

**Department of Information Systems
London School of Economics and Political Science**



Working Paper Series

143

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“From Epistemology to Ontology: Challenging the Constructed “truth” of ANT”

March 2006

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A version of this paper is under review for Information Technology and People

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“..all the absurdities [which] I have disputed for twenty-five years [are]: that science is socially constructed; [and] that there is no reality out there; ... such nonsense”.

(Latour 1999b)

ABSTRACT

This paper concerns how actor network theory has been used as an interpretative lens rather than an ontological foundation to inform research in information systems. The basic argument presented is that actor network theory has been forced to adopt the ontology of interpretivism and thus suppress its own ontology, to what we consider to be a disadvantage to not only the understanding of actor network theory, but also its ability to frame problems. Interpretivism is constructivist in nature but ANT is not. Therein lies the gap, a gap that is traversed by using actor network as a lens within the interpretivist epistemology. Whereas the ontological foundation of interpretivism deems the interpreter to be in a position to construct reality in his/her mind, ANT, on the other hand, accentuates that reality is constructed by the interplay of more than one actant and this reality emerges outside the mind of any individual. Thus for interpretivism, reality is created in the mind and for ANT, reality emerges ‘out there’. Though the actor network theory has value even as a lens within interpretivist research, but to only use it as a lens is restrictive and limiting.

KEYWORDS

Interpretivism, IS research methodologies, actor network theory, ontology of actor network theory, epistemology of actor network theory, constructivism.

1. INTRODUCTION

Actor network theory [ANT] is increasingly used as an analytical framework to inform IS research. It has often been described as the theory that gives voice to technological artefacts. In a minimalist version, ANT has been used to describe and to enlighten us to the role of

technology in the process that shape the relational outcome of the interplay between technology and people. The most common use of this theory in the IS field is within the interpretative epistemology. In this context, ANT is seen as a powerful methodology to collect and analyse data that are thus interpreted or, following Myers and Walsham (1998), understood “*through the meanings that people assign to them*”. Unfortunately, actor network theory has rarely been used as the ontological foundation for the understanding of the nature of the interaction between technological artefact and people.

In this paper we criticize the use of ANT in the interpretative epistemology and hence the underpinning constructivist ontology, highlighting the alternative ontological foundation provided by ANT. Researchers that use the theory as an interpretative lens for the analysis of the effects of technology on relational networks and vice versa are not acknowledging the magnitude of the theoretical foundation of ANT. Actor network theory has thus become more of a method for data collection and analysis in interpretative research than an ontology to inform IS research. However, and this paper attempts to fill this gap, actor network theory has the potential to provide an alternative ontology to constructivism that can supply a rich milieu to inform research in IS, especially for alternative explanations of the nature of dynamic of the interplay between technological artefacts and people.

The aim of this paper is to delve into this debate and provide a better understanding of the consequence of the use of ANT to inform research in information systems. The sections of the paper are as follows. Section 1 shows where and how ANT has been used in the IS field, section 2 covers the salient features of ANT. Section 3 expands on the main argument of this paper, addressing the reasons why ANT has been used in this way in the IS field and how it might rather be used as an ontology. Section 4 concludes the argument.

2. ACTOR NETWORK THEORY IN INFORMATION SYSTEMS

The different approaches to information system research can be classified in a continuum where at the one extreme we have the theories of social construction, and at the other, techno deterministic ones (Hanseth and Monteiro 1996, Lundberg 2000). Along this continuum it is possible to classify the different research approaches by the importance given to technology, or society, in shaping the other. The strong dichotomist distinction between the social and the technological dimension has characterised the early studies of the diffusion of computer-based

technologies in society (Dahlbom and Mathiasen 1993, Walsham 1997). When changes in technologies and in their use made it more difficult to clearly identify the distinction between technology and its users (Dahlbom 1997), such as in the case of network technologies, a new interest emerged for the study of the interplay between the two.

