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SOCIOMATERIALITY: AN OBJECT-INSPIRED PROPOSAL FOR IS SCHOLARS

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Research paper

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Abstract

The ideas presented in this paper have emerged from our curiosity about how technological objects might be leveraged as more than mere evidence in IS research. As constructions of a particular time and place, objects can tell us a great deal about the people, organisations and cultures that produced and used them. Objects reflect the values, beliefs and activities of those people, organisations, and cultures. But many IS scholars following a sociomaterial agenda continue to see objects as no more than background facts that play a supporting role in our research. There is little guidance in the IS literature on how objects might participate more directly and fully in our research and how we as scholars should engage with them. In this paper, we present an object-inspired perspective largely drawn from the material culture literature where we engage with objects as the units of observation. We discuss what this might contribute to IS theory-building and what opportunities it might create for new types of object-centred and -driven theories. We describe a framework for undertaking this object-inspired research. In so doing, we are challenged to think about the ontological commitments of our approach and how this differs from dominant forms of sociomateriality.

Keywords: Sociomateriality; theory; technological objects.

1 Introduction

The emergence and rapid adoption of new technologies vividly illustrate the growing role that objects[1] play in transforming our personal and organizational lives. One would assume that this increasing entanglement of material and social in our lives makes it untenable for scholars to ignore the potency of objects in our theory-building efforts. However, an increasing number of theories are presenting *"... a world of humans devoid of things"* (Joerges 1988, p. 220). For example, Orlikowski (2007, p. 1436) notes how a *"... quick perusal of much organization literature reveals the absence of any considered treatment or theorizing of the material artifacts, bodies, arrangements, and infrastructures"*. Even the majority of studies examining technology-use in organisations, fail to describe the technological objects in question (Leonardi 2012; Markus and Silver 2008; Orlikowski and Iacono 2001). Likewise, there has been a general shift in Information System (IS) research away from technological to managerial and organizational issues (Myers 1997). There is, therefore, a growing discrepancy between the important roles that objects play in our lives vis-a-vis how they are presented in our research.

This puzzling state of affairs calls on us to acknowledge the centrality of objects in our lives and their messy relationships with humans (Humphries and Smith 2014). We must seek to balance the insights gathered from humans with those gathered from objects (Brown 2013). We must view objects as more

[1] In this paper when we use the word 'object', unless we say otherwise, we are referring to human-constructed objects.

than 'support materials' or 'background facts' represented by language (Brown 2013). To date a number of influential contributions on sociomateriality have been published in the IS literature (e.g. Leonardi 2010; Leonardi 2011; Leonardi and Barley 2008; Leonardi and Barley 2010; Orlikowski 2006; Orlikowski 2007; Orlikowski and Scott 2008; Scott and Orlikowski 2009) that go some distance to achieving these aims. However, there remains little guidance in the IS literature as to how objects might participate more directly in our research and how we as scholars should seek out insights from them.

The proposal that we present in this paper has emerged from our curiosity about how objects (and technological objects in particular) might be leveraged as more than mere evidence in our IS research. This has brought us on a journey to reconnect with the material world and to bring objects back into focus. We seek out deeper, richer and transformative insights that can be got from objects, even when those objects are estranged from the practices involved in their design, construction, and usage. In this paper, we present an object-inspired perspective largely influenced by the material culture discourse. We discuss what this perspective might bring to IS theory-building and what opportunities it might create for new types of IS theories. The paper enlarges a small stream of research that is beginning to emerge focusing on the topic of technological objects (c.f. Faulkner and Runde 2010; Kallinikos 2002; Kallinikos et al. 2010; Leonardi 2010; Volkoff et al. 2007). However, this journey has also challenged our thinking about the ontological position of objects in our research and how this might clash with the position adopted in some mainstream sociomateriality literature.

The remainder of this paper is structured as follows. In the next section we investigate the background to material culture and the role of materiality across disciplinary boundaries. We introduce the concept of sociomateriality and the extreme relational ontological position adopted by some of its leading exponents. We outline the different types of theories made possible by object-driven and –centred approaches. In the third section, we outline the features of an object-inspired ontology. We follow this with a description of the domains forming the backbone of an object-inspired narrative. In the fifth section, we introduce a methodological framework for producing these object-inspired narratives. We finish with some concluding remarks and a brief discussion of possible future research directions.

