TOWARD "THIRD WAVE" INFORMATION SYSTEMS RESEARCH:

LINKING SOCIOMATERIAL PRACTICE WITH BROADER INSTITUTIONAL LOGICS

Completed Research Paper

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Abstract

The sociomaterial movement has done much to strengthen the theorizing of IT artifacts in practice. This "second wave" information systems research, which focuses on theorizing of the interpenetration of IT artifacts and human activity, is a response to the positivistic, reductive accounts that overly simplified human activity around the development and adoption of IT in the name of generalizability. However, with their focus on local ideographic interpretation, sociomaterial views have abandoned the search for regularities across contexts and across time. In this paper, we take a step toward a "third wave" approach as we look to theoretically account for both idiosyncrasies in sociomaterial practice in situ, and the regularities across these practices. Drawing on institutional logics and the concept of sociomaterial practice, we develop a conceptualization that highlights how technologies afford the enactment of different practice scripts as users draw on different institutional logics.

Keywords: Institutional Logics, Sociomateriality, Affordances

Introduction

The sociomaterial movement (Leonardi et al. 2012; Orlikowski 2007; Orlikowski 2009) in information systems (IS) research has done much to strengthen the theorizing of information technology (IT) artifacts in practice. Naïve views that hold IT artifacts exogenous to practice—or, worse yet, avoid considering IT artifacts at all—can no longer be sustained in the digital age. Instead, we are realizing the degree to which IT artifacts and human activity are mutually constitutive in practice. IT artifacts and human activity interpenetrate in what Pickering (1995) refers to as the "mangle" of practice. In contemporary life, humans are in many ways inseparable from the IT artifacts they work with.

Accompanying the sociomaterial turn toward stronger theorizing of the interpenetration of IT artifacts and human activity, there has been a wave of empirical works that detail different aspects of this relation through highly contextualized accounts (Goh et al. 2011; Leonardi 2011). This focus on local, idiosyncratic context is consistent with what Pollock and Williams (2009) dubbed "second wave" information systems research. Second wave research is a response to the positivistic, reductive accounts of information systems in organizations that overly simplified organizational activity around the development and adoption of IT in the name of generalizability. Second wave research thus focuses primarily on idiographic accounts of situated local contexts in an effort to offer a richer view of these phenomena and make them more accurate. In doing so, however, second wave research often abandoned any search for regularities across contexts—regularities across different organizational settings and regularities in the same context over time (Pollock and Williams 2009). Emerging "third wave" information systems research attempts to extend second wave approaches through a broader search for regularities. In doing so, third wave approaches do not abandon the pursuit of descriptive local accounts, but to this they add a perspective that actively searches for regularities across contexts (Pollock and Williams 2009). This is done through continuous "zooming in" to local practice to capture highly contextualized descriptions, combined with "zooming out" across practice in search for regularities (Latour 2010; Pollock and Williams 2009; Sandberg and Tsoukas 2011).

In this paper, we take a step toward a "third wave" approach whereby we look to theoretically account for both the local idiosyncrasies in sociomaterial practice in situ, and the regularities across these practices. To do so, we take an institutional approach. Institutionalism is a theoretical lens well suited for identifying regularities across practices (Orlikowski and Barley 2001). Within the broad institutional discourse, there is a particular stream of work dubbed the "institutional logics perspective" (Thornton et al. 2012) that enables the multilevel zooming from local practice to society's broad institutions through the mechanism of a "logic" (Friedland and Alford 1991). Drawing on the institutional logics perspective and relating it to the concept of sociomaterial practice, we propose a conceptualization that highlights how technologies afford the enactment of different practice scripts as users draw on different institutional logics. Our conceptualization thus highlights the way in which IT artifacts are not co-constituted in practice in some sort of vacuum. Affordances aren't constructed out of wholecloth anew each time, but rather, they are constructed according to the rules of a particular game (Bourdieu and Wacquant 1992) or even through unreflective habit in the ongoing milieu of human activity (Giddens 1984). Affordances are always enacted in practice that is already embedded in a historical, cultural, institutional context. In this paper, we lay the groundwork for theorizing that accounts for *both* idiographic sociomaterial practice *and* broad consistencies across contexts and across time using an institutional lens.

The remainder of the paper is organized as follows. First we briefly review and contrast the sociomaterial with the institutional perspective, and then we address some of the work on affordances in the sociomaterial tradition, followed by illustrations from the existing literature where we apply the perspective. We conclude with a multilevel development of how sociomaterial practice and institutional logics are linked and a discussion of implications and future directions.

Sociomateriality & Institutionalism

Sociomateriality has emerged as a research stream in information systems (IS) and organizational research that views IS-related phenomena in the light of "the recursive intertwining of humans and technology in practice" (Orlikowski 2007, p. 1437). This perspective is a response to the critique of the

traditional primary schools of research on technology in organizations that either posit a deterministic view, where technology is viewed as an exogenous variable (focus on material agency) (e.g., Brynjolfsson and Hitt 1996), or that view technology as an emergent process, thereby focusing on human agency (e.g., DeSanctis and Poole 1994; Orlikowski 1992; Orlikowski 2000). Both perspectives share a dualistic view of agency (Orlikowski 2009). In contrast, the sociomaterial lens treats technology and humans to be ontologically inseparable in practice (Orlikowski 2007; Orlikowski 2009). The underlying ontology is relational, which is opposed to a dualistic ontology (e.g., Orlikowski 1992), and the focus is on constitutive entanglement of humans and technology (Barad 2003; Orlikowski 2007; Orlikowski 2009; Pickering 1995). In this view, information systems constitute dynamic sociomaterial configurations that are performed in practice, where capacities for action are seen as relational (Orlikowski 2009).

