

# Drop Your Tools: Exploring Theoretical Explanations of Technological Change

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## Abstract

The debate between protagonists of different theoretical approaches continues in the IS field, with little prospect of resolution. The debate is typically characterised by tendentious arguments as advocates from each approach offer a somewhat one-sided condemnation of other approaches. Using a recent debate on technological agency in SJIS it is shown how the debate on the qualities of theoretical explanations of technological change is hampered by the shadow of supremacist strategies that is cast over the debate. The debate illustrates the manner in which IS researchers are polarised into opposing camps, both of which tend to view the other as inferior. In order to overcome this polarization we advocate the strategy recommended by Weick (1996): Drop your tools - hold your concepts lightly and update them frequently. Three reasons for dropping our theoretical tools are put forward: the focus on improving practice, the focus on building cumulative tradition in the mother discipline, and the focus on building cumulative tradition in one's own discipline. Finally, the paper concludes with an assessment of the relevance of dropping your theoretical tools as a means to move forward both for individual researchers as well as for the research community as a whole.

## 1 Introduction

Even though the notion of technological agency has been debated in some detail within the IS discipline one could argue that this debate has not taken us very far. (Grint and Woolgar 1997; Collins and Kusch 1998; Rose and Truex 2000; Kallinikos 2002; Rose et al. 2005a; Rose et al. 2005b) In mainstream IS, the impact of IS researchers informed by actor-network theory (ANT) or structuration theory (ST) remain marginal. In 2006 it seems as if positivist approaches building on the idea of casual agency has more to tell us than any model informed by an idea of technological agency. This certainly seems to be the case when reading the table of contents in MISQ or ISR. Why is it then that an approach such as ANT has failed to make a similar impact as positivistic accounts of technological change? One reason can be found in the character of the intellectual debate surrounding such as ANT – it seems as if the debate is concerned with arguments for or against ANT rather than what ANT can tell us. In a inspiring piece of intellectual thinking, Weick (1996) reminds us that we should hold our concepts lightly and update them frequently. To “drop our tools”, as he puts it, is to renew our ideas and the character of our discipline. We think such an attitude would be fruitful in our discipline as a means to push the debate on technological agency further.

This paper is influenced by the work of those scholars who have become sensitive to the need of dropping the tools frequently. In particular the work of Callon (1998, 1999, Callon & Muniesa, 2005) who has examined the contrasting explanations that economists and sociologists offer for the functioning of economic markets. He suggest that the gulf that exists between these two viewpoints is unhelpful, and we need to “drop the tools” that help maintaining that gulf. In other words, certain theoretical constructs appear to cause problems rather than solving them in that they serve as a barrier to theoretical development.

This paper is structured as follows. Initially, a recent debate in SJIS on the topic of technological agency is used as a vehicle for illustrating the problem. While interesting, the

debate is hampered an almost theological-epistemological posturing where one side or another seeks to assert the supremacy of position over others in the debate. Thus the debate illustrates the manner in which IS researchers are polarised into opposing camps, both of which tend to view the other as inferior. In the third section we advocate the strategy recommended by Weick (1996) in order to overcome the polarization into opposing camps: Drop your tools, hold your concepts lightly and update them frequently. We will put forward three reasons for dropping our tools: the focus on improving practice, the focus on building cumulative tradition in the mother discipline, and the focus on building cumulative tradition in the IS discipline. Finally, the paper concludes with an assessment of the relevance of dropping your tools as a research as a means to move forward.

