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RESEARCH ARTICLE

INNOVATING MINDFULLY WITH INFORMATION TECHNOLOGY[1]

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Abstract

Although organizational innovation with information technology is often carefully considered, bandwagon phenomena indicate that much innovative behavior may nevertheless be of the "me too" variety. In this essay, we explore such differences in innovative behavior. Adopting a perspective that is both institutional and cognitive, we introduce the notion of mindful *innovation with IT. A mindful firm attends to an IT innovation with reasoning grounded in its own organizational facts and specifics. We contrast this with* mindless *innovation, where a firm's actions betray an absence of such attention and grounding. We develop these concepts by drawing on the recent appearance of the idea of mindfulness in the organizational literature, and adapting it for application to IT innovation. We then bring mindfulness and mindlessness together in a larger theoretical synthesis in which these apparent opposites are seen to interact in ways that help to shape the overall landscape of opportunity for organizational innovation with IT. We conclude by suggesting several promising new research directions.*

Keywords: Information technology innovation, organizing vision, organizational mindfulness, bandwagon phenomena, organizational mindlessness

Introduction

Whether, when, and how to innovate with information technology—this complex and crucial question confronts managers in virtually all of today's enterprises. Yet, it is by no means clear that managers always engage the question in a deliberative way. Reminiscing about his experience as a Gartner Group analyst for enterprise resource planning (ERP) systems in the 1990s,

[1]Jane Webster was the accepting senior editor for this paper.

Erik Keller recalls the explosive growth in this market:

> By the mid-1990s, ERP was a topic that was being bandied about in boardrooms. It wasn't just an information technology (IT) project, but a strategic business imperative.…The ERP genie was out of the bottle—every company needed to have an ERP implementation.…When I asked (one client) why he was embarking on an ERP program, he looked at me in a puzzled way and said, "No one ever asked me that before." After 45 minutes of further discussion, he could still not come up with a reason. (Keller 1999, pp. 45-46)

Such stories are familiar in information technology practice. Bandwagon phenomena (Abrahamson 1991; Abrahamson and Fairchild 1999 Abrahamson and Rosenkopf 1997) suggest that more than a little innovative behavior may be of the "me too" variety, where adopting organizations entertain scant reasoning for their moves. Especially where the innovation achieves a high public profile, as with ERP, deliberative behavior can be swamped by an acute urgency to join the stampeding herd, notwithstanding the high costs and apparent risk involved. How should we account for such seemingly "mindless" behavior (Fiol and O'Connor 2003)? What are its antecedents and effects? What implications might it have for the development and prospects of the IT innovations themselves? Indeed, what implications might it hold for the shaping of our own academic community's research agenda (Swanson 2000)?

On the other hand, perhaps we should regard such mindlessness as unsurprising. Consider IT innovation as a practical matter. It can be a daunting challenge to make sense of a major IT innovation in a way that fully considers its potential fit to the particular circumstances of a real organization. Some of the challenge may reside in the innovation itself; after all, given their frequently novel technological foundations, IT innovations are often subject to "several possible or plausible interpretations and therefore can be esoteric, subject to misunderstandings, uncertain, complex, and recondite" (Weick 1990, p. 2). But organizational difficulties also intrude, and the firm trying to make sense of an IT innovation may confront ambiguous, portentous, and disruptive issues of organizational transformation and strategic repositioning. In this light, to witness an organization jumping on the bandwagon in the pursuit of some widely touted "best practice" should perhaps be regarded as commonplace. Indeed, it may be more remarkable to observe an organization being fully "mindful" in its engagement with an IT innovation.

In fact, where IT innovation is concerned, we believe it is apposite to wonder at *both* mindful *and* mindless organizational behavior. We do so in this essay. Our overall aim is to explore both mindfulness and mindlessness and, in so doing, break new ground for research in the domain of IT innovation. (For recent reviews, see Fichman 2000; Gallivan 2001; Swanson 1994.) In particular, we undertake to theorize more richly than has heretofore been done about the constitution of organizational rationality and sensemaking, where IT innovation is concerned. To accomplish this, our approach takes an *institutional view* that is, in itself, relatively novel to IT research (Orlikowski and Barley 2001). The concept of mindfulness also enables us to offer a fresh perspective on IT innovation adoption, a phenomenon that in the past has often implicitly been framed as a good thing to do and the earlier the better. (For a broader discussion of pro-innovation bias in innovation research, see Chapter 3 in Rogers 1995.) Finally, we strive to connect IT innovation to larger issues of organizational capabilities and competence that are central to research in organization and strategy (Cohen and Levinthal 1990; Dosi et al. 2001; Hamel and Prahalad 1990; Kogut and Zander 1992; Nelson and Winter 1982; Teece 1998; Teece et al. 1997).

We proceed as follows. We first review the mindfulness concept as it has been developed by Karl Weick and his colleagues. To set the stage for extending mindfulness into the arena of IT innovation, we next introduce an institutional view that embraces both the IT innovation and the firm's innovation-engagement process. We then adapt

mindfulness to the IT-innovation context, after which we draw instructive contrasts to the conditions and effects of mindlessness. We then outline a preliminary theoretical synthesis, bringing mindfulness and mindlessness together as dynamically interdependent complements, and we offer a related set of propositions to help frame future work around this pair of concepts. We close with a wider discussion of the possibilities for research in this domain.

Conceptual Foundations

Mindfulness in Organizations

Mindfulness, at its roots, is a psychological notion that reflects upon the cognitive qualities of the individual (Langer 1989b; Langer and Moldoveanu 2000). The key qualities of a mindful state of being are said to involve:

> (a) openness to novelty; (b) alertness to distinction; (c) sensitivity to different contexts; (d) implicit, if not explicit, awareness of multiple perspectives; and (e) orientation in the present (Sternberg 2000, p. 12; see also Langer 1989a, p. 62).

Recently, the idea of mindfulness has been extended from individuals to organizations, and more specifically to high reliability organizations (HROs) (Weick and Sutcliffe 2001; Weick et al. 1999). HROs, such as naval aircraft carriers, nuclear power-generation stations, and air traffic control units, "operate in an unforgiving social and political environment, an environment rich with the potential for error, where the scale of consequences precludes learning through experimentation, and where to avoid failures in the face of shifting sources of vulnerability, complex processes are used to manage complex technology" (Weick et al. 1999, p. 83). Organizational mindfulness is necessary if an HRO is to avoid situations in which minor errors compound one another to precipitate catastrophic failure. High reliability, for these firms, means achieving a high resistance to intolerable failure.

For Weick and his colleagues, mindfulness is an organizational property grounded in, although not reducible to, the minds of participating individuals through a process of heedful interrelating (Weick and Roberts 1993). Heedful interrelating arises as individuals interpret and act upon a model of the organizational situation in such a way that they produce (and reproduce) that model in objective fact, fashioning their individual actions in accordance with the presuppositions that constitute their complementary (if not entirely shared) mental representations of the situation.

Although they take HROs as their point of departure, Weick and his colleagues argue for extending the mindfulness concept to other kinds of organizations:

> longer term environmental conditions such as increased competition, higher customer expectations, and reduced cycle time create unforgiving conditions with high performance standards and little tolerance for errors. These conditions are likely to continue, as environments become more competitive, uncertain, turbulent, and complex (Weick et al 1999, p. 104).

In general, then, for any organization seeking reliability or, to speak more broadly, viability, mindfulness concerns *the adaptive management of expectations in the context of the unexpected*. It entails

> the ongoing scrutiny of existing expectations, continuous refinement and differentiation of expectations based on newer experiences, willingness and capability to invent new expectations that make sense of unprecedented events, a more nuanced appreciation of context and ways to deal with it, and identification of new dimensions of context that improve foresight and current functioning (Weick and Sutcliffe 2001, p. 42).

As a concerted venture into the unexpected, innovation, we believe, constitutes a critical area for organizational mindfulness. Innovative initia-

tives are frequently a core part of a substantively mindful response to emerging opportunities and changing conditions (Van de Ven 1993). At the same time, efforts at innovation may themselves be more or less mindful. Accordingly, mindfulness plays a dual role in innovation, enhancing the recognition of organizational circumstances demanding an innovative response, while also fostering effectiveness in executing the response itself. Mindfulness, however, is not simplistically promotive of innovation. It may entail *wariness* in some circumstances, and where needed it may foster a resistance to jumping on innovation bandwagons (Fiol and O'Connor 2003, p. 66).

Accordingly, innovating mindfully may actually mean that the firm forestalls or foreswears a new initiative, as facts and conditions relevant to the local organizational context dictate.

What is true for mindfulness in organizational innovation overall also holds more specifically for IT innovation. Mindfulness as the nuanced appreciation of context and ways to deal with it lies at the heart, we believe, of what it means to manage the unexpected in innovating with IT. But taken by itself, this rather general observation begs the question of what the *context* really comprises where IT innovation is concerned. Attempting to answer that question sets one down the path toward a conceptualization of mindfulness that is specific to IT and its management. We begin that undertaking, next, with an examination of the institutional and processual nature of the IT innovation phenomenon.

The IT Innovation Phenomenon

We will start by defining *IT innovation*, in process terms, as the pursuit of IT applications new to an organization. Our view is therefore oriented around how IT comes to be applied in novel ways. (Swanson [1994] provides a typology.) The potential for new applications is commonly created by the emergence of enabling technologies that are new in their own right. Nevertheless, there may be significant lags between the first availability of a new IT and the eventual onset of important uses for it. Our view of innovation is also adopter oriented. Even laggards can meaningfully be said to be innovators (Rogers 1995).

While innovating with IT is at one level an organizational process (Fichman 2000; Gallivan 2001), it also takes place in a wider institutional field (DiMaggio and Powell 1983). While the firm is necessarily the site where the material instantiation of an IT innovation occurs, the innovation-as-concept simultaneously enjoys an existence at large, beyond the boundaries of any particular enterprise. We call the innovation in this form an *organizing vision*, which we define as a focal community idea for applying IT in organizations (Swanson and Ramiller 1997).

