What does organizational change mean? Speculations on a taken for granted category

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Despite widespread research on why and how organizations change, what constitutes change is often taken for granted. Its definition is avoided. Studies based on individuals' rational choice imply that change flows from purposive actions in accordance with an objective, external reality whereas contextualism argues that change results from institutional pressures, isomorphisms and routines. But both depict change as the passage of an entity, whether an organization or accounting practices, from one identifiable and unique status to another. Despite their differences over whether reality is independent, concrete and external, or socially constructed, both assume that actors (or researchers) can identify a reality to trace the scale and direction of changes. This reflects modernist beliefs that organizational space and time are unique and linear. The paper takes issue with this and argues that 'a-centred organizations' and 'drift' should replace conventional definitions of organizations and change. The arguments are inspired by the arguments of the sociology of translation and constructivism, and insights from two case studies of Enterprise Resource Planning system implementations in large multinational organizations. The latter illustrate how defining change is problematic—as new systems gave rise to multiple spaces and times within the organizations. The paper traces the implications of this for control and accounting studies *tout court*.

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1. Introduction

Organizational change is a central issue within organization theory, management and, increasingly, accounting. Consultants argue that firms should adopt various 'new' accounting systems with acronyms such as ABC/M, EVA and TOC (Cooper and Kaplan, 1988; Johnson and Kaplan, 1987). Many firms have responded with alacrity, adopting them with varied results. Academics have commended various theoretical frameworks to explain these accounting changes, e.g. Briers and Chua (2001) commend Actor-Network Theory whereas Burns and Scapens (2000) proffer Old Institutional Economics. Research is divided over whether and how management accounting changes bring success (Cobb *et al.*, 1992; Shields, 1995), and whether clear-cut definitions of success versus failure exist (Malmi, 1997). Change has been examined across different geographical and temporal spaces to find variations (Lukka, 1994). Resistance to accounting change (e.g. Scapens and Roberts, 1993; Ezzamel, 1994) has been identified alongside models of how to implement change (Innes and Mitchell, 1990; Vaivio, 1999). Since Hopwood's frequently quoted claim that 'very little is known of the processes of accounting change' (1987, p. 207), studies on change have proliferated.

   This has provoked controversy over the theory of why and how changes are occurring. Accounting change has been attributed to conditions of possibilities (Hopwood, 1987), the emergence of accounting constellations (Burchell *et al.*, 1985), interplay between actions and institutions (Burns and Scapens, 2000), disciplinary regimes (Hoskin and Macve, 1986, 1988; Ezzamel, 1994; Miller and O'Leary, 1997) and adaptations to macro-economic markets (Vamosi, 2000). Differences have provoked epistemological, political and ethical debates. Post-modernists and historical materialists (Miller and O'Leary, 1994, 1998; Arnold, 1998; Froud *et al.*, 1998), and critical Marxists and Foucauldians (Neimark, 1990, 1994; Hoskin, 1994) have argued over whether accounting transformations represent exercises in rhetoric and ritual rather than practice, and the political implications of methodological choices for whether one is *for*, *against* or *indifferent* to the *status quo*. Yet despite all this effort, this paper will argue, little is known about what change is—its epistemological status is left unexamined. What the *concept* of change means, whether it can be conceptualized independently from its *process* and how these factors relate to the practice of accounting is taken for granted and is poorly understood.

   Latour contends that ignorance of key concepts in scientific analysis is commonplace:

> We know very little about what causes sciences, technologies, organizations and economies. Open books on social science and epistemology, and you will see how they use the adjectives and adverbs 'abstract', 'rational', 'systematic', 'universal', 'total', 'complex'. Look for the ones that try to explain the nouns 'abstraction', 'rationality', 'systems', 'universe', 'science', 'organization', 'totality', 'complexity', without ever using the corresponding adjectives or adverbs, and you will be lucky to find a dozen. Paradoxically we know more about the Achuar, the Arapesh or the Alladians than we know about ourselves (1993, p. 116).

We wish to add 'change' to Latour's list.
Roland Munro places change theorists into two categories:

> On the one hand, […] there are those who lionize a 'people' view of power …called methodological individualism; individuals change the world. On the other hand are those who profess an 'institutional' view. Here a motley crew of social structures, including class,

> genders, capital, the professions and even democracy, *reduce* the discretion of persons; and conspire to keep the world the same (1999, p. 430; emphasis in original).

Munro's dichotomy between individualism and contextualism[1] is premised on how theories of change are constructed methodologically.[2]

His grouping of the literature may be too schematic and oversimplified (as he concedes) but it captures how research on organizational change, especially in accounting, has evolved—though not necessarily chronologically. Following calls to put accounting in its institutional and social context (Burchell *et al.*, 1980), neo-classical approaches were often abandoned by accounting researchers, especially in Europe (Scapens and Arnold, 1986). Instead they focused on how socio-economic factors explain the emergence of accounting, its functions and, above all, how and why it changes. Neo-classical and realist assumptions that individuals transform situations by gaining knowledge of an external reality and acting appropriately have been substituted by approaches questioning this relationship (Cohen *et al.*, 1972; Cooper *et al.*, 1981 to name but a few), and emphasizing how reality is socially constructed (Chua, 1986*a,b*). Institutional theories and vocabularies from writers such as Berger and Luckmann (1966), Meyer and Rowan (1977), Powell and Di Maggio (1991), Scott (1995), Zucker (1991) have become commonplace in accounting papers (Carmona *et al.*, 1998; Carruthers and Espeland, 1991; Carruthers, 1995; Meyer, 1986). They argue that accounting 'constitutes economic and organizational realities' (Carruthers, 1995, p. 321) by shaping

> organizational participants' views of what is important, with the categories of economic discourse [...] that are implicit within the accounting framework helping to create a particular conception of organizational reality (Burchell *et al.*, 1980, p. 5).

Thus accounting has become perceived as a means of exerting control at a distance (Robson, 1991, 1992) rather than providing information that mirrors an external, objective reality as argued by conventional wisdom.

However, the institutional approach has problems as 'it depicts an institution as somehow distinct from those who comply and, more importantly, from the act of compliance itself. *The result reifies the notion of institution*' (Barley and Tolbert, 1997, p. 95).[3] It presumes that people perceive (or are unconsciously affected by) institutions similarly and conform to its rules, norms and routines. Once the

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[1] Individualism makes single actors and one-to-one transactions the cornerstone of social theory (see Nagel, 1963, 1968; Donzelli, 1986; Salmon, 1989; Sparti, 1995). They discover elements of systems and their inter-relationships—be they organizations, accounting systems, or economies. They then behave as individual agents according to either full or bounded economic rationality to exploit this knowledge (see Robbins, 1932; Friedman, 1935; Donzelli, 1986; Hodgson, 1988). Behaviour is presumed to be purposeful and in accordance with knowledge of an external reality possessing a firm ontology. Elements, be they individuals or transactions, and their inter-relationships are building blocks for constructing knowledge as a whole—be it about an organization or an entire economic system. Contextualism in contrast emphasizes how situational factors and social collectivities shape individuals' construction of meanings that form the basis for purposeful behaviour. It gives explanatory power to concepts such as 'society', 'culture' and 'institutions'. Individualism looks for the smallest building blocks or atoms of the observed phenomena to build the whole upwards, whereas contextualism explains phenomena through larger social constructs, i.e. it builds theory downwards.

[2] 'Methodology' is defined here as a discourse (*logos*) on how theories are constructed (*hodos*) in a particular domain of study (Laudan, 1977, p. 81).

[3] The institution is reified as a 'thing' (from the Latin *res*).

theory explains how institutions exist, it has no capacity to explain further changes. Assumptions of teleological behaviour (be it conscious or unconscious) render accounting studies using socio-constructivist epistemology similar to those drawing from realism (and neo-classical economics). Both reify the heuristic category (the individual or the context) that is the cornerstone of their theoretical construction, i.e. they make (*facere*) this category a thing (*res*). Thus both apparently opposed schools explain change through processes towards equilibrium. Neither defines change nor explains why equilibrium changes. Both assume a unique external reality, socially constructed or real, and a linear view of space and time. Both essentially explain processes towards stability.

Barley and Tolbert (1997) argue that different degrees of institutionalization exist and incomplete processes leave room for changes following interactions between structure and agency. Analogous attempts to address this issue in management accounting studies employing institutional approaches have investigated relationships between the socially constructed institutional realm (structure) and the realm of action (agency), e.g. Burns and Scapens, 2000. Change has been seen as a process with no predetermined outcomes (Brunsonn, 1985; Hopwood, 1987; Laughlin, 1991) or as a process with no outcomes at all (Burns, 2000). However, this leaves fundamental questions of institutional theory unanswered. Who can 'see' institutions, actions and processes? Who can judge when processes making an institution a taken for granted and socially constructed reality are complete? If they are not, then what is an institution? How can one affirm that institutions are socially constructed and taken for granted entities and then argue that change is an ongoing process with no outcomes? Is the concept of institution a useful heuristic for explaining change as a process and are categories such as 'environment', 'context', 'institution', presumed to be either inputs or outputs of theories of change, valid if change is not a passage from a given entity to another but is a process? Lastly, and above all, what of the concept of change in itself? Who can state, be they an academic or a manager, whether an institution has *changed*? How can an institution become something different (something *new*) from what it was *before* without being charged with reifying the concept of an institution as a thing?

The definition of organizational change and the avoidance of reifications are methodological issues that motivate this paper. In accordance with studies calling for multiple accounts of processes of change (e.g. Laughlin, 1991; Briers and Chua, 2001), it argues that relationships between (positive or socially constructed) knowledge, action and rationality should be reformulated in order to redefine conventional notions of change through the concept of 'drift'. This requires re-theorizing where these relationships occur, which requires redefining organizations as 'a-centred' rather than centred as is the norm presently.