Recent works on sociomateriality have been focusing on the interplay of human and material agency within idiosyncratic contexts (Goh et al. 2011; Leonardi 2011). In essence, these authors theorize about the idiographic continuous co-construction of material-discursive practices (Orlikowski 2009). Important concepts that are used in order to explain the sociomaterial assemblage of human and technology agency include affordances (i.e., technologies afford possibilities for action to humans) (Leonardi 2011), imbrication (i.e., human and material agency create routines and technologies) (Introna and Hayes 2011; Leonardi 2011), and the notion of constitutive entanglement ('the social' and 'the technical' are co-constituted) (Kautz and Jensen 2012). These conceptualizations have contributed to a new way of thinking about technology in organizations (Kautz and Jensen 2012) that highlights and characterizes the role of the material aspect of contemporary society (Leonardi et al. 2012).

However, the sociomaterial perspective, as applied in recent publications—with a focus on human and material agency, individual perceptions, intentionality, and local idiosyncratic contexts—may downplay the role of structures and institutions in influencing the adoption, use, appropriation, and effects of information technologies in organizations. Local contexts are never de-contextualized themselves but are always already embedded in historical, cultural, and institutional contexts (Bourdieu and Wacquant 1992). Thus the mutually constitutive nature of any sociomaterial assemblage does not occur wholecloth from new conditions each time. Instead, the character of this assemblage is rooted in the experiences of the individuals, the organizational structures, and the broader culture and path dependencies (Thornton et al. 2012). The regularities that influence the nature of sociomaterial practices—and simultaneously result from those enactments—can be addressed, at least in-part, through an institutional perspective (Orlikowski and Barley 2001).

Contemporary organizational institutionalism (new institutionalism) (Greenwood et al. 2008; Powell and DiMaggio 1991) provides a theoretical lens that allows us to explain the relationships between situated practices and organizational, cultural, and societal contexts (Berente and Yoo 2012; Orlikowski and Barley 2001). At a basic level, institutions are defined as organized, established procedures (Jepperson 1991) that are continually reinforced through their reenactment, persist over time, and are thus objectified in discourse (Berger and Luckmann 2011). The concept of institutional logics conceptualizes the linkage of broader institutions (at the organizational and societal levels) to individual practices (Berente and Yoo 2012; Friedland and Alford 1991). An institutional logic is a set of goals, values, and prescriptions (Thornton and Ocasio 2008), which constitute the organizing principles of practices that are consistent with a specific institution. Institutional logics are sets of "material practices and symbolic constructions" (Friedland and Alford 1991, p. 248). Organizations can be institutionally plural, and individuals can draw on different—sometimes consistent and sometimes contradictory—institutional logics (Dunn and Jones 2010; Kraatz and Block 2008). Actors may further loosely couple different practices that are consistent with the different, sometimes competing institutional logics, thereby satisfying the demands associated with those logics (Berente and Yoo 2012; Meyer and Rowan 1977). In order to understand how institutional logics can link the broader institutional context to local, situated practices, it is important to note that, in this view, actors are not seen as being passive, non-rational recipients of institutional scripts, but as acting rationally and exercising their agency within a given context, which has been described under the notion of embedded agency (Thornton and Ocasio 2008). Actors can do what they wish, to the extent that they follow the rules of the game (Bourdieu and Wacquant 1992).

Figure 1 describes the institutional logics perspective—the process by which institutions are enacted in practice through their logics and the relationship between these logics and the identities of the individuals (Thornton et al. 2012). Individuals are faced with a situation and they draw upon the appropriate logics

given their identities in that context. Drawing upon particular institutional logics can involve novelty and intentionality, or unreflective habit. Appropriate scripts for legitimate activities are available in the field, consistent with the particular logic, and the actor enacts those scripts in practice—thus reinforcing, and sometimes evolving, those scripts (Thornton et al. 2012).

Figure 1. Model of Institutional Logics and Practice
(based on Thornton et al. 2012)
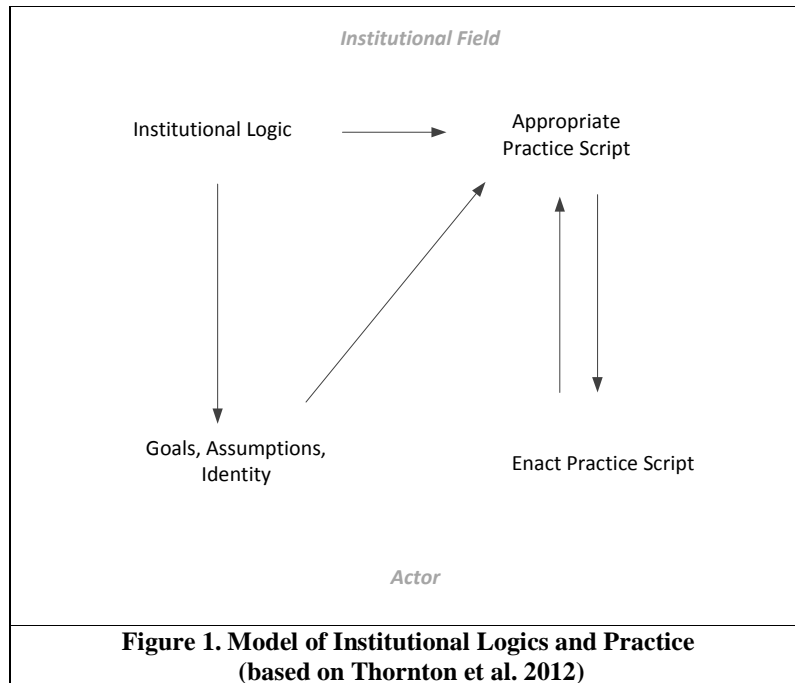
Just as sociomaterial scholarship can benefit from explicit attention to the context within which sociomaterial practice is embedded, institutional accounts can benefit from a sociomaterial view. For example, according to Berente and Yoo (2012) in their institutional study of NASA's ERP adoption: "human activity is historically dependent, culturally conditioned, politically charged, and contextually embedded" (p. 377). This line of thinking emphasizes the human and the contextual, while clearly not accounting for the material elements of the system itself in that practice. However, the materiality of technologies-in-practice have important roles in shaping that practice (Leonardi 2011). Information technologies can trigger structuration in particular ways (Barley 1986) and can act as "carriers" of institutions (Scott 2001) and also material embodiments of decades of sedimented practice (Pollock and Williams 2009).