An organizing vision is a construction in discourse (Foucault 1972; Porter 1992; Ramiller 2001c) that emerges from a heterogeneous collective consisting of such parties as technology vendors, consultants, industry pundits, prospective adopters, business and trade journalists, and academics. The organizing vision is always a work-in-progress, evolving to incorporate the experiences, insights, and beliefs of these diverse interests. It defines the innovation it speaks to in broad strokes. In doing so, it provides a focus for the innovation's interpretation, aids in legitimizing it, and helps to mobilize associated material and commercial processes (Swanson and Ramiller 1997). It influences the sensemaking and decision making of prospective adopters. And eventually it advances the material innovation toward institutionalization and a taken-for-granted status (Scott 2000; Zucker 1987) or, alternatively, toward a collapse in credibility and eventual abandonment.

An organizing vision is commonly recognizable by one or a few "buzzwords" that serve as a topical label for the wider community discourse. Knowledge management, customer relationship manageent (CRM), and Web services provide recent examples. The proliferation of such buzzwords and the rapidity with which they come to prominence and then fade away are themselves hallmarks of the general milieu of IT innovation. This ebb and flow in discourse reflects the fact that

every organizing vision has in effect a *career*, marked by rising and falling visibility, prominence, and influence over time (Ramiller and Swanson 2003). This discursive career parallels the material diffusion of the innovation itself (Wang 2002).

If an organization's mindfulness toward an IT innovation is a matter of careful attention to local specifics, the larger community's organizing vision is nevertheless the point of embarkation for the organization's sensemaking journey. How its members engage that vision will weigh heavily in the organization's determination of whether, when, and how it will innovate, and what measure of success it will enjoy (Ramiller 2001c).

The organization's engagement with the community discourse extends over time and evolves along with the organization's practical involvement with the material innovation. This brings us, then, to the processual character of IT innovation. In Figure 1, we depict a firm's involvement with an IT innovation as a mosaic of several interrelated processes and intentionalities. We note that while there is an inherently sequential order to the activation of these processes and intentionalities, once activated each process or intentionality is likely to remain more or less active over the course of the firm's innovation. Hence Figure 1 is not, strictly speaking, a stage model of innovation (see Wolfe 1994).

We introduce the concept of intentionalities in order to emphasize the goal-oriented and purposeful character of IT innovation. Among the intentionalities, engagement and achievement are *positional*" because they focus primarily on a state the organization strives to achieve. Commitment is *transitional* because it revolves around the change process itself.

We identify four processes: *comprehension*, *adoption*, *implementation*, and *assimilation*.[2] The firm's innovation journey begins with comprehension. Through the sensemaking efforts of its members, the firm engages the organizing vision in substantive terms and ponders the signals about its importance embedded in the broader community's reaction to it (Swanson and Ramiller 1997). As it learns more about the innovation, the firm develops an attitude or stance toward it (Rogers 1995, Chapter 5) and positions itself, in a basic way, as a prospective adopter or non-adopter.

If adoption is entertained, a deeper consideration of the IT innovation follows in which the firm typically develops a supportive rationale, or business case (see, for example, Orlikowski 1993). Organizational *know-why* becomes central to the deliberations among the participants (Swanson 2003). The organizing vision typically provides some general principles to draw on, but know-why demands attention to issues specific to the firm. Both the business value of the innovation and the challenge presented by the prospective change are likely to be weighed before the organization decides whether to proceed and commit its resources.

The implementation process that follows then calls for a myriad of considerations, choices, and actions that will shape the transition. Timing may be a crucial issue, relative both to the organization's own preparedness and to the readiness of the enabling technology and the maturity of complementary services in the larger community. *Know-when* is accordingly a focus of the organization's attention. *Know-how* also comes to the fore as the firm navigates the details of what may be, and commonly is, a perilous venture (Swanson 1988). Some of this know-how may need to be acquired in the marketplace, and here the larger community discourse may provide guideposts, although what is acquired will need tailoring to the

[2]Our four processes combine elements of Rogers' (1995) familiar innovation-decision process model (p. 161) and his model of the organization's innovation process (p. 392). We draw sharper distinctions between comprehension and adoption, and implementation and assimilation, than does Rogers. We caution that we use several terms more narrowly than elsewhere in the innovation literature, where the terms *adoption*, *implementation*, and *assimilation* have sometimes been stretched to cover the innovation process in its entirety. For other innovation process frameworks in an IT context see Cooper and Zmud (1990), Fichman (2000), Gallivan (2001), Kwon and Zmud (1987), Larsen (1998).

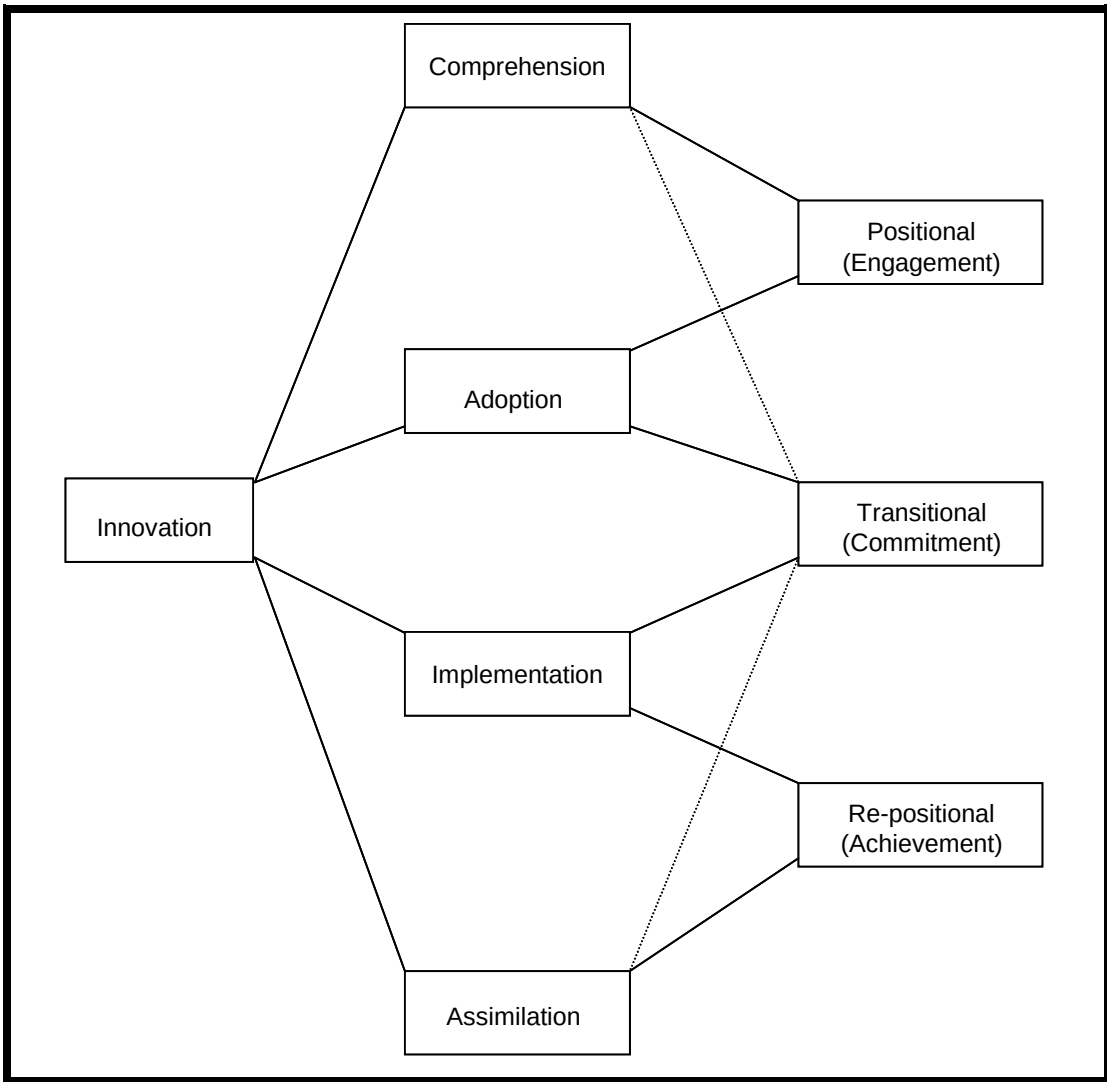

Figure 1. Organizational Innovation: Its Processes and Intentionalities (Innovation comprises four component processes: comprehension, adoption, implementation, and assimilation. Each is associated strongly [solid line] or weakly [dotted line] with underlying positional and transactional intentionalities.)

firm-specific context. Bringing the innovation to productive life for its users is the immediate aim, with the wider goal being to advantageously reposition the firm in its larger environment.

Assimilation commences as the IT innovation begins to be absorbed into the worklife of the firm and to demonstrate its usefulness. In time, the innovation may come to be infused and routinized (Cooper and Zmud 1990), woven into the fabric of the organization's work systems, even as the latter undergo their own adaptive change. The organizing vision that inspired and motivated the innovation may then be largely forgotten. Alternatively, the innovation may be visited by persistent and disruptive problems that eventually

discredit it in the perceptions of management and users, sometimes leading to its curtailment or eventual rejection. In such an event, the larger community discourse may now provide contrary rationales, particularly where the organization's own encounter with the innovation mirrors the problematic experiences of others.

In summary, organizational process and purposefulness interact with discursive and material resources in the larger institutional environment to shape the pattern of a firm's engagement with an IT innovation. While the journey begins with the firm's consideration of what others in the field are being said to accomplish with the innovation, it ends with its consideration of what it has itself achieved.[3]

Purposefulness implies that cognition counts in our understanding of IT innovation (Daft and Weick 1984; Meindl et al. 1994; Weick 1995). Nevertheless, simply pointing to the purposefulness of innovation does not imply that organizational mindfulness necessarily obtains. Accordingly, we next consider more closely what mindfulness entails when an organization undertakes to innovate with IT.

