



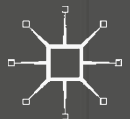
MATERIALITY AND MANAGERIAL TECHNIQUES

NEW PERSPECTIVES ON ORGANIZATIONS, ARTEFACTS AND PRACTICES

EDITED BY NATHALIE MITEV, ANNA MORGAN-THOMAS,
PHILIPPE LORINO, FRANCOIS-XAVIER DE VAUJANY AND YESH NAMA



TECHNOLOGY, WORK AND GLOBALIZATION



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Materiality and Managerial Techniques

New Perspectives on Organizations,
Artefacts and Practices

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Preface: Materiality and Managerial Techniques

To rephrase Keynes (1936), it is not only the ideas of economists and political philosophers, both when they are right and when they are wrong, that are more powerful than is commonly understood. It is also the case that the ideas of management and organization scholars should be added to the list. The reasons are evident. Most of us spend at least 35 hours a week and often many more hours than that, almost every week, in organizations shaped in their design, structures and practices by some more or less explicit ideas about how to organize. Practical men and women, those who believe themselves to be quite exempt from any intellectual influences are, as Keynes said, usually slaves of some defunct economist and, one might add, defunct organization and management theorist. Indeed, if it is the case, as I submit, that the everyday world of work is ruled by little else other than such ideas, then one might as well be clear about what it is that is being thought and practised, in the name of which theories, with what provenance.

Management is an area in which there is considerable public and private investment producing much thought, consuming a great deal of paper in its retail and retelling. The journals of management are replete with articles on almost any conceivable topic, plus some that might have been better not conceived, as well as some that might strike one, initially, as somewhat inconceivable. The practices of management intersect occasionally with some of these conceptions although many of these practices

have an unblemished relationship to anything that smacks of a formal theory or evidential basis. It is a matter of most people's mundane acquaintance with the world of work and organizations that much of what is practised in their routines is locally constituted rather than being an explicit instantiation of a more general theory. Nonetheless, there are more general theories that can often account for that which is practically unaccounted.

At their best, the ideas of management and organization scholars are premised on a deep engagement with that which they seek to account. In this volume the accounting is structured in terms of a focus on managerial techniques. Now, there are many ways of approaching such techniques: for instance, they can be audited or surveyed in terms of the intersection of local understandings of management techniques made sense of through the techniques of survey research methods. In such approaches the tensions between the sense-making evident in local contexts and the striving for acontextual findings that contribute to the sense-making of more general theories can often be evident. The two sets of techniques can easily become entangled in confusing ways. Such entanglements are revealed in tensions between the status of the lay theories in use in specific contexts and the formal theories embedded in professional management and organization scholarship in universities and other research centres. Moreover, embedded in these tensions is a warp and weft that connects the local with the formal, often through the management consulting industry and its products.

There are other ways of researching and these other ways are widely represented in this book. Think of managerial techniques as locally embedded practices, formed through habitual custom, shared ritual and periodic incantations to performativity in the practices displaying such custom, ritual and incantation. In other words, think of any specific practice of managerial techniques as being in many ways similar to a complex social organization and intersection of cultural and material practices, much as an anthropologist might find as they delve beneath the surface of everyday life in whatever communities of practice they study. Typically, we think of these communities as exotic but, of course, they are not exotic to those whose communities they are: that is just how they live their life in that place in a way that is no more nor less exotic than that of the

everyday context from which the alien anthropologist comes. Good anthropologists understand this and so seek to delve deep and translate the rich and often tacit elements of the complexity they engage with into terms that can make sense in other thought worlds.

Managerial techniques constitute complex local thought worlds and associated communities of practice. Rituals, beliefs, artefacts, routines, practices, reflexes and materialities characterize these worlds, many of which will bear close family resemblance, others of which will be more distant, some more refined in thought and feeling, created by clever, highly trained people while others will be evidence of a more common touch, a certain folksiness, foolishness even, that trumps more sophisticated intelligence in what it deals into being and limits in becoming.

Reader, in this book you will be able to vicariously experience managerial techniques in the raw, in the contexts in which they are embedded, by gleaning anthropological insight from these many and various accounts of managerial techniques as institutions, symbolic artefacts and collective activities. The upshot should be that seemingly mundane managerial techniques might be seen as much more exotic than was ever previously envisaged. Aspects of mundane organization such as local theories in use, the affordances of space, aspects of managerial control or information technology (IT) systems, or conceptions of risk and its management, take on previously unrevealed dimensions and aspects. Much as the anthropologist brings illumination to what might otherwise seem dark arts to the untutored observer so the mores, materialities and managerial techniques of everyday use in organizational settings are enlightened by these accounts. In these strange days, when a plenitude of defunct ideas seems to roam the world with increasing ease and frequency, enlightenment is no small thing.

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Reference

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Managerial Techniques in Management and Organization Studies: Theoretical Perspectives on Managerial Artefacts

Nathalie Mitev, Anna Morgan-Thomas,
Philippe Lorino, Francois-Xavier de Vaujany,
and Yesh Nama

This edited book focuses on the relationship between the materiality of artefacts and managerial techniques. The book therefore combines the recent scholarly interest on sociomateriality with an emphasis on management.

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This introductory chapter opens with a short overview of the Organization, Artefacts and Practices (OAP) workshop series and previous volumes in the series. It then provides a brief evaluation of the current scholarly treatment of managerial techniques within four major themes: managerial techniques for managers, techniques in practice, managerial work, and innovation and technology. Next, the chapter addresses materiality in management and extends its discussion into managerial techniques to show how material treatment of managerial techniques has contributed to their conceptualization and critical assessment. Having outlined the main strands of academic work within materiality of managerial techniques, the chapter closes with an overview of all contributions in this volume.

This edited book continues exploring the theme of materiality, following from previous volumes on *Materiality and Space*, *Materiality and Time* and *Materiality, Rules and Regulation* published by Palgrave Macmillan in 2013, 2014 and 2015, based on the (OAP) series of workshops run at Paris-Dauphine University, the London School of Economics and LUISS in Rome. This fourth volume is based on the fifth OAP workshop¹ on ‘Materiality and Managerial Techniques’ that took place in Sydney in December 2015. The event was organized jointly by University of Technology Sydney, Paris-Dauphine University and Wollongong University.

OAP was set up with the goal of facilitating discussions among scholars from various disciplines (e.g. management, anthropology, sociology, organization studies, history, geography, ergonomics, philosophy, information systems, psychology...) who share an interest in Science and Technology Studies (STS) in the context of organization and organizing. OAP relates to debates in the fields of STS, sociomateriality, organizational space, symbolic artefacts and managerial techniques, among others. Some of the recurrent OAP themes are: artefacts and objects as the constituents, results or outputs of organizations and organizing; materialization and performativity in organizations; the entanglement or imbrication between the material and social dimensions of organizational practices; new vocabularies to act or overcome the social–material dichotomy; discourses and materiality; the exploration of organizational

space, artefacts and spatial practices; the affordance of materiality and space in organizations; performativity, time and materiality; Marxist and post-Marxist approaches of materiality; history, *longue-durée* and materiality.

Topics covered at the Sydney workshop included managerial techniques and their sociomateriality (Wagner, Moll, & Newell, 2011); their performative dimension (Lowe, 2004); their role in managerial control; the place of materiality in fads and fashion in their adoption; their symbolic dimension; their relationship to organizational space; their relationship to organizational legitimacy (Richardson, 1987); the entanglement or imbrication between the material and social dimensions of managerial techniques and their uses; their affordances; and historical perspectives on their material underpinnings. Some of these will be represented in the chapters of this volume, selected from the forty-six papers presented at the workshop.

Structural shifts in economies have induced major alterations in the management of enterprises (Adler, Everett, & Waldron, 2000)

This volume concentrates on the subject of managerial techniques, i.e. the social and material tools and assemblages used by actors to 'guide' (i.e. channel, facilitate, make meaningful, rationalize...) collective activities. Managerial techniques are omnipresent in most intra- and extra-organizational relationships. Within organizations (Quattrone & Hopper, 2005), managerial techniques may appear in the form of performance measures (Dambrin & Robson, 2011; Lowe, 2004) such as enterprise-value added (Ezzamel & Burns, 2005), balanced scorecards (Busco & Quattrone, 2015), activity-based costing, dashboards, and management models among others. In relation to extra organizational and interfirm relationships, aspects of managerial (control) techniques and practices have been studied in the form of, for example, target costing/functional analysis, open book accounting (Mouritsen, 1999; Mouritsen, Hansen, & Hansen, 2001), strategic frameworks or outsourcing strategies. Managerial techniques may be designed and disseminated either by internal actors or external experts such as IT and management consultants,

publishers, and academics. Many institutional systems produce and spread a growing amount of more or less standardized managerial techniques.

New managerial techniques are tried by pioneering organizations, achieve some widely publicized successes and become more attractive to others seeking to improve their operations and/or their image. (Lozeau, Langley, & Denis, 2002, p. 537)

It is important to understand how and why managerial techniques are reconstructed in the course of ongoing interactions. This volume particularly explores the valuation and legitimation practices or processes involving managerial techniques, their modalities and specificities, and their involvement in collective activities.

Theoretical approaches on managerial tools, instruments, apparatus and ‘dispositifs’ (Aggeri, 2014) have garnered interest in social sciences, particularly French social theorists (Callon, 2013; Lascoumes & Le Galès, 2004; Moisdon, 1997). Management scholars (Aggeri & Labatut, 2010; Aggeri & Labatut, 2014; Boussard & Maugeri, 2003) have drawn on these social theorizations and provided valuable sociological insights on managerial instruments, tools and techniques. Latest thinking focuses on the performativity of managerial techniques (Vosselman, 2014), their sociomaterial nature, the role of calculative devices in organizing processes (Callon & Muniesa, 2005) and the valuation practices in which they are involved (Helgesson & Muniesa, 2013). Approaches to studying these can be actor-network (Lowe, 2001), practice-based (Nama & Lowe, 2014; Schatzki, 2001), neo-institutional (Quattrone, 2015), phenomenological, activity-based (Lorino, 2005), pragmatist (Lorino, 2001), Foucauldian (Cowton & Dopson, 2002), cultural (Ahrens & Mollona, 2007), political, symbolic (Ansari & Bell, 1990), structurationist, semiotic (Eynaud, Malaurent, & Mourey, 2016), critical, interactionist and conventionalist (Chiapello & Gilbert, 2013; Chiapello & Gilbert, 2016). However, much of this work has only been published in academic journals so far and much literature on managerial techniques is descriptive and uncritical and essentially present in management textbooks.

The aim of our volume is therefore to enable the integration of knowledge allowing for the mapping of current thinking and setting future research directions. Whichever perspective is taken, what is of more substantive interest for our purposes in the current volume is that mediations are enacted and organizational environments are shaped through managerial techniques assuming material features. The relationship of management techniques with management practices and ordinary work practices, and particularly ordinary collective work practices, is a key concern. This book explores in different ways and instances how material artefacts are able to inscribe and enforce managerial action which affects daily work practices.

Managerial Techniques

Managerial or management techniques have been the topic of much interest in management studies, and they cover a large range of analytical techniques, from strategic decision-making, accounting, performance measurement, project management, marketing to human resources techniques. However, the majority of publications that centre on managerial techniques take an applied approach and provide instrumental 'how to' guides focusing on particular aspects of managerial roles and aimed at practising managers. Few publications take a more critical stance that would appeal to an academic audience and these tend not to address sociomaterial aspects of managerial techniques.

Managerial Techniques for Managers

Handbooks and business books offer guidelines for managers on what they should do. A large number of volumes describe many such techniques. These types of books present detailed and systematic analytical methods for managers to assist in decision-making and to improve efficiency and effectiveness. The techniques cover all fields of modern management including corporate management, marketing management, operations management, financial management, human resource

management, information management, management science, planning and resource allocation.

Armstrong (2006) is representative of the enormous quantity of such business books. This is the fourth edition of a bestselling guide to modern management techniques and is designed as a companion for all types of managers, as well as a reference for business students. Its first edition in 2001 was entitled *A Handbook of Management Techniques: the Best-selling Guide to Modern Management Methods*. There are several versions of the handbook covering human resource management (Armstrong & Taylor, 2014), performance management (Armstrong, 2009) and leadership (Armstrong & Stephens, 2005). Other examples are Kandula (2003) on Human Resource Management (HRM) models and tools; Doherty (2000) on techniques and strategies for managing corporate risk; Tiwana (2000) on practical techniques for knowledge management; Porter (2008) and Fleisher and Bensoussan (2003) on techniques for competitive strategy; Fried, Schmidt and Lovell (1993) on techniques for measuring efficiency; Solvay, Sanglier and Brenton (2001) on managerial techniques for portfolio analysis; Olin (2002) on managerial techniques for new product development; Stacey (2012) on tools and techniques for leadership.

Many of these handbooks and business textbooks tend to concentrate on quantitative analytical techniques, as represented by McNeil, Frey and Embrechts (2015) on techniques and tools for risk management; Srivastava, Shenoy and Sharma (1989) on quantitative techniques for managerial decisions; or Linoff and Berry (2011) on data-mining techniques for marketing.

As well as describing and prescribing these managerial techniques, some books also evaluate them but mainly according to their internal logic and systematic qualities. Some study them in specific environments (e.g. Henschel (2008) evaluating risk management in Small and Medium-sized Enterprises (SMEs); or compare them, for example, Guillén (1994) who compares management models about work and authority. But few offer a critical deep-level analysis of what managers actually do with these techniques.

Managerial Techniques in Practice

Such analyses can be found in academic journals, for example Lozeau, Langley and Denis (2002), Addicott, McGivern and Ferlie (2007), Wilson (1995) and Staw and Epstein (2000) who expose the corruption, distortion, cultural control and bandwagon effects of management techniques.

There are few monographs that critically engage with the use of managerial techniques. Wensley (2013) presents a wide range of management tools and techniques but also offers theoretical insights. He illustrates the need for a balanced approach, emphasizing the importance of the questioning process in clarifying the nature of action proposals and any underlying assumptions. He eschews any approach which advocates one right way and encourages a greater appreciation of practical issues through analysis and theory. Some issues he addresses are: rationality, simplification, representation, choice, reflexivity, learning, evidence, uncertainty, isomorphism, false rhetoric, consensus, folk wisdom, engagement, error, casual causality, deliberate action, contradictory commonsense, fashions, the perils of learning from the past, the role of stories, dissonance, procrastination and interrogation. Elger and Smith (2005) challenge conventional views on the management and operation of branch plants of international firms, draw on detailed case study research of Japanese manufacturing plants based in Britain, and look at the interaction of international firms' work regimes and local contexts. They question the transferability of managerial techniques across different contexts through examining space and locality studies and the scope and limits of collective and individual action, resistance and acquiescence, and the hybridization of management models.

Managerial Work

Another strand in organization theory is to address the work of managers from a critical perspective. These include Fineman (2012) who explores the concepts that have shaped work in different societies at different

times. He considers the organization of working—from employment and labour—their social class and power implications; explores the types of work and their moral implications; looks at the cultural aspects of gender issues and work; and highlights how the concept of work continues to change and how it will develop in future. The role of managers is explored by Diefenbach (2009) who contends that the organizations of our time are in essence managerial organizations, and that even our societies are managerial societies. His book looks behind the portrait of management as value-free ‘technicality’ and challenges the image of managers as the selfless pursuer of an organization’s survival and development. He argues that the prevailing understanding of management and managers is only at the surface about functional aspects. Management has been, and is, all about the power and control, interests and ideology of managers. In an edited book, Tengblad (2012) concentrates on how managers understand their managerial selves and social situations from a practice perspective, using behaviour and activities of successful, experienced and skilled managers as the primary data for theorizing good management. The main tenet is to overcome the rationalist fallacy in management research and observe actual management in practice. Contributions include practice perspectives and everyday approaches on leadership and managerial work, identities, processes and interactions, operational managerial work, work activities, stress, muddling through and top managerial work. Watson (2001) observes the lives and experiences of managers struggling to succeed in a business organization facing major strategic challenges. He considers important questions about the nature of management, showing the rewards and pains managers experience as they cope with both traditional business pressures and changing cultures. However, material aspects of managerial techniques hardly feature in this type of work.

Managerial Techniques, Innovation, Technology

Another body of literature examines management, technology and innovation which presumably could be concerned with materiality, for instance books by Dodgson, Gann and Salter (2008), Gaynor (1996) or

Tidd (2006). However, their concern is predominantly about how to manage technological innovation strategically to improve companies' financial performance and competitive positioning. They cover frameworks, tools and techniques to manage innovation strategy, communities and networks; Research and Development (R&D), design and new product and service development, operations, production and commercialization; how to optimize investments in technology, achieve efficient business integration, link between strategic competencies, knowledge management, organizational learning and innovation; the measurement, management and improvement of organizational, technological and market competencies; and relationships with strategic, operational and financial performance. Pitsis, Simpson and Dehlin (2013)'s edited handbook of managerial innovation has a broader aim by placing humans, their acts, practices, processes and fantasies at the core of innovation. Their contributors present organizational and managerial innovation as a complex concept underpinned by varied ontological and epistemological traditions and disciplines. They reveal that it is something that exists and occurs at multiple levels of analysis, and from multiple zones of experience—the experience of managers, workers, psychologists, philosophers and economists.

Materiality and Management

Much has been written on materiality and the social, in general and increasingly in the context of organizations and organizing. Organizational scholars have produced a few volumes relating materiality, management and organizations and are the closest to our concerns. Carlile, Nicolini, Langley and Tsoukas (2013) look at the way material objects and artefacts are conceived in organizations, and how they function in interaction with human agents. They offer a new conceptual repertoire and vocabulary that allows deeper thought and discussion about the inherent entanglement of the social and material. Leonardi, Nardi and Kallinikos (2012) explore how the materiality (the arrangement of physical, digital or rhetorical materials into particular forms that endure across differences in place and time) of technologies, ranging from computer-simulation tools

and social media, to ranking devices and rumours, is implicated in the process of formal and informal organizing. Dale and Burrell (2007) concentrate on material space and examine the role and utilization of workplace space: how it is organized; how it can reflect organizational values; how it can affect employee identities; and the many ways in which the physical environment can influence and affect organizational goals, especially in areas such as commitment, creativity and innovation. These authors span multiple disciplines, including management, information systems, communication, sociology, the history of technology, and open up a new area of research regarding the relationship between materiality and organizing.

We have similar objectives with our present edited book and wish to dig further into the role and materiality of managerial techniques and tools in management and organizations. Our focus lies at the intersection of the topics briefly reviewed above, managerial techniques in practice, managerial work, and management and materiality which seem to be still considered as separate bodies of knowledge.

There is evidence of research crossing over these separate areas, but currently in academic journals only (see, e.g. Jarzabkowski, Spee, & Smets, 2013, Aggeri & Labatut, 2010). An example is Waddington and Frick (2015) who examine how a general strategic technique, Value Based Care (VBC) is implemented and legitimated in a local context. They find that an essential part of the strategy of VBC is materialized, and by using theories of institutional work and materiality, they identify that both humans and material objects participate in the institutional work. They show that humans and materials collaborate in the creation of institutions, and that the dynamics of materiality can result in different effects on institutional work, such as reinforcing effects, and hampering effects.

The key issue with journal articles is that the common themes and ideas pertaining to materiality tend to appear in narrow and specific titles that are aimed at very specialized audiences. The diversity of journals hampers cross-fertilization. An edited volume offers a great opportunity to bring the separate strands together to highlight both the breadth of the field and the common themes.

Materiality and Managerial Techniques

Most of the literature considering both materiality and managerial techniques together is published in articles, and to our knowledge there is only one book particularly related to our focus, *Sociologie des Outils de Gestion*, by Eve Chiapello and Patrick Gilbert (2013), the latter one of our contributors. We understand from these authors that their monograph will be translated into English with the provisional title *Management Tools: A Social Science Perspective*. This demonstrates the growing interest in this topic, and our edited volume would therefore address similar and timely concerns.

Recent work on managerial techniques by other French scholars has also been published as individual book chapters in French edited volumes: Aggeri and Labatut (2014), Chiapello and Gilbert (2016) and Eynaud, Malaurent, and Mourey (2016). They draw on social theories of managerial techniques such as a philosophical analysis by Moisdon (1997), a political approach by Boussard and Maugeri (2003) and a governmental perspective by Lascoumes and Le Galès (2004).

Aggeri (2014) emphasizes that the notion of ‘dispositif’, or sometimes also ‘agencement’ or ‘arrangement’ (‘apparatus’, ‘instrument’, ‘assemblage’ or ‘device’ in English but there is no exact translation for the French ‘dispositif’) has been mobilized in social sciences, but in a limited way in management and organization studies. It is a richer and more appropriate notion than ‘tool’ or ‘technique’, which we had to use in English here. Aggeri (2014) explains the malleability of the concept and its methodological difficulties. It generally refers to technical, legal or even artistic ‘arrangements’, but we concentrate primarily here on the technical ones. It relates closely to cognitive and socio-material aspects which format and guide managerial decision-making and practices. The setting up of a ‘dispositif’ refers to the arrangement of heterogeneous elements assembled according to a managerial objective and to deploy rhetorical strategies.

A technical ‘dispositif’ involves a set of elements constituting a mechanism, an apparatus or a machine but it must not be confused with a technical object. Many sociologists of science have studied socio-technical ‘dispositifs’ to encompass equipment and their associated use conditions,

examining their framing effects on collective action. However, their perspective is not so much on the logics or configurations of a socio-technical ‘dispositif’, but on its performative effects (Callon, 2013). In management and organization studies, the notion of *dispositif* is more concerned with its arrangement of rules, tools and actors, and its ultimate aim (Moisdon, 1997).

Management tools/instruments are present at work every day, even if we are not necessarily aware of them—from electronic badges, management information systems, to email or dashboards. They include work procedures, sorting systems, calculation and formulae, decision methods, organizational schemes, databases, computerized interfaces and management software. Beyond their explicit functions intended by their designers, managerial tools also ensure a range of implicit functions. Their examination can help understand what action these tools do to our world, what these tools do to action as we use them to act, including their unexpected effects.

Often considered from a technicist perspective, they need to be questioned as social actors of management in organizations. Eynaud, Malaurent and Mourey (2016) see a managerial tool not as external but intertwined with subjects/humans for action, and part of a multiplicity of use schemes which give it meaning and different functions. They analyse managerial tools as a composite: an artefact (an object or a set of material or symbolic artefacts); and a use scheme (subjects organizing activity) which include representational and operational dimensions.

According to Chiapello and Gilbert (2016) it is only quite recently that managerial tools have been recognized as having an existence of their own with which human actors constantly engage and rely upon. The agency of managerial tools indicates that they exert an action and are endowed with a capacity to act in the world, on humans, and influence them. They embody intellectual techniques which organize thinking, structure information and modes of action. Emphasizing their agency is important since they are present in situations and actions. Socio-technical *dispositifs* have an active role in carrying or inducing a certain way of doing things, or action as ‘performance’. Actor-network theory has shown that even though non-human actors do not have their ‘voice’ (or intentionality), they can influence behaviour through what it is inscribed in them.

Material instantiations of managerial techniques have been examined by management scholars from a range of perspectives. Miettinen and Virkkunen (2005) use activity theory to point out the limitations of neo-institutional studies as focusing on the pre-reflective and embodied aspects of human practice. Instead, they use the concepts of epistemic object and artefact mediation of human activity. They argue that representational artefacts, such as concepts, informational tools, procedures and models, are instrumental in inducing change in human practices.

Accounting research has shown much interest in accounting tools and techniques, and Lorino (2005), another of our contributors, applies activity theory to analyse target costing and organizational learning in new product development. Lorino (2001) also used a pragmatist approach to analyse the role of management and control systems in organizational learning, seen as related to the learning capacity of the individuals, and formal representations of organizational action (action processes, objectives, results and resources). Those formal representations include management systems for financial and management accounting, budgeting and planning, performance scorecards, investment and project management, task definition and so on. He uses Peirce's theory of triadic interpretation to represent the collective learning process as a constant interaction between formal representations and individual interpretation processes.

Ahrens and Chapman (2007) adopt a practice theory perspective to consider the role of management accounting in the constitution of organizations. Building on Schatzki's notion of arrays of activity, they emphasize the ways in which organizational members actively reconstitute their management control systems by drawing on them as a shared resource. By tracing the skilful practices through which social actors understand and mobilize accounting techniques, authors situate the interrelationships between technical and interpretive accounting processes and elaborate the ways in which management control systems as structures of intentionality both shape and are shaped by shared norms and understandings.

Actor-network theory has inspired much accounting research (see Justesen & Mouristen, 2011) on managerial techniques. For instance Briers and Chua (2001) study the implementation of activity-based

costing through the role of actor-networks and boundary objects in management accounting change. An organization's accounting system can be changed by a heterogeneous actor-network of local and global actors and actants. They focus on the role of boundary objects (e.g. data repositories, visionary objects, ideal type objects, and standardized protocol) able to stabilize and mediate diverse interests. Mouritsen, Larsen and Bukh (2001) analyse intellectual capital statements as managerial technologies making knowledge amenable to intervention. They mobilize aspects of actor-network theory to suggest that the intellectual capital statement is a centre of translation, via knowledge narratives, visualizations and numbers. Statements are a means of 'dis-locating' knowledge resources making them amenable to interventions. The latter allow tacit knowing of individuals to come into the open space of calculation and action at a distance. Mouritsen and Thrane (2006) conceptualize accounting as an actor helping to mediate, shape and construct interorganizational networks through self-regulating and orchestration mechanisms. Both mechanisms are organized around various kinds of accounting (e.g. transfer prices and intellectual capital statements) and around the construction of segmentation in the network that provide it with a topology of centres and peripheries.

Skærbæk and Tryggestad (2010) base their study on Callon's notion of performativity, specifically the active role of accounting techniques in relation to strategy formulation, and the configuration of the identity of key actors, and in constituting strategy and strategic change. They show how accounting devices reject, defend and change corporate strategy by mobilizing people. Dambrin and Robson (2011) explore performance measurement practices in the pharmaceutical industry with a particular focus on the inscribing (or 'tracing') of pharmaceutical representatives. They show how ambivalence, opacity, bricolage and practical actions enabled by inscription devices strengthen networks of performance measurement. This highlights how weak references can perform and circulate without reversibility in the chains of transformation between matters and forms.

Goffmanian approaches explore further how accounting techniques point to social frames. Vollmer (2007) investigates the ways in which the use of numbers is involved in the ordering of activity in social situations.

Goffman's method of frame analysis is drawn upon to investigate how the utilization of numbers is interactively regulated. Through framing and keying, numbers acquire a three-dimensional character combining calculative, symptomatic and existential qualities. A social order unfolds when participants attempt to regulate at a distance activities embedded in networks of circulating numbers. Lorino, Mourey and Schmidt (2017) also draw on Goffman's theory of frames and situated meaning-making to explore the role of accounting in managers' ongoing efforts to understand and influence organizational change. Accounting numbers are viewed as signs mediating situated interactions. They show the mediating role of frames, and the plasticity and vulnerability of framing processes. The paper exemplifies the dual nature of accounting numbers in situated meaning-making; they can be viewed simultaneously as generic models—parts of social frames—and singular events—parts of the current situation.

Critical approaches have also been used to study accounting managerial techniques. Miller and O'Leary (1987) draw on Foucauldian governmentality in their study of the construction of theories of standard costing and budgeting. They see them as calculative practices, part of a much wider modern apparatus of power, concerned with the construction of the individual person as a more manageable and efficient entity.

Others have also concentrated on management techniques as a language or a form of narrative account and discourse, such as Boland (1989)'s reliance on the hermeneutic turn to appreciate that our knowledge of accounting and organizations is not guaranteed by a method that separates the objective from the subjective. He argues that knowledge of accounting and organizations is constructed through a social practice in which such distinctions are not meaningful.

Finally, the conventionalist approach (Boltanski & Thévenot, 2006; Chiapello, 2005; Eymard-Duvernay, 2002) is represented by Chiapello and Gilbert (2016) who explain that managerial tools carry 'truths' and tend to order and hierarchize according to various value systems, objects and people. Managers rely on these productions to make decisions, and it is difficult to disentangle the role of tools in these decisions. We can talk about codecisions by tools and humans since the action is due to the fusion of the manager and his instrumentation. Managerial tools create

new realities, much as administrative practices create what they pretend to describe; similarly to how economic science is performative in that, instead of describing the world, it tends to transform it so that it conforms to economic theories. For ideas to shape the world in their own image, a large number of sociotechnical mediations are necessary. Chiapello and Gilbert (2016) analyse functions of managerial tools in three categories: epistemic (enable to know), pragmatic (enable to act and decide) and political (enable to influence, control, dominate and arbitrate). Their epistemic and pragmatic functions—explicit since tools are there to be of use—are not sufficient to describe what they do to action. Indeed, enabling action often means imposing on it a deeper structure. Using a tool changes the structure of the activity, and can result in new activities to be carried out. For instance, a tool often fulfils two simultaneous aims, enabling an action and reminding that something must be done.

Chiapello and Gilbert (2016) argue that value judgements embodied in managerial tools usually trigger a quasi-automatic allocation of social goods (reputation, financial benefits, status and power). Thus effects due the pragmatic function of tools can largely be seen as related to issues of power. Since actors are aware of the weight of tools on their action possibilities (structuring effect) and on the allocation of resources they can access, they change their modes of action in order to improve their situation. The fundamental ambivalent nature (between malleability and rigidity) of managerial tools delineates a space in which social actors will fight to set up new rules—through objecting to, absorbing or appropriating tools.

Chiapello and Gilbert (2013) believe that a social analysis of management tools has to start with thinking about the notion of ‘instrumentation’ in management. Whereas traditional thinking tends to only see their normative and rational aspects, activity theory stresses the instrumental dimension of managerial tools which resides in how they mediate individual action and support collective learning. Anthropologists of techniques highlight their immaterial dimension to go beyond their commonsense understandings and envisage them as objects with triple characteristics—functional, structural and processual. In the narrative paradigm (e.g. Karl Weick), a managerial tool is a ‘language being’ which

gives sense to action in organizations. Other sociological approaches such as performativity (Muniesa, 2014) or quantification (Desrosières, 2016) also help to understand organizational action through techniques.

Some managerial tools can become institutional references and adopting them reinforces organizational or individual power. There are two main forms of domination—reification and legitimation. In both cases the technical dimension of managerial tools is predominant and acts as a veil covering power struggles, erasing power asymmetries and making them seem normal. Since managerial tools objectify only some representations amongst many possible ones, they tend to mask existing conflicts. An example is digitization ('big data') which gives the impression that what is measured is precise, exact and objective, whereas a measure is a questionable contingent construct. In hiding this and the arbitrariness of the conventions they carry but disguised as neutral techniques, managerial tools contribute to legitimating social asymmetries. Managerial tools are ambivalent in terms of social relations as much as work practices.

Theorists and anthropologists of technology have had a strong influence on these scholars and their understandings of technical objects. They are inspired by, for instance, Simondon (1989) and Leroi-Gourhan (1945, 2013), who have explored the inscription of technologies in various contexts and questioned the relative autonomy of technical systems; they have shown how technology offers extended means to behave and act, moving beyond the dichotomy between an idealist understanding of techniques as representations, and a materialist vision which sees the material world as a given (Lepage, 1989, in his introduction to a special issue on Technical Systems in *Anthropologie et Sociétés*).

Based on the above, particularly a strong record in accounting research, we can divide the analysis of the materiality of managerial techniques into the following theoretical traditions:

- Activity theory (e.g. Lorino, 2005; Miettinen & Virkkunen, 2005);
- Pragmatism (e.g. Lorino, 2001);
- Practice theory (e.g. Ahrens & Chapman, 2007);
- Actor-network theory (e.g. Justesen & Mouristen, 2011);
- Performativity (e.g. Skærbæk & Tryggestad, 2010);
- Interactionism (e.g. Vollmer, 2007);

- Critical approaches (e.g. Miller & O’Leary, 1987);
- Narrative or discourse approach (e.g. Boland, 1989);
- Conventionalism (e.g. Chiapello & Gilbert, 2016).

Other approaches are also possible, such as structurationism and its focus on the way in which tools shape behaviour, and the role of actors in how tools become legitimate and meaningful; and neo-institutionalism which concentrates on the design, development and adoption of tools based on institutionalist and isomorphic approaches.

Drawing on this classification, we summarize four main streams of literature in Management and Organization Studies about managerial techniques in Table 1. We are aware that there could be some overlap: for instance, column 3 is somehow hybrid and can point to some research in column 2: ‘solidification of a culture’ can be close to ‘solidification of power relationships’; or between columns 3 and 4, for example, where the ‘symbolic’ in column 3 is close to ‘signs’ in column 4, with both to some extent involving the symbolic mediation of activity through managerial techniques. Our table therefore represents main tendencies and seems to us an appropriate device for organizing the contributions to this volume.

Book Structure

Participants to the OAP Workshop on Materiality and Managerial Techniques contributed to some of the streams in Table 1, which are therefore represented in this volume. We organized them into the following three parts:

- Part I: Managerial Techniques as Institutions
- Part II: Managerial Techniques as Ideology
- Part III: Managerial Techniques as Symbolic Artefacts
- Part IV: Managerial Techniques as Collective Activities

The following provides an overview of the individual chapters in each part.

Table 1 Managerial techniques (MTs) in management and organization studies

	Stream 1 Managerial techniques as tools (possibly adopted)	Stream 2 Managerial techniques as ideology	Stream 3 Managerial techniques as culture or cultural artefacts	Stream 4 Managerial techniques as activities or embedded into activities
Description	MTs are tools. They can be adopted or not by organizations and key strategic actors in organizations. Fads and fashions are important dimensions of the process	Artefacts are a sign among others of a managerial culture. This culture is part of a broader system including dominated and dominant stakeholders	Organizations are cultural systems or parts of cultural systems. MTs are cultural artefacts, they emerge as part of the cultural iceberg. Focus on symbolic dimensions of MTs Some commonalities with stream 2.	MTs exist and come to existence primarily through their instrumentation in the context of collective activities
Ontology and status of managerial artefacts	Artefacts exist out there. They can travel from one organization to another, and have specific causal properties that can be used by organizations	Ideology and superstructures are at the heart of theorizations	MTs are either the reification of organizational culture or an expression of it	MTs and collective activities are consubstantial to each other
Core concepts and ontologies	Tools; adoption; isomorphism; fads; fashions	Ideology; buzzwords; managerial domination	Culture; values	Techniques; instruments; activities; sign; instantiation

continued

Table 1 continued

Philosophical foundations	Stream 1 Managerial techniques as tools (possibly adopted)	Stream 2 Managerial techniques as ideology	Stream 3 Managerial techniques as culture or cultural artefacts	Stream 4 Managerial techniques as activities or embedded into activities
	Neo-institutional literature Institutional literature about fads and fashions (Abrahamson, Fairchild, etc.)	Post-Marxist and critical perspectives of managerial techniques, methods and concepts	Cultural perspectives (e.g. Schein) Symbolic perspectives (e.g. the Standing Conference on Organizational Symbolism)	Structuration theory, pragmatist theories, activity theory, conventionalism, instrumentalism theories (Simondon)

Part I: Managerial Techniques as Institutions

Chapter 'The Organizational Side of Outsourcing' by Luca Giustiniano and Federica Brunetta explores how, although outsourcing is a popular management fashion and its strategic and financial outcomes have been well documented, the literature has not examined the managerial techniques to address its organizational implications. They propose to examine these issues into two categories: (1) the paradoxes of outsourcing and (2) the management of the 'liminal' effects generated. The link between the decision to outsource some activities and the expected structural and strategic changes should encourage the adoption of long-term and multi-actor perspectives in the evaluation of the results. The reality is, however, very different. Top managers believe the organizational design will automatically adapt to the new post-outsourcing setting, without inertial constraints or negative reactions. Where companies once sought order, clarity and consistency (depicted in the organization charts and procedures), the outsourcing of activities might engender chaotic contradictions and inconsistencies. The unveiling of such paradoxes could contribute to the design of ad hoc techniques through a re-examination of the outsourcing phenomenon that would do justice to its inner complexity.