This has implications for viewing accounting change that contrast sharply with those of conventional and social constructivist approaches. Despite the latter's different theoretical underpinnings, both approaches depict accounting as an organizational practice that constrains behaviour through accounting rules and routines set centrally. Thus, accounting provides 'pre-scriptions' from 'centres of calculations' (Latour, 1987, 1991; Robson, 1991, 1992) which drive change but also enhance stability. This paper calls for an alternative approach that views accounting as creating 'centres of discretion' (Munro, 1999). Here accounting is a process of fabricating knowledge (Latour, 1999) that forms part of a broader

attempt to construct organizations (Brunsonn and Sahlin-Andersson, 2000) that is always incomplete (Law, 1997). If accounting drives organizational change it is not because it reproduces a new template for action but because the very incompleteness of implementing and enacting its systems leads to accounting knowledge being interpreted differently across organizational spaces and times. Accounting is not created according to a central predetermined plan but rather by the interplay between calculations and discretion within accounting practices.

The stimulus to write this theoretical paper came from trying to understand observations from case studies of management control in two multinational organizations. This required overcoming and explaining the dichotomies outlined above. The constructivism of Foerster (1981) and Morin (1977, 1986) and the sociology of translation of Callon (1981, 1986, 1991); Latour (1987, 1991, 1999) and Law (1997, 2000) were particularly useful in this respect. However, the paper does not apply or 'use' a specific theory entirely but rather operates a 'theoretical *bricolage*' of theories that deconstruct how dichotomies within modernity occur. The paper deliberately does not start with a theoretical section, as it does not wish to create further dichotomies between theory, researchers and practices.

The paper is organized thus. The next section illustrates how and why realism and socio-constructivism do not explain the complex dynamics between change and stability and why they stunt our understanding of change within a modernist framework. An amended definition of knowledge, action and rationality is called for. The third part explores how inter-relationships between knowledge, action and rationality expressed through enaction, poly-rationality and *praxis*, provide a better understanding of change. This activity of categorization is illustrated through two case studies of implementing enterprise resource planning (ERP) systems in two multinational organizations (MNOs). The fourth section outlines how change within organizations can be interpreted through the metaphor of 'drift', and how the theoretical category of 'a-centred organizations' acts as a heuristic for describing the events within the two MNOs (and organizations *tout court*). The conclusion traces the implications of the paper for accounting and control research. The message is that accounting needs to be studied for the knowledge it provides—which organizational actors take for granted—along with the conditions that give rise to this fabrication (the knowledge of knowledge, Morin, 1991; Quattrone, 2000*a*).

2. Speculations on a modernist construction of change

What does *change* mean? An English dictionary definition is

> Making or becoming different, a shift from one state, stage, or phase to another (*The On-line Encarta English Dictionary*).

The definition of the change process is consistent with its treatment in contemporary theories embracing a modernist epistemology as represented in Figure 1.

Figure 1 shows how a given entity passes from one state to another—from one specific spatio-temporal domain to another. Ontologically, this conception of change attributes definite features to the entity undergoing change. Thus the entity (be it an organization, an individual or a state of mind) has well defined characteristics at point 'A' that change when the entity becomes something else at point 'B'.

$$A \xrightarrow[\ s_1 \hspace{5cm} s_2\ ]{\ t_1 \hspace{5cm} t_2\ } B$$

Figure 1. Modernist constitution I: a schematization of the concept of change.

Organizations 'change' when they transform their structure and operations; or management control systems 'change' when a new information system, such as ERP, is implemented; or cost accounting systems 'change' when cost allocation bases are redefined from direct labour hours to activities. As the object of change passes from state 'A' to state 'B' it is modified; i.e., it gains and loses identifiable features. Methodologically, this definition can be charged with naive positivism for it implies that researchers or managers can identify these two separate states and the *in*-come and *out*-come of the process of 'change'. Also, it assumes that the process takes place in a segmented and linear spatio-temporal domain constituted by the intervals s_1–s_2 and t_1–t_2.[4]

Individualism and realism claim that organizations change when individuals' actions modify the organization with respect to some chosen criteria. For instance, organizations may become more efficient after implementing an ERP system transforming how payables and receivables are treated. Contextualism and socio-contructivism view change as a process of institutionalization through the adoption of rules, norms and routines. For instance, introducing ERP is a process of homogenization that leads organizations to adopt such technologies because of contextual imperatives. Although both perspectives may have different epistemological underpinings they share a modernist conception of change and the entities involved.

Figure 2 models relations between knowledge, action and rationality in individualism and contextualism.[5] Here individuals (or organizations) acquire (or have imposed) knowledge 'K' about a unique reality 'out there' (be it the 'real' world or a 'socially constructed' institution). This is followed by actions 'A' (be they guided by individual agency or a super-imposed norm). Behaviour is rational ('R') if it

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[4]This is the same fragmented spatio-temporal framework used to describe modern control practices and post-modern control theories (see Quattrone and Hopper, 2000*a* and Quattrone, 2000*b*).

[5]This representation of relations between knowledge, action and rationality may appear very schematic but very broadly it reflects the evolution (not necessarily chronological) of theories of rationality and their use in accounting. It is not the aim of this paper to review all the studies of relations between knowledge, rationality and action in organization theory, economics, sociology and accounting. However, it is worth noting that following Simon's delineation of bounded and procedural rationality (1976, 1983) two divergent streams of studies developed that had significant impacts upon the accounting literature. The first draws on bounded rationality and is followed by the so-called School of Chicago, e.g. Hogart and Reder, 1987; Tversky and Kahneman, 1981, and in accounting Hogart (1991, 1993). The second draws on procedural rationality and was followed by the 'Scandinavian' school, e.g. Brunsson (1985), Cohen *et al.* (1972), March (1988) and in accounting, for instance, Cooper *et al.* (1981), Brunsson (1990), Malmi (1997). This may be see as the 'weak' version of Simon's approach, leading to social constructivist views of the organizational world and the use of Berger and Luckmann (1966) and neo-institutional sociology in accounting studies (Meyer, 1986; Carruthers, 1995; Vamosi, 2000, to name but a few). It is the latter stream of studies that are deemed to fall within the socio-constructivist approach in accounting. They close the 'Arch of Knowledge' (Oldroyd, 1986) by reifying the subject (and the context) rather than reality (and the object).
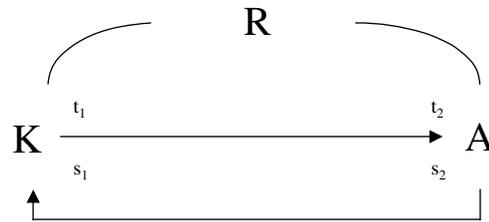
$$R$$

$$K \xrightarrow[\;s_1\;]{\;t_1 \qquad\qquad\qquad t_2\;} A$$

Figure 2. Modernist constitution II: relationships between knowledge, action and rationality.

complies with either reified reality. If not then behaviour stimulated by feedback tries to bridge the gap. In this scheme, accounting controls play two roles. In realism, accounting feedback (should) provide information to judge whether actions were rational against a template of a unique organizational reality. In socio-constructivism accounting becomes an organizational practice by reproducing a socially negotiated organizational reality. In both, behaviour is teleological (aimed at individual or institutional goals) and sequential from a state in time and space (t_1 and s_1) to another (t_2 and s_2). Both theories see behaviour as adaptation (i.e. action is guided by knowledge). Individualism grants actors an omniscient ability to transact according to the rules of *homo economus* to reach socio-economic equilibrium. In contextualism change behaviour (consciously or unconsciously)[6] mimics reified institutionalized routines, rules and norms. Both approaches emphasize acts of compliance to objective (or objectified) rules and norms rather than possibilities of escaping from them. Any resistance that occurs is assumed to be in response to 'institutions', i.e. to reified things that are perceived.

This stultified view of change as adaptation to external blueprints prohibits investigation of the complex dynamics between stability and change, and results in static, deterministic analyses. Both approaches are trapped in a 'modernist constitution' (Latour, 1999) where change is conceived as linear, segmented passages from one unique location in space and time to another (see Figure 1). Individualism and contextualism interpret change but do not define it—what is change is taken as self-evident. Individualism grants entities subject to change a strong 'ontology', i.e. precise and identifiable features, whereas contextualism grants actors a strong 'methodology', i.e. social interaction constructs and gives life to institutions with specific characteristics. Both define the uniqueness of the world they seek to interpret: a hard external reality for methodological individualism, and a socially constructed one for contextualism. Both present a uniform and unique world-view and organizational reality that precludes alternatives. Both presume that either actors (or academics in their analysis) can *see* the institution. Actors become voluntarily isomorphic to it or the institution moulds them involuntarily with little resistance. Once equilibrium is achieved or the isomorphism is complete, no room is left for further change.

Both perspectives presuppose a specific and unique notion of order based on making sense of organizations by using theory to categorize and model events. Both realism and social constructivism put an external reality at the centre of their

[6]See for instance the cognitive variants of neo-institutionalism (Scott, 1995) where actors behave according to the institution without being aware of it or in opposition to it.

theoretical speculations (see Quattrone, 2000*a*). Their contributions thus become *centred* round a heuristic category outside the explanatory framework used to explain change. They assume a 'centred' view of knowledge, action, rationality, change and, ultimately, of organizations (Quattrone and Tagoe, 1997). Their rationale assumes linear relationships in a unique organizational world, and the absence of gaps when interpreting changes from 'A' to 'B' suggests a neat, describable process of transformation. We suggest that such modernistic ordering is misleading.

