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Multiple Forms of Innovation Implementation: The Role of Innovation, Individuals, and the Implementation Context

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A STORY OF TOYOTA AND PIGGLY WIGGLY

In the early 1950s, a delegation of the Toyota Motor Company visited the United States. The delegation, led by Eiji Toyoda, was on one mission: to improve the manufacturing process of Toyota – then a nascent company that started automobile production in 1947 – so that it would equal the productivity of the Ford Motor Company. While Eiji was impressed by the scale of Ford's production facilities, he was utterly appalled by numerous inefficiencies that plagued the facilities. However, on their visit to Piggly Wiggly, an American supermarket chain, the delegation was inspired by how the stores reordered goods only when the goods have already been bought by customers. The Toyota Motor Company applied the lesson from Piggly Wiggly by minimizing its inventory level and reordering in just-in-time basis. This became a central pillar of the "Toyota Way," a production system that revolutionized the competitive landscape of the automobile industry.

Toyota's "Piggly Wiggly" implementation was not a static process. Neither Eiji nor anyone for that matter could have articulated the exact process through which the new production system would work. Rather, the company's implementation efforts involved a series of controlled experiments

through which the company continually responded to problems identified during the implementation. For instance, the just-in-time production method in Toyota was complemented by a system where employees were empowered to promote activities for spontaneous improvements in response to the continuously changing status of production.

Unfortunately, the complex process through which innovation implementation actually takes place is largely treated as a "black box" because innovation implementation has been typically treated as a rather mechanical or even automatic process. This line of thinking overlooks the rich possibility of outcomes that may appear during the implementation process. This is a critical deficiency particularly because the benefits of innovation depend as much on *how* it is implemented as on *whether* it is implemented. Effective implementation is critical for organizational innovation because even the most brilliant ideas fail to bear fruit if organizations fail to use them properly.

We challenge the prevailing view and argue that the implementation stage may provide organizations ample opportunities to rediscover innovations through their members' distinct ways of using them, which provide strategic advantages to organizations. The idea that innovation unfolds and is transformed through a process that involves individual users was explored in a seminal work by Stephen Barley. Scholars have also explored the interactions between innovation and individuals in the context of IT (information technology) systems, user-led innovation, and innovation appropriation.

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Drawing on the rich literature on innovation, we elaborate the patterns of innovation implementation that result from mutual adaptation between innovation and individual users. Specifically, our framework captures the diverse forms of implementation behavior by individual users that may emerge during the implementation stage. Given that innovation implementation often leads to unintended consequences, our approach is particularly useful in explaining the process through which organizations may accrue benefits from both intended and unintended consequences of innovation implementation. We also highlight antecedent conditions that may promote different forms of innovation implementation.

MULTIPLE FORMS OF INNOVATION IMPLEMENTATION

The implementation process, which involves the inevitable interaction between an innovation and its users, often induces the modification of the original design of the adopted innovation, which may by itself comprise an innovation. This interaction between an innovation and its users takes place over time; in this process, the users and the innovation transform each other, continually creating a new equilibrium that settles the tension between the two systems. In this dynamic interaction perspective, neither the person nor the innovation is a stable entity during the implementation stage. For this reason, the emerging pattern of mutual adaptation between person and innovation guides the implementation process and determines the form and effectiveness of the innovation in question.

IDENTIFYING DIFFERENT FORMS OF IMPLEMENTATION

Although employees pursue stability in their organizational life, they often encounter new objects, ideas, or practices that may disrupt the equilibrium of their work life. In a narrow sense, the potential outcomes of implementation for organizational members *can* be binary – they either reject or accept the innovation. However, organizational members who implement an innovation may react with diverse behavioral patterns that cannot be captured in simple binary terms. Instead, they may interact with the innovation to produce varying forms of implementation. The present model explores alternative mechanisms by which the two systems (i.e., person and innovation) mutually influence each other and regain equilibrium.