In chapter 'Budgeting the Future: Negotiating the Values of a Contemporary Liberal Democracy', Başak Saraç Lesavre approaches valuation techniques as an on-going, constructive and contested process and tackles a specific case of a very complicated object of valuation: nuclear waste in the context of the United States. The valuation of nuclear waste is both an ambivalent process related to the object under scrutiny and it is an extremely consequential one: the entire industry revolves around the values of nuclear waste. Scientific, political and regulatory institutions are not always armed with instruments and procedures that are specifically designed to handle temporalities and risks associated with dismantling and managing nuclear waste. Regulations and knowledge bases are far from being self-evident and generate major social, technical and political tensions. Based on fieldwork conducted in New Mexico, Nevada, Washington D.C., Arizona, and Boston, the author considers the design

and vicissitudes of the budgetary process to finance the North American nuclear waste programme, and dissects the uses of a standard economic evaluation method that is deployed to calculate the economic value of spent nuclear fuel. Proposing a sociology of valuation, she shows that in all those processes valuation is never solely about the object that is being subject to valuation, but it is also about the procedures, methods, equations, instruments, actors, documents, texts, debates and discourses that the processes engage. Valuation and evaluation processes render explicit the values of the state, the values of a community, the values of an economic method, the values of a government, at least as much as the values of the object under scrutiny.

In chapter 'Standardizing Control and Controlling Government: The Introduction of Internal Auditing in the French Government's Central Administration', Laure Célérier studies the establishment of an internal audit function within the French state central administration, intended to renew the modalities of control and to conform to the professional norms of internal audit, which proved to be destabilizing. She explores how the standardizing effects of internal auditing are articulated with local idiosyncrasies in a public administration context. This investigation is based on a study of a reform that implemented internal audit in the French government administration. It shows that internal auditing changes controllers' work, albeit in a circumscribed way; that the standardizing effects of internal audit are involved in a dialectical movement, where controllers seek their emancipation *vis-à-vis* external influences; and that the control of the administration is echoed by a control of controllers and of the government through internal auditing. This chapter invites us to rethink the effects of New Public Management reforms, with a higher attention paid to actors' appropriation of constraints in implementing new managerial techniques.

Part II: Managerial Techniques as Ideology

In chapter 'The Impact of Contemporary Management Ideas: Their Influence on the Constitution of Public Sector Management Work', Christine Shearer, Judy Johnston and Stewart Clegg draw on empirical

research conducted in Australia's Commonwealth Public Sector with senior management practitioners to address how contemporary management ideas influenced them and their work. The role played by senior managers, central agencies and the government in the acceptance or rejection of contemporary management ideas, including how such ideas travelled, translated, transferred and transformed is considered. Their disposition to being receptive to management ideas is explored, as is the process of legitimizing and accepting such ideas. The extent to which adoption of contemporary management ideas took place is considered. They find that many of the contemporary management ideas were deemed inappropriate and unsuited for the public actors, environments, and roles and responsibilities that constitute public sector management work. Reformers with an economic rationalist perspective advocated contemporary management ideas derived from the private sector. Reformers paid little attention to the uniquely complex characteristics and nature of the public sector.

In chapter 'Reconfiguration of Information Flows by Public Sector IT Systems: The Question of Fairness and Ethics', Dubravka Cecez-Kecmanovic and Olivera Maranovic argue that the proliferation of public sector Information Technology (IT) systems deployed to achieve transparency and accountability of service providers and to provide better services to citizens is based on a widely held assumption that IT systems are neutral tools that society can use to achieve common good and serve public interests. Their chapter addresses the question of ethics of public sector IT systems by problematizing the ontological separation between the technological means (tools) and the social ends. The tool view of technology is behind the notion of the information flows as 'intermediaries' that transmit information (meanings) from an IT system to its users. In contrast, the relational view assumes that IT systems and social practices coconstitute each other. From a relational perspective, IT-enabled information flows are 'mediators' (Latour, 2005) that translate, reconstruct and distort information they supposedly transmit. The chapter aims to demonstrate how this alternative relational framing of ethical questions makes a difference. This is achieved by examining ethical questions in a case study of a public sector IT system in education in Australia regarded as essential to achieving transparency and accountability. The

chapter demonstrates that the view of information flows as intermediaries hides complex processes at play in the creation of the new social order in the education sector. The ‘transparent’ process of becoming a good/bad student, a good/bad teacher and a good/bad school demonstrates that information flows are mediators that include largely hidden translations and distortions of meanings and identities, thus suggesting a particular ontological politics at play.

Part III: Managerial Techniques as Symbolic Artefacts

In chapter ‘Shall We Just Call Them Sociomaterial Black Boxes or Take a Peek Inside? An Anthropologist’s Impressionist Remarks’, Pierre Lemonnier offers an account of a real anthropological situation: one of those circumstances when acute astonishment appears within an otherwise thoroughly well-known context. While attending the OAP workshop in Sydney, he felt like an anthropologist in a foreign country: how was it possible that people who were obviously raising the sort of questions he had been dealing with for more than forty-five years said such bizarre things? In his chapter, he tries to understand why and delineates the questions that may arise from his discomfort. Since part of what then seemed to him incongruities resonates with debates in the anthropology of material culture decades ago, he clarifies the commonalities and differences between ways of looking at material culture. The anthropology of objects and techniques has recently stopped talking about techniques and materiality from afar and turned to exploring in detail the specificities of what materiality actually ‘does’ in human societies and culture. This has led to the demonstration of the highly specific role of materials, artefacts and physical actions in people’s everyday life, namely an essential participation in the sharing of a common world and way of life. He proposes that ‘sociomateriality’ should similarly be based on round-trips between theory and the ethnographic description and analysis of concrete situations, and not on a never-ending search for philosophical formulations of the mysteries of the ‘constitutive entanglement’ of the ‘material’ and the ‘social’ that every discipline interested in technology or materiality rightly takes for granted anyway.

Chapter 'Physical and Epistemic Objects in Museum Conservation Risk Management' by Erica Coslor introduces conservation risk management in museums as a type of managerial technique, highlighting the utility of object-focused approaches. It interweaves techniques of material culture studies, sociology of knowledge, STS and sociomateriality to think about two distinct types of objects in museums: the cultural and historical objects of the collections and the epistemic knowledge objects that contribute to management practice. In museums, risk management approaches can guide preventative conservation of collections and help to make decisions, providing a method for considering how limited resources can best be applied to the protection of collections, which links to issues of New Public Management. We also see the deployment, use and development of less tangible, epistemic objects of knowledge. Such epistemic objects are part and parcel of the risk management systems of study. Scientific knowledge objects, such as rates of decay and likelihoods of pest infestations under various conditions, form part of the conservation risk models. The author 'follows the object' and looks at the history and movement of collection risk management tools and practices in museums as a managerial technique, keeping in mind the important distinctions between the types of objects. She provides a historical study of models and equations through ethnographic research at Museum Victoria in order to see the actual practice, use and discourse around conservation risk management. This theoretical approach provides a foundation for future ethnographic research focusing on actual practice.

In chapter 'Organizing, Management Tools and Practices', Philippe Lorino examines the many different theoretical frameworks used to explore the relationship between management tools and organizational practices: rationalist characterization of management models as the vectors of best practices; cognitivism and its view of management systems as artificial representations of logical problem-solving procedures; practice-based analysis of management control as a situated practice; actor-network theory emphasizing the performativity of managerial tools, their 'actant' status and their situated combination into 'bricolages'; institutional views of legitimacy and decoupling between management systems and organizational practices; critical studies of managerial tools as conveying power and domination relationships. It is suggested that these streams of research adopt one of two

main theoretical and epistemological characterizations of management tools as regards their relationship with organizational practices: they assign to them either a status of representation, in the cognitivist sense of the word, or a status of social mediation, in a semiotic perspective. The chapter illustrates this using a case study concerning the management of experience feedback in the nuclear industry. Concerning management systems, the category of ‘textility’ proposed by anthropologist Tim Ingold may be more adequate than the category of materiality. Textility appears as a particular interweaving of purposeful—teleological—movements, in which meaning-making social groups make/fabricate situations as ‘material’ situations, by exploring the intimate structure of so-called matter. Management tools are not objects, in the sense of already formed and meaningful things, but materials to elaborate and to construct new forms, and principally narrative materials to build narrative forms—as the example of nuclear experience feedback shows.

Part IV: Managerial Techniques as Collective Activities

In chapter ‘Imbrication in Operational Control Practices: Evidence from a Complex Process Industry Setting’, Alan Lowe and Fazlin Ali seek to illustrate control practices that emerge as a result of the imbrication process between people and material/technology. These interactions take place as people seek ways to maintain a balance between an organization’s concern to meet desired product quality, while achieving the targeted yield and cost set in the budget. Management accounting practices and the development of measures and targets are implicated in micro day-to-day work. The authors find that the variable nature of input materials and production environment warrant for intermittent adjustments and controls on a very short-term basis to ensure productivity. They also consider the materiality of production and control technology and artefacts to provide insights into the explanation of the situated functionality of management accounting and control as practice by giving emphasis to the complex relations and processes of entanglement between bundles of social, material and technology as well as other rational practices in constituting management accounting and control practices.

Chapter 'How the Materialization of a Managerial Model Contributes to its Take Up: The Case of "Liberating Management" in France' by Patrick Gilbert, Nathalie Raulet-Croset and Ann-Charlotte Teglborg, focus on how managerial tools create an 'invisible technology' or a 'management engine' which structures or determines human behaviours and influences human action, bypassing their original objective and developing an 'agency' effect (Chiapello & Gilbert, 2016). They suggest that the management tools' materiality amplifies their 'agency', as it leads to combine the determining effect of the tool, and the strength relative to its materiality. Materiality induces 'shaping', often accompanied by irreversibility effects. They analyse the progressive materialization of a management model and study its implementation in a new context through the lens of its materiality. To analyse this solidification, they focus on socio-material assemblages and use the concept of *dispositif*. For Foucault, a *dispositif* is a heterogeneous ensemble of material and discursive elements (discourses, institutions, architectural layouts, rules, etc.). They show that the management model gradually takes the form of a formalized *dispositif*. They focus on the *dispositif*'s materiality, and wonder to what extent this materiality influences the transposition of the *dispositif* in the new context. The chapter develops two cases: a die-casting pressure company specialized in copper alloys, and a leader of own brand biscuits for large and medium supermarkets, hypermarkets and discounters. They reconstitute the model materialization process, from the managerial techniques in the first case study, and the transposition of the model in the second case. They identify different phases showing the progressive solidification of the *dispositif*. Finally, they analyse how the materiality is both the reason for a better diffusion of the model but also a source of resistance against its implementation.

Chapter 'Schatzki and Techno-Organizational Practice' by Anna Morgan-Thomas, argues for an important conceptual shift in sociomateriality research. Although centrality of practices as the ontological building blocks of organizational and social realities is widely acknowledged and activities represent a common concern in sociomateriality research, a closer reading of the literature reveals an important fault line. Studies tend to analytically privilege either entities or actions and the scholarship seems split between those relying on theories of arrangements versus those sympathetic to theories of

activities. The former conceives of social life as essentially revolving around arrangements of entities where social phenomena are organized in configurations and connections. By contrast, theories of actions explore situated actions in contexts; their focus is on action rather than configurations of entities. The analytical efforts to move from individual actions with objects to sustained patterns and manifolds of activity are meeting with limited success. Another problem concerns a somewhat reduced view of humanity that results from a post-humanist take on practice. Finally, the ontological assumptions behind assemblage theories deny the existence of a broader context for action and scholarship struggles to account for situated actions, actions in context or dynamic unfolding of actions in time. In an attempt to rebalance the theoretical repertoire, this chapter proposes an activity-based theory of practice by extending Schatzki's theory to the study of sociotechnical entanglements. The key argument is that a theory of actions may effectively address relational entanglements of materiality and action whilst allowing for the residual humanism, thus accounting more fully for sociality with objects, without weakening the position of technologies. The author's objective is to critically review current studies to explicate the treatment of practice and to offer an alternative approach. She examines how theories of practices have been conceptualized and analytically deployed in the study of sociomateriality. She then presents how Schatzki's treatment of practices differs from alternative approaches and how its use may be advantageous in the study of sociomateriality. The chapter explores the implications of the activity perspective for future study of sociomaterial practices by showing differences and important existing bridges.

In chapter 'Social Impact Measurement as a Dynamic Process: A Study in a French Non-profit Organization', Julien Kleszczowski and Nathalie Raulet-Croset focus on the process by which social impact is measured in non-profit organizations. They seek to understand how the positioning of social impact measurement at the border between internal and external issues influences the evaluation process; and how processes and results of social impact measurement simultaneously achieve simplification and maintain a sufficient level of complexity (Moisdon, 1997). They carry out action research in a French non-profit organization and follow two projects for which they describe the different steps of each process. They analyse these processes into two types: 'closing movements' that reduce

the activity to particular forms, and ‘opening movements’ that instead broaden the spectrum of evaluation. They show that external expectations match closing movements, while the internal challenges correspond to opening movements. They find that social impact measurement is a process where temporary imbalance characterized by either oversimplification or high complexity is corrected by reverse movements in order to get a balanced result. These results suggest the possibility of coexistence of divergent objectives and logics within one social impact measurement, and emphasize the dynamic dimension of social impact measurement.

In chapter ‘Managing Knowledge Management: Managing the Manifold Epistemic Objectives in Professional Health Care Organizations’, Christian Lystbaek concentrates on the emergence of agencies that specialize in the distribution of knowledge across professional and organizational boundaries such as standard-setting governmental bodies at international, national and local levels. Drawing from a research study exploring interdisciplinary collaboration in health care, the chapter looks at how the production, distribution and application of knowledge in health care relate to managerial techniques in knowledge management and form complex epistemic practices. Knowledge management in health care has the promotion of ‘evidence-based’ health care as a core objective. However, the notion of evidence-based health care is complex and contested. Different and sometimes contested epistemic practices, i.e. epistemic modes of working, have formed through which health care professionals get involved in ‘evidence’. Through knowledge management techniques, epistemic objects and objectives are identified, organized, materialized and further circulated in local communities of practice. Moreover, knowledge management practices are routed in specific ways along the logics and pathways suggested by knowledge management techniques. Thus, knowledge management techniques are ‘doers’; they have power, produce effects, mould perceptions and shape the course of collaboration among professionals. They are not only materialized as epistemic objects, but are collectively developed and ‘come to matter’ in health care organizations through different knowledge management techniques.

These three parts are introduced and concluded by the coeditors, explaining the structure of the book and summarizing the key contributions of the contributors with regards to managerial techniques and the material dynamic of organizations. Avenues for further research in the field of management and organizations studies are suggested in our 'Conclusion' chapter. A preface on materiality and managerial techniques by Stewart Clegg and a postface on management and sociomateriality by Karlheinz Kautz precede and finally conclude the chapters.

Notes

1. <http://workshopoap.dauphine.fr/fr.html>

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Part I

Managerial Techniques as Institutions

The Organizational Side of Outsourcing

Luca Giustiniano and Federica Brunetta

Introduction

Outsourcing is broadly identified as a relevant and multi-faceted strategic choice, but to date, its actual outcomes are still debated. It is well recognized that the success of outsourcing passes through cultural change, organizational restructuring and the ability to adapt to an extremely complex coordination. The frequency and scope of outsourcing and offshoring have increased constantly during the past twenty years, along with their popularity, which has coincided with other ‘management fashions’ (Abrahamson & Fairchild, 1999) and similar ‘bandwagons’ (Staw & Epstein, 2000), like business process re-engineering, strategic focalization, creation of shared services and corporate downsizing (Angeli & Grimaldi, 2010; De Fontenay & Gans, 2008; Gospel & Sako, 2010).

Being a multi-faceted strategic choice, outsourcing relates to structuring the entire organization in order to respond adequately to different issues. For this reason, it has been investigated by different streams of

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literature, such as the ones relating to: (1) strategic management (Prahalad & Hamel, 1990; Sanchez, 1995); (2) organizational approaches (Carlsson, 1994); (3) law and institutions (Domberger, 1998; Hart, 1995); (4) human resources (Leimbach, 2005; Marsden, 2004); (5) internationalization (Grossman & Helpman, 2005; Yu, 2005); (6) operations (Morrioni, 1992); and (7) innovation (Van Long, 2005).

Scholarly works on outsourcing have concentrated on the motives for adopting the practice rather than on its actual outcomes and effects, debating the idea of an adoption of outsourcing practices either as a fashion and isomorphic response, or as a more rational, cost and efficiency trade-off solution. Indeed, outsourcing and decentralization do not automatically—or necessarily—lead to a more competitive organization (Lankford & Parsa, 1999).

Literature has argued that ‘contracting out might be no more than a temporary enthusiasm’ (Savas, 1993, p. 43), and has noticed that it may be the result of an institutional fashion (Clegg, Burdon, & Nikolova, 2005), or even simply a technique, functioning as myth, that may be ceremonially adopted (Meyer & Rowan, 1977) as it may be selected for efficiency criteria but in practice may deliver far less efficiency than is often claimed (Benson & Littler, 2002; Walker & Walker, 2000). Looking at adoption of outsourcing practices in the public sector, the institutional motives and rationales seem to hold even more, even as a case of mimetic isomorphism (DiMaggio & Powell, 1983), if we consider that contracting out of public sector activities is adopted as a technique to bring the public sector into alignment with the practices of large private business enterprises (Quiggin, 1996).

Those who favour this ‘institutional fashion’ perspective, tend to emphasize the idea of an adoption of outsourcing practices based on mimetic, isomorphic behaviours (DiMaggio & Powell, 1983), rather than efficiency arguments (Clegg et al., 2005), especially when looking at the lack of understanding and dissatisfaction (Barthelemy, 2003) by top management teams (Rothery & Roberts, 1995) of its specifics and effects. Many contributions have shown that there are several weaknesses of the outsourcing strategy (Barthelemy, 2003; Lankford & Parsa, 1999) such as the fear of losing control of activities given in trust to a third party, and risk of quality erosion, or the reluctance to share confidential or strategic

data with third parties, or the difficulty of reusing human resources that can be made redundant after the transfer of some functions to outsourcing companies (Brunetta, Giustiniano, & Marchegiani, 2014). Thus, they tend to explain dissatisfaction and low performance effects of such strategies (Rothery & Roberts, 1995; Doig, Ritter, Speckhals, & Woodson, 2001; Shinkman, 2000; Macinati, 2008; Burmahl, 2000) with the idea of an adoption occurring only as an 'institutional' or 'culturally valued' phenomenon (Clegg et al., 2005).

On the other hand, a large number of studies focus on strategic motivations, such as an increased ability to focus on core activities by delegating to others activities that are considered of lower strategic importance, coupled with a potential quality increase in those activities requiring skills not available within the company, or even the possibility of acquiring more power to control activities or functions that are difficult to manage (Brunetta et al., 2014). Externalization of work at the task level through outsourcing or offshoring of work has been of interest to socio-material scholars (Leonardi & Barley, 2008), as social and material elements become interdependent in the process of organizing. Changes in artefacts provide people with new capabilities, changing their interaction and their reaction to change (Lommerud, Meland, & Straume, 2009).

Notwithstanding strategic motivations, economic rationales—and especially the quest for cost-efficiencies—remain the most potent tools for the promotion of outsourcing (Clegg et al., 2005), with outsourcing being adopted for activities in which the organization holds no special skills or fails to exploit economies (Brunetta et al., 2014),

Economic, institutional, strategic and financial rationales of outsourcing have thus been well documented (e.g. Giustiniano, Marchegiani, Peruffo, & Pirolo, 2014; Marchegiani, Giustiniano, Peruffo, & Pirolo, 2012), as well as some additional indirect costs, such as transaction costs (Coase, 1937; Williamson, 1989) related to contract monitoring and oversight, generation and negotiation, but also social costs, namely low morale, lower productivity (Dogerlioglu, 2012) and counterproductive anxiety (Barthelemy, 2003). Nonetheless, both the managerial practice and the extant literature still lack a set of consolidated managerial techniques capable of tackling some of the organizational issues relating to outsourcing.

Our aim in this work is to focus on the main organizational issues arising from outsourcing choices, and highlight how managers should adopt proactive techniques and play a definitive role in a company's life. Thus, we focus on the following research question: how can managers contribute to the sustainability of the competitive advantage by tackling the main organizational issues relating to outsourcing? We specifically focus on the two main categories of problems: (1) the paradoxes of outsourcing, namely the time span for the evaluation of outcomes and the effects of a multiplicity of stakeholders, and (2) the management of the 'liminal' effects generated by the adoption of outsourcing practices.

The Paradoxes of Outsourcing

The link between the decision to outsource some activities and the expected structural and strategic changes should encourage the adoption of long-term and multi-actor perspectives in the evaluation of the results. The reality is, however, very different. Two kinds of paradoxes deserve further discussion: (1) the time span for the evaluation of outcomes; and (2) the multiplicity of stakeholders, which is relevant to the decisions and their implementation. Managerial techniques can therefore be applied to deal with such paradoxes.

In a world where 'change is no longer a background activity but a way of organizational life' (Orlikowski, 2002, p. 1) and organizational change is no longer a merely slow, incremental and cumulative process (Meyer et al., 1993), the 'time paradox' relates to the fact that massive reorganizations of value chain activities call for a process of organizational change that often overtakes the time spans considered for the assessment of the outcomes. Organizational literature has analysed organizational change management through different perspectives (Orlikowski, 2002), each underlining, to a different extent, the role of managers in managing change, such as literature on planned change, depicting that managers deliberately initiate and implement changes in response to perceived opportunities and thus give emphasis to the rationality of managers directing the change (Pettigrew, 1985) or literature on punctuated equilibrium that assumes change to be rapid, episodic and radical, with

‘relatively long periods of stability (equilibrium)...punctuated by compact periods of qualitative, metamorphic change (revolution)’ (Gersick, 1991, p. 12).

The search for a new way of organizing the various elements of work, for example through re-engineering, which is fundamentally a ‘rethinking and radical redesign of business processes to achieve dramatic improvements on performance’ (Hammer & Champy, 1993) requires sufficient provision to deal with current and future requirements of the organization, but—more importantly—requires time. Organic ways of organizing arise, in substitution of traditional, hierarchical bureaucracy. In order to adapt to external change and pressure, functions are disaggregated and outsourced, in the search for an improved competitive advantage (Grey & Mitev, 1995). Thus, although companies expect the organizational settings to adapt to changes in the medium-term, the evaluation of the outcomes occurs mostly in the short-term. Lengthy evaluations and implementation processes require managers not to focus solely on short-term needs, but a long-term view of the move to outsourcing (Lankford & Parsa, 1999). The situation is even more serious when top managers believe the organizational design will automatically adapt to the new post-outsourcing setting, without inertial constraints or negative reactions. Consequently, where companies once sought order, clarity and consistency (depicted in the extant organization chart and procedures), the outsourcing of activities might engender chaotic contradictions and inconsistencies in terms of organizational goals, structures, processes, cultures and even professional identities (Latour, 2005; Smith & Lewis, 2011). An attempt to analyse issues related to the design activities and their relation to change has been made looking beyond the mere participation of managers to the inclusion of employees in the process, paying particular attention to material artefacts and to their role in making sense of change processes and work development (Stang Våland & Georg, 2014).

Social and material elements are interdependent in the process of organizing, they are, indeed, ‘constitutively entangled’ (Orlikowski, 2007, p. 1437). Indeed, changes in artefacts provide people with new capabilities, modifying their interaction and their reaction to change (Leonardi, 2013). Thus, materiality may enable outsourcing or offshoring of work at

the task level (Leonardi & Barley, 2008), rather than functional level. Nonetheless, outsourcing, or offshoring arrangements often involve great disparities in the expertise at home or at the external site (Carmel & Agarwal, 2002; Lacity & Willcocks, 2001), prompting new kinds of knowledge transfer problems. This is particularly relevant when specific knowledge is embedded in artefacts and tools, requiring learning related to firm-specific work practices, needs and specifications, not just general occupational skills and knowledge.

Managerial techniques should therefore be able to deal with such paradoxical tensions (e.g. efficiency vs. efficacy, control vs. autonomy, centralization vs. decentralization) that might persist over time (e.g. Andriopoulos & Lewis, 2009; Cameron & Quinn, 2006; Smith & Lewis, 2011). The unveiling of such paradoxes could contribute to the design of ad hoc techniques through a re-examination of the outsourcing phenomenon that would do justice to its inner complexity. Nevertheless, the long-term sustainability of goals depends on both short-term coordination and control of activities and the long-term maintenance of the relationships (e.g. Gittell, 2004), with both outsourcees and other stakeholders.

Thus, the idea that organizations are subject to multiple pressures is not new. In fact, any organization is subject to different groups of stakeholders, or of 'who or what really counts' (Freeman, 1984; Mitchell, Agle, & Wood, 1997), or 'constituencies' (Zammuto, 1984), and prompts us to identify a second paradox of outsourcing, which relates to the multiplicity of stakeholders.

The existence of a multiplicity of stakeholders is a consistent dimension of organizational life, and permeates any organization model and choice (Freeman, 1984; Rowley, 1997). Stakeholder theory focuses not only on an explanation of stakeholder influences on these decisions, but, since their relationships do not occur in a vacuum but rather in a network of influences (Rowley, 1997), on the multiple and interdependent interactions that simultaneously exist among stakeholders, driving tensions and influencing how organizations will operate under various conditions (Brenner & Cochran, 1991). Donaldson and Preston (1995) introduced three distinct, albeit mutually supportive, approaches to identify company stakeholders: descriptive, instrumental and normative. In particular, the descriptive approach explains the behaviours and characteristics

of companies whereas the normative approach focuses on the function of the corporation and identifies the 'moral or philosophical guidelines for the operation and management of the corporation' (Donaldson & Preston, 1995, p. 71). Through this lens, when it comes to outsourcing, the extant literature mostly describes companies as oriented to financial and strategic goals with a minimal consideration of other relevant stakeholders; whereas a normative approach addressing management techniques would tend towards a more inclusive consideration of all the stakeholders (e.g. including trade unions and work representatives). Because of the diversity in stakeholders' interests, a critical need exists to encourage managers to achieve a shared understanding among stakeholders and not only focus on responding to the self-interested goals of key organization-level stakeholders. This implies balancing expectations in response to different institutional pressures (Oliver, 1991), driven by the multiplicity of stakeholders. In other words, attempting to achieve parity among or between multiple stakeholders and internal interests, which is particularly important if external expectations conflict with organizational interests and an 'acceptable compromise' (Oliver, 1991) on competing objectives and expectations, may result in serving multiple interests more effectively.

The Liminal Effects

Despite the abundant amount of literature on the strategic and economic impact of outsourcing, few works have focused on the labour and worker perspectives (e.g. Brooks, 2006; Leimbach, 2005; Lommerud et al., 2009; Marsden, 2004), and most of them have focused on the social cost or the personnel issues relating to the idea that employees generally view outsourcing as an under-estimation of their skills, and counterproductive anxiety or under-commitment may arise (Barthelemy, 2003).

We focus, more specifically, on the 'liminality' effects arising from outsourcing decisions, as an additional organizational issue, and trade-off, arising from outsourcing decisions. Liminality is a state of being 'betwixt and between the original positions arrayed by law, custom, convention and ceremony' (Turner, 1977, p. 95). In other words, a space where the

regular routines of the formal organization are frozen (Sturdy, Schwarz, & Spicer, 2006), which includes temporary employees (Garsten, 1999), professionals in between different organizational identities (Zabusky & Barley, 1997) and workers who are involved in interorganizational networks and projects (Tempest & Starkey, 2004). Generally speaking, the experience of liminality is profoundly unsettling (Sturdy et al., 2006), because the known and stable organizational identities, routines and rules are dismantled, and substituted by new blurred or transitional identities, routines and norms. Nonetheless, liminality poses an interesting challenge, as it creates a space between formal institutions where cultural rules, norms and routines are not necessarily valid or applicable, thus the consistent state of fluidity might be seen as creative and even desirable (Garsten, 1999).

Some human reactions to outsourcing (of any kind of activities) are very similar to those observed by scholars who have analysed the dynamics of Information Technology (IT) infrastructure (Giustiniano & Bolici, 2012; Hanseth, 2000; Latour, 2005; Monteiro, 2000). Following David (1986), it is possible to identify some specific typical actors as:

- *Blind Giants*: 'Actors whose vision we would wish to improve before their power dissipates' (Hanseth, 2000, p. 68). All companies' stakeholders, including top management, can be trapped in this role when they uncritically try to favour or contrast any international outsourcing initiative and do not assess the effect of the defence of the in-house activity on the overall business of companies ('liminality of focus').
- *Angry Orphans*: groups of users whose routinized standards have been changed. Any employees working in an area that has any interdependence with an outsourced function could react with inertia or inefficiently to the change ('liminality of standards').

The execution of outsourcing strategies could generate new organizational exigencies like gateway roles or links between internal and external parts of the same business process. Such roles could be played either by contact/interface employees or by previous employees of company A who have moved to company B, along with the outsourcing of some activities. In this context, two scenarios are of interest in terms of new managerial

techniques ('liminality of role'): (1) employees remaining at the outsourcing company might experience significant job enrichment/impoverishment in terms of duties, coordination and control; and (2) if employees are absorbed by the outsourcee, they could suffer a temporary liminality that generates frustration and loss of individual/organizational identities.

Issues for Discussion

Outsourcing as a strategic choice for organizations experienced a widespread growth in the 1980s and 1990s. As the adoption of outsourcing practices grows, managers need a spectrum of information for the analysis of such a strategic option in order to better identify the opportunities and challenges involved with the externalization, but also to monitor decision factors relating to outsourcing.

The literature recognizes that for outsourcing to be successful the decision needs to be an informed one: while there is abundant literature on the motives for outsourcing, a more structured approach to the analysis of outcomes is being sought by managers and scholars in order to achieve stronger support in decision-making. We attempt to accomplish a deeper understanding of the outcomes of outsourcing, by identifying two main categories of organizational issues relating to the outsourcing decision, such as: (1) the paradoxes of outsourcing, namely the time span for the evaluation of outcomes and the effects of a multiplicity of stakeholders; and (2) the management of the 'liminal' effects generated by the adoption of outsourcing practices.

First of all is the issue of time to evaluate the outcomes of organizational change, as managers tend to expect the organizational settings to adapt to changes in the medium-term while the evaluation of the outcomes, by different stakeholders, occurs mostly in the short-term. Lengthy evaluations and implementation processes require managers not to focus solely on short-term needs, as the new organizational solutions do not automatically adapt to the new post-outsourcing setting.

Second, the multiplicity of stakeholders surrounding the firm permeates any organization model and choice; thus the inclusion of multiple

perspectives in the evaluation of outsourcing choices could be a solution to avoid unnecessary tensions and converge towards common decision processes.

Finally, the issue of liminality has been growing in the organizational literature, due to the increased attention given to the permeability of organizational boundaries, and will be taken into account when analysing outsourcing decisions, as these are likely to determine liminal spaces, which can be seen as both desirable and creative, but are traditionally considered as potentially unsettling.

Outsourcing is a business strategy and, being so, the link between the decision and the expected structural and strategic changes is tight. Managers should encourage the adoption of long-term and multi-actor perspectives in the evaluation of the results.

Although outsourcing is broadly recognized as a relevant and multifaceted strategic choice, its actual outcomes are still debated and detailed information in the hands of management can help avoid a costly and not easily reversed choice. Effective management of the outsourcing relationships is an organizational imperative, as it is well recognized that the success of outsourcing passes through a cultural change, organizational restructuring, ability to adapt and an extremely complex coordination.

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Budgeting the Future: Negotiating the Values of a Contemporary Liberal Democracy

Başak Saraç-Lesavre

In 1987, the US Congress designated the Yucca Mountain as the sole candidate site to host a geological repository project for the disposal of spent nuclear fuel and high-level waste in the United States, with the idea that the project would confine radioactivity for the next 10,000 years, and protect the safety and the security of present and future generations. Located at the Western periphery of the Nevada Test Site, in the Mojave Desert, one of the geographically largest but in terms of demography, the least populated states in the United States, the Yucca Mountain stands within the territories of the Nye County, where Mr. Terrible owns casinos, gas stations and grocery shops.¹ Joseph Masco, an anthropologist of the American West, states:

If the narrative of nuclear weapons scientists at the NTS (Nevada Test Site) presents a desert modernism in its positive form (that is, still invested in a conceptually pure narrative of progress), then the Yucca Mountain project represents its flip side, an arena where the dream space of absolute control and mastery of nature slips out of joint revealing other processes also to be at work. (Masco, 2005, p. 33)

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Extant literature on the permanent disposal of nuclear waste at Yucca Mountain has paid particular attention to the confinement of the monument of contemporary society ‘into eternity’. Among others, Joseph Masco considers permanent disposal of nuclear waste as an attempt to master the ‘uncontainability of the future’ and as an extension of modernist planning and its official discourse (e.g. Kuletz, 1998; Masco, 2005). Naomi Oreskes stresses that in response to environmental problems and natural hazards, the role of prediction has been heightened, as policy-makers increasingly demand temporal prediction for aiding their decisions. She stresses that this ‘political imperative’ particularly influenced earth sciences (Oreskes, 2000, p. 37). In line with her analysis, a number of scholars have examined how regulatory science pushed the limits of hydrology and geology in an effort to predict the very long-term behaviour of a geological formation through the deployment of predictive models at Yucca Mountain (e.g. Long & Ewing, 2004; MacFarlane & Ewing, 2006; Metlay, 2000).

Anthropologists and ethicists have investigated the kind of legal and technical knowledge basis deployed by regulatory science for the formulation of radiation standards with the aim of securing the population and the environment during the next thousands of years by preventing environmental contamination (e.g. Ialenti, 2014; Shrader-Frechette, 2005). Others have examined how ‘far-future’ societies have been imagined and how those imaginaries are inscribed in various instruments designed to warn far-future generations about the dangers of nuclear waste (Bloomfield & Vurdubakis, 2005; Galison & Moss, 2015). Other *Science and Technology Studies* (STS) scholars have examined how contemporary political institutions anticipate the necessity to cope with technical and political irreversibilities generated by long-lasting policy actions (Barthe, 2006; Callon, Lascoumes, & Barthe, 2001).

However, efforts to govern long-term futures are not always welcome. For instance, sociologists Barbara Adam (Adam, 1999) and Chris Groves (Adam & Groves, 2007) argue that considering that the consequences of modern undertakings occur solely in the present, these efforts can only be considered as wishful thinking. According to them, when the conventional knowledge system meets the actual outcome of its products in time, that meeting takes the form of a clash that generates paradoxes and

unintended consequences, which had not been anticipated by the society that put that system into action: neither its scientific predictions nor its control methods can do anything other than fail once they face contemporary conditions (Adam & Groves, 2007, p. 113).

When I started my fieldwork, I was witnessing the termination of the Yucca Mountain geological repository project; a termination that was in line with the political demands of its opponents in Nevada, who named the bill designating Yucca Mountain as the single site for high-level nuclear waste disposal the 'Screw Nevada Bill'² and considered that the project had been 'pushed on the throat of Nevada'.³

Once designated as a nuclear waste site, the fate of the project has mainly been delegated to techno-scientific, regulatory and political procedures that were explicitly crafted for the Yucca Mountain project, each of which engaged very long temporalities. The initial Nuclear Waste Act of 1982⁴ and mostly its 1987 amended version defined in detail the procedures that would lead to the validation of the candidate site to host a geological repository. First, the Department of Energy (DOE) was assigned to conduct a techno-scientific assessment, an environmental impact statement, during which it also had to release a technical viability assessment for the siting of a repository project at Yucca Mountain. Then, depending on its results, the Secretary of Energy could recommend the site, which would then be submitted for the President's approval. In the next phase, once the project received the President's approval, it was planned that the DOE would submit the licence application to the Nuclear Regulatory Commission (NRC) for a review of its compliance with NRC regulations and standards. Then, the termination of the Yucca Mountain project could only be the result of its failure to fulfill those complex procedures.