To avoid this, relations in Figures 1 and 2 need to be reconceived. As Law states, there is a need to adopt a minimalist attitude when interpreting processes of change that

> recognizes its incompleteness. It knows that it cannot tell everything, order everything. It knows, yes, that it will fall over if it tries to say it all. *If it tries to centre in one place* [it knows] that it cannot, therefore, take anything that it says in as many words about the ordering of the world at face value. Which means that it needs to take distance from its orderings, even as it orders them. [...] It is rather an irreducible complexity of partial connections, which may be performed in one way or another, but cannot, as it were, be ordered, told, or performed *from any particular place* (1997, p. 10; emphasis added).

The counterpoint to theories represented by Figures 1 and 2 recognizes the need for gaps, incompleteness and 'a-centredness'. When putting order into things one must be aware of its caducity, the limited abilities of people to order and the effects of other perspectives, world-views and orders. This does not deny that boundaries need creating to de-*fine* things so people can make sense of organizations and act accordingly. However, every de-*finition* (i.e. every form of closure) is a *de*-finition (i.e. an incomplete order). For example, accounting has been depicted as creating 'centres of calculations' from whence order can be conceived, represented and executed. However, accounting is also a practice that allows disorder, which puts organizations into a continuous state of flux. Thus accounting needs to be conceived not only as a managerial practice that creates centres of calculation but also as a constellation of practices that constructs 'centres of discretion'. There is a need to talk about knowledge, rationality, action, change, organizations and the relations amongst them differently—they need to be made a-centred.

Research methods

The research was based on case studies of two MNOs implementing an ERP system, namely SAP, throughout their operations. SAP is an acronym for *Systems, applications and product in data processing* (Jazayeri and Scapens, 1999), a German software package that claims to integrate operations across different business functions and remote geographical areas.

The first case studied the effect of SAP at various hierarchical levels and locations in a large American MNO (from now on Think-Pink). The firm operated in three related industries: building materials, pipes and fibreglasses. Its headquarters (HQ) are in the USA Mid-West and it has subsidiaries across the world: from the Americas to Europe, from East Asia to South Africa. The case studied the links between a UK subsidiary providing insulation products, the regional HQ for European businesses and the HQ in the USA. Initial contacts were developed in the UK subsidiary during the pilot study on the implementation of ERP projects. This phase consisted of semi-structured interviews (six managers interviewed for one hour and a half on average) across all business functions. They had a strong focus on accounting and control issues and

relationships between the subsidiary and HQ. The second phase involved a visit to the European regional HQ in Belgium to interview controllers of the entire European business and the manager responsible for corporate Information Systems (IS) (three managers interviewed for two hours on average). The case culminated in a visit to the HQ in the USA to interview members of the accounting, budgeting and planning team and key managers responsible for developing IS throughout the corporation (14 managers interviewed for about one hour each). The company also provided relevant reports produced via the ERP system. Material about the corporation was also collected, especially company reports and web-site data.

The second case studied the design and implementation phase of an ERP project within the sales and distribution function of the European HQ of a Japanese multinational (henceforward Sister-Act) for a year. The MNO markets office automation products, and industrial and domestic sewing machines. It has manufacturing and selling and distribution facilities in Japan, the Far East, Europe and the USA. Semi-structured interviews were held with those responsible for the ERP project, mainly the director of the project, members of the steering committee, and leaders of project teams (12 interviews—typically an hour and a half). Some members of the project were interviewed more than once to clarify and discuss aspects of the projects as they progressed. In addition, during the initial stage of the research (circa three months), the researcher participated in the weekly team leaders' meeting where key actors exchanged views on the ERP project, its progress and future plans. Documentary material such as company histories, brochures and the newsletter about the project were also collected and analysed. These two cases are described and compared in greater detail elsewhere (Quattrone and Hopper, 2000*a,b*). They are used here merely for illustrative purposes.

The data was collected over 12 months in 1999/2000. Thus many interviews focused on events that could have taken place five years before the interview. However, this was not a major problem given the epistemological approach adopted. The paper does not claim to represent how 'things really went' and then explain the empirics with a pre-packaged theory. Rather the interviews and the case are used as insightful devices for addressing issues of change and its re-definition. Thus, the paper is neither theoretical nor empirical in its origin. What is written is in the spirit of critical accounting research being the product of (personal) experiences, readings, cognitive biases and limitations, opportunities and chance events, research protocols, case interviews and theories such as the sociology of translation, constructivism and the experiential learning theories of Piaget (1967*a,b*; 1970).

3. Re-conceiving the relation between knowledge, action and rationality: from centred to 'a-centred' organizations

Any definition of change presupposes a specific conception of knowledge, action and rationality, and where their reciprocal relations occur (see Figure 2). This paper uses insights from the Think-Pink case to reformulate knowledge, action and rationality and their relations to conduct a similar exercise on definitions of change and organization.
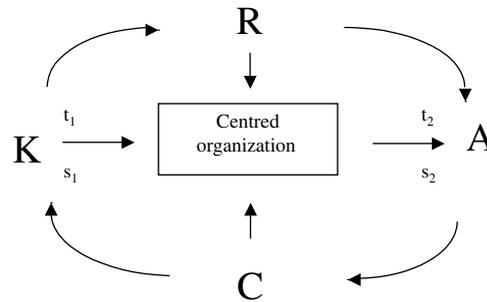
Figure 3. Modernist constitution III: the relations between knowledge, action, rationality and change entailing 'centred' organizations.

Conventional (and rational) wisdom assumes that every action to implement SAP follows a learning process to gain the knowledge necessary to perform this complex act. If so, then the design and implementation of a new software package would follow the logical sequence described in Figures 1 and 3. More prosaically, to do *something* one has to know *how* to do it (the relation between Knowledge and Action), as expressed in Figure 3. The implementation is judged as 'right' or 'wrong' according to canons of rationality, i.e. whether the implementation (the *action* 'A') followed the guidelines in time t_1 and space s_1 (*knowledge* 'K') that makes the system work, thereby modifying organizational features (making it *change* 'C') and resorting to the guidelines ('K') if this was ineffective. Rationality 'R', aided and abetted by a control system, reigns sovereign: it acts as judge on whether the implementation ('A') reproduced the new information system in time t_2 and space s_2 by following this sequence of events. Paradoxically, depictions of change as isomorphic and rational processes share the same schematization. The difference is merely the socio-constructed nature of K, R and A. Both processes depict the ordering concept or category of a *centred organization* through the *centre* driving relations within a structured and hierarchical depiction of knowledge, action, rationality and change. The conception of an organization as a flat space where actions follow a specific temporal sequence is centred because the perspective (be it from a theory or the interpretation of a divisional manager) makes everything ordered. All the terms in the relationships have a clear de-*finition* that is understood by those involved in the change. These terms are 'reified' because they are viewed as things (*res, rei*) that can be seen or acted upon.

'Enaction' as the co-production of knowledge and action: on learning and SAP
The paper seeks to avoid 'rei-fications' and categorizations that assume individuals have a common understanding of definitions. The dichotomy between knowledge and action depicted in Figures 2 and 3 is misleading because it presupposes a sequential relationship between two separate poles. This opposition did not depict relations between knowledge and action during the implementation of SAP in Think-Pink.

Think-Pink started to implement SAP in 1995, initially in a UK subsidiary acquired the year previously. A member of Information Systems Business Relationships at USA headquarters[7] recounted why.

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[7]This team was, and still is, responsible for informing personnel about the support they can receive about information technology—it initially proposed the SAP project to top management.

> We put together the proposal to the board [for the information technology strategy] of which SAP is a big component. ...Our original sales pitch to company leadership was that ...having a common, global, simple set of processes and system support was the right thing to do. ...In parallel ...we are going to spend ...money taking all of these legacy systems and making them year 2000 compliant. ...We might have sold it first on, we have got this year 2000 problem, we have got all these disparate legacy problems that need to be modified, but I think a close second was, it was the right thing to do anyhow.

The company decided to adopt what was then believed to be a pre-constituted information package—SAP. However, contrary to common beliefs amongst users of business software packages, SAP is not ready to use. It needs a long process of customization to meet business requirements of specific companies. This may be because the standard SAP 'is designed having in mind how a German company works' (*Information Systems Business Relationships, US HQ*) (see Quattrone and Hopper, 2000*b*, on customization).

SAP is an interesting object (or quasi-object, Star and Greisemer, 1989) for studying change as it often entails a major reorganization of processes, roles and tasks, as the Financial Controller of the UK subsidiary testified:

> There was a two year programme where our people ...were basically living in the States to develop a business engineering plan ...It wasn't just a case of changing IT systems [...] we are changing the way we do business. And it meant that there was far more devolved responsibility. So guys now on the shop floor who are keying in GRNs [Goods Returns Notes] are actually posting into the ledgers. Now they don't necessarily know that is what they do but that is the effect that it has ...I don't have accounting people anymore either here or at [a UK plant] who are making sure those GRNs are going to the right account. The system does that for us.

After the first implementations the greater part of the corporation was managed through SAP (it currently manages $4.5 out of $5 billion turnover). Doing business in Think-Pink was revolutionized—from finance to customer service, and from management control to logistics (Quattrone and Hopper, 2000*a*). SAP was described as one of the major changes the organization has undergone in the last decade. For example, conventional reporting procedures were dramatically changed as HQ and other plants could now access key financial indicators for all plants across the globe in virtually real time. SAP made control from multiple locations possible. A Plant Analyst in the UK subsidiary described the consequences:

> There are three plants which are the same: [A, B and C]. And we are constantly compared ...[A] is seen as ...an exceptionally good plant, very simple, low stock levels, good production, and clean. And often we are compared against [A] and obviously unit cost is a key indicator.

