

HETEROGENEITIES, MULTIPLICITIES AND COMPLEXITIES:

Towards Subtler Understandings of Links between
Technology, Organisation and Society

Proceedings of Triangular 2008

Edited by
Simeon Vidolov
Peadar O'Scolai
Raoni Guerra Lucas Rajão
Isam Faik
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Contents

Acknowledgements	iv
Preface	v
Editorial	vi
Part 1: IS Research in Developing Countries	
Chapter 1 Reading Between the Lines of Time and Space <i>Isam Faik</i>	2
Chapter 2 FLOSS Governance by Formalizing “Communities of Practice” <i>Humberto Gumeta</i>	13
Chapter 3 Mobilizing Open Source Software Development Networks <i>PJ Wall</i>	28
Part 2: Healthcare IS	
Chapter 4 bodyPaint <i>Cecily Morrison</i>	36
Chapter 5 Critiquing Complex Sociotechnical Networks in Clinical Settings <i>Paraskevas Vezyridis</i>	52
Chapter 6 A Hermeneutic Materiality in Telemedicine <i>Peadar Ó Scolaí</i>	65
Chapter 7 Extending Social Network Theory <i>Michael Zisub Ngoasong</i>	77
Part 3: IS Practice and Work	
Chapter 8 The Site of IT <i>Raoni Guerra Lucas Rajão</i>	92
Chapter 9 Collective Aspects of Software Design Processes <i>Allen Higgins</i>	106
Chapter 10 Interaction Between Individuals and Information Systems <i>Elaine Tavares</i>	129
Part 4: IS and Distributed Organizing	
Chapter 11 Accounting for Stability of Interorganizational Information Systems <i>Stefan Schellhammer</i>	146
Chapter 12 Distributed Modes of Ordering <i>Simeon Vidolov</i>	159
Chapter 13 Organizing Control in Real-Time Environment <i>Aleksi Aaltonen</i>	173
Chapter 14 Globalisation of the IT Industry <i>Anita Popovska</i>	183
Table of Contributors	193
Index of Figures	194
Index of Tables	194

CHAPTER 8 THE SITE OF IT

Practice-Orders Bundles and Actor-Network Theory as Complementary Approaches for Studying IT in Organisations

Raoni Guerra Lucas Rajão

Departament of Organisation, Work and Technology
Lancaster University Management School

Abstract

By comparing actor-network theory (ANT) and Schatzki's practice-orders bundles (POB), this paper argues that the two approaches can learn from each other in order to improve our understanding of IT artefacts in organisations. Both ANT and POB can be seen as a post-structuralist approach since they deny the existence of disembodied structures, and defend a more fluid and decentred view of social life. They are also a post-humanist approach because through the notion of "orders" (arrangements of human and non-human entities) and "networks" they pay due attention to the role of materiality and non-human agency in the social. The philosopher Theodore Schatzki proposes that the social transpires from meshes of bundles of practices and orders. Relating Schatzki back to the study of IT in organisations, it is argued that IT artefacts are non-human entities that are part of the orders of many contemporary organisations. From this follows that IT artefacts should be conceptualised as a component of organisational orders that together with practices form the contexture from where the organisational life transpires. Since IT artefacts are parts of orders they impact on organisational life in two ways: as source of meaning; and through pre-configuration of actions – mechanisms that also have parallels in ANT. When it comes to the points in which ANT and POB cross-swords, it is possible to argue that they have the potential to help each other. On the one hand ANT's longer history and clearer empirical focus can provide to POB a starting point for its introduction in the IS field. On the other hand, ANT's principles of symmetry between humans and non-humans, will to power and consequence conceptualisation of social practices leads to limitative accounts. Drawing on Schatzki this paper argues that the notion of teleoaffective structures and the focus on social practices that goes beyond network building and maintenance has the potential to lead to better practice-based, materially aware descriptions of the role of IT in organisation.

Keywords practice-orders bundles, theory of practice, actor-network theory, Information Technology artifacts, materiality, post-structuralism

1 Introduction

How should we conceptualise the site of information technology (IT) in organisations? Is IT like a shapeless fog that embraces organisations as a whole, making them more efficient just like the fog makes London more mysterious? Or, are IT more like tools that single employees engage with, in order to work better and faster, and thus by summing the individual improvements led to changes at organisational level? Or maybe neither and IT can be found as part of an intermediate social entity that does not always coincide with the whole organisation or the single individual. If so, how do IT implicate in organisational life?

In this paper I will endeavour to answer some of the questions above in meta-theoretical terms by the practice-orders theory proposed by the philosopher Theodore Schatzki and actor-network theory (ANT). More than a coherent theory, ANT is a framework pioneered by Michel Callon, Bruno Latour and John Law in the 1980's within the sociology of science, later extending its focus on technology in general, including IT (Bloomfield,

Coombs, Cooper, & Rea, 1992; Callon & Latour, 1981; Latour, 1987, 1996; Law, 1987). More recently, there has been an increasing number of studies of IT in organisations drawing upon ANT. In this regard, probably it is fair to say that within ANT has become, along with theories such as Giddens's structuration theory, one of the mainstream approaches within the anti-positivist fridge information systems field.