Innovating Mindfully with Information Technology

Mindfulness, again, concerns the adaptive management of expectations in the context of the unexpected. In innovating with IT, there is often much that is unexpected. While the nostrums and prognostications that appear in the organizing-vision discourse provide some generic guidance in applying the technology—which may, indeed, improve and become more useful over time—organizational particulars are missing. So alertness to the unexpected falls of necessity to the firm itself, and depends on paying close attention to the IT innovation's fit to local circumstances. Where innovations are involved,

> mindful decision making involves discriminating choices that best fit a firm's unique circumstances, rather than familiar and known behaviors based on what others are doing (Fiol and O'Connor 2003, p. 59).

Accordingly, an organization is *mindful* in innovating with IT when it attends to an innovation with reasoning grounded in its own organizational facts and specifics. Attention to *organizational specifics* is crucial in supporting sound judgments about *whether* adopting a particular innovation is a good thing to do, *when* committing to the innovation is likely best to take place, and *how* implementation and assimilation can best be pursued. This is so because *context matters* in rendering such judgments.

In short, although the term *mindful* might at first glance suggest merely a cognitive alertness, for true mindfulness such alertness must be joined to *contextually differentiated reasoning*. By this we mean that the organization's engagement with the IT innovation must entail a learning process rich with interpretation of the innovation's implications for the organization's own situation. The situational specifics, in fact, can be quite complex, including, among other issues, the innovation's ramifications for operational efficiencies and strategic advantage; the organization's preparedness for the change involved; the quality and availability of complementary resources needed; implications for various common and conflicting interests, both internally and in interfirm relationships; and the effects of adoption on the firm's legitimacy with outside constituencies.

How, then, can an organization accomplish a high level of such contextually differentiated reasoning?

[3]In outlining the four processes, we mean to offer a useful, albeit general, scheme for thinking about IT innovation in process terms. We acknowledge that the reality is commonly more complicated. Thus, for example, an organization can often experiment with an innovation before committing to it (Rogers 1995, p. 171)—in a sense, *implementing* it before *adopting* it. Similarly, a firm may do a pilot rollout in one unit before deciding whether to install it elsewhere. In practice, the four processes will often be engaged in overlapping and complex ways.

Weick and his colleagues identify five attributes of mindfulness that can provide a point of departure for addressing this question (Weick and Sutcliffe 2001; Weick et al. 1999), including a *preoccupation with failure*, a *reluctance to simplify interpretations*, a *sensitivity to operations*, a *commitment to resilience*, and a *reliance on expertise* over formal authority. In the next section, we elaborate and adapt these attributes for use in the context of IT. We then suggest ways in which IT-innovation mindfulness, characterized in this manner, may come into play during a firm's evolving engagement with an IT innovation.

Attributes of Mindfulness in IT Innovation

The mindful organization, first, does not celebrate its successes. Instead, it is obsessed with the possibility of failure and interprets close calls as cautionary lessons. It regards quiescent periods marked by smooth operation as potentially dangerous—an indication, perhaps, that important signals of trouble are being overlooked. With regard to IT innovation, such a *preoccupation with failure* can aid in identifying opportunities for realizing value from an IT innovation. Sustaining and extending the firm's competence thus sets the context for mindfulness about the innovation itself. This larger mindfulness may entail being alert for the success that breeds failure, those paradoxical competency traps in which pronounced success during a certain period in the organization's history fosters an inability to adapt to changing conditions. More narrowly, the process of IT innovation is itself prone to failure, and reflective attention to the possibilities for failure in this domain also enlarges mindfulness.

The mindful organization resists the temptation to settle into simplified and reproducible heuristics in its interpretation of events. Instead, recognizing that complex responses are needed in complex environments (Weick 1995), it actively entertains novel, diverse, and conflicting perspectives. Such a *reluctance to simplify interpretations* applies to IT innovation in a number of ways. Mindfulness calls for the organization to eschew stock or formulaic interpretations of IT innovations. This entails resistance to the simplified image of the innovation that is encoded in the organizing vision. That image, commonly imbued with an exaggerated sense of discontinuity, tempts the firm to forgo thoughtful comparisons to current practices; often, the image is also associated with the aura of best practice, which can undermine critical and contingent thinking (Ramiller 2001b). The exercise of mindfulness, by contrast, entails entertaining complex and even conflicting interpretations. On the one hand, it demands an alert attention to organizational variability that may render certain generalities about an innovation of little account locally. On the other, it entails vigilance against the proverbial not-invented-here syndrome, a response to innovations of external origin, which occurs like an antibody to preserve routine and "protect" the firm from new ideas.

The mindful organization attends vigilantly to small and seemingly insignificant details in day-to-day operations. This reflects the fact that catastrophes commonly originate in the interactions of minor errors and random events. In the context of HROs, such a *sensitivity to operations* is valued because organizational reliability depends on sensemaking and responsiveness under extreme time pressure. By contrast, innovating with IT may call for entertaining a pronounced degree of *un*reliability in current operations. Indeed, IT innovation commonly involves thinking beyond and eventually dismantling one operational process, however reliable, and replacing it with another, often because of crucial miscues that appear outside moments of everyday operation but that, nevertheless, can still produce dire consequences (albeit over a longer timeframe). Still, innovating with IT concerns reliability in the broader sense of assuring the firm's *viability* in a changing environment. *Sensitivity to operations* accordingly still applies to the IT context. Often, improvement in problematic operations is itself the goal of the innovation, providing the focal know-why for IT innovation. Also, the innovation project itself constitutes a kind of operation that interdigitates with the business operations of the firm. It is the occasion for the firm not merely to implement the

innovation, but also to discover how it can best be made to fit (Orlikowski 1996). How successful the firm is in this undertaking will depend upon its sensitivity to the particulars that come to define the mutual adjustment and interaction between the innovation and the firm's work systems (Alter 1999, 2002). In practice, it seems that this lesson has to be continually relearned. Thus, many ERP implementations have encountered problems with business process change, as opposed to software change, through insensitivity to the complexities of their operations (see, for example, Markus and Tannis 1999).

The mindful organization is resilient, favoring improvisation over planning, adaptation over routine, and effectiveness over efficiency. Resilience entails the recognition that anticipation is necessarily incomplete: It is impossible to identify and develop contingency plans for every possibility. In the context of IT innovation, *commitment to resilience* is likely to assume increasing weight as time passes and unfolding reality departs ever more widely from the firm's initial expectations. This implies a practical and realistic view, one that acknowledges that trade-offs between schedule, budget, and delivered functionality may need creative adjustment. More broadly, this implies a dedication to opportunistic learning from the inevitable surprises and mistakes that attend such undertakings, not only when new systems are first rolled out to their users, but beyond.

Mindfulness depends on a readiness to relax formal structure so that authority for action can flow in times of crisis to the individuals and units having the requisite expertise to deal with the problem at hand. Such *deference to expertise* is central to mindfulness in IT innovation. But in bringing this attribute into the IT context, care must be taken not to conceptualize expertise too narrowly. Mindfulness in this domain is, again, about *attending to the innovation with reasoning grounded in the firm's own facts and specifics*—and these facts and specifics reach well beyond the technology and "system," narrowly conceived. Indeed, they also concern the firm's objectives, structure, and processes, and the firm's relationship to its larger environment. This implies that the requisite expertise is heterogeneous and dispersed, and that authority for action must flow readily to different places over the course of the innovation project. It means, more specifically, that expertise is often found with senior management and other business-side participants (Ross and Weill 2002). Also, because the expertise needed is to a substantial degree constructed collectively through the very process of innovation, organizational mindfulness depends in part on the on-going learning that organizational members can help to foster in one another.

Mindfulness Across the IT Innovation Process

Mindfulness, as characterized in the preceding manner, is concerned not only with moving the organization from the abstractions of the organizing vision to the specifics of locally adapted innovation; it also has to do with rising to a succession of emergent challenges during the course of innovation.

In first engaging the organizing vision for an IT innovation (see *comprehension* in Figure 1), the mindful enterprise will not take generalized claims about the innovation's benefits and applicability at face value but will instead critically examine their local validity. Organizational members will ask, "Would this be true for us? How so?" Boundary-spanning activities (Adams 1976; Aldrich and Herker 1977) are key at this juncture, as the firm exploits its community ties in an effort to gather available information and diverse interpretations. In the process, it is likely to extend those relationships in ways that serve the sensemaking task. The mindful enterprise will also act to create situations for rich and context-specific learning (Lave and Wenger 1991), expanding its comprehension through such activities as demonstrations, site visits, R&D alliances, and experimental prototyping.

The mindful firm will cast a critical eye on model rationales for adopting the IT innovation that are

being promulgated in the wider community's discourse. Mindfulness here will be found in the care with which the available rationales are considered and examined for fit to the firm's own circumstances. The mindful firm will respond with complex interpretations that rely on the efforts of internal experts, working in the relevant technical and business domains, who are able to relate the larger vision to substantive problems in the firm's existing operations.

In considering *adoption* (again, see Figure 1), the mindful firm will fashion its own rationale, for or against. A rationale in favor of adopting will be context-specific, rich in its consideration of local organizational facts, and focused on the innovation's potential contribution to the firm's distinctive competence (Selznick 1957). It is important to recognize, however, that the mindful firm's rationale may actually point *against* adoption, or it may favor deferred adoption. A significant benefit of mindfulness is that it helps to open up the option to *reject* innovations. A preoccupation with failure schools the mindful firm in caution, as it resists the powerful cultural norm that suggests that innovation is *per se* a good thing (Rogers 1995), and as it works to counter the industry hyperbole that often dresses up an IT innovation with claims about revolutionary advances and best practices (Ramiller 2001a). The mindful firm, then, approaches the threshold of commitment through complex interpretations, the marshaling of heterogeneous expertise, and close attention to the problems of current operations. Furthermore, commitment to resilience now comes into play, helping to keep the firm from premature commitment.