Benchmarking was easier and available almost instantaneously. Yet, it was not necessarily and exclusively done at HQ: plants could compare performance across manufacturing sites. This was one of many *changes* that SAP brought into Think-Pink but they cannot be represented merely as technical exercises to learn how to use SAP. The shift to SAP precipitated a complex process of change accompanied by shifts in beliefs and practices about conducting business. SAP's rationale was integration, real-time visibility of actions and controls—the opposite of what people were used to and the design of Think-Pink's traditional management control system. For example, in the 'good old times' (as managers often said), reporting procedures were clear and simple (the controlled, typically the subsidiary, produced regular reports for the controller—typically at HQ). Now, following SAP, managers at HQ could run

performance reports on a subsidiary unbeknown to that subsidiary and possibly *before* its managers had bothered to do so (Quattrone and Hopper, 2000*a*).

Every implementation of a new system entails learning how to use it. SAP was no exception: its introduction was accompanied by a long and hard training period on its rationale and consequences. However, this was not successful initially and SAP had disruptive effects as is testified below:

> The business units [. . .] had a very simplistic business model . . . they can't have much sophistication in their systems world. . . . We could go in and say: 'Here is what you have, here is what we can deliver with SAP . . . and can you live that way?' And the answer was 'Yes, we can'. So we got prepared for deployment . . . through until March the next year in 97. . . . We put all the business rules in place, we put all the systems in place, and we fired everything up. And we struggled mightily. . . . Even though we went through all the right steps, no one was really checking to see whether the folks out in the field really practised on the system and that they really had used the training window appropriately and that they were ready to go live. We assigned the accountability for training and monitoring training to someone in the . . . field. So a representative for the plant would have that accountability and he or she made sure that the folks that were going through the training process attended the class. But they did not follow up and make sure that they truly understood what was there. So they put in their time but there was no real confirmation. [. . .] Actually what we ended up doing was what we call certification. We really had no certification model in place or acceptance in very limited areas. And we really, really struggled. It was a very dark time for us, those of us that had worked very hard for the year to the point of being able to pull the trigger and then discovered that the system is very, very stable but the processes to wrap around it were very, very chaotic. And we ended up with customer disruption issues and, I mean, could have very easily been to the point of saying, 'Wait a minute, let's go back to what we have and figure out a better way to do that'. Fortunately we had some very strong executive support at that time and we worked our way through those issues (Director of Electronic Business, US HQ).

SAP's instigators had to check the learning process to ensure that SAP's functionality was understood. Controls were introduced to prevent a subsidiary going 'live' without personnel understanding the implications of the new SAP philosophy. However, the learning process was more complex than just testing whether specific instructions on using SAP (i.e. knowledge about the system, 'K') had been correctly transferred to its users so they could operate it (i.e. act, 'A'). As the Business Relationship IS support team leader at USA HQ stated,

> Another lesson learned was that we needed to require the plants to demonstrate through use that they knew what they had been taught. It's not good enough to have people go to training, pass a test, and be proficient enough when the system goes live. We train people now and then put people through . . . several iterations of integration testing leading up to their deployment, so that they can demonstrate to us that not only were they trained but they can put that training into use. We didn't do that in our early deployments. . . . When we went live we had a bunch of confusions, which led to a lot of support and a lot of people actually travelling to that remote site to carry out that integration experience. . . . The last couple of deployments we have forced the sites . . . to go through with these iterations for the three or four weeks leading up to the deployment and the deployments have been much more successful as a result.

The initial learning strategy was consistent with the modern constitution of change in Figure 1: before acting (using SAP) you need to learn how to use it (follow a set of guidelines). This assumes certain knowledge (a packaged set of instructions on what SAP is, what it does, how it can be used, its features etc) that must be transferred to prospective users. This relation between knowledge and action did not work in Think-Pink and training had to be re-conceived.

An analysis of the implementation through the theoretical lenses of Figures 2 and 3 might attribute the initial problems to bad training (the package of knowledge) resulting in a bad implementation (set of actions). However, another theoretical frame of reference leads to a different interpretation more consistent with managers' recollections. They suggested that the revolution implied by SAP's underlying philosophy of 'Common, Global and Simple' made little sense outside the daily context of tasks putting into practice the abstract knowledge from training sessions. This is different from 'learning by doing' where skills are acquired by practice, which assumes the transfer of fixed skills is implanted through rehearsal. In Think-Pink what people learned was constantly de-*fined* and re-*de*-fined during daily business activities. SAP was often described as evolutionary, hence difficult to grasp and define. Three examples illustrate this.

- *SAP is so powerful that you can't just go to one person and say what is the best way of doing this. It really is evolutionary (Financial Director, UK subsidiary)*

- *It has changed a lot . . . since I first saw it. People discover new features and new ways of doing things every day. There is very much an onus on looking into the system: into what you actually can do. I don't think there has ever been a limit put on the system. (Plant Analyst, UK subsidiary)*

- *What we didn't fully understand was. . . that somebody who sat in [the Customer Service Centre] can actually run a report or monitor as products are leaving the factories. What we were told was, 'You do this and you do that' and then somebody further down the line was told, 'Right, you input this data that says that this material is now loaded and is on its way and that will create the invoice' . . . We knew that that was how the invoice was created but what we didn't know is that that posting allows us to look at it and say, 'Right, this customer wants delivery at five o'clock in the morning, it has left in plenty of time'. . . . Once we realized what it could do we then said: 'Right we will actually change what the load consolidation people do', so that not only are they putting the loads together but they can advise the customer that not only is it completed but that it is on its way.*
  So we have had to re-engineer further on as we have discovered the other things that SAP can do for us rather than just the basic order processing. Again it is coming out of reports. Once you understand what the system can do for you in terms of reports, you then look at 'Is that a useful report, to whom is it useful?'. In this case we are saying: 'Yes, we know it is left . . . hang on! We can use that for the customer! We can advise him it is on its way'. . . . The re-engineering is still taking place . . . as we are discovering . . . what the system can do for us. [For instance] I'm going to start something called Pricing Management because we have now discovered how we can predict price, look at price, analyse price and its effect on stages in the pricing process, off invoice rebate etc. So we are reorganizing ourselves to get a firmer control on price . . . it is only recently that we can do these things. (Customer Service Leader of the UK subsidiary)

The functionality and features of SAP changed with usage. Rather than having specific pre-defined characteristics, its ontology was defined through a long process of black boxing (Quattrone and Hopper, 2000*b*).[8] Daily activities defined the features of the system (what it is and does): not those who originally designed and sold it.

[8]Black boxing is defined by Latour as 'An expression from the sociology of science that refers to the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when

Knowledge ←——————→ Action
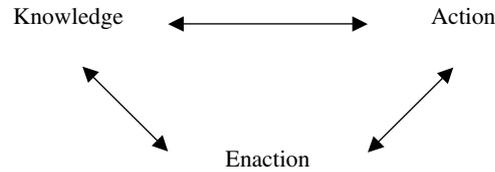
Enaction

Figure 4. The 'a-modern' constitution I: relations between knowledge and action. The notion of 'enaction'.

External knowledge on what the system is and what it becomes cannot be separated. It was dubious whether the organization isomorphized into what managers often referred to as 'best practices'. No single best way to implement the system existed because SAP's features were co-defined by the implementation itself (Quattrone and Hopper, 2000*b*). Managers and SAP users defined SAP's features through its use *in practice*—by enacting, understanding and enriching the abstract and sterile knowledge imparted during training. Daily acts using SAP and customizing it defined its functionality and made it intelligible. Without this, organizational members could not have understood or internalized the new philosophy of control proffered by SAP and the transformations it wrought.

False dichotomies between knowledge and action can be avoided by the concept of 'enaction' (Varela *et al.*, 1991) that assumes knowledge and actions are inseparable. Individual actions within organizations do not flow from a pre-ordered framework of facts and laws but are part of complex learning processes during which individuals create knowledge by doing things (i.e. actions). As is illustrated in Figure 4, knowledge and action are interdependent: *knowledge is a form of action* inseparable from the activity of doing. Individuals make sense of abstract forms of knowledge—such as that taught on training courses—through practical activities that eventually become codified into managerial practice. Analogously, *action is a form of knowledge* because acting requires learned practices to make it possible. Actors wishing to use SAP, understand it and define its characteristics and reports must rely on categories created through previous processes of fabrication, for example, defined and agreed notions of cost, transactions. Previous objects of black boxing give a common meaning to SAP.

Enaction does not reify relations between knowledge and action; it avoids privileging theories as *the* form of knowledge *par excellence*. If knowledge cannot distinguish abstract prescriptions from the practices that generate them, then practices (management duties and tasks) must have a status equal to theories (Quattrone, 2000*a*). Yet, practices flow from a long process of theorization and abstraction (or, as Latour, 1999, would say 'black-boxing'). The challenge is to reformulate relations between knowledge and rationality without reifying them or dichotomizing between them.

a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become' (1999, p. 304). See Quattrone and Hopper (2000*b*) for an interpretation of SAP as the emerging result of black-boxing activities.