2 Sociomateriality and Objects

In recent years, the term 'materiality' has been cropping up in fields as diverse as management, communication studies, and sociology (Leonardi 2010). Some scholars have made the claim that if organizations are as much material as they are social and if technologies are as much social as they are material, then perhaps it is time to move away from duality and to break down the boundaries between humans and objects. Sociomateriality posits that humans and objects are inseparable and instead both emerge through sociomaterial 'assemblages' (c.f. Suchman 2007), 'entanglements' (c.f. Orlikowski 2007), or 'mangles' (c.f. Pickering 1995). Sociomateriality is a recursive intertwining of humans and objects in organisational practices (Orlikowski 2007, p. 1437), where practices are the collectively negotiated activities of individuals or collectives (Cook and Brown 1999). The intertwining of humans and objects is produced and re-produced differently across practices that take place in different settings and at different times. So when an object is used in a specific organisational practice, it is one thing out of many possible things (Schinkel 2004). The object shapes the practice, which in turn shapes the object. This complexity results in objects and practices appearing in a constant state of flux.

At face value, sociomateriality privileges neither humans nor objects. However, among some scholars, there is an ontological commitment to an extreme relational world in which humans and objects exist only in relation to each other and have *"… so thoroughly saturated each other that previously taken-for-granted boundaries are dissolved"* (Orlikowski and Scott 2008, p. 455). In this case, entities (whether humans or objects) do not pre-exist as separate entities with given properties, but acquire form, attributes, and capabilities through their intertwining in practices (Cecez-Kecmanovic et al. 2014; Orlikowski and Scott 2008). This relational ontology *"… treats entities and materialities as enacted and relational effects. Its relationality means that major ontological categories (for instance,*

'technology' and 'society', 'human' and 'non-human') are treated as effects or outcomes, rather than as explanatory resources" (Law 2004 p. 157). Rather than being an attribute of either humans or objects, agency therefore is an attribute of practice. Faulkner and Runde (2010) refer to this as the *interpenetration thesis* and point out that it is significantly stronger than the lesser claim that humans and objects exist separately but in relation to each other. We refer to theories adopting this stronger claim of sociomateriality as Extreme Relational Sociomaterial Theories (ERST). ERST implies an ontological merging of humans and objects, which (as we will explain later) can result in objects falling unintentionally into the background. In the next section we present different types of theories that can be categorised as either object-centred or object-driven.

2.1 Objects in Theory-Building

Building on Herman's (1992) classification of relationships between histories and objects, we draw out three roles that objects can play in the practice of theory-building. *Theory from Objects* is object-driven in that objects are used as primary sources of insights about a phenomenon. The objects are essential props in the theory-building. *Theory of Objects* is object-centred in that objects are the phenomena of interest. The objects are more than props but are the very subject of the theory-building. *Theory with Objects* is generally object-driven in that objects provide direct access to independently valuable aspects of a phenomenon that otherwise may be inaccessible.

Category of Theory	Description	Example of study
Theory with Objects	This object-driven category includes studies where objects provide important supporting evidence for creating and validating theories. The primary focus is not the object but a phenomenon of interest in which the object plays a role.	A software development project produces many project objects. For instance, the design can be captured on paper or in an electronic file. Long after the project has ended, the design survives as ink, paper or bits. These objects can be used to trigger memories of unknown or forgotten project design practices and also on questioning the veracity of some of these memories.
Theory of Objects	This object-centred category includes studies focused on the design and evaluation of objects. The primary focus is the object, which is the phenomenon of interest.	A software development project designs a technological object that is intended for use by a number of organisations. The design includes those features that are expected to 'afford' most value to the organisations. The design of the software can be explored in the form of a design theory that interprets and validates the heuristic quality of the design.
Theory from Objects	This object-centred category includes studies where objects provide essential (and in some cases the only) evidence for otherwise unexplored phenomenon. This is particularly useful in unlocking insights that cannot be gathered from humans.	In the aftermath of a catastrophic design failure, the past practices that contributed to the disaster may no longer exist. The people involved in the design, commissioning, and use of the technology may no longer be available, their memories may be faulty, or their recollections cannot be trusted. However, objects can provide evidence of what took place prior to and during the disaster.