We propose the following four forms of innovation implementation in accordance with the degree of changes in the innovation and the degree of changes in organizational members: mechanical implementation, learning, reinvention, and

mutual adaptation (see Table 1). The objective in developing this model is to highlight the divergent possibilities that may ensue at the implementation stage following the adoption of an innovation. The four categories, however, should not suggest a rigid stratification of four mutually exclusive possibilities. For instance, the degree of change among organizational members may depend on changes in the innovation. Moreover, the degree of changes among organizational members (i.e., learning) can reduce the need for changes in innovation (reinvention) because in such a case, individual users actively accept the innovation and adapt to it. Thus, the four forms are presented to serve as a simplified conceptualization of what is, in reality, a continuum of various forms of implementation.

Mechanical Implementation

This form of implementation occurs when employees use a particular innovation with minimal changes to the innovation or themselves. Thus, the result of mechanical implementation can be depicted as a highly faithful replication of the original design of the innovation. This form of implementation is close to the traditional image of implementation: producing an unaltered copy of well-designed, technically superior innovations. Mechanical implementation is common in well-known franchises and retail store chains (e.g., McDonald's, Walmart, and Starbucks) that rely on "precise and reliable replication" of the model store and standardized operations that are expressively communicated through service and operation manuals. In fact, franchisors often threaten to revoke licenses to compel franchisees to meet certain necessary operating standards to retain their carefully crafted brand images. In this form of implementation, organizational members tend to conform to the prescribed behavior and replicate the practice by the book. At the same time, in mechanically following the directives of the innovation, organizational members make few adjustments in their identity or behavior.

Learning

This form of implementation involves employees adapting to innovation by changing their values, skills, and work behavior in accordance with the demands of the innovation. The burden of adjustment is shouldered almost entirely by the users, as the innovation itself is practically unaltered. Organizational members cope with potentially disruptive innovations by adjusting their psychological beliefs and by modifying their task behavior. For instance, with the introduction of a team-based structure or reward schemes, employees may change their attitudes toward collaboration, thereby increasing collective task efforts and valuing team performance. Implementing Six Sigma, a process approach to

Table 1 Modes of interaction between innovation and individual users.

		Person adaptation	
		Low	High
Innovation Adaptation	Low	Mechanical implementation	Learning
	High	Reinvention	Mutual adaptation

quality improvement, often involves substantial changes in the skills and values of employees because they need to learn new statistical skills and other quality management tools that may change their daily problem-solving activities. However, when the person-innovation gap to be bridged is stretched beyond a certain point, organizational members may hesitate changing themselves, because the demand for learning is so overwhelming that it seems unrealistic.

Reinvention

Reinvention refers to the degree to which an innovation is modified by users during its implementation. Reinvention involves diverse forms of deletion, addition, and/or alterations in the design, features, and functions of the innovation that occur during the implementation stage. Reinvention can range from minor modifications, such as changes in the label and the order of procedures, to substantial reconfigurations of the form and function of the innovation, which often serve the goal of local adjustments. For example, Toyota's implementation of the just-in-time (JIT) production system ran into considerable problems during the initial stages due to the lack of communication among employees about their production needs, which created part shortages and line stoppages. This incident inspired the modification of the innovation, that is, to include a Kanban system in which employees use cardboards to communicate their needs to one another. This color-coded system was adapted through the company's quality circle, and the workers provided a great deal of input in modifying the Kanban system to best suit the unique needs of their production teams at Toyota factories.

Mutual Adaptation

This form of implementation involves changes in both innovation and organizational members. In reality, implementing an innovation is apt to take the form of compromises between the person and the innovation, involving changes in both. We conceptualize mutual adaptation as synchronous, reciprocal interactions between the two entities involved, resulting in new equilibria for them. Such interactive processes may have

a lasting impact on the part of the involved individuals and reshape the innovation in accordance with the local situation. For example, during Toyota's implementation of the JIT and Kanban system, the original design of the production system evolved to optimize manufacturing efficiency while organizational members underwent change to best exploit the continuously evolving system. Similarly, when a new team-based structure is implemented, the new organization design and employees mutually influence each other. This mutual adaptation process, which reflects the existing power dynamics among members and leaders, results in unintended team design features and the redistribution of roles and skills among members.