Poly-rationality as the co-production of knowledge and rationality: what counts as 'best practice'? Arguing that a unique form and notion of rationality does not drive human and organizational behaviours is trite. Refuting that universal best practices of management exist has become common wisdom (except for sellers of best practices, e.g. ABC, TQM). Many studies of management control, (e.g. Bryman, 1984; Dermer and Lucas, 1986; Weick, 1976) demonstrate how individuals and groups within organizations have different interests and objectives and are in continuous struggle to attain them. Recognizing how organizational behaviour results from such struggles has been defined as 'multi-rationality'. Multi-rationality recognizes a variety of interests, valid sets of knowledge and best organizational practices. As Jones (1992, p. 244) points out 'there are differences in interests which attach to the different positions in the social structure occupied by individuals or groups'. Distinctions between functions, hierarchies and groups of allegiance within organizations help classify the rationality within which they are bound. Organizational behaviour and the definition of organizational practices are thus an emergent rationality from whatever organizational divisions prevail. However, slicing the organization into factions and then representing it holistically reproduces structural dichotomies that this paper wishes to avoid, e.g. individuals versus organizations. Depicting organizational behaviour as compromises at individual, intra-group, inter-group and organizational levels implies that each level externally exists. This creates another set of reifications that causes the continuous process of change to be neglected.

In Think-Pink achieving consensus on best practice was not easy. Theories of multi-rationality would attribute getting agreement on best practice for implementing SAP as individuals initially defining what should be done, followed by group discussions, e.g. within the Information System Development Group at HQ. Once this group reaches agreement after arguments and compromises, this definition of best practice will be negotiated with other hierarchical levels, e.g. the subsidiaries. Thus what is defined as best practice and rational for, say, which accounting system to implement within SAP passes through progressive aggregations, from the individual to corporate HQ levels. Ultimately the entire company agrees on what is best, although everyone knows that this has been negotiated. However, observations from the case study contradict this way of constructing best practice on what SAP is and does (see Quattrone and Hopper, 2000*b*). The multi-rational process follows a spatio-temporal sequence that is unique because spatial and temporal distinctions stem from categorizations and orderings of the observer that have no essence of their own. Multi-rationality cannot interpret events in Think-Pink because notions of time and space were multiple and neither linear nor progressive. This is illustrated by three examples of different consequences of implementing SAP.

The evolutionary nature of SAP: the serendipity of the process. Managers in Think-Pink often referred to the evolutionary nature of SAP but this was not linear in space and time. Notions of best practices and roles played by different spaces within the MNO changed in complex processes as the Finance Director of the UK subsidiary testified:

> If I am honest [SAP] is almost evolutionary, it doesn't stop. What typically happens is that you roll it out in a business and they make the first sort of beachhead and then they roll it out in another business and the lessons that they have learned in that first business get transferred to the second business, but in doing so they actually add something to the piece.

> And the trick is that as each business gets rolled out, to bring the businesses that are already on SAP up to the new level of knowledge. It's actually quite difficult. . . . And so there is this constant retraining almost, not just of the new business but of the old business, saying we have learned something else and you need to come up to speed. It's a great idea.

Managers' descriptions of how SAP continuously evolved and changed its features did not follow linear paths. Nor was it driven by the centre (HQ) or any ideal model of best ways proselytized by HQ, though the support of the USA HQ for SAP was important. As the Customer Service Leader of the UK subsidiary remarked,

> We are constantly looking at how each other works and . . . it took some time for [HQ] particularly, to have to admit that the way that they operate only works for the US, right. What we have had to learn is that we can't impose an organization around the same system. The organization is going to change as market situations dictate.

He observed that attempts by HQ to bridle innovations from sites across the world failed.

> [The Vice-President for Customer Operations globally] tried to get customer operations leaders [together] and it didn't work . . . because we were all trying to do different things with SAP, right, and we were also saying, 'No, no. . . ', or even switching off because . . . 'What you are talking about now is of no interest to me'. And we soon realized that we couldn't all get together. We were actually wasting our time but we still needed a link, right. Instead of all being together it is much better if it is a wheel with a hub and spokes in the middle that we can all sort of feed into and that is how we operate.

The solution was experimentation through mediated compromises:

> [The Vice President of Customer Operations globally] goes around, talks to people, looks at good ideas, . . . When I talk to her, we sit and talk . . . like we are doing now. She will pick ideas from me, she will say, 'Well, we have tried this' and she will send me emails and presentations that they have done. If I've got a problem that I can't sort, either I will contact her through Customer Pride [a unit set up to solve SAP user problems] if it's a system thing, or if it's a process thing I will just ring her or send her an email and say, 'Look we have got this, have you got any ideas?'. And she will come back to me and say: 'We have got it'. That sort of chain. We tried to formalize it.

The centre or focal point leading innovations for improving the functionality of SAP changed constantly: it could be in Europe, Asia-Pacific or Africa. For many organizational members where this centre lay ceased to matter—Think-Pink was becoming a-centred.

SAP versus Scala: a never-ending story.   Insights from case study research often come from fortuitous encounters. The story below is an example. During the researcher's visit to the European HQ, a manager scheduled for interview was temporarily unavailable and the researcher was invited to interview a manager responsible for another software package in the corporation—Scala. The encounter proved fruitful and insightful.

The manager compared Scala to SAP thus:

> SAP uses a big centralized system . . . all the data will be consolidated into a big database. Scala will cover almost all the same processes. . . . All the functionality that you can find in SAP, you can find in Scala, maybe not with all the same features but . . . Scala will work locally. [. . .] Where you want to get full consolidation of your data, real time consolidation of your data, SAP is the best solution. But if you want a full package and want to do all your business from finance, logistics, manufacturing, project, service, whatever you need, if you want to have a local support, if you want the software in your own language, if you want

> to have most of your local regulation met by the software, then Scala is a good option. . . .
> Scala is a company operating in 90 different countries. Scala is translated in over 30 different
> languages and all the countries where we had it implemented we found local support.

The reason for Scala's survival within Think-Pink was attributed to the following:

> [Think-Pink] decided to go on SAP four or five years ago. [Think-Pink's] Pipe Division is
> mainly composed of ventures. They are small companies all around the world and . . . they
> came to the conclusion that it was impossible to deploy SAP there. It is too heavy, and too
> expensive and . . . in most of the countries where this division has a site the technology is not
> in place. At that time the Pipe Division was looking for a common system to be deployed on
> all the sites and we were already using Scala in two sales offices, three sales offices in Spain,
> in Germany and in Sweden. [. . .] We said: 'Why not see if this one can be used?'. Then I spent
> one year almost in Norway where we had the technology centre for the Pipe Division just
> prototyping and discussing with the user and checking whether or not we could use Scala
> as a strategic IT package for the division and we came to the conclusion that this package
> could be used. We started to deploy it in Norway and after that we just ordered it out all
> over the world and today we have it within the Pipe Division. We have eight plants using
> Scala. And, at that time [Think-Pink] was deploying SAP and in some of the sites they came
> to the conclusion that they could not install SAP for different reasons: localization, for local
> regulations, language—in Italy, for instance, SAP could not be deployed because within the
> local site, there were not enough English speaking people.

Scala was used in sites beyond the Pipe Division where it cohabited with SAP.
It could appear that Scala was merely residual software awaiting replacement by
SAP. This was not so. When asked whether this cohabitation caused problems of
integration the manager replied

> You will find my answer a bit strange. . . I am not convinced that they. . . [Think-Pink] need
> full centralization of all the data. For sure, to be able to manage . . . say a multinational
> division, you need . . . minimum . . . financial consolidation, and you may need . . . some
> regular reporting on, say . . . stock level or whatever, but I am not convinced that you need
> to use SAP to do that. Is the fact that Italy today is running Scala an issue for the business?
> I cannot answer you—we are not in the business. In terms of financial consolidation for
> instance, I don't think it is an issue because . . . from Scala we automatically extract the
> balance of the accounts, convert it to the SAP chart of account, and integrate it in SAP.

The manager responsible for Scala offered a different view on SAP's pretensions
to globally integrate activities in Think-Pink. This was difficult for him to digest
as, apart from the composite business, Think-Pink's businesses appeared quite local
rather than global. He commented

> Why do they centralize in [HQ] when anyway what you are producing and storing in the
> UK you can only sell it in UK? . . . OK you will have some manager in [the USA] that will
> have a view on your figure but that is all . . . if you can provide those people with regular
> information, the need for centralization would disappear.

He continued

> The IT world, or the business world is a cyclic one. Ten years ago we said you should
> decentralize to have small businesses that can respond very quickly . . . can change the
> way they are doing business . . . we had to decentralize almost all the IT work that we had
> done. Now we have started the other way. We have said that we need to be a world wide
> selling company. We needed a global view on the business because we can produce in India
> and in Africa and in South America and stuff like that. It means that we need to centralize
> everything and, as I told you, the idea behind SAP is 'global, common and simple'. Global
> it is for sure. . . . They tried to stay common but the more and more they are progressing in
> the deployment of SAP the more and more they discover that to have common process in
> completely different businesses is very difficult. If you want to stay common, either you put

very complex process where you do not need it...or you put two simple processes where you need a more complex process. But it is not simple any more because in any plant in the world to make a small change you need to report that centrally [...]. And before the change has been made it has to be made to everybody first and it has to be checked that by doing this change it will not impact all the other business. It means that we have built a ship but a ship that big that it could become a Titanic soon! ...We are in a position where we cannot move the direction where we go without paying a lot of money or without taking a big risk because I tell you, every single change that you want to make in the business, for one business will impact all the other businesses.

The issue pertinent to this paper was the suggestion that the rationale (and rationality) underlying the choice between SAP and Scala was changing once again. To a degree, relations between knowledge and rationality in this dispute over best business practice in Think-Pink were a matter of fashion (see Carmona *et al.*, 1998). Like most fashions it would soon change.

This possibility was apparent in the creation of a joint venture with another MNO involving Think-Pink's European Building Material Division (managed almost entirely through SAP with the exception of the plant in Italy). The manager commented that: *'This new venture is a very good example of where just to spread the information between two different companies costs two million dollars'*. A major issue for the joint venture was whether to keep SAP or choose an alternative, of which Scala was a leading candidate.