In contrast, Schatzki's (2002, 2005) practice-order bundles theory (POB), his version of theory of practice, is pretty much unknown within the IS field. Indeed, to my knowledge, there has been no study in the literature that uses his work as one of its main theoretical tenets. It is possible to think of different reasons for that. First, in comparison to ANT, Schatzki's POB is very recent and maybe, still demands further refinement and development. Second, as a philosopher Schatzki has different theoretical interests and draws upon a literature usually unfamiliar to IS researchers making his work had to penetrate. Nevertheless, the complementarity of POB and ANT makes the effort of engaging with Schatzki's work worthwhile, especially for those IS scholars interested in issues such as materiality, non-human agency and social practices.

In order to make the meta-theoretical comparison between ANT and POB I will have to make some rough characterisations of different social theories at two points. First, by using Schatzki's (2005) notion of social ontology to discuss the IS literature I subscribe to his attempt to classify social theories into three broad categories - individualism, societism and site ontology. Second, even though ANT is a multifaceted, evolving set of concepts, here I refer to it as a single theory by mentioning key theoretical constructs proposed by some of its founding fathers. I am aware that in both cases, this representing creating an idealised version of those theories - a move that certainly does injustice to hundreds of years of social theory. However, without reductions and simplifications the task of comparing the ANT tradition to Schatzki's work would be unfeasible in the space of a paper. Furthermore, as suggested by Reckwitz (2002), the comparison between idealised theoretical positions has an important role in establishing the identity and clarifying the theories under analysis.

The examples used to substantiate the theoretical discussion of this paper come from the case study of the use of Amazon monitoring system by AEP (a governmental body) in the environmental protection of the Brazilian Amazon rainforest. AEP is the main governmental body responsible for the enforcement country's environmental protection law, which stipulates, amongst other things, that 80% of the private owned lands located in the Amazon rainforest region have to be preserved. The Amazon monitoring system was created in 1988 by the federal government to calculate the yearly deforestation rates of the rainforest using satellite images, and since then has evolved into a sophisticated geographic information system (GIS) able to detect within a few weeks the exact location of ongoing deforestation. Mr. Silva¹ is one of the directors of AEP that is directly responsible for coordinating the actions of forest rangers in the Amazon rainforest. Amongst other things, he and his team uses the Amazon monitoring system historical data to plan preventive and law enforcement actions to tackle illegal deforestation in the region (Rajão, 2008; Rajão & Hayes, 2007).

This paper is organised as follows. The next section starts with the characterisation societism and individualism in general, related studies in the IT in organisations literature, and finishes exposing the limitations of these approaches, as pointed out by post-structuralist and post-humanist movements. The third section outlines actor-network theory, and POB - two theories that address the limitations of societism and individualism - and elucidates how, from those perspectives, IT influences organisational life. Finally the forth section argues that from the two approaches above, practice theory is more suitable for studying IT in organisations given its broader conceptualisation of human agency and work practices.

¹ In order to keep anonymous informants' identity all names have been changed.

2 Mainstream social ontologies

In order to understand how IT artefacts influence organisational life, we need to make a step back and try to understand the *nature* of social phenomena in general, of which organising is a special case. In other words, in order to explore the role of IT in organisations, we need to discuss the ontology of this kind of social phenomena. Theodore Schatzki (2005) proposes that the ontological assumptions in the social literature fell in two major groups: individualism and societism.

2.1 Ontological individualism

The first group, *ontological individualism*, believe that “social phenomena can be both decomposed into and explained by properties of individual people” (Schatzki, 2005: 466). Therefore, society entities like organisations are simply the sum of the mental states, beliefs, actions and relations of the individuals that form it. For instance, positivists such as Herbert Simon (1955) depict social behaviour as the aggregate of rational decisions done based on information available to individuals. In the IT literature this kind of approach is often reflected in human-computer interaction studies whereby humans are depicted as rational data-crunching machines that function following mathematical models (e.g. Newell & Card, 1985).

Furthermore, data collection method through lab experiments reflects the individualist ontology notion that by aggregating the behaviour of single isolated individuals interacting with a machine it is possible to obtain picture of how IT artefacts are used in organisations (see Woolgar, 1991). From this it is possible to conclude that the for individualist IT artefacts are seen in connection to single individuals, and that by summing up the micro impact of IT in individual behaviour we can understand the macro impact of IT in organisations. In sum, for the individualist ontology the site of IT is in connection to single individuals.

2.2 Ontological societists

The second major group in the social literature is based on the *societist ontology*. In contrast to the individualists, the societists believe that the social cannot be found in single individuals. Instead, the site of the social is *collections* of individuals such as organisations or industrial conglomerates. From this follows that instead of focusing on properties of individuals, social enquiry should attempt to uncover the features of collectives. Even though the proponents of the societist ontology, such as Karl Marx and Émile Durkheim, agree that social phenomena cannot be decomposed into features of individuals, there is no consensus on what that extra-individual dimension of the social might be. While Durkheim, for example, focus on social facts (self-standing real social phenomena), Marx argues that modes of production (combination of productive forces and social-technical relations of production) is the extra-individual phenomena that shapes social life (Schatzki, 2005).

