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Rose, Jones and Truex (2005) offer a valuable discussion of the issue that has occupied center stage in IS research for decades: how to conceptualize the relationship between technology and organizations? They raise a number of important concerns with existing approaches to this issue, and by highlighting these limitations, Rose, Jones and Truex challenge us to rethink our cherished assumptions and conventional approaches to studying information systems (IS) phenomena.

The question of the relationship between technology and organizations is a fundamental one in the IS literature, and goes to the heart of how we think about, study, and develop information technologies. Whether explicitly addressed by IS researchers in their work, or not, all IS studies reflect a particular position on this question (Orlikowski and Iacono 2001). And that position has tended to swing, like a pendulum throughout the history of IS research (Kling and Scaachi, 1982; Markus and Robey 1988), from those privileging the technology (technological determinism, discrete-entity tool view, autonomous technology), to those favoring the social (strategic choice view, web-based ensemble models), and then onto more middle-ground approaches as reflected in socio-technical and emergent perspectives.

More recent movements of the pendulum have incorporated views from broader social formations, most particularly, structuration theory (Giddens 1984) and actor-network theory (Law 1992; Latour 1987). And it is to the development and application of these two theories within IS that Rose, Jones and Truex devote most of their attention. With respect to the question of agency, they argue that both the structurational and actor-network perspectives are lacking in different ways. Structurational treatments are seen to privilege human agency and (inappropriately) discount technological agency, while actor-network investigations, which treat human and technological agency equivalently, are seen to go too far in their assumptions of symmetry and thus as not accounting adequately for differences between humans and machines.

There is little to quarrel with these assessments. Rose, Jones and Truex have correctly identified the different choices articulated in different theoretical viewpoints: structurational perspectives reflect the humanist tradition of making the human subject the center of the action, while actor-network perspectives adopt a post-humanist stance with their decentering of the human subject. Not surprisingly then, these different perspectives offer alternative explanations for the development, implementation, use, and consequences of technology in organizations. In and of itself such differences are not problematic (indeed, they are inevitable), but to the extent that particular theoretical inflections blind us to some empirically consequential influences (e.g., technological capabilities in the case of structuration research, or human intentionality in the case of actor-network studies), difficulties arise in our ability to offer insightful accounts of IS phenomena.

The authors empirical examination of three ERP implementations suggests that some critical influences are overlooked by adopting one or the other theoretical approach, and so they pose their challenge, can we do better? The answer is, we can, and I want to suggest some ways to begin to do so.

First, is to recognize and learn from the rich literature in the sociology of science and technology that is grappling with similar issues. For example, the 2002 special issue of the journal *Theory, Culture and Society* offered a rich debate on "The Status of the Object," and included a number of exciting and powerful ideas that may help us move beyond the current difficulties of established positions in the IS field. In particular, engaging with such debates and commentaries may help us recognize the extent to which the apparent 'problem of agency' is of our own making, constructed out of the ways we have conceptually carved up the world. Latour (2004, p. 227) recently and provocatively made this point:

> To distinguish a piori 'material' and 'social' ties before linking them together again makes about as much sense as to account for the dynamic of a battle by

imagining, first, a group of soldiers and officers stark naked; second, a heap of paraphernalia—tanks, paperwork, uniforms—and then claim that 'of course there exists some (dialectical) relation between the two.' No! one should retort, there exists no relation whatsoever between the material and the social world, because it is the division that is first of all a complete artefact. To abandon the division is not to 'relate' the heap of naked soldiers with the heap of material stuff, it is to rethink the whole assemblage from top to bottom and from beginning to end.

This is an important caution—by privileging either the technology or the social, we lose sight of their intermingling. But similarly, we might add, to treat the naked soldiers and the material heap symmetrically, is to lose sight of their differences. The challenge then is to develop a new vocabulary, a new set of understandings that may help us address the situated entanglement of the technology and the social. And to do so without embracing technological determinism, without taking the technology for granted, and without allowing the technology to vanish from view.

Second, is to experiment with different conceptual treatments of human and technological agencies. In earlier work, Jones (1999) has proposed adopting Pickering's (1995) notion of a 'mangle of practice' that recognizes "the constitutive intertwining and reciprocal interdefinition of human and material agency" (Pickering 1995, p. 26). In this view, neither material nor human agency is privileged, both are seen to exhibit different influences and contingences, and both are temporally emergent from ongoing practice. This seems like a promising direction for IS studies, but I would like to offer a couple of friendly amendments. My preference is not to speak about 'material agency' as that seems too similar to actor-network accounts and may inadvertently lead us into the same difficulties of not adequately distinguishing differences between human activities and technological doings. Instead, I find the notions of 'human agency' and 'material performativity' more useful, helping us to recognize the power of both without equating them. In this view, material performances and human agencies are both implicated in the other (human agency is always materially performed, just as material performances are always enacted by human agency), and neither are given a priori but are temporally emergent in practice. This view further allows us to recognize the unanticipated conditions and unintended consequences of temporal intertwining, thus reclaiming the bases from which to make some observations about institutional outcomes, social purposes, and human reflexivity.

In challenging us to rethink our assumptions about core aspects of the phenomena we study, Rose, Jones and Truex have done us a service. By reminding us of our blind spots they encourage us to do something about them, or to

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continue to run the risk of conceptual missteps at best, and theoretical break-downs at worst. For those of us weaned on the social construction of reality, a recognition of the role of technological performativity may help us to acknowledge the important ways in our realities are also inextricably materially constructed. For those of us uncomfortable with the privileging of human agency, a recognition of different types and forms of agencies may help us to see the many ways in which human agencies and material performances are not the same, and to see what is lost by continuing to assume they are. For all, such reconsiderations will require a giving up of previously closely-held (and possibly hard-won) positions. But such a shift should not be seen as either a retreat or a defeat. Rather, it is an opportunity to learn. As Weick (1996) reminds us, we should hold our concepts lightly and update them frequently. To drop our tools is to renew not just our ideas, but our identities as well.

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