## **2 Conceptualizing the relationship between technology and organizations: Consequences of supremacist strategies**

The history of IS research has been characterised by the hegemony of the positivistic research tradition (Orlikowski & Baroudi, 1991). There has been a clear tendency in the field to relegate 'soft' research approaches to a secondary position compared to the 'hard' positivist approach (e.g. Benbasat *et al.*, 1987). However, Dutton (1988) has criticised the Benbasat *et al.* interpretation of how qualitative case studies should be conducted because of the explicit bias towards quantitative methods. The preoccupation in the IS field with 'hard' research approaches is manifest in the excessive reliance on positivist and quantitative strategies for IS research. Clearly, while paradigms should ideally serve as a lens to illuminate research issues, in practice they serve as blinkers to help achieve closure. A pluralist strategy would allow for different paradigms to be applied in a research situation. It would also allow for theoretical approaches to be a part of a contingent tool-box approach where their strengths could be used as appropriate (Landry & Banville, 1992). In contrast, a supremacist strategy would seek to establish one theoretical approach as universally applicable and 'best' in all situations (for a discussion see Fitzgerald & Howcroft, 1998). The character of much of the current debate seeking to identify or establish agreement about the 'center' or 'core' of the IS discipline (Benbasat & Zmud, 2003) has the character of the later strategy.

In a recent debate in SJIS, Rose, Jones and Truex (2005a, b) discuss 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, they challenge us to rethink our cherished assumptions to studying technology in context. With respect to the question of agency, Rose et al argue that both the ST and ANT perspectives are lacking in different ways. ST are seen to privilege human agency over technological agency, while ANT go too far in their assumptions of symmetry between humans and machines. Rose et al (2005a) described this incompatibility between ANT and ST accounts of humans and machines as *the problem of agency* and suggested some guidelines for a more consistent theoretical treatment of agency, and a metaphor for that theoretical development: 'the double dance of agency.' In doing this they are in a sense urging the IS community to drop their tools and to push the debate further.

The idea of the double dance of agency was commented by a number of researchers with experience from working with ANT, ST or both. While Walsham (2005 p. 153) argues that, instead of building integrative agency theories, we should "encourage a thousand theoretical flowers to bloom", Orlikowski (2005 p. 183) suggests a distinction between human agency and material performativity as a way forward. Hanseth (2005 p. 159) is negative about the potential contribution of structuration theory, and correspondingly more positive about the

contribution of actor network theory. Hanseth argues that ANT addresses and resolves central problems in the relationship of organizations and technology. Hanseth points out that structuration theory, in common with many other social theories, is technology blind. He suggests that instead of focusing on symmetry, we should focus on the ANT notion of *hybrid collectif*. McMaster and Wastell go further in saying that “only collectives can act.” In general, Hanseth finds the presentation of ANT by Rose et al too focused on the issue of symmetry, which he implies is a historical concern; a concern that is no longer in the forefront of theory development. His recommendation is to forget about symmetry and concentrate on hybrids and collectives. McMaster and Wastell (2005 p. 175), responding to the challenge to ANT theorists to be more specific about the way non-humans act, argue that this is really a non-issue in ANT. The challenge is expressed in a way that separates and contrasts humans and machines—precisely the dichotomy that Latour’s project sets out to undermine. McMaster and Wastell accuse Rose et al of “symmetrophobic block” (p. 175) arguing that symmetry is not the same as equivalence.

In their response to Hanseth, Rose et al (2005b) argue that “Hanseth rather ignores the positive role of ST (and key ST adapters such as Orlikowski) in sensitizing the IS field to social issues, progressing it beyond over-simplified managerial and organisational explanations, and opening up the debate about technology and organisations. However his position seems to strengthen rather than undermine our ‘problem of agency’ argument.”

Rose et al (2005b) have the following to say about the criticism they attracted from ANT scholars:

“It may be that ANT theorists will not accept our formulation of the problem, but we still conclude that they have some agency issues to address if they want to develop ANT to be a believable and consistent descriptive theory of IS phenomena. We agree that terminological precision is part of the solution to the problem of agency, but still maintain that we could do with some better theorisations of it. We still think there is value to the basic idea of identifying underlying theoretical problems in the field and trying to solve them. The problems are *our* problems, not the problems of the disciplines that we borrowed the theories from, and the consequent theory developments are, good or bad, *our* theories.”

In other words, they argue for steering away from the locked positions and to add to cumulative theory in IS.