The first phase was characterised by the research of optimal models for the management of the information systems (Dahlbom 1997). The second was more interested in the analysis of the relations between technology and society in a state where the “symbolic boundary between people and information technology is in a constant state of flux across a wide spectrum of contemporary work and leisure activities” (Walsham 1997). Actor network theory has been seen as breaking this symbolic boundary addressing the problem right from ‘inside’. Information technology and users are not defined outside their relationship but *in* their relational networks.

The significance of the interplay between technology and society is not new in the IS literature, nor is ANT the only theory to address this issue. In the 1990s structurational models of technology addressed the problem of the interplay between technology and users (Orlikowski 2000); the same can be said for hermeneutics (Lee 1994) and phenomenological studies of information systems (Boland 1985); but in these contexts it is the interpretivist approach which has been growing in strength in the IS field from the mid 1990’s onwards (Klein and Myers 1999, Lee, *et al.* 1997, Walsham 1993, Walsham 1995). Within IS research interpretivist approaches acknowledge that, although information systems have a physical component which permits their technical operation, they are designed and used by people operating in a complex social context (Doolin 1998). Thus, an information system is understood (constructed) differently by different individuals, and is given meaning by the shared understanding of such phenomena which arises out of social interaction and not from the essential characteristics of the technology: “Events, persons, objects are indeed tangible entities. The meanings and wholeness derived from or ascribed to these tangible phenomena in order to make sense of them, organize them, or recognize a belief system, however, are *constructed realities*” (Lincoln and Guba 1985). The interpretive epistemology thus considers knowledge within a constructivistic ontology, and the use, design and study of information systems in organizations is thought of as a hermeneutic process of reading and interpreting this construction as a text (Walsham 1993).

As already discussed, the role of technological systems in organisational settings is often envisioned as either a technological problem or an organisational one. In describing the tension between technologies and social settings, Markus and Robey (1988) refer to an *emergent* perspective, that focuses the study on the interaction between organizations and technology, as response to both a technological determinism or a social determinism. Following this idea, Barley (1986) suggests structuration theory (Giddens 1984) to describe the ongoing and recursive effects between the organisation's institutional settings and behaviours and the new technologies. Similarly, Orlikowski (1992) discusses technology as a soft structural property of organisations arguing that technology are “experienced differently by different individual” (Orlikowski 2000) so that technologies are defined in practice “to refer to the specific structure routinely enacted as we use specific machine, technique, devices, gadgets in recurrent ways in our daily activities” (Orlikowski 2000). This prepares the ground for the growing body of research in the IS field that approaches the analysis of this interplay from a *structural* perspective (Ngwenyama 1998, Orlikowski 1992, Orlikowski 2000, Orlikowski and Robey 1991, Walsham 1993), which is grounded in the analysis of the course of human action. It is therefore useful in explaining the emergence of diverse uses of the same technology in different contexts (Orlikowski 2000). Nevertheless, this approach mainly takes into consideration only one of the aspects of the interplay, namely the process of social construction of technology. It neglects the importance of the role played by technologies and their characteristics in the understanding of their displacement, use, and adoption in social contexts (Hanseth 2004) arguing that technology only exists in our mind; it “exists only in and through our descriptions and practices” (Grint and Woolgar 1995). Therefore, it fails to recognise that the characteristic of the object/technology is also an essential element to consider when we try to understand the possible ways it can be shaped (Law 1992).

The importance of technology to understanding the configuration of an organisation is not new. It has been recognized since the seminal work by Woodward (1965) in the late fifties, Thompson (1967) in the late sixties and, in general, by the technology studies of organisation that considered technology as a essential determinant of organisational structure. Consequently, technology has often been considered as the material cause that determines the structure of the organisation (Orlikowski and Barley 2001). In this understanding, technology develops independently from social contexts - but directly affects society.