Even if the mindful firm decides in favor of an innovation, it will not necessarily settle on being an early adopter. Being an early adopter, indeed, is not always a good idea. An innovation may or may not be an irresistible concept destined to sweep the broader industry, and early adopters can find themselves stranded with odd technologies and practices lacking network support (Shapiro and Varian 1999). The organization itself may or may not be ready for the innovation, particularly in light of the relative lack of wider resources available early on to support implementation. Hence, the mindful firm is characterized more by early comprehension and contingent engagement than it is, necessarily, by early commitment. It aims above all to be a discerning and prudent adopter.[4]

The mindful firm will chart an *implementation* strategy with deliberateness, giving particular attention to the processes with which it will manage its own on-going expectations. With its focus on organizational-specific learning, it will be skeptical of simplistic, one-size-fits-all solutions, and it will look to reinvent the innovation as necessary. Even so, the mindful firm will attend closely to the experiences of the innovation's earlier adopters, seeking to capitalize on the community's growing knowledge about the innovation. Of course, the mindful firm that adopts relatively late will enjoy access to richer community resources and will seek to take advantage of its late entry by coming up the learning curve faster than did earlier adopters (Swanson 2003).

The five attributes of mindfulness assume prominence in implementation. Mindfulness begins with an appreciation of the significant potential for failure along the way. Eschewing simplistic interpretations, then, the mindful firm will be attentive to problems of all kinds, treating them not merely as obstacles to be overcome but also as potential symptoms of prior misconceptions. Operational sensitivity will draw attention to small oversights or areas of neglect that might otherwise lead, through complex and poorly understood causal chains, to larger failures. Meanwhile, with the expansion in participation that accompanies implementation, care will be taken in marshaling, and giving

[4]This claim, we note, represents a departure from classical innovation adoption theory (Rogers 1995). We are proposing that the mindful firm is likely to be early, and even pioneering, in its sensemaking, but it may well not be an early adopter. This suggests that the innovation researchers' traditional search for the predictors of early adoption is not entirely to the point. We are likely to find the mindless as well as the mindful among both early and later adopters. The preoccupation in innovation research with early adoption therefore fails to effectively distinguish and explain mindful choices, whenever they may be made over the course of the innovation's diffusion.

authority to, the requisite experts. On the other hand, external consultants, who often lack understanding of the local context, will be used judiciously. Resilience will characterize the effort, overall. While planning is to be taken seriously, mindful implementation demands a readiness to make needed adjustments. At the extreme, the mindful organization must be prepared to eschew escalation (Keil et al. 2000) and identify and accept implementation failure, if necessary, to serve its overall interests.

In assimilating the IT innovation, the mindful enterprise will shun rapid acceptance and closure, and will instead remain open to surprises, continued learning, and the potential for adaptations that address unanticipated problems or realize unforeseen potential. Apparently smooth assimilation may mask the overlooked opportunity or the unexpected threat. Accordingly, the mindful firm will attend closely to what early users' utilization reveals about the innovation's incorporation into work-system routines and its integration into user knowledge-sets (Cooper and Zmud 1990). It will also reflect on what this means for the organizational benefits that might yet be achieved.[5]

Failure remains possible even at this stage but, absent wholesale user rejection, catastrophic failure is less a concern than the possibility that the innovation will fail to deliver on its potential value. Mindfulness in this phase is crucially served by a commitment to resilience: Recognizing that the innovation, as a locally constructed material fact, is still less than fully constituted helps to foster the learning-by-doing (Rosenberg 1982) that real use promotes. Deference to expertise also matters now: Here the focus of expertise shifts in great part to the innovation's users, whose sensitivity to their own operations and interpretive sophistication are essential to further organizational progress with the innovation.

[5]For instance, is a lack of mindfulness during assimilation a factor in the situation reported for many firms that have failed to take advantage of the advanced functionality available with ERP (Davenport 2000; Markus and Tannis 1999)?

Mindlessness

We have presented mindfulness in innovating with IT as a kind of ideal type, in the Weberian sense of an elaborated abstract category for use in making empirical comparisons to real cases (Weber 1949). But the reader may be tempted to infer that we are also offering mindfulness as a normative ideal. Indeed, why should an organization be anything but fully mindful in its engagement with IT innovations? Of course, real organizational conduct, as we noted at the outset, commonly departs from this apparent ideal. In this section, we entertain some reasons why this should be so.

We begin by characterizing mindlessness, also, as an ideal type. We then consider what in the basic nature of organizations appears to make mindlessness not only possible but even commonplace. In addition to considering origins, we also examine the matter from the point of view of purposeful action, by looking at the rewards and risks of mindlessness. This will help set the stage for considering the interrelationship between mindfulness and mindlessness, a task which we take up subsequently.

Characterizing Mindlessness in IT Innovation

In contradistinction to mindfulness, an organization is *mindless* in innovating with IT when its actions betray a lack of attention to organizational specifics. This lack of attention manifests itself in a variety of ways across the phases of the innovation process.

The mindless firm pays little attention to identifying and exploring new IT innovations. It attaches little or no importance to the early *comprehension* of organizing visions. Content to be a follower rather than a leader, it may believe that IT is not critical to its distinctive competence. Rather than actively seeking intelligence about IT innovations, it will wait for innovations to come to it—thrust upon it, say, by a consultant selling a solution for a putative performance gap, or by a CEO who happens to

encounter a fashionable idea (Ramiller 2001a). Confident that others will call the important innovations to its attention when needed, the mindless enterprise conserves its cognitive resources, perhaps for other good ends.

If and when a bandwagon develops around an IT innovation, the mindless firm may join it, caught up in the momentum generated by prior adopters, and impressed by "success stories" that appear to validate the innovation as a good, maybe even an irresistible, idea (Strang and Macy 2001). To justify *adoption*, then, the mindless firm may be content with the rationale that "everyone is doing it" or the justification that "it's time to catch up." It thereby places its faith in what the broader community appears to know—in the common competence, so to speak—rather than pursuing by means of innovation its own distinctive competence. While, as we have already observed, the mindful innovator also draws upon the common competence, the mindless innovator seeks simply to attach itself to this learning, its *engagement* superficial and uncritical.

Mindless adoption can presage equally mindless *implementation*. When mindless firms adopt an ERP package, for example, they, like many of the mindful companies before them, may turn to the dominant vendor within their industry. They may then join some of these other firms in implementing a "plain vanilla" version. Indeed, the mindless firm may see no need to consider anything else, since its decision to adopt was not guided by attention to organizational specifics.

Since mindlessness entails an inattention to the firm's own circumstances, *assimilation* is likely to be regarded as unproblematic, a simple matter of rolling out the innovation to its end-users, who will in effect be left to fend for themselves. Initial confusion, frustration, or resistance may be dismissed as anomalous or attributed to shortcomings in the users themselves. Purposeful adaptation of the innovation based on users' experience will not be entertained; rather, users will be left to devise work-arounds as needed. Above all, management will stubbornly seek to stay the course, letting certain problems take care of themselves. Where conflict obtains, management will trust that a negotiated truce among affected parties can eventually be achieved (Nelson and Winter 1982, Chapter 5).

This characterization of mindless conduct across the IT innovation process suggests, not unsurprisingly, that mindlessness may be deeply problematic. It may become particularly so as the firm's engagement with the innovation progresses. Why, then, should we witness mindlessness at all?

The Origins of Mindlessness

Conditions endemic to organizational life tend to set the stage for mindlessness in organizations' encounters with IT innovations. We suggest three such conditions here, which can operate separately or in combination: attention deferral, contextual insensitivity, and institutional preemption.

Many things compete for the attention of organizational members (March and Simon 1993). As cognitive effort isn't limitless or free, some issues, events, and opportunities are heeded while others inevitably are not. One consequence, when it comes to innovating with IT, can be *attention deferral*. In particular, an organization can sometimes sacrifice early comprehension without immediate ill effects. When other matters press upon management's attention, there may be little time for engagement with the new and especially with that which may be "not quite here yet." Deferral of attention can also extend into adoption, a common occurrence where the decision is rushed under a sense of urgency induced by bandwagon pressures.

Mindlessness can also be traced to *contextual insensitivity* on the part of the firm and its management. This insensitivity may come about because the organization and its members take much of their circumstances for granted. The firm "knows itself" to a substantial degree tacitly (Brown and Duguid 2000), and while genuine skill and deep knowledge is encoded in this manner, it can also constitute a dark pool of unreflective,

unexamined assumptions that drifts into conflict with the firm's shifting circumstances. Knowledge is also locked into organizational routines (Nelson and Winter 1982), which may enhance the reproducibility and efficiency of work under normal conditions, but can also narrow attention in a way that reduces acuity for changing circumstances.

Contextual insensitivity can also follow from certain strategic choices, often in the guise of innovation itself. We may witness this, for example, where a firm's performance lags and its leadership calls for radical change, and perhaps brings new management in to shake things up. Here the attraction of innovating with IT may be precisely because it can help to overthrow the established order. For example, some managers have reportedly adopted ERP as a means to force reengineering of the firm's business processes, valuing the software first of all for its potential to foster creative destruction (Champy 1997). In such circumstances, managers may be all but invited to be insensitive to the current operational context. Where destruction is the first order of business, mindlessness is sometimes entertained, while mindfulness is left to the rebuilding.