There are many interesting arguments in this debate. We can see contours of a *supremacist strategy* – a strategy aiming at establishing one theoretical approach as universally applicable. Pursuing another line of reasoning, Holmström (2005, p. 167) focuses on the historical context of theories and their trajectory—what came before and what comes next. His point is that we need to focus not only on what came before (how the likes of Latour and Giddens formulated their ideas) but also what comes next; our own theoretical contribution. Focusing solely on “what came first” may hamper any discussion on what comes next. In a similar vein, Orlikowski (2005) proposes terminological changes: to speak of ‘human agency’ and ‘material performativity’ in order to avoid falling into unfortunate traps that may hamper further understanding of technological changes. But these responses may all be kinds of linguistic slights of hand. Building a cumulative theory assumes common and agreed notions of the ‘*problem*’ and potential future. Changing our description of the nature of agency as invested in people or things does not change that nature. And as Susan Langer and Sherry Turkle each independently illustrate in the domains of the visual arts, media and language, our

inclination as humans to personify technology does not make it human. (Langer 1953; Langer 1957; Turkle 1984) Rather it *humanizes* technology so that we might more easily assimilate it in to our value systems, routines, social structures, work and, indeed our collectifs.

The unfortunate consequences of the supremacist strategy could be that we end up with a debate for or against a particular theory instead of what it can tell us in the ongoing discourse in our discipline. To this end we will in the next section focus on reasons for dropping the tools.

### **3 Three reasons for dropping the tools**

As the IS discipline has evolved with relatively permeable research boundaries over the years, the diversity in theoretical underpinnings has been not only healthy but also essential to the evolution of our discipline. To this end we find the challenges raised by Rose et al (2005) to both researchers and practitioners interesting and valuable. The authors argue that when reference theories are taken into the domain of IS, different problems emerge. Among other things, they argue that there are correct and incorrect ways to use theories. Clearly such a focus on “what came first” – what was really said in the original theories?– should be a key concern. But this is not enough. Rose et al also point at the need for a continuous evolution of theories. In the following section we will seek to do this by advocating the strategy recommended by Weick (1996): Drop your tools, hold your concepts lightly and update them frequently. We will put forward three reasons for dropping our tools: *the focus on improving practice, the focus on building cumulative tradition in the mother discipline, and the focus on building cumulative tradition in the IS discipline.*

#### **3.1 Focus on improving practice**

In recent years, the IS community has come under severe criticism for conducting research that has little relevance for practice. The gist of the criticism is that IS academia operates in isolation from practice and the findings of academic research efforts do not influence practice. A dynamic perspective of the interaction between IS academia and practice will help us understand better how IS academia can influence practice. This process should be continuous and subtle (Koch et al., 2002) but as it stands today this process needs to be strengthened. Moody (2000) defines relevant research as that which “addresses a practical need”, and goes on to state that relevance and utility can only be evaluated by practitioners. However, since much research do not have direct or immediate relevance to practitioners, the question arises as to how those findings should be disseminated to them in a suitable form at such time as they do become relevant. While a journal like MISQ is found to be important to research, practitioner publications are generally found to be more useful for teaching. This practice is slammed as being hypocritical by Robey & Markus (1998) who insist that academics be forced to “eat [their] own dog food”.

While the lack of a cumulative tradition within IS research is often lamented (Keen, 1991; Benbasat & Zmud, 1999), there are voices who argue that a cumulative tradition may actually hinder relevance in an era of rapid change (Davenport & Markus, 1999; Robey & Markus, 1998). In fact, results that are highly relevant to pragmatic issues might be rejected as being irrelevant merely because it is presented in an inaccessible style (Robey & Markus, 1998). Too often research is driven by researchers’ own interests and the profiles of publication outlets rather than practical needs (Moody, 2000; Lyytinen, 1999). If academics work in isolation and then try to impose ideas on industry they are bound to fail. IS researchers should therefore look to practice to identify research topics that are likely to be of future interest (Benbasat & Zmud, 1999). Clearly, we need a change towards a greater appreciation for