Both the techno-deterministic and socio-deterministic approaches underestimate the importance of the interaction between technology and organisation and the process that mutually shapes the two: one does not deterministically shape the other. Rather, it is the dynamic interaction between the two that shapes the ongoing configuration of technology and organisation. ANT is chosen to explain the dynamics of this concept of infrastructure in action as it focuses on the movement, the dynamic interaction of actors in the circularity of the interactions between human and non-human entities, and in their “mutual constituency” in the process (Latour 1999a, Suchman 1987). This perspective indicates that IT infrastructure cannot be considered as the invisible background to other kinds of work (Star 2002): it has to be conceptualised as an emergent phenomenon that cannot be understood from the stability and form of artefacts, but as output of the “interaction of heterogeneous elements that are shaped and assimilated into an open ended network” (Law 1990).

It seems that the conventional models of analysis, which draw on the consideration of the effect of technology on people or vice versa, tend to be more linear and neat than the reality that emerges from the analysis of the constitutive relational interplay between technology and its users.

We see the spread of ANT in the IS field as associated with the interpretative epistemology and hence with the constructivistic ontology (Walsham 1997, Wynn 2001). Following this assumption, the relational dimension of technology and people is explored and interpreted in this set of paradigmatic assumptions. A large number of the studies in IS which are based on actor network theory focus attention on how specific inscribed characteristics of actors affect a chosen actor-network, where inscription is defined, following Akrich’s (1992) socio-constructivistic explanation, as the activity of “designers” who define “actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and assumes that morality, technology, science, and economy will evolve in particular ways” (Akrich 1992). In her work Akrich (1992) uses the comparative cases of photoelectric lighting kits in Paris and of electricity generators in Senegal as examples to show how the ‘creation and extension of networks simultaneously define both the social and the technical’. In the first case of the photoelectric lighting kit, it is explained that in order to describe technical objects a mediator is required, so as to make apparent the link between technical content and user. Without this mediation, to clarify the use and method of use of the lighting kit, users begin to get confused by the product and thus this ‘produces a non-user’. In the second case the example of

generators in Senegal elaborates how technical objects can be used in ways not envisaged by the designer, thus creating a need for a mediator between the users and technology.

Monteiro and Hanseth (1996) discuss the role of standards in the shaping of large information system infrastructures. In this paper the authors analyse Structuration theory and its use in IS research and come to the conclusion that perhaps ANT with its toolbox of translation, actor-network, alignment, inscription and irreversibility is better suited to the study of standards in infrastructure. Similarly, the same authors (1995) examine the effects of standards on the achievement of flexibility in the actor-network that shaped the TCP/IP protocol. Timmermans & Berg (1997) analyse how medical protocols affect the contingent practices of the medical intervention. The two authors highlight three elements in relation to protocols, technoscientific scripts, trajectories, and protocols as a standard or crystallization instance. Bowker and Star (1994) study the effect of the use of the International Classification of Diseases within different actor-networks. The medical infrastructure which arises from this classification is not tidy and nor is it easy to trace backwards. In order to trace the classification scheme, Bowker and Star believe that they need to go into the offices of nurses and other medical personnel and study how each member involved files material and under which classification.

All of these cases show a partial use of ANT. An alternative use of actor network theory can be applied to analyse the process that leads to a possible stabilization of an actor-network (irreversibility). In this case the focus, rather than on the study of the effects of more or less black-boxed inscriptions on a specific actor-network, is on the analysis of the interplay that takes place in the actor-network that can indeed result in a black-boxed relationship. This formulation of the problem rather than “opening the black-box” to study the process that made it stable “tracks the process *before the box actually gets closed*” (Lanzara 1999).

3. ACTOR NETWORK THEORY

Latour (1987) argues that science and technology have to be studied in action and that we have to focus on the dynamics of their interaction rather than on the stability of their relationships. Actor network theory is proposed as an analytical tool that provides the theoretical and methodological underpinning for the study of these dynamic relationships. The theory is thus positioned in the middle of the debate between constructivist and technological deterministic studies. At one end technological determinism assumes that technology and its

impact are given and defined, while constructivism tends to assume that technology does not matter, because it is always and inescapably socially-constructed (Lundberg 2000).