In the IT literature this approach can be exemplified by studies that drawing on institutional theory explain how IT innovations fail or succeed due to actions of institutional actors (e.g. university, industry lobbies, professional organisations), implying that agency, for instance, should be studied as a macro phenomena (Currie, 2004; King et al., 1994). From this it is possible to conclude that societist ontology conceptualises IT as artefacts that relate to groups of people (such as organisations), and believe that IT influence their lives in a wholesale fashion. So, for the societist ontology the site of IT is in relation to groups of people, and as such, IT should be studied as a macro phenomenon from the outset.

2.3 Theoretical issues

It is clear that studies based on the societist and the individualist contains important contributions to the understanding of social phenomena, including the role IT in organisations. In last decades, though, the use of those approaches in organisational theory has been increasingly under criticism due some of the theoretical limitations and its empirical agenda. The first theoretical criticism comes from the post-structuralism, a movement that emerged in the 1960's that criticised some basic assumptions of the societist and individualist ontology regarding

the structure of the social. In particular, post-structuralists argue that rigid dichotomies (e.g. micro and macro) and the notion of static real structures are limitative because they wrongly imply the existence of a single centre based on which the entire social life rotates. Likewise, the two ontologies do not question the origins and mechanisms behind social order (e.g. states, organisations, etc) (Deleuze & Guattari, 1988; Derrida, 1978). John Law (1992) by defending ANT reflects the post-structuralist critique to the individualist and societist ontologies:

If we want to understand the mechanics of power and organisation it is important not to start out assuming whatever we wish to explain. For instance, it is a good idea not to take it for granted that there is a macrosocial system on the one hand, and bits and pieces of derivative microsocial detail on the other. If we do this we close off most of the interesting questions about the origins of power and organisation. Instead we should start with a clean slate. For instance, we might start with interaction and assume that interaction is all that there is. Then we might ask how some kinds of interactions more or less succeed in stabilising and reproducing themselves: how it is that they overcome resistance and seem to become "macrosocial"; how it is that they seem to generate the effects such power, fame, size, scope or organisation with which we are all familiar. (380)

The second line of criticism to the societist and individualist ontologies comes from the post-humanist movement. It argues that the two traditional ontologies wrongly assume that social phenomena emerge only from human agency. By studying in detail human activities as diverse as fishing and biological research post-humanist authors have shown that social phenomena cannot be fully understood without including in the analysis the role of non-human actors such as scallops and spectrometers (Callon, 1986; Latour & Woolgar, 1979; Shove & Pantzar, 2005). In the same line, more recent research in IT and organisational theory echoed those criticisms and pointed out that most studies in the literature do not pay due attention to the material (and non-human) dimension of organising, such as IT artefacts, formal rules and paperwork (Hasselbladh & Kallinikos, 2000; Orlikowski, 2007). Law (1992), while explaining ANT, offers an example that shows the importance of non-humans in social interaction:

I am standing on a stage. The students face me, behind serried ranks of desks, with paper and pens. They are writing notes. They can see me, and they can hear me. But they can also see the transparencies that I put in the overhead projector. So the projector, like the shape of the room, participates in the shaping of our interaction. It mediates our communication and it does this asymmetrically, amplifying what I say without giving students much of a chance to answer back. (381-2)

2.4 Empirical issues

In addition to the theoretical limitations above, other commentators pointed out that the societist and individualist ontologies dominant in the organisational theory and IT literature fail to uncover empirically some major changes that happened after the 1960's. Barley and Kunda (2001) point out that forms of organising are intrinsically linked to specific work practices, so that it is not possible to understand organisations without comprehending the content of work practices. Indeed, it was thanks to a series studies during the 1950's focused on work that it was possible to attain a good understanding of the large bureaucratic organisations that emerged in the first half of the 20th century (e.g. Blau, 1955; Dalton, 1950). However, given the relative stability of this form of organising during the 1960's and 1970's, scholars abandoned the detailed grounded research and focused instead in the development of more abstract theories, such as systems theory, and the use of quantitative research methods. As a result of this shift, important technological and societal changes in work (and thus forms of organising) have not already been sufficiently understood by the contemporary organisation theory.