Finally, mindlessness in innovating with IT may be rooted in what we will call *institutional preemption.* In their IT structures and practices, as in many other respects, firms often come to look more alike than might be expected given differences in their individual circumstances. Such isomorphism (DiMaggio and Powell 1983) reflects the operation of institutional forces, of which three types have been described: *coercive*, based in political power and/or regulatory authority; *normative*, stemming primarily from professionalism; and *mimetic*, derived from standard responses to uncertainty, which commonly have the effect of cognitively foreclosing the consideration of alternatives (Scott 2000). Thus, firms are sometimes compelled by more powerful parties to proceed with an innovation (see, e.g., Hart and Saunders 1997). In other circumstances they may be carried along toward innovation by influential norms. And finally, there are occasions where it is simply difficult for an organization to think outside the box—that is, even to imagine a possibility outside the framing imposed by the larger community's organizing vision. All these influences tend to be preemptive, reinforcing the taken-for-granted in innovating with IT (Covaleski and Dirsmith 1988), and potentially undermining mindfulness.

Institutional effects of these kinds are, we believe, rather common and clearly important in IT innovation. Organizing visions, being prescriptions for new IT that attract a variety of powerful interests, become focal points for institution-building activity (DiMaggio 1991; Galaskiewicz 1991). IT innovations, accordingly, tend to acquire the institutional quality of being "infused with value beyond the technical requirements of the task at hand" (Selznick 1957, p. 17).

Together, the three conditions we have identified can interact to produce a potently mindless response in a firm's engagement with an IT innovation, especially in the context of fads and bandwagons. In providing sweeping legitimacy to an IT innovation, however transiently so, a bandwagon can in effect legitimize the exercise of mindlessness. Attention deferral and contextual insensitivity may appear to be unproblematic in the face of the overwhelming "proof" afforded by the larger community's rush toward the innovation. Mindlessness can therefore be rendered socially and politically acceptable, to some degree, in innovating with IT. We note too that because IT innovation is widely understood to be both good and problematic, a certain amount of failure can be tolerated (and even celebrated in the guise of learning), providing ready excuses for the misfortunes of mindlessness. In innovating with IT, mindlessness and its consequences can in part be masked.

Mindlessness as Strategic Choice: Rewards and Risks

To be mindless is certainly not a good thing, on the face of it. Still, we will suggest that there are circumstances in which mindlessness may prove to be adaptive, and therefore may constitute a reasonable, if not fully reasoned, course of action.

In fact, we will argue that organizations often *choose* to be IT-mindless, at least in some respects. They may do so relative to certain innovations. Or they may do so during particular periods of their engagement with a given innovation. Because mindfulness represents a costly and demanding sensemaking regime, a firm may, as a matter of strategic choice, decide to forego or delay it. To do so does not necessarily imply that the organization's members are indulging in a wider disregard for the organization's own welfare.

Broadly, mindlessness in innovating with IT can reasonably be entertained whenever and wherever its likely rewards outweigh its risks. Consider the practice of attention deferral in early comprehension of IT innovations. Firms that consider themselves followers, rather than leaders, may reasonably choose to embrace this practice, as already suggested. Consider too the phenomenon of apparently mindless adoption under bandwagon pressures. In fact, relatively mindless adoption may suffice where homogeneity in outcomes across firms is basically acceptable. This can happen with reception of a new industry standard, or when the firm sees no need to differentiate itself in its response from the larger community of adopters. Also, even a mindless adopter may be able to improve upon its situation, where it can employ the innovation as a means to jettison particularly bad legacy systems (Davenport 2000). More generally, the mindless adopter can become through imitation a participant in a kind of trans-organizational learning taking place in the wider community. There is, after all, usually something to the best practices being touted, even if these lack contextual specificity.

Considering again the common competence, we note that much learning associated with new IT in fact takes place within the broader community, rather than within the individual firm itself (Swanson and Ramiller 1997). The organizing vision constitutes a kind of umbrella for the common competence, providing a developing innovation story that incorporates, and yet generalizes across, the experiences of a range of adopters. Of course, the vision itself merely alludes to the common competence; it hardly captures it. Still, it provides a kind of focal narrative structure for organizing the activities and discourse of those working on the innovation, such as consultants, vendor representatives, and peripatetic IT professionals. This heterogeneous collective gradually assembles a certain trans-organizational know-how, which enables transmission and replication of the common competence among firms. As experience mounts, a degree of contingent thinking can feed back into the organizing vision and help the community move beyond one-size-fits-all thinking, where the specific IT innovation is concerned. Accordingly, bandwagons in innovating with IT can in part be reflective of real, appropriable, learning.

Mindless adoption of a prominent IT-enabled best practice may also be justified by the enhanced legitimacy a firm can enjoy with wider constituencies (DiMaggio and Powell 1983), such as trading partners, the financial markets, and regulatory agencies. Such enhanced legitimacy may yield benefits apart from those that mindfulness would identify (Staw and Epstein 2000), an eminently practical consideration given the importance of the firm's public image in garnering access to external resources. Also, the mindless adopter can position itself to benefit from the network effects that are characteristic of much IT innovation (Au and Kauffman 2001; Katz and Shapiro 1986; Kauffman et al. 2000; Rohlfs 1974; Shapiro and Varian 1999).[6]

In short, mindless adoption can position an organization to enjoy benefits from an IT innovation, however fortuitous these may appear to be. Even so, the hazards of inattention may be significant here. The integrity of the adoption decision can be undermined by a neglect of firm particulars pertinent to both strategic fit and organi-

[6]We do not mean to suggest that organizational legitimacy and network effects *cannot* be the subject of mindful attention. Because the magnitude of these benefits is likely to depend to some degree on the firm's circumstances, mindfulness toward them is likely to produce outcomes superior to those that mindless conduct can achieve.

zational capability. Not every innovation is good for everyone, common competence and best practices notwithstanding. Accordingly, the mindless pursuit of a best practice may be just as likely to produce real and sustained performance losses as it is accidental improvement (Nash 2000; O'Neill et al. 1998). Legitimacy effects and network benefits may be transitory, leaving the mindless adopter stranded—and even conspicuously de-legitimized—when the tide of the larger community's enthusiasm for the innovation washes out.

Even where adoption does prove to be appropriate in principle, mindlessness raises another set of issues when the organization engages in processes of implementation and assimilation. Here, as material investments come heavily into play, the practical consequences of mindlessness begin to be most keenly and gravely felt.

On the positive side, the mindless follower can let the leaders bear the costs of working with insufficiently tested technology and unproven implementation methods. It can subsequently benefit from well-tested, off-the-shelf methods that are relatively easy to execute. The difficulty is that not all stock implementation approaches are equally suitable in all situations, a point the mindless adopter is likely to miss. Relative to network effects, even as complementary technologies and services grow around the IT innovation, the mindless implementer will be at risk of making bad picks from among them. It may face stiff competition for the community's knowledge resources, particularly during an accelerated and crowded growth period, when these resources are likely to be stretched thin (Swanson 2003). Having developed little knowledge of its own, the mindless innovator faces substantial implementation risks, not the least of which may arise through the use of under-skilled consultants and contractors who spring up to fill the larger void.

In assimilation, the new IT must be absorbed by the firm's work systems (Alter 2002). Here, local organizational facts may raise a particularly obvious challenge to the mindless firm's on-going course of action. Nevertheless, as we have noted, mindlessness can persist. It can manifest itself especially plainly in regard to the users' encounter with the IT innovation. Under such conditions, assimilation is likely to be painful, and may produce negative human-resource effects such as excessive turnover and knowledge loss. Inattention and insensitivity will fail to correct mismatches in the fit of IT to the task. Moreover, the implicit discounting of user experience may lead the organization to overlook opportunities for the mutual adaptation of technology and work systems. Thus, mindlessness in assimilation can mean a crucial loss of learning opportunity and a diminishing of the larger organization's adaptability.

In summary, the me-too stance of the mindless innovator may secure certain rewards, subject to associated risks. Even if mindfulness generally represents better practice, mindlessness has its place in IT innovation. Nevertheless, we would argue that mindlessness is in general entertained with the lowest risk during the firm's early engagement with the innovation, and that risk tends to rise from comprehension, through adoption, implementation, and assimilation, as the firm's depth and complexity of engagement with the IT innovation increases. Accordingly, the firm that begins as relatively mindless in its engagement will tend to find increasingly compelling reasons for mindfulness as it advances. As a prelude to the following discussion, then, in which we bring mindfulness and mindlessness together, we offer the following proposition:

(P1) *The organization that innovates with IT will be most prone to mindlessness in its early engagement with the innovation. It will be less prone to mindlessness the longer it has been engaged with the innovation.*

Toward a Synthesis

Considering mindfulness and mindlessness in IT innovation raises certain compelling questions. For example, why do we tend to witness mindfulness or mindlessness in varying degrees, at different times, across populations of organizations?

Does mindfulness simply displace mindlessness (or vice versa), or is it meaningful to talk about an interaction between the two? Addressing questions like these calls for theory that accomplishes a synthesis of mindfulness and mindlessness as complementary expressions of a common underlying phenomenon. This synthesis, we believe, has to be based on threading back and forth between the *organizational level*, in which mindfulness is realized and practiced, and the wider *institutional environment* which invariably affects all adopters, the relatively more mindful and the relatively less mindful. While we do not seek to depart from Weick's regard for mindfulness as an organizational property, we do intend to call attention to the interdependence of organizational mindfulness and the larger community discourse surrounding the innovation, where the latter serves as the crucial site for the development, capture, and sharing of knowledge among firms.

Revisiting the five attributes of mindfulness (Figure 2), we note that preoccupation with failure, sensitivity to operations, and commitment to resilience are by their nature organizational accomplishments. On the other hand, richness of *interpretation* and the development and deployment of *expertise* can be said to apply to both the organization's sensemaking and the interorganizational discourse. Moreover, the firm and the larger interorganizational field do a kind of trade in interpretations and expertise. The firm draws on the knowledge resources of the larger community (Attewell 1992), as it navigates the innovation process. Reciprocally, those resources are built up over time, in great part through the contributions of innovating firms. Interpretation and expertise, then, define a zone of mutual permeability between the firm's own mindfulness and knowledge construction in the wider community discourse.