This has insights for relations between knowledge and rationality. A practice rejected because the knowledge it incorporates does not constitute best practice is not necessarily discarded forever. It can return, possibly modified (making the arrow of time in Figures 1, 2 and 3 reversible). The sheer scale of MNOs and the multiplicity of spaces they inhabit provide refuges for discarded IT practices that, when conditions permit, re-emerge from their hiding places and ambush attempts to homogenize MNOs. SAP, with its slogan of 'global, common and simple', appeared to be overwhelming Scala, whose slogan was 'local, different and customized'. But this did not happen. There was no evolution towards a centre, or to common practice based on the 'best of the possible worlds' (Voltaire, *Candide*). Instead there was a co-existence of variety with different aims, information systems and needs. Once again, despite the mediations of the centre, processes of change and evolution were neither linear nor cumulative.

From the totalitarianism of modern control to the 'orgy of totalitarianisms' of a-modern control practices.   The exertion of control after implementing SAP denoted a passage from a 'totalitarian' view of control (where an identifiable *locus* in space and time, say the controller at the reporting period end defining what is 'good' and 'bad' management performance) to a multiplicity of *loci*. Here spaces and times competed and collaborated to re-define good practice without a cumulative and linear learning processes. The 'a-centredness' of Think-Pink was apparent in how the SAP philosophy transformed ideas and practices of control.

Before implementing SAP, control in Think-Pink traditionally resided with the accounting function. The accountants reproduced centralized control from specific spaces in time and space, i.e. the accounting function was represented at each hierarchical level where it enacted accounting reports periodically, for example, monthly cycles. This ceased once SAP was in place. Control became dispersed across many business functions (spaces) at indiscriminate intervals (times).

The Director of Finance of the UK subsidiary described the accountants' ensuing roles as follows:

> We are seen as not so much controllers but very much as within the process, trying to drive efficiencies, trying to reduce costs, trying to enhance revenue growth. ...My financial team is almost not my financial team ... for instance I have a team of plant analysts and they work on a day-to-day basis far more closely with the manufacturing people than with me. So I set up a framework for them from a financial management point of view but in day-to-day relationships they are far more embedded in the manufacturing team. Similarly I have a sales analyst who on a day-to-day basis deals with the sales leaders rather than with me.

The accountants' role changed from a bookkeeper (and gatekeeper) to an analyst (Jazayeri and Scapens, 1999). Accountants lower down the hierarchy recognized this as a plant analyst recalled

> With SAP the days have gone where if you are the maintenance leader you come to me and say 'How much money did I spend this month?' because you can just get to your terminal and look. And obviously it is your responsibility to control that cost and part of the job expectation is to (1) forecast how much money you are going to spend, let's say on repair materials and (2) also track ...the costs, how much you are spending, whether you are going to meet your plan and your forecast in the budget. And I think that it is because the information is there.

He continued

> A good example is the plant that I work at. It used to be ...totally isolated and it didn't have SAP. ... I had been at [that plant] from September of 1999 and it went live on SAP in July but before July it was a stand-alone business. It had its own sales team, it had its own internal sales. People now call here [UK HQ] and order [that plant's] products, but before they were used to calling directly to the plant. But with [Think-Pink] having absorbed us now it's a manufacturing unit, so a lot of the duties that were required ... they used to have a couple of accountants because they used to need to reconcile the balance sheet...that is now not happening because that is managed centrally and other people are doing ...typically accounting things. The maintenance manager is responsible for his costs. There is no requirement for the cost analyst or the plant analyst to track those other than to give the final numbers, consolidate for the plant.

Paradoxically, centralizing the accounting function decentralized control to people previously controlled by accountants. After SAP people became 'hybrid accountants', as Burns and Baldvinsdottir (1999) point out. Even the traditional core activity of accountants, posting the books, was delegated to a myriad of centres. The Director of Finance added

> The other issue with SAP is that people have had to get used to new ways of dealing with money, a new way of working almost ... it's almost outsourcing the financial recording to this shared services organization. And there is a process that you go through where you check everything that you do and ... most of the things that they do until you are happy that, yes, they know what they are doing. Eventually ... you just accept the result. My analysts do very little conventional posting. They may post the odd correctional entry. In fact some analysts aren't allowed to post. They generally are analytical people rather than analytical accountants.

The changed beliefs and practices emanating from centralizing records (now kept virtually on a central server far away from plants) and decentralizing accounting analytical work, marked a transition from totalitarian control—centralization via control exerted by accountants—to 'an orgy of totalitarianisms' where everyone in the business might act as a controller (Mazza and Quattrone, 2000). Previously, good business practice (the relationship between knowledge and rationality) was, at least

ideally, defined and controlled centrally. Now this has gone. Like an orgy, everyone participates in it for the same reason (pleasure) but the meaning of pleasure may vary for individuals and be achieved differently. Everyone has access to SAP and can get information and exert control as they wish, slicing and dicing the organization and information, and defining what should be controlled, how and why, differently. Ostensibly, integrated business functions decide what is best for each business area and accountants analyse how this can be attained. In Think-Pink there were different centres and ways of defining good practice, knowledge and what is rational. There was a move to a definition of rationality no longer linked to a centre. Traditional views of rationality and 'weak' versions of multi-rationality have always looked for a centre to discern where different rationalities can be mediated. Now multiple centres exercise control and define discretional activities. The more people are involved in control, the less control is reducible to a common and shared view. Where and how many centres should exist is becoming less important than looking at how they interact. This is part of the journey towards a-centred organizations and poly-rationality.

From multi-rationality to poly-rationality (and beyond).   Multi-rationality oversimplifies the co-production of knowledge and rationality. Alternative explanations are required that recognize the significance of poly-rationality, multiple spaces and times and the emergence of a-centred organizations. ERPs and other real time information technologies make this more evident as Law (1997) recognizes:

> Different organizations [be they individual business units of a MNO spread across various areas] do not inhabit entirely separate worlds. *They do not happily co-exist in parallel universes. Instead they support, undermine, and in general interfere with one another in complex and uncertain ways*...they are partially connected (Law, 1997, p. 7, emphasis added).

Think-Pink is not a uniform universe but a melange of partially connected spaces and times that SAP helps connect.

Distinctions between organizational realities across space, such as HQ and subsidiaries, and across time, as illustrated in the Scala versus SAP event, have no existence independent of the observer (Foerster, 1981). Different categorizations, be they reporting times; or distinctions between HQ, subsidiaries and functional areas, differ according to the perception of the organizational actor making the categorization, for example, defining membership of an interest group. Nor can individuals and groups be segmented into conflicting camps with homogenous interests and beliefs, as multi-rationality implies—conflicts and mediations extend to individuals and the groups they are attached to. Homogeneous forms of rationality do not drive organizational actors (whether individuals or groups): rather they are driven by *poly*-rationality.[9]

Poly-rationality is intrinsically and reflexively related to space(s) and time(s). As is illustrated in Figure 5 knowledge and rationality are reciprocal. *Knowledge is a form of rationality* (in a synchronic and linear context; *hic et nunc*) because it provides co-ordinates giving value judgements on organizational activities such as

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[9]Our preference for the term '*poly*-rationality' (rather than '*multi*-rationality') is not based on an etymological analysis. However, the prefix 'poly' denotes a variety of abstract *poles* that define notions of 'best knowledge' and modern dichotomies such as knowledge and rationality, controller and controlled. The term is also adopted to signal differences between our concept and what is in the extant literature.

Knowledge ⟷ Rationality
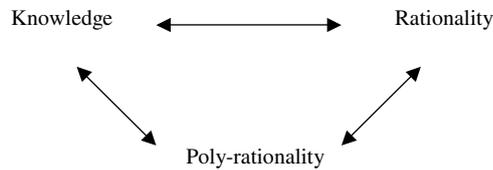
Poly-rationality

Figure 5. The 'a-modern' constitution II: relations between knowledge and rationality. The notion of poly-rationality.

implementing SAP. Treated as such, knowledge is the product of a given spatio-temporal framework. *Rationality is a form of knowledge* because it is enacted through daily practices across times and spaces. What is rational at one point in time and space may not be so elsewhere as new categories (new and different orderings) are rendered giving rise to a multiplicity of spaces and times. Times and spaces are also reflexively linked in a 'complex' and non-linear manner. The definition of 'before', 'now' and 'after' is a co-definition of all three terms (e.g. we cannot conceive of a 'before' without a 'now' and an 'after'). Analogously, constructs in a space ('here' and 'there') can only be defined through their co-definition. This process is tautological but it is impossible to escape: a word can be only defined through other words that in turn are defined by the word they seek to define (Morin, 1991). Current daily use gives sense and shared meaning to abstract words in a dictionary. Analogously, organizational practices construct and make sense of abstract notions of knowledge, actions and rationality, to create 'best practices'. Practices or 'doing things' shape abstract forms of knowledge and rationality by enacting them and delimiting the time and space where these forms and the orderings that they entail make sense. This is analysed below.

Praxis as the co-production of rationality and action: the importance of 'doing things'
How accounting shapes knowledge in contemporary societies has only recently been examined (e.g. Miller and O'Leary, 1991; Hoskin and Macve, 1986, 1988). Academic accountants often view practices as an inferior form of knowledge compared to theories. Consequently, academic attention has been deflected from the practical activity of enacting and fabricating knowledge that becomes judged as rational (Latour, 1999). Rationality assumes meaning only if it is made operational through regular practices located in a specific space and time, as Loft notes:

> To the untutored eye of an Azande tribesman an accounting statement would have no meaning other than a random pattern upon paper, just as a religious artefact from that culture would have no significance to us beyond its immediate physical and aesthetic appearance (1986, p. 138).