VARIOUS FACTORS SHAPING THE FORM OF INNOVATION IMPLEMENTATION

Building on the foregoing discussion, we isolate the antecedent conditions that lead to different forms of implementation. The following discussion focuses on various factors that account for diverse forms of implementation. Specifically, the forms of innovation implementation may be driven by three factors: (a) the innovation to be implemented; (b) organizational members who put it into use; and (c) the social organizational context surrounding this interaction between the innovation and organizational members. Considering that innovation implementation involves an individual's use of a particular innovation, we have to consider the attributes of the innovation and of the individual users. In addition, people tend to adhere to existing courses of action rather than to voluntarily initiate new ones; hence, contextual forces often better explain behavioral changes involving innovation than personal characteristics. We understand that employees' implementation behavior can also be explained by external contingencies, such as the demand for and patterns of implementation by suppliers, customers, and competing organizations. In the current framework, however, we focus on immediate factors such as the innovation, its users, and the implementation context that comprise the dynamics of innovation implementation (see Fig. 1).

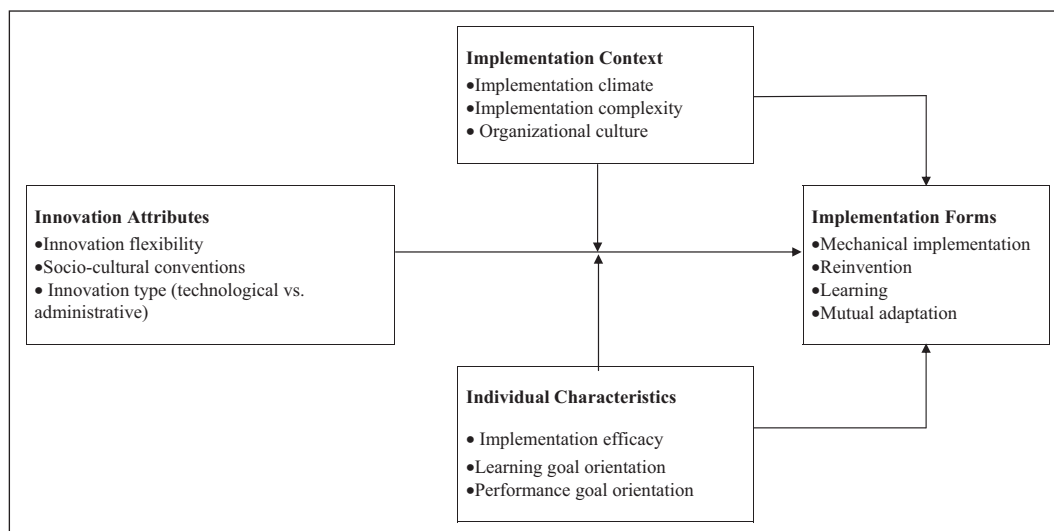


Figure 1 Framework of multiple forms of innovation implementation.

In each of the three antecedent categories, we identify several plausible predictors of implementation. For innovation attributes, we consider core features of innovation, such as innovation flexibility, socio-cultural convention related to the innovation, and types of innovation. These attributes offer opportunities and constraints for the emergence of different forms of implementation. For individual characteristics, we focus on organizational members' implementation efficacy and goal orientations, which should provide them the ability and motivation for different forms of implementation. Finally, for organizational contexts, we include implementation climate, implementation complexity, and organizational culture, all of which should guide organizational members' efforts toward a particular direction of implementation. The specific predictors included in each of the three categories are in no way exhaustive of all factors that can affect innovation implementation. Instead, these predictors are meant to identify the most salient factors and illustrate their effects on multiple forms of implementation, which have substantial practical and scholarly implications.

INNOVATION ATTRIBUTES

Flexibility Promotes Reinvention

Innovations may provide different levels of flexibility for customization in their implementation. For example, the modularization or divisibility of an innovation allows for partial implementation of selected elements without full use of the innovation. Modularization facilitates individual users' customization of the innovation to better serve their personal needs and task requirements by encouraging them to choose among different combinations of multiple components of the innovation.