Looking at the IT literature it is possible to see a similar trend. With notable exceptions such as Barley (1986) and Zuboff (1988), most studies in the IT literature look quite superficially at organisational life. Back in 1991 Orlikowski and Baroudi assessed that almost all studies on the IT literature were based on a positivistic (and mainly quantitative) stance, away from the actual IT-centred work practices. More recently, though, Walsham (2006) recognised that there has been a growing interest in the use of qualitative research methods to study the IT in

organisations, but those studies rarely go beyond interview data. For Barley and Kunda (2001), again this approach does not lead to the kind of empirical data necessary to fully understand changes at work:

Although useful for studying points of view and meaning, such [interviewing] techniques are less adequate for studying work because most work practices are so contextualized that people often cannot articulate how they do what they do, unless they are in the process of doing it [...]. Consequently, whether qualitatively or quantitatively oriented, most contemporary students of organising employ methods that distance them from the kind of data needed for making grounded inferences about the changing nature of work and work practices. (81)

3 The Site Ontology

In the last few decades theories based on a third social ontology have emerged in response to the theoretical and empirical issues with the main the mainstream individualist and societist ontologies outlined above (Schatzki, Savigny, & Knorr-Cetina, 2001). Schatzki (2001, 2002, 2005) points out that this theoretical turn is based on the *site ontology*, an stance with significant differences in relation to the individualist and the societist approach. The hallmark of the site ontology is the assertion that social life is deeply linked to a particular *site*, namely, a type of context with powers of determination over it. So, for theories bearing the site ontology, the social resides neither in people's minds nor in disembodied social structures, but in a space of intelligibility, which according to the specific theoretical position, can be composed of social practices, embodied *habitus*, relations between entities, etc... In a certain sense, the site ontology is a middle ground between the individualist and the societist position since it recognises at the same time that the social goes beyond properties of individuals but points out that those extra-individual elements should not understood as something significantly different from the mental states and sayings and doings of individuals.

Schatzki's (2002) version of theory of practice proposes that the social site is composed by practices and orders. More specifically:

The context as part of which human coexistence inherently transpires [...] as an overall mesh of practices and orders, itself organised as nexus of practice-order bundles, nets, and other complexes. This mesh also carried along and altered by streams of human and nonhuman doings, though human activities enjoy primary responsibility for maintaining and transforming its forms (265)

By practices Schatzki means open hierarchically organised doing, sayings, tasks and projects that can be learnt and transmitted exclusively by humans, while orders "are arrangements of entities through and amid which human existence transpires, in which the entities involved relate, occupy positions, and enjoy meaning" (*ibid.*: 24). Orders and practices are also intimately related, since at the same time practices maintain and create orders, and orders enables and constrains certain doing/sayings that by their turn constitute certain social practices (for a simplified graphical representation see Figure 13). So, coming back to our case study, from this perspective the practice of environmental protection of the Amazon rainforest is a social arena that provide a space of meaning containing technical jargons, common purposes, normative lenses that allow forest rangers, biologist and government bureaucrats to coexist and interact intelligibly.

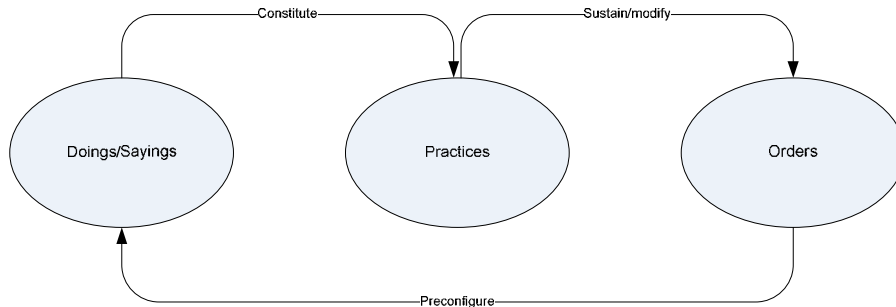


Figure 13 Relation between practices and orders in Schatzki (2002)

3.1 Post-structuralist solutions

It is possible to argue that practice theory proposed by Schatzki addresses the theoretical preoccupations from both post-structuralist and post-humanist concerns with the current mainstream societist and individualist ontologies. Schatzki's (2002) definition of the site of the social in practice theory satisfies the post-structuralist concerns since it does not suppose a neat division between micro and macro social phenomena. According to him social life is composed by bundles of practices-orders that connect to each other forming broader meshes, and nets that encompass the whole human world. Therefore, it is possible to look at the social life from different heights without incurring in predetermined levels of analysis, such as the "micro" and "macro". Schatzki (2002) show in his analysis of the life of shaker community that his theory is able to gaze in a detailed way into the localised activities necessary to produce medicines in a specific shaker family, but also zoom out in a continuous way and observe, for example, the feverous religiosity that arise from practice contexture of the shaker community as a whole, or their relation to the broader pharmaceutical industry in the end of the 19th century - without entailing artificial discrete jumps such as the "individual" and her "social structure".

3.2 Post-humanism solutions

Similarly, Schatzki theory of practice also addresses post-humanist concerns. Schatzki's (2002) version of the site ontology provides an account of the implication of non-humans in the social in line with post-humanism by using the notion of orders: arrangements of human and non-human entities that together with practices form the site of the social. Schatzki account of how orders indulge in the constitution of social life has important similarities to actor-network theory, one of the most prominent post-humanist theories. First, orders as actor-networks are made of both human and non-human entities/actors. Second, in both approaches, non-human elements are seen not simply passive elements, but as active agents in the constitution of social life. So in his account of the social practices of a shaker community, he also describes the role of non-human entities, such as the mechanical tools and rats. In the next section we will explore the implications of the site ontology for the conceptualisation of the role of IT in organisations.