Accounting statements and artefacts of tribesmen have no specific meaning outside processes of enactment. Analogously, the adjudication of whether an accounting statement is 'right' or 'wrong' cannot be made against an abstract and general model but only from a practical and contingent definition. Accounting (and management information systems) have no essence (Miller and Napier, 1993) or specific meaning if they are unrelated to other entities, which in turn assume significance through accounting statements (see Ricoeur, 1992). Thus evaluations of

SAP and its implementation[10] unrelated to contingent practices and local meanings lack significance. This is evident in the different experiences of Think-Pink and Sister-Act when implementing SAP.[11] The rationale for SAP in Sister-Act was based on the company strategy known as 'the three Gs'—Global, Group, Growth. However, Sister-Act's attempts to use SAP to become more global differed markedly from Think-Pink's efforts towards the same ideal.

   The research in Sister-Act commenced shortly after it had held SAP workshops for its European subsidiaries to determine the best practice for each business process. This would then be incorporated into the SAP programme for all subsidiaries. In the words of the Director of Finance,

> We have brought a lot of these good ideas from Europe into the specification that we are developing. And we are giving the consultants and SAP some headaches … but we didn't promise them an easy life. … We are, after all, told that what SAP can do is provide the solution for the best practice for the business and if we are sure that getting everybody together will get us the best practice, then surely that is the goal that we should be aiming for.

He continued

> That is what these workshops are all about. It is not just saying this is the way we do it, but what we do is we say, 'Let's find out all the different ways that we do it and see what SAP has to offer and then choose between them'. So a group of accountants will get together and agree what is the best approach so that we can get the best out of what SAP can do. In other places we are saying, 'Let's do it that way and that is good and efficient and SAP will work'. There are others where we disagree. I've got a meeting later on this morning to fight the argument for [weighted] average and FIFO stock accounting and control … moving averages is the way that [SAP] does it and therefore they say that that is the best practice. I maintain that that may be the way that you do it but it is not best practice.

   Best practice was the aim but what was best for the consultants acting as spokespersons for SAP and its German designers was not necessarily best practice within Sister-Act. Differences were fundamental: they extended to what SAP could and should do. The ideal of integration driving SAP in Sister-Act was different from that in Think-Pink. In Think-Pink SAP was described as 'a cost cutting exercise' (International Business Controller, EU Regional Headquarters), and a stimulus for new, improved practices, whereas in Sister-Act the ERP project merely sought economies in current practices.

   Sister-Act's organization chart was left untouched by the implementation of SAP. For example, manufacturing remained separated from selling and distribution throughout the corporation.[12] The SAP design was expected to reproduce this differentiated structure: integration was not a priority. Also there were three SAP projects running concurrently (a European one, one for USA manufacturing and another for HQ in Japan directed at manufacturing). It was accepted that this would result in three different SAP systems running on three different servers.

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[10]That is, the value judgement on the activity performed—the link between rationality and action.

[11]A fuller comparison is in another paper on how action at-a-distance helps exert control in MNOs (Quattrone and Hopper, 2000*a*).

[12]The Japanese HQ directly owned all manufacturing facilities whereas a holding company owned the regional HQs responsible for selling and distribution.
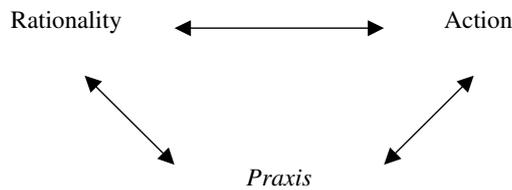
Rationality ←——————→ Action

Praxis

Figure 6. The 'a-modern' constitution III: relations between rationality and action. The notion of *praxis*.

SAP projects in Sister-Act were not expected to alter inter-company transactions. A complicated web of flows of goods and orders linked the various segments, areas and levels within the MNO. For example, typically an order received by a selling subsidiary would be passed to its regional sales HQ. This HQ would transmit its orders to relevant manufacturing facilities that would direct finished goods to the sales subsidiaries. The Japanese HQ, which directly owned the plants, would bill the regional sales HQ, which would bill the respective selling and distribution subsidiary! When the researcher contrasted the complexity of this exercise in Sister-Act to Think-Pink's methods a manager in Think-Pink exclaimed, 'Oh my goodness!!!' (Account Receivables Manager, Shared Service Centre, UK subsidiary). Sister-Act chose an evolutionary rather than a revolutionary approach to SAP.

This preference was not shared by all, especially the ERP project team members within the European HQ but it was how the (Japanese) manager responsible for the project and other key figures (members of the project steering committee and the Director of Finance) wanted it. This may be informative about the reflexive relationship between power and knowledge but, more importantly for the analysis here, it illustrates how relations between rationality and action, especially established routines, create path-dependencies for future actions. The taken for granted way of doing business in Sister-Act was not challenged by the eruption of SAP's philosophy. Ultimately, the design of practices and their enactment within the activities of managing the business determined what was deemed rational, even if they ran counter to initial judgements. Daily management practices created a paradigm for organizational members to judge what was right or wrong. Such value judgements could only be made if members had experience of different situations that enabled them to draw from different co-productions of knowledge and action. Value judgements only made sense if related to a specific spatio-temporal context and had no significance outside it.

This brief comparison of Think-Pink and Sister-Act illustrates how rationality and action are co-defined. This is illustrated in Figure 6. Here actions and rationality are interdependent. Actions reflect what is considered rational in a specific location in time and space. The practices of Think-Pink associated with SAP incorporated notions of best practice, integration that were different from those within Sister-Act (although both were using the same system). We refer to this co-definition of action and rationality as *praxis*, an act permitting individuals to make sense of organizational practice and judge its rationality. In turn, abstract notions of rationality and abstract judgements on the correctness of a given practice assume tangible value and meaning only if referred to concrete *praxis*—specific tasks and

operations that organizational actors carry out, such as the implementation and usage of SAP.

4. Organizational change as 'drift' in 'a-centred' organizations

The paper has reformulated relations between knowledge, action and rationality introducing the categories of enaction, poly-rationality and *praxis* to redefine change. A central argument has been that abstract (and abstracted) forms of knowledge, rationality and action have little meaning and hence influence upon behaviour in organizations. Actors attribute meaning through enaction and everyday *praxis* in a context of poly-rationality. The two case studies indicate how action made abstract claims such as 'global, common, simple', tangible. Everyday activities of problem solving, mediation and displacing abstract objectives and knowledge defined SAP as an entity and a working system: its potential could only be realized through practice (Quattrone and Hopper, 2000*b*). Making an idea operational is not a simple, practical conversion of managerial prescriptions but a creative and artistic act emerging from partial connections. What then is change given these claims about enaction, poly-rationality and *praxis*? Do the transformations in the cases correspond to modern definitions of change in Figure 1, i.e. an ordered path from a de-*fined* entity A to another B? The answer is No.

Change in Figure 1 is teleological, operating in a unique and linear spatio-temporal framework. In the cases there was teleology (however constructed) symbolized in the slogans of the two projects (*global, common and simple* and *global, group and growth*) but, above all, there was serendipity and a displacement of objectives. New practices defining the organization were casually stumbled upon. Conventional notions of knowledge, action and rationality could not explain the SAP implementation stories because they require a single set of criteria whereas in practice there were multiple right(s) and wrong(s). There were many centres defining SAP. This led the researchers to view control not as a hierarchical, totalitarian and centred practice but rather an orgy of totalitarian practices embracing multiple controls and locations. External (and unique) knowledge was not a template for implementation, nor were accounting and accountability practices creating single and unique benchmarks for assessing the validity of actions. Figures 1, 2 and 3 had to be reconceived to incorporate this multiplicity. Figure 7 is the result.

In the cases there was not adoption but *enaction*. There was no direct implementation of the SAP package because there was nothing to implement (see Quattrone and Hopper, 2000*b*), rather SAP's identity was constructed through *praxis*. Thus there was no change from one state to another as expressed in Figures 1 and 3 capable of being judged as rational from a single perspective. Rather there were multiple worlds in multiple spaces and times giving rise to *poly-rationality*. The modern definition of change needed replacing by an a-modern definition of *drift* to act as a proxy for change.

When things are drifting (say castaways in a boat in the ocean or friends lost during an excursion in a wood), they may have no devices such as maps or a clock to give them a conception of time or space. They cannot accurately define their location or the time though they are likely to continually try to do so. This does not mean that they will not act purposefully—they may try to create a shared idea of the 'right'
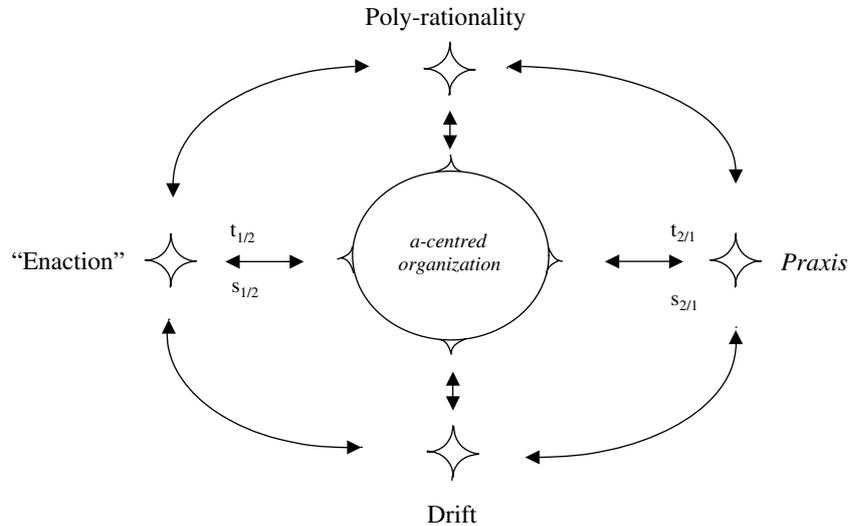
Poly-rationality

$t_{1/2}$

"Enaction"

$s_{1/2}$

a-centred organization

$t_{2/1}$

Praxis

$s_{2/1}$

Drift

Figure 7. The 'a-modern' constitution: relations between 'enaction', *praxis*, poly-rationality and drift entailing 'a-centred' organizations.

direction. Nor are they doomed to perish under the waves or in the perils of the wood. They may reach a safe beach or an (un)known village and get help. If they are unlucky they may return to where they started. But in both instances the purposeful action involves serendipity and chance, i.e. drifting.