Actor-network theory contributes to this debate from an intermediary position that systematically avoids the dualism between technology and society (Bloomfield and Vurdubakis 1997) focusing on the processes through which socio technical networks are created. As Law (1999) puts it, “..entities take their form and acquire their attributes as a result of their relations with other entities” (Law 1999). In the same way, Law (1992) argues that society, organisation, agents and technological artefacts are all effects generated in patterned networks of diverse materials.

These considerations move the focus of the analysis from the actor, either technology or society, towards a more complex and less defined phenomenon that is the interaction. This change in focus not only affects the analysis of the phenomena, but also the assumptions about the nature of the entities that constitute the phenomena. Actor-network theory rather incites us to reconsider sociotechnical relationships as an open ended set of interactions where the actors of the sociotechnical interplays do not pre-exist the relationships; the actor is generated in and by these relationships. It has a “relational materiality” (Law 1999) i.e. actors achieve their form and attributes as a consequence of their relations with other actors. This reflects an aversion to accept *a priori* the pre-existence of social structures and differences as somehow intrinsically given in the order of thing. There are no distinctions between social and technical subsystems. It is the relationship that produces the actors as emergent from the interplay among different, human and non-human, entities. There is neither only a local dimension nor only a global but only a relational one¹ (Latour 1999a). Many such issues are discussed in greater detail and critique in McLean and Hassard (2004). Indeed they focus on what have been considered to be the main issues of concern in ANT, the inclusion and exclusion of actors; the treatment of humans and non-humans; the nature of privileging and status; the handling of agency and structure; and the nature of politics and power in heterogeneous engineering. We touch on some of these issues in our arguments below.

¹ Obviously, the analysis of the relational dimension can be more focused on the study of local or global relationships.

Latour thus clarifies that there is clearly no dualistic distinction between technology and society. Technology and people do not have *a priori* different and defined effects on their relational interplay. Both participate in and mediate the relational networks, but at the same time they are the outcome of the same relationships. The concepts of subjectivity and objectivity themselves do not exist other than in the context of the relationships. Thus Latour (1999a) proposes the redefinition of the concepts in terms of intersubjectivity and interobjectivity to emphasise the relational dimensions of the two.

The relationships developed in a network that dynamically shape and re-shape the actors also define recursively the characteristics of the involved actors. The actor can thus be defined as one output of the relationship in a network. As Callon puts it, a network could be defined as a “group of unspecified relationships among entities of which the nature itself is undetermined.” (Callon 1993).

However, and this is where the complexity and power of the theory emerges, the actors that are part of the network are also the constitutive elements of the network. Therefore, the concept of actor and of network are concatenated and one cannot be defined without the other. Actors and network are both constituted in what is defined as an actor-network. “The actor network is reducible neither to an actor alone nor to a network....An actor network is simultaneously an actor whose activity is networking heterogeneous elements and a network that is able to redefine and transform what it is made of.” (Callon 1987). In ANT actors are not defined and analysed in a stable set of relationships. It is the researchers who artificially define the analytical range of the study to see “what the various actors in a setting are doing to one another” (Akrich and Latour 1992). By limiting the level or focus of the investigation it is possible to study and understand some of the relationships that are shaping both actors and the relational networks. However, it must remain clear that actors and actor-network are naturally *embedded* in open ranges of relationships that cannot be artificially limited by the scope of any particular analysis. Actor network are “open ended” and can only be artificially (but usefully) closed and isolated from the broad and natural openness of relationships.

The complexity of the relational pattern in an actor-network is enhanced by the fact that not all the actors in the actor-network embody the same level of flexibility. Actors embody various characteristics that are the outcome of their relationships with “heterogeneous elements,

animate and inanimate, that have been linked to one another for a certain period of time” (Callon 1987). These characteristics are renegotiated in the interplay with other actors. An actor-network embodies these characteristics so that the outcome is the result of “a set of diverse forces” (Akrich 1992) (Akrich 1992) that affect and define the inter-networked relational settings. These forces can be considered as an embodiment of prescriptions by the actors. A prescription is defined as “what a device allows or forbids from the actors -humans and non-humans - that it anticipates; it is the morality of a setting both negative (what it prescribes) and positive (what it permits)” (Akrich and Latour 1992).