Within this context defined by the interplay of the organizational and the institutional, mindfulness and mindlessness travel together, complementary aspects of innovation diffusion. A given firm engages an IT innovation in an environment shaped by its prior adoption by other firms, as well as by the public manifestations of other firms' efforts to make sense of the innovation. Cumulatively, then, innovating with IT involves more imitation than invention. The majority of firms inevitably follow the lead of a few innovators and early adopters (Rogers 1995). As we have suggested, they may do so more mindfully or less mindfully, with a deeper or shallower consideration of their own organizational particulars. Their experience in turn becomes grist for the sensemaking mill of later adopters. Over time, then, the larger environment comes to be infused with the manifest actions of the mindful and mindless alike, as their claims, counter-claims, critiques, heroic stories, tragedies, and ironic tales make their way into the community discourse.

Accordingly, while we can speak of mindfulness and mindlessness displacing one another by degrees within a given firm, at the level of the larger community the relatively mindful and the relatively mindless substantively interact. On that larger stage, mindfulness and mindlessness complement one another to define a kind of dynamic landscape of knowledge and belief. At any point that landscape, in turn, strongly affects what prospective adopters perceive as the universe of possibilities for innovating with IT.

What can we say, then, about this interaction between the mindful and the mindless? Most centrally, *mindfulness often must confront mindlessness*. In taking other adopters' actions as possible models for emulation and adaptation, the mindful organization is on uncertain ground in evaluating the mindfulness that lay behind those models. Some firms' choices and actions are surely mindful on balance, but others will not be, and telling the difference can be difficult. For one thing, interpreting the validity of other firms' interpretations challenges the mindful firm to distinguish *real learning* "in which management discourse properly specifies the connection between actions…and outcomes" (Abrahamson and Fairchild 1999, p. 714) from *superstitious learning* in which "the subjective experience of learning is compelling, but the connection between actions and outcome is misspecified" (Levitt and March 1988, p. 325). Bandwagon conditions may make such a determination especially problematic,

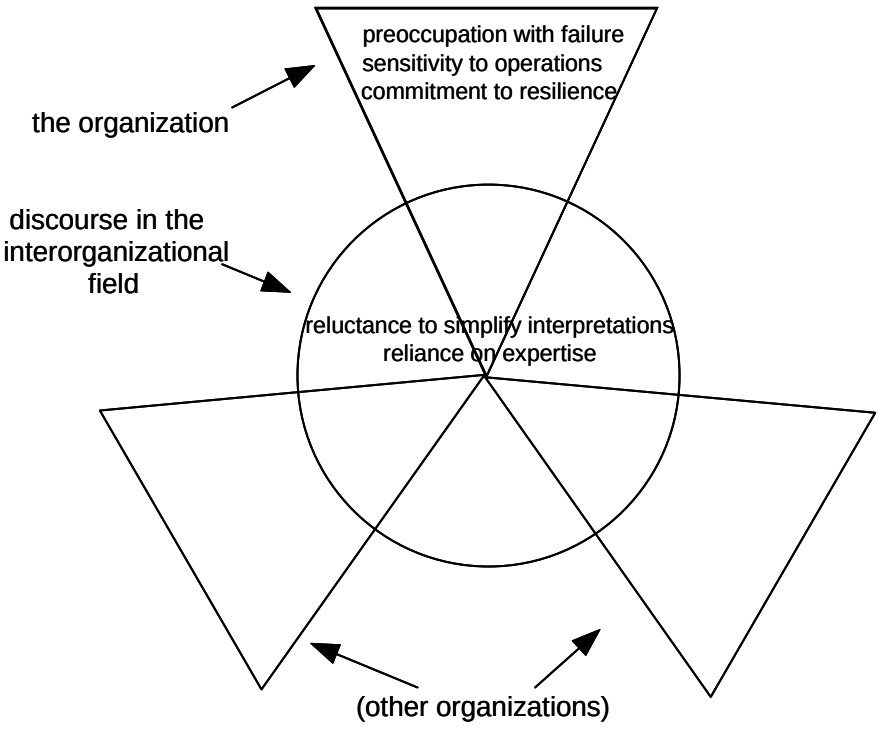

Figure 2. The Interpenetration of Mindfulness in Organizational and Institutional Spheres

given their ability to obscure the more mindful bases for adoption in sheer noise and tumult. Also, *informational cascades* may prevail, falsely suggesting that a broad, substantive, and well-considered consensus exists (Bikhchandani et al. 1992).

In practice, then, mindfulness may call not only for a keen alertness to the organization's own circumstances, but also an outward-looking wariness of herd behavior and a stubborn insistence on uncovering, to the extent possible, the contexts in which others' actions are taking place (Fiol and O'Connor 2003). For instance, have firms in one industry simply followed their high-status leader in adopting an innovation, or have they adopted the innovation for perhaps similar but nevertheless firm-specific reasons? Are any of these firms experiencing implementation problems with this new IT and if so, what does this suggest?

The mindful firm attempting to judge the mindfulness behind others' behavior must also recognize that while mindfulness is adaptive, it is not necessarily definitive. Thus, caution must be exercised in inferring mindfulness based on outcomes. Mindfulness, as an organizational capability, is not to be confused with the relative supply of knowledge; in fact, the mindful firm can be especially short on knowledge early in its engagement with new IT. Where knowledge is scant and uncertainty is high, unintended and unanticipated consequences can readily afflict even the mindful. Moreover, under these conditions mindfulness can point toward incommensurate and conflicting conclusions about the best course of action. As one aspect of its reluctance to simplify interpretations, then, the mindful firm may sometimes be recognized by its willingness to embrace paradox (Fiol and O'Connor 2003; Ramiller 2001b; Robey and

Boudreau 1999). For example, the executive endorsing ERP may find herself asking, "How do we retain competitive advantage by doing exactly what others are doing?" In short, in evaluating the mindfulness of others, their processes, to the extent observable, are likely to be a better indicator than their outcomes.

If organizational mindfulness must take account of mindlessness in the institutional field, *mindfulness meanwhile creates opportunities for the mindless*. Here we are thinking about a kind of mindfulness-by-proxy, based on imitation and invoked to fill the gaps left by uncertainty. The prospective adopter may "borrow" mindfulness by taking with serious regard what salient and respected parties have to say about an innovation's benefits (Fulk et al. 1987; Kraut et al. 1998; Rogers 1995). We note that imitation as a rational response to uncertainty has a long history in organization theory (Cyert and March 1963; DiMaggio and Powell 1983; Rao et al. 2001); in the context of IT innovation, it can reflect the considered acknowledgement that others may have resources, including time, money, experience and knowledge, unavailable to the innovating firm itself. Nevertheless, such mindfulness-by-proxy has its limits, because of the absence of truly local attention to organizational particulars. Moreover, even where little differentiation is sought and a stock solution is tolerable, mindfulness-by-proxy still demands a direct and critical mindfulness of the suitability of particular opinion leaders to serve as generic models.

In summary, the relatively mindful and the relatively mindless interact, through the organizing-vision discourse, to create an evolving landscape of supposition, hopeful belief, and qualified knowledge. If telling the difference between the mindful and mindless is, as we have noted, difficult, challenging too is distinguishing among these categories of putative "knowledge." This challenge, however, does not remain the same over time: We propose that the community can generally be expected to advance in its understanding of an IT innovation as its collective experience grows. Certain things do get decided, through processes of learning at this higher level, even as the need for local adaptation continues to challenge mindfulness at the level of the individual organization.

Patterns in the Institutional Landscape of Mindfulness

If the community can be said to learn about an IT innovation, we believe also that the distribution of mindfulness in the larger population of firms tends to shift systematically over time. This, we note, is not the same thing as saying that the distribution of *knowledge* about an innovation changes—although this, too, is certainly true. Mindfulness, again, is not about what firms know as such, but about a disposition that shapes their capacity for learning and adapting. In this section we consider some possible patterns in the distribution of organizational mindfulness. In a subsequent section, we entertain some complementary research directions.

We suggest that patterns of mindfulness and mindlessness among firms, over time, and across innovations will tend to reflect:(1) the nature of the innovations themselves, (2) the reception of the corresponding organizing visions in the larger community, (3) the normative force that diffusion imparts in its own right, and (4) firm characteristics. We consider each influence in turn, advancing a small and suggestive set of propositions with which to seed future theorizing.

The Nature of Innovations

Here, our attention is attracted specifically to an innovation's *radicality*. Radical innovations, as opposed to incremental innovations, require completely new organizational routines and may impact participants' beliefs and values (Dewar and Dutton 1986; Nord and Tucker 1987; Tornatzky and Fleischer 1990). Their organizing visions suggest a substantial *discontinuity* in the degree of departure from current practice (Ramiller and Swanson 2003). The greater this discontinuity and the more compelling the new concept, then, the more likely firms will be tempted to dismiss their

own present circumstances as seemingly passé. For example, in the early 1990s many firms rushed to embrace business process reengineering which, with the aid of enabling IT, promised "orders of magnitude improvement" through the "obliteration" of current inept practice (Hammer and Champy 1993). Accordingly, we propose that

(P2) *Mindlessness in innovating with IT will be observed more widely the more radical the innovation. Mindfulness, in contrast, will be observed more widely the more incremental the innovation.*

We acknowledge that this proposition may suggest to skeptics that if it were true, more radical innovations would be adopted more widely.[7] Where fads are concerned, there may certainly be something to this. However, not all radical concepts catch on, and, where they do, mindlessness, while significant, may also be fleeting, tempering further adoption. Future research around this proposition will want to consider the sensitivity of the proposed association to temporal dynamics and conditions in the adopter community (see the following discussion), as well as the all-important observation that widespread (and perhaps transitory) adoption does not necessarily imply actual implementation (Fichman and Kemerer 1999).