Table 1: Sociomaterial emphasis versus institutional emphasis	
Sociomaterial Emphasis	**Institutional Emphasis**
Agency	Taken-for-grantedness
Individual perceptions	Habit; unreflexive adoption of scripts
Intentionality	Unintended consequences
Local idiosyncratic context	Regularities across contexts
Idiographic continuous co-construction; continued accomplishment of material-human interpenetration	Institititutionalization of patterns of interaction—becoming stable and taken-for-granted
Materiality and perceived affordances	Structural, cultural, and historical—routinized action

To summarize, the sociomaterial literature has favored material and human agency, perception,

intentionality, and continuous co-creation over embedded agency and the explicitly structural view advocated by adherents of new institutionalism (e.g., Powell and DiMaggio 1991). Table 1, for the sake of comparison, provides an overview between sociomaterial and institutional emphases.

From a sociomaterial perspective, inattention to institutional context in sociomaterial assemblages is unfaithful to Giddens' original idea of structuration as a basic social process, where structure represents rules and resources (Giddens 1979; Giddens 1984), and where Giddens "provides a cognitive theory of commitment to scripted behaviors" (Powell and DiMaggio 1991, p. 23). This becomes particularly relevant considering the influence that Giddens' ideas have had on seminal works in the direct trajectory of the emergence of sociomateriality in IS research (DeSanctis and Poole 1994; Jones and Karsten 2008; Orlikowski 1992; Orlikowski 2000; Poole 2009). While recent writings in fact consider the routinization of action (e.g., Goh et al. 2011; Leonardi 2011), which is consistent with Giddens' understanding of actions as having routinized aspects (Giddens 1984), little emphasis is on the idea that structures and institutions condition these actions. While structuration has sought a balance between the impact of structures and institutions on individual capacity of action on the one hand, and the impact of individual action on structure on the other, in recent works on sociomateriality this balance has given way to a focus on the co-constitution of material and human agencies. Our essential research question thus is:

> *What is the relationship between the institutional context of organizations and the constitutive entanglement of human and material agency captured by the sociomaterial view?*

In order to seek answers to this question, we next turn to one important concept that has been used in order to explain the co-constitution of the social and the material, namely that of affordances (e.g., Goh et al. 2011; Leonardi 2011).
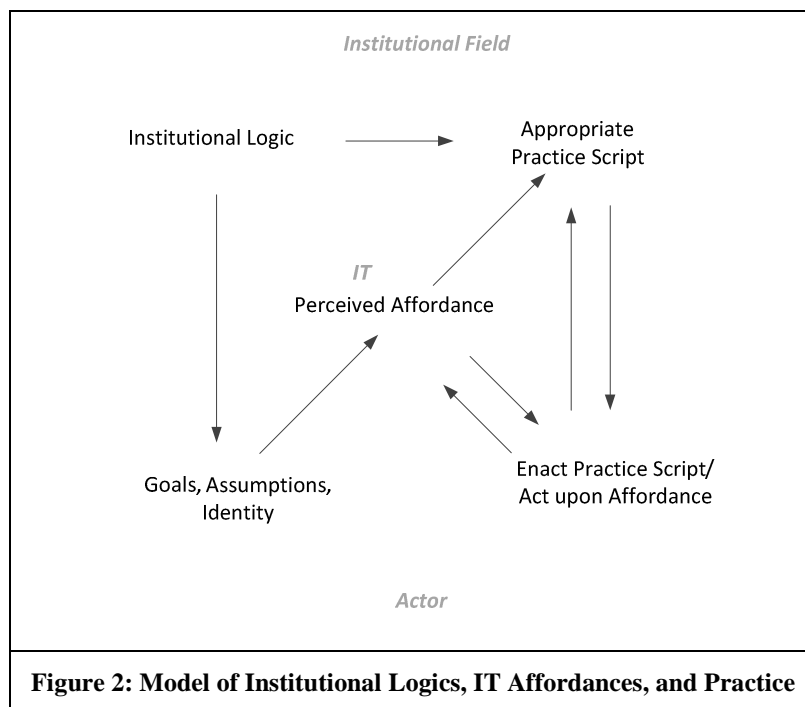
Affordances and Institutional Logics

The concept of "affordance" originates from the field of ecological psychology (Gibson 1977) and has been adopted in the IS discipline, where it describes relationships between technical objects and humans (Markus and Silver 2008, p. 622). Specifically, affordances describe the action possibilities that technical objects provide to users, depending on the context of use (Markus and Silver 2008). Affordances provide a suitable theoretical lens to study the relationship between institutional context and sociomaterial co-constitution as (a) they are context-dependent (Markus and Silver 2008)—which is consistent with the institutional literature—and (b) they are subject to individual perception and interpretation (Chemero 2003) and have an underlying relational ontology (Gibson 1977; Markus and Silver 2008)—which is consistent with the basic ontology underlying sociomateriality. As such, the concept of affordances bears the potential to account for both institutional and sociomaterial perspectives. Table 2 provides an overview.