When an actor is analysed in isolation (taken from the network) it is seen to embody specific inscribed characteristics that may strongly affect the configuration of the contextual relational network under analysis. But the settlement of the actor-network is not defined *a priori*. It emerges from the complex, open set of relations and from the characteristics of the elements that are part of and constitute the actor-network. People and technology “are never located in bodies and bodies alone, but rather that an actor is a patterned network of heterogeneous relations, or an effect produced by such a network” (Law 1992). As a consequence, actors do not embody action or *actantiality* (potential for action) but it is their relational dimension that generates instances of action (Latour 1999a, Law 1992). The actantiality is generated in a process of negotiation. A process which is circular and recursive, the course that defines and redefines actors in their multiple contexts. Actors are in action and, as a consequence, in a continuous state of mutation. This continuous relational interplay is the *performative* characteristics of actor networks, where actors are in fact “*performed* in, by, and through relations” (Law 1999).

Thus actors and actor-networks can not embody stable characteristics but rather reflect a process of multiple trajectories that can become either stable, as a dynamic equilibrium, or reflect unstable misaligned relationships. The diverse configurations of actors in an actor-network are the outcome of the interplay between different forces. While actors are emerging and retreating from the interplay in the actor-networks they are also defining the characteristics of the interplay via their embodiment of relationships in other actor-networks. Therefore, the actors are not neutral to the relational context. As the actors are influenced by the network, they in turn influence it. The process of stabilization of the relationships in the network is the outcome of the alignment of different actors’. Actors in their interplay within

the actor-network negotiate their forces in a process of translation. "By translation we understand all the negotiations, intrigues, calculations, acts of persuasion and violence thanks to which an actor or force takes, or causes to be conferred to itself, authority to speak or act on behalf of another actor or force." (Callon and Latour 1981). Translation is the circular process of "interpretation" or as Callon (1991) puts it, the "definition" that every actor makes of other actors in the actor-network.

Such dynamics of translation reflects different levels of rigidity of the inscription and alignment of the actors achieved in the actor-network. When actors translate each other they try to enrol the other to "support" or believe in them (Latour 1987). The less prescribed actors get more easily translated into the interest of others, more rigidly inscribed and prescribed. This is a consequence of actors with lower prescriptions being more easily reconfigured into the interest of others with stronger inscribe trajectories. If the process of translation does not result in an alignment of interest, it is considered misaligned. In this case the actors are configured in "separate spaces with no common measure" (Callon 1991) A misaligned actor-network does not produce a stable set or relationships that can be analysed as a stable and configured output of the relational interplay in the actor-network. This means that the actor-network cannot be *black boxed* and thus considered as an element produced by many elements acting as one (and most actor networks are of this type) (Latour 1987).

Finally, recalling the concept of circularity of the actor-networks relations, it is clear that every actor-network affects and is affected by the characteristics of the actors and then by the different interests the actors endow in the actor-network. Every actor can bring characteristics that have emerged from other actor networks to which it belongs. Recursively, new, emergent characteristics are re-proposed back into the other actor-networks. This circularity explains the action that is endogenous to the relational interplay analysed by actor network theory.

4. ANT: ONTOLOGY OR LENS?

Certain recent work (Latour 1999b) on ANT has centred around the ontological debate concerning the existence of reality. The focus has been on whether reality exists "out there" or is a product of our mind (Latour 1999b). Generally speaking, two different assumptions can be taken to elucidate this ontological dilemma. Choosing one answer rather than the other, such as positivism or constructivism, not only answers the question about the assumption

underpinning the understanding of the existence of reality, but also determines the range of methodologies or approaches that can be used to study the phenomenon that constitute reality². If nature and social reality are recognised as existing “out there”, the task of the researcher is to solve the problem of explaining the given phenomena. Myers (1997) describes the position taken by positivist research as one characterised by formal propositions and quantifiable measures of variables articulated to describe the reality that is considered as objectively given.