Yet, in a striking contrast with that expectation, in spring 2009, the Yucca Mountain project was abandoned, and from the beginning of 2010 a Presidential Advisory Commission worked to make recommendations about the reformulation of a national nuclear waste policy. Exploring how it was terminated, I discovered that the highly controversial and contested geological repository project was not terminated due to the results of a failure of its techno-legal licensing review procedure, nor through the political procedures that were put in place specifically for the

project, nor through the enactment of new nuclear waste legislation by Congress. The project was stopped through a budgetary action undertaken under the Obama Administration, despite the fact that it still figured in the national legislation as the only candidate for the siting of a geological repository project in the United States.

I conducted one of my very first interviews in Washington DC with a leader of Nevada's opposition to the Yucca Mountain Project, following an open hearing of the Presidential Advisory Commission assigned by the Obama Administration. Together with other activists, she had formed the Nevada Nuclear Waste Task Force, a non-profit organization, in late 1987, following the site designation of Yucca Mountain. Since then, the Nevada Nuclear Waste Task Force has been working as the contractor and the outreach arm for the state of Nevada's Nuclear Waste Project Office, the organization in charge of Yucca Mountain and nuclear projects within the state of Nevada. During the interview, her description of the history of the opposition in a single sentence was particularly revealing:

We sort of thought, we probably never admitted, but we thought we never would win, we wanted to keep the fight going on, and hoped that the government finally would not want to spend any more money...⁵

Her conclusion about the 'fight' was intriguing. Before reaching that conclusion, she described their 'fight' in detail; such as the state of Nevada's claims of authority on its territory at federal courts, the action of its politicians within Congress, and the production of scientific and technical counter-expertise by the State of Nevada questioning the technical and scientific uncertainties about the project's capacity to confine nuclear waste from the biosphere for thousands of years. Despite all those efforts, the activist expected the accomplishment of the termination of the project to be mediated by the government's unwillingness to further finance the project, and not as a direct result of more than two decades of long, legal, political, techno-scientific contestations and controversies.

All the previously mentioned studies examined how different fields of expertise pushed the limits of existing legal, scientific, regulatory, political technologies, and knowledge bases, in order to render nuclear waste governable. However, within the existing literature, there is not much scholarly work that retains budgetary mechanisms as the focus of analysis.

This chapter offers a genealogy of the Nuclear Waste Fund (NWF) that was specifically designed to finance the US nuclear waste programme. How did the institutions in charge of designing a nuclear waste programme, and a specific budgetary mechanism negotiate the values to be inscribed in such a mechanism?

In order to explore the budgetary process, I inquire into the technology that was put in place, which was made to translate this particular form of policy action into its budgetary form. This requires a first reflection on budgetary instruments and technologies. Political scientists Lascoumes and Le Galès suggest that ‘instruments’ should be put at the core of the analysis of public policies rather than being considered as secondary themes that are pushed behind the analysis of institutions, actors and their beliefs (Lascoumes & Le Galès, 2004, p. 11). They redefine the notion of ‘instrument’ against its functionalist use in the public policy literature, which uses the notion to describe neutral objects; whilst their questioning explores whether they efficiently display the objectives that are defined during their constitution by their designers (Lascoumes & Le Galès, 2004, p. 30).

Following *Science and Technology Studies*, Lascoumes and Le Galès consider that ‘instruments’ are socio-technical objects that cannot be reduced to pure technical rationalities, that are inseparable from the actors who deploy them, make them evolve and redefine them in use. Thus, the exploration should not be limited to the use of an instrument, but should also encompass the network in which the instrument is engaged. This perspective echoes with one of the main explorations of the social studies of accounting interested in the genealogy of accounting technologies (e.g. double entry book-keeping, discounted cash flows or standard costing) that transformed into accounting conventions, and penetrated into the everyday life of individuals, while society is also transformed through those technologies (Miller & O’Leary, 1987).

Then, it is important not only to explore how certain rationalities are being translated into technologies, but also how they are operationalized in an already operating world. Moreover, it is also important to acknowledge that the translation of rationalities into technologies also implies valuation processes. I am not only interested in the rationality of government, but also in the values around which such a mechanism is formulated. Drawing on the work of John Dewey (1939) and adopting a

pragmatist approach to valuation, just like Fabian Muniesa (2011), I approach the problem of value via a ‘flank movement’. It mainly consists of abandoning the consideration of ‘value’ as a substantive feature and implies considering valuation as an empirical act.

In this chapter, I explore how the NWF was made to enact a certain set of values and how those values have been constantly negotiated in practice.

A Peculiar Temporal Problem

Let me start by analysing different political and expert debates that took place to formulate a budgetary mechanism to finance the US national nuclear waste programme. Expert studies commissioned by the President, Congress and federal agencies to nurture the debate around the formulation of the national nuclear waste policy are interesting to start with. Those studies comprise specific sections on the management and funding of the nuclear waste programme. Whereas the techno-scientific, regulatory, legal and political formulations of the nuclear waste projects were debated in their relation to ‘deep time’ (Benford, 2000), the nuclear waste programme had its own temporality:

The waste management program will have an extraordinary longevity. Siting construction and emplacement of wastes will likely occupy a period of 45 years at the most. A repository would need to be maintained in a state such that the wastes could be retrieved for various purposes for an additional period of time, perhaps 50 years, before decommissioning. Thus the time frame for all these activities is about a century, already an exceptional period of time for most business organizations and longer than the lifetime of most of our government agencies... (U.S. Department of Energy, 1984)

This is an excerpt from the self-description of a study panel that was set up to study alternative means for managing and financing the construction and the operational phases of the nuclear waste programme, which treated the temporality of the management and the financing of the programme as a peculiar issue. The budgetary mechanism had to remain

under the continuous scrutiny of some kind of organization or institution: it was a different technology compared to the rock bolts or the titanium shields that were designed by the engineers to ensure the confinement of nuclear waste. The budgetary system had to be accountable to contemporary institutions, but the same institutions and their politics had to be maintained at a certain distance from the Fund, so that the project could be pursued during the course of its long life. Thus, the budgetary mechanism was supposed to enable a balance between a certain independence that ensured the continuity of the programme, and a certain control that maintained it under the scrutiny of contemporary institutions.

This was a challenging task. Budgetary and management instruments were included in several legislative proposals. In the hearings on a number of legislative proposals preceding the adoption of a national nuclear waste policy into law, mainly between 1981 and 1982, few comments were submitted on the budgetary mechanism of the programme, and more particularly on its spending side. The US nuclear waste policy was founded on the principle that nuclear utilities and other waste generators should be responsible for fully financing the nuclear waste programme. Thomas Cotton was one of the experts who testified and submitted comments on the spending of the collected revenues. He was in charge of the Office of Technology Assessment's (OTA's) nuclear waste policy mission. Until it ceased in 1995, the OTA had been an office of Congress in charge of the evaluation of scientific and technological decisions, providing Congressional members and committees with alternative analyses of the complex scientific and technical issues.

Before the House, Cotton expressed the OTA's vision on the pending nuclear waste legislation. He based his arguments on a comprehensive report that the OTA was preparing.⁶ Cotton articulated the two conflicting promises that the spending mechanism had to reassemble 'the steady and predictable progress towards timely achievement of a long-term goal', by maintaining the programme's independence and 'oversight and control that is required in a democratic society' (Cotton, 1982). He articulated that the reconciliation of the two was 'one of the most difficult challenges involved in devising a comprehensive waste management program'.

Translating Values of the Programme into a Budgetary Mechanism

Hence, finding a technology that can generate an arrangement between the continuity of a long-term programme while making it subject to the control of democratic institutions is an issue that involves translation (Callon, 1986; Latour, 1984). As Arnaboldi and Palermo (2011) suggest, the translation of programmes of government into instruments often creates gaps, discrepancies and ambiguities.

Furthermore, the ideas of those who design the script of the instruments, and of those who operationalize them, often have ‘heterogeneous and rivalrous’ (Rose & Miller, 1992) perspectives on the objectives to be achieved by the instruments (Arnaboldi & Palermo, 2011), a potentiality that is often inherent in the script of the instruments themselves (Akrich, 1992).

In the Congressional Budget Office’s study, which was released at the request of the OTA and conducted by its economists, this balance was sought in the exploration of three traditional budgetary technologies, namely direct appropriations, trust funds and revolving funds. The tension between the required independence from short-term politics and accountability towards institutions was translated into a fine-tuning of the frequency of Congressional oversight, into the placement of the Fund within the US Treasury, and into various displacements and adjustments to generate the possibility of relatively long-term planning. The expertise and the debate on the choice of the budgetary mechanism to be adopted for the nuclear waste programme were not attempts to invent new budgetary processes for the programme, but were mainly attempts to generate a certain arrangement among already existing budgetary technologies, which could reconcile the values that were expected from those technologies.

Among those three technologies, the CBO (Congressional Budget Office) evaluated trust funds as the one that best corresponded to accomplish the searched arrangement. This was also the case in other studies (Interagency Review Group, 1979; Office of Technology Assessment, 1982; U.S. Congressional Budget Office, 1982; U.S. Department of Energy, 1984). Trust funds were recommended as they are created solely to serve specific purposes. They do not render funds available for the general purposes of the government, and they can be set up so that the

funds are accessible without Congressional action (U.S. Congressional Budget Office, 1981). Trust Funds are considered as generating a particular relationship between receipts and spending, different from the one generated by general taxation. Martin, Mehrotra and Prasad (2009, p. 3) stress that taxation consists of an obligation to contribute to the activities of the government through money or services, in a way that excludes any form of return or exchange. Taxes do not have a sense of particular individual or collective benefit, whereas trust funds explicitly seek that link. Patashnik (2000), a political scientist specializing in public policy whose work focuses particularly on trust funds, underlines that they are mainly employed to reduce the uncertainty about the continuous long-term funding of programmes, to ensure that the funds are collected for their dedicated purposes, and to avoid the transfer of financial liability of a specific group of actors on a particular programme towards taxpayers. However, as Patashnik (2000, p. 6) notes 'US budget trust funds are theoretically intriguing because their significance as a commitment device is not obvious'. The promises underlying public trust funds are not subject to an external enforcement mechanism (Patashnik, 2000, p. 6). Schick (2000, p. 40), another federal budget expert, notes that 'a trust fund is only as secure as its beneficiaries are powerful'. Therefore, a trust fund in itself does not constitute a legally binding engagement that immunizes the use of the fund from political intervention.

Once the issue arrived at Congress, legislative proposals concerning the design of the NWF addressed the revenue and the spending relationship of the nuclear waste programme separately, with different political objectives to be inscribed in each. They generally suggested the NWF takes the form of a trust fund,⁷ implying the funds that are collected for the nuclear waste programme are dedicated to that programme. But there were major differences in the formulation of the engagement they planned to set up between the federal government and the financiers of the programme.

One set of proposals suggested the payment of a lump-sum amount into a 'Repository Trust Fund' by those who own commercial spent nuclear fuel, mainly nuclear utilities, based on the estimated overall cost of the nuclear waste programme. The adoption of this formulation would have pre-engaged nuclear utilities and would have ensured funding as soon as the programme was initiated by the federal government, which

would have avoided taxpayers financing the programme. Another set of proposals⁸ suggested a contractual relationship between the owners of waste and the DOE. According to those proposals, contracts would have been signed once the DOE was ready to receive waste at federal nuclear waste facilities. Therefore, waste owners would have started financing the nuclear waste programme only from that moment on. Those proposals implied the federal government would collect a tax from nuclear utilities for them to finance the government-provided nuclear waste services. Making the NWF take the form of a trust fund was the only detail that guaranteed that federal government used those funds for the specified purpose. In the Congressional hearings, nuclear utilities supported the bills that were based on the creation of a contractual relationship, which implied the liabilities between the nuclear utilities and the federal government to take a legally and mutually binding form.

Nevertheless, in most of the legislative proposals, spending required Congressional approval through Congressional appropriations. In direct appropriations, spending is authorized through the annual appropriations process, and it requires the implication of the Congressional Appropriations Committees: therefore, that of short-term Congressional politics. In that sense, whereas the receipts were designed to be independent from general taxation, spending was attached to Congress, and to its budgetary instances. These proposals did not satisfy the OTA. Cotton stated that subjecting the NWF to an annual budgeting process was a threat to the availability of funding, hampering the programme's stability and continuity both by attaching the NWF to immediate budgetary politics, and by impeding the long-term planning that the nuclear waste programme required.⁹ Giving testimony on those legislative proposals, Thomas Cotton pointed out the dilemma inherited by those proposals:

...the predictability of the program depends upon the predictability of the annual expenditures from the waste management fund, not simply the predictability of the revenues going into the fund. By retaining a degree of Congressional control over annual program expenditures, these bills leave open the possibility that, in a period of pressures to balance an increasingly tight federal budget, some of the expenditures required to assure steady progress on the waste management schedule might be deferred or eliminated—thereby jeopardizing the long term goal. (Cotton, 1982)

Whereas politicians delegated nuclear waste to scientists and engineers, and to their capacity to produce a techno-scientific project that would confine nuclear waste for thousands of years, they had major difficulties in reducing the control they had on a domain that fell under their jurisdiction: the budget. Thus, the nuclear waste programme had major difficulties in imposing its own temporality in a process that involved the potential intervention of political actors and Congressional budgetary instances.

In the legislative documents I studied and during the interviews I conducted, the DOE officials and politicians often referred to the NWF as a 'trust fund', so I was later surprised to discover that the NWF was not conceived as a trust fund. Finally, the NWF was established in the legislation as a 'separate fund in the Treasury of the United States' that could be 'only used for the purposes of radioactive waste disposal activities as defined in the Act' (Nuclear Policy Act, 1982). It was subject to Congressional appropriations, but unlike the annual direct appropriations, was subject to a triennial appropriations process. The Act also included other measures to ensure that the programme would receive continuous and sufficient funding without interruption.

The legislation prescribed the receipts and spending of the Fund to be exempt from apportionments¹⁰ of the Office of Management and Budget (OMB), and included a provision that authorizes the Secretary of Energy, having budget authority over the programme, to borrow funds from the US Treasury to cover any short-term shortfalls in the NWF (Schick, 2000). With those measures, the spending mechanism could have a certain level of independence from the Congressional instances, while it was protected from potential short-term funding shortfalls. Those small alterations attempted to ensure the continuity and stability of the programme.

By making the programme subject to triennial appropriations, the legislation attached the nuclear waste programme to the Congressional appropriations process, which relies on 'coordination' (Wildavsky, 1988, p. 11) among a diverse range of Congressional and non-Congressional actors. The Congressional appropriations process engages the Appropriations Committees at both Houses of Congress that define the amount of funding to be allocated to federal programmes; the Budget Committees that control whether the appropriated funds correspond to

the federal budget targets; the federal agencies that hold budgetary authority seeking to obtain funding for their authorized federal programmes; the OMB that prepares the President's budget; and the President himself.

However, for the NWF the budgetary mechanism did not just engage Congressional actors. The NWF as it was enacted into law was founded on a contractual relationship. A standard contract between the DOE and seventy parties¹¹ formalized the distribution of responsibility between them all. Waste owners and utilities engaged in the payment of a fee (\$1 mill per kWh) for each unit of electricity they generated and sold, and the federal government engaged in providing nuclear waste services by a strict deadline (January 1998).¹² Thus, the revenues were under legal commitments that were stronger than in all the other options. The programme was not only attached to the Congressional budgetary instances and to its politicians, but also to seventy contractors who each signed a standard contract with the DOE, which was bound to provide waste services. As a consequence, the activities of the programme, and its funding, were placed under the close scrutiny of the contractors who could invoke legal remedies each time they considered that there was a breach of contract.

For instance, during the comments period about the formulation of the contract, between the draft and the final versions, nuclear utilities showed that they would be demanding contracting parties. Several industrial commentators asked for the inclusion of a provision in the contract¹³ allowing the utilities to be attributed auditing rights on the managerial economic efficiency of the programme's management. As the contracting party, the DOE responded to that demand by underlining that it 'saw no precedent for the private sector to audit the federal government'¹⁴ and added that the DOE's Inspector General, the Government Accountability Office, the Office of Management and Budget, and a public accounting firm would provide the programme's oversight.

A Management Organization Under the Scrutiny of the Federal Government

Conceiving the management organization that would hold the budget authority of the programme was at least as important as the budgetary technologies themselves; to be spent, the NWF had to be requested. Most

expert studies (Interagency Review Group, 1979; Office of Technology Assessment, 1982; U.S. Congressional Budget Office, 1982; U.S. Department of Energy, 1984) have recommended that the management organization take the form of an independent organization or an independent agency. The Nuclear Waste Policy Act of 1982 not only established a budgetary mechanism but also established an Office of Civilian Radioactive Waste Management (OCRWM) as a single purpose agency in charge of the nuclear waste programme within the DOE. During the Congressional hearings, Thomas Cotton had pointed out that the priority during the preparation of the legislation had been given to techno-scientific, regulatory and political procedures, whereas the programme's management and budgetary procedures had been considered as secondary elements. He insisted that those points required further reflection, and recommended an evaluation following the enactment of the Act. Following that recommendation, enacting the policy into law, the Congress prescribed that the DOE undertake a panel study and evaluate alternatives for managing and financing the nuclear waste programme, including the option of private corporations.¹⁵ Nevertheless, the Act did not enact any means of enforcing the implementation of the conclusions of such a future study.

Following the enactment of the law, the DOE organized a study panel in the form of an independent citizens' panel. After a long period of study, the study panel concurred with the earlier expert reports, and recommended the nuclear waste programme be managed by an independent agency. The panel considered that an independent agency was a means to enhance the 'stability', 'longevity' and 'continuity' of the nuclear waste programme while ensuring its independence from 'political interference' (U.S. Department of Energy, 1984). The DOE declined the recommendations of the panel and responded in a letter by emphasizing that it would handle the nuclear waste programme by expanding the mission of the OCRWM and, by doing so, would create a 'more stable, more sustainable, and more reactive organizational form' compared to the ones recommended by the panel (U.S. Department of Energy, 1985). The nuclear waste programme was placed under very strict deadlines, and the DOE's priority has already shifted towards the swift accomplishment of a nuclear waste repository project rather than the reconsideration of its

management organization and its budgetary mechanism. The panel study concluded that the siting process and schedule laid out by the Nuclear Waste Policy Act had ‘unusual degrees of detail and prescriptiveness’ (U.S. Department of Energy, 1984).

Following the refusal of the DOE to take into account the conclusions of the panel, the OCRWM transformed into the *de facto* permanent management organization of the nuclear waste programme and remained a part of the DOE. From then on, the OCRWM was responsible for all aspects of the waste management programme for high-level waste and spent nuclear fuel. Its director was appointed by the President and confirmed by the Senate, and reported directly to the Secretary of Energy.

Following this first series of translations, the nuclear waste programme was integrated into a large network of actors. Continuous interpretations of the notions of ‘independence’ and ‘control’ placed the organization and the budgetary mechanism under the oversight of the federal government, its agencies and Congress, while delegating the programme’s continuity and stability to their judgement.

Conclusion

Exploring contemporary liberal democracies’ attempts to find modalities to govern nuclear waste helps us analyse the values that constitute them. The real challenge that contemporary institutions face to govern nuclear waste is not just to design a repository project that successfully confines radioactivity from the biosphere for the next thousands of years. Various other political, judicial, techno-scientific, but also economic, knowledge bases and technologies are necessary to keep a nuclear waste programme up and running, before nuclear waste can ever be entrusted to geology.

In this chapter, I attempted to show the interest one might find in inquiring into this particular material via the angle of the budgetary mechanism that was specifically designed to finance its containment. The nuclear waste programme had its own unique temporality. At the early stages of its conception, Congress, the federal government and institutional experts made major efforts to formulate a budgetary mechanism that would remain sustainable, independent and immune from short-

term political interventions, and stay under the control of political institutions. The chapter demonstrates that enacting those two values inside a budgetary mechanism required a whole set of negotiations. The mechanism was put in place in an already operating world, requiring the activation of a whole network of valuation (engaging a whole set of technologies, knowledge bases, institutions and sites). The formulation of the NWF also required defining the distribution of political, legal and technical roles and responsibilities among a diverse range of actors.

When operationalizing the nuclear waste programme, actors did not always think about the exceptionality of the material to be governed. Priorities evolved with time towards the accomplishment of a deep geological repository project 'on time' and 'on budget'. This first became visible during the conception of a management organization. The federal government chose not to spend time designing a fully independent management organization and the one created was placed under the authority and oversight of the federal executive branch, making it vulnerable to the shifts and drifts of its political priorities. Furthermore, once in use, the notion of 'control' gained a new sense; the budgetary technologies in action transformed the NWF into an ordinary item within the US federal budget. It no longer merely meant ensuring the programme's accountability *vis-à-vis* a wide range of institutions, it also meant subjecting the programme to 'budgetary control' as in the notion used in New Public Management reforms (Barretta & Busco, 2011; Pollitt & Bouckaert, 2004); one that aims to reduce public expenditure and enhance the 'efficiency and effectiveness' of government actions.

Notes

1. Field notes, Nye County, Nevada, 24 April 2012.
2. Interviews with leaders of Nevada's opposition to the Yucca Mountain Project, 13 May 2011, Washington, DC.
3. Interview with leaders of Nevada's opposition to the Yucca Mountain Project, 27 April 2012, Las Vegas, NV.
4. Nuclear Waste Policy Act of 1982, 42 U.S.C. § 10101–10270 (2006).
5. Interview with a leader of the Nevada's opposition to the Yucca Mountain Project, 13 May 2011, Washington DC.

6. The OTA's analysis on the management and financing of the nuclear waste policy was founded on a study that the OTA specifically requested from the Congressional Budget Office. The Congressional Budget Office is a staff institution that is independent from committees and parties, and it mainly provides technical knowledge, produced by the economists who are employed by the Office.
7. Legislative bills introduced at the House for the national nuclear waste policy that included the mention of a trust fund in the 97th Congress are H.R.2840 and H.R.1993.
8. Legislative bills introduced to the Senate and the House that refer to a contractual relationship in the 97th Congress are H.R.5016, S.612 and S.1662.
9. Hezir (2011) notes that various Congressional Budget Office cost estimates referred to the NWF as a trust fund and provided Congress with cost estimates, including projected surplus or deficit balances in the NWF, on the assumption that revenues would be spent from the NWF as needed to meet programme schedules, and that the NWF could borrow funds from the Treasury to cover any short-term requirements not covered by fees.
10. Apportionment is a budgetary measure that can affect the timing of the obligation of appropriated funds (see Schick, 2000, p. 288).
11. By 30 April 1983, the DOE had signed an initial seventy contracts with fifty-six different organizations, including forty-six nuclear utilities (accounting for sixty contracts due to multiple plant operations), eight owners of industrial test reactors and two nuclear fuel vendors. These contracts covered all of the nation's then commercial generators and owners of spent nuclear fuel. The contracts set forth the specific terms and conditions, as well as the procedures for collection and payment of fees under which the DOE makes available disposal services for commercial spent nuclear fuel under the Act.
12. DOE Standard Contract with utilities as finalized in 48 Fed. Reg.5458.
13. Carrying out the Act's contracting provisions, the DOE first drafted a standard contract and published it as a proposed rule in the Federal Register on 4 February 1983. On 3 March 1983, the DOE held public hearings on the proposed contract in Washington, DC. In addition to the oral comments at the public hearings, the DOE received written comments from eighty-five organizations representing electric power associations, nuclear power companies, environmental organizations, consumer protection associations, state and federal agencies, and individual citizens.

14. DOE Standard Contract with utilities as finalized in 48 Fed. Reg. 5458.
15. Nuclear Waste Policy Act of 1982, 42 U.S.C. §10101–10270 (2006).

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Standardizing Control and Controlling Government: The Introduction of Internal Auditing in the French Government's Central Administration

Laure Célérier

Introduction

Over the past thirty years, internal auditing has emerged as a dominant standard of managerial control for all kinds of organizations and in every area of activity (Power, 1994, 2010). Rather than being discredited by financial scandals and crises for its inability to prevent them, internal auditing has been strengthened by each turmoil (Power, 2009). The success of internal auditing has relied on a combination of elements and actors. Professional associations have become progressively structured since the 1940s, when the American Institute of Internal Auditors was created; today, it is the best-known professional association for internal auditors and oversees its subsidiaries all over the world. These associations have encouraged the expansion of internal auditing, which they have promoted as a profession, and have lobbied governments and regulation agencies for internal audits to become part and parcel of good governance

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requirements. Decision-makers were eager to listen to their requests, as internal audit could provide a response to calls for increased regulation, all the while allowing companies to implement their own internal control devices. Lastly, the recent rise of internal audit in financial institutions has been an important element in its expansion, in a context of financialized capitalism where innovations easily spread from the financial sector to other areas of activity (Chiapello, 2014).

The plasticity of internal audit is another element that has significantly contributed to its success (Power, 1994; Mennicken, 2010). Internal auditing has come to encompass a wide range of managerial control activities. Most recently, it has leveraged on the success of internal control and risk management, with which it became articulated (Célérier, 2016). Internal audits may take very different forms depending on organizational configurations, local traditions of control and how those involved in developing internal auditing understand it. This plasticity of internal auditing is thus both a key factor in its success and what makes the implementation of internal auditing so difficult to predict: there is no certainty around the form an internal audit will take in a given organization. Hence, organizational isomorphism is both caused and limited by the polysemy and ductility of internal auditing. In public administrations, there is a specific tension between, on the one hand, the intrinsic ambiguity of reforms so that the introduction of any managerial device can lead to diverse interpretations and scenarios (Arnaboldi & Lapsley, 2009; Arnaboldi & Palermo, 2011); and on the other hand, the convergence of public sector administrations in a New Public Management (NPM) context, where standards are being implemented and 'good practices' for the uses of these standards are being established (Pal & Clark, 2013).

In this chapter, we focus on this tension in the introduction of internal auditing into the public sector: we explore how the standardizing effects of internal auditing are articulated with local idiosyncrasies. Our research is based on an investigation conducted from 2012 to 2015 into the French central administration.¹ In this administration, a reform was launched in 2011 introducing an internal audit function covering the whole range of ministerial activities. This reform created new bodies, including internal audit committees and teams, directly attached to their respective ministers. We conducted semi-structured interviews with 100

people, most of whom were high-ranking civil servants who prepared the reform, as well as controllers who endorsed the reform and introduced internal auditing in their own ministries.

The setting of this investigation has several research interests. First, the different reasons for the development of internal audit in European central administrations have been given little attention so far. An investigation of the conditions for the possibility of the French reform thus enables us to grasp the diverse determiners of the success of this international standard of control in European administrations, especially since in the French scenario, no single element triggered the reform. Second, because the French reform was not accompanied by a change in controllers' recruitment, it is possible to apprehend the effects of internal audits on control practices. Most government controllers involved in the implementation of the reform were in place long before the reform. They were working in ministerial control services, in the eleven ministerial ensembles of the French central administration; in these control services, they were performing diverse control activities and reporting to their ministers on the functioning of administrative services and the implementation of public policies. Third, the reform was still very recent when we began our investigation. Consequently, it was possible to explore the motivations that presided over its development as well as the early debates around its implementation.

This chapter begins by presenting the rise of internal audit in government administrations, with a focus on European countries and France. We show how the introduction of internal auditing in the public sector, which appears to be inevitable, can transform control activities. Then, we discuss the context of the French central administration, in which a diversity of audits and internal audits existed prior to the 2011 reform; we demonstrate that beyond audit diversity, a common pattern of change affected controllers. Lastly, we investigate the preparation and implementation of the 2011 reform and show that there existed a dialectical movement between convergence and distinction: both the French government and a subgroup of government controllers saw internal audit simultaneously as a constraint and as a leverage to increase their influence—at the European level for the government and within the administration for controllers.

The Irresistible Rise of Internal Auditing in Public Administrations

Internal audit is seen as a dominant standard of control for government administrations. In this section, we first trace the rise of internal audit in public sector organizations and then show how it became inescapable in Europe and France.

The Internal Audit at the Core of the Most Recent NPM Developments

Audits have played a nodal role in the implementation of NPM reforms (Barzelay, 2000; Pollitt, 1999; Pollitt & Bouckaert, 2011). They monitor the implementation of new managerial tools and devices, with the purpose of rendering public administration more efficient and public servants more accountable. They have been analysed as vehicles of new mindsets through the implementation of new chains of control, the diffusion of accounting-based decisions and the rise of standardized managerial techniques in all areas of activity (Power, 1999). Their spread across the globe has been made possible by a convergence of factors. First, international organizations such as the Organization for Economic Cooperation and Development (OECD), the World Bank and the International Monetary Fund (IMF) have encouraged the development of audits: they have provided audit methods and training for civil servants from various countries, imposed the development of audits in reporting operations in public administrations in exchange for loans and created arenas for leaders in public organizations to share their audit practices (Sahlin-Andersson, 2002; Célérier, 2016).

The evolutions of audits are a symptom of the transformations of NPM. Different ends have indeed been assigned to public sector audits, depending on the context and the broader agenda of public sector reform including decreasing expenditures when the aim is to downsize public sector organizations or reporting the results of newly created independent agencies when reforms are reshaping the state. These consecutive stages of NPM reform—and the associated objectives of audits—have

been thoroughly analysed in the existing literature (Bezès, 2005; Pollitt & Bouckaert, 2011).

Since the 1990s, internal audits have become increasingly important for public sector organizations. They are now a core component of a new architecture of financial control based on the development of internal control, and they are oriented towards risk management (Célérier, 2016). In their reports, the OECD, the World Bank and the IMF promote internal auditing, associating it with good governance and the fight against fraud and corruption, and public administrations are increasingly required to implement it to obtain funds (1996, 2011, 2013a, 2013b; IMF, 1998, 2007; World Bank, 2000). Moreover, several countries considered to be at the vanguard of NPM reforms, such as Canada, the United States and Denmark, have strengthened internal auditing in their public administrations. These countries refer to internal audit norms defined by the Institute for Internal Audit (IIA) (Chadler, 2003; OECD, 2011; US GAO, 2007, 2011). In the 2000s, internal auditing has become a dominant standard of control for public sector organizations.

The French Government's Central Administration and the Grip of Internal Auditing

In European Union (EU) countries, a conjunction of factors has favoured the spread of internal audits. First, since the 1990s, the European Commission imposed the implementation of audit methods on countries receiving structural funds in order to assess the management of these funds. If these audit methods are not, *per se*, internal audit methods relying on the IIA framework, they nonetheless encourage new control practices based on the development of internal control and are associated with good governance and fraud detection (Célérier, 2016). Second, after the media disclosure of wrongdoings that resulted in the *en masse* resignation of the Santer Commission in 1999, the new European Commission deeply transformed its control organizations. Newly created internal audit services and internal auditors replaced the so-called inspections and their controllers: very few controllers from the former control services were retained (Célérier, 2016; Commission

Européenne, 2001, 2004; Georgakakis, 2000). The implementation of internal auditing was thus part of a set of reforms designed to deter fraud and avoid new scandals. Third, the Commission imposed financial control reform, with the introduction of internal audit at its core, on countries applying to the EU and those under close budgetary surveillance, such as Portugal and Greece: the Public Internal Financial Control Framework was issued by the European Commission in 2006 (de Koning, 2007; European Commission, 2006). A joint programme of the OECD and the EU, called the SIGMA group, was launched in 1992 with the ambition of helping neighbouring EU countries reform their administrations through, among other things, the introduction of auditing and, later, internal auditing (1998; SIGMA–OECD, 1992). Finally, in the 2000s, the Directorate-General for Budget in the European Commission set up a club to bring together those in charge of coordinating control and internal audit activities in the public administrations of EU countries. This club served as an arena where civil servants could compare their practices. A compendium was published by the club in 2012 that outlines the diverse internal auditing experiences of its members (European Commission, 2012).

The French public administration has not remained untouched by the success of internal auditing in the world. First, the public sector elite, who play a central role in shaping government reforms, have often also held leading positions in public and private sector organizations, including in international organizations and the banking industry, over the course of their careers. The Inspectorate General of Finance (Inspection Générale des Finances) and the Court of Auditors (Cour des Comptes) are two of the most prestigious institutions in the French public administration and have played historical roles in shaping government reforms; a number of high-ranking civil servants from these two institutions have been involved in the development of internal auditing in France and in international organizations. Finance inspectors Daniel Bouton and Marc Viénot authored three reports in favour of the development of internal audit and control for private sector organizations (Bouton, 2002; Viénot, 1995, 1999); these reports have had a long-term influence on control activities as they led

to regulations imposing internal controls and audits that have affected an increasing number of companies. Jean-Pierre Jouyet, another finance inspector, was head of the French Financial Markets Authority (AMF) when this body issued a framework for internal control (AMF, 2010). Daniel Pannier of the Court of Auditors was in charge of the OECD internal audit service from 2009 to 2013. High-ranking civil servants can also join short-term missions that advocate reforms of the financial control of public sector entities. These missions are either conducted for these international organizations—such as the IMF and World Bank—or under bilateral agreements between French control services and their foreign counterparts. Thus, before the 2011 reform, controllers from different ministries—Finance, Justice, etc.—were involved in programmes to train foreign controllers on internal auditing (IGA, 2011; IGSJ, 2008). In several control services, training French controllers on internal auditing was also seen as a way to modernize and professionalize control activities. This training was even compulsory for those who participated in the audit of European funds. Two commissions were created in the 1990s to audit them; these commissions gathered controllers from the ministries that benefitted from European subsidies (Social Affairs, Agriculture, Interior and Finance) and were presided over by a finance inspector (Arrêté du 27 avril, 1981; Décret n° 2002-633; Décret n° 2008-548; Décret n° 93-985, 1993; Décret n° 96-389, 1996).

The implementation of internal audit in the public administration of the French government appears as the logical consequence of the irresistible rise of internal auditing. In neo-institutional terms (DiMaggio & Powell, 1983), one can say that through normative, coercive and mimetic isomorphism, internal audit has become the dominant standard of control for public sector organizations all over the world. In the EU in particular, the implementation of internal auditing seems to be inevitable, as it is expected at diverse levels of European institutions. These external changes have an influence over French government controllers. Yet, this trend towards organizational isomorphism is both facilitated and favoured by internal audit polysemy, so that the standardizing effects of internal audit are indeterminate.

Audits and Internal Audits in the French Government Administration: Unbridgeable Differences?

The 2011 reform is not just the result of external changes: within the French government, the first decade of the 2000s saw the proliferation of audits and the introduction of internal auditing, first outlined below. Beyond their differences, these audits were together a symptom of significant changes in control activities and government accountability, as then discussed.

A Plurality of Audits at the Core of French Government Reforms

During the 2000s, two government reforms were implemented that involved the whole administration and had long-lasting effects on civil servants and their work: the Organic Law on Finance Laws (*Loi Organique Relative aux Lois de Finances*, or LOLF), which was voted in 2001 and implemented in 2006, and the General Review of Public Policies (*Révision Générale des Politiques Publiques*, or RGPP), which was launched in 2007 and ended in 2011. These reforms differed in several aspects. The first difference concerns their development and steering: the LOLF was a consensual reform, supported by a wide alliance of members of Parliament from competing political parties, high-ranking civil servants from the Court of Auditors and the Ministry of Finance and members of the cabinet (or the Conseil des Ministres). On the other hand, the RGPP was a polarizing reform, driven by President Sarkozy with the support of civil servants from the Ministry of Finance, and it was vividly criticized by the political opposition and several members of the majority. These reforms also differ in their materialities: while the LOLF consisted of a long text with major juridical impacts (LOLF, 2001)—an organic law is above ordinary laws and just below a modification of the Constitution—there was no text to the RGPP at all. Lastly, the two reforms diverged in terms of their content and purposes: the LOLF was a multi-dimensional complex reform, containing the introduction of private sector account-

ing in the government's central administration, the implementation of management by objectives and a reform of budgetary procedures. In contrast, the RGPP mostly targeted a reduction of public expenditures (Bezès, 2008, 2011; Eyraud, 2012).