Against this backdrop, we will use the concept of affordances to explain how the idiographic continuous co-construction is effectively embedded in a broader institutional context. Specifically, we will draw on the concept of institutional logics to explain how affordances emerge in local, idiosyncratic contexts in a way that is consistent with already-established broader institutions. Thereby, this view provides a novel theoretical lens at the interface between institutional theory and sociomateriality.

In short, the co-constitution of the social and the material is situated in an organizational context that can be described by multiple, sometimes contradictory, institutional logics (i.e., sets of goals, values, and prescriptions) (Berente and Yoo 2012; Thornton and Ocasio 2008). Thus, individuals (re-)interpret information technologies in light of specific goals, assumptions, and identities that define the institutional logic they draw on, thereby perceiving what the system can be used for (Chemero 2003). When enacting the scripts provided by the institutional logic (and afforded by information technology), the actor acts upon an affordance. That is, not only the practice script (and therefore the practice), but also the actionable space (i.e., what the technology is used for) becomes reified. Figure 2 extends the image drawn from Thornton et al (2012)—Figure 1—to include the role of perceived affordances in a manner consistent with this model. Put simply, the affordance describes what an actor can do with an information technology when drawing on a specific institutional logic.

Table 2: Properties of the Concept of Affordances	
Properties of the Concept of Affordances	**Relationship to Institutionalism and Sociomateriality**
Context-dependent (Markus and Silver 2008)	Consistent with the literature on institutions that highlights embedded agency (Berente and Yoo 2012; Thornton and Ocasio 2008) and that "human activity is historically dependent, culturally conditioned, politically charged, and contextually embedded" (Berente and Yoo 2012, p. 377) Consistent with the sociomaterial literature that emphasizes human agency and material agency as inherited, contextualized states (Leonardi 2011)
Need to be perceived before they can be enacted (Chemero 2003)	Consistent with literature on sociomateriality that highlights the role of individual perception (Faraj and Azad 2012) Consistent with the recursive, structurational relationship between institutional scripts and enacted practice (Barley 1986; Thornton et al. 2012)
Relational ontology (Gibson 1977; Markus and Silver 2008)	Consistent with the basic assumption of sociomateriality that technology and humans cannot be ontologically separated (Orlikowski 2007; Orlikowski 2009) Consistent with the institutional literature that addresses the way logics are drawn upon in relation to identities, goals, values consistent with those logics (Thornton et al. 2012)

That is, institutional logics are associated with affordances that originate in the material properties of information technologies. When drawing on an institutional logic, individuals perceive and act upon affordances, which results in concrete, observable practices. If habitually enacted, both the practice script and the potential use of IT become reified.

Figure 2: Model of Institutional Logics, IT Affordances, and Practice

As organizations are institutionally plural, the same information technology may afford different possibilities for goal-oriented action (depending on the specific institutional logics an actor draws on) within the same broader organizational context, thereby allowing for different practices to emerge / different practice scripts to be enacted. At this, the different possibilities for goal-oriented action may emerge under new institutional logics, and enable practices that the system was not intended for. The concept of affordances can thus help us explain how the broader institutional context translates into local, idiosyncratic interpretations and use of IT. Figure 3 visualizes our view of this model.
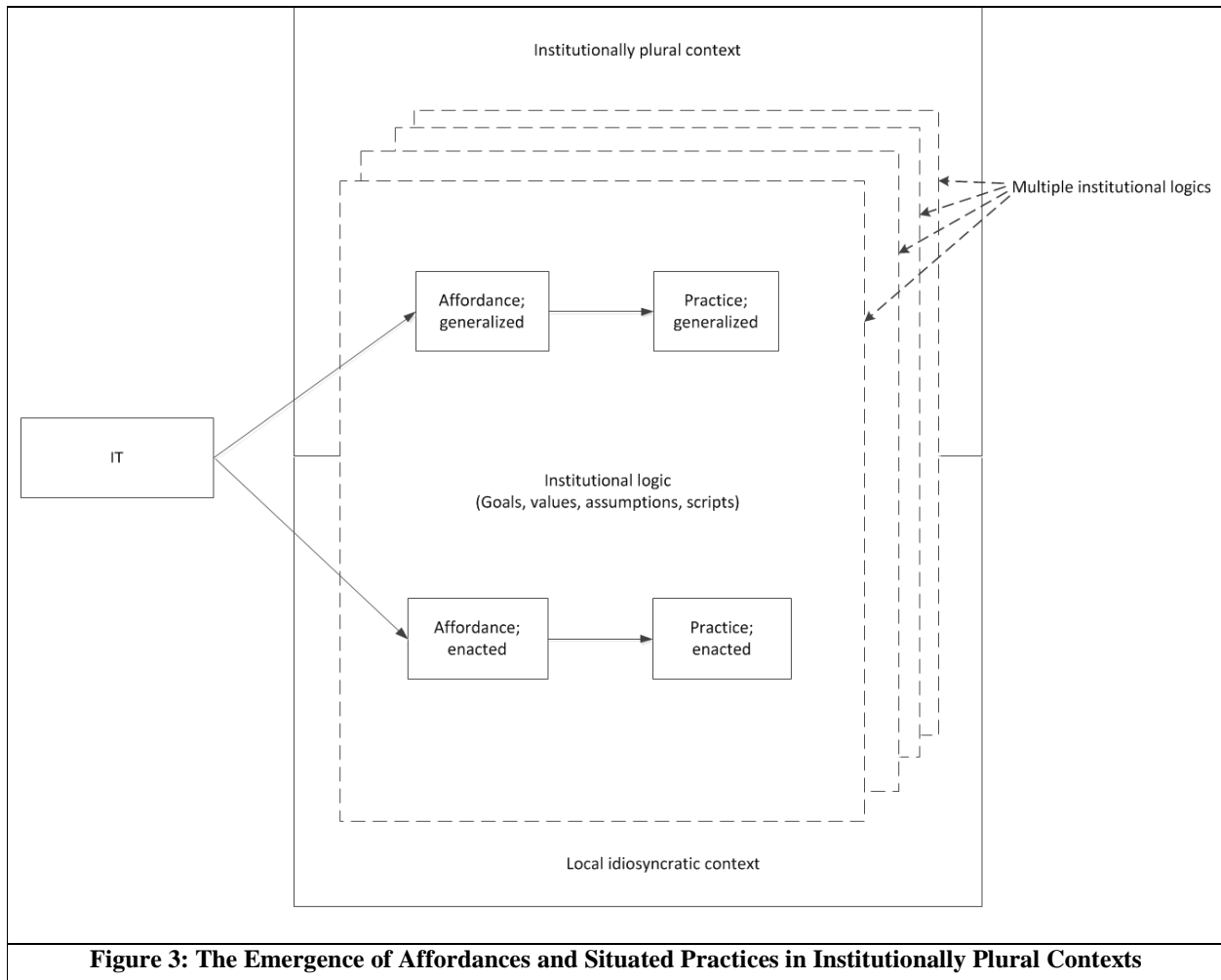
Figure 3: The Emergence of Affordances and Situated Practices in Institutionally Plural Contexts