practical issues. To drop your tools, to update them and adjust them to face this challenge, is a part of this effort. In the SJIS debate we could see no efforts in this direction. Rather, it reminds us of the analogy semologist David Blair uses (after Ziff) when describing words as tools, whose meaning are determined *in use*. He illustrates with the notion of a screw driver, which is normally used as a tool for driving fasteners with an inclined plane, but which in a paint shop may be used to pry paint lids of cans or, in a street fight, may be used as a defensive weapon. (Blair, 1990) If we allowed theories in IS to be more exposed to practice we could also expect to see more creativity among IS scholars in adapting theories in relation to actual needs in practice. We would then indeed be “eating our own dog food.”

### **3.2 Focus on building on cumulative tradition in the mother discipline**

Holmström (2005) finds the challenges raised by Rose et al. to both researchers and practitioners valuable. In particular, Holmström

“...find the argument that there are correct and incorrect ways to use theories to be an interesting and important challenge to our field. When it comes to theories one cannot only take the good bits and leave the bad bits behind. If a researcher does not understand enough of the theoretical tradition from its original setting, s/he is likely to open the work up to any of the same criticisms of that theory that have already been voiced in the original discipline.”

However, the relation to the discipline wherein the theory of interest has emerged is rarely reflected upon. Even more rare is the effort to actually contribute to that discipline. An exception can be found in Truex, Holmstrom and Keil, 2006 wherein the authors suggest that the researchers borrowing theories from other disciplines have the responsibility to do so knowledgably, with fidelity and with current knowledge of the discourse surrounding those theories in the home discipline, but also that they have responsibility to actually attempt to further the discourse by use of the theory in a second discipline. They say:

“When using a specific theory as a resource in the theorizing process, the researcher should be able to answer: What is the added value to the theorizing process when using theory x that is not added when using theory y? The answer to this question should be given considering the tradition of the field – what we know and what we don’t know. To contribute to cumulative tradition, a piece of research has to step beyond that which we already know.” (pg. 30)

For them “...there is a pressing need to pay attention to cumulative tradition when adapting theories to IS research.” They illustrate via Keil’s use of Escalation theory how work in IS research settings may contribute to the cumulative tradition and feed back into the discourse in the home field. This is a way in which escalation theory can be dropped in order to pursue a better explanation of technological change. Such a willingness to adapt theoretical tools is rare but looks like a promising rout to pursue.

### **3.3 Focus on building on cumulative tradition in the IS discipline**

The key challenge for an IS researcher approaching a theory from another discipline for use within IS is to invest the time and effort to understand the theory in its native environment, to learn the vocabulary and underlying assumptions of the theory, to understand its weaknesses as well as its strengths, and to acknowledge its previous use. But while we need to be more reflexive about the ways in which we adapt theories to our field and to deepen our understanding about how and why any theory is adapted, the faithfulness towards original theories is only a part of such reflexivity. For this reason we want to elaborate on the

importance of considering not only a theory's historical context, but also the theorizing process' contribution to cumulative theory.

Weick (1995) points out that "theory is a continuum" and as theories move from visions to detailed constructs and propositions they lose some of their accuracy and become more of an approximation, but they also become increasingly useful to the discipline. Building on Weick's description of the theorizing process, Truex, Holmström and Keil (forthcoming) explore how social theories should be adapted to IS research and argue that both the theory's historical context and the theorizing process' contribution to cumulative theory should be considered. This is in concert with Weick's idea of embedding your theoretical contribution in the context of what came before and what comes next (Weick 1995, p. 389). This includes not only the lifecycle of one's own research process but, more importantly, the ongoing discourse in the particular discipline one is immersed in. Such development depends on the generalization that Yin labels as an 'analytical generalization,' where the researcher "is striving to generalize a particular set of results to some broader theory" (Yin 1994, p. 36).