Central to both the LOLF and the RGPP, audit and internal audit experienced an unprecedented upsurge in the central administration (Bezès, 2005; Célérier, 2016). The introduction of private sector accounting in the central administration led to a certification of the accounts by the French Court of Auditors, which encouraged the development of financial internal auditing in the central administration to prepare the certification; these internal audits were carried out by government controllers, who were often backed by auditors from the Ministry of Finance (*i.e.* a different service from that of the Inspectorate General of Finance). Then, new managerial devices and tools, including performance auditing, supported the implementation of management by objectives. New, mainly quantitative information on the central administration was produced and provided elements for the development of audits. For example, performance reports and projects were issued every year; these announced objectives for the year to come and assessed the achievements of goals defined the previous year. Performance auditing focused on these achievements, on the definition of the objectives and the relevance of the indicators. It was carried out by inter-ministerial teams of government controllers under the supervision of a finance inspector; performance audit reports were delivered to Parliament. Moreover, the production of new quantitative data on the central administration favoured the implementation of efficiency audits that were strongly supported by the conservative government and had not initially been provided for in the LOLF. These so-called 'modernization audits', which aimed at reducing operational costs in the central administration, were performed from 2005 to 2007. They were strongly supported by the Minister of Finance and were carried out by government controllers, very often under the supervision of finance inspectors and with the help of private sector consultants and auditors. The RGPP took over from these modernization audits from 2007 to 2011: the RGPP audits were carried out in the whole administration, with the explicit purpose of reducing public expenditure. The Ministry of Finance had privileged access to both the modernization audit and the

RGPP audit reports. In 2000, audit became well installed in the French administration. At the same time, audit dynamics in the French administration are largely divergent: audit reports are delivered to Parliament, the Court or the Ministry of Finance. They are oriented towards different goals—efficiency, performance, certification, etc. No single methodology is being adopted: each type of audits follows a given pattern.

Making Control More Traceable and French Government More Respectable?

By 2010, divergent dynamics of internal audit had emerged: in addition to the development of financial internal auditing under the supervision of the Court of Auditors, non-coordinated initiatives blossomed in the central administration at all hierarchical levels. Some of these initiatives were undertaken by isolated controllers, drawing on their audit experiences to develop internal auditing for different types of objects and sponsors as diverse as the Court, their minister or public sector managers, among others. Moreover, entire internal audit services were set up at every level of the central administration. In the Ministry of Ecology, an internal audit cell was thus created, inside the ministerial control service, with the purpose of delivering financial audits to the Court that would go beyond a mere preparation of the certification. Lastly, in three ministries, ministerial audit functions were set up; they integrated different levels of control into one internal audit device associated with a new governance of control focused on risk management. Each of these three internal audit functions was different. In the Ministry of Defense, the internal audit function focused on financial audits only and was driven by the ministerial control service, which devoted controllers to these audits. Internal audit reports were delivered to the Defence Minister. In the Ministry of Social Affairs, an internal audit function was also implemented by an *ad hoc* service in direct competition with the existing ministerial control service. It delivered financial audits to the Court. Finally, in the Ministry of Finance, the Inspectorate General of Finance structured an internal audit function, in which controllers from the whole ministry performed financial internal audits, and only a small minority of audits was performed by

finance inspectors. If internal audit is to be understood as a standard of control, there was little standardization of internal audit before the reform!

Beyond their differences, internal audits and audits performed in the French government's central administration at the end of the first decade of the 2000s are together the symptoms of underlying changes, not only for control services but also for the government. We have identified three main changes affecting controllers: internal audits imply a methodological change, a movement of 'accountingization' (Power & Laughlin, 1992) and a change in accountability. Internal audit imposes the use of a pre-defined methodology, while government controllers typically had been very independent in their approaches and employed methods that were very rarely formalized. Next, internal audits imply that controllers rely on accounting data to an unprecedented extent to appreciate the efficiency and performance of the administration, while controls in the public administration had been traditionally juridical. Lastly, these audits require a new level of accountability on the part of government controllers toward different services and institutions, including the Parliament, the Court of Auditors, the Ministry of Finance or the minister to which controllers are directly attached. In this regard, the Inspectorate General of Finance is in a very specific position: while its controllers very rarely participate in internal audits, it supervises audit activities performed throughout the whole central administration. This new accountability of controllers reflects the government's own new accountability. The importance of meeting the perceived expectations of different stakeholders—such as citizens, the EU and rating agencies—is a leitmotiv in controllers' discourse around the *raison d'être* of these audits.

The introduction of internal auditing in the central administration of France appears both obvious and uncertain prior to the 2011 reform. Its introduction is consistent with evolutions outside the administration, is a continuation of previous reforms and participates in a movement of renewal for control services and for the government. At the same time, there is a plurality of possibilities for internal auditing, which can serve different institutions and be used in diverse ways by control services. These different possibilities were debated by controllers involved in the preparation and implementation of the 2011 reform.

The 2011 Reform: Between Standardizing Control and Preserving the Autonomy of the Government and its Controllers

The 2011 reform was characterized by a dialectical movement of imitation and distinction in the implementation of internal auditing. In this section, we first show how the 2011 reform is directly associated with the double purpose of unifying audit in the administration and meeting the requirements of international organizations, while serving to increase the prominence of reformers and their auditing service in the central administration and of France on the international scene. Then, we demonstrate that controllers' search to preserve their own autonomy is a delicate exercise.

The 2011 Reform and the Control of Government Control

The 2011 reform provided the opportunity to unify audit activities in the French government's central administration. The Inspectorate General of Finance prepared the reform with two reports, which were published in 2008 and 2009 (Guillaume & Colin, 2008; Guillaume et al., 2009). The first report consisted of a benchmark of internal auditing in five OECD countries and in the services of the European Commission. From this benchmark, finance inspectors concluded that internal auditing was well established in the governments of a number of countries and that France could no longer remain on the sidelines of this worldwide trend. The second report provided a picture of the development of internal auditing in all French ministries and was accompanied by a proposal for a decree to implement an internal audit function in the central administration covering the whole range of ministerial activities. This decree mostly brought organizational changes: in each ministry, an internal audit committee and an internal audit team were created, the former supervising the activities of the latter. Those at the head of the internal audit teams were also *de facto* members of the inter-ministerial committee coordinating the implementation of the reform (Comité d'Harmonisation

de l'Audit Interne or CHAI). In the proposal of the decree, the Ministry of Finance would play a leading role, as this Ministry holds key positions in the CHAI: the minister in charge of the budget chairs the committee, and two representatives of the Budget and Tax Directorates have a permanent seat in the CHAI. No external auditor is supposed to use the internal audits carried out by controllers since these internal audits are intended for ministers and central administration managers—except for the financial internal audits that were started with the LOLF and were integrated in the new architecture of internal audit. Members of the central administration attribute several merits to the reform. First, finance inspectors have made it explicit that they feel that internal auditing would make the impetus for control services more virtuous through a 'professionalization' of their work—*i.e.* the use of a pre-defined methodology, the increase in continuous training, etc.—and the recruitment of younger controllers. Control services mostly shelter high-ranking civil servants at the end of their careers. Then, it is also believed that the introduction of management by objectives in the administration would remain only partial without the introduction of internal auditing. Third, for many controllers, the reform is both made relevant and justified by the high public debt and deficit in France. Many high-ranking civil servants feel that France risked having to bend to requirements from the EU or the IMF that would, in the future, impose such a reform; these civil servants preferred that France take this initiative on its own, rather than it being imposed on the country later.

On another level, the reform is seen as a way to preserve some autonomy for both controllers and the government. The reform was precipitated by the Inspectorate General of Finance to limit the influence of the Court of Auditors over control services: by taking the initiative on the reform, the Inspectorate General of Finance has claimed control over the organization of government control *vis-à-vis* the Court. Further, it has affirmed the legitimacy of controllers, over that of the Court, in conducting internal audits for their own ministries. Thus, with the implementation of internal auditing, the Inspectorate General of Finance pulled the rug out from under the Court, which had been encouraging the development of internal auditing. At the governmental level, the finance inspector Henri Guillaume, who supervised the two reports issued by the

Inspectorate General of Finance, insisted that France could take the lead in the elaboration of a European internal audit framework for public administrations—until now, the IIA framework has been the same for all kinds of organizations. There seems to exist a dialectical movement between, on the one hand, controllers' and government's search for recognition, and on the other, the affirmation of their autonomy and the drive to take a leading position. Navigating this dialectic through the implementation of the reform has involved delicate work for the government and its controllers.

Internal Auditing and the Delicate Work of Preserving Controllers' Autonomy

The preservation of the autonomy of control services was a condition for controllers' enrolment in the reform. Of course, many controllers resigned themselves to a reform project driven by the Inspectorate General of Finance with the idea that such a reform would have been imposed by the EU or international organizations, sooner or later, in the context of high debt and deficit. At the same time, resistance was high. The preparation and implementation of the 2011 reform was characterized by vivid discussions and debates inside the public sphere. Among the minority of controllers who showed an interest in internal auditing and believed it could improve their work—the majority of controllers were either indifferent or hostile to internal auditing—most raised their concerns that internal audit would be too closely driven by the Ministry of Finance. The Ministry of Finance chose to take this concern into consideration, so as to rally a large number of controllers behind the reform. Compared to the initial text of reform that was integrated in the second Guillaume report, a number of changes were introduced in the two texts that were published in June 2011; these changes reduced the influence of the Ministry of Finance and asserted that internal auditing should be adapted to the specificities of each ministry. Moreover, finance inspectors attached a lot of importance to creating a spirit of collegiality in the CHAI. In this context, for many controllers, participating in the reform had a number of advantages: it provided the opportunity to share good practices with

internal auditors from other ministries—thus breaking the isolation in their own ministries—and to influence the outcomes of the interministerial discussions to make them better conform to the perspectives in their own ministries.

The early stages of the implementation of the reform were characterized by tensions between the reformers' search for recognition outside of the central administration and the ambition to preserve controllers' autonomy. Controllers from the Ministry of Finance were in favour of adopting an internal audit framework largely based on the existing framework from the IIA. This framework would be close enough to the IIA norms to be recognized by this body, with some degree of specificity. It could set an example for other government administrations and would also give legitimacy to the newly created CHAI inside and outside the French administration. Most controllers originally opposed this view and called for the creation of an internal audit framework from scratch that would affirm France's independence from the IIA. After a year of discussions in the CHAI, controllers agreed on adopting a framework derived from the IIA norms, with the hope that it would send a positive signal to the EU in these times of budgetary surveillance. The framework, which was adopted in June 2013 and issued in September the same year, was sent to the IIA, which officially congratulated France for this action (IIA, 2014). At the same time, the CHAI affirmed its autonomy shortly thereafter by issuing two statements: the first affirmed that ministerial internal audit reports should not be sent to the Court of Auditors; the second reacted to a document issued by the IFACI (the French subsidiary of the IIA) and insisted that the French institute had no legitimacy in commenting on the organization of internal audit in France's central administration (CHAI, 2015; Jochum & Charrié, 2014). The CHAI thus set itself up as the only legitimate body to evaluate the implementation of internal auditing in the French government administration, while at the same time endorsing internal audit norms defined by the IIA. However, divergences between controllers threaten the autonomy of internal audit in the administration: in a few control services, controllers continued sending their internal audit reports to the Court, which welcomed these initiatives and asked for more such reports. Moreover, some controllers from the public administration organized meetings at the IFACI that

compete with the CHAI's meetings and increase the influence of the IIA in the administration. In both cases, these controllers increase their legitimacy and break their isolation in their services and the administration, as internal audit is not always thought very highly of and not all internal auditors have equal opportunities to participate in CHAI meetings.

A search for both imitation and distinction at the level of both controllers and government was at the core of the 2011 reform. The reform was invested with the ambitions of making France conform to dominant control practices that would improve the quality of control and make the administration more efficient and performance oriented. At the same time, reformers from the Inspectorate General of Finance were hoping to reduce the Court's influence on administrative control and for France to take a leading position in Europe through the elaboration of a French internal audit framework. In the process of implementing the reform, there was a tension between the preservation of controllers' autonomy and the search for recognition. First, controllers were brought together at the cost of several concessions that increased the variability in controllers' interpretations of the reform and in their practices of internal auditing. Then, controllers from the Ministry of Finance managed to impose an internal audit framework in the CHAI; this framework was derived from internal audit norms and aimed to emancipate controllers *vis-à-vis* the Court and the IIA, after obtaining their recognition. Controllers' autonomy appears to be a delicate thing to preserve, in a context of oscillation between the search for recognition and strategies of emancipation, and with divergent allegiances within the administration.

Conclusion

In this chapter, we have explored the articulation between the standardizing effects of internal auditing and local idiosyncrasies in its implementation. This research has focused on the context, preparation and elaboration of a 2011 reform that introduced internal auditing into the French central administration. This reform can be seen as the logical outcome of the international success of internal auditing, a success that some of the French public sector elite played a role in. The reform is also a

continuation of previous changes in the French central administration that renewed control activities. Lastly, the 2011 reform was dictated by a preoccupation with providing foreign institutions with pledges of goodwill and good administration. At the same time, internal audit was believed to contribute to reinforcing the autonomy of France as well as the autonomy of some controllers. With internal audit, reformers were hoping to place France at the vanguard of European governments in terms of internal auditing. For controllers, involvement in the establishment of internal auditing was seen as an opportunity to make the reform comply better with their own aspirations.

Our research offers three main contributions. At first, beyond their polysemy and their conceptual instability, audit and internal audit do change controllers' work, yet in a circumscribed way. There is neither decoupling, in which internal audit would be adopted without changing controllers' daily practices (Broadbent & Laughlin, 1998), nor colonization, whereby the audit mentality would spread throughout all dimensions of the organization (Power, 1994). There is instead a common pattern of change. We have found that the introduction of internal auditing has led to a greater accountability for controllers, an important use of accounting information and the deployment of management methods; the extent to which this last is applied depends on controllers' desire for the reform and their room to manoeuvre in implementing it. Second, we show a dialectical movement, involving an imitation through the implementation of internal audit and the search for distinction through the affirmation of the specificities of French public sector auditing. New Public Management reforms can thus simultaneously—even consistently—involve a convergence of administrations and the affirmation of local specificities. We also demonstrate that the equilibrium is hard to find, as controllers are divided and the search for recognition can approach alienation and may limit controllers' autonomy. While this investigation was conducted in the early stages of implementation of the reform, further research should help us apprehend the outcomes of this tension between allegiance and autonomy and of these disputes among controllers. Lastly, the exploration of the introduction of audit and internal auditing in the French central administration interlocks three dimensions: making the central administration more performance oriented,

controlling controllers and providing pledges to foreign institutions. It is our hope that this research inspires further work on the meta-signification of the audit explosion in the public sphere and governments' heteronormization through their use of a standard of control.

Notes

1. The *administration centrale*, or the central administration, is composed of the ministers, their offices as well as the services attached to them (roughly equivalent to American government departments, as in the Department of Justice, the Department of Education, etc.).

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Part II

Managerial Techniques as Ideology

The Impact of Contemporary Management Ideas: Their Influence on the Constitution of Public Sector Management Work

Christine Shearer, Stewart Clegg, and Judy Johnston

Introduction

Public sector reforms informed by contemporary management ideas that have taken place across Anglo-American polities since the 1980s were focused on economic rationalist concepts and managerialist approaches that prevailed in the private sector. Hence, concepts such as efficiency and effectiveness were advocated for the public sector, often on the assumption that they were relevant and could be applied easily. Private sector management concepts, principles, processes and practices were promoted under the mantra of ‘let the managers manage’ to be followed by ‘make the managers manage’. Critics have deemed public sector reforms, inspired by contemporary management ideas, as unsuitable in application to the public sector, given the unique character of public management (Brunsson, 2006; Gregory, 2003; Moe, 1994; Savoie, 1994; Sundstrom, 2006; Talbot, 2001; Williams, 2000). Nonetheless, these ideas became very fashionable in the English-speaking world.

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This chapter discusses the impact of contemporary management ideas couched as public sector reforms from the 1980s onward and specifically addresses the question of how contemporary management ideas have influenced Departmental Secretaries and their work. The role played by the Departmental Secretaries, central agencies and the government of the day, in the acceptance or rejection of contemporary management ideas, as well as the analysis of how such ideas travelled, were translated, transferred and transformed, is also considered.

Senior Public Sector Managers: Cynics and Sceptics

The shock of the new

Abrahamson and Eisenman (2008, p. 720) propose that management fads are:

“collective behaviors thought to arise from a chance conjunction of forces triggering their diffusion’ and that management fashions are ‘transitory collective beliefs that certain management techniques are at the forefront of management progress. (Abrahamson, 1996, p. 254)”

ten Bos (2000) argues that the problem with management fashions and fads is that they are rationalist and positivist, hence utopian and idealized rather than practically pragmatic and grounded in the reality of the lived experiences of those practising management (Townley, 2004), managers who require the exercise of judgement (Barnard, 2002[1936]). As Townley (2004) argues, there is a need for managers to use judgement and practical reason to determine which, if any, managerial techniques and technologies might be considered and applied based on their practical relevance and suitability.

Some of the New Public Management (NPM) ideas underpinning reforms, were translated, transferred and transformed from private sector experience and thought (Czarniawska & Joerges, 1996; Czarniawska & Sevón, 1996; Sahlin-Andersson, 1996; Sahlin-Andersson & Engwall,

2002), sometimes in ways that suited public actors, their places of work and the activities they performed but not always. Contemporary management ideas and public sector reforms entered the Australian Public Service (APS) through sponsorship by those with decision-making power, such as the government of the day and especially the Departmental Secretaries of the top four central Departments of Prime Minister and Cabinet, the Treasury, Finance, and the Australian Public Service Commission, in the APS. The evidence shows that it is the disposition of these parties that will determine the acceptance, adoption, promotion or rejection of ideas and reforms. Where such ideas are accepted, this is usually based on an assessment of the suitability of these ideas as deemed to 'fit' the existing public sector.

Departmental Secretaries are prepared to consider the merit of contemporary management ideas but disposed to think that such ideas are more than likely temporal fads and fashions rather than matters of substance, which creates a degree of scepticism and cynicism towards these ideas. Nonetheless, Departmental Secretaries are well positioned to consider contemporary management ideas because of their involvement in a range of local and 'globalizing webs' (Hansen & Salskov-Iversen, 2005, p. 214); hence, their disposition towards specific ideas is a determining factor in the eventual determination of their suitability, recommendation or rejection.

Many of the Departmental Secretaries interviewed commented on the 'faddish or fashionable' (2:48)¹ nature of contemporary management ideas. Contemporary management ideas were seen as often coming in various 'tides or waves' (16:12) over time. Many contemporary management ideas were recognized as being temporally fashionable and so were generally avoided by Departmental Secretaries.

So you necessarily have to think, is this particular management tide or leadership tide applicable to the public service or not? (14:12)

Many Departmental Secretaries believe that management consultants and management gurus promote contemporary management ideas that are overly complex, theoretical and unnecessarily complicated; in practice, they argue, such ideas are often based on commonsense, practical

experience and intuitive knowledge (2:35). Some argued that management consultants 'trammel their wares' using buzzwords, advocating so-called new theories, new terms and new concepts which were simply a new 'flavour of the month'. Some compared management consultants to 'snake oil salesmen peddling their wares' (9) of management fads. They saw management fads as dangerous when they were accepted without consideration.

I mean I have read most books about management and leadership that exist. Most of them are bullshit. They are mutually exclusive. They are quite contradictory in nature and they assume a one size fits all prescription for organizations. You most usually find this expressed by consultancy firms, they have got the solution to a problem you may not even know you have got when they come in and do this. (20:23b)

These fads created a degree of scepticism and cynicism amongst some Departmental Secretaries, especially those who had observed other Departmental Secretaries being 'seduced' by and succumbing to such fads on a yearly basis (7:13; 13:17e; 24:28). Some believed that the APS had erred on the side of importing too many contemporary management ideas without applying a degree of analysis to establish the suitability and relevance of these ideas for the public sector:

I think we [the APS] sometimes...make the error of sort of grabbing, trying to grab, whatever the latest thinking is in the private sector management world. (10:11)

Not all senior managers were just downright rejectionist. Some expressed concern that others in the public sector had dismissed all contemporary management ideas because of their distaste for management fads that had been adopted unquestioningly in the past.

You know lots of terms that came out of the literature over the years that I think breed cynicism in a lot of people. Because most people who have been a witness to the impact that they [contemporary management ideas] were having in the public sector saw that they were usually temporal fads. The trouble is that people used to dismiss really good ideas as temporal fads

because of the terms that were used sometimes and because many of them were temporal fads, they would dismiss everything. (13:21)

Many contemporary management ideas were understood to be variations on a theme. Delivery mechanisms such as information technology management, call centre management and payroll management systems were examples of contemporary management ideas which had been considered and adopted but which were not original:

So I think a lot of the new ideas force you to think about things in different ways but for me a lot of it is variations of a theme. (2:23)

Contemporary management ideas were often considered by Departmental Secretaries not to be new ideas but instead reinvented, or recycled, with many originating not from the private sector but from earlier public sector experiences (11:7*d*; 15:28*a*; 15:28*b*), such as the concept of merit-based employment and promotion. They are reflecting here the primacy of the public sector and the public service to which they belong which frames their reception of ideas.

Often contemporary management ideas were thought to be recycled, based on the application of new or different labels or names, heavily promoted and marketed (11:7*c*; 13:20; 24:28). Departmental Secretaries commented that the public sector workforce was an educated workforce that was not easily fooled or persuaded by old management ideas purporting to be contemporary. Departmental Secretaries were mindful of promoting ideas, simply because they purported to be new. They recognized so many of these ideas to be, as Galbraith (1980) argues, labels applied by researchers and others to what has been created by practitioners in the past. Instead they applied an evaluative lens to such ideas (13:19).

...I'm not cynical about having a theory of management. I suppose what I'm cynical about is old ideas being dressed up in new clothes every year, you know there is this sort of brilliant new theory, [but] there is not much new. But people make a living out of saying that they have got this brilliant new way of seeing the world or of doing things and it's usually not new, it's just some well-tried and established principle by another name. (7:12)

Departmental Secretaries reflect a disposition that is predominantly sceptical, restrained, and sometimes disparaging towards contemporary management ideas. Their disposition is opposed to the majority of contemporary management ideas to which they are exposed, because these ideas challenge their bureaucratic identities, clash with their political and governmental environments, and contradict their institutionalized work.

The majority of Departmental Secretaries, however, are not merely retrograde and iconoclastic. As will be discussed below, in a seemingly contradictory sense they acknowledge learning from exposure to contemporary management ideas via local and 'globalizing webs' of public service affiliation. Departmental Secretaries, on occasions, offered constructive criticism of contemporary management ideas, indicating a need to show that they are modern thinkers, open-minded and receptive to change, even when they understood that positive change from such contemporary management ideas had mostly been negligible in its implications for their management work. It also reflects the view that Departmental Secretaries believe there may be no real need for change; as one shrewd former Mandarin commented: 'there would be something wrong with the bureaucracy [public sector] if you could change or break the bureaucracy'.

Exposure to Local and 'Globalizing Webs'

Departmental Secretaries are members of a variety of local groups, committees, fora and professional associations (or webs). These local webs (Hansen & Salskov-Iversen, 2005) include the Australian Public Service Commission, the APS200 (a forum for the top 200 Senior Executive Service in the APS), the Secretaries Board, professional public sector bodies such as the Institute of Public Administration Australia (IPAA), professional associations and institutions such as the Australian Institute of Company Directors (AICD), the Australian Human Resources Institute (AHRI) and the Australian Institute of Management (AIM). Departmental Secretaries' participation in these webs include: delivering presentations/sessions on a range of subject matter areas; advising and guiding other

APS agencies; contributing to 'whole of government' initiatives and mandates; promoting the APS Values and the APS Code of Conduct, and other similar activities.

Departmental Secretaries commented that it was these local webs that enabled them to learn about contemporary management ideas (2:35), from within and across the public sector and to disseminate them to a range of communities, groups and organizations in Australia and overseas (6:32). Such comment appears in stark contrast to Departmental Secretaries' sceptical, restrained and disparaging disposition towards contemporary private sector sourced fashionable management ideas and exemplifies their portrayal of a more contemporary, accommodating, progressive and adventurous persona.

I guess I was influenced and pushed in certain directions by the management ideas that were current at the time. I think that's responsible in a way. You do need to try to stay across the literature and to be active in management forums and to listen and try to take the best ideas and to implement them at home. (17:19)

Departmental Secretaries were also exposed to contemporary management ideas via a number of global organizations, universities and colleges (Scott, 2008) through participation in education, development, training, secondments, reading literature and other activities. In particular the Harvard Business School/University, (especially its Advanced Management Program), John F. Kennedy School of Management, the Institut Europeen des Affaires d'Administration (INSEAD), Kellogg School of Business (North-Western University, Illinois), London School of Economics, Boston Consulting Group, McKinsey's Consulting (and other academic institutions and 'think tanks') have featured prominently as vehicles for the development of Departmental Secretaries (12:16).

So I was very fortunate that the government sent me to Harvard Business School to do the Advanced Management Program in 2008...I have got a Master's in Business Administration...So I've seen lots of those [ideas] the latest in management thinking. (4:14)

Departmental Secretaries commented on seeking out influential principals, professors and other academics (within these above-mentioned institutions) to learn from their ideas. Individuals mentioned as people to whom they had been exposed included US Secretary of State Colin Powell, CEO Jack Welch, author and consultant Steven Covey, academics Peter Senge and Peter Drucker; contemporary public administration professors such as Malcolm Sparrow, John Kotter, Patrick Dunleavy and Ronald Heifetz, and other academics such as Daniel Goleman, Patrick Lencioni, Martin Seligman, Tony Wilson and others (*1:10; 1:11; 12:16*). The concept of ‘superstitious learning’ proposed by Levitt and March (1988, p. 325), whereby:

the subjective experience of learning [assumed after exposure to managerial ideas and techniques] is compelling, but the connections between actions and outcomes are mis-specified,

might be indicated here: Stars are remembered but, to beg the question, what they are remembered for is more problematic.

Although Departmental Secretaries commented on having valued this exposure as it allowed them to consider contemporary management ideas for application in their management work and more broadly across the public sector, at the same time they rejected many of the ideas from these sources as they deemed them to be, in essence, simplistic, commonsense and of negligible value to their work; nonetheless, limited acceptance of many of these ideas contrasts with positive rhetoric about the value of such exposure. The positive rhetoric is akin to what Abrahamson and Fairchild (1999, p. 715) argue ‘management knowledge entrepreneurs’ generate to reduce the anxiety that can develop when ‘environmentally induced performance gaps’ in organizations develop, which call forward fashionable or ‘quasi-magical’ solutions. Their covert disposition is evident, despite a positive rhetoric.

Malcolm Sparrow, a fellow from Harvard who did some stuff on leadership, wrote a book, made about \$10 million out of it and he has got three principles to his philosophy. He says understand what you and your organization [are], where you are, so what’s your culture, your performance and

all that sort of stuff, so understand that; understand where you want to go; and then finally go there [laugh]; that's it! (2:48)

Departmental Secretaries acknowledged that contemporary management ideas were generated via collaborative communities of national peer and global government and public sector institutions. These institutions include: Public Sector Departments across Australia and more globally; Public Service Commissions across the world; and the Group of 20 (G20), Organization for Economic Cooperation and Development (OECD), International Monetary Fund (IMF) and other institutions who meet together with their peer Finance and Treasury Ministers. Best practices are shared across these global communities of peer institutions and intellectual property is aggregated and made accessible.

While communities of peer institutions expose Departmental Secretaries to contemporary management ideas, analysis of the evidence shows that it is contemporary public sector topics of a technical nature that are disseminated via such global webs rather than contemporary management ideas. Common frameworks and standards on a range of contemporary public sector topics are discussed and considered for use across jurisdictions. 'Internationally we've championed quite a lot of working closely together [on technical work] with the other [...] administrations' (9:21c). Hence collaboration with peers provides Departmental Secretaries with opportunities to compare and contrast contemporary public sector topics of a technical nature with their peers with a view to improving this work (3:7; 3:14a; 3:14b; 9:10; 9:21d; 19:14a; 19:14b) rather than contemporary management work. These examples indicate that their disposition towards contemporary management ideas is secondary in importance to them and their constitution of public sector management work.

Departmental Secretaries espouse a positive rhetoric of being open minded and receptive to contemporary management ideas and of being influenced by such ideas (8:12; 13:22; 17:21; 21:23; 22:25; 16:17b) via local and globalizing webs. Their rhetoric shows a desire to appear current, progressive and open to change (Parker & Ritson, 2005; Williams, 2004). They believe the public sector should not be insular and inward

looking, and that it is not appropriate and indeed, is 'arrogant', to assume that they cannot learn from or can ignore contemporary management ideas (*12:17a; 12:17b; 13:20; 25:8b*). Departmental Secretaries commented that consideration and comparison of contemporary management ideas is taking place more frequently than in the past. They commented that there is more flexibility today than twenty or thirty years ago, to consider and apply contemporary management ideas deemed applicable to the public sector (*11:6*). Yet contemporary management ideas and managerial artefacts have been largely ignored in public sector management work as they do not accord with the bureaucratic actors, the political, governmental and bureaucratic environments, or the duality of activities performed in the public sector. At best such ideas have been tolerated where necessary but generally have not taken hold because they were not deemed relevant.

The fervour, commitment and ideology of novel ideas, the reform processes in which they were couched and the managerialist narrative that frames them, are mostly lost in practice. Contemporary management ideas, reforms and managerialist devices clash with a system that was and remains enduring because it is bureaucratic (not in a pejorative sense), political and governmental in substance. This system is enduring and influences public sector management work because it is much more relevant to how Departmental Secretaries constitute public sector management work.

Contemporary management ideas do not necessarily fit the public sector domain, because management fads and fashions originating from the private sector were foisted on a public sector that operates with a different logic. As Friedland and Alford (1991) argue, a set of competing and challenging institutional logics exists, in this case between the private and public sectors, and these different logics do not lend themselves easily to the acceptance of contemporary management ideas generated in one sector for use across other sectors. Furthermore, despite comments made by Departmental Secretaries about understanding the need to consider contemporary management ideas, many explained they do not have sufficient time to devote to engaging with and considering these ideas (*15:29b*). The sourcing, consideration, analysis, translation, application

and assimilation of contemporary management ideas require resources, not least time. But the public sector has not, in a collective sense, dedicated sufficient resources to this activity and has not been able to benefit from the possible learning. The lack of resourcing is suggestive of the lack of value that these ideas are accorded, as generally resources are allocated to valued activities. They do not necessarily actively dedicate time to these and so their exposure is likely to be more ad hoc or incidental.

Contemporary management ideas were sometimes seen as being about an 'ideal' that was not realistic for the highly contextual constitution of public sector management work, especially because of the institutionalized 'command and control' style of management in the public sector. This makes it difficult for the public sector to apply contemporary management ideas, as these often contradict the established, traditional and conservative style of public sector management. This practice of conservative embeddedness fearful of novel challenges to the bases of its authority is reminiscent of the idealization and utopianism of management fashions that ten Bos (2000) refers to and his suggestion (drawing on Achterhuis, 1998, pp. 362–363) that managers in organizations tend to resist these idealized and utopian standards because they are understood to be unrealistic and impractical. Whilst managerialism is a term understood intellectually by the Departmental Secretaries and the broader public sector workforce, its practices do not resonate with how public sector management work is conceived and done. Furthermore, the lack of passion of Ministers for the management domain, as well as the lack of experience of it for most of them, also drives behaviour unfavourable to contemporary management ideas.

The management idea has been the management ideal of doing. I've thought about good management and leadership over the years. I've spent time studying [contemporary] management ideas. I've actually been quite studious in reading up and understanding them. Not necessarily just applying them by rote. Because there are good things to be gathered from different management theories. [But] at the end of the day for me it was a question of maintaining my own authenticity and integrity. (9:19)

Legitimacy and Acceptance of Contemporary Management Ideas

The constitution of public sector management work as described by current and former Departmental Secretaries in Australia's Public Service is fundamentally different from the managerialism that has been advocated by public sector reformers. Public sector management work has little to do with managerialism and much to do with the bureaucratic actors, political environments and duality of activities performed. Coupled with the relatively adverse disposition Departmental Secretaries typically have towards contemporary management ideas, there exists a process of legitimization and acceptance required prior to the sanction of such ideas. Departmental Secretaries referred to the roles played by government, central agencies and the public sector workforce in legitimization and acceptance. Analysis of the evidence shows that although it is rare for such parties to legitimize and accept contemporary management ideas, even where such parties do so, such ideas rarely modify the constitution of public sector management work in a significant sense. This is because of the enduring institutionalized nature of public sector management work.

Role of Government and the Four Central Agencies

The findings indicate that the legitimacy and acceptance of contemporary management ideas and their sanction are based on three primary factors. The first factor is the nature of the relationship between government and the public sector, as well as the government mood for centralized or devolved communication between the two parties. Where the nature of this relationship is open and collaborative, it allows for decentralized communications and the public profile or media presence of the four central agency Departmental Secretaries is generally higher. However, where the relationship is closed and less participative, the Departmental Secretaries' freedom to communicate is restricted and their visibility or public profile is less. Departmental

Secretaries commented that communications became more centralized as governments of all persuasions chose to adopt a singular and controlled message (16:18b; 16:21b-22). Communication during such periods comes directly from the government of the day, often via the Minister's Office. Thus, although seemingly contradictory, centralized communications create less cohesion in the take up of contemporary management ideas because the voices of the four 'key' Departmental Secretaries are quashed.

It is political factors that shape the dissemination and legitimization of contemporary management ideas in public sector management. The adoption of such ideas is dependent on who controls the dissemination of communication, that is, the government or the public sector central agencies. If the public sector central agencies are closed out of the relationship with government, it is difficult for them to disseminate contemporary management ideas across the sector and their take up is less palatable.

But I think the inability to maybe translate in an open and visible way a lot of the management ideas and learnings that are going on elsewhere. That used to happen through the mechanism that I've talked about, through PM&C, Head of PM&C and others [Finance and Treasury] is not as evident these days as it was [due to centralized communication]. And I think it just seems to me that is having an adverse impact on the service as whole and its sense of purpose and direction and its take up of contemporary ideas. (16:21a)

The second factor in the legitimization and acceptance of contemporary management ideas and their sanction is also dependent on the government's zest or propensity for such ideas and reforms (1:4c; 5:6). It was recognized that without political commitment, or when political commitment wavers, no real ideas or reforms would be realized. Departmental Secretaries recognized catalysts originating from within society that drove reforms through government to be implemented by the public sector. They explained that recent amendments to the Public Service Act 1999 (amended in 2013) were brought about by demands from within society, agreed to by government through the Parliament, leading to consequent

changes to the public administration framework. Thus, public sector reforms are dependent on the political judgements made by politicians within the government of the day.