Table 1. Contributions of Objects to IS Theory Building

In Table 1 we describe each of these three forms of theory and we review the contribution of objects in enriching and enhancing our theory building efforts. Objects can complement language based techniques by being a source of insights that cannot be accessed through language alone (Leone and Little 2013; Lubar and Kingery 2013). For example, Humphries and Smith (2014) find that an object-inspired narrative can affect the insights scholars receive from their respondents during narrative col-

lection. Inviting respondents to construct, elaborate and transform narratives by referring to objects can *"... enrich data, deepen researcher insight and interpretation, and alter participants' perceptions of themselves and their experiences as they talk"* (Sheridan and Chamberlain 2011, pp. 316-317). This is because: *"Focusing on things, and especially on those that hold relevance for the talker, encourages narratives to be extended and elaborated, thus offering greater leverage for interpretation and insight"* (Sheridan and Chamberlain 2011, p. 316). In addition, the objects can *"... pull the rug out from under some cherished notions of past happenings"* (Brown 2013, p. xxx). Objects force the emergence of insights that otherwise would remain unspoken (Humphries and Smith 2014; Sheridan and Chamberlain 2011).

In the next section we turn our attention to reviewing object-oriented perspectives that claim to embrace the power of objects.

2.2 Object-Oriented Ontologies

We briefly revisit some aspects from the literature on material culture and offer them as a counterbalance to the ontological position adopted by the literature on sociomateriality. Material culture refers to *"... the manifestations of culture through material productions"* (Prown 2013), which may be utilitarian, sensory, aesthetic, symbolic, or a combination of these (Jones 2013). The underlying premise of material culture is the study of objects in order to understand culture through discovering the beliefs (i.e. the values, ideas, attitudes, and assumptions) of a particular community or society at a given time. We are particularly interested in those objects that *"... reflect, consciously or unconsciously, directly or indirectly, the beliefs of the individuals who commissioned, fabricated, purchased, or used them and, by extension, the beliefs of the larger society to which these individuals belonged"* (Prown 2013). Objects as units of observations are seen as sources of often hidden insights, otherwise unavailable to scholars, that are not necessarily textual and that are not straightforward to 'read' (Harvey 2013). The research skills required to detect and reconstruct 'stories' of or from objects are different to those required for reading texts (Harvey 2013).

Graham Harman (2011) introduces an object-oriented philosophy that challenges some key ideas from the literature on sociomateriality. An object is *"... anything that has a unified reality that is autonomous from its wider context and also from its own pieces"* (Harman 2011, p. 116). Objects are always more than the sum of their qualities and the relations in which they participate. There are aspects of objects that are hidden, not yet or perhaps never to be made visible in their relations with humans. This perspective stands against the extreme form of sociomateriality (found in ERST), which suggests that objects have no inherent properties separate from the practices in which they participate. So while sociomaterial studies are satisfied with describing objects through the agencies of practices, object-oriented studies are not and see objects as independent entities. For the latter group, objects cannot be reduced to *what they do* instead one must also consider *what they are*.

In the next section we advocate a 'complementary approach' that accepts the original thinking behind sociomateriality in: (1) not giving primacy to either the social or the material; and (2) embracing the richness of the relationships between the social and the material. However, similar to an object-oriented approach it accepts the ontological separation of humans and objects from practices. Finally, it seeks to supplement the role of human language in understanding the reality of practices. In this way we attempt to bring objects forward from behind the curtain of human recounted practices. We pro-

pose an *object-inspired* approach, where the object becomes the unit of observation and from which we can attempt to draw insights that help us understand the complexity of socio-material[2] practices.

