that is, employees' shared perceptions of the importance of innovation implementation within the team or organization. When a unit's climate for innovation implementation is strong and positive, employees regard innovation use as a top priority, not as a distraction from or obstacle to the performance of their "real work." Both Klein et al. (2001) and Holahan et al. (2004) found that implementation climate was a significant predictor of innovation use.

Managers play a critical role in the implementation process, so their support of the innovation is the third critical factor. In the absence of strong, convincing, informed, and demonstrable management support for implementation, employees are likely to conclude that the innovation is a passing managerial fancy: Ignore it and it will go away. As Repenning (2002) admonished, "Managers may be understandably suspicious of the recommendation that, once they choose to adopt an innovation, they support it wholeheartedly irrespective of any reservations concerning lack of appropriateness. To do otherwise, however, insures that the implementation effort will fail" (pp. 124–125). Sharma and Yetton (2003) found that the more an innovation requires employees to work together—as the innovations on which we focus in this article do—the stronger the positive re-

lationship between management support and implementation success.

The fourth factor is the availability of financial resources. Implementation is, of course, not cheap. It takes money to offer extensive training, to provide ongoing user support, to launch a communications campaign explaining the merits of the innovation, and to relax performance standards while employees learn to use the innovation. Like Nord and Tucker (1987), Klein et al. (2001) found that financial-resource availability was a significant predictor of the overall quality of an organization's implementation policies and practices and thus, indirectly, a predictor of the organization's implementation effectiveness.

The fifth necessary factor is a learning orientation: a set of interrelated practices and beliefs that support and enable employee and organizational skill development, learning, and growth. In organizations and teams that have a strong learning orientation, employees eagerly engage in experimentation and risk taking; they are not constrained by a fear of failure. A learning orientation is critical during innovation implementation because implementation is rarely an easy, smooth process or an instant success. Bugs, errors, and missteps are likely. A strong learning orientation allows organizational members to overcome such obstacles, experimenting, adapting, and persevering in innovation use. The research of Edmondson et al. (2001) suggests that leaders create a shared team learning orientation by (a) articulating a compelling and inspiring reason for innovation use; (b) expressing their own fallibility and need for team members' assistance and input; and (c) communicating to team members that they are essential, valued, and knowledgeable partners in the change process. As a result, team members—targeted innovation users—come to see innovation implementation as an exciting learning opportunity, not as a burden to be endured. Further, team members must feel sufficient psychological safety (Edmondson, 1999; Baer & Frese, 2003) to express their ideas and opinions, as well as to admit their errors. A psychologically safe social environment is one in which group members collectively feel secure taking interpersonal risks (Edmondson, 1999). Indeed, Baer and Frese (2003) found that psychological safety moderates the effects of process innovation on organizational performance: The greater an organization's climate for psychological safety, the stronger the positive relationship between the organization's adoption and implementation of process innovations and its financial performance.

Lastly, the sixth critical factor is managerial patience—that is, a long-term time orientation. Managers who are committed to achieving the long-term benefits of innovation implementation understand that the implementation process may diminish unit productivity and efficiency in the short term. The more managers push employees to maintain or improve immediate task performance, the less time and energy employees can devote to the implementation of innovations that offer long-term, and potentially more enduring, performance gains (Repenning & Serman, 2002).

CONCLUSION: PRACTICAL IMPLICATIONS AND NEW DIRECTIONS FOR RESEARCH

Researchers have begun to identify the practices and characteristics that allow organizations to overcome the challenges of innovation implementation. Clearly, top management cannot close the book on an innovation after they have decided to adopt it. To ensure targeted users' sustained and skillful use of innovative technologies and practices, managers must devote great attention, conviction, and resources to the implementation process.

While important strides have been made in understanding the process of innovation implementation, more research is needed and important questions remain. How does the implementation of technological innovations like new computer systems differ from the implementation of nontechnological innovations such as new managerial, educational, training, or patient-treatment interventions? How does success or failure at implementing an innovation in one team or location spread through an organization or community? Do units that succeed in implementing one innovation succeed in implementing others as well? Though questions remain, the growing innovation-implementation literature draws needed attention to the challenge and the importance of effective innovation implementation. In the absence of effective implementation, the benefits of innovation adoption are likely to be nil. After all, how physically fit can you get if you buy a top-of-the-line exercise bike or treadmill but never use it?

Recommended Reading

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