The idea of drift is preferred to change for several reasons. First, it has no connotation that individuals are sufficiently conscious of space and time to transcend the contingent factors facing them. Secondly, there is no assumption that people move from well defined situations A or B in a linear, predictable and ordered spatio-temporal framework. Finally, it recognizes contingent factors (such as currents in the sea metaphor) that actors may be aware of, seek to respond to, but carry them along in unpredictable ways. In organizational terms, drift recognizes the existence of some knowledge of what an organization is, where it is and where it should go (for instance implementing SAP because of the pressures of global markets and automation). However, possession of such knowledge does not transcend actions or outcomes to unknown destinations.

Drift better represents the SAP implementations than modern definitions depicting change as the establishment of a fresh state in space and time. The modern definition does not recognize the number, complexity and scattered distribution of states in each MNO. How SAP modified doing business and its emergence from complex processes of mediation is more complex than conventional models of change imply. Mediations determined what SAP was, what it drew from and what it did but this was not simply the result of compromises between hierarchical spatial configurations such as subsidiaries and HQs as in the conventional model. Rather the new technology brought new and unstable spatio-temporal frameworks of control where various streams (teleologies) conflicted and co-operated in an orgy of totalitarianisms (serendipity) to produce organizational drift. It cannot be claimed that the streams transformed the organization, as this presumes the existence of the problematical

before and after dichotomy within conventional ideas of change. The organizations studied did not change from point A to B but drifted—paradoxically they could find themselves back where they were five years previously, as in the Scala case. Drift resembles incomplete *attempts at organizing* (Brunsonn and Sahlin-Andersson, 2000; Law, 1997) rather than a move from and to tangible, definable and reified objects ('things', *res*, *rei*). Managers (like academics) tried to categorize technologies, systems and events by definitions that were different, unstable and incomplete. There was no single over-riding perspective and no single centre that captured this organizing endeavour.

Figure 7 illustrates how relations between enaction, *praxis*, poly-rationality and drift produce a-centred organizations. Figure 3 was built on one perspective that defined knowledge, rationality, action and change. In contrast, Figure 7 incorporates multiple worlds, spaces and times and recognizes that one perspective in space and time producing a single categorization is unlikely to emerge in complex organizations. SAP was enacted and defined through its usage in doing business at each point. Praxis defined 'best practice' regarding SAP's features, implementation and use. In Figure 3, establishing whether an organization has changed always requires value judgements because what counts as knowledge, rationality and action is not self-evident but requires choice and categorization by the observer which in turn defines criteria for judging the effectiveness of change. In contrast, Figure 7 has no stable point of vantage in space or time for observing and assessing change. Instead there is drift. There are attempts to organize across multiple spaces and times but these are not necessarily linearly ordered. There is no neat linear flow of instructions from s_1 to s_2. Hence the lack of a pre-ordered pathway (in space and time) in Figure 7 for defining what an organization *is* and how it *changes*. Instead it depicts how many attempts at *organizing* through enactions, poly-rationalities and praxis exist simultaneously leading to organizational *drifting*.

Notions of improvement, progress and advancement have strong temporal connotations of movement from one time period to another. However, multiple times co-existed in the MNOs studied, hence the arrow of time in Figure 7 is no longer linear but multiple and reversible ($t_{1/2}$, $t_{2/1}$). What one organizing space in the MNO considered a more *advanced* IT system (for example SAP rather than Scala) was not necessarily shared in another location. Also, what appeared more advanced could change under different circumstances as occurred after the emergence of the joint venture operation. Paradoxically, the actors that define best practice may consider what they categorize as less advanced as more suitable for their locally enacted information needs. Under such circumstances notions of centred organizations do not reflect the partial encounters of different worlds partially connected (Law, 1997), how multiple centres and points of view attempt to order events and how each attempt is incomplete and unable to centre the organization in itself. The concept of 'a-centred' organizations recognizes these factors and calls for an a-modern constitution (Latour, 1991) that does not unquestioningly accept taken for granted notions of knowledge, rationality, action, 'best practices' and their reciprocal relations. Instead it endeavours to show how these different poles are constructed on a daily basis, and how organizing gives meaning to abstract claims and management practices.

Viewing organizations as 'organizing(s)' does not depict organizational development as an evolution towards better states. There is no room for isomorphisms that

make actions identical to an ideal 'reality' (whether socially constructed or 'real'). Instead organizations are conceived as in a continuous state of flux where multiple activities of categorization intersect to create different notions of 'best'. The path of this drift (and associated value judgements) cannot transcend the contingent praxis in which it is constructed. Thus there is no problem of closing the gap between knowledge and action, and determining the correct training to ensure that SAP is correctly used becomes irrelevant, as there is no single knowledge to provide a benchmark. As a consequence, accounting needs to be seen not only as a centre of calculation but also as a centre of discretion, as a set of practices that intrinsically constrain but also enable change. The issue shifts from determining instructions on correct knowledge to one where instructions can only be reconstructed after defining knowledge, rationality and action through enaction, poly-rationality and *praxis*.[13] Whether this is a viable and robust framework for understanding organizational and accounting change (or drift) requires further investigation. Whatever, it is an attempt to persuade colleagues in organization theory and accounting who have also abandoned the secure harbour of rational choices, methodological individualism and realism to reflect further on the epistemological consequences of this decision. Once the safety of the harbour of realism has been abandoned certainties are lost and voyagers are tossed into a turbulent ocean of research methodology.

5. Concluding remarks: implications for research in accounting and control

The paper has argued that studies of organizational change have largely ignored the question of what change is. The paper has illustrated how and why the extant literature, whether inspired by a theory of rational choices or by the search for contextual factors explaining change, is trapped in a problematical modernist constitution that grants the object of change and observers a definite ontology and methodology. Even attempts that highlight the plurality of inputs and outputs of accounting change are trapped within a modernist dichotomy which defines boundaries such as *in* versus *out*, *external* versus *internal*, *organization* versus *context*. Attempts to overcome this issue have viewed change as a process drawing on the notion of institution but epistemologically it is difficult to reconcile this with the idea of change as process.

   The paper speculated on how to move from this state of affairs. Observations from two case studies of management control systems and works within the sociology of translation and constructivism helped redefine modernist conceptions of knowledge, action and rationality through notions of 'enaction', poly-rationality and *praxis*. These were used to construct notions of 'drift' and 'a-centred organization' as proxies for conventional definitions of change and organization.

   The paper has sought to offer insights for interpreting organizational change processes (or drifts?), including accounting ones. Usually accounting has been studied as a practice that creates centres of calculation. Thus it initially drives change only to culminate in maintaining organizational stability. This paper advocates instead studying how accounting destabilizes organizations and conceiving accounting

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[13]Gould (1985) calls the expression of the impossibility of linking a pattern of actions to a 'given', metaphysical, reified and super-ordered form of knowledge 'exaptation'.

as a practice that allows 'centres of discretion' (Munro, 1999). If organizations are 'a-centred' then a re-conceptualization of accounting and control as a discipline and an organizational practice is required. Epistemologically, this requires stopping treating accounting and control research and practice as productions of organizational knowledge and starting to investigate the conditions that give rise to such fabrications. As is argued in Quattrone (2000*a*), accounting should not be interpreted as an activity that produces knowledge but as the 'knowledge of knowledge'. This requires studying how and why accounting information is produced and its effects on organizational drift, within the context of dynamic and evolutionary fabrications of knowledge in organizations. Accounting knowledge needs to be treated as a co-production of different points of view across multiple organizational worlds, times and spaces, rather than a static and centred performance measurement activity for predetermined ends.

Centred organizations presume control is a prescriptive activity establishing rules to programme activities: The theoretical employment of 'a-centred' organizations presented here requires control practices and theories that acknowledge the importance and role of gaps. A useful way forward may lie in adopting the minimalism of Law (1997) in his call for an epistemological re-orientation of control, and the proscription of Varela *et al.* (1991). 'Proscriptive' activities of control are oriented towards investigating actions trying to provide stability to networks called organizations, rather than prescribing actions necessary for successful organizational performance. Rather than asking 'What is the 'right' behaviour to achieve organizational objectives?' we should ask 'What behaviour is permissible without undermining the organizational stability of the network of humans and non-humans called organizations?'. Control is then no longer about prescribing 'right' courses of action but describing 'possible' courses of action. The issue is no longer making organizational activity isomorphic to a specific and de-*fined* kind of knowledge (be it 'real' or 'socially constructed') but taking into account how and why actions construct such knowledge. This requires the academic and practical arms of accounting and control to more explicitly recognize how it is concerned with organizational pluralism rather than organizational uniformity, and being open to and recognizing multiple, diverse worlds rather closure to a single, homogenized world.

Acknowledgements

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