The Community Reception of Organizing Visions

Here, we pick up on the phenomenon of IT fads and consider a vision's *fashionableness*. A management fashion is defined as "relatively transitory collective beliefs, disseminated by the discourse of knowledge entrepreneurs, that a management technique is at the forefront of rational management progress" (Abrahamson and Fairchild 1999, p. 709). This definition serves reasonably well for IT fashions, with the substitution of "IT innovation" for "management technique." Fashionableness is thus reflected in the vision's discourse and may be found in a variety of communication forums, including the published literature and trade press (Wang 2002). Amplified by hyperbole (Ramiller 2001b), the fashionable vision may exert a strong, if transitory, normative pull among managers. It is also likely to attract those who have heretofore been deferring attention to the innovation in question.

Recently, Gartner Research has articulated a "hype cycle" model that may be understood to address this phenomenon (and indirectly is a commentary on its own role in the process). The regard for an IT innovation rises in the community to a "peak of inflated expectations," from which it then falls into a "trough of disillusionment"; from there it can then rise again, more gradually, along a "slope of enlightenment." Nelson (2001), for example, provides a hype cycle for CRM. We suggest that such inflated expectations can constitute a fashion bubble in which the innovation is followed mindlessly; this is especially likely when a large number of firms are simultaneously engaged in the early phases with the innovation and are therefore more prone to mindlessness. (Refer again to proposition P1, above.) The preeminent illustration of such a bubble may be the dot.com movement associated with the vision for electronic commerce. Thus, over a vision's career,

(P3) *Mindlessness in innovating with IT will be observed more widely the more fashionable the organizing vision. Mindfulness, in contrast, will be observed more widely the less fashionable the organizing vision.*

The Normative Force of Diffusion

In some circumstances an innovation's cumulative diffusion pattern can help to foster institutional preemption. The rate of adoption, conveyed and amplified in the organizing-vision discourse, may send a strong message to managers that there is a convergence in expectations regarding the IT innovation's efficacy. Rapid adoption together with news of successful implementations may signal a "social sweep" (Mohr 1987, pp. 16-17) that exerts normative force over the remainder of the population:

[7]We are grateful to a reviewer for pointing this out.

(P4a) *Mindlessness in innovating with IT will be observed more widely the more rapid and widespread the adoption of the innovation. Mindfulness, in contrast, will be observed more widely the less rapid and widespread the adoption of the innovation.*

We note that this proposition is mute on the question of whether early adoption, in circumstances of rapid diffusion, is more mindful than later adoption. Nevertheless, our lead-in argument does imply that later adopters are more likely to be "impressed" by the accumulating number of adoptions that precede theirs. However, received wisdom arguably holds that later adopters will make more informed decisions, because more knowledge is available.[8] While the quantity of available knowledge, as we pointed out earlier, is not equivalent to the level of mindfulness, one might suppose that it is *easier* to be mindful when greater knowledge exists. On the other hand, evidence from institutional theory suggests that there are circumstances where firm specifics more strongly explain early adoption but later adoption is driven by the very fact of diffusion, which legitimates the innovation and becomes a comprehensive and self-perpetuating rationale for adoption (Tolbert and Zucker 1983). Such contrary predictions, then, qualify this issue as a promising topic for empirical investigation.

We note that P4a specifically addresses adoption (recall Figure 1). Where innovating with IT is involved, however, legitimacy is not likely to be sustained by adoptions alone. Implementation, in particular, can be deeply problematic, as well illustrated by ERP (Davenport 1998; Willcocks and Sykes 2000). Until firms have seriously engaged implementation, the community more generally cannot be said to have learned much from the innovation. Indeed, the apparent diffusion of some IT innovations, when examined more closely in terms of real implementations and genuine assimilation, may be found to be *illusory* (Fichman and Kemerer 1999). While such innovation gaps arise in substantial part from real knowledge barriers, they can also be exacerbated by mindless adoption associated with the innovation's fashionableness and rapid early diffusion. Nevertheless, once the gaps become apparent within the community, they are likely to dampen mindless behavior by signaling to those yet to adopt that the benefits of adoption can't be rapidly and easily achieved. Similarly, exposure of such gaps will warn recent adopters that mindfulness in fitting the new IT to the firm may be unavoidable.

As a consequence, where implementation and assimilation gaps become prominent in the larger community's discourse, the innovation's progress toward institutionalization will be slowed. In the extreme, persistent problems can force a reexamination of the innovation itself, slowing or reversing the course of adoption, and even leading eventually to abandonment, as happened widely with CASE (computer-aided software engineering) (Iivari 1996; Ramiller and Swanson 2003). Broadly, implementation and assimilation gaps are likely to burst whatever fashion bubble remains. Thus, mindlessness receives a wake-up call:

(P4b) *Mindlessness in innovating with IT will tend to be displaced by mindfulness the larger the implementation and assimilation gaps that arise with the innovation.*

We add a caveat, however. Should the community become too discouraged with an IT innovation because implementation and assimilation gaps persist, it may give rise to a kind of mindless foreclosure on further efforts to innovate with that IT! Some might wish to argue that this happened with CASE, for instance. Accordingly, while we have proposed that the community *generally* advances in its understanding of an IT innovation, we view this as an empirical tendency rather than an *a priori* principle.

Firm Characteristics

Firm characteristics can play a role in determining where mindfulness and mindlessness appear in a

[8]We also owe our thanks to a reviewer for outlining this position.

population of prospective adopters over time. Consider recent firm performance. Firms performing relatively well are likely to be mindful of the possibilities for IT innovations to enhance their competitive advantage. On the other hand, those performing relatively poorly may be preoccupied with their competitive *disadvantage.* A firm in this category, concluding that it has fallen behind others in innovating with IT, may come to disparage its own competence in this arena. As a consequence, in contemplating the innovative activities of others, it may be more inclined to look for models to slavishly emulate than to critically appropriate for local fit.

In the early 1990s, many firms coming under cost pressure turned to business process reengineering in part because it promised to relieve them of this burden through simple headcount reduction (Kleiner 2000). Mindlessness in innovating with BPR accordingly may have been induced in part by the economic conditions of this period. Of course, some firms innovated very mindfully with BPR, and these were more likely to have reaped the touted benefits (Hammer and Champy 1993). However, on the whole,

(P5) *Mindlessness in innovating with IT will be observed more widely among organizations with relatively poor recent performance. Mindfulness, in contrast, will be observed more widely among organizations with relatively good recent performance.*

As a qualification, however, we should point out that the successful organization may also be prone to fall short in mindfulness—precisely because of its success. Routines that are currently effective can lull a firm into complacency.[9] This is an important aspect of competency traps which, as we argued earlier, a truly embracing mindfulness must actually take account of. Accordingly, this proposition, too, invites nuanced consideration in future empirical work.

[9]We thank the senior editor for reminding us about this important phenomenon.

Prior experience with IT is another organizational characteristic we propose for consideration. Firms with substantial in-house experience in implementing IT applications are more likely to be mindful. Their know-how concerning the application of IT to the enterprise provides context-specific expertise for the mindful evaluation of new opportunities. This sophistication contrasts with that of firms content to purchase IT services and expertise as marketplace commodities. The latter should be more vulnerable to mindlessness:

(P6) *Mindlessness in innovating with IT will be observed more widely among organizations that are not IT sophisticated. Mindfulness, in contrast, will be observed more widely among organizations that are IT sophisticated.*

Additional Research Directions

The propositions we have just entertained relate to the complementary distribution of mindfulness and mindlessness. This area of concern suggests some additional lines of research that might be undertaken with mindfulness as the focal point of inquiry. We structure our discussion around intersecting levels of analysis, beginning with community-level diffusion, proceeding to the level of organizational process, and concluding with individual mindfulness.

Mindfulness and Mindlessness in Innovation Diffusion

We suggest first that research should examine how mindfulness and mindlessness in the community affect *the genesis, evolution, and fate of the IT innovation* itself. For example, what is the effect of mindless adoption on the innovation's organizing vision? While it is unlikely to contribute much to the substantive shaping of the innovation, mindless adopters' commitments should nevertheless tend to reinforce the prevailing conventional

wisdom about the value of the innovation. Mindless adoption can thereby give added momentum to the organizing vision, providing one more case showing that "everyone is doing it."

On the other hand, where mindless innovators visibly stumble in implementation, the community may need to rework its discourse. Research should therefore be alert to repair activities appearing in the larger discourse, such as the inclusion of key risks and contingencies, that serve to put distance between the innovation as high concept and the foolhardy whose misbehavior would give it a bad name. Accordingly, comparative longitudinal studies of organizing visions that take both mindless and mindful adoption into account may yield important institutional insights, offering new explanations for diffusion patterns and histories. Emerging methods in discourse analysis (Phillips and Hardy 2002) offer considerable promise for systematic inquiries of this kind.

Studies of organizing visions that become management fashions should also be helpful in shedding light on patterns in mindfulness and mindlessness. Here the period during which the organizing vision is in "high fashion" can be contrasted with the periods before and after to discern differences in the mindfulness associated with behaviors across firms.

Research on succession among management fashions (Abrahamson and Fairchild 1999) suggests that it might also be fruitful to undertake historical studies of the interrelationships among the careers of organizing visions. Particular attention could be paid to shifting patterns of mindfulness and mindlessness in organizing visions that appear to successively occupy a common fashion niche. An example would be the process by which ERP displaced MRP II, which earlier had displaced MRP, in the manufacturing systems fashion niche. We might then ask, what patterns of mindfulness and mindlessness characterize such fashion transitions? For example, given the absence of a dominant fashion during a transition period, would the period be characterized by widespread mindfulness?

Is institutional preemption more prominent in diffusion within industries than diffusion across industries? In diffusion across industries, more obvious differences may invite more careful scrutiny. (This may be a contributing cause for ERP's rapid diffusion within a few industries at first, while catching on in other industries only gradually.) Time may be a consideration here, too. As diffusion becomes more widespread, would such cross-industry mindfulness tend to wane? Finally, should these industry effects be expected for all IT innovations or just some?