Individualization Promotes Reinvention

Similarly, the individualization of an innovation allows organizational members to use the innovation for their individual output, independent of other members' use of the innovation. For example, the increasing number of business software and Internet services allows users to selectively utilize some elements of the innovation and to benefit from the innovation regardless of the way others use it. An extreme case of flexibility is the use of open source software (OSS) that engages users to participate in its development and evolution. Thus, reinvention is more likely to materialize when the innovation is equipped with flexibility through modularization, individualization, and openness to user involvement in its design and implementation.

The Lack of Socio-Cultural Convention Promotes Reinvention

Individual users' sense-making of an innovation can be driven by a certain set of social rules and routinized practices based on their prior experiences and schema. For example, when we look at a microwave oven, rather than seeing a rectangular object made of plastic, we attribute the function that allows us to heat food because we have come to understand such functions through social learning processes. This notion

is particularly important in organizational innovation because without certain societal or cultural conventions attached to an innovation, there is room for subjective interpretations and creative use of the innovation.

If technological systems or work practices to be implemented are quite new to organizational members, and if the members do not have prior experiences of using similar types of innovations, they will interpret the objects and practices using their intuition and related schema to develop their own sense of purposes and potential uses related to the innovation. In such cases, the innovation may take a life of its own and evolve into something different from its original intent and function. For example, when organizations introduce new devices (e.g., iPad) or new practices (e.g., virtual parallel teams), organizational members lacking adequate experiences on these innovations tend to develop their own interpretations and creatively incorporate them in their work, often distorting the original design or intended manner of implementation. This circumstance is apt to engender reinvention of the innovation.

Technological Innovation Promotes Learning

We expect technological innovations to engender more learning, whereas administrative innovations may be more vulnerable to reinvention. This expectation is based on differing levels of transferability or communicability of an innovation, which refers to the degree of articulate clarity of the innovation to the users. Technological innovations, such as new products, new manufacturing technologies, and job redesigns, occur within the primary task domain of the organization. These innovations tend to have a high level of transferability based on a well-defined structure, documentation (e.g., manuals), or formal training programs, thus leaving less room for subjective interpretation and reinvention by users. The presence of manuals and training programs in highly transferable innovations should promote individual users' learning by offering clear directions for change in skills and task behavior.

Administrative Innovation Promotes Reinvention

On the other hand, administrative innovations address the social system, including organizational structure, reward system, interaction patterns among workers, and belief systems shared among workers. Compared to technological innovations, administrative innovations, such as cross-functional teams and new HR practices, provide greater room for subjective interpretations and are more pliable to the context in which they are implemented. This is perhaps due to the difficulty of providing specific and clear directions for mostly intangible forms of administrative innovations. For this reason, administrative innovations are more prone to reinvention by organizational members who may reinterpret and form distinct reactions according to their own values and task circumstances.

INDIVIDUAL CHARACTERISTICS

Moderate Implementation Efficacy Promotes Learning

Self-efficacy refers to a person's belief that he/she can successfully perform a specific task. In the context of innovation,

implementation efficacy refers to one's belief that he/she can successfully implement a particular innovation. Organizational members may estimate their implementation efficacy by assessing how much personal and situational resources (or constraints) are present in relation to the innovation to be implemented. When employees believe that they already have the skills or resources needed to implement the innovation (high implementation efficacy), they can easily incorporate it into their work without additional efforts for learning or adaptation to the innovation. For instance, telecommuter self-efficacy is positively related to telecommuters' adaptation to the new work arrangement, such as increased time structuring.

On the other hand, when organizational members believe that they do not have the capacity or resources necessary to implement the innovation (low implementation efficacy), they expect many difficulties in implementing it. This leads to resistance to the innovation, effectively insulating organizational members from possible failures and protecting positive self-identity. Thus, both low and high implementation efficacy may reduce employees' motivation for learning (although for different reasons). Employees are most likely to engage in learning when their implementation efficacy is moderate, thus perceiving that the innovation is challenging to implement and that the new demand is not overwhelming.