In sum, Schatzki's (2002) theory of practice provides an account of social life that overcomes at the same time the theoretical limitations of individualists and societists. First, by conceptualising the social as nets of practice-order bundles, it allows the researcher to see social life from different scales, thus avoid the use of simple micro/macro dichotomies. Second, Schatzki's approach through the notion of "order" gives due attention to the role of materiality and non-human actors in organisations. The next section explores the implications of the use of site ontology and practice theory for the study of IT in organisations, and how ANT can help in this task.

4 The Site of ANT in Schatzki

4.1 Where is IT?

So, if the site of the social is in meshes of practices and orders, where is the site of the IT? It is easy to observe empirically that IT artefacts are actively involved in the sayings and doings of many contemporary organisations. In the case of the environmental protection of the Amazon rainforest, the different agencies of the government do many of their “sayings” via emails (e.g. informal communications), and perform many of their “doings” (e.g. coordination of anti-deforestation teams, or writing of reports to the ministry of the environment) using computers. Furthermore, their own understanding of the Amazon rainforest is mediated by IT artefacts, since the maps showing deforestation are generated, transmitted and stored by an IT artefact, namely, the Amazon monitoring system.

Given the importance of IT artefacts in contemporary organisations, an account of the orders that take part in its social life should necessarily include IT artefacts as one of its elements. Since IT artefacts are important elements of organisational orders, it is reasonable to think that orders with IT artefacts influences organisational life in a similar way that orders in general influences social life. In order to base this discussion in more familiar grounds to IT scholars, we compare POB to actor-network theory (ANT) – an approach which is better known within the IT field (Hanseth, Aanestad, & Berg, 2004; Walsham, 1997). Roughly speaking, ANT proposes that the social transpires from networks of actors made from heterogeneous materials. These actors can be either humans (e.g. managers, politicians, forest rangers) or non-human (e.g. Amazon monitoring system, flora and fauna of the rainforest) – and give the principle of symmetry, both types of actors have agency and are full-fledged participants in social life. An actor-network can be said to be stable (and thus enduring through time) when the actors within it have aligned interests, or instable, when the interests diverge and as a consequence the actor-network heads towards disintegration (Callon, 1986; Latour, 1987; Law, 1992).

4.2 The constitution of meaning

Coming back to practice theory, Schatzki (2002) suggests that orders are central to the constitution of two of the main dimensions of social life, namely, meaning and agency. Regarding the first dimension, he proposes that “the meaning of a component of an arrangement derives partly, and in some cases primarily (e.g. being run by horsepower), from its position in the arrangement – its location in the plexus of actual relations among the arrangement’s components”. Furthermore, since entities can be part of multiple orders (or arrangements) they can also have multiple meanings (Schatzki, 2002: 57).

Schatzki account of the constitution of meaning has two important similarities ANT. First, following the enrolment of an actor in ANT, whereby an actor becomes a member of a network, the actor assumes a specific role (or identity) within that network. In this process, like in Schatzki, the identity/meaning is determined mainly by the position that that actor assumes in the network – a point that might also qualify ANT as a site ontology theory. Second, also according to ANT, actors have multiple identities, since they are part in multiple networks, which is consistent with Schatzki theorisation of the multiple and unstable meanings of entities as they entities get in and out different orders (Latour, 1987).

So, if we take our case study, example of a certain Mr. Silva, his identity “as a representative of the ministry of the environment and user of the monitoring system”, or the Amazon monitoring system meaning “as a tool to combat illegal deforestation actions in the Amazon” are not intrinsically contained in the entities themselves, but emerge from the position Mr. Silva occupies in an order called AEP, which is composed by a set of humans (e.g. his boss and colleagues), non-humans (e.g. his laptop and the Amazon monitoring system) entities and their relations. Furthermore, at the same time Mr. Silva, has the identity of “husband” and “amateur football player” in relation to the order of his family and his group of friends, respectively. But if he gets divorced or give up playing football in the weekends he would then lose those meanings/identities. Similarly, if tomorrow the government decides to stop using the Amazon monitoring system, the meaning of this non-human entity as “anti-

deforestation tool” and Mr. Silva identity as its “user” would cease to be appropriate, as it would not be part of AEP’s order anymore.

4.3 Order and preconfiguration

Another important way in which orders helps to constitute the social is by preconfiguring action. Schatzki (2002) points out that agency is not a self-standing detached phenomenon that invents the future wholesale from its own resources. Instead, due to the preconfiguration of human and non-human entities and practices, agency is show before the human actor a series of possible paths².