So there are catalysts every so often. They are really driven not from the bureaucracy but from the society. It says to government, what are you going to do about this? I think we are in a mess. Something has got to change drastically here and we want, we're looking to you, you're the government. So they're supported obviously by smart people in the bureaucracy but in the end it's a political decision to make a big change. (5:16a)

Whilst the influence of government reforms and contemporary management ideas can be potentially significant because the public sector is responsive to government (3:24) and hence is required to follow its direction, reforms promoted (and in some cases forced through) by government rarely challenge traditions of public sector management work. Governments via their Ministers are less concerned about the management domain than they are about the technical domain or policy dimension of public sector work. Reforms and ideas are not regarded with the same gravitas as recommendations made in relation to public sector work that is fundamentally associated with its 'technical' core.

The third factor contributing to the legitimacy and acceptance of contemporary management ideas and their sanction is the role of the four central agencies and the strength of personality of their respective Departmental Secretaries. This factor aligns with the identification by Mathews (2015, p. 311) of the role individuals play, encompassing their personality, in the decision to adopt ideas. Departmental Secretaries commented that those contemporary management ideas and reforms which are successful are often driven from within the public sector, in particular from its four central agencies: the Department of Prime Minister and Cabinet, the Treasury, Department of Finance, and the Australian Public Service Commission. These central agencies and the strength of personalities of their respective Departmental Secretaries influence which contemporary ideas and reforms are driven throughout the public sector. These central agencies and their Departmental Secretaries are in positions of authority, and have roles

and the prerogative to recommend to government relevant contemporary management ideas and reforms to improve the public sector and its management work.

I was going to go on to say how influential it is the contemporary management ideas and how to fix public sector management. There are some key leadership positions within the public service that are fundamental to the take up of those ideas. Really if you think back about over the last 20–25 years or so...it's fallen more often than not to the heads of the Department of Prime Minister and Cabinet, the Public Service Commission, maybe the Department of Finance and maybe the Department of Treasury, so those four Departments. And at various points they have quite strong personalities. So if you think of PM&C in particular where you had the Max Moore Wiltons, you had the Peter Shergolds. (16:17a)

The personality of these Departmental Secretaries who head the four central agencies was considered to be a key factor in the promotion and implementation of contemporary management ideas and reforms and hence their legitimization and acceptance. Depending on who they were, these position holders were able to consider contemporary management ideas from business, academia and consultancies, and then promote/advocate and disseminate them across the public sector with greater or lesser success.

Departmental Secretaries work by reinforcing what they are familiar with and what they value and what they deem appropriate for the public sector. This indicates passive and active resistance to reforms with which they do not agree. Over the past four decades, various incumbents have initiated and effected reforms and ideas, often reflecting a bias towards the existing status quo or marginal and incremental modifications to the constitution of public sector management work. However, over the past four decades these reforms have not always been incremental, as the initial surge of managerialism (Pusey, 2003) was radical and supposedly involved a paradigm shift. There have been waves of reform initiatives sometimes led by influential Departmental Secretaries and sometimes by governments influenced by external reformers, including managerial consultants/academics and business peoples, recently with the reform initiatives during the Rudd/Gillard government 'vigorously promoted by

both the Secretary to the Prime Minister and Cabinet Department, Moran, and the Public Services Commissioner, Sedgewick' (Pollitt & Bouckaert, 2011, p. 236).

Similarly, other Departmental Secretaries reported that they, their Departments and the APS as a whole, were well regarded by the government and their views were regularly sought on contemporary management ideas, via formal invitations by the Australian Federal Parliament (3:13). They were asked to deliver presentations on their organizations' functions, to participate in orientation sessions for new members of Parliament incorporating sessions on the work of their Departments, and to deliver occasional lectures. On occasions, requests are made by the Parliament for Departmental Secretaries to discuss their views via semi-formal briefings on the future of public administration and similar topics. However, although there is respect and regard for the knowledge, experience and proficiency of the Departmental Secretaries, the contemporary management ideas which are shared are often those which reflect the status quo and so reinforce the constitution of public sector management work resulting in institutional isomorphism, and isopraxis (Powell, Gammal, & Simard, 2005, p. 233).

Adoption of Contemporary Management Ideas

Contemporary management ideas sanctioned by the government or the four central agencies are sometimes accommodated via tailoring in attempts to make them better fit the APS. Tailoring is not extensive because there is rarely great interest, concern or focus on innovation in public sector management work. The focus is on the rational managerial dimension of work: ideas have been imported directly into the public sector with little or no tailoring and have created dysfunction and disarray.

Tailoring, Translation and Transformation

Rarely did Departmental Secretaries embrace or adopt contemporary management ideas in an indiscriminate manner or assimilate them in

their original form or in a wholesale manner (7:11; 17:21; 22:15; 24:28) ‘...yes we’ve certainly looked at those management ideas and concepts and typically we don’t adopt them vanilla’ (6:31). Departmental Secretaries reported keeping abreast of management ideas and considering their merits and applicability for the public sector (3:19). They chose to selectively ‘cherry pick’ what they took to be the best:

...for the last 30 years, private sector ideas have been dominant. I think there was a lot of merit in some of those private sector ideas but I don’t think they translate perfectly into a public sector environment.... (17:19)

Departmental Secretaries reported the adoption of tailored ideas such as the use of outsourcing of some services in which the public sector had little industry- based expertise; the balanced scorecard adapted into a ‘four quadrant’ model focusing on stakeholder relationships, products and services, staffing, and business processes (3:19; 6:31*b*); scenario planning (22:25); the adaptation of Steven Covey’s ‘Seven Habits’ framework to encompass the articulation of values (6:31*c*); the use of total quality management and six sigma concepts in quality assurance processes: the achievement of ISO standards; principles of the ‘learning organization’; concepts associated with ‘emotional intelligence’ (EQ); project management; financial management; accrual-based accounting and budgeting processes; concepts of ‘transformational leadership’ and ‘adaptive leadership’; and customer service.

The tailoring of novel ideas comprised variation, selection, retention and rejection of managerial fashions as proposed by Abrahamson and Fairchild (1999) rather than simply acceptance and retention. However, most of these ideas reflect only the rational components of managerial work rather than the substantive constitution of public sector management work. As ten Bos (2000, p. xiv) argues, such contemporary management ideas and similar ‘fashionable [management] topics’ are often ‘subjugated to rational and utopian forms of understanding rather than to a more lyrical one’. In reality, the constitution of public sector management work has changed only marginally, if at all, through the adaptation and adoption of such ideas.

Contemporary management ideas, introduced as a consequence of public sector reforms, have been controversial and problematic because

they were adopted from the private sector, with little, if any, adaptation (13:3). The performance appraisal and management system, and its counterpart, the performance bonus system, were imported directly from the private sector to evaluate and measure performance. Although still in place in the public sector, Departmental Secretaries commented on the challenges which such systems brought to the sector (18:3). In effect they simply tolerate these systems as they have limited, if any, confidence in their value.

Although the performance appraisal, management and measurement systems are still in place, their impact on the constitution of public sector management work is negligible because the parties bound by such systems, Ministers and Departmental Secretaries, understand and acknowledge their limitations and compensate for them by 'working around' these systems, rendering them devoid of their intended objectives in practice. As one Departmental Secretary commented, Ministers understand that although performance agreements are drafted and in place for Departmental Secretaries, their accountabilities often change 'before the ink has dried on the agreement document' (18) and so they are largely disregarded. Such systems resemble institutional polymorphism, and polypraxism (Powell et al., 2005, p. 233) and their impact on the constitution of public sector management work is low:

... I think we overstepped the mark see, where we used some private sector practices too far. I think we had some problems with accrual accounting, [and performance management systems] I think we had some problems with over reach in terms of losing sight of the values of the public service and some parts of that. (24:6)

The dismantling of tenure and the placement of Departmental Secretaries on contracts of employment was another public sector reform imported directly from the private sector with no adaptation or tailoring. Most former Departmental Secretaries considered it to be an inappropriate import from the private sector as it presented a challenge to the provision of 'frank and fearless' advice to Ministers and government by Departmental Secretaries (15:8*b*). Instead, insecurity created by the possibility of termination of contract was believed by some to have led to a change in the quality of advice provided to government.

Whilst current Departmental Secretaries hold a different view, notably that their advice continues to be 'frank and fearless', they do not articulate any diminution of the provision of 'frank and fearless' advice as to do so would be to admit weakness. Recently, advice offered to Ministers by current Departmental Secretaries indicates that there is an apparent risk to their continuing employment where that advice is deemed controversial for the government (see Bettles, 2013). One can see this in regard to the termination of contract by the Abbott Liberal National Government in 2013 of the former Departmental Secretary of Immigration and Citizenship, Andrew Metcalfe (who was not a participant in this research).

Several other ideas copied directly from the private sector included the outsourcing of public sector information technology (IT) and human resources (HR) functions to the private sector and the introduction of a centralized industrial relations mechanism via 'whole of government' enterprise bargaining arrangements. Both of these ideas have led to unintended negative consequences such as higher costs, lower standards and services, confusion and dysfunction for the public sector (19:2, 19:2c).

But at other times, some of these ideas for very good reasons aren't necessarily sensible within the public sector or indeed the private sector. The classic is, well one of the classics, was huge outside, outsourcing of your core IT and your core HR capability and in my view, those things were both disasters for the public sector. (14:13a)

These ideas were seen as an aberration with unintended outcomes and the outsourcing approach has since been repealed and dismantled.

Analysis of the evidence indicates that many contemporary management ideas, especially those associated with managerialism, can be forced upon the public sector with little tailoring, translation or transformation. Instead they are bolted on and merged into the existing frameworks, almost out of desperation but are not implemented with rigour. In other cases, naiveté is evident, whereby public servants can be seduced into uncritical acceptance by those promoting such ideas, especially where the promoters have limited knowledge, experience and interest in management and the public sector. Some of the younger, less-experienced Departmental Secretaries more recently appointed to their roles, show more enthusiasm for such ideas than

older, more-experienced, shrewd veterans. Only remnants of managerialism remain in the constitution of public sector management work and these are treated with contempt.

Collectively contemporary management ideas and the public sector reforms on which they were based have had a mixed (often negative) but marginal impact on the constitution of public sector management work. Such ideas were generally considered with caution and scepticism and few were adopted or even adapted to fit the sector. Even fewer have effected radical change on the constitution of public sector management work. Instead incremental changes only have taken place.

Equilibrium and Incremental Change

Regardless of their origin, whether generated by the government, the central agencies or the public sector workforce, contemporary management ideas are not accepted 'wholesale' for implementation across the sector. Instead, only relevant components of contemporary management ideas are considered with marginal influence as a result of the desire not to disrupt the equilibrium of the public sector by making 'abrupt shifts to the left or [to the] right' (17:22). It is also a reflection of the acceptance by the government, the central agencies and the Departmental Secretaries that the public sector is highly institutionalized and not susceptible to radical change.

And management ideas are like that too. And so, the most obvious one... [the public sector] should pick up the approaches of the private sector because they're much more efficient, they can probably do the job better than the people in the public service and so on and so forth. There's some truth in that and still is. In fact, there was a lot of truth in it. But within that, the public sector has to find its own way. The reason it has to find its own way is that it's a different beast to the private sector. You know, it really is a different beast because its whole motivation is not to make money. Its motivation is to act and behave in the best interest of the country. And/or to do what the government of the day tells it to do. And that should be deemed to be in the best interest of the country because these people are elected by the people to be their leaders. (14:12)

Although reforms and contemporary management ideas play only a limited role, this does not mean stasis. One former Departmental Secretary held a view that the APS has been reformed and transformed since its inception more than a century ago, most recently over the past thirty-five years, with this transformation contributing much to Australia's economic prosperity and well-being. Such reforms have modified some features of the Departmental Secretaries' activities predominantly as a result of successive legislative changes to the public sector (see Commonwealth of Australia, 2010). These reforms and transformations have been slow, cautious and measured as befits the public sector: they have been considered with an eye to assuring fair and equitable treatment of citizens; they have been based on formal processes and procedures as required by the rule of law; and they have been implemented where they were deemed to be appropriate and relevant within the context of promoting the national interest. The transformation has been bureaucratic in nature, incremental over time, not necessarily overtly communicated and represents constancy in the constitution of public sector management work and hence is imperceptible to outsiders. This perception of the public sector's acceptance and implementation of change, albeit incremental, is held by many Departmental Secretaries:

...the public service has been very successful in totally transforming itself...the period of economic reform over the last thirty years or thirty five years has been accompanied by a parallel period of public sector reform going through various phases which have been integral to the economic reform which has transformed Australia in a positive way...the point is [that] there is any amount of evidence that although public servants like to play by the rules, because that's their job, treat citizens fairly and equally, because that's their job, try to do the right thing with an eye to the national interest, because that's the sort of people we recruit into the public service. Despite all of those things nonetheless the public services have changed radically to the benefit of Australia and nobody's actually managed to explain that to the people. (25:10)

As Departmental Secretaries commented, what is not often acknowledged is that the constitution of public sector management work requires more than simply a managerial economic focus, because at its core is a

policy dimension, and that 'policy is more than what economists work on, although, economists think that economics equals policy' (25:8a). They explained it was problematic to apply contemporary management ideas, within the public sector, as it is considered to be a 'different beast to the private sector' (14:12), one oriented to the governmentally bureaucratic and political (Allison, 1984; Allison & Zelikow, 1999) rather than being market oriented. Departmental Secretaries made the comment that while there is much to learn from the private sector, there were important differences which needed to be taken into consideration and significant tailoring of models needed to be made so as to take into consideration the unique circumstances of the public sector. They commented on how many mainstream Ministerial Departments had considered contemporary management ideas but, recognizing their limitations for the public sector, had implemented few (25:8c).

Departmental Secretaries acknowledged the 'great divide' between the private and public sectors and that contemporary management ideas, which were generated and travelled from the private sector, were limited in their applicability to the public sector. For many, contemporary management ideas played little role, if any, in their work (10). Many contemporary management ideas from the private sector were deemed not easily transferable and in some cases not at all transferable to the public sector. There was acknowledgement that public sector reforms or the 'new managerialism' were an attempt to take ideas that worked in the private sector context and apply them in the public sector, especially in an endeavour to improve the efficiency and effectiveness of the public sector.

Managerialism's proponents did not take into consideration the different logics that exist across the private sector and the public sector, rendering many contemporary management ideas unusable. Hence public sector management work has been influenced only marginally by external ideas.

Conclusion

Many of the contemporary management ideas which became manifest within public sector reforms did not alter the constitution of public sector management work in Australia, because they were deemed

inappropriate, neither suited to nor fitting for the public actors, the political environments, and the duality of roles and responsibilities constituting public sector management work. Reformers, with an economic rationalist perspective, advocated the introduction of contemporary management ideas that were derived from the private sector. As Friedland and Alford (1991) proposed, a set of competing and challenging institutional logics exists, in this case between the private and public sectors, and many contemporary management ideas simply clashed with public sector logics.

Ideas associated with efficiency and effectiveness were advocated for the public sector and a lexicon including terms also derived from the private sector, such as strategic planning, personnel management, financial management and accountability for results, were introduced (Allison, 1984; Pollitt & Bouckaert, 2011; Stewart & Ranson, 1988). Indeed, many have argued, as does this research, that such concepts and terms 'do not map the territory [of public sector management] directly' (Allison, 1984). The quest to 'reinvent' government or 'banish' bureaucracy, as suggested by the two texts *Reinventing Government* (Osborne & Gaebler, 1992) and *Banishing Bureaucracy* (Osborne & Plastrik, 1997), was in effect a presentation of ideas which were 'devoid of a knowledge of public administration and its historical context' (Coe, 1997; Fox, 1996; Goodsell, 1992; Kobrak, 1996; Nathan, 1995; Russell & Waste, 1998; Williams, 2000; Wolfe, 1997).

Although many, if not all, the contemporary management ideas proposed by reformers were circulated, diffused and translated (Czarniawska & Joerges, 1996; Czarniawska & Sevón, 1996; Sahlin-Andersson, 1996; Sahlin-Andersson & Engwall, 2002) during their travels across the Anglo-American polities, they were received in a differential manner (Powell et al., 2005, p. 233), with only a few resembling processes of institutional isomorphism, isopraxis and isonymism, whereas others resembled institutional polymorphism, and polypraxis, and still others were completely discarded. Such decisions were made in large part by the Departmental Secretaries of the top four central agencies in the APS and by others who constitute public sector management work in Australia's Public Service, as well as by the government of the day.

The research found that it was senior public actors who determined what, if any, contemporary management ideas would be accepted and in what form, and that such determination was related to the extent that contemporary management ideas would ‘fit’ and suit the existing constitution of public sector management work. Ideas were judiciously considered and what appears to have endured is the Departmental Secretaries’ unique constitution of public sector management work. Fads, fashions and radical changes seem more absent than present, despite earlier prognostications to the contrary (Pusey, 2003).

Notes

1. The coding in brackets refers to the raw data/quotes relevant to the thesis lodged at UTS. The coding uses a system which reflects the transcript number and page number, and where there was more than one quote per page number per transcript, the addition of the letters a, b, or c follows the page number. Therefore (1.1a) refers to transcript (or interview) number one (1.), page number one of the transcript (.1), and the first of several quotes on the same page of this transcript (a). These raw data/quotes are referred to either in full in the thesis and this chapter or they are referred to via their codes at the end of the relevant sentence and paragraph to which they pertain within the thesis and this chapter. These quotes are italicized to differentiate them from other quotes in the thesis and this chapter.

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Reconfiguration of Information Flows by Public Sector IT Systems: The Question of Fairness and Ethics

Dubravka Cecez-Kecmanovic and Olivera Marjanovic

Introduction

The free flow of information is essential to a democratic society. Advances in information technology have the potential to significantly enhance this flow of information, and thus strengthen the institutions of our society, from financial markets to government agencies. The flow of information must, however, not only be 'free', but 'fair'. Financial markets, for example, have learned that they must guard against abuses, such as insider trading.

An early, much shorter version of this chapter was presented at the Australian Conference of Information Systems (ACIS 2015).

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Businesses and healthcare institutions must guard against the misuse of personal information put in their trust by their customers. As we have the opportunity to use information technology to strengthen our societal institutions, we must understand the potential pitfalls, and the safeguards we must put in place to achieve both a free and fair flow of information. (PITAC, 1999)

This quote from the Information Technology Advisory Committee Report to the President of United States reads as an extract from a manifesto for contemporary digital society. Not only because it clearly identifies the importance of the ‘free flow of information’ and the role of Information Technology (IT) in enabling and enhancing the flow and thereby strengthening social institutions, but also, and more importantly, because it warns us that the flow of information must ‘not only be *free*, but *fair*’. This warning is particularly critical to contemporary democratic societies as they relentlessly pursue digitization, open data and massive surveillance (Zuboff, 2015). Most notably IT deployment in the public sector, following successes in the private sector, has been seen as the most cost-effective way of enhancing information flows between government agencies and citizens and strengthening democratic institutions (Corydon, Ganesan, & Lundquist, 2016; Dunleavy, Margetts, Bastow, & Tinkler, 2006; Helbig, Cresswell, Burke, & Luna-Reyes, 2012). However, consideration of fairness of IT-enabled information flows and how society can guard against unfair flows have not received necessary attention, academe including.

The deployment of IT systems in the public sector—health care, education, social services, etc.—is radically transforming information flows between government agencies, public sector organizations and citizens (see e.g. Blum, 2014; Corydon et al., 2016; Fox, 2010; Keevers, Treleaven, Sykes, & Darcy, 2012; Rondinelli, 2007). While the logic of IT deployment in the public sector is largely following the private sector’s pursuit of efficiency and effectiveness, there are specific objectives of *accountability* and *transparency* that are promoted by the public sector (Blum, 2014; Keevers et al., 2012). Importantly the deployment of IT systems in the public sector is typically justified by the introduction of new, efficient and free flow of information between citizens, govern-

ments and public sector organizations (service providers) with the objective of increasing these organizations' accountability and transparency. However, studies have shown that such new and free information flows have produced both the intended positive and unintended negative consequences for citizens, organizations and segments of community (see e.g. Fichman, Gopal, Gupta, & Ransbotham, 2015; Kappos, Rivard, & Lapointe, 2005; Overby, Slaughter, & Konsynski, 2010; Tarafdar, Gupta, & Turel, 2015; Tarafdar, Pullins, & Ragu-Nathan, 2015). These studies suggest that such free information flows in the public sector that purportedly increased accountability and transparency have not necessarily been fair and ethical. Conspicuously, the fairness and ethics of information flows enabled by public sector IT systems remain hidden in the rhetoric of efficiency, accountability and transparency.

In this chapter we draw attention to and examine the fairness and ethics of information flows introduced and enabled by public sector IT systems. Specifically we focus on IT systems that provide open performance-related data and services to citizens and thus create new, as well as modify the existing, information flows in a public sector (e.g. education, health care, social services). We are concerned with the broader implications of such IT-enabled information flows on 'the good life within one's community' (Mingers & Walsham, 2010, p. 841). When these implications are in any way harmful and negatively affect the well-being of a community and its members, the goodness or virtue of such information flows have to be questioned and addressed (Mason, 1995; Mingers & Walsham, 2010). The problem however arises when such unintended negative implications are not publicly recognized, when they are denied or considered insignificant within the grand agenda of public sector modernization and digitization. The disregard and neglect of negative social effects of open data and free information flows do not allow serious issues of their fairness and ethics to be publicly debated, thus preventing society from addressing them. How could society 'guard against' harmful implications of IT-enabled information flows in the public sector and ensure that the objectives of transparency and accountability are not devoid from the fairness and ethicality of information flows?

Central to this debate is the understanding of the nature of IT-enabled information flows and the ways they mediate and transform the social and moral order in a public sector. In this chapter we therefore seek to answer the following research questions:

1. How do IT-enabled information flows reconfigure relations among citizens, public sector organizations and government?
2. How do such reconfigurations of relations in a public sector produce various unintended negative social effects for citizens, organizations and segments of community despite government intentions to achieve positive effects?
3. How can we articulate the questions of fairness and ethicality of IT-enabled information flows that would reveal the mutual responsibilities of social actors and the necessity of public engagement in restraining information flows to guard against negative social effects?

To answer these questions we propose a theoretical view of *information flows as intermediaries* and *mediators* (based on Callon's (1991) and Latour's (1992) notion of intermediaries and mediators) and demonstrate empirically how they enable (different) understandings of the ongoing reconfiguration of relations in a public sector and their social effects. To do so we draw from a longitudinal study of My School portal¹ launched in January 2010 by the Australian Government that to this day continues to provide open performance data about 10,000 Australian schools. Based on the analysis of extensive publicly available documents, reports, newspaper articles, websites and blogs about My School we demonstrate that the nature and effects of complex reconfigurations of IT-enabled information flows and their fairness and ethics are not well understood and cannot be understood within the view of information flows as intermediaries that is dominant in the public debate. This view, we claim, obstructs public recognition of and debate about critical social and ethical implications. By proposing an alternative view of information flows as mediators we show how the data from the My School portal become transformed in multiple ways due to (re)interpretation, processing, and dissemination by media and other social agents, leading to translation and distortion of the intended meanings. This allows us to explain

how the new (distorted) meanings of data provided by My School perform new subjects: schools become 'good/bad' schools; students become 'good/bad' students; teachers become 'good/bad' teachers. Such an understanding of the unintended negative effects of My School provides a foundation to debate its fairness and ethics, including responsibilities of actors involved and actions to guard against the negative social effects.

In the remainder of the chapter we first review the literature that addresses public sector IT systems that provide open data and services to citizens—thus creating new information flows—as part of public sector digitization and modernization. We then propose a view of IT-enabled information flows as intermediaries vs. mediators as a theoretical foundation for our study. This is followed by a brief presentation of the methodology, including a description of the My School case. We then summarize the empirical findings from our study. In the discussion section we provide a theoretical interpretation of the reconfiguration of social order in the education sector emerging through My School-enabled information flows and reveal how such a reconfiguration produces reported, unintended, negative social effects for students, parents, teachers, schools and the education system. The chapter concludes with theoretical and practical implications for understanding the fairness and ethicality of IT-enabled information flows, for establishing responsibilities of the social actors involved and fostering public engagement that would restrain information flows and guard against negative social effects.

Literature Review

Public sector IT systems are increasingly used to provide open data and services to citizens, often in the name of public sector modernization. Although the actual deployment of these IT systems may vary, provision of open data has two underlying objectives: increased public accountability through transparency and economic growth (Janssen et al., 2012; Magahjeas, 2013). Increasingly open data initiatives are making their way into public sector domains such as health care, education and social services (Denziger & Andersen, 2002; Dunleavy et al., 2006; Smith, 1995).

By providing open data, public sector IT systems are meant to bridge the traditional separation between public organizations and their users (Janssen et al., 2012). There is a common assumption that simply supplying more data will lead to more use, leading to more value creation and in turn motivating government to continue opening data (Helbig et al., 2012). However, this is not as simple as often anticipated. When the public access and interpret open data provided by government IT systems and combine them with other data (Janssen et al., 2012) new interactions are created. Their collective interaction with open data and subsequent actions they take in turn result in new IT-enabled information flows between governments, public sector organizations and citizens as well as other actors in a society. Therefore, by making relevant data (e.g. in health care or education) publicly available and allowing free access and unrestricted usage of data, these IT systems radically reconfigure information flows in a public sector in complex and unpredictable ways (see e.g. Blum, 2014; Salzberg, 2014; Smith, 1995).

While economic efficiency, accountability and transparency typically justify deployment of IT systems in a public sector, the resulting new information flows create unintended, unanticipated and often negative social implications for certain segments of society that remain either unnoticed or neglected (Earl & Katz, 2006; van der Hoven & Wickert, 2008; Vanderlinde, Hermans, & van Braak, 2010; Visscher & Coe, 2003). Several studies reported that the increasing implementation of IT-enabled information flows in the public sector has introduced new inequalities and produced unfair and unjust (though unintended) implications for some sections of a community (Earl & Katz, 2006; Rondinelli, 2007; Smith, 1995). These are among important ethical questions that scholars have only begun to consider as relevant research problems (e.g. Davison et al., 2009; Mingers & Walsham, 2010; Stahl, 2008; Stahl, 2012).

In this chapter we focus on particular types of public sector IT systems that are used to provide open performance data in the education sector. These types of IT systems have been investigated in education research, education management and leadership, public administration, political science, social sciences and, to a lesser extent, in Information Systems (IS) and organization studies. For example, Smith (1995) describes a

case of unintended and very serious consequences of publishing open school performance data in the UK education system. Other studies conducted in the United States (Earl & Katz, 2006; Jacob & Levitt, 2003) and Denmark (Henriksen, Andersen, & Medaglia, 2011) also confirm serious negative consequences of publishing performance data in their education systems. Especially damaging were instances of publishing the so-called school league tables based on simplistic interpretations of performance data by media and other interested parties. Consequently, national testing systems such as those reported in the UK, the United States, Denmark and Australia become high-stake, with the performance of teachers, schools and students made all of a sudden visible through the public display of data (Roberts-Holmes, 2015). Polesel, Dulfer and Turnbull (2012) provide a very comprehensive literature review on the impact of high-stake testing on students and their families, confirming that:

this substantial body of work reveals consistent and worrying concerns which emerge in almost all of the literature which reports research in this field. A narrowing of curriculum, a restriction in the range of skills and competences learnt by students and a negative impact on the ability of teachers to employ creative and engaging pedagogies are all cited in the extensive body of literature which relates to this field. (Polesel et al., 2012, p. 12)

In summary, the literature from different disciplines draws attention to public sector IT systems deployed to provide open performance data and services to citizens. As a consequence, new emerging information flows are introduced between government (agencies), public sector organizations (service providers such as schools, hospitals) and citizens. The literature warns that the discrepancy between the claimed benefits to citizens and community on the one hand, and negative, unintended effects on the other, are under-reported and under-researched. Importantly, broader social implications and significant negative unintended consequences of these IT-enabled information flows in the public sector create new ethical and moral challenges for modern democratic societies (Mingers & Walsham, 2010; Rondinelli, 2007; Smith, 1995).

The key questions that remain open concern the (lack of) understanding of the nature of IT-enabled information flows in the public sector and how they mediate and transform the social and moral order and thus affect ‘the good life’ within a community (Mason, 1995; Mingers & Walsham, 2010). In the next section we propose a theoretical grounding for answering these questions and then proceed with the empirical study to answer them.

IT-enabled Information Flows as *Intermediaries* or *Mediators*

The theoretical concepts of *intermediaries* and *mediators* (Callon, 1991; Latour, 1992, 2005) can help us understand the nature of IT-enabled information flows. Objects and technologies (non-humans) are seen as intermediaries when we treat them as black boxes that transmit actions, force or meaning between actors without making any changes. As Latour (2005, p. 39) explains, an intermediary ‘transports meaning or force without transformation’. Both Callon (1991) and Latour (1992, 2005) critiqued this view and argued that technologies and things are rarely mere intermediaries and should be treated more accurately as mediators. Mediators, writes Latour, ‘transform, translate, distort, and modify the meaning or the elements they are supposed to carry’ (Latour, 2005, p. 39). While intermediaries’ inputs determine their outputs, mediators are complex and their outputs are unpredictable.

Drawing from these dichotomous concepts we can conceptualize IT-enabled information flows as either intermediaries or mediators (see Table 1). The view of *information flows as intermediaries* denotes data transmission from the sender (IT system) to the users in such a way that the intended meanings—assumed to be ‘given in the data’—are reproduced by the users. Such a view of information flows as intermediaries largely dominates the public discourse: it is widely believed that by providing open data government IT systems enable information flows that transmit fixed and intended meanings to the users. The effects of these information flows (data usage) are thus predictably as intended.

Table 1 IT-enabled information flows as intermediaries vs. mediators

Different views of IT-enabled information flows	
IT-enabled information flows as <i>intermediaries</i>	IT-enabled information flows as <i>mediators</i>
Information flows as intermediaries transmit data and the meanings given in the data from an IT system (source) to its users; users thus infer the intended information from the data;	Information flows as <i>mediators</i> translate, modify and distort meanings of the data they supposedly transmit; users infer information by interpreting the data in their context in opaque and unpredictable ways;
Information flows cause intended changes in users' practices and therefore produce determinate and predictable impacts on the users.	As numerous social actors use the data and make their interpretations publicly available, IT-enabled information flows are multiplied; the ensuing effects on users' practices are thus emerging and unpredictable.
Different approaches to fairness and ethics of information flows	
Fairness and ethicality concerns are focused on open data provided by IT systems, their built-in assumptions, values, interest and purposes as well as the predicted impacts of information flows and data use on the users;	Fairness and ethicality concerns are (should be) focused on the ongoing performative co-construction of information flows and users' practices;
Fairness and ethicality of government IT systems are assessed based on their intended purposes and predictable and determinate effects on users.	Fairness and ethicality of government IT systems are (should be) assessed based on the emerging usage and effects of information flows in users' practices and the ensuing reconfiguration of relations in a public sector.

Consequently, considerations of fairness and ethicality are limited to the intended meanings and the use of the open data provided by IT systems.

An alternative view of IT-enabled *information flows as mediators* does not assume that data have given and fixed meanings but rather consider that the meanings emerge, constructed through data use and interpretation, in different contexts. Furthermore, the provision of open data by IT systems in a public sector creates complex information flows involving a large number of actors who process and interpret the data in their specific contexts (and with specific purposes) and make their interpretations publicly available to other actors. When used by other actors, such inter-

pretations of data are reinterpreted and potentially combined with other data in new contexts and for unforeseen purposes. Information flows thus multiply and in turn transform, modify and distort meanings of the open data in opaque and unpredictable ways. Such a conception of IT-enabled information flows as mediators in a public sector opens new insights into the reconfiguration of relations among government, public sector organizations and citizens, allowing a novel approach to understanding of the emerging social implications. This conception enables empirically and theoretically grounded questioning of fairness and ethicality of IT-enabled information flows that reveals mutual responsibilities of social actors in the public sector in addressing and preventing negative social effects.

Methodology

We answer our research questions by drawing from a longitudinal case study (2006–2016) of an Australian Government portal My School (www.myschool.edu.au) that provides school performance data, based on the National Assessment Program—Literacy and Numeracy (NAPLAN) test. NAPLAN is administered each year to Year 3, 5, 7 and 9 students of all Australian schools (currently about 10,000). The Government agency ACARA (Australian Curriculum Assessment Report Authority) planned and designed the NAPLAN test during 2006–2008 and has administered it since 2008. In 2010, ACARA launched the My School portal making school performance data (NAPLAN test results for schools) for 2008 and 2009 publicly available. The objective was to achieve transparency and accountability of schools and teachers, which were expected to lead to improved quality of education (ACARA, 2010)

My School is an exemplary case of a government IT system that provides open data for public consumption. These data are used, (re)interpreted and propagated by numerous actors, thereby introducing new and unpredictable information flows between the government, schools and citizens. As these information flows emerge they reconfigure relations in the educational system with various intended and unintended consequences.

The launch of the My School portal in January 2010 created unprecedented public controversy and criticism (Bonnor & Shepherd, 2016; Lam, 2010; Thomson & Cook, 2013), so much so that four months later My School was subjected to a Senate Inquiry (known as the First Senate Inquiry in 2010). While the media largely celebrated the public availability of ‘school performance data’, the Senate Inquiry documents (submissions, testimonials, reports) revealed numerous cases of unintended harmful effects on the intended beneficiaries—children, parents, teachers and schools. Furthermore, professional reports by education associations (ASPA, 2010; NSW PPA, 2010) and research studies in education (Lingard, Thompson, & Seller, 2016; Wu, 2016; Wyn, Turnbull, & Grimshaw, 2014) all questioned the claim by the My School portal that public availability of school performance data ‘benefits everybody’ and provided evidence of serious negative implication to students, teachers and schools. As public controversy continued the Second Senate Inquiry was conducted in 2014 and a government review in 2015 (see Ziino & Matheson, 2015).

Data collection for this study spans a period of over ten years (2006–2016). We have collected publicly available documents related to the initial planning and development of the NAPLAN test in 2006, the implementation of NAPLAN during 2008 and 2009, the My School portal development and its launch in 2010, and ongoing use of My School data by various agents in society until today. The data set collected so far consists of 600+ documents including government reports, media releases and documents; My School portal content; the First and Second Senate Inquiry documents; media articles; public debates; video cases posted on various websites (government, school principals’ association, teachers’ associations); blogs and twitter feeds; as well as numerous published studies completed by researchers in other disciplines (documents quoted in the chapter are provided in the Appendix at the end of this chapter).

Our study is broadly interpretivist as we adopted hermeneutics as both a philosophy and a methodology for analysing and interpreting texts and making sense of actors’ actions and their meanings (Crotty, 1998; Gadamer, 1960). As we continued to collect evidence our interpretation emerged gradually through a dialogical engagement with relevant docu-

ments and through observation of actions by the growing number of actors (government agencies, media, school principals, teachers, parents, children, researchers, politicians and others). Based on the documents collected we investigated the emerging information flows between My School and numerous users. This hermeneutic process was iterative in a sense that our understanding was constantly moving from the whole to the part and back to the whole—referred to as a hermeneutic circle (Gadamer, 1960; Klein & Myers, 1999). Our interpretation thus emerged and continues to emerge as we collect new documents and interpret them within a dynamic rich picture of My School information flows in the Australian education sector.

Data analysis was conducted through a number of hermeneutic circles. We read the documents as we collected them and classified them using our own classification scheme which included, for example, a document's source, authority and medium, a document's purpose, actors and related event(s), and the topics (keywords) addressed. For this chapter we selected documents related to:

- key events that affected the changes of information flows in the education sector (e.g. the launch of My School; ACARA's announcements; publication of school league tables by media; Senate Inquiries; responses by schools, teachers and principals to the My School portal);
- implications of the emerging information flows for schools (e.g. how schools became labelled 'good' or 'bad' schools after school league tables were published by newspapers; how school practices changed in response to students' NAPLAN test results; and how teachers became labelled 'good' or 'bad' teachers);
- implications of the emerging information flows for students and parents (e.g. how students became 'good' or 'bad' students as reported by testimonies during Senate Inquiries; parents' comments in the media; students' and parents' views reported in various publications).