If the reality cannot make direct reference to the world "itself," but only via other intermediation so that nature and social reality are constructed *via* this intermediation, the task of the researcher is to interpret and hence explain the processes that are “producing” the phenomenon. Interpretivism, like positivism, is itself socially constructed, populated with social science researchers whose shared beliefs include the four concepts outlined by Lee (1997). First, the subject matter of interpretative research involves the ‘life world’, which includes humanly created meanings, whether those that are individually held or those that are shared by groups. Second, the researcher him or herself must inevitably serve as an instrument of observation. Third, interpretation is iterative (hermeneutic) and lastly the validity of an interpretation can be assessed³ (Lee, *et al.* 1997).

Interpretive approaches to research thus adopt the stance that knowledge is a social construction, and that such ontological positions concerning reality provide ways of ‘making sense of the world’ rather than ‘discoveries about the world’ which represent absolute truth (Walsham 1993). The very act of ‘making sense’ would imply that reality is constructed by interpretations that emerge from analyses based on alternative and non-univocal, interpretative lens. ANT has often been considered as one of the possible interpretative lenses available to analyse and thus interpret the complexity of the dynamics associated with IS use (Monteiro and Hanseth 1996, Walsham 1993). The word lens here is used in the sense of Orlikowski (2000) where certain features are focused on and emerge, and where the rest in the picture fall into the background. It is a way of viewing, such that Klein and Myers (1999) emphasize in one of their principles of interpretive research, that of the Principle of Contextualization.

² Morgan (1980) advises that paradigm and methodology are so closely concatenated that it is very difficult to make explicit distinctions between the two.

³ There are numerous ways of assessing the validity of an interpretation. With a good interpretation, any apparently absurd or irrational behaviours would no longer appear so. The burden is on the reader to reach an understanding of the text so he must read on or re-read and search for clues to make sense of the text. When the ambiguities are ironed out and he re-reads the whole text he will see ‘new’ ideas emerge from what he previously thought he understood. This is a simple hermeneutic interpretation.

Following this rationale, ANT, instead of providing a new ontology to expose the nature of relationships is used as method within an alternative ontology. Interpretivism considers reality not as an emergent phenomenon, as in the case of ANT, but as an outcome of the process of interpretation of people. Actor network theory, compared to interpretivism, clearly argues against the notion of constructivism. ANT maintains that the constitutive forces in the interplay among actors themselves define, constitute and construct this interplay (Latour 1999b, Law 1999). This theoretical stance is indeed critical toward constructivism, social-constructivism and hence interpretivism. The *essence* of the theory stands in the argument of the co-definition and co-evolution of objects and humans, both called indistinctly actors. Thus the constitutive essence of actor network theory cannot be confused with the constructivist assumption of interpretivism. It follows that ANT does not only propose a new way of questioning reality; it also introduces a new way of conceptualising the understanding of reality. What Latour (1999b) calls ‘realistic realism’ (Stalder 2000).

Actor network theory, if considered in its ontological dimension clearly distinguishes its nature from other constructivist approaches to the study of technology and organisational interplay. All constructivist approaches have in common the assumption that technology and technological change cannot be analysed as linear and clearly delineated processes. Rather, technological change is the outcome of “a number of technological controversies, disagreements, and difficulties, that involve different *actors*” (Brey 1997). However, rather than considering these actors or groups as engaged “in strategies to win from the opposition and to shape technology according to their own plan” (Brey 1997), ANT considers the interplay between the different actors, technology included, as the constitutive force. Actor network theory does not distinguish between technical and non-technical humans elements emphasizing the heterogeneous character of their relational nature. It argues that the reality does not exist *per se*, but states that the construction of reality is achieved through the interplay between different actors, both human and non-human, with equal constitutive characteristics (Latour 1987, Law 1992, Law 1999).