Likewise, for instance, an order composed by desks, electricity, personal computers, technicians classifying satellite pictures and the Amazon monitoring system (which is black-boxed as the Amazon monitoring system) enables Mr. Silva to perform certain tasks like, verify the deforestation rates in the municipality of Altamira, in the Amazon region, which would not be possible if that order was not available to him (imagine assessing from the ground an area bigger than England). At the same time, this same material arrangement constrains the types of actions that he may perform, due to the intrinsic limitations of that order and availability of materials for the performance of certain practices. For example, the order above makes it difficult for Mr. Silva to understand (and act against) illegal settlements that generate deforestation because the order’s physical location in Brasília (tens of hundreds of km away from the rainforest) and technological order (the monitoring system “sees” only macro phenomena, such as land cover changes in large areas) renders “invisible” immigrations (Rajão & Hayes, 2007).

Again, the ways in which orders prefigures action found in Schatzki (2002) has important similarities with actor-network theory understands the impact of IT in organisations. Empirical studies in the ANT literature point out that networks of non-human actors such as technological artefacts are also able to preconfigure action since they contain frozen inscribed interests that forces human actors to adapt in order to make part of a stable network become one of the IT artefact’s “users”. In ANT terminology, this accounts for the process of enrolment, whereby human and non-human actors have to translate their interest in order to form a stable network (Callon & Latour, 1981). Since non-human actors such as IT artefacts usually are black-boxes containing classification schemes or other types of frozen discourses”, the human actors have only two options: to align themselves to the interests already inscribed in the IT artefact and “use” it as expected, or fail to “use” the IT artefact and abandon the network. Bowker and Star (1999) make a similar point:

Marx referred to technology as “frozen” labour – work and its values embedded and inscribed in transportable form. [...] The arguments, decisions, uncertainties, and processual nature of decision making are hidden away inside a piece of technology or a in complex representation. Thus, values, opinions, and rhetoric are frozen into codes, electronic thresholds, and computer applications. Extending Marx, then, we can say that in may ways software is frozen organisational and policy discourse. (p. 135)

The literature contains studies that show empirically this phenomenon. Woolgar (1991), for example, point out that software engineers develop software applications based on an idealistic vision of the “user” with specific desires, and capabilities. Then, during the trial tests, if the actual flesh-and-bones user does not “fit” the idealistic image inscribed into the software application, the engineers usually understand this as human fault. Similarly, Walsham and Sahay (1999) argue that certain Western interests embedded in GIS technology (e.g. use of maps and superiority of rational decision-making) were incompatible with the Indian society, which led to the failure to form a stable network comprising government officials and GIS applications. This confirms both the ANT’s

² It is important to note that the notion of enablement/constrain has also been proposed by Gidden’s (1986) structuration theory and by Deleuze and Guattari’s (1988) metaphysics amongst others. However, while in their case the constraining/enabling entities are mainly abstract overreaching abstract machines or modalities, respectively, in Schatzki (2002) the enablers/constrainers are arrangements of concrete human and non-human entities and their tangible relations (e.g. spatial, hierarchical and social relations).

notion that the human relation with black-boxed IT artefacts usually implies a one-way adaptation, and Schatzki's assertion that orders (arrangement of hardware, software, software engineers, etc) preconfigures users' agency.

The notion of preconfiguration does not imply, though, that a certain technological order (set up of software and hardware) produces a deterministic effect in organisations. As pointed out empirically by different studies, the specific constitution of orders (which also includes humans) and practices varies from context to context. Thus, the preconfiguring effect varies according to the localised uses that a certain community makes of their technological order (Barley, 1986).

4.4 How ANT can help POB

The similarities between ANT and POB allow us to obtain insights from the former that might help Schatzki's work in three ways. First, to my knowledge, there is not empirical study in the IS field that draws mainly upon Schatzki's POB. In contrast, ANT has been proven quite popular in this field. As such ANT might help POB by providing, at the same time, a large set of empirical data to test some of its concepts and a point of departure to introduce to the IS community this theory. Second, while Schatzki's work is driven mainly by theoretical concerns, ANT seems to evolve more in response to challenges posed by empirical data. Thus, ANT could help POB to become aware to important changes in the way IT relates to organisations, and allow it to refocus the theory accordingly.

Finally, certain concepts developed within the ANT literature might also be useful to POB. The concept of "punctualisation" seems a candidate for finding its way into POB (Law, 1992). Schatzki (2002) seems to consider unproblematic the distinction between entities and orders. So for instance, when describing the social site of a day trading branch office he describes that particular order as the arrangement of entities such as "managers, technicians, rooms, computers, computer network, power system, potted plants" and so on (205) However, if we take a closer look at one of those elements, a computer, for instance, it becomes clear that this entity is an order, since it is composed by a series of other non-human entities (e.g. software applications, processor, monitor, etc...). For this reason, ANT can be illuminating since it considers that actors/entities are "either reducible or irreducible to anything else", but instead only appear as a single unity via precarious simplifications (Latour, 1994, p.: 114; Law, 1992).

5 Practical Issues

Different authors have praised ANT's capability to analyse organisations where people and IT interwoven in complex ways (Hanseth et al., 2004; Walsham, 1997). However, on the light of the concerns with the current organisational theory literature with social practices ANT might have face some challenges ahead (Barley & Kunda, 2001; Orlikowski, 2000). In this sense, POB distinct conceptualisation of human agency and social practices might help ANT in the study of IT in organisations. This argument is based on three points where ANT and POB diverges.