With this in mind, Rose et al. (2005a, 2005b) can be said to concentrate on what came before rather than what comes next. They ask us to remain faithful to the original ideas from Giddens and Latour, but following Weick's idea of theorizing we must seek not only to remain faithful to the key elements in the original theory, *but also* to develop the theory further. This opens up for an interesting challenge: What is the difference between not being faithful to an original theory and developing it further? We suggest that: To be ready to drop your tools, then, is to be ready to develop them further in line with a theory-development ideal.

We will use Orlikowski's efforts to adapt Giddens' notions to the realm of research on information technologies use. Orlikowski, recalling 'interpretive flexibility' emphasizes that "there is flexibility in how people design, interpret, and use technology, but that this flexibility is a function of the material components comprising the artifact, the institutional context in which a technology is developed and used, and the power, knowledge, and interests of human actors..." as well as time (Orlikowski, 1992: 421). To her credit, her adaptation is a development of Giddens' original ideas to the practicalities of IS. Even so a problematic issue in Orlikowski's model is that she puts technology between human agency and structure, and thus re-establishes a dualism that Giddens' structuration theory achieves to overcome (Rose and Truex, 2000; Jones 1998). In a later work Orlikowski (Orlikowski 2000) appears to recognize this and proposes a 'practice lens' as a means of overcoming these inconsistencies, thus bringing her characterization closer in line to Giddens' intent.

However, an important point should not be missed. Namely that those, like Orlikowski and others, who adopt structuration theory for their research are adapting and, willingly or not, developing Giddens' original ideas as they fit them to the practicalities of IS. In the process their work has spawned a debate that illustrated the challenges of adapting general theories of society to the particulars of organizational life and IT research.

The debate concerning the adaptation of Giddens' original ideas to IS research is a good example of the complexities involved in adapting a social theory to the IS discipline. There are two positions at the heart of this debate. There are, on the one hand, arguments advocating the need to remain faithful to the main thrust of Giddens' original ideas. On the other hand, there are arguments advocating the necessity to adapt Giddens' original ideas to the particulars of IS research. A good researcher will be able to combine these two positions, but

in order to do so s/he will need to be open towards the idea to drop her/his theoretical tools in order to contribute to cumulative tradition in IS.

## 4 Conclusions

This paper is influenced by the work of those scholars who have become sensitive to the need of further developing our explanations of technological change. In particular, Weick (1996) reminds us that we should hold our concepts lightly and update them frequently. To “drop our tools”, as he puts it, is to renew our ideas and the character of our discipline.

With this in mind, why is it then that an approach such as ANT has failed to make a similar impact as positivistic accounts of technological change have? One reason can be found in the character of the intellectual debate surrounding ANT; the debate is concerned with arguments for or against ANT rather than what ANT can tell us. Clearly, the debate between protagonists of different theoretical approaches – ANT and other theories - continues in the IS field, but with little prospect of resolution. The debate is typically characterised by tendentious arguments as advocates from each approach offer a somewhat one-sided condemnation of other approaches. Using a recent debate on technological agency in SJIS it is shown how the debate is hapered by the shadow of supremacist strategies that is casted over the debate. The debate illustrates the manner in which IS researchers are polarised into opposing camps, both of which tend to view the other as inferior. In order to overcome this polarization we advocate the strategy recommended by Weick (1996): Drop your tools, hold your concepts lightly and update them frequently.

Theories shape what we notice and ignore and what we believe is and is not important. To this end, we agree with Lyytinen and King (2004) that better theory is likely to contribute to stronger results. But how do we accomplish better theory? To know if what one is putting forth is a theory, you have to put it in “context of what came before and what comes next” (Weick 1995, p. 389). If you move from one part of the process to another part of the process, then there is the process of theorizing and it is or is becoming a theory (Weick, 1995, p. 389). A theory should add to the body of knowledge, not just rewrite existing knowledge (Whetten, 1989, p. 491). The usefulness of a theory is tied directly to its ability to guide future research. However, theory can – and should – also be of value to practice. To this end, we put forward three reasons for dropping our tools: the focus on improving practice, the focus on building cumulative tradition in the mother discipline, and the focus on building cumulative tradition in the IS discipline.

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