3 Proposing an Object-Inspired Ontology

Theory provides us with an ontologically committed lens through which we simplify reality by focusing on some aspects of a phenomenon but at the same time filtering out other aspects (c.f. Outhwaite 1983). Theories are, therefore, double edged swords in that they help us describe and understand complex phenomena, but do so by greatly (and perhaps overly) simplifying those phenomena. We refer to the result as ontological myopia, whereby theories can become misaligned with the realities of the world in which we live. Care must be taken in understanding the ontological commitments of the theories we adopt and build. While, Cecez-Kecmanovic et al. (2010) argue that sociomateriality has helped us question the supposed ontological positions of the social and material in organisations, we also believe we need to ask whether there is a ontological myopia associated with these new positions. There are a number of differences between the ontologies adopted by ERST and an object-inspired approach. Here we outline an object-inspired ontology by way of describing these differences.

First, sociomaterial studies do not start nor end with an object but instead focus on the series of activities or events that make up a practice (Kärrholm 2014). The unit of observation in these studies is the practice being studied. On the other hand, an object-inspired approach assumes the unit of observation is an object. An object-inspired approach can be particularly useful where direct observation of an activity is difficult or impossible for any one of many reasons, such as: (1) the activity is infrequent; (2) the activity is remote; and (3) the activity takes place over a very short or a very long period of time (Ramduny-Ellis et al. 2005). While it may have been impossible to capture the actual activities, the objects that were used during the practice or emerged from the practice can be a useful source of insights for what actually happened.

Second, sociomaterial studies position language as the route to understanding practice (Budach et al. 2015). It can be argued that talk around objects has been neglected in favour of discursive talk around representations (Budach et al. 2015). Increasingly objects are understood through the agency of the subject and studies often use the 'voice' of the subject in order to understand the role of the object in relation to the phenomenon. Barad (2003) suggests that language has been granted too much power in that *"... at every turn lately every 'thing' is turned into a matter of language or some other form of cultural representation"*. Yet is also widely recognised that information obtained from living people through conversations, interviews or questionnaires can be untrustworthy (Rathje 1984). Kouwenhoven notes *that "... we have been too ready to accept verbal evidence as if it were the equivalent of the evidence of our senses"* (1963 p. 82). An object-inspired approach recognises this over privileging of verbal evidence by advocating objects as complementary sources of insights or as means for questioning the veracity of human accounts. Objects are containers invested with aesthetic and instrumental value, which can be experienced somatically, and through haptics and mimesis, rather than linguistically (Budach et al. 2015).

Third, sociomaterial studies present objects as constantly in a state of flux and refuse to recognise any permanency in objects. Olsen (2013, 178), while recognising that sociomateriality has contributed to the rehabilitation of things in the social sciences, critiques the relational perspective and what he calls the popularity of "matter-in-flux" approaches where *"... things, objects, materials are never allowed to be hard, stable, lasting, or in place"* (2013 p. 180). An ontology-inspired approach reinstates the

[2] We purposely use the hyphen in the term 'socio-material' to indicate that the social and material can exist independently as well as in relation to one another. We can see these relationships play out in practices, but the practices on their own do not capture the full essence of the object.

autonomy and singularity of objects and maintains that objects exist independently of their qualities and relations. The approach embraces the '*social life of objects*', whereby a single object can live a complex life intertwining with many other objects and humans engaging in various practices. The object is a container, whereby it is a real thing that contains traces of its life story and the story of those that designed, commissioned and used it. In this way its permanency provides a forensic opportunity to uncover the embodied knowledge and experiences of it and those environments and people that it came into contact with (Ramduny-Ellis et al. 2005). Objects stabilize meanings in context and carry meanings across time, space, and scale (Budach et al. 2015). In the next section, we review what an object-inspired narrative might look like.

4 Creating an Object-Inspired Narrative

We extend the work of Humphries and Smith (2014), who propose three domains through which an object narrative can be collected and expressed – Object Materiality, Object Practice and Object Biography. As can be seen in Table 2, we define these domains differently to those used by Humphries and Smith. For us the *Material-Focus* is concerned with uncovering *what an object is*. This is generally revealed by direct or indirect examination of the structure of the object. The *Practical-Focus* is concerned with *what the object does*. This is generally revealed by direct or indirect examination of the interactions between the object and humans. The *Biographical-Focus* is concerned with *the life of the object*. This is generally revealed by direct or indirect examination of the life stages of the object. While the domains are inter-related, they are not inter-dependent in that each one on its own functions autonomously in deepening the object narrative and shedding light on the phenomenon of interest. Individually and collectively, the domains offer potential for rich, complex and multidimensional insights. Objects offer a wedge by which deep and rich accounts of organizational action and sense-making can be leveraged (Humphries and Smith 2014).