5.1 Ontological status of humans and non-humans

First, ANT and Schatzki consider the status of human and non-humans in different ways. One of the main pillars of ANT is the principle of generalised symmetry that states that humans and non-humans are ontologically similar; therefore we must use the same vocabulary to describe both social and natural phenomena (Callon, 1986). From this it follows that according to ANT the Amazon monitoring system is an agent with the same ontological status as Mr. Silva. In contrast, Schatzki (2002) strongly dismiss the symmetry between humans and non-humans

proposed by ANT³. He argues that while non-humans can be an active part of the social life by taking part into *orders*, only humans can learn, transmit and do *practices*, the human element is requirement in every network (or mesh of practices or orders). Similarly, Miettinen (1999: 177) points out that only humans have a specific “type of orientation and consciousness [...that] implies the capability of imagining and planning what the future may hold; that is, intentionality” (see also Pickering, 1993). From this, it might be limitative to apply the principle of symmetry in a rigid way and do not use the notion of human intentions to understand social phenomena.

So, in our example, the Amazon monitoring system has agency since it performs actions such as “detect” deforestation, and “store” data and “transmit” data. However, the capacity to envisage that this deforestation data means that the Amazon rainforest is going to disappear in the next 50 years, and perform environmental protection practices informed by this projection, can only be done by Mr. Silva as a human agent – an important distinction that is missed by ANT’s principle of symmetry.

5.2 The driving force of networks and practice-order meshes

Second, practice-order meshes and actor-networks are also different in what concerns the inner force drives that entities to act. Different authors argue that the force that drives actors in ANT bears some similarities with Nietzsche’s notion of *will to power* (Callon & Latour, 1981; Harman, Forthcoming; Miettinen, 1999). Nietzsche (1993), incarnating the ancient Persian prophet Zarathustra, wrote:

Wherever I found a living thing, there I found the will to power; and even in the will of the servant I found the will to be master.

That to the strong the weaker shall serve - thereto he persuades his will who would be master over a still weaker one. That delight alone he is unwilling to forego. (p. 136-7)

Nietzsche (1968) later wrote on the Will to Power (a post-mortem collection of his manuscripts on the topic):

My idea is that every specific body strives to become master over all space and to extend its force (–its will to power;) and to thrust back all that resists its extension. But it continually encounters similar efforts on the part of other bodies and ends by coming to an arrangement ("union") with those of them that are sufficiently related to it: thus they then conspire together for power. And the process goes on – (s. 636)

From the small sample of Nietzsche’s ideas above it might be possible to draw some parallels between the ways he describes will to power and ANT principle of translation. In ANT every actor (which also includes inanimate things) has an interest (or a will) that it tries to impose over other actors in the formation of a stable network (or arrangement), which by definition have to have aligned interests so that they behave as one (Law, 1992). Indeed, Callon and Latour (1981) point out in a early work that already showed many elements of ANT, that powerful actors such as multinational corporations are the result of a successful process whereby other actors wills (e.g. employees, machines, buildings) are translated into a single will.

Schatzki (2002) suggests, in contrast, that the will to power (as in the text fragment above) is not the only force motivating bodies/actor/entities to act and form arrangements/networks/orders. Instead, in order to explain why actors engage in certain practices and form certain orders he uses the more inclusive notion of *teleoaffective structures*⁴ – the combination of the Greek word *telos* (purpose, end or goal) and *affection* (sentiments towards something or someone). More specifically, a “teleoaffective structure is an array of ends, projects, uses (of things), and even emotions that are acceptable or prescribed for participants in the practice” (Schatzki, 2005: 471-2).

³ Schatzki (2002) remembers us the distinction of human and non human actors is in line with both Foucault’s (Callon, 1986; 1977) apparatuses and Deleuze and Guattari’s (1988) assemblages. Indeed, for them neither apparatuses nor assemblages exist without the participation of human agents.

⁴ Note that in the case of Schatzki’s theory of practice the driver agency is not inherent to the entity/actor but to social practices, so, it presupposes the engagement of people in some sort of practice in order to explain agency. For the importance of common goals in social practice see also Barnes (2001) and Thévenot (2001).

It is undeniable that the will to power is a very important (if not the most important) component of the teleoaffective structure of many practices. However, teleoaffective structure includes but is not limited to power. Religious conviction, love and other relatively altruistic ideals, are as well considered to be part of teleoaffective structures, and as such, important driving forces of social life (Schatzki, 2002). The importance of passion and affection to the understanding of human agency has been shown empirically by different studies (Gherardi, Nicolini, & Stratti, 2007; Knorr-Cetina, 1997). Engeström, Puonti and Seppanen (2003) provide a good example of the role of passion for the object in the development of an IT artefact. The authors show that the engineers and entrepreneurs felt in love with their object of activity: a love that at the same time motivated them to passionately dedicate themselves to the project and prevented them from acknowledging serious faults within the project. A phenomenon, the authors point out, a strict application of ANT's principles cannot explain.