This view is congruent with (a) prior institutional literature that postulates an impact of taken-for-grantedness and adoption of scripts on human activity (Jepperson 1991; Powell and DiMaggio 1991; Scott 2001) and (b) the literature on sociomateriality that argues for an inseparability of human and material agencies (Orlikowski 2007; Orlikowski 2009). The institutional logic describes both the goals that are pursued when individuals use a system, as well as values and prescriptions that may constrain the actionable space (i.e., the affordances) to the boundaries of those values and prescriptions.

For example, Twitter is a "microblogging" service that enables users to post, or "tweet," messages up to 140 characters. Features of the technological artifact include the number of characters, the network and "following" patterns, the elements of the user interface, etc. Take the feature of the 140 character message. This is a technical feature that can be appropriated by different people in different ways. For example, an instructor might use the features of the service to promote dialog among students (thus enacting a script consistent with the institutional logic of classroom education). An environmentalist may use it to rally awareness for current issues (consistent with an institutional logic of social responsibility). An author may

use twitter to promote his books (i.e., a market-based institutional logic). A researcher may use it to communicate recent work of interest in the field, including his or her own findings (consistent with the logic of scientific research). This is a limited list of affordances associated with the feature of microblog communication using 140 characters in this particular venue, but each has an identifiable institutional context.[1]

The proposed view is further consistent with the understanding that in institutionally plural organizations actors meet the requirements of competing institutional logics through the loose coupling of practices (Berente and Yoo 2012). It is further consistent with the structurational view of technologies-in-practice (Orlikowski 2000) that lie at the root of contemporary sociomaterial literature. Through the lens of the proposed model, the elements of practices that are combined in loose coupling originate from different affordances that are provided by the same technology in the light of competing institutional logics. That is, affordances are the platform for those (elements of) practices to be launched, and actors satisfy the demands associated with different institutional logics by enacting different actionable spaces.

In summary, by situating the concept of affordances within the institutional logics perspective we can identify the different actionable spaces that allow for possibly contradictory practices. This conceptualization seeks a middle ground between institutional logics (taken-for-grantedness, unreflexive adoption of scripts, routinization) on the one hand side, and a focus on sociomateriality (human and material agency, perception, continuous co-construction of the social and the material) on the other. Next we will illustrate the usefulness of this lens by reinterpreting data from existing literature and conclude by suggesting a multilevel model of how sociomaterial practice and institutional logics are linked.

Empirical Illustrations

To illustrate the analytic potential for the proposed theoretical lens, we will provide five illustrations from existing literature. These particular published studies were chosen because they (1) provided enough of a description of divergent sociomaterial practice and institutional context; and (2) each represented a slightly different level of analysis. As such, they are ordered as described in Table 3.

Table 3 Illustrations of the Proposed Theoretical Lens			
Illustration	**Level**	**Setting**	**Citation**
1	Micro-practice / specific feature	ERP and NASA	Berente and Yoo (2012)
2	Practices / set of features	Lotus Notes and Alpha	Orlikowski (2000)
3	Organizational practices / general functionality	CATIA and Frank Gehry	Yoo, Boland, and Lyytinen (2006)
4	Organizational practices – local practices / general functionality	EPS and Lloyds of London	Barrett and Walsham (1999)
5	Organizational practices / genres of functionality	Social Media and Cleaning Products	Reilly and Weirup (2010)

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[1] An interesting point is that all of the above affordances could be enacted by the same information systems scholar— who might use the same tool to afford practices consistent with diverse logics.

Illustration 1: ERP Affordances at NASA

In their study of NASA's ERP implementation, Berente and Yoo (2012, p. 383) offer the following brief description of how different scientists appropriated the ERP system for procurement:

> *"…one research indicated that he addressed this through "cheat sheets" and related practices. Other engineers and researchers simply filled out the input screen in "one" way that they know the system took, knowing that it was not the right information. They relied on quality control people in the procurement department to call them and correct their order entry. Yet, still others circumvented the system entirely—using credit cards to purchase items, when possible, and thus following a completely different procedure"* (Berente and Yoo 2012, p. 383).

NASA is an institutionally plural organization, and the case contrasts two institutional logics that are potentially contradictory.

First, under the institutional logic of *managerial rationalism,* scientists use the ERP system procurement functionality using cheat sheets and such—an appropriation that is consistent with the managerialist purposes associated with the system in the case study. In this case, the underlying system (structured fields in the ERP screen) proffered an affordance of *ordering* and therefore the enactment of the managerial rationalism logic.