Amsterdamska (1990), in a review of Latour’s *Science in Action*, criticized ANT and Latour for trying to strike an uneasy balance between his realism and constructivism. This critique hinged on Latour’s first principle, which states, “The fate of facts and machines is in later

users' hands; their qualities are thus a consequence, not a cause, of collective action". Amsterdamska (1990) insists that this is the most direct proof of the social constructivist nature of ANT. Considering that the Oxford dictionary defines cause as 'That which produces an effect; that which gives rise to any action, phenomenon, or condition' and consequence as 'A thing or circumstance which follows as an effect or result from something preceding' (OED) we understand Amsterdamska's insistence on calling ANT social constructivist. If facts and machines and what they *are* is merely a consequence of another actor's use of them and they have no causal powers of their own then ANT does indeed sound social constructivist. However, we believe this is closer to the halfway step that Latour took in Pandora's Hope with his constructive realism. In other words it is all about agency, human and non-human.

5. HUMAN AND NON-HUMAN AGENCY

Non-human agency in ANT is an oft argued concept (Collins and Yearley 1992) and yet it is this very idea that differentiates the ontology of ANT from the interpretivist lens use it has enjoyed in Information Systems. This also brings the focus back to Information Systems because it gives actionable power to non-humans like technology because it is hybrids [a combination of human and non-humans], in other words the network, that plays such a key role in creating the reality around us. The hope is that by understanding how non-humans create reality, because they too have agency, we can respond to Monteiro and Hanseth's (1996) call to be 'more specific about the technology' and bring the focus back to technology and Information Systems.

Callon (Callon and Law 1995) explains how 'agency is an emergent property' because '*by themselves*, things don't act. Indeed, that there are no things "by themselves." That, instead, there are relations, relations which (sometimes) make things'. This is the main argument of both the strong realist overtones of ANT and how this is possible because of actant agency, rather than just human. Lenoir (Lenoir 1999) repeats the same but is not happy with this angle of ANT "*.. for Latour, the performance of the actor presupposes competence. Subjects are defined not only as subjects, but by the position occupied in a narrative journey, a journey characterized by the acquisition of competences.... All this is great fun, but I have serious doubts about whether we are not led in the end, kicking and screaming, back into an old-style realism*" (p293). Non-human agency is possible because of the general symmetry rule of ANT

(Callon 1986, Callon and Latour 1992). As explained earlier, ANT doesn't recognize a dichotomy between humans and non-humans. The discussion between Callon and Law (1995) unfolds the close link that Callon has built between performativity, interaction and agency. He understands reality as a heterogeneous network of relations, but these relations perform and it is in their performance that creates agency. Indeed Law (Callon and Law 1995) paraphrases this well when he says, 'a *collectif* is an emergent effect created by the interaction of the heterogeneous parts that make it up' where a *collectif* is agency created by many actants being aligned and interacting in order to fulfil some goal. We draw on an American television program focused on forensic science called CSI – Crime Scene Investigation, to explain the actancy of a *collectif*. In most episodes there is one or more dead bodies with few or no witnesses to the 'murder'. The team of CSI, headed by Gil Grissom, analyse the entire scene [the network] not just as the summation of the evidence collected but as a set of relationships with a specific contextual meaning. By this we mean that the evidence is not divisible but instead we must understand it as a set of relationships which are meaningless when not part of the network or on their own. The way this team elicits a response is through an interaction that is the story they are in search of. This is a good example to show how ANT can be used to depict reality, actant agency and the performing of a network. The murderer(s) is inevitably caught by the evidence 'speaking out'.

Some more recent ideas on agency have been developed by Rose and Jones (2004) who have based their 'double dance of agency' concept heavily on ANT. They criticise the stance taken by ANT which they understand to mean that non-humans are also endowed with intentionality through their agency. However, Callon (Callon and Law, 1995) would somewhat refute this with the idea of ANT that all agency is emergent. It only emerges through interaction and performativity of various actants so intentionality is shared by the hybrids. Rose and Jones accept the emergent part, indeed they include it as a key idea in their double dance of agency concept and sum the latter up as 'humans and machines can both be understood to demonstrate agency, in the sense of performing actions that have consequences, but the character of that agency should not be understood as equivalent' (p34). Using Orlikowski and Iacono's (2001) ensemble view of technology they explain that non-human agency comes in the form of enabling or constraining of humans or what they call as '*marshalling*'. However, this sounds too similar to ANT and the authors seem to just want to avoid the epistemological questions that ANT was forced to face.