High and Low Implementation Efficacy Promotes Reinvention

On the other hand, when implementation efficacy of organizational members is either low or high, they are more likely to reinvent the innovation. When people perceive that implementing a particular innovation is not feasible (low implementation efficacy), they may make the innovation less threatening by simplifying the seemingly complicated innovation. In its extreme form, this situation can lead to implementation failure due to *superficial implementation*, in which employees "nominally" use the innovation without adopting its core principles.

In contrast to such a passive and dysfunctional form of reinvention, when employees feel confident that they have enough personal and situational resources for implementation, they can easily customize the form and the parameters of the innovation to suit their needs. For instance, organizational members with expertise relevant to the innovation tend to initiate the customization, local adjustment, and continuous improvement of the innovation by identifying convenient ways of implementation (e.g., shortcuts) and by finding its new usages. Thus, organizational members may modify or reinvent the innovation according to their needs under conditions of either high or low implementation efficacy.

Learning Goal Orientation Promotes Mutual Adaptation

The implementation behavior of organizational members may also be driven by their motivational dispositions. In the context of innovation, the distinction between individuals' performance and learning goal orientation seems pertinent. Research shows that individuals with high learning

goal orientations hold higher levels of self-efficacy, internal locus of control, risk taking, and task performance than those with high performance goal orientation. Those with high learning goal orientations are eager to improve their task competence, and are thus open to adopting new practices and enhancing their mastery. These may enhance their willingness to change their skills and values in line with the innovation. In addition, they regard potential failures as opportunities for learning and thus willingly experiment with new ways of doing things. This increases their efforts to identify multiple ways of implementing the innovation and to reconfigure the innovation for maximum payoff in their job. Therefore, individuals with high learning goal orientations are likely to actively engage in both learning and reinvention, thus promoting mutual adaptation.

Performance Goal Orientation Promotes Mechanical Implementation and Learning

Individuals with high performance goal orientation may adhere to the given form of innovation and attempt to integrate it into their tasks, especially when they believe that innovation implementation is encouraged by others and thus forms part of the criteria for performance evaluation. Given their strong risk-averse tendencies, they are not likely to try new ways of using the innovation beyond formal instructions, thus leading to mechanical implementation. In addition, those with high performance goal orientation may change their skills and values as demanded by the innovation (learning), when they perceive that innovation implementation is necessary to obtain positive external evaluations.

ORGANIZATIONAL CONTEXT

Strong Implementation Climate Promotes Mechanical Implementation and Learning

Implementation climate or the beliefs of organizational members regarding the organizational context of innovation implementation affect their innovation use behavior. A strong implementation climate can be realized through three interlocking factors: (a) ensuring that employees have the skills required to use the innovation, (b) rewarding innovation use by both tangible and intangible incentives, and (c) removing obstacles to innovation use. When organizational members perceive that their organization promotes a given innovation, they are more likely to accept and use the innovation. A strong implementation climate may facilitate organizational members' adaptation by adjusting their skills or values in accordance with the innovation.

In addition to facilitating organizational members' assimilation to the innovation, a strong implementation climate may reinforce mechanical implementation. When the values and competencies of organizational members are not supportive of implementing the innovation, organizations often introduce behavior modification interventions (e.g., training programs and incentives for innovation use) that can realign these values and competencies, thereby reinforcing the use of the innovation as it is originally designed. Thus, by offering training or technical support and by introducing rewards for

using the innovation as specified, a strong implementation climate forces employees to adhere to the original form of the innovation rather than to challenge it.

Implementation Complexity Promotes Reinvention

Implementation complexity reflects the organizational span and scope of implementation. Organizational span refers to the number of individuals targeted by the implementation effort, whereas organizational scope refers to the number of different subunits affected by the introduction of an innovation. When an innovation is applied to a large number of individuals and subunits, it is more likely to be reinvented by the users who want to customize it to their specific problems and context because they are likely heterogeneous in their tasks, priorities, and value systems. For example, when a generic innovation, such as an information system or an HR practice, is applied to a large number of employees and subunits, it may evolve into different forms that accommodate the distinct needs, values, and abilities of each individual and work unit.