Second, under the institutional logic of *scientific professionalism,* scientists use the system to not actually perform the ordering, but instead to get an insufficient order accepted by the system so others can do it appropriately. This appropriation occurs when scientists economize on the amount of administrative work so that they can get on to the "real" work of conducting science. In this case, the structured fields of the ERP system afforded *pushing the appropriate procurement practice elsewhere* in the organization and therefore the enactment of the scientific professionalism logic.

In both cases, the same material property of the underlying system—structured fields in the ERP screen—proffered an affordance that was consistent with the institutional logic the actors draw on, and thus afforded the enactment of the according practice script. That is, the same system is interpreted as providing different possibilities for goal-oriented action (i.e., affordances) depending on the institutional logics an actor draws on. In this example, the re-interpretation of information technology occurs at the level of micro practices and specific features.

Illustration 2: Lotus Notes Affordances & "Alpha" Consultants

In her seminal study on technologies-in-practice, Orlikowski (2000) highlights how different groups in the same organization, different groups in different organizations, and the same group at different times draw on different rules and resources (structures) to enact Lotus Notes collaboration software as different technologies-in-practice in different contexts. Of course, it is entirely consistent with the idiographic approach to show how different groups interpret technology differently in different contexts at different times. However, in this study she also shows how consultants from Alpha—apparently members of the same "group" —enacted Notes much differently.

The differences and similarities both between groups and within the same group can be explained in terms of appropriation associated with two institutional logics.

The majority of consultants made sense of the technology from what we might call a market-based or *competitive logic*—sharing knowledge via Notes would work to the detriment of a consultant's core knowledge:

> *"… we have a lot of problems getting people to share expertise and information… People hide information because it gives them an edge"* (Orlikowski 2000, p. 417).

Other consultants, ostensibly in the same "group," trained in the same way, and faced with the same challenges, interpreted the Notes system as a productivity tool. The knowledge sharing affordances of Notes do not represent losing an edge in expertise, but rather, in gaining productivity in what we might describe as an *automation logic.* Drawing upon this logic, loss of expertise is not salient, instead the idea that the material features of "technology can speed up some existing tasks" (p.418) was fundamental to

the way in which a smaller set of consultants enacted Notes. In this illustration, the set of features in Notes afforded knowledge sharing in general were brought to bear in the examples provided. Those consultants drawing from a competitive market-based logic appropriated Notes in a minimal way—in a sense the affordance involved protecting their important knowledge but hurting their productivity. Those rooted in an automation logic appropriated Notes in a fuller way and Notes did not necessarily act to protect their knowledge, but did increase their productivity.

Illustration 3: CATIA Affordances & Frank Gehry

In their study of the use of CATIA, a computer-aided design tool commonly used for aerospace applications, Yoo, Boland, and Lyytinen (2006) describe how radically innovative architect, Frank Gehry, appropriated the tool differently with different suppliers across four projects. The same software was used as follows:

- Fish project: completely paperless with the "master model" in CATIA
- Bilbao project: CATIA used primarily for communication—contractors used their own systems
- EMP project: bidirectional information flow with general contractor
- PBL project: CATIA used in the design phase, then trades afterwards as communication tool

The same features of CATIA afforded different practices depending on the institutional logics that guided the action.

The architecture, engineering, and construction (AEC) industry is a heavily institutionalized field with a well-established logic of *arm's length contracting*. Contracts are explicit at the outset of the project and the architects, engineers, and each of the contractors use their own systems to do their work. The Bilbao project proceeded using the logic of the AEC industry, and the powerful CATIA tool was relegated primarily to the role of communication tool in the broader project. That is, the tool afforded *communication* within the project and thus the enactment of the arm's length contracting logic.

With the Fish project, on the other hand, there were no contracts until after the building was complete. This certainly did not involve the logic of the AEC industry, but instead an innovative *design logic* associated with experimentation, innovation, and emergence. Consistent with this logic the full master model capabilities of the CATIA system were enacted in a much different way. That is, the system afforded, amongst others, *design*, that is, the system afforded the enactment of the design logic.

The other projects appeared to have hybrid logics—where the system afforded to enact the design logic early in the PBL project, for example, but where the AEC logic was only enacted later in the project.

Thus we have a level of analysis where the overall system affords different modes of organizing, depending on the institutional context. Drawing on the AEC industry profession's logic, the powerful CATIA tool affords little more than communication across firms. However, when drawing on the design logic, CATIA can afford the substitution of contracting institutions and radically changes interorganizational structures of action.

Illustration 4: EPS & Lloyds of London

Barrett and Walsham (1999) show how an "electronic placing system" (EPS) offered the potential to disrupt the way the London insurance market transacted business—moving from face-to-face to "pure screen trading" (p. 12) over time. This shift occurred as Lloyds of London moved from its traditional logic to a new managerialist logic. In both logics, managing risk was critical, but the assumptions about how to do this varied dramatically.

The existing logic in the London insurance market involved insuring very complex risks, which required a heavily institutionalized set of arrangements which were organized around the *professional logic* of this particular industry —such as physical space, temporal continuity, and face-to-face negotiation. In both logics, but according to the professional logic this was best managed through interpersonal connections among highly skilled knowledge workers (underwriters). Thus underwriters resisted the system because to them its technical features afforded "longer hours," "reduced commission rates," and "loss of control," amongst others (p.15). Essentially these underwriters saw the electronic trading and rationalized risk

assessment as counter to their highly skilled, professional identities.