Domain	Description	Comment
Material-Focus *(i.e. what it is)*	This describes the object primarily by referring to the object itself and to its material attributes. This can include assessing what the object is made of and its characteristics (e.g. size, weight, parts, design, style, decoration and cost).	The object here is assumed to be an entity with a unified reality that is autonomous from the wider context and from its own pieces. The object can be either material or non-material (e.g. digital) but it is fixed for a period of time. This perspective is different to that adopted in ERST studies.
Practical-Focus *(i.e. what it does)*	This describes the object in the context of the functions it affords. Some of this can be determined from the object itself (e.g. usage evidence from the object) but also from supporting evidence (e.g. user manuals).	The object is assumed to have materiality that remains the same regardless of who and where it is being used. The functionality of the object is enabled by the features of the object even though the object may be perceived differently in different uses. This perspective is largely different to that that exists in ERST studies.
Biographical-Focus *(i.e. its life)*	This describes the life of the object. This can include life stages spanning from production of the object through to its use and its disposal. This maps the connections and transitions that occur over the life-course of the object, which can, in turn, reveal a changing network of organizational relations. This may consider who made the object, how it was made, when it was made, who used it, how they used it, etc.	The object here is assumed to have a social life. Every object is radically and incomparably itself so that the object and its relationships with humans and other objects can be traced. This perspective is largely missing from ERST studies.

Table 2. Domains for an Object-Inspired Narrative

Our aim in the following sub-sections is to describe in more detail each of these domains and to ground each in extant literature.

4.1 Material-Focus on Technological Objects

For scholars, such as Humphries and Smith (2014, p. 483), materiality *"... incorporates a common sense view of objects as physical items that occupy volume in three-dimensional space"*[3]. These objects have a position or location in the physical world and they can be pointed at (Kärrholm 2014). While most scholars start with definitions of objects as 'material', more often than not they provide examples of digital objects, such as software (Leonardi 2010). Many scholars claim that software can be described in terms of its materiality even though it obviously is not material (c.f. Hutchby 2001; Jackson 1996; Leonardi 2007; Leonardi 2010; Orlikowski 2007; Suchman 2000; Volkoff et al. 2007). As *"... most information technologies are software rather than solid physical objects, it may seem odd to say that information technologies have 'material properties'"* (Leonardi and Barley 2010). Leonardi (2010), therefore, concludes that for Orlikowski and many others matter is not a necessary component of the definition of materiality. So this begs the question as to what materiality actually is. For example, what is the materiality of a smartphone App?

Faulkner and Runde (2013) suggest that the shortcoming in the definition can be overcome by substituting the notion of an object's matter and form with the more general notion of an object's structure. In other words objects are 'structured continuants' (Faulkner and Runde 2010; Faulkner and Runde 2013). Here 'structure' means that objects are *composed of distinct parts* that are *organized in some way*. The word 'continuant' means that objects are *fully present* at each and every point in time at which they exist. Leonardi (2012, p. 28) colourfully suggests that *"... when everyone packs up their bags and goes home at the end of the day, those inherent properties of the technology do not go away"*. For Leonardi (2012, p. 29) materiality, therefore, refers to the ways in which the *"... physical and/or digital materials are arranged into particular forms that endure across differences in place and time"*. Materiality as an adjective refers to the properties of objects that do not change from one moment to the next or across different locations. But this definition seems to question Orlikowski's (2000, p. 411) claim that technologies are *"... never fully stabilized or 'complete', even though we may choose to treat them as fixed, black boxes for a period of time"*.

Here we advocate a focus that looks at the structure of the object of interest that is assumed to have an independent unified existence that remains stable regardless of past, current and future uses.