Similarly, identical formal structures can result in different social systems that reflect pre-existing differences in power distribution within work units. This tendency toward reinvention is stronger when individuals and subunits are relatively independent of one another and thus possess substantial control in utilizing the innovation in their own ways. When target users are highly interdependent on one another, they have less autonomy in customizing the innovation according to their local context because making changes invites the need to coordinate with other individuals or groups, which may lead to potential conflicts and political backlashes.

Organizational culture characterized by high individualism, low power distance, and low uncertainty avoidance promotes reinvention. Finally, we propose that cultural values of the implementing organization may affect the way innovations are implemented. The extent to which organizational members reinvent an innovation can be shaped by three cultural values: individualism, power distance, and uncertainty avoidance. First, individualism involves loose ties between individuals. Individualism is likely to institutionalize creativity and reinvention of innovations because it creates an environment less conducive to uniform engagement in implementation. Thus, individualism may effectively shield users from having to conform to certain norms such as using an innovation in a prescribed manner.

Second, power distance refers to the extent by which hierarchy and inequality in power are accepted. Employees in high power-distance organizations prefer to get formal approval before any work activities, thus limiting the possibility of proactively initiated reinvention. Third, uncertainty avoidance is defined as the degree to which users feel threatened by uncertain situations. Individuals in uncertainty-accepting organizations are more positive toward new ideas and are more accepting of non-conforming behaviors. This gives employees more opportunity to tailor innovations to their own needs, thereby increasing the likelihood of reinvention. Thus, we suggest the following effect of cultural orientations on reinvention.

STRATEGIC INNOVATION IMPLEMENTATION AND COMPETITIVE ADVANTAGE

The current discussion on multiple forms of innovation implementation highlights several intriguing issues for managing innovation in organizations.

Implementation as a Strategic Opportunity

Significantly, the changes in innovation and individuals may create competitive advantage for the organization because those changes can comprise a source of a non-replicable practice of business operations. Similar to the selection theory in biology literature, even the slightest advantage derived from reinvention and learning can cause substantial effects when continued. Therefore, the utmost challenge for organizations in introducing innovations is managing the intensity and directions of reinvention and learning during implementation so that they can maximize benefits and gain distinct advantages from the innovation.

The Challenge and Risk of Reinvention

Unfortunately, if we define reinvention as a version of innovation that the original designers did not foresee, and naturally something that the users could not have foreseen, we are left with a situation full of unforeseen contingencies. Neither the users nor the designers of the innovation can predict the end payoff from reinvention and learning at the beginning of the implementation process. In this sense, organizations with very limited slack resources (e.g., organizations in extremely competitive industries) would be the type of organization likely to refrain from encouraging non-mechanical implementation outcomes. Ironically, though, it is precisely these organizations that could benefit most from technological breakthroughs and unforeseen opportunities to achieve distinct strategic advantage.

Strategic Choices for Channeling Innovation Implementation

Given that innovation implementation can take various forms, managers may need to make strategic choices of desirable forms of implementation and shape the implementation context in accordance with their choices. The choice between different forms of implementation may not only be driven by organizational strategy (e.g., proactive versus defender strategy), but also by the organization's orientation toward innovations. For example, to achieve mechanical implementation, organizations may set a stringent meaning on the identity of the innovation by generating strong social conventions around it and introduce incentives for adhering to guidelines that strengthen the implementation climate. Similarly, conformity is likely to occur under a culture characterized by collectivism, uncertainty avoidance, and high power distance; hence, organizations may endorse these values if the reliable, consistent, and uniform application of an innovation is necessary. In contrast, organizations may incentivize members to develop their own usage patterns and find new forms uniquely suited to their tasks and social surroundings by institutionalizing minimal oversight for innovation implementation.