The overwhelming evidence—media reports, government documents and reports, two Senate submissions, public hearings and recommenda-

tions, school principals' association and teachers' associations reports, and education research studies—indicated that the My School portal has radically transformed information flows in the education sector with numerous unintended negative consequences. These documents show that *free flow of information* and transparency of school performance data have been detrimental to some sections of society and thus are *not fair*. However, despite two Senate Inquires and two government-commissioned reports, no decisive actions to guard against these negative consequences have been taken (hence the relevance of the warning by the ITAC in our motto). Such a state of affairs has made the case of the My School portal particularly relevant for exploring the fairness and ethics of the new emerging information flows in the public sector. In the following section we present the most relevant findings that illustrate the social and ethical implications of public availability of school performance data on the My School portal.

Empirical Findings from the My School Case

ACARA administered the very first NAPLAN to all Year 3, 5, 7 and 9 students in all Australian schools in May 2008, followed by the second one year later in May 2009. The tests were held at the same time in all schools and, upon processing by ACARA, the results were returned to schools, students and parents. This was quite significant for the Australian education system, because for the first time NAPLAN made it possible for parents, teachers and schools to benchmark their school's results against cohort averages across Australian schools. The response from the schools was overwhelmingly positive, because up to that point there were no nation-wide standardized tests to enable comparisons and benchmarking of any kind. It is important to note that during these two years NAPLAN results were not open to the public. Instead, they were kept confidential and only provided to individual students (their parents) and schools for self-assessment and improvement. Therefore the initial information flows were kept within the boundaries of the education system enabling schools, teachers and students/parents to interpret the results in their own context and take appropriate actions.

The scenario, however, changed in January 2010 when ACARA officially launched the My School web portal, making the school-level performance data (based on 2008 and 2009 NAPLAN results) publicly available. The justification for making school performance data publicly available (Cook, 2014, p. 15) was: (1) To enable evaluation of school performance by the government and other interested parties; (2) public accountability of the education system; and (3) better resource allocation by policy-makers.

At the heart of the My School operation is the ongoing process of data collection, processing and dissemination that continues to be managed and improved by ACARA. NAPLAN tests are administered in individual schools where they are conducted in teacher-supervised classrooms, each year at the same time across all Australian schools. In its current implementation, students' answer booklets are collected and sent to ACARA. In addition to NAPLAN tests, schools are collecting and providing additional data such as parents' education and occupation for each student, a school's financial data as well as its profile data including student enrolments, attendance rates and staff/student ratio. ACARA is also collecting data from the Australian Bureau of Statistics (ABS) including, for example, ABS census of population and housing data for the areas where individual schools are located.

Following data collection, ACARA processes the data and records NAPLAN test results in a database. In order to enable a more meaningful grouping and comparison of students across similar schools, ACARA developed the so-called Index of Community Socio-Educational Advantage (ICSEA index) and a special-purpose financial methodology.

In the final step, data are then disseminated to individual students, teachers and their schools and soon after school results in an aggregated form are made available online on My School. The same process is repeated each year. Some aspects of it are soon to be automated in order to improve the efficiency of NAPLAN data collection and processing. This is expected to expedite the 'feedback loop' and make the results available to schools (and posted on My School) much faster. According to ACARA, the online NAPLAN tests will be implemented starting from 2017 on an opt-in basis over a period of two to three years (ACARA, 2016).

Even though the overall process of data collection, processing and dissemination pre-My School (2008 and 2009) and post-My School implementation (January 2010) may appear similar, the action of making data available on a public portal altered fundamentally information flows in the education sector, creating many unforeseeable, unintended and undesirable consequences.

The controversy started on the day My School went online and continues to this day. Using the powerful mantra of ‘consumers have a right to know how service providers are performing’ (The Australian Editorial, 2010, p. 1), the Australian media welcomed the provision of ‘objective, measurable and reputable data’ (Mocker, 2013) as a ‘health check for the school system’ (Ferrari, 2014). Media celebrated My School as ‘revolutionizing Australian education’ and soon started publishing very crude *school league tables* that in effect publicly labelled some schools as ‘good’ (above average) and others as ‘bad’ (below average). For example, a leading national newspaper produced ‘a “wrap-around” of school “results”, based on aggregating 10 test results and producing an average mark’ (NSW PPA, 2010, p. 2)

Consequently, many parents, who up to that point were not even aware of My School, reacted by trying or even demanding to move their children from ‘bad’ to ‘good’ schools (Thomson & Cook, 2013). The public and parents’ pressure on school principals and teachers intensified, with NAPLAN results translated into new labels for students and their teachers. Thus, students with below average NAPLAN results became ‘bad’ students and similarly teachers whose students showed below average results became ‘bad’ teachers. Some teachers responded by ‘gaming the system’ to produce better data, by teaching to test, offering visual cues to students during test or asking low-performing students to stay at home and avoid the test (Thomson & Cook, 2013).

As school performance data continued to be propagated, reinterpreted and reused, the unprecedented number of complaints and concerns turned to serious public pressure on the Australian Government to intervene. For example, the Australian Government Primary Principals’ Association (AGPPA) reported to the Australian Federal Minister a number of concerns about the My School portal regarding the misuse of over-simplified data and their misinterpretation as well as serious negative consequences of publishing school league tables (NSW PPA, 2010).

The First Senate Inquiry was initiated following ‘allegations of schools cheating and manipulating test results by excluding students when the literacy and numeracy tests [occurred]’ and was held in May 2010 (The Senate, 2010, p. 10). After examining all evidence, the inquiry confirmed the negative effects on students, parents, teachers and schools caused by publishing My School data and proposed twelve recommendations (Australian Government, 2011). However, despite these recommendations negative effects continued and the Australian Government intervened again. The Second Senate Inquiry was open on 15 May 2013 (The Senate, 2014), this time focusing on the effectiveness of NAPLAN, including the impact of publishing NAPLAN results on the My School website. Again a large number of submissions were made confirming the continuous negative effects on students, parents, teachers and schools. Table 2 provides an illustrative sample of negative effects reported in both Senate Inquiries.

From the evidence regarding information flows instigated by propagation and reuse of open data throughout the society, it is possible to conclude that both Senate Inquiries revealed serious negative effects of My School. However, these inquiries did not succeed in effectively addressing and preventing the negative effects, even when very specific recommendations were made with regards to data dissemination. For example, Recommendation 9 from the First Senate Inquiry called for examination and public reporting on ways to mitigate the harm caused by simplistic and often distorted information in league tables published by newspapers (The Senate, 2010). Despite the Senate recommendation, Australian media not only continued with the practice of publishing school league tables, but took it to the next level by creating their own ‘My School-like’ web portals.

A prime example of this practice is the so-called Your School interactive web portal published and maintained by the leading Australian newspaper (*The Australian*) using My School data. The welcome page of the Your School portal to the public, very much echoes what is written by My School:

The Australian presents information on almost 10,000 schools in every state and territory, providing snapshots of key characteristics and easy evaluation of school performance. (Your School, 2016)

Table 2 Illustrative examples of unintended consequences of My School

Intended beneficiaries	Unintended consequences
Students and parents	<p>'NAPLAN results for individual students, which go home to parents, often give an unreliable and distorted view of the strength or weakness of that individual.' (Senate Inquiry 2014, Submission 94)</p> <p>'Children become sources of data...Learning becomes something that is cut, sliced, packaged and weighed.' (Senate Inquiry 2014, Submission 4)</p> <p>'[S]chool improvement takes time and what is likely to happen is that those parents who are able to do so will remove their students [from a low ranked school], only exacerbating the situation for the school involved and those students who remain. This "free market" model also fails to acknowledge that many students, because of location or socioeconomic factors, have no effective choice.' (Senate Inquiry 2010, Submission 40)</p> <p>'A parent of a child attending a school with below average NAPLAN scores commented on what she saw as "labelling" students as low achievers, expressing a fear that her daughter and others like her would simply accept the label and stop trying to do better.' (Senate Inquiry, 2010, Submission 83)</p>
Teachers	<p>'What was supposed to be a tool to help teachers learn more about the students they teach and the way they learn and the remedial action required to really help their students, has been taken and twisted by different educational organizations and school boards and used as a rod to beat teachers over the head with, and placed unfair pressure and stress on students and teachers alike.' (Senate Inquiry 2014, Submission 85)</p> <p>'We are constantly told not to teach to the test and are criticized if we do. But if we don't, especially with our young students, they will be so disadvantaged.' (Senate Inquiry 2014, Submission 91)</p> <p>'Teachers, despite knowing that they should not be teaching to the tests, do alter the regular curriculum delivery to "train" the students in the peculiarities of the tests. Much time is given over even in the previous year to NAPLAN, to enable the students to have the best opportunity to demonstrate their skills and knowledge.' (Senate Inquiry 2010, Submission 19)</p>

(continued)

Table 2 (continued)

Intended beneficiaries	Unintended consequences
Schools (Principals)	<p>'School principals are feeling immense pressure exerted by the system as both schools and states jockey for league position. They, in turn, explicitly or inadvertently, place additional pressure on their teachers. (Senate Inquiry 2010, Submission 22, 4)</p> <p>'My School publication of results exposes schools to blunt, arguably inaccurate and damaging comparison and ranking. By raising the public profile and stimulating media commentary and league tables based on raw scores, it encourages uninformed and harmful debate.' (APPA, 2014)</p>
School systems and governments	<p>'NAPLAN produces results, which are used to determine the future of [education] systems, processes, schools and teachers.' (Senate Inquiry 2014, Submission 98)</p> <p>'Elevating the status of NAPLAN results via the My School website diminishes the public's trust in the teaching profession and portrays NAPLAN incorrectly as a definitive and absolute measure.' (Senate Inquiry 2010, Submission 23)</p> <p>'A system previously promoting a "love-of-learning" in a child-centered environment thus sacrificed "quality education" for "data-based schooling".' (Senate Inquiry 2010, Submission 20)</p>

As reinterpreted and processed data provided by Your School portal continue to propagate, they create additional information flows in the education system. In the meantime, ACARA has been working on NAPLAN Online (recommended by the Second Senate Inquiry) expected to improve the efficiency of My School information flows by speeding up data collection and processing. For example, on 22 November 2016 ACARA announced the launch of the NAPLAN Online public demonstration site and invited 'students, teachers, parents and the broader community to see how NAPLAN Online will work and what it will look like' (ACARA, 2016). As stated by ACARA, the My School web portal continues to be improved, with more information and better functionality being provided to its users (ACARA, 2016).

However, no attempts were made that would at least mitigate the unintended negative consequences created by propagation, reuse and, most importantly, reinterpretations of information flows. As school performance data are now provided, not only by My School but also by additional portals such as Your School, information flows are becoming more complex and unpredictable and their negative effects more disturbing. Most concerning, however, is the lack of public discourse about the fairness and ethicality of My School-enabled information flows to which we turn next.

Discussion: On Fairness and Ethicality of My School Reconfiguration of Information Flows

Findings from the My School case study provide substantial evidence to explore our research questions. We first explain how My School-enabled information flows reconfigured relations among citizens, public sector organizations and government, and how such reconfigurations produced various unintended negative social effects for citizens, organizations and segments of communities despite government intentions to achieve positive effects.

Information flows enabled by NAPLAN testing before the launch of My School in January 2010 included the collection of NAPLAN test booklets from schools that were processed to produce cohort averages, followed by dissemination of individual results to students and their parents, as well as aggregated results to teachers and schools. As mentioned earlier, individual test results and comparisons with the cohort average were confidential and provided to each student (and their parents) for self-evaluation and improvement. Similarly this was done for teachers and schools so that they could compare their students' test results with average school performance across Australia. Describing these information flows as intermediaries is adequate as they transmit NAPLAN test results data (individual and average) from which information is derived in a straightforward manner. Individual students (and schools) could see how much they out-performed or under-performed the national average. This type of performance feedback systems has been implemented

elsewhere with varying degrees of success (Earl & Katz, 2006; Vanderlinde et al., 2010; Visscher & Coe, 2003). Apart from the attention to data content and distribution of feedback reports, discussions on fairness and ethics emphasized confidentiality of data as vital for such systems to achieve their purpose and the desired effects. However, as Vanderlinde et al. (2010) warn, the production, transmission and use of data have to be continuously monitored to identify potential unintended negative effects.

Information flows, however, radically changed after January 2010 when NAPLAN test results for individual schools became publicly available on the My School web portal. The My School web portal, as we demonstrate above, has reconfigured and continues to reconfigure relations in the education sector in Australia. Reconfiguration is performed by new information flows instigated through the use of school performance data by a variety of users (media in particular) who propagate simplified reinterpretations of the data (such as school league tables) feeding public discourse on the 'quality of education' and the 'problem of underperforming schools'. My School continues to provide confidential data about each individual student's NAPLAN test results and aggregated scores for teachers. However, due to the publication of school league tables in the media (most recently on *The Australian* Your School portal), additional information flows emerged that transformed and distorted the intended meanings of these test results. In the public discourse, simple school league tables are interpreted as hard evidence of how schools perform, 'clearly showing' the good (above average) and the bad (below average) schools. My School was praised in the media for enabling parents to exercise their rights to know the 'quality of schools' and make the 'right choices for their children'.

Within such a discourse the individual student's NAPLAN scores acquired new meaning. They were no more simple literacy and numeracy tests that indicate an individual student's result relative to a cohort. In the new public discourse, the NAPLAN scores became student performance measures. Such interpretation then flows to teachers as their students' aggregate scores are treated as their performance measures. The field of education is transformed: a simple performance measure represents schools' quality with significant implications for their reputation and

government funding; similarly this measure represents teachers' quality (that affects their careers and rewards) and students' quality (that affects their well-being and future education prospects).

It is important to note that in the new scenario after January 2010 information flows instigated by the My School portal (and extended by other actors' reinterpretation of data) could not be considered intermediaries any more. They are not simply transporting the data (and their intended meanings) to the broader public as it is widely assumed. Information flows instigated by My School are mediators as they are distorting the meanings of the simple NAPLAN test data by translating them into performance measures of schools, teachers and students. This is happening through processes of reinterpretation and abstraction by numerous actors (media, education institutions, journalists). Through public discourse, schools, teachers and students were performed as good or bad, desirable or undesirable, with serious negative consequences for many. That the NAPLAN data are simple literacy and numeracy test results has been forgotten as the public attention is drawn to the school league tables and comparisons of schools' performance in particular regions and across the country.

Negative reported effects of My School (as illustrated in Table 2) have been occurring despite ACARA's objective to serve the public interest and benefit everybody. ACARA is committed to providing valuable open data to the public: 'My School is a valuable online tool to help educators and communities understand what is happening in schools right across Australia' (ACARA, 2016, p. 1). How can we explain that despite clear intentions to achieve positive outcomes My School created so many negative implications for some sections of the community?

From the evidence collected we can see that ACARA maintains that after the introduction of the My School portal, information flows did not basically change. It is assumed that information flows remained intermediaries. Consequently My School and the information flows it enabled were assessed and justified based on the data content (and analytic tools) made available. In other words, by assessing and justifying the inputs (NAPLAN test data) it is assumed that the outputs (information derived from the data by different users) are consequently justified. When questions of fairness and ethics were raised (by Senate Inquiries) ACARA

responded by plans to improve data collection and security. For instance, the first Senate Inquiry recommendation 9 called for examination and public reporting on ways to mitigate the harm caused by simplistic and often distorted information in league tables published by newspapers. In response, ACARA strengthened legal and technical protection of data and the new version My School 2.0 has new login requirements and terms and conditions to protect the integrity of data (Australian Government, 2011). Furthermore, consistent with the view of information flows as intermediaries, negative effects are attributed to 'improper' or 'inaccurate' use of data. Hence ACARA promised to take steps to counter any inaccurate use of My School information, including public response, with corrected data.

As this discussion suggests, My School-enabled information flows have performed an ongoing reconstruction of relations in the education field. As relations among citizens, public sector organizations and government reconfigured, they produced significant unintended and unexpected negative social implications for the education system and segments of the community. The questions of fairness and ethics of My School-enabled information flows are becoming ever more critical as negative implications continue to be reported despite two Senate Inquiries, government reviews and education reports. The question arises of how to articulate the issues of fairness and ethicality of IT-enabled information flows that would reveal the mutual responsibilities of social actors and the necessity of public engagement in restraining information flows to guard against negative social effects.

The harmful effects of My School have not been denied but the public debate, ACARA and Senate recommendations have not as yet provided more clarity regarding the fairness and ethics of My School, nor did they address the harmful effects. The dominant underlying view of information flows as intermediaries focused the debate on identifying the 'causes' of harmful effects seen as anomalies (e.g. the improper use of data) and on the responsibilities of users to interpret and use data properly. The view of My School-enabled information flows as intermediaries limited the debate on fairness and ethics to justification of My School data content and intended benefits from public availability of schools' performance data. What remains hidden is that the use and

interpretation of the data from My School by the media, numerous analysts and journalists, educational institutions and professional associations, schools, teachers, students and their parents, all play important roles in enacting and expanding the information flows with unpredictable consequences.

Understanding My School information flows as mediators radically changes the perspective for considering fairness and ethics of My School. The view of My School information flows as mediators reveals how intended meanings of the data are (re)interpreted, translated and distorted in unpredicted and uncontrollable ways. As our analysis shows, the effects of data usage are produced through the recurrent performative co-construction of My School-enabled information flows and practices by multiple actors. These are dynamic processes in which individual actors reinterpret the data that are propagated further and in turn used and reinterpreted again by other actors. Data use and reinterpretation in a particular actor's practice are part of the complex information flows in society and in turn contribute to the emergence of these flows. These dynamic processes of recurrent performative co-constructions of information flows and actors' practices reveal mutual responsibilities of all social actors involved, not only ACARA as owner of the My School portal. Exploration of the fairness and ethicality of My School cannot thus exclude any of the social actors as their participation in these processes is consequential not only for their own well-being but also for the well-being of other actors and the education system.

This discussion suggests that an articulation of the questions of fairness and ethicality of IT-enabled information flows (such as My School) that is grounded in the view of information flows as mediators, enables novel revelation and exploration of roles and mutual responsibilities of various social actors involved. Further research is needed to advance understanding of their recurrent performative co-construction of information flows and practices that can form a basis for recognizing mutual responsibilities and for motivating engagement in public debates, in order to restrain information flows and guard against negative social effects. Research is also needed to explore practical forms of actors' engagement in public debates and recognition of mutual responsibilities.

Conclusion

In this chapter we propose and discuss two conceptual views on information flows as a foundation for exploring the questions of fairness and ethicality of public sector IT systems that provide open performance data. Our findings and discussion of the My School case demonstrate how the view of My School information flows as intermediaries, which underlies the public debate so far, constrains the debate and prevents society from addressing serious negative social implications (extensively reported in publicly available documents related to My School). Our discussion further shows the difference that a conception of IT-enabled information flows as mediators, rather than intermediaries, makes in understanding the reconfiguration of the social order in the education sector and how social effects become performed and enacted through data use, (re)interpretation and circulation that expand information flows in unpredictable ways (Introna, 2007).

The discussion thus offers an important contribution to understanding negative social effects of IT-enabled information flows in a public domain and how such negative effects can be examined and addressed. The key lesson is that the alternative perspective on My School-enabled information flows as mediators reveals the complex and dynamic co-constitution of information flows and actors' practices that continuously reconfigure relations and produce a new social order in the education sector. By exploring these dynamic processes, we explain how negative social effects of My School are produced despite the government's clear intention to create positive effects and benefit everybody. By enabling a better understanding of the reconfiguration of relations in the education sector, the view of IT-enabled information flows as mediators helps us expose numerous practices of the actors involved (government agency, media, schools, education institutions, teachers, students and parents) and opens to scrutiny their (changing) roles and mutual responsibilities.

We conclude that the chapter opens a new theoretical frontier for exploring the questions of fairness and ethics of IT systems that provide open performance data and their information flows in society as an important domain for future research. We call for more case studies of other public sector IT systems and open government data in health

care, education and social services, and the ethical challenges created by their information flows. Future work should explore possible approaches for ethically mindful IT-enabled information flows in a society seeking ‘the good life within one’s community’ (Mingers & Walsham, 2010, p. 841).

Notes

1. MySchool website: www.myschool.edu.au

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Part III

Managerial Techniques as Symbolic Artefacts

Shall We Just Call Them Sociomaterial Black Boxes or Take a Peek Inside? An Anthropologist's Impressionist Remarks

Pierre Lemonnier

Insofar as it lacks field enquiry and largely ignores the relevant literature on Organizations, Artefacts and Practices (OAP), this is merely an amateur's chapter. However, despite its slapdash appearance, this chapter is the result of a real anthropological situation: one of those circumstances when acute astonishment appears within an otherwise thoroughly well-known context. While attending the OAP meeting in Sydney in December 2015, I felt like an anthropologist in a foreign country: how was it possible that people who were obviously raising the sort of questions I have been dealing with for more than forty-five years said such bizarre things? In the present chapter, I will try to understand why and to delineate the questions that may arise from my discomfort. Since part of what then seemed to me incongruities resonates with several of the debates going on in the anthropology of material culture decades ago, it may be useful to clarify the commonalities and differences between the two ways of looking at material culture.

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In particular, it may be worthwhile to make a detour via the chaotic and inefficacious stammerings of my own discipline (some of which might resemble present hesitations in the study of OAP), because it was probably necessary to run into dead-ends and get bogged down in particular theoretical statements before the anthropology of material culture came to do what it does nowadays: which amounts to no less than a demonstration of the highly specific role of materials, artefacts and physical actions in people's everyday lives in specific, well-documented ethnographic circumstances; in other words, an essential participation in the sharing of a common world and way of life. At the same time, the discipline has stopped talking about techniques and materiality from afar and turned to an attempt to explore the specificities of what materiality actually 'does' in human societies and culture (or 'collective', if you wish).

As we shall see, the turn that allowed the anthropology of materiality to contribute new ideas on the nature of 'sociomaterial' practices, their workings and their role in human life was a series of back-and-forths between theory and the ethnographic description and analysis of concrete situations, and not a never-ending search for philosophical formulations of the mysteries of the 'constitutive entanglement' of the 'material' and 'social' that every discipline concerned with technology or materiality rightly takes for granted (e.g. Hughes, 1986; Latour, 1991; Lemonnier, 2012; Orlikowski, 2000 among dozens of others).

The one unanswered question will of course be that of the scope of the prospective specificities of the material culture of a world for which a new word, 'sociomateriality', had to be invented. Below, I suggest why this may nevertheless be an important question, capable of bridging two disciplines that ignore each other despite their countless common interests (see Scott & Orlikowski, 2013 for a similar call for multiple approaches).

At first everything in the room looked familiar. Dozens of women and men with jet-lagged yet smiling faces embraced and greeted each other as old friends, some twiddling their badges, some looking for a printer. There was a somehow low-key and ineffable ambiance of publish-or-perishability, the ins and outs of which I had no idea; but a glance at the paper titles and ten seconds of eavesdropping reassured me that I was in

the right place. References to 'materiality' were omnipresent, and the participants' vocabulary included the usual 'relations', 'actor', 'body', 'network', 'structure', 'practice', 'agency', 'performativity', 'change', 'process', 'critical episode', 'distributed knowledge' and so on. Whether wishful thinking or rock-hard certainties, the by-words sounded familiar, too (off the top of my head): 'Give matter its rightful place!'; 'Let's get rid of the material/social dualism'; 'Let's reinclude matter in the social link'; 'Consider materiality beyond symbolism', etc. To put it briefly, although the exact meaning and challenges of the big word 'sociomateriality' were still unclear to me, I had no doubt that it had something to do with my daily juggling with all sorts of seamless (Hughes, 1986) configurations of artefacts, organizations and practices, for years, and primarily in New Guinea. Numerous references to colleagues I have interacted with for decades (Philippe Descola, Tim Ingold, Maurice Godelier, or Bruno Latour) would confirm that feeling.

Therefore the sky was clear, when suddenly, crash!/wham! My landmarks disappeared! I rapidly realized that I was confronted with an unexpected case of mistaken similarity. Indeed, during these two days—and in the literature, as my unprofessional and shamefully rapid survey later showed—everyone seemed to take for granted statements that frankly contradicted my anthropological experience (in terms of theory, method and fieldwork). For instance, there was an awkward (to me) insistence on flux, on unstable and always-changing situations; actor-network theory (ANT) was reduced to controversies; 'structure' was opposed to 'network'; and everyone claimed that the theoretical war on dualism had led to some implementation in real case studies.

To add to my confusion, novel (for me) notions were raised, such as a series of variations on the word 'realism' (agential, critical, subtle—e.g. Leonardi, 2013) that everybody in Sydney understood, whereas no anthropologist to my knowledge ever used them. Conversely, I was puzzled by the absence of reference to the one indisputable beacon of anthropological research on material culture, namely Mauss' paper on techniques! And *horresco referens*, when I mentioned his name, one of the workshop attendees (whom I had already identified as a high-ranking OAP specialist) immediately guffawed, probably thinking that I was cracking a joke.... Were we talking about different things? And if so, in what respect?

I hardly dare add that the deepest mystery of the day was the scarcity of field observations. I will return to this at the end of the chapter, but it constitutes my main remark: compared to the minute, documented, clever, and brilliant papers dealing with the conceptual frame for the study of sociomateriality, the paucity of field observation and information about the way actors are embedded in the materiality of a given organization is striking. Maybe this should set off an alarm?

In any case, my brief experience with OAP studies reminds me of the preliminary questions, paradoxes and dead-ends in the anthropology of technical systems, say from 1970 until the mid-1990s. As already mentioned, it was that long before the area produced any original results—I mean, gave information on social life that could not be established otherwise (see the later section ‘[The Blending Power of Material Actions](#)’). But it may be worth summarizing these early wanderings of a discipline that, until further notice, shares a lot of questions with the project ‘sociomateriality’. In fact, every single anthropologist interested in ‘material culture’ could use the word ‘sociomaterial’, which leads me to two remarks in passing. First, I have retained Orlikowski’s (2007, p. 1438) definition of ‘sociomaterial’, namely: ‘the constitutive entanglement of the social and the material in everyday organizational life’. Next, please do not stop reading here if only for the chapter’s seemingly dualist mood: the difficulty of avoiding dualism is one of the enigmas it addresses.

I start with an impressionist account of my own particular strain of anthropological study of material culture, namely *technologie culturelle*, in other words, the anthropology of objects and techniques that gives a prominent place to the physical actions of people making and doing things, to the way things are made and physically used, and to technological processes, by documenting and analysing operational sequences (*chaînes opératoires*) and their variations in space and time.

Technologie culturelle: An Impressionist View

It all started, of course, with Mauss’ paper on ‘body techniques’ (Mauss, [1934] 2006, pp. 77–95), which demonstrated that even the more ‘natural’ physical interactions with our environment and material culture (like

walking, swimming or giving birth) were cultural productions, like every technique:

I call technique an action which is *effective* and *traditional* (and you will see that in this it is no different from a magical, religious or symbolic action). It has to be *effective* and *traditional*. There is no technique and no transmission in the absence of tradition.

Mauss therefore demonstrated once and for all that techniques are a topic for social sciences (Schlanger, 2006). His paper also contained an extraordinary remark that retrospectively waves away any monomaniac approaches to cultural phenomena:

Technical actions, physical actions, magicoreligious actions are confused for the actor. (Mauss, [1934] 2006, p. 82)

In other words, in our theories, methods and analyses, we scholars often decide to put forward power, legitimacy, gender, historicity, controversies or God knows what; but in real life, people have constantly to deal with several of those alleged domains—I cannot help but signal that this is what the section on the ‘[Blending Power of Things](#)’ deals with below.

Needless to say, in the 1970s scholars (anthropologists at least) were immediately confronted with the unique nature of techniques and with the epistemological questions it raises. It is well known that objects and techniques (material actions performed by human beings) are everywhere and always present in human realms. Every human evolves in a material culture that is present even before birth (the baby clothes are here before we are) and after death (when our corpses are readied) (see among others Pickering, 2013; Warnier, 2001). In turn, this ubiquity of material actions makes this particular domain of sociocultural invention, production or reproduction different from all the other ‘domains’ that are artificially isolated by social sciences. One could not say, for instance, that ‘kinship’, ‘law’, ‘gender’, ‘relations with the invisible’, ‘relations of production’, etc. frame action everywhere and at all times in an individual’s and group’s life, whereas techniques are omnipresent. One can (and does!) claim that one of those domains offers the best explanation, ‘in the last analysis’, but that is a different story.

For decades before their own post-dualism period, and not surprisingly, anthropologists considered that what was important to study was—choose one—the effects of techniques on society, the inscription of some sociocultural regularity in techniques, the reciprocal relations between the ‘technical’ and the ‘social’, etc. It was admitted that objects and techniques had simultaneously a ‘stylistic’ (communicational) dimension and a functional (effect on the material world) dimension. I understand that sociomateriality specialists had similar options at some time (Leonardi, 2013, p. 62; Pratt & Rafaeli, 1997; Scott & Orlikowski, 2013, p. 78). Note that one had to start field research somewhere, and that those were not bad questions at all: studying what happens in a remote society when they go ‘from stone to steel’ (Salisbury, 1962), or the role in the wearer’s identity of symbols on a costume (e.g. Delaporte, 1988; Wobst, 1977) is important. Naturally, the reciprocal relations of ‘style’ and ‘function’ were immediately at the heart of the debate, though they were still puzzling (summary in Lemonnier, 1992, examples in Lemonnier, 1993).

In terms of a general notion characterizing globally a local material culture, French *technologues* referred mostly to Leroi-Gourhan’s (1971, 1973, 1993) *milieu technique*—I write French specialists because, although paying attention to ‘material life’ was by no means only a French specialty at the time (e.g. Schiffer, 1975), it happens that it was at the crossroads of archaeology, Marxist economic anthropology and structuralism that *matérialisme* became a ‘big thing’ in French anthropology of the 1970s. After Gille (1986 [1968]), and within the general ambiance of the time (von Bertalanffy, 1968), it was also clear that techniques taken together formed a system in any society, and that this ‘technical system’ had all sorts of relations with other domains of human life (Lemonnier, 1983, 1992). That particular view on materiality emphasized the multiple aspects of social life ‘other than technical’ (everyone was dualist then) that are related in some way or another to any of our material actions. This was in line with such great books as *The Social Shaping of Technology* (MacKenzie & Wajcman, 1985) and *The Social Construction of Technological Systems* (Bijker, Hughes, & Pinch, 1987). With a huge difference: because, to my knowledge, no one in anthropology has described such a system, that is, the relations between several

techniques within one material culture. In all events, the anti-determinist attitude in sociology and history of innovation paralleled what anthropology then termed the question of technological choices (Lemonnier, 1993).

The tricky question of the nature of the entanglement ('articulation' was the catch-all word then) of materiality with and within *other* socio-cultural phenomena became quite fraught when Latour and ANT entered the picture, and it remained hotly debated until quite recently (e.g. Guille-Escuret, 2003)—as among sociomateriality specialists (Leonardi, 2013; Orlikowski, 2013). In anthropology, sets of new related questions then cropped up—we are in the early 1990s: are innovations and technical changes the best gateway to the study of material cultures? Is there a specificity of innovation in modern technologies? In particular, are controversies and processes of 'stabilization' (Akrich, 1992) the most powerful gateway to understanding the specificities of the 'seamless web' of which material actions are a component (I am trying to choose words that are as neutral as possible)? Do we anthropologists study 'problems' only? In particular, once a technique has 'stabilized', does it not become a physical constraint (a horrifying word in ANT)? Shall we opt for an approach in terms of 'network' and get rid of the notion of 'structure', as Latour insisted in informal meetings with anthropologists (myself included)?

Anthropology and ANT Certitudes: A Matter of Nuances

For an anthropologist doing fieldwork in a non-industrial society there were—there are—no obvious answers to these questions, and so untroubled were the certitudes of Sydney OAP-ists that I find it worthwhile to explain why. Let us start with the equation ANT = sociology of innovation = analysis of controversies and processes of stabilization (I am sure you will forgive this simplification). Actually, and as we will see below when I summarize recent work on the specificity of the power to entangle that characterizes material actions, controversies are conspicuously absent from anthropological studies which, apart from that, are a sort of

ANT-oriented work on materiality. Or rather, even if controversies have been observed, they are by no means at the heart of what is going on with and around the materiality in question.

For instance, in Papua New Guinea, *Baruya* men constantly shout different appreciations about the better way to build a wooden garden fence: ‘Make two knots, not one!’, ‘You fool, you put this plank upside down!’, etc. But no *Baruya* ever questioned the necessity of garden fences of a particular type, nor the ways to construct them. These practices are not the matter of ‘problems’, discussions, legitimacy, etc. Moreover, an insistence on controversy would miss the major role of such fences in the non-verbal communication of the pillars of local social order via the very making, maintenance and appearance of these walls that protect the gardens against wandering pigs, namely: gender asymmetry, the necessity of male initiations and solidarity, as well as the unspoken tension between this compulsory male solidarity and the competition for women (Lemonnier, 2012).

Focusing on a process of stabilization is not obvious either. First, as Orlikowski remarks (2000, p. 406), there is life after stabilization, which holds the possibility of more on-going changes. Above all, the question of the coexistence of long-time stabilized techniques with new forms of materiality is important. On the one hand, there is no doubt that an anthropologist working in a non-industrial society observes that some artefact–organization duos are either in a process of stabilization (off the top of my head, LED lamps instead of bamboo torches, smartphones as sexual arousers, the replacement of bows and arrows by M16 rifles) or in constant flux (school teachers going to town to attend seminars on education rather than being in their rural schools—and therefore the collapse of the education organization—would prove to illustrate an extraordinarily complex situation).

But, on the other hand, it is remarkable that the bulk of the material culture of New Guinea people is not only stable, but it is so from what could be glossed as a sociomaterial point of view. Gardening, for instance, is everywhere present in daily life: food production in gardens, exchange of food, raising children, male/female division of labour, relations with invisible and active non-humans, production of a landscape, etc. are all aspects of life that are inextricably intertwined with what is going on in a garden opened in the forest. Worms, words, tubers, spirits, ancestors,

human beings, mysterious (for us) energies, etc. are constantly interacting in visible and invisible fluxes. However, the general elements, settings and human/non-human relations that comprise the bulk of the group's material culture, which, again, I have no reason not to call its sociomateriality, are remarkably stable. The sets of relations between all sorts of entities that characterize a particular way of forming a group and living as a group, of imagining and materially sharing a common world are relatively stable. In particular, they are stable enough to be studied, and to allow change to be studied when and where it happens—this is the case even in colonial and post-colonial situations where people are dealing with those previously unknown actors that are overwhelming organizations such as the state, the church, the market, health services, and education.

As you see, with respect to flux, stabilization, controversies—I pass over the changing uses of the notion of 'structure', which would deserve a book of its own—it is at least possible to nuance and discuss some well-established, post-essentialists credos of ANT, the study of sociomateriality, or 'material culture studies' (*à la* Anglo-Saxon). But the one untouchable creed of OAP specialists that is not nuanced but instead mistreated by those anthropologists paying attention to material actions is the condemnation of the separation between the 'material' and the 'social' (e.g. by among others Latour, 1991, 2005, 2014; Scott & Orlikowski, 2013; de Vaujany & Mitev, 2015).

On the one hand, it suffices to read Mauss' already-mentioned 80-year-old paper to be convinced that any anthropologist looking at a tool, a technical gesture or a material culture has no doubt about the non-duality of 'technical acts'. Yet, some maintain that, in practice, when observing a technical action, one cannot help having this opposition in mind and *de facto* using it to observe and describe what is going on during a field investigation. As Miller (2005, p. 41) put it:

It has been suggested that (...) we are likely to embrace various forms of philosophical resolution to the problematic dualism between persons and things. While this resort to philosophy is essential to our academic purpose, the integrity of anthropology demands another commitment: a promise to betray such philosophical resolutions and return to the messy terrain of ethnography.