4.2 A Practical-Focus on Technological Objects

Faulkner and Runde's (2013) theory of the technical identity of technological objects[4], reduces the identity of objects within a community to two considerations: *Materiality* and *Functionality*. Materiality (as we have seen) refers to the material from which objects are made and the form that the materials are induced to take. On the other hand, functionality refers to the uses for which objects are designed, or the uses to which they are put. In order for the objects to support functions, they must generally possess the form and features (i.e. materiality) required to perform those functions (Faulkner and Runde 2013). Schiffer (1992) distinguishes three types of functions of technological objects – techno-functions, socio-functions and ideo-functions. *Techno-functions* refer to the utilitarian purposes

[3] Humphries and Smith (2014, p. 483) do recognise that objects can also be non-physical entities (e.g. systems, processes, policies, etc.), but they chose to *"... bracket the idea of objects as abstract concepts in order to attend to the tangible and touchable"*.

[4] This builds on what the philosophy of technology refers to as the dual-nature conception of technology.

of an object. Socio-functions and ideo-functions are related to the symbolic meanings of an object. *Socio-functions* are associated with signs or symbols that are imparted to owners of or users of an object (Schiffer 1992). *Ideo-functions "… encode or symbolise ideas, values, knowledge, and information*" related to an object (Schiffer 1992, p. 11). For example, a chair has the techno-function of supporting a sitting human, a luxury chair has the socio-function of demonstrating the wealth of the owner, and a regal chair has the ideo-function of symbolising the authority of the king. Some functions, therefore, can only be fully understood by tracing the context and practices within which an object found itself, finds itself or will find itself.

Gibson (1979) suggests that although the physical matter of a technological object is common to each person who encounters it, the *affordances* of that object are not. Affordances are unique to the particular ways in which a person perceives materiality. To this end, he offers the following explanation of the relationship between materiality and affordances: "*The psychologists assume that objects are composed of their qualities … color, texture, composition, size shape and features of shape, mass, elasticity, rigidity, and mobility … But I now suggest that what we perceive when we look at objects are their affordances, not their qualities. We can discriminate the dimensions of difference if required to do so in an experiment, but what the object affords us is what we normally pay attention to*" (Gibson 1979, p. 134). The functionality of technological objects must, therefore, make reference to the intentional behaviour of humans (Priemus and Kroes 2008). In other words, the functionality of a technological object is grounded on the one hand in its materiality, on the other in the relation between this materiality and the intentions of humans as encapsulated by its affordances. Technological objects are both material as well as social constructions in that both their function and meaning are mainly socially constructed (Priemus and Kroes 2008). An object's material properties afford different possibilities for action when a particular user acts in relation to them, based on how he or she perceives those properties and on the context within which the object is used (Doolin and McLeod, 2012). Thus, the same material properties may produce multiple and different affordances across different users or different contexts of use (Hutchby, 2001; Leonardi, 2011; Doolin and McLeod, 2012).

Here we advocate a focus that in addition to looking at the qualities of an object (as advocated by the material-focus) looks at the affordances of the object. It considers the relationships of the object with the intentions and beliefs of humans. However, when these intentions and beliefs are difficult to access, the object itself can provide some evidence of affordances.

4.3 A Biographical-Focus on Technological Objects

According to ERST, an object is not the same object when it is introduced into different practices. On the other hand, our object-inspired approach suggests that objects have some permanency and have social lives. For example, Holtorf (1998, p. 23) sees that objects *"… are made somewhere; they often do something, and some move from place to place; their meanings and functions can change in different contexts, and, as time goes on, they age; eventually most things die, and whatever is left of them is discarded in a final resting place where it gradually disintegrates*". Likewise, cultural anthropologist Kopytoff (1986, p. 86) suggests that *"… objects are culturally constructed entities with social lives"*. Biographies can trace these lives and provide a method to reveal the relationships between people and objects (Joy 2009, p. 540). Objects and humans have multiple and overlapping biographies so that an object's many life stories reveal its complex entanglements with humans (Gosden and Marshall 1999; Humphries and Smith 2014; Joy 2009; Kopytoff 1986). Biographies may emphasize a physical, technical, economic or social narrative.