In the example of the environmental protection of the Amazon rainforest, ANT's take on will to power is probably an important component of the teleoaffective structure of the practices that of Mr. Silva subscribes. During his relative short career he is already one of the directors of AEP, and currently is also occupying *ad interim* an even higher position. However, judging by the passionate way he talks about the environmental protection of the Amazon rainforest, the love for nature and the conviction that the region should be preserved (which are altruistic ends) are also important aspects the practices that Mr. Silva are part of, and thus, an important driver of his agency that goes beyond the will to power.

5.3 Explaining practices

The third point of divergence concerns the featuring of practices in both theories. From the different ways in which ANT and Schatzki's approach explain the motivation behind agency it follows that the two theories also see work practices in different ways. One of the main focus of ANT has been the description of the formation of actor-networks. Indeed more than seeing ANT's constructs as static networks, they should be seen as net work, namely, the constant effort to create and maintain networks (Callon & Latour, 1981; Law, 1992). Studies of the formation of network include, for instance, cases as diverse as the introduction GIS technology in India (Walsham & Sahay, 1999), and the Portuguese marine expansion in the 16th century (Law, 1987). From those studies it is possible to see that ANT is usually more concerned with the tactics applied by actors in order to enrol other actors into heterogeneous actors with aligned interests. Given the actor's will to power, outlined above, it should not be surprising that ANT's work practice accounts usually describes methods similar of Machiavelli's prince, like the use of persuasive rhetoric and anticipating the reaction and responses of actors to be translated (Bloomfield et al., 1992; Law, 1992).

However, it does not seem to be the case that every set of sayings and doings with social relevance can be attributed to the Machiavellian building of networks. For this reason, the idea that the social is not only composed by networks (or orders) but also by social practices which teleoaffective structure may differ from the will to power, has the potential do deliver richer account of social phenomena. Detailed descriptions of work practices, that by their turn would collaborate to address our currently lack of understanding of contemporary forms of organising (Barley & Kunda, 2001) - an empirical agenda that given the omnipresence of IT artefacts in contemporary organisations is strongly related to the study of IT in organisations.

So, relating this notion back to our example, an ANT study of the use of the Amazon monitoring system would probably focus on the process of network building around this specific IT artefacts, and the clashes of interests of the different actors involved (e.g. Walsham & Sahay, 1999). A study of the same case using POB, in contrast, in addition to studying the formation of the orders of that specific site (e.g. arrangement of the Amazon monitoring systems and its users) it would also attempt to understand in detail the social practices carried out by the people of that social site (e.g. environmental protection practices, political negotiation practices).

6 Conclusion

In this paper I have argued that the comparison between Schatzki's notion practice-order bundles and actor-network theory could improve our understanding of the implications of the use of IT artefacts in organisations transcending the limitations of the societist and individualist approaches. On the one hand, both ANT and POB address the post-structuralist and post-humanists concerns with rigid dichotomies and the non-human agency, respectively. Also, the two discuss the constitution of meaning and preconfiguration of action in similar ways. Based in those similarities I have argued that the ANT literature, as an approach with a longer history and clearer empirical focus, can provide to BOP a starting point for its introduction in the IS field.

On the other hand, I have argued that the strict application of ANT's principles of symmetry and will to power is limitative. Following Schatzki I have pointed out that the principle of symmetry between humans and non-humans leads ANT to ignore the fact that only human beings' learn practices and act intentionally, namely, only humans learn and transmit certain ways of doing things, and act in the present bearing in mind the future consequences of their actions. Second, ANT believes that the 'will to power' is the main force motivating actors to engage into networks, while POB through the notion of teleoaffective structures considers that the purpose behind practices (and as a consequence orders) can also be altruistic (e.g. affection and religious conviction) – a limitation of ANT that has also been found in other empirical studies. Third, even though ANT accounts include social practices, those accounts are usually limited to the use of Machiavellian methods used in network building. Schatzki, in contrast, instead of focusing the entire social around the building and maintenance of "order" (or networks), he conceptualises work practices (and related teleoaffective structures) as dimension of the social as important as orders. So, from this it seems that BOP while accepting many ANT's concepts, it seems be attentive to a broader spectrum of social phenomena. As such, BOP might help ANT researchers to understand the human agency and practices in the study of IT in organisations.

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About the Author

Raoni Guerra Lucas Rajão achieved his BSc Hons (Laurea) in Computer Science (Informatica) at the University of Milan-Bicocca (Italy). After working as a programmer, IT consultant and statistical analyst for public and private organisations in Brazil and Italy, he changed the focus of his work from the technical to the social side of information systems while undertaking the MRes in Information Technology, Management and Organisational Change at Lancaster University. Raoni is currently a doctoral researcher at the PhD programme in Organisation, Work and Technology in the same institution. His research intends to contribute to a deeper understanding of the implications of the introduction of geographic information systems to governmental policies and practices by studying the work practices around a satellite-based monitoring system used by the Brazilian government to manage the Amazon rainforest.