Shift from Micro to Macro Patterns of Implementation

Eventually, different forms of implementation observed at the individual level form the overall implementation pattern in an organization. This transition of micro behavior of individuals into a macro phenomenon of the entire institution may be achieved through various processes. According to the social construction of technology theory, new forms of innovation developed through reinvention may initially be very small, and either remains restricted to these groups, or may evolve and spread by being adopted by larger groups. In the latter circumstance, a critical mass of users is accumulated, where organizations are in a position to accrue unexpected benefits from the modified version of the innovation. In organizations, this shift from a micro to a macro phenomenon may be guided by social networks and institutional processes.

The Role of Institutional Elites

A related mechanism that explains the micro–macro shift of implementation patterns involves managerial interventions that initiate institutional forces based on signification, legitimization, and domination. The behavior of the first few actors can produce similar behavior from countless followers when their behavior is driven by positive signals. Since signals are most credible if they come from authority, cascades coming from senior management or opinion leaders are likely to be particularly effective. For this reason, when institutional elites such as executives endorse a particular form of reinvention and learning (or mutual adaptation) and reassure the followers of its legitimacy, such a form of implementation is likely to successfully achieve transition from a micro adaptation of individual members to an overarching pattern of organization-wide implementation.

CONCLUSION

The prevailing discourse on innovation implementation has mostly focused on what we call mechanical implementation, which conceptualizes implementation as a single-dimensional construct ranging from non-implementation (resistance) to acceptance or assimilation of the innovation. In reality, however, carbon-copying a blueprint model of an innovation is rather unusual. More importantly, replicating the original form of an innovation that was successful in other organizational settings may be suboptimal from an economic standpoint.

By examining the interaction between innovation and organizational members, our propositions reveal innovation outcomes that are unintended and somewhat different from original blueprints of the innovation. Employee resistance during implementation could serve as a catalyst to transform the innovation blueprint, paving the way for the organization to discover a wide spectrum of new forms and usages of the innovation. Thus, our framework highlights the need to consider innovation implementation with a broader conceptualization. This framework provides a sophisticated understanding of the multiple outcomes of innovation and sheds light on designing the implementation stage in accordance with the implementation strategy to obtain optimal patterns of innovation use. By considering the characteristics of innovation, organizational members, and the implementation context that explain how and when different forms of implementation emerge, managers can achieve micro and macro implementation patterns that optimize benefits from innovations in their organizational context.



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SELECTED BIBLIOGRAPHY

Major sources of inspiration are seminal works by Barley and Rogers. S.R. Barley, "Technology as an Occasion for Structuring: Evidence from Observation of CT Scanners and the Social Order of Radiology Departments," *Administrative Science Quarterly*, 1986, 31(1), 78–108; E.M. Rogers, *Diffusion of Innovations* (New York: Free Press, 5th ed., 2003). In identifying various forms of implementation, we drew on Nicholson's model of work role transitions, which elaborates the mechanisms by which people adapt to their new work roles. Nicholson proposed four modes of role adaptation (i.e., replication, absorption, determination, and exploration) by combining two dimensions: person change and role change. N. Nicholson, "A Theory of Work Role Transitions," *Administrative Science Quarterly*, 1984, 29(2), 172–191.

Other books and articles that the reader might find informative and that helped us write this article are: D. Leonard-Barton and I. Deschamps, "Managerial Influence In the

Implementation of New Technology," *Management Science*, 1988, 34(10), 1252–1265; E. von Hippel, *The Sources of Innovation* (Oxford: Oxford University Press, 1988); E.P. Piening, "Insights Into the Process Dynamics of Innovation Implementation," *Public Management Review*, 2011, 13(1), 127–157; J. Swan and P.A. Clark, "Organizational Decision-Making In the Appropriation of Technological Innovation: Cognitive and Political Dimension," *European Work and Organizational Psychologist*, 1992, 2(2), 103–127; A. Tucker, I.M. Nembhard and A. Edmonson, "Implementing New Practices: An Empirical Study of Organizational Learning in Hospital Intense Care Units," *Management Science*, 2007, 53(6), 894–907.

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