The life trajectories of objects can often alter dramatically, meaning that they can be re-interpreted a number of times throughout their lives (Humphries and Smith 2014; Joy 2009; Kopytoff 1986; Moreland 1999). While the material aspects of objects may remain static, the biographies of objects can be rather more chaotic. The lives of objects do not necessarily follow linear patterns but instead the objects might die and reincarnate a number of times as they move through different practices. Ob-

jects can also live a number of simultaneous lives which can run concurrently as they partake in different practices simultaneously. The biography of some objects is further complicated because they extend beyond the lives of some humans with whom they developed relationships and in other cases the objects may even span a number of human lifetimes. For example, Humphries and Smith (2014) trace the life of a Xerox 914 photocopier from its *"... conception (arguably when Chester Carlson filed a patent for electrophotography in October 1937, or produced series of prototypes), followed by its physical birth on the assembly line, its involvement in relationships and events over 17 years of production and its eventual death as a consumer product when it was superseded by the 710"*.

Here we advocate a focus that in addition to looking at the qualities of an object (as advocated by the material-focus) and the affordances of the object (as advocated by the practical focus), considers the eventful lives that objects live. Unlike other studies we now seek to move on from this largely philosophical discussion with its ontological considerations to exploring what it means for IS scholars studying people, objects and organisations.

5 Outlining an Object-Inspired Framework

While objects can tell us much about the past and present, their power is seldom realized as they offer a challenging and stubborn kind of 'record' and it is only if we are able to 'read' them that we can unlock their evidence (Brown 2013; Lubar and Kingery 2013; Pennell 2013). Lubar and Kingery (2013) write that scholars within the field of material culture aim to read objects in some of the same ways that traditional historians read books. But the way one reads objects is very different from how one reads text (Brown 2013; Lubar and Kingery 2013). Kingery (1996, p. 2) explains: *"No one denies the importance of things, but learning from them requires rather more attention than reading texts. The grammar of things is related to, but more complex and difficult to decipher than, the grammar of words. Artifacts are tools as well as signals, signs, and symbols"*. We, therefore, require methods that recognise the 'language' of objects. Our intention here is to outline some methods that privilege the object-inspired narrative presented in the previous section. These methods elevate the position of objects from playing a bystander approach to recognising them as active agents with a capacity to invoke change and to make some difference in the state of affairs within organizations (Humphries and Smith 2014; Latour 2007). We can use these methods to consider the material and functional aspects of objects at each of their life stages and we can investigate how these aspects change over time.

In this section we draw on material culture literature in order to produce a list of methods that will be of interest to the IS scholar looking to adopt an object-inspired approach. Talking with and about objects becomes a multidimensional, multisensorial experience for both participants and the researcher (Mason and Davies 2009; Sheridan and Chamberlain 2011). Gordon (2013) identifies two basic method types to be used in interpreting technological objects. The first is the analysis of the intrinsic characteristics of a technological object (such as through the use of archaeometry) and the second is the analysis of the context of the object. From a deeper analysis of the literature (particularly from archaeology) we identify two further method types. The first is the direct experience of the technological object and the second is speculation about the object. This results in the four method types outlined in Table 3.

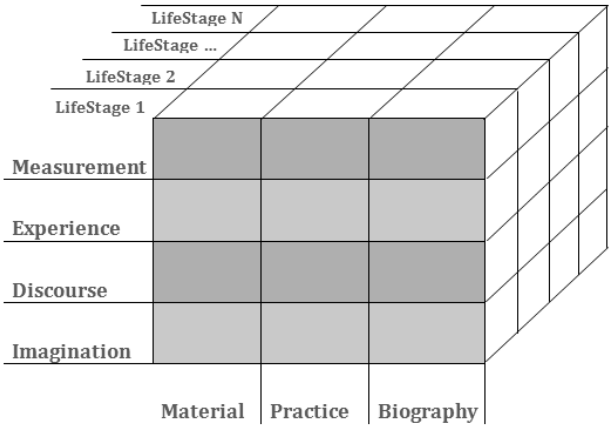

Figure 1. Object-Inspired Framework for IS Scholars

These research methods can be used by IS scholars in tracing the material, practical and biographical aspects of objects. In Figure 1 we juxtapose these dimensions to form a framework to support the object-inspired theory-building efforts of IS scholars.