This incumbent logic stood in stark contrast to the *managerial rationalist logic* of the leaders who saw EPS as a way to facilitate shared underwriting and better manage risk. The managerialist logic implied some level of deskilling and disembedding at a local level, but overall improvements to the total system. Some underwriters, capitalized on this managerial rationalism. These underwriters saw the potential for career advancement through being proactive with EPS—expertise with the system offered potentially better job security, and also working with the system afforded them flexibility in their work arrangements:

> *"I can work when I am not usually working... I can conduct normal brokering in the morning outside the core underwriting hours... With more time available, I can serve more clients and customers and be more productive"* (Barrett and Walsham 1999, p. 18).

EPS afforded directly contradictory outcomes—deskilling and reducing the ability to deal with risk versus reskilling and enabling superior ways to deal with risk (i.e. efficiency)—depending on the logic through which it was appropriated. This is consistent in overall character with the Orlikowski (2000) illustration (#2 above).

Illustration 5: Social Media Affordances & Cleaning Product Environmentalism

Corporations are actively seeking to manage their images on social media. The affordances of social media platforms such as Facebook and the accompanying ecology of "friends" and devices enable a venue to message and respond.

In the consumer cleaning products industry, for example, Reilly and Weirup (2010) find a number of companies that actively promote a "green" image of stewardship of the natural environment. Some of these firms have good ratings from sustainability rating agencies, and a number have corporate social responsibility and sustainability in their mission statements. In such cases, one might infer that these organizations appropriate the affordances of social media in line with an authentic environmentalist or *corporate social responsibility logic*.

They found that other firms, however, promote a green image while not doing well on audits and display no evidence of a commitment to the natural environment in their corporate documents. Such use of social media is superficial—what the authors refer to as "greenwashing"—essentially using social media to enable an industrial-age version of the *market-based capitalist logic*. The same genre of technologies affords what appear to be very similar activities for different firms in the same field (i.e. communicating and shaping opinion), but have fundamentally diverging, oppositional implications for the true complexion of the sociomaterial practice based on the logic of the enactment of these affordances.

Discussion and Conclusion

In this article we have proposed a conceptualization that highlights how technologies afford different situated practices as users draw on different institutional logics in an effort to bring together two emerging traditions in information systems. On the one hand, the sociomaterial tradition focuses on local, situated practice and emphasizes the materiality of information systems. The institutional logics tradition, on the other hand, focuses on institutionally plural contexts and highlights how regularities can be explained through drawing upon and enacting a repertoire of scripts. The proposed conceptualization enables both the material to be included in institutional analyses and institutional context within sociomaterial analyses.

On the basis of our reinterpretation of existing published cases, we have further illustrated that the emergence of affordances in light of specific institutional logics can pertain to multiple levels of analysis—ranging from micro level phenomena (e.g., Berente and Yoo 2012) to organizational level phenomena (e.g., Barrett and Walsham 1999) and even entire genres (e.g., Reilly and Weirup 2010). This view suggests that affordances can be nested, and enables us to link the sociomaterial co-constitution to broader levels of analysis, in turn. The same information technology may afford different possibilities for goal-oriented action depending on the level (individual, group, organizational, or industry) and on the underlying institutional logic that the individual, group, organization, or industry draws on. At this, our work makes

an initial step towards a multilevel view of sociomateriality. Such view will be capable of accompanying a broader variety of sociomaterial assemblages (Orlikowski 2007; Orlikowski 2009) as it allows theorizing how sociomaterial practices emerge at different levels of analysis, and may therefore lead to a more encompassing view of sociomateriality. We would contend that such view is congruent with the basic tenets of sociomateriality, most notably with the underlying relational ontology (Orlikowski 2009). In contrast to recent publications on sociomaterial entanglement with their focus on perception, intentionality, co-creation, and human agency at the individual level (e.g., Leonardi 2011), however, the relations we are looking at may not only be between individuals and technologies, but also between groups of individuals and technologies, organizations and technologies, and even entire industries and technologies. This, we would argue, is consistent with the view proposed in Markus and Silver (2008), where affordances are described as relationships between *groups* of users and technical objects. The concept of institutional affordances thus allows us to conceptualize how the regularities across contexts and time are translated into specific actionable spaces that emerge at the individual, group, organizational, or even industry levels.

We would further argue that the proposed conceptualization may provide some novel analytical means in order to study sociomaterial assemblages. In our paper, we have argued that, if habitually enacted, the potential uses of IT (i.e., the affordances) become reified. As a consequence, the affordances become objectified and may enable researchers to conceptualize certain relations between 'the social' and 'the material.'

This paper represents an initial step to bringing two emerging and powerful traditions in information systems research together. We have thus laid the groundwork for a "third wave" approach to information systems research that accounts for both ideographic sociomaterial practice and broad consistencies across contexts and across time.

References

Barad, K. 2003. "Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter," *Signs* (28:3), pp 801-831.

Barley, S.R. 1986. "Technology as an Occasion for Structuring: Evidence from Observations of Ct Scanners and the Social Order of Radiology Departments," *Administrative Science Quarterly*), pp 78-108.

Barrett, M., and Walsham, G. 1999. "Electronic Trading and Work Transformation in the London Insurance Market," *Information Systems Research* (10:1), pp 1-22.

Berente, N., and Yoo, Y. 2012. "Institutional Contradictions and Loose Coupling: Postimplementation of Nasa's Enterprise Information System," *Information Systems Research* (23:2), June 2012, pp 376-396.

Berger, P.L., and Luckmann, T. 2011. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Open Road.

Bourdieu, P., and Wacquant, L.J. 1992. *An Invitation to Reflexive Sociology*. University of Chicago Press.

Brynjolfsson, E., and Hitt, L. 1996. "Paradox Lost? Firm-Level Evidence on the Returns to Information Systems Spending," *Management Science* (42:4), pp 541-558.

Chemero, A. 2003. "An Outline of a Theory of Affordances," *Ecological Psychology* (15:2), pp 181-195.