Our philosophical and epistemological truths are something, but the ethnographer in the field must and does put a lid on them. For instance, after some months of daily participant observation somewhere, you will have no doubt that a ritual, a garden in the forest, a wood carver's workshop, or a sea journey is an entanglement of various beings, objects, forces, spirits, knowledge, shared ideas, body postures, myths, words, etc. You also feel that the answer to the main anthropological question in a monograph—in what respect are the practices I observe here and now particular to the people who welcome me?—is partly or entirely to be found in the specificities of this (definitely sociomaterial) entanglement. Unfortunately, what you see, hear, and touch are gestures, artefacts, words, materials, sounds, emotions (your own), etc. The sacrosanct entanglement is nowhere to be seen or touched.

One can only observe, learn about ('the spirits do this to your hammer') or imagine the invisible relations, tens of relations actually, between the elements that comprise the particular cultural whole one is interested in, that is: identify those elements and reconstruct, step by step, what is related to what. Failing which, we are condemned to repeat endlessly that this ritual, garden, workshop, journey is a sociomaterial whole, without being able to say anything about sociomateriality itself, which remains a black box, definitely there, but opaque, outside our field of enquiry.

One thing was sure in the 1970s: in order to speak about techniques and technical systems in various societies, that is, to be able to compare them, we needed to standardize the way to describe and analyse material actions. We are still very far from achieving this goal, and I do not have room here to go into the story of that particular methodological endeavour. Suffice to say that those anthropologists who used to observe, record, transcribe and, hopefully, analyse humans' interactions with materials resorted (and still resort) to 'operational sequences', mostly envisaged at the time as means of documenting production processes. Those *chaines opératoires* are merely a reminder, a practical tool that helps sum up, more or less in chronological order, what is going on before one's eyes. As Coupaye (2013) rightly remarks, spirits and (for us) imaginary agencies would not have had their place in an operational sequence forty years ago (Cresswell, 1972; Lemonnier, 1976, 1992), but the 'asymmetrical' Latourian move has brought us to accept worms, spirits, states of mind, invisible sexual dispositions, etc. in a *chaîne opératoire* (Coupaye, 2015).

Incidentally, if I may venture a word of advice, the best way to get used to the tricks, difficulties and value of this documenting device is to produce an ad-hoc device yourself. You simply take a pencil and a piece of paper (later on a stop-watch, a camera, a tape-recorder, an assistant...) and try to describe yourself doing a basic and often-repeated task: for instance getting your breakfast (difficult) or morning tea (easier). Within a few minutes or hours, you will share with dozens of anthropologists a series of introductory questions and problems: where and when does a given operation start? How do I note several simultaneous operations (toaster + butter on previous pieces of toast + tea kettle ready)? What if I have no tea but coffee instead? Are the neighbour's kids entering the kitchen to be considered part of what is going on? What if the toaster runs amok? Etc. You may not succeed in your endeavour, but your will have a different, more materialized feeling of what the 'entanglement' of 'material' and 'social' means in your own kitchen.

I must also point out that elaborating and polishing the descriptive method of technical action has inconveniently been a lengthy process (Balfet, 1991; Schlanger, 2005), has quite slowed down theoretical reflection and sometimes delayed fieldwork. In fact, many of the dead-ends encountered by anthropologists when contemplating the possibilities of studying materiality may ring a bell for specialists in the study of materiality, which is still in its infancy, according to Orlikowski and Scott (2013, p. 79). Hence the next section.

Dead-ends, Pitfalls, Incompatibilities and Various Ways to Postpone Fieldwork

Anthropologists have invented several ways to sweep materiality (and its boring description) under the rug. Some are just extraordinary, and paradoxical. First of all, in retrospect it is clear that the *technologie culturelle* of the 1970s and 1980s faced the difficulty of combining Leroi-Gourhan's programme with Marxism and structuralism. For fear of being 'vulgar' or 'technicist'—as in a sentence such as 'The watermill gave feudalism'—the French Marxist anthropologists (and all *technologues* were Marxists at the time) scorned any study of the social dimension that might be embedded in things, objects, tools, machines. Save for what touched on the

productivity of tools or the organization of labour, artefacts were paradoxically absent, scorned, banished from the analysis as if they were not cultural enough. So much for Mauss.

Another dead-end of the 1970s–1980s was the search for ‘correspondences’ between patterns in *chaînes opératoires* and other ‘structures’. Some regular patterns would appear on graphs summarizing the steps of a given technical process (making a pot, sharpening an arrow) and, in turn, as if by magic some kind of likeness (with no more precision) would appear between this pattern and some other structural aspect—a culture or social organization. There were structures in kinship studies and myths, why not in operational sequences? This, too, led nowhere (Lemonnier, 1986 illustrates such a failure).

Unhappy with the kind of ethnographic description or results obtained via the study of production activities, other scholars, in England notably, developed ‘material culture studies’ focused on the consumption of goods—‘the processes whereby persons make mere objects their own’ (Kuchler, 2014). In general, they did so without paying much attention to the way things are physically made and used, that is to materiality, to what happens to materials when they are transformed and experienced by those who manipulate them, as Ingold rightly criticised (2007), in an uproarious paper. (If I dare paraphrase Descola (2016), that was a time when Ingold was still in anthropology, not philosophy.) For instance, most papers dealing with ‘material culture studies’—about objects *and* consumption, *and* gender, state, modernity, innovation, identity, etc.—quote(d) Appadurai’s *The Social Life of Things* (1986) and its essays on ‘value’, ‘power’, ‘status’, ‘cultural biography of things’, etc., although this book paid no attention whatsoever to the materiality of things.

Another spectacular way to mention ‘technology’ while ignoring materiality is illustrated by Gell’s otherwise leading anthropological work on the ‘agency’ of artwork. He constantly used the notion and word ‘technology’, but he dissolved its anthropological pertinence by expanding it to ‘the pursuit of intrinsically difficult-to-obtain results by roundabout, or clever, means’ (Gell, 1998, p. 6). Therefore, according to him, kinship is a ‘technology of reproduction’, while art, music, dance, rhetoric, gifts, etc. are ‘technologies of enchantment’ (Gell, 1992, 1998, p. 7)

using ‘magical technology’ (Gell, 1992, p. 59). As a result, what we are interested in here—what specifically do the materiality, physical actions and things entangled in sociomaterial wholes ‘do’?—appears nowhere in his work (see Lemonnier, 2012, pp. 152–155 for this critique).

Some other seemingly exciting yet procrastinating approaches to material culture are the admixture of friendly looking approaches that are in fact incompatible, or the elaboration of theories or mere intuitions that cannot be translated into questions and methods in real life (i.e. in a case study). Simultaneous references to Descola and Ingold would be a nice example of the first genre. Both authors are inspiring for the study of sociomateriality and at first seem to comfort each other in the anti-dualist crusade. Yet, in their own terms, their positions are radically irreconcilable, and their debate is about the very nature of anthropological research (Descola, 2016; Ingold, 2016).

Similarly, in a theoretical domain that is very familiar to the sociology of organizations, the very adaptation to field enquiry of the trio actor—network—symmetry that has inspired all of us via Latour (1991) and the admirable didactical Bijker (1995) may need a warning. In any case, one should have in mind Latour (2005) explaining, twenty years on, that these three fundamental words should not be taken in their ordinary senses. The difficulty of using such notions is huge when time comes to study real-life situations (real people, real interactions with a material culture), that is, for anthropologists, who must observe, describe, transcribe and analyse them (See Latour, 2005, p. 46 for ‘actor’, note 89; p. 76 for the ‘principle of symmetry’; and pp. 129–130 for ‘network’). In fact, this is probably why these notions have to be repeated again and again—I have in mind Orlikowski (2013, p. 78) on what non-essentialism means, or Latour (2014) on my own supposedly hopeless assumptions about the necessity to be a-symmetrical for some time when dealing with material actions in the field).¹

As you see, the tendency to leave aside actions on the material world—to speak about materiality from afar—is largely shared. Yet, taking pains to analyse what people actually do and make—and not only what they say about them—and getting one’s hands dirty has proved to be extremely profitable.

New Questions and Results in the Anthropology of Material Culture: The Blending Power of Material Actions

While many anthropologists insist on finding their own formulation or answer to the question of the particular entanglement of material actions with humans' lives or chew over the hopelessness of implementing non-dualism in the field, others have stopped asking these questions and turned to what can be called the 'blending power' of material actions. If I may put it in pre-Latourian terms, or in the compelling terms of a real situation, the question some anthropologists now are tackling deals with the fact that material actions are a good means for thinking about social relations. To address that question, they are now looking for what material actions, artefacts, physical devices and technical operations do in the making, sharing and reproduction of system of thoughts and actions.²

Damon's work, for instance, has profoundly modified our views on one of the regions most studied by anthropologists, the Massim, site of the famous *kula* exchanges described by Malinowski and commented upon by a score of scholars (Damon, 2008). He has shown that, when people make canoes and comment on their making and use, what is at stake are the types and geographical origin of the trees and vegetal ties used to bind the wooden pieces made from these trees, the proportion of the mast to the keel, or the distance between the keel and the outrigger float, as well as the ability of the mast-mount used to cushion the effect of the wind and waves. This material thing that is a canoe eventually appears as a complex synthesis of a social world scattered at sea. It also almost explicitly associates the inter-islands network with management of the risk of loss of resources and famine.

Still in Papua New Guinea, Coupaye (2013) has described and analysed in detail the operational sequences involved in months of yam gardening among the Abelam. He has shown that the production of this ritual tuber entails a series of related networks of exchange (cuttings, magic, shell-money, expertise) as well as group and individual rivalries similar to those involved in the exchange of wealth, pigs and even heads,

elsewhere in Melanesia. In this case, too, it is the material peculiarities of the cultivation of the yams that creates their 'aesthetic power' (in Coupaye's terms), that is, what makes the actors put together what they think about yams and do with them—as Abelam people—in a productive, ritual, political organization that is central to their culture.

As for Revolon (2012, [in press](#)), she shows that, among the Owa of the Solomon Islands, an optical effect—iridescence and contrast—works as a means to bring together temporarily opposed and irreconcilable entities in various contexts: the living and the dead, opposing moieties in a village.

My own work on the mortuary ceremonies that allow the Ankave of Papua New Guinea to drive away the spirits of the recently deceased and 'to forget' them, describes and illustrates a similar nexus of thoughts, social relations, attitudes and strategies, in which an artefact and the practices around it play a crucial role. The artefact in question is an hourglass drum given to the Ankave by invisible yet atrociously present actors, the *ombo*'. Together with male initiations, these drum-beating ceremonies are a pillar of local social organization and everyday life, because references to the drums and the *ombo*' intersect in many ways in the Ankave's ordinary life and pervade their behaviours, exchanges, worries, strategies, illnesses, emotions, hopes and despairs.

The *ombo*' are invisible man-eating beings deeply hostile to humans, which the Ankave hold responsible for most fatal illnesses and among which some have recognized, according to 'true stories', maternal kin, those very kin who are held to be responsible for giving life to human beings. The drum appears to be a funnel-shaped artefact that conveys souls from one world to the other, a narrow canal whereby the ghost travels from this world to that of the *ombo*', who reputedly live in a pond. When the first hourglass drum was discovered, floating for a moment at the surface of the water, it appeared as a passage between the two faces of the water, between the world of the *ombo*' and the human world. There is no mystery as to how the spirit of someone who has recently died passes into the world of the *ombo*'. According to my (anthropological) interpretation, the spirit of the deceased is drawn in by the 'arms' of a mask, which continually whip the air above the mask-bearer's head. At this point, the spirit slips through the two pieces of the instrument, about

which the myths have much to say: the narrow piece that connects the two chambers of the drum and the python-skin membrane act as a gateway to eternity.

Fieldwork—that is, observation of what people do during several nights of drum-beating ceremonies, and hours and days of conversations with them about what was going on—shows that the people who sing and circle have in mind, in some way or another, the mythical origin of the drums and the reason why they make these instruments with a given wood, lianas, python skin, etc., in the manner they do. They know the part the *ombo* played at the origin of the ceremony as well as their bad habit of killing and eating humans; they know how the terrifying hybrids gather, dance and feast in their own adjacent world.

Ultimately, what is non-verbally made present to the minds of the participants—a ‘bundling of material qualities’ as Keane (2003) would say, but also of ideas and practices—is a network connecting cannibal monsters, shamanism, the various origins of illnesses and the ways to cure them, the management of mourning, the representation of life, and proper conduct in the presence of maternal kin. At the same time, the horrific truth that creates the major tension of Ankave society is communicated in a non-verbal way: the *ombo* are maternal kin responsible both for giving life and for taking back the meat of their nieces, nephews and cousins by cannibalizing their corpses during their own drum-beating ceremonies, which reflect those of the Ankave actors.

I have posited that, in the minds of the people in the process of doing something (beating drums) and in the minds of those observing them (other participants in the ritual), the way materials are made and used draws on convergent references to multiple domains of their social lives, each with its own system of inference. As they pass through various sensory channels, these composites generate unspoken messages about essential aspects of the way people coexist, most notably the attendant tensions and contradictions that at times go unvoiced (Lemonnier, 2012, pp. 127–132). The next and difficult question is: how does that work?

Clearly, ‘affordance’ (Hutchby, 2001; Knappett, 2005; Leonardi, 2013), or rather ‘perceived affordance’ (Norman, [1988] 2002, p. 9) plays a role there: if a python skin materializes a threshold to eternity, it

is because everyone knows that snakes change their skins but are eternal (according to the Ankave) and because a snake's skin does not rot. The narrow neck of the drum is the image of the physical action of funnelling. While they walk and circle in single file, night after night, people reproduce the whirlpool from which the first drum popped up, according to the myth.

By and large, with regard to the question of the entanglement—seamless web, blending—at the heart of sociomaterial wholes is the fact that, for the actors, beating drums as they do is a unique way of bringing together myth, ritual efficacy and material actions by doing and making things, rather than by looking at them or talking about them—‘beyond symbolism’ as it were (see Pickering, 2013). The material actions performed during a drumming ceremony play a pre-eminent role in the building and the wordless revelation of the unspeakable status of maternal kin as both gentle life-givers and detestable killers and cannibals. It is only during the drum-beating rituals, and because of the very physicality of the drums—the way they are made (cutting trees, making a hole in a log, hunting ‘immortal snakes’, looking for lianas, etc.), the way they are used by a crowd—that all these aspects of life converge, bounce off each other, and wordlessly refer to the atrocious ambiguity of the maternals. So, I see no other way but a dualist attitude in the field to observe and describe the drum as an artefact and the meaningful physical ways in which the beater holds it, dances, walks, moves his mask, etc.

What is operational in the local blending, entanglement, sociomateriality are phenomena that must be identified as a physical element: by documenting the building, maintenance and use of canoes, the ‘making and growing’ (Coupaye, 2013) of ceremonial tubers, the incrustation of bits of shiny shells in a wooden bowl, or the dozens of manipulations, gestures, perambulations, etc. around and with drums. As you see, the distinction between humans and artefacts is not ‘analytical only’ (Orlikowski, 2007, p. 1438). It *de facto* drives the observation and the questions asked about what one sees. And what one sees are hands beating drums, bodies walking and swinging masks, people shouting, membranes vibrating. One can only guess and reconstruct ‘performed relations’ (Orlikowski, 2007, p. 1438).

Entanglement: Is there a Special Sociomateriality of the Late Moderns?

The ethnographers dealing with canoes, ceremonial tubers, funerary drums or wooden mortuary bowls saw these artefacts as hybrids, as obvious keystones of what was going on before their eyes, that is of systems of thoughts and actions comprising—as in ANT books—most diversified types of actors and modes of relations between those actors. So that they have realized that it would be nonsense to try to understand what was going on around these artefacts from one point of view only. Whether or not they were acquainted with Mauss' statement on the actor's mixing domains of life, what they remarked were material actions and objects that materially illustrated this *mélange* from the actor's point of view, and help to think it.

In my own case, the significant artefact in question was an Ankave eel-trap. I had recorded the operational sequence of its making, and a few minutes before it was set into the water, it was displayed for a short ritual. At this moment, somewhere between the outdoors workshop where the trap had been made and the particular spot in the torrent where it would be laid for weeks, the trap appeared at the same time as a 'technical' device aimed at catching eels in view of a ceremony, as an 'aesthetical' object, decorated with all sort of nice-looking and good-smelling, coloured leaves, and as a 'ritual' object at the centre of the operations by which a woman re-enacted the key action of the origin myth of eels: namely, the severing of an ill-mannered ancestor's long penis, part of which became the parents of today's eels. And the woman's one gesture that triggered the release of the spring-bow that snapped shut the door of the trap was both a ritual action and the technical verification that the trap worked properly. The trap had at the same time to look nice and smell good to please the father of the eels, who would then release the catch (Lemonnier, 2012).

When taking the time to look at the preparation of this trap, and not only study the role of smoked eels in funerary exchanges—or worse, lazily be content with merely tagging such objects as 'hybrids' or 'polysemic'—it became absolutely clear that what was to be investigated and under-

stood was this ability to blur and blend various domains of the Ankave's world. And it is this blending power of some sociomaterial practices that is demonstrated by the series of anthropological case studies summarized in the previous section.

In order to enhance their key place in the sharing of a world of ideas and actions within a given human group—'collective' if you like the term—as well as the blending way they seem to work, I have given the name 'resonators' to artefacts such as a Massim sea-faring canoe, an Abelam yam, a *Baruya* fence or an Ankave drum. As I said at the beginning of this chapter, the elucidation of this previously undescribed role of objects and material actions in the sharing of a way of life, its key aspects and tensions constitutes a result that could not be obtained otherwise than by taking on board, in a provisional dualist manner, the observation and analysis of the physical dimensions of objects and actions within particular sociomaterial sets. As one can see, these results differ from those produced by most studies in material culture studies because what they deal with is not a matter of exchange, identity, controversies, legitimacy, status, social hierarchy or art appreciation.

These results and examples are also important for anthropology and history in general because they take into account a major anthropological truth: in real life, people do not care about the categories that academics work with. Every person is at the same time a producer and a consumer of goods, a religious being, a male or female family member, a historically situated, political being, etc. One of the issues facing anthropology is that of understanding how our numerous social roles and contexts function in our lives, and the specific ways in which the spheres of our social existence interact and which we, the scholars, arbitrarily compartmentalize (the political, the religious, the way we approach death, etc.). Indeed, the recent anthropological studies just mentioned help grasp how the members of a society themselves perceive and share the life they live collectively, how they conceive their unique world of rules and unspoken social givens, their unique system of ideas and ways of doing things, their unique material world, as well as how they conceive its justifications.

In this respect, sociomateriality is not specific to any period of time, and one is confronted with a question Latour and I have previously raised (Latour & Lemonnier, 1993, p. 17): is it the case that the findings of the

anthropology of techniques in non-industrial worlds apply to ‘high tech’? And if anthropologists of non-industrial societies and OAP specialists are talking about different things, in what respect do the respective modes of sociomateriality they are dealing with differ? We need to understand in what respect and where and when (and why) there has been a break. Where exactly do the prospective differences lie that would set apart our ‘late modernity’ (Harrison & Schofield, 2010).

The anthropology of blending devices may suggest potential questions common to the two situations. The first refers to the opening of the black boxes that represent sociomaterial practices, whether they hinge on resonators or not. There are definitely ‘resonators’ in our own societies—see Wayland *à propos* of organizations taking care of ‘warbirds’ (Wayland, 2014) or my own analysis of the classic car passion (Lemonnier, 2013)—but what the resonators involved in the sociomateriality specified by scholars studying OAPs would be has yet to be explored.

I suggest that that could be done by taking a peek into the black box of sociomateriality, that is, by studying what the actors feel to be black boxes. In this respect, everywhere on Earth sociomaterial devices are equated with black boxes from the actor’s standpoint. We ourselves are more or less knowledgeable about smartphones, ICT’s innards, computer-based car-fault reports, the logic of coffee machines, etc., but they appear mostly as esoteric black boxes that nonetheless profoundly modify entire areas of our daily life—see Orlikowski (2007) on the alienation (my interpretation) embedded in two contemporary organizational techniques (Google search and the 24/7 reception of emails on smartphones). And for those who would make much of the collapse of time and space that ICTs allow, remember that it is far from unknown in the places where yams, canoes or drums are more than often at the centre of people’s lives. For instance invisible *ombo*’ travel from one side of a mountain to the other in the blink of an eye. That is, at the same speed and with the same collapse of time and space as a search for an airline flight or hotel on the Internet.

The second set of questions we would have to deal with touches upon the ways a same actor switches from his entanglement with the sociomateriality of a contemporary organization to his ordinary material culture, his ‘everyday life’, as regularly stated by OAP specialists. We do indeed

engage hundreds of times a day with a material culture that is more or less the same as that of our grandparents (Edgerton, 2007): we cook in pots, wash ourselves with soap, walk, sit, cut with knives, etc. So do the people among whom a garden fence, an ordinary drum, a canoe, or a tuber have proved to be artefacts, the materiality of which blends a host of ‘actors’, ideas, relations, etc.

Why not try to clarify, for instance, in what respect the tangle of spirits, gestures, bow and arrows, wooden corridors, innumerable species of leaves, clays and birds that make up the organization that transforms boys into fearless warriors during the male initiations of the Anga of New Guinea differs or not from the mixture of algorithms, gestures, keyboards, speed of light, power plants, etc. that influence our choices and actions when we travel, buy a TV set, order a book or find a reference?

We are able to open the black box of an Ankave drum, an Abelam yam, etc. in action. Why could we not clarify, in particular from the point of view of the actors, what happens in our lives and social relations when we google something? Say, in the way Dant (2008) did with using an iPod compared to manipulating cassettes, or Hutchins (1994) tracing the various ways ‘a cockpit remembers its speeds’ (by the way, in a study that is a model for any study on material culture, almost as important as the solution you will find to the tricky questions of the transcription of your breakfast’s *chaîne opératoire*).

Last, the greatest achievement of the contemporary study of material culture is the profitability of the regular exchanges between anthropology, archaeology, primatology, art studies, history, design, philosophy, etc. (e.g. as seen in the journal *Techniques & Culture*). Why would the specialists of the study of sociomateriality in OAPs stay apart?

Notes

1. Other friendly looking notions over which I pass for lack of space would be the ‘sociomotricity’ involved in techniques of the self *à la* Warnier (2001), or the notion of ‘becoming’ (Ingold, 2011) that I feel helpless to implement when it comes to observing and describing what would correspond to these intuitions among my New Guinea hosts.

2. This would deserve another paper but it is worth having a look at Sigaut (2012) on the propensity of human beings to associate material actions and physical objects with the production and rendering visible of social relations because ‘we model our beliefs and conventions on successful acts’; acts that involve objects provide us with an immediate experience of what constitutes an effective system of relations.

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Physical and Epistemic Objects in Museum Conservation Risk Management

Erica Coslor

Introduction

This chapter examines risk management in museum conservation, an example that both exemplifies risk management practices and can be productively studied with a focus on objects. An object-focused approach is useful to study communities of managers, such as communities of practice and professional expertise (Bechky, 2003; Knorr Cetina, 1999; Knorr Cetina & Reichmann, 2015; Lave & Wenger, 1991). I would like to weave together several approaches here to think about two distinct types of objects in museums: the cultural and historical objects of the collections, and the epistemic knowledge objects that contribute to management practice. These can be considered together with risk management tools that assemble and transform various objects, often producing new objects as outcomes, which can then become inputs for further

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N. Mitev et al. (eds.), *Materiality and Managerial Techniques*, Technology,
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management practice. The latter might also be extended to consider ‘risk objects’, which are objects that present an identifiable risk of harm or danger. In applying an object-focused approach to several examples from this intriguing research context, my goal is to highlight the methodological gains of a focus on objects, particularly for students, researchers and practitioners interested in diverse ways of studying management practices in organizations.

Risk management systems, practices and tools have been studied in a number of ways by management and organizational researchers (Fischer & Ferlie, 2013; Maguire & Hardy, 2013), and can provide a productive site for the study of managerial techniques, typically defined as the social and material assemblages used by actors to guide collective activities. As decision systems, they can both input expected risks and output aggregated numbers, functioning as material devices (Callon & Muniesa, 2005; Muniesa, Millo, & Callon, 2007) that can guide behaviour and coordinate activities. They can also, however, shape power relations in unexpected ways, a point we find in various work on management control systems (Jordan & Messner, 2012). In museums, risk management approaches can guide preventative conservation of collections and also help users make decisions by providing ‘a method for considering the most difficult decision we face—how limited resources can best be applied to the protection of collections’ (Waller, 1995, p. 21). This resource allocation role also aligns with New Public Management (NPM) concerns about accountability, transparency and rule by numbers (Power, 1999).

However, these systems also require the integration of different types of objects, from ‘risk objects’ that make risks calculable, knowable and often political (Fischer & Ferlie, 2013; Maguire & Hardy, 2013), to ‘managerial objects’ that abstract technical and material objects for management and control purposes (Czarniawska & Mouritsen, 2009), and even the epistemic knowledge objects and their unfolding properties that orient expert communities (Coslor & Spaenjers, 2016; Knorr Cetina, 2001). I highlight these distinctions in order to better understand the processes of risk management systems in bringing together diverse objects. This can also require different methods of research, such as Actor-Network Theory (ANT) (Latour, 2007) or sociomaterial approaches (Carlile, Nicolini, Langley, & Tsoukas, 2013; Orlikowski & Scott, 2008),

which allow a sensitivity to technical systems and organizational processes. One particularly useful approach is to ‘follow the object’ (Czarnecka, 2004; Kopytoff, 1986; Latour, 1987), meaning to trace an object over space and time as it moves and changes. This is similar to native ‘follow the thing’ methodologies in material culture studies and ethnohistory (for example, Kopytoff, 1986) but can also be used for people, non-physical boundary objects or epistemic knowledge objects.

The productive application of this object-focused approach is provided through an examination of conservation risk management tools in museums, a setting chosen not only for my own research interests, but also because museums provide a strong context for the examination of managerial techniques. Museums are a site of professional practice, suggesting the utility of research methods that are well suited to studying knowledge-intensive scientific and professional epistemic cultures (Knorr Cetina & Reichmann, 2015). For example, Museums Victoria is home to some 17 million items, only a small portion of which will be on display. In carrying out the organization’s conservation, research and teaching missions, risk management becomes an important managerial technique, one that also links to conservation research (Muething, Waller, & Graham, 2005; Waller, 1995). The importance of artworks as physical objects in museums (Dominguez Rubio & Silva, 2013) also speaks to the utility of studying practices in these organizations using an object-focused approach. After reviewing theories of objects and how to follow them, I highlight key examples of both physical and epistemic objects in museums and how they are joined together in risk management systems.

Physical Versus Epistemic Objects in Managerial Practices

Approaches to objects are admittedly vast, with work in material culture studies, anthropology, sociomateriality, science and technology studies (STS) and ethnohistory. Outside of the rich work on ANT, a primary focus on objects is still an unconventional method in management studies. But the approach is promising, especially for researchers interested in materiality and systems of management control, as we find growing

interest in object-focused, material culture and sociomaterial approaches (Czarniawska, 2004; Knorr Cetina, 2001; Knorr Cetina & Bruegger, 2002; Mailhot & Langley, 2017; Orlikowski & Scott, 2008).

The application of these useful object-focused approaches also entails a level of syntactic ambiguity: in addition to physical objects, we also see the deployment, use and development of less tangible objects, such as epistemic objects of knowledge (Knorr Cetina, 1999; Nerland & Jensen, 2012) and boundary objects that span across different user communities (Star & Griesemer, 1989). For example, in her treatment of boundary objects, Star (2010) noted the ability for these to be either physical or non-physical. Hence, rather than using the term 'materiality' (Carlile et al., 2013; Leonardi, 2012), which can encompass both physical and digital materials (de Vaujany, Haefliger, Fomin, & Lyytinen, 2015, p. 263), I want to embrace the distinction between physical and virtual things, and will consider physical and non-physical objects separately. This more clearly shows the conversions between the physical and non-physical form. We can then aggregate objects into systems, seen in the way that Czarniawska and Mouritsen (2009, p. 158) note the difference between 'material objects', as opposed to 'quasi-objects' such as accounting reports, which again, may exist in physical printed form or live only on screens. The latter, along with management technologies, are helpful to managers as mediators. Objects feature throughout our physical and virtual lives as managers, from the computers on our desks, the production of products and the reports that detail key measures. The latter, quasi-objects, however, are strongly preferred by managers (Czarniawska & Mouritsen, 2009, p. 158), perhaps because these tools are helpful mediators. Let me extend the physical and non-physical distinction.

First, when it comes to physical objects, researchers in management seem to be more interested in systems to manage objects. Nonetheless, in line with ethnography, I think it is important to strongly consider physical objects themselves. This continues a traditional focus on physical objects in consumption, ethnomethodology, anthropology and other fields dealing with cultural artefacts and 'things' (see Appadurai, 1986; Douglas & Isherwood, 1978). As we will see, this is particularly true for museum studies, art history, archeology and various disciplines that deal with cultural and historical artefacts, and I will pick up the focus on

physical objects again in later sections, as the conservation of objects is a core purpose for museums.

Second, for the purposes of risk management, we must also think about virtual, digital, epistemic and other non-physical objects. 'Knowledge objects', that is, epistemic objects of knowledge, provide one potential focus of research (Knorr Cetina, 1999, 2001; review in Nerland & Jensen, 2012). A key role of these objects is seen in science studies, where we find focal epistemic knowledge objects around which research fields revolve. With a focus on phenomena and artifacts with unfolding properties, this encapsulates an evolving set of knowledge: 'Since epistemic objects are always in the process of being materially defined, they continually acquire new properties and change the ones they have' (Knorr Cetina, 2001, p. 181). Another important type of non-physical object is a 'risk object' (Brivot, Himick, & Martinez, 2016; Fischer & Ferlie, 2013; Maguire & Hardy, 2013), defined as 'things that pose hazards, the source of danger, the entities to which harmful consequences are conceptually attached' (Hilgartner, 1992, p. 41). Here, if the actual phenomenon (fire, flooding, etc.) is a physical object or process, the risk object also encapsulates the knowledge about the risk.

Objects employed as management tools can also bridge different social worlds and occupations, helping to span occupational communities and practices (Bechky, 2003; Nerland & Jensen, 2012). For example, various boundary objects helped amateur naturalists and museum researchers to work together in collection processes (Star & Griesemer, 1989). A focus on epistemic knowledge objects can also be used to examine the development of scientific and professional fields: an epistemic culture approach was helpful in our examination of the historical development of art as a financial investment, with the field centred around a focal art-investment knowledge object. The art-investment knowledge object tends to develop in a forward direction, in contrast to the experimentation around different investment structures, yet both help to drive the field forward (Coslor & Spaenjers, 2016).

Coming back to physical and epistemic objects, we see how objects can also be transformed, through time, use, intervention, combination and other factors. For example, we might tailor a building to suit changing

uses over time (Brand, 1994). Sometimes this transformation is natural, as with use or decay, sometimes this requires outside assistance. For example, an evolving experimental artwork must be transformed by museum staff into a stable 'museum object', that is, with a 'freezing', which is 'necessary to establish a stable and recognizable material reference upon which the museum can legitimate its discourses of authenticity, uniqueness and originality, as well as later operations of conservation and restoration' (Dominguez Rubio & Silva, 2013, p. 171). Virtual objects can similarly be transformed, as seen in the example of valuation inputs and outcomes (Coslor, 2016). Transformations also relate to management practice. For example, in accounting, firms need to take field-level policy objects (for example, ISO updates) and translate these to actual practice at the organizational level (Power, 2015).

Objects are also mobile, transitioning from one form to another, physical to virtual and vice versa. This transformation from physical to virtual is seen with the mortgage-backed securities that were at the heart of the financial crisis (MacKenzie, 2011), translating homes into secondary and tertiary investments. This involves tools and processes of transformation and commensuration to make things the same, for example in the construction of tradeable carbon credits (MacKenzie, 2009). In the other direction, virtual to physical, a sculpture might show the physical manifestation of an artist's mental image. As 'quasi-objects' such as accounting reports are strongly preferred by managers, physical objects and material objects are often turned into managerial objects in order to better manage them; in the Latourian sense, these management objects are 'mediators' that actively constitute, create and modify (Czarniawska & Mouritsen, 2009; Latour, 1993).

Both physical and non-physical objects can be combined, from a necklace assembled from a series of beads, to epistemic objects combined in scientific models. The implementation of management devices and tools that integrate both physical and epistemic objects would typically require the translation of physical objects into managerial or otherwise commensurable knowledge objects (or their outputs) that would enable abstraction and movement. These could then be used in material devices, tools that assemble objects (Callon & Muniesa, 2005; Muniesa et al., 2007). This can entail interesting slippages through issues of 'upkeying' and

‘downkeying’ (Vollmer, 2007) as we shift between levels of detail and aggregation.

Systems and models to assemble objects and knowledge also circulate, from financial models like the Black-Scholes-Merton model that enables futures trading (MacKenzie, 2003; Millo & MacKenzie, 2009), to evolving families of financial derivative equations (Lepinay & Callon, 2009). Such models may be self-generated, or imposed from above, such as the accounting objects used in the imposition of university research impact measures in the UK, which then had to be adapted to the organizational level (Power, 2015), engendering and inspiring new sets of management practice.

I will next elaborate more on the way that a ‘follow the object’ approach can contribute to studies of management practice.

‘Follow the Object’

As noted, a key research approach is to ‘follow the object’; that is, to follow something across space and time (Czarniawska, 2004; Kopytoff, 1986; Latour, 1987). This is a shorthand to describe several object-focused methodologies, where the objects under study may or may not be tangible physical items. Building upon the anthropological tradition whereby researchers ‘follow the thing’, such as in Marcus’ (1995) multi-sited ethnographic methods, or trace the ‘biography of the thing’ (Kopytoff, 1986), this method involves documenting the circulation of a commodity or a material object of study through different contexts, or through time (see the review in Marcus, 1995, pp. 91–92). Tracing the history of transformation and provenance is essential to this endeavour, as is illustrated by Roginski’s (2015) engaging history of a skull found in the Museums Victoria collections and later repatriated back to the Aboriginal community.

This is also a common methodology used in Science and Technology Studies (STS), where following the object can help engineers to trace processes (Adams et al., 2011) and evolving epistemic objects illuminate professional practices over time (Nerland & Jensen, 2012). This method can examine a laboratory research site (Knorr Cetina, 1981; Latour & Woolgar, 1986 [1979]), or it can focus on movement, for example,

following scientists (Latour, 1987) or tracking objects (Knorr Cetina, 1997; Latour, 2007). Even beyond technology studies, similar methods are found in a wide range of disciplines that study physical objects and devices, such as archeology (Miller, 1985) or medical ethnography (Franklin & Roberts, 2006, p. 75; Lindberg & Walter, 2013). Marcus (1995) has also pointed out the relationship to commodity-chain studies.

My examination of objects and how to study them is thus informed by several theoretical traditions, drawing insight from Latour (1993) on 'object tracking', Knorr Cetina (1997, 1999, 2007) on sociality with objects and epistemic knowledge objects, plus Star on boundary objects (Star, 2010; Star & Griesemer, 1989). Czarniawska (2004, 2007) suggests 'shadowing' people throughout the working day or 'following' objects, such as in the construction of accounting reports or patient records, which might involve various transformations, for example, from artefact to record. We can also 'follow' epistemic objects, for example, following the evolving economic properties of art as an investment (risk, return, etc.) over time (Coslor & Spaenjers, 2016) or the development of FICO—Fair, Isaac and Company—credit scores (Poon, 2007).