This does however bring us back to the question that if there is no need for an interpretivist approach then why and how is it that the IS field has used ANT as part of this approach for so long and so comfortably? One easy reply to this question is that ANT has been used too often in IS research just as an interpretative lens. This lens colours or dictates how we view the world and collect data. In this way ANT is very similar to an approach or underpinning assumption that, to a great degree dictates how, when and what we 'see' as data. When a researcher employs ANT s/he *will* collect data that comes to attention – and what surfaces as important data here will be guided by the 'lens' of the theory. In this way, ANT is used as a descriptive methodology. “Interpretive methods of research adopt the position that our knowledge of reality is a social construction by human actors. In this view, value-free data cannot be obtained, since the enquirer uses his or her own preconceptions in order to guide the process of enquiry.” (Walsham 1995).

In contraposition, we argue that the researcher must allow the actants to 'speak'⁴ for themselves and not put words in their mouths. Any attempt to interpret the actants in the heterogeneous networks would invalidate the first principle given by Latour, and Amsterdamska (1990) would seem to agree. Moreover, using the ontological dimension of ANT, this attempt would simply become an action of merely *one* of the actors in the network. ANT is concerned with the *interplay* of more than one actor and what emerges from this interplay. Thus it seems that ANT considers reality to be “emerging out there” while interpretivism states that reality is constructed via interpretation. Using this ontological dimension of ANT, this action would be configured as one act, among others, within the complex heterogeneous network. In order for reality to actually materialize, ANT requires that there be interaction amongst actants and it is *only* from this interaction that reality can emerge.

If we try and analyze the different ontologies, and ANT and interpretivism both have their own distinct ontology, then we realize that the socio-constructivist ontology of interpretivism allows easy accommodation of ANT, but only when ANT is used as a means (lens) to locate or extract data. In a sense then ANT is amenable to use as both an interpretative lens and

⁴ For more on actants 'speaking' look at Pouloudi, A. and E. A. Whitley (2000) "Representing Human and Non-Human Stakeholders: On Speaking with Authority". in *Organizational and social perspectives on information technology*, pp. 339-354, Kluwer, Aalborg, Denmark, June 10-12, 2000. Pouloudi, A. and Whitley, E. A. (2000) In *Organizational and social perspectives on information technology*(Eds, Baskerville, R., Stage, J. and DeGross, J. I.) Kluwer, Aalborg, Denmark, pp. 339-354.

ontology. This paper is a push to question why, if ANT has its own ontology, do many IS researchers only use it as a lens? Does this do justice to the complexity and magnitude of ANT if we restrict our use to only an interpretation of part of it? ANT has been used as a lens only because this is the outcome of a constant use of this theory in an interpretivist context and thus accordingly ANT itself has been interpreted and constructed within its use. In contrast, using an ANT perspective, the theory evolves and is defined within its use. Paraphrasing Law, ANT is not anything in particular” (Law 1990), but is what it is.

6. CONCLUSION

The use of ANT as a lens is coherent within the interpretative ontological constituency, but contradicts the fundamental ontological stances of ANT, and for this reason seems at least questionable from a theoretical point of view. The interpretivist ontological foundation clarifies that reality doesn't already exist but is constructed in the very act of interpretation. Information systems research, which is inferred by this stance, relegates the understanding of the relational dimension of technology and people mainly to the interpretation which is given. This paper is an attempt to highlight the distinct ontology of ANT and to show that the use of ANT, over and above just an interpretivist lens, could provide a better understanding of this relational dimension. In this case the focus is on the emergent properties of the relationship followed by its evolving dynamic rather than on the mere effects of either people over technology or vice versa. The ontology of ANT is that reality emerges through the interplay of various actors [both technology and people], so in a sense reality becomes 'real' when actors interact. The adoption of the actor network theory ontology thus gives rise to an opportunity for research in IS where the focus is on these alternative natures of technology, people and their relationship.

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