Lastly, studies might compare IT innovation diffusion during different social and economic periods. Extrapolating from our conjecture (P5) that mindlessness may be associated with relatively poor organizational performance, should we also expect widespread mindlessness to be characteristic of economic downturns? A competing conjecture is that economic boom periods would witness greater mindlessness, with excess slack providing a cushion for indulging mindlessness that would tend to be absent in lean times. Here, in addition to empirical studies, alternative conjectures might be explored through dynamic modeling.

Mindfulness in Organizational Process

Moving to the organizational level, we see a particular need for field studies of innovation-sensemaking in the early stages of organizations' engagements with new IT (Figure 1). This implies closer study of early *comprehension*, including organizational approaches for tapping into industry discourses. Studies should pursue not just boundary-spanning activities as such, but the extent to which such activities enable the firm to derive contextually differentiated meaning from their encounters with organizing visions (Nambisan et al. 1999; Tillquist 2000).

The *adoption* process, although historically the subject of considerable research attention (Fichman 2000), nonetheless offers some unexplored territory where mindfulness is concerned. We need to learn more about the processes through

which adoption rationales are developed, and whether certain routines and structures for creating them are important in determining the mindfulness involved. We also need to consider more directly how the decision is transformed into commitment, and how that process may be influential in setting up the conditions for mindfulness in implementation.[10] Furthermore, research should examine how mindfulness enters into sustaining and adapting the adoption rationale, as the organization moves forward into implementation.

With regard to *implementation*, we would be interested to know how mindfulness embraces opportunities for continuous learning, as distinct from the taking of more prepackaged and predetermined approaches. Consider, for example, the explicit incorporation of change management expertise and responsibilities in ERP implementations, in recognition of the need to attend mindfully to the innovation's disruptive effects (see, for example, Bancroft et al. 1998, Chapter 11). Such disruptive effects can be anticipated at best in a general way, and must ultimately be dealt with in situation-specific terms through rich interpretations, contextual sensitivity, and commitment to flexibility.

Relative to mindfulness in *assimilation*, we envision research that goes beyond individual perceptions and attitudes, and begins to address how the individual's response is formed in the context of what are fundamentally social processes of technology appropriation (DeSanctis and Scott Poole 1994). A promising foundation for such work is the research in our field based on Giddens' (1984) structuration theory (see, for example, DeSanctis and Scott Poole 1994; Majchrzak et al. 2000; Orlikowski and Robey 1991; Orlikowski et al. 1995). Apropos organizational mindfulness, studies should examine how firms attend to and respond to the unexpected in their members' use of IT innovations. We note that such responses may range from simple emergency support (or correctives), through structural forms of post-implementation support (e.g., help desks), to processes that support continual learning (such as close partnerships between technical staff and users). Studies of the *reinvention* of the innovation by its users (Rice and Rogers 1980) should also yield new insights.

In addition to investigations specific to each innovation process, we also recommend work that better articulates linkages among the processes. This is another arena in which mindfulness or its lack may affect outcomes. For example, whether *organizational readiness* (Iacovouet al. 1995) is mindfully factored into the decision to adopt is likely to be important downstream in implementation. In turn, mindfulness in implementation is likely to affect the course of secondary adoption (Leonard-Barton 1988; Leonard-Barton and Deschamps 1988), infusion, and routinization (Cooper and Zmud 1990). Methodologically, longitudinal field studies may be particularly well-suited to the exploration of linkages among processes.

Finally, we point to the importance of timing in the organization's innovation processes relative to developments in the broader environment. As we have noted, early adoption and late adoption are not the same. Because of evolution in the larger context, later adopters often face a very different situation in comprehending, adopting, implementing, and assimilating the innovation. Accordingly, what mindfulness demands may shift systematically over the course of the innovation's history. For example, the stock of appropriable adoption rationales is likely to change as the innovation matures and proves itself in one area but not another. Also, early adopters may need to be especially mindful in their implementations, as the community knows little about crucial contingencies determining the applicability of different approaches.

On a methodological note, organizational-level research must be served by the development of measurements for mindfulness. Weick and

[10] In the case of ERP, Markus and Tannis (1999) remark that, "Clearly, what companies think they are about when they adopt enterprise systems must figure somehow in the ways they approach the enterprise systems experience and in the outcomes they achieve" (p. 180). Swanson and Wang (2003) find that firms that adopted ERP for business coordination reasons tended to be the more successful.

Sutcliffe (2001, Chapter 4) provide an instrument for assessing organizational mindfulness in a broad way, based on their five attributes. This might be adaptable for use in measuring mindfulness in innovating with IT. However, given the complexities in the organizational processes we have discussed, we believe that measurement approaches will need to be tailored carefully to particular studies.

Managerial Mindfulness

While organizational mindfulness is our principal concern, research on the individual mindfulness of managers is of related importance. Mindfulness is not an exclusive prerogative of management, nor is the organization's mindfulness reducible to the astuteness of individual managers. Nevertheless, managers have a special responsibility: In addition to contributing their own mindfulness, they must foster conditions that promote collective mindfulness in the firm.[11]

Managerial mindfulness should not be equated with a manager's *personal innovativeness* with IT, or "the willingness of an individual to try out any new information technology" (Agarwal and Prasad 1998, p. 206). Such personal innovativeness may be more mindful or less mindful, with important organizational ramifications. On the one hand, the manager who fosters selective and careful in-house experimentation with new IT helps to promote learning about the technology's local efficacy. On the other hand, the manager who indiscriminately puts into play all kinds of new IT (perhaps largely for the pleasure of a professionally oriented technical staff or to promote his/her own identity as an innovator) is, we would argue, doing little to foster organizational mindfulness. Given contrasts like this, studies of managerial innovativeness and mindfulness taken together should yield valuable insights into what constitutes effective managerial agency.

In a similar vein, we believe that innovation *championship* (Beath 1991; Heng et al. 1999; Howell and Higgins 1990) might be usefully studied in relation to mindfulness. As with personal innovativeness, we conjecture that innovation championship may be more or less mindful. Champions' "transformational visions" for IT (Armstrong and Sambamurthy 1999) may be more or less anchored in local realities. They may give more or less attention to knowledge barriers and the development of means to overcome them (Attewell 1992; King et al. 1994; Tanriverdi and Iacono 1998). They may be more or less oriented around the substantive organizational learning process.

Finally, the oft-mentioned *top management support* (Rai and Patnayakuni 1996; Swanson 1988) deserves reexamination in a mindfulness context. Earlier we remarked that a certain strategic mindfulness is needed to attend to the disruptive effects of IT initiatives. Such a strategic mindfulness, which entails a wary concern for the firm's longer-term viability, may best be placed with top management. In its absence, other forms of support, such as the provisioning of monies and people, might not suffice to enable the innovation to weather the storms of implementation and ultimately be successfully assimilated. To explore this issue, case studies should be especially helpful.

Conclusion

In this essay, we have explored the concept of mindfulness in innovating with IT. We began by considering the idea of mindfulness in the psychological and organizational literatures, and then argued for its applicability in the IT realm. Next, we introduced some conceptual foundations needed to adapt the concept for use in IT

[11]Here, Fiol and O'Connor (2003) suggest that mindful senior managers, in pursuit of more discriminating choices, cultivate expanded scanning for data beyond traditional sources as well as questioning interpretations based in multiple organizational perspectives. They add, with respect to future research, "We … need to know more about how widespread mindfulness must be among decision makers in order to produce positive outcomes, as well as the costs and returns of the investment required to produce this level of mindfulness" (p. 67).

research. These included, first, recognizing the institutionally embedded nature of the IT innovation, and second, specifying a process model for organizational innovation that takes cognizance of the larger institutional context. With this background in place, we characterized mindfulness and mindlessness in some depth, and then outlined a theoretical synthesis in which these apparent opposites could be seen to interact in systematic ways. Finally, we identified a number of potential implications for research.

We have attempted to break new ground in this essay, and our approach to the subject has therefore been decidedly exploratory. Other researchers may wish to take different paths. They may wish, for instance, to argue for a different focus for mindfulness or to propose a different set of mindfulness attributes. Our own work, in short, merely provides a beginning.

One of our primary goals has been to raise questions about (1) what it means to be mindful in innovating with IT, (2) when organizations should be mindful, and (3) how organizations can be mindful. While our discussion has been theoretically motivated, its implications in fact are quite practical. Deficient understanding—handmaiden to mindlessness—has been identified as a prime cause of firms' widespread failures with IT investments (Nash 2000). Meanwhile, the very language of IT practitioners speaks to the hazards of innovating on the basis of weak interpretation and poor communication (Ramiller 2001b, 2001c), additional hallmarks of mindlessness. Accordingly, the concept of mindfulness offers an eminently practical focus for managers seeking to increase their firms' collective intelligence and responsiveness in the face of the uncertainties associated with new IT.

On the scholarly side, our contribution has been to lay the groundwork for the application of the mindfulness concept in future studies that seek to elucidate organizational processes in IT innovation or to explain wider patterns in the spread of innovative IT ideas. More broadly, our discussion also represents a call for enlarging our academic community's efforts to investigate the cognitive processes of organizations (Meindl et al. 1994), and to recognize in firms' engagements with new IT their fundamental character as systems for accomplishing interpretation (Daft and Weick 1984). Finally, our effort here points toward one possible way in which to theorize the IT artifact (Benbasat and Zmud 2003; Orlikowski and Iacono 2001), specifically as the multilevel product of local and trans-organizational forces acting in concert. Hence, it serves to remind researchers who turn their attention to the cognitive that local interpretations are invariably bound to a wider institutional context. On that larger stage, the trade in new ideas is shaped and complicated by norms, fashions, and cognitive limitations, the problematic quality of expertise and authority, and the challenge posed by the shifting patchwork of others' mindfulness and mindlessness.

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