DeSanctis, G., and Poole, M.S. 1994. "Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory," *Organization Science* (5:2), pp 121-147.

Dunn, M.B., and Jones, C. 2010. "Institutional Logics and Institutional Pluralism: The Contestation of Care and Science Logics in Medical Education, 1967–2005," *Administrative Science Quarterly* (55:1), pp 114-149.

Faraj, S., and Azad, B. 2012. "The Materiality of Technology: An Affordance Perspective," in: *Materiality and Organizing: Social Interaction in a Technological World*. Oxford: p. 237.

Friedland, R., and Alford, R.R. 1991. "Bringing Society Back In: Symbols, Practices and Institutional Contradictions,").

Gibson, J.J. 1977. "A Theory of Affordances," in: *Perceiving, Acting and Knowing: Toward an Ecological Psychology*, R. Shaw and J. Bransford (eds.). Hillsdale: Lawrence Erlbaum Associates, pp. 67-82.

Giddens, A. 1979. *Central Problems in Social Theory*. Berkeley, CA: University of California Press.

Giddens, A. 1984. *The Constitution of Society: Outline of the Theory of Structuration*. Univ of California

Press.

Goh, J.M., Gao, G., and Agarwal, R. 2011. "Evolving Work Routines: Adaptive Routinization of Information Technology in Healthcare," *Information Systems Research* (22:3), September 2011, pp 565-585.

Greenwood, R., Oliver, C., Sahlin, K., and Suddaby, R. 2008. *Sage Handbook of Organizational Institutionalism*. SAGE.

Introna, L.D., and Hayes, N. 2011. "On Sociomaterial Imbrications: What Plagiarism Detection Systems Reveal and Why It Matters," *Information and Organization* (21), pp 107-122.

Jepperson, R.L. 1991. "Institutions, Institutional Effects, and Institutionalism," in: *The New Institutionalism in Organizational Analysis,* W.W. Powell and P.J. DiMaggio (eds.). Chicago: The University of Chicago Press, pp. 143-163.

Jones, M.R., and Karsten, H. 2008. "Giddens's Structuration Theory and Information Systems Research," *MIS Quarterly* (32:1), pp 127-157.

Kautz, K., and Jensen, T.B. 2012. "Sociomateriality - More Than Jargon Monoxide? Questions from the Jester to the Sovereigns," in: *European Conference on Information Systems*. Barcelona, Spain.

Kraatz, M.S., and Block, E.S. 2008. "Organizational Implications of Institutional Pluralism," *The SAGE handbook of organizational institutionalism* (840).

Latour, B. 2010. "Tarde's Idea of Quantification," in: *The Social after Gabriel Tarde: Debates and Assessments,* M. Candea (ed.). Routledge.

Leonardi, P.M. 2011. "When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies," *MIS Quarterly* (35:1), pp 147-168.

Leonardi, P.M., Nardi, B.A., and Kallinikos, J. 2012. *Materiality and Organizing: Social Interaction in a Technological World*. OUP Oxford.

Markus, M.L., and Silver, M.S. 2008. "A Foundation for the Study of It Effects: A New Look at Desanctis and Poole's Concepts of Structural Features and Spirit," *Journal of the Association for Information Systems* (9:10), pp 609-632.

Meyer, J.W., and Rowan, B. 1977. "Institutionalized Organizations: Formal Structure as Myth and Ceremony," *American journal of sociology*), pp 340-363.

Orlikowski, W.J. 1992. "The Duality of Technology: Rethinking the Concept of Technology in Organizations," *Organization Science* (3:3), pp 398-427.

Orlikowski, W.J. 2000. "Using Technology and Constituting Structures - a Practice Lens for Studying Technology in Organizations," *Organization Science* (11:4).

Orlikowski, W.J. 2007. "Sociomaterial Practices: Exploring Technology at Work," *Organization Studies* (28:9), pp 1435-1448.

Orlikowski, W.J. 2009. "The Sociomateriality of Organizational Life: Considering Technology in Management Research,").

Orlikowski, W.J., and Barley, S.R. 2001. "Technology and Institutions: What Can Research on Information Technology and Research on Organizations Learn from Each Other?," *MIS Quarterly* (25:2), pp 145-165.

Pickering, A. 1995. *The Mangle of Practice: Time, Agency and Science*. Chicago, IL: The University of Chicago Press.

Pollock, N., and Williams, R. 2009. *Software and Organisations: The Biography of the Enterprise-Wide System or How Sap Conquered the World*. Taylor & Francis US.

Poole, M.S. 2009. "Response to Jones and Karsten, "Giddens's Structuration Theory and Information Systems Researched"," *MIS Quarterly* (33:3), pp 583-587.

Powell, W.W., and DiMaggio, P.J. 1991. *The New Institutionalism in Organizational Analysis*. Chicago: The University of Chicago Press.

Reilly, A., and Weirup, A. 2010. "Sustainability Initiatives, Social Media Activity, and Organizational Culture: An Exploratory Study," *Journal of Sustainability and Green Business*).

Sandberg, J., and Tsoukas, H. 2011. "Grasping the Logic of Practice: Theorizing through Practical Rationality," *Academy of Management Review* (36:2), pp 338-360.

Scott, W.R. 2001. *Institutions and Organizations*. Thousand Oaks: Sage.

Thornton, P.H., and Ocasio, W. 2008. "Institutional Logics," *The SAGE handbook of organizational institutionalism* (840).

Thornton, P.H., Ocasio, W., and Lounsbury, M. 2012. *The Institutional Logics Perspective: A New Approach to Culture, Structure, and Process*. Oxford University Press.

Yoo, Y., Boland, R.J., and Lyytinen, K. 2006. "From Organization Design to Organization Designing,"

Organization Science (17:2), pp 215-229.