Method Type	Description	Guidance	Example
Examination	We seek to describe the object itself and in particular its qualities.	We assess physical (e.g. size, weight, etc.) and/or non-physical (e.g. design, style, etc.) characteristics.	Similar to archaeometry, we use formal techniques in the analysis (e.g. internal structure, form in relation to functions, and superficial use markings) of technological objects to provide information about their production and in particular past usage.
Experience	We seek to experience the object through our senses.	We experience the object in order to glean what we can from handling it, observing it, and using it.	Experiences of sight, sound, smell and touch can generate a surprising array of insights that otherwise may not be obvious to the scholar. It may, for example, indicate how the object was manufactured or used, problems in manufacturing and usage, as well as a deeper understanding of the materiality and meaning of the object
Discourse	We seek to reconnect the object with the real world.	We use verbal sources in order to 'peel off' layers of function and meaning around objects in order to find out things about the relationships between the objects, humans, and the practices involved in making, using and living with those objects.	We track the *backward-links* to identify the practices that gave rise to the objects and those involved in designing and making them. We use *forward-linkages* to track the objects' use cases. The resulting insights are combined to create the biographies of the objects and humans.
Imagination	We seek to speculate about the object and its relationships with the real world.	We use insights from the other techniques together with 'creative imagining' in order to fill in the gaps in our knowledge of the object by speculating about why the object is the way it is.	We use speculation in order to deepen our understanding of why the technological object might be the way it is, how it might be used, and its impact.

Table 3. Methods for Collecting Object-Inspired Insights

For example, we could use imagination in order to speculate about the practical lives of objects. We can triangulate the results with those insights that emerge from written narratives or interviews with those that manufactured or used the objects.

6 Concluding Remarks

Sociomateriality is said to have contributed to a renewal of the debate about the theoretical foundations of the IS discipline (Kautz and Jensen 2012). Such a debate has been essential in a field where scholars have been struggling to reconcile the social and the material dimensions of IS (Kautz and Jensen 2013). Orlikowski (2007, p. 1436) makes the argument that even though organisations are saturated with objects, research *"... largely disregards, downplays, or takes for granted the materiality of organizations"*. In response there have been numerous recent calls for a more sophisticated treatment of materiality in organizational life, especially in relation to technological objects (Faulkner and Runde 2010; Leonardi 2010; Leonardi and Barley 2008; Orlikowski 2007; Orlikowski and Scott 2008). However, we have seen the rising dominance of a more extreme form of sociomateriality, referred to here as ERST. We believe that ERST can introduce an ontological myopia that limits the contribution of objects to IS scholarly research. It focuses mainly on '*the space between things*' (e.g. the networks, routines, institutions and so on) rather than on the things themselves (Leonardi 2010). We suggest that this ontological myopia can reduce the scope and depth of IS studies compared to what would result from a more object-inspired ontology.

As constructions of a particular time and place, objects can tell us a great deal about the people, societies and cultures that produced and used them as they reflect their values, beliefs and activities (Herman 1992). Ramduny-Ellis et al. (2005) suggests that: "*Like the fossil left behind after the soft parts of the body have decomposed, [objects] act as a residual record of work done and work in progress; in and of themselves, they form a resource for analysis*". So like a palaeontologist looking at fossils, there are a variety of circumstances in organisations where *"... the soft tissue of lived work, the ephemeral actions and words, are difficult or impossible to collect and so the matrix of [objects] that remains needs to be interpreted"* (Ramduny-Ellis et al. 2005). Scholars are, therefore, being called on to become sensitive to the role of objects when seeking to explain organisational phenomena (Lowe 2004, p. 338).

Of course, it could be argued that objects offer no insights other than the one (or ones) we choose to take from them. When we 'listen' to the stories 'told' by objects, perhaps we are only ever hearing our own voices (Humphries and Smith, 2014). Notwithstanding this view, we posit that object-inspired narratives can bolster data richness through offering a complementary way of thinking about objects as units of observation and analysis where materiality, practice and biography interplay. As a result, we have made a proposal for an object-inspired approach to complement a more traditional sociomaterial approach. We conclude with the following colourful summation from Barad (2003, p. 801) that: "*Language matters. Discourse matters. Culture matters. There is an important sense in which the only thing that does not seem to matter anymore is matter*". We hope that this paper goes some distance in re-addressing this imbalance for the betterment of IS scholarly practice.

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