Using this 'follow the object' approach, I am interested in the integration and aggregation of objects into systems, integrating both physical and non-physical objects. This is another way to connect an object-focused approach back to material devices, which is particularly interesting for risk management or accounting; that is, following physical and epistemic objects as they become integrated into systems, allowing for abstracted management (Czarniawska, 2008, p. 13). That sounds like an ambitious goal, so perhaps I should pause here to show how this might actually be used in research. The technique is flexible and, as with ethnography in general, it could include historical, observational and other data, such as organizational documents. But a key point is that it involves tracing an object or a process. For example, Adams et al. (2011, p. 60) detail their interest in 'follow the object' fieldwork:

Engineering students should have at least one experience in which they participate in fieldwork that follows the lifespan of an actual technical object, which begins in the minds of people, finds its way onto paper and

into computer based representations and slowly takes material form. This could be embedded in traditional co-op or internship experiences, in which students 'follow the object' through phases of an engineering project and see how the technical object in question (e.g., a microchip, a robotic vacuum, or a water system) is shaped and deflected by the many humans with whom it comes into contact.

While the description above provides a guide for engineering education and training, use of 'follow the object' as a research method is similar. For example, Kopytoff (1986, pp. 11–12) details the biography of a hut:

For example, among the Suku of Zaire, among whom I worked, the life expectancy of a hut is about ten years. The typical biography of a hut begins with its housing a couple or, in a polygynous household, a wife with her children. As the hut ages, it is successively turned into a guest house or a house for a widow, a teenagers' hangout, kitchen, and, finally, goat or chicken house—until at last the termites win and the structure collapses. The physical state of the hut at each given age corresponds to a particular use. For a hut to be out of phase in its use makes a Suku uncomfortable and it conveys a message.

Examination of the beginnings of a technical object or the 'death' of a hut can help to unpack key relationships that form around these objects in organizations and cultures. Another example suitable for use with students can be found in *The Box* (Levinson, 2008), the book that inspired a BBC news series following a shipping container around the world (Hillman, 2008).

Similarly, in art the provenance, the history of transactions, is important for valuation (Coslor, 2016), for example, in helping to establish the authenticity of a piece by avoiding forgeries. This is the historical record of the price, with documentation of ownership over time, and sometimes sales. But these 'biographies' of things can also have multiple components providing different potential lines of inquiry (Kopytoff, 1986). Physical movement provides one focus, while transformations provide another: in the case of artistic provenance we could examine the physical movement of the artwork, as opposed to, say, prices.

As with more familiar ethnographic techniques, a ‘follow the object’ approach is not a representative sample methodology, but a technique that can be used for systematic examination and theory building. It is particularly salient for studies of innovation, as seen in the engineering education example, given that it is both flexible and systematic. It allows us to focus on emergent and often spontaneous processes that need to be tracked over space and time, yielding insights that have the potential to translate into testable theories and constructs. Meanwhile, the technique itself is systematic in following a traceable object. I would next like to use this methodology to examine some connections to management devices, by ‘following’ museum objects into risk management systems.

Following Physical and Epistemic Objects in Museums

As large and prominent organizations, museums often show a patchwork history, emerging from the collections and interests of early founders, and evolving as new and different collections are both donated and assembled. In contrast, the institutional structure of museums is more standardized. For example, the natural history research museum came about as a particular organizational form in the seventeenth century, when private collectors ‘opened their cabinets of curiosities to public view’ (Star & Griesemer, 1989, p. 391). Museums are a setting that have received reasonable attention from management and organization scholars, often using sociological, institutional or economic approaches to focus on the organizational field (Alexander, 1996; DiMaggio, 1991; Feldstein, 1992), in contrast to science and technology studies (Alberti, 2005; Star & Griesemer, 1989), where we find a longstanding affinity for museums as a research site. Some research in this context also focuses on the objects, material and otherwise, that might be found in museums.

A less-studied element in management is that museums are also sites of managerial duties and professional practice, including finances, legal matters, governance and fundraising (American Association of Museum Directors, 2011). The intersection of museums and their current or

historical management systems thus presents an intriguing research context for management researchers, from accounting for collections to the systems of governance. This is particularly true at the level of everyday practice, as specific management practices may be required, for example, to coordinate disparate communities, such as the specimen preservation management systems devised by the first director of the Museum of Vertebrate Zoology in the early twentieth century (Star & Griesemer, 1989).

Risk management is an important managerial focus in the museum context, given that museums face risks from theft, fire and the deterioration of objects. Even normal exhibition, research and conservation can damage the physical objects or run the risk of compromising important features. Risk management practices thus link to conservation research, as can be seen with the clear connections in published work in the area (for example Muething et al., 2005; Waller, 1995). Next, I will examine physical objects and research methods in museums, then move to non-physical and epistemic objects. Together these topics provide an empirical foundation to theorize the integration of physical and non-physical objects in risk management systems.

Physical Objects in Museums

Prior research provides multiple perspectives on physical objects in museums. Physical objects are important in the museum environment and in contemporary art (Dominguez Rubio & Silva, 2013). One could write a material history of museums through the history of their collected objects (Alberti, 2005), while cultural objects and their movement can be the subject of public controversies (Lai, 2006). Thus, in following these physical objects, the consideration of movement and modification is an important starting point.

These movements and modifications are often encapsulated in the art world under notions of provenance. In ethnohistory and anthropology we find an expanded parallel view, one which highlights the physical nature of museum collections through a focus on exchanges, sales, gifts and

donations to follow an object across time and space. For example, Alberti (2005) presents a history of museums through the biographies of objects in their collections, an approach linking scientific practice and material culture. Similarly, in his presidential address for the American Society for Ethnohistory, Daniel Usner (2012, p. 443) details his ‘Canastromania’, or love of baskets, using key examples of these (physical) objects passing through various hands and locations. In tracing the history of transactions and movements of a collection of baskets, he notes how these can help to reveal the complex relationships among buyers and sellers.

Following is thus a ‘native’ museum methodology as well, and thus apt for examining physical specimens in museums. For example, Melbourne Museum, part of Museums Victoria, houses vast collections of animals and insects, collected since the museum’s opening in 1854. Only a small proportion of these are exhibited, with the rest housed in extensive stores, nonetheless contributing to the museum’s teaching and research functions. Not only are museums specifically devoted to the protection and conservation of actual historical and cultural objects, they are also important research institutions. When I had the chance to visit these collection stores during a tour, I was struck by the example of the ‘bird room’, hosting thousands of specimens. Some were reassembled into a full taxidermy, i.e. ‘fully mounted’ and stood on cases or inside larger glass cabinets.

Most of these were in the form of flat skins with plumage attached, which can conveniently be housed in drawers. Not only does this save space, it only takes about 20 minutes from start to finish to [preparing] a skin in the field, as opposed to weeks or months to prepare a fully mounted item... Extinct (specimens) become extremely important for research’ (field notes).

Similar to the stabilization and freezing process necessary to convert a contemporary artwork object into a ‘museum object’ (Dominguez Rubio & Silva, 2013), this preparation enables the conversion of an animal’s skin into a research object, flat for storage or mounted for exhibition.

A fully-mounted specimen is probably more familiar for museum-goers, compared to the flat hides in storage. But even these and other publicly-displayed items can become objects for research. For example, in an exhibition case in the teaching and event space of the museum, I saw

a fully-mounted quoll, a marsupial native to Australia. The case also housed footprint impressions from other animals, as well as a placard indicating that the specimen usually residing in that space had been ‘temporarily removed for research’ (field notes). Thus, an item in the collections can transfer from exhibition item to object of research.

A focus on the physical objects in museums naturally adds to questions about management strategies and physical infrastructure needs, given the vast size of the permanent collections. Storage also requires management, both up close and from afar.

Non-physical and Epistemic Objects in Museums

I would next like to extend the idea of research objects and managing physical objects with a further consideration of management and epistemic knowledge objects. That is, ‘management objects’ allow an abstraction for more ready management (Czarniawska & Mouritsen, 2009), while epistemic objects (Knorr Cetina, 2007; Nerland & Jensen, 2012) provide a focus for scientific research. In the museum, we see various management objects and epistemic knowledge objects around scientific and cultural topics, as well as around conservation and natural processes.

As noted, the physical items seen in museum exhibitions are only part of the vast collections. The rest are housed in stores like that of the bird room discussed previously. As larger fully-mounted birds, for example penguins, might stand several feet tall, skins and other formats are clearly the more space-efficient option, highlighting one area for management decision-making. Physical objects engender the need to manage space, security and condition. But there is also a related set of dedicated systems, processes and procedures for management from afar. In the museums, this means engaging with electronic systems, like EMu, a standard electronic records management tool (registration system) commonly used in museums (Axiell, n.d.). These systems require abstractions to represent the physical items so that collections can be managed from one’s desktop.

These systems also create new uses, for example, online collections enabling teaching and research (for example the Bioinformatics project, Museums Victoria, [n.d.](#)).

As these registration systems require physical objects to be abstracted, they can engender problems in terms of how the physical things might be represented, using words, symbols and numbers. We find a type of flattening in abstraction, which is not necessarily a smooth process. One example is seen in objects with multiple pieces, either because of design or breakage. The curators referred to this as the issue of ‘and parts’, that is, the main object and its related parts. This created problems in recording—is this one item (one record) or several items (several records)—which, given the structure of the database, had to be thought through carefully. The issue resonates with problems of ‘upkeying’ and ‘downkeying’ (Vollmer, 2007) found in quantifications that go up or down in scale. Moreover, objects—and their electronic keepers—do not always cooperate, engendering ‘unruly objects’ (Czarniawska & Mouritsen, 2009). Sometimes they are misplaced, as we saw in the course of the valuation exercise that I observed.

The relative significance of the managerial objects (for example, database records) used to represent the physical artefacts (bird specimens, cultural items) is also interesting, because when it came to actual practice in museums, I saw that the physical object was often focal, perhaps indicating a difference in professional culture (Knorr Cetina & Reichmann, 2015). While management objects might be preferred by managers in offices (Czarniawska & Mouritsen, 2009), managers in the museum showed a strong sensitivity for the physical details. This may be explained by museum managers having been promoted from within, and thus trained as curators and conservators of art and artefacts. This experience seems to engender different understandings of the relationships between physical objects and their abstracted representation. For example, the supervising manager in the valuation exercise relied on reports that aggregated items into categories of ‘strata’, but she was nonetheless sensitive to material conditions. Details were compressed for abstracted management, but also enhanced in discussion. For example, discussions of

moving around dinosaur bones for the regular valuation exercise involved consideration of pallets and access to items.

If physical objects are turned into managerial objects to better manage them, which tends to compress details, physical objects can also be turned into knowledge objects that expand and explode information, that is, becoming objects of research and study. A single local basket can form the basis for multiple doctoral dissertations. The physical object becomes the anchor for research on provenance, cultural and historical context, and can also become an object of scientific research on the object's physical properties, such as the geography of basket reeds or carbon dating of bones. This turns physical objects into epistemic knowledge objects, with related tools and methodologies.

Thus, in one direction, we see physical objects becoming objects of research, whereas in another type of abstraction, we find the construction of management objects. The former typically expands, while the latter typically flattens and compresses, a distinction furthering my goal of relating objects to risk management practices.

Risk Objects in the Museum

Exhibition, conservation, storage and even research can also entail risks to the artefacts, requiring new epistemic objects. Scientific knowledge objects, such as rates of decay and likelihoods of pest infestations, comprise an essential part of the conservation risk models. For example, Table 1 identifies nine agents of physical deterioration, along with custodial neglect as risk factors. Physical forces and insect epidemiology become objects of knowledge in this framing, with evolving properties

Table 1 Agents of deterioration

Physical forces	Fire	Water
Criminals	Pests	Contaminants
Light and UV radiation	Incorrect temperature; incorrect relative humidity (RH)	Custodial neglect

Adapted from Muething et al. (2005)

that might need to be updated because of advances in scientific research or professional practice, as we see in the next section. Table 1 indicates a new composite object, a list informing decisions in risk assessment.

Properly managing these risks falls to museum managers. In the United States, risk decisions are left up to the museum director:

The director is responsible for using the museum's collections for teaching and research, without exposing the objects to undue risk. The director must have sole discretion as to how, when, and where objects from the museum's collection are used and under what conditions they are stored and exhibited. Policies and practices covering the foregoing should be included in the institution's written collection management plan. (American Association of Museum Directors, 2011, p. 30)

The agents of deterioration are one tool for museum directors and other managers to understand potential risks, with an eye toward managing these risks through collection management policies and practices.

Physical and epistemic objects are thus joined by various risk objects which represent potential threats to the collections. For risk management purposes, these potential threats must be organized, studied and systematized. The agents of deterioration are already arranged into an integrated scheme, that is, a quasi-object. In the next section, we see the integrative systems framework more fully realized and taking in various objects.

Integration and Management of Objects in the Example of the Cultural Property Risk Analysis Model

With this more extensive review of physical objects and several varieties of non-physical objects, we are ready to come back to the focal interest in risk management systems. This requires consideration of the drivers of management practice in this space and theories of integration. I will then discuss the Cultural Property Risk Analysis Model (Waller, 2003).

As noted, museums house valuable collections and thus must consider issues of risk. For example, as noted by the American Association of Museum Directors (AAMD):

The museum must protect its facilities against potential risk and loss through appropriate measures, including a comprehensive, board-approved emergency-preparedness plan that includes regular staff training. The museum must comply with all applicable federal, state and local laws, rules, and regulations. (American Association of Museum Directors, 2011, p. 13)

This guidance clearly sets up the need for risk management practices, though with little direction about specific measures that might qualify as ‘appropriate’. This ambiguity might allow such practices to become boundary objects, which take a less-structured common form, but are highly structured locally through work at the level of local practices (Star, 2010; Star & Griesemer, 1989).

We thus see legislation and professional guidance requiring risk procedures at the local level in organizations. This parallels Power’s (2015) thinking about how field-level accounting objects become realized and inscribed at the local level within organizations, which has helpful connections to the issue of practices. Rather than accounting objects, here the concern is with risk objects and management tools that flow into organizations from professional bodies, regulators and elsewhere at the field level. Guidance from the professional community interacts with local knowledge, informing ‘how a manager understands, relates to and justifies the use of a managerial technology’ (Townley, 2004, p. 429). Local practices may also diffuse more broadly, from museum to museum, often emanating from leading institutions, but also from smaller museums at the cutting edge of a particular practice.

Thus, we find a search for appropriate practices and techniques, informed by research. Practices might arise in local form, but require validated forms in other cases: ‘we can’t just make up a methodology’ (field notes). Hence, it is clear that management tools must come from somewhere. These may be imposed from above, perhaps by the state or federal government, or suggested by professional bodies, as with the AAMD’s

professional practice guidance. Or they may be decided locally, in response to general government requests, as seen in the state government mandate for Museums Victoria to value the collections, which gave methodological agency to organizations at the local level, as long as these were validated. For this reason, just as physical museum objects might circulate for exhibition around the world (Lai, 2004, 2006), we also see a global circulation of museum management practices, including risk models. These knowledge flows also include risk objects like the agents of deterioration noted previously, as well as management systems, evoking a global professional community.

The system architecture of common tools and systems may also contain inbuilt assumptions related to professional practice. For example, Axiell, provider of the EMu records management systems mentioned earlier, facilitates the diffusion of management practices by selling the same platform to various museums, featuring:

- An integrated DAMS (digital asset management system) stores and manages all digital assets and their derivatives. Digital assets can be associated with any record. All media types are supported and the complete Dublin Core attribute set can be recorded for each multimedia resource.
- Narrative and thematic material can be authored for different audiences and purposes (exhibitions, wall labels, brochures, web-based stories, in-gallery interactives, self-guided tours, and so on).
- EMu provides online access to the records you choose to publish on any digital platform (desktop computers, in-house kiosks, phones, tablets, etc.), consistent with your online presence.
- Capture workflows and assign steps to staff; specify commencement and completion dates, and automatically send email notification of pending and overdue tasks (Axiell, n.d.).

Interaction with a standard professional tool engenders a set of management practices common to the professional field, even if local use might vary, meaning these become material devices or boundary objects that connect practitioners within a museum and worldwide.

Coming back to specific examples of tools used for risk assessment and management, these often include a series of models in use in everyday practice that help to aggregate and display risks. These models and tables may again diffuse across museums, informing practices through their standard attributes and expectations, but typically showing customization with local practices.

To follow risk management models and systems, I selected a model that extends the commonly-used nine agents of deterioration framework by integrating these factors into a cohesive risk model with implications for management practice: the Cultural Property Risk Analysis Model. The model was devised by Robert Waller (1995), who wrote an initial article about the model while serving as the Managing Director of the Collections Division for the Canadian Museum of Nature. Later writings followed his career trajectory, as he had become Head of the Conservation Section by 2005, when he published a follow-on article with Garnet Muething. This is one mechanism for practices to become embedded and expanded, with key figures in a prominent organization writing about practices in ways that allow them to diffuse. Given the public nature of published research, as researchers we can examine Waller's work and extensions (Waller, 2003; Muething et al., 2005), which provide a foundation for future research and practice.

The Cultural Property Risk Analysis Model integrates different objects necessary for risk analysis, starting with the elements of deterioration. It then provides specific examples for each element: with 'physical forces', examples include earthquakes, mishandling and poor support. Through clear tables and instructions, a universe of potential risk types, sources and locations are outlined, together with specific examples of the types of risk and relative importance of implementing means of control at each possible level for control (Waller, 1995, p. 22). Types of risk are quantified (1 = catastrophic, 2 = severe, and 3 = mild/gradual).

Similar to the visual risk models that should be familiar from Occupational Health and Safety training, Waller's overall tables communicate by using both numbers and colours. They join the estimated severity of the risks to the potential levels of control (location, site, cabinet, specimen, policy, etc.). The levels of control relate to the physical space of

the museum and handling practices of objects (location, site, building), but also come into play at other levels, such as the policy level or procedure, highlighting links to the level of actual practice.

The integration of everyday practices as a form of risk management is clearly noted in museum practitioner literature. Waller discusses taken-for-granted practices as containing a risk management element:

We make dozens, if not hundreds, of risk assessment and risk management decisions each day...Many decisions are exceedingly simple. An example is deciding whether to re-close the cap on a jar of fluid preservative after a specimen has been removed for a brief examination, or to leave it open. (Waller, 1995, p. 21)

Within the model, the nine general sources of deterioration engender specific examples, and these examples are assessed with a level of severity, as is typical for risk management. In addition to the table, this can be quantitatively aggregated into a total risk:

Similarly, the total risk to a collection from all agents of deterioration can be calculated as the combination of all individual risks. However, the total risk is not the simple sum of the individual risks. A complete description of the combinative analysis required to determine a numeric value for the total risk to a collection is beyond the scope of this chapter. Further, at present, this exact calculation is probably of little value considering the uncertainties in our knowledge of the magnitudes of individual risks. (Waller, 1995, p. 23)

The risk system outlined provides a basis for decision-making in a semi-quantitative fashion and provides another material device that informs managerial decisions. As part of the process, the risk matrix organizes and commensurates through a set of identified levels of severity. To be effective, the risks outlined should then translate back into actual practice within the museum, as policy-level modifications.

This expands our thinking about the role of commensuration in integrated systems. If market devices typically commensurate into dollars, this risk matrix translates into 'risk units'. Of course, dollars could also be added at another point, for example, in estimated damages or losses,

perhaps using numbers from a valuation exercise. However, in contrast to problematic financial risk models (Czarniawska, 2012), the suggestions translate back out to practices at the local level, in particular sites, locations, cabinets and also policies and procedures. This shows the utility of examining similar management practices across diverse contexts.

Discussion and Implications

Applying an objects framework to conservation risk systems is productive in examining the transition of physical and non-physical objects into museum risk management systems and practices. It is insightful to notice how we usually deal with the later steps in management research. That is, dealing with management objects, quasi-objects or epistemic knowledge objects, rather than the specific artefacts, their physical properties and the history prior to entry into the organization. Examination of the whole process is interesting because conversions of physical objects into quasi-objects suitable for desktop management is messy—objects might not fit into the database, as seen with the issue of ‘and parts’. The object may be elsewhere for research or exhibition, challenging the location-based assessment steps. Hence, much like the tacking back and forth between the common (ill-structured) and local (structured) boundary object (Star, 2010; Star & Griesemer, 1989), the museum staff seem to work back and forth between the systems, the physical objects and their rich knowledge of the physical objects. This has important implications for research, in that if we primarily follow the quasi-objects or purely electronic objects, it is easy to forget how curators are thinking intently about physical artefacts.

In terms of theoretical aims, I have used this chapter to introduce conservation risk management in museums as a type of managerial technique, with the goal of highlighting the utility of object-focused methodologies, especially for following objects. Object-based approaches are admittedly numerous, and my review interweaves research from various traditions. But the primary objective has been to consider two distinct types of objects in museums—the cultural and historical objects of

the collections, and the epistemic knowledge objects contributing to management practice—then to connect these back to risk management systems and practices.

This contributes three insights. First, we see the agentic properties of objects. If risk models inform decisions, physical objects can also display agentic properties: consider the breakdown of plastics over time, requiring attention and care from conservators, similar to the way that physicists have object relations and relationships of care towards tools such as particle accelerators (Knorr Cetina, 1999). Moreover, epistemic objects take the role of a tool *and* of an object of inquiry when it comes to a particular knowledge practice (Knorr Cetina, 1997; Nerland & Jensen, 2012). This might include an outline of various potential risks and risk objects, such as the example of physical breakdown and the attendant conservation needs, which highlights the links with the associated epistemic objects, such as scientific rates of decay. The circulation and agency of the risk matrix and risk management procedures provide another example. Here, we see the movement of the risk techniques, which have jumped from the Canadian Museum of Nature's and Waller's publications to be used in wider professional practice, including at Museums Victoria. The risk matrix allows commensuration, standardization and calculation of risk figures, becoming a boundary object that lets people work together (Star, 2010; Star & Griesemer, 1989), with a translation of risks into a common platform across various groups.

Second, risk management systems assemble physical and epistemic objects. The physical objects must first be transformed into more abstract concepts, like collections or specimen types, or in other words, management objects organized into 'quasi-objects' (Czarniawska & Mouritsen, 2009). Thus abstracted, they can join up with other knowledge objects, here in ultimate form as a calculation measured in risk units. This parallels my research on the art market, where I found that experts took auction prices and then went through several steps to create a valuation: collecting realized past prices and other relevant information, sorting and potentially discarding some prices to reach appropriate 'comparables', then adjusting for market conditions and other factors for a final valuation (Coslor, 2016). The material devices, such as the risk management model, help to stabilize the more abstract objects into practices within

the organization (Power, 2015). The risk model's calculated results could then necessitate modifications of practice, informing risk management practices at the policy, cabinet and specimen level.

Finally, we see the tacking back and forth between the management objects and the actual artefacts, because artefacts can be both unique and unruly, creating an awkward integration with systems geared for standardization. This is similar to sharing between local and shared forms of boundary objects (Star, 2010). Managerial work to bridge these gaps seems to be an essential feature of management practice in museums, again showing why we need to care about physical objects, even when studying management practices. In terms of future research, there are a number of potential questions. Do museum risk management systems ever 'fail' the same way as valuation tools (Coslor & Spaenjers, 2016), for example, if the organization providing a particular system goes out of business? How do risk calculations here compare with those in financial markets? Examination of the evolution of museum risk systems can enrich our understanding of general management practices, and inspire productive comparative research.

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Organizing, Management Tools and Practices

Philippe Lorino

Introduction

Research about management techniques and systems has been exploring the relationship between management tools and organizational practices for decades, with many different theoretical frameworks, for example:

- the rationalist characterization of management models as the vectors of best practices;
- cognitivism and its view of management systems as artificial representations of logical problem-solving procedures;
- practice-based analysis of management control as a situated practice;
- actor network theory (ANT) emphasizing the performativity of managerial tools, their ‘actant’ status and their situated combination into ‘bricolages’;

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- institutional views of legitimacy and decoupling between management systems and organizational practices;
- critical studies of managerial tools as conveying power and domination relationships.

Of course, it will not be attempted here to analyse all those frameworks, which would require a whole encyclopedia. It is rather suggested that, actually, all those streams of research adopt *one of two main theoretical and epistemological characterizations of management tools as regards their relationship with organizational practices*: they assign to them, either a status of *representation*, in the cognitivist sense of the word, or a status of social *mediation*, in a semiotic perspective. This chapter will start with a case study concerning the management of experience feedback in the nuclear industry. Then it will characterize the two paradigms: representation and mediation. The status of materiality in that debate will be examined, before concluding on the theoretical and practical stakes of this analysis.

How to Analyze Incidents and Ensure Experience Feedback in Nuclear Power Stations

Experience feedback is one of the main methods used to improve the level of operational safety and quality in such high-risk industries as nuclear power generation, the chemical industry, aeronautics, etc.

The First Approach to Quality/Safety Management: Variance Control/Representationalism

In the manufacturing and process industries, process standardization and variance control have long been the basic method to manage performance, including quality and safety ('regulated safety'). This is still an important aspect of safety management in such high-risk activities as nuclear power generation. The effective and efficient way to act has been

formulated in a predictive and normative standard procedure, which is thus supposed to reflect the best—or at least a satisfactory—practice, based on the best available expertise. Actual action may deviate from the planned standard. Performance control is based on variance identification. The most significant variances—sometimes responding to pre-determined categories such as technological defect, operators' mistake, lack of time or resources, insufficient transmission of information, lack of machine reliability, lack of people's effort, price of supplies, market decrease, selling prices through management systems—are analysed and lead to corrective forms of action and to some form of sanction (warnings, blames, rewards, retraining). The core of this approach to safety is representational: the standard procedure is supposed to be a faithful and normative image of best practices. It is also supposed to be potentially prescriptive, meaning that it has the power to determine actual activity, through conformance imperatives.

The Second Approach to Quality/Safety Management: The Causal Tree

Since the 1980s, it is admitted that the situations in which incidents take place are so variable and complex that it is illusory to assume that they can be understood strictly as deviations from a pre-established standard scenario. The management tool traditionally used to analyse incidents in the French nuclear power stations for the past 20–30 years is a causal tree: starting from the observed incident, an expert tries to identify the immediate causes of the incident, then the causes of the causes, then the causes of the causes of the causes, etc. by interviewing the actors of the incident situation. The method is no longer based on the assumption that best practices can be identified and represented *ex ante*. The situation now plays an important role: incident feedback requires the *situated* analysis of the incident causes. However, while it abandons the idea of accurately representing practice, the method assumes that the reasoning procedure about incidents can be standardized and represented, because it is strictly logical. Thus we move from the substantive form of representationalism (variance analysis) to a procedural form of representationalism (causal

tree), not the representation of the best practices, but the representation of the best reasoning procedures. The causal tree method is based on linear cause–effect analysis and assumes that causes are separable. It is devoid of chronology, since it only tries to show logical cause–effect links. It does not require the active participation of field actors in the incident inquiry. In 2012, Electricité De France’s (EDF’s) results after so many years of causal tree analysis were rather negative (Lorino, 2015). This method can hardly go beyond immediate and apparent causes, i.e. in most cases an operator’s mistake, while the experience-based general wisdom of nuclear electricity companies is that ‘human mistake is never an in-depth cause of incident’. The method only involves the limited group of actors directly and immediately concerned with the incident, where and when it took place.

The Third Approach: Organizational Factors and Collective Narrative Practice

In the nuclear generation of electricity now, there is an international tendency to give more attention to—still little explored—organizational factors of risk, beyond ‘human’ and ‘technological’ factors. The causal tree almost never led to organizational causes: sometimes technological causes, more often human causes. That is why EDF in 2013 and 2014 tested a new method, called AAE (‘in-depth analysis of event’). After a limited experimentation on four sites, it has been decided to generalize it to all sites. The AAE method stresses the *narrative* and chronological dimension of the inquiry: the inquiry starts with a first phase which aims at the collective construction of a chronological narrative, without any cause–effect analysis; in other words, first narrative, later logics. This first phase, which is just about telling a story, involves *plotting* acts and events, i.e. organizing them in a chronology and a narrative structure, and stresses the contextual specificity of situations. It leads to the gradual temporal, spatial and organizational extension of the inquiry, far beyond the immediate boundaries of the visible incident situation. It allows the identification of critical steps—actually, the construction of *events*, moments of the story which are judged key punctuations of the narrative. Then, in the

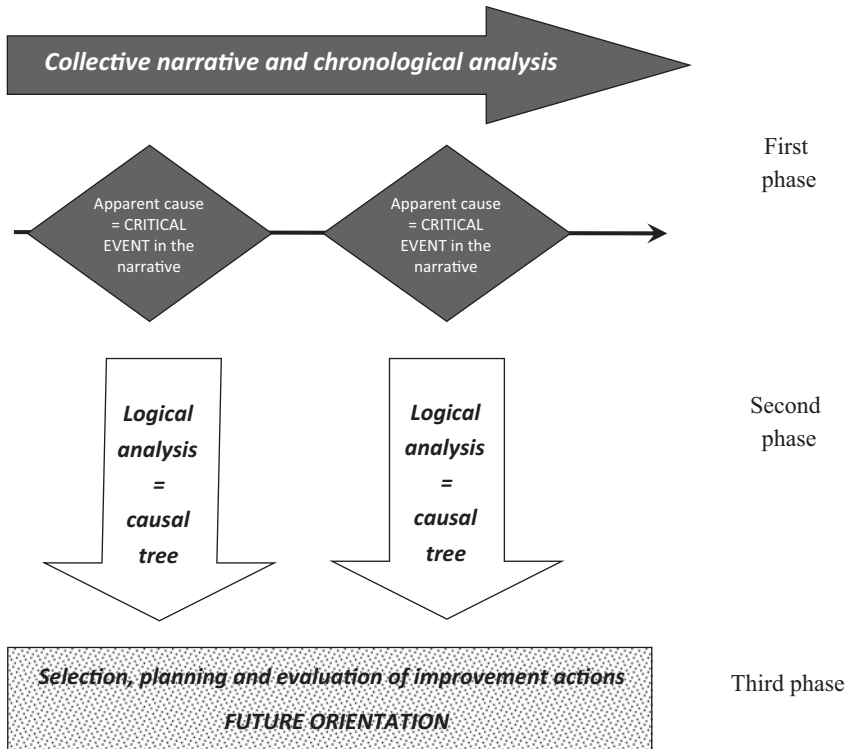


Fig. 1 The three phases of nuclear incident analysis

second phase of the inquiring process, actors achieve cause analyses starting from the so-defined *critical events*. Finally, in the third phase, they discuss action plans for the transformation of the organization in the future. The logical analysis of causes (second phase) thus appears as a punctuation between two key phases: first, reconstructing the past history of the incident; and second, defining the projected organization of the future (Fig. 1).

The historical phase determines the boundaries and the profiles of the concerned inquiring community of actors, beyond the immediate actors of the incident. Generally, the inquiry starts with the small group of immediately concerned actors, and then it widens to include the planners and designers who author key episodes of the story. One of the main

outcomes of the new method is precisely the construction of a widened community telling the story of the incident and inventing the new organization which should avoid the repetition of the same type of scenario: telling a story to invent a future. According to its structure and utilization schemes, the management tool can impose a repertory of classified ready-made narratives excluding any new class of meaning (e.g. the traditional standard-actual variance analysis used to impose categorized causes of variance—competence, tooling, resources, information, technical breakdown, etc.—corresponding to generic forms of action, often ‘set in stone’ through the design of information systems). Later on, the classical ‘causal tree’ tended to quickly classify nuclear incidents into generic causes (‘technical problem’, ‘human mistake’, ‘subcontractor defect’, etc.). Finally, the management tool can work as a procedural narrative frame, leaving room to actively build a narrative collectively in the situation, through a living polyphonic performance. Then the tool provides a language, a time–space frame, and rules, to make narrative elements as interactively constructible as possible (Czarniawska, 1998), empowering the inquiring community to develop organization skills.

Representation: The Representationalist Mainstream of Management Control and Accounting Studies

Cognitivism and Representationalism

The concept of representation, under this designation or others (e.g. model, standard, plan, explicit knowledge, theory of action), has played for decades and keeps on playing a major role in the research about management tools (Lorino, Tricard, & Clot, 2011). The representationalist view can be found in different versions:

- The substantive rationality version (e.g. Taylorism) assumes that it is possible to represent action—and more particularly best practices—in accurate ways and to use the representation of best practices as a

prescription for situated action. It is still very influential in the life of organizations: Taylorist standard processes, standard operating procedures, production scheduling imposing time and quantities, budgets and plans, are all more or less supposed to determine actors' behaviours. Management tools are then expected to be accurate and normative representations of the best practices. The control of actual activity is based on variance control.

- In the bounded rationality version, management tools are normative representations of satisficing practices, i.e. practices that are not optimal, but fulfil a minimum performance requirement. Optima are not accessible for lack of data collection and processing capacity.
- In the procedural rationality version, management tools are not accurate and normative representations of action itself, because situated action is too complex and variable to be usefully replicated, but they represent thinking procedures used in concrete situations to determine satisficing forms of action, i.e. decision-making and information processing procedures (Simon, 1947/1997).

The mainstream of research about management instruments combines those three approaches to rationality. When situations are simple, the rationalist framework is used to develop the concept of routines, close to the Taylorist definition of standard operations, at least in the original March and Simon's version, inspired by the S-R (Stimulus-Response) psychological model. But when situations are more variable and complex, procedural and bounded rationality prevail. Management tools are then considered as organizational representations that specify and regulate, not actors' behaviours directly, but their ways of *thinking about and understanding* situations. Action is no longer likely to be accurately represented and specified outside the situation. But *thought* about action is supposed to follow standard and logical procedures and to be representable. A later version of the theory of routines is then developed, where routines govern thought about situated action rather than action itself.

Thus, the central hypothesis of the cognitivist approach to organizations is that collective thought and/or action can best be understood in terms of representational structures and computational (i.e. logical data processing) procedures that operate on those structures, shared by

organization members. As a result, the cognitivist approach to organization assumes that the organization handles logical representations (cause–effect models, quantification and calculation models, industrial models, time schedules) and computational procedures (deduction, matching, consolidating, averaging, comparing, sampling). The organization is conceptualized as an information-processor. Mimetic representations can be mental or can be transformed into technological artefacts which are shared by the members of an organization and specify and regulate their actual action. This is possible because the working procedures of human brains and computers are viewed as similarly based on rational data processing. Therefore, the cognitivist concept of representation is closely linked with the concepts of:

1. *Sharedness*: sociality is based on the sharing of mental and artificial representations. A theoretical problem has haunted Organization Studies for decades: what is the relationship between the individual and the organizational processes? While sense-making, interpreting, learning, knowing, are well explored at the individual level, in particular by psychologists, how can we move from this ‘micro’ level to build the ‘macro’ level of organizational sense-making, organizational meaning, organizational learning and knowing? How can we explain that different subjects, each one with a specific history and inner life, plunged into the same situation, may behave in similar or coherent ways and thus generate collective and organizational behaviours? Representationalism brings a solution to this problem: the ‘*sharedness*’ or ‘*commonality*’ response, for which the organizational or social level is based on the *sharing* of representations at the ‘micro’ level by all the individuals belonging to a given social group, for example an organization:

most theories that study the interdependency of culture, cognition and conduct hold that *shared* beliefs, cognitions, representations, schemas, models, and so forth, enable a successful exchange of meaning. (Verheggen & Baerveldt, 2007, p. 10)

The limit of human understanding in the presence of complex social structures leads human beings to construct simplified maps (i.e., theories or

models) of the social system in which they operate, and to behave as though these maps were the reality. To the extent that such maps are *held in common* they must be counted among the *internal constraints* on rational adaptation... The process of organizing involves, among other things, securing acceptance by the organization members of a *common model* that defines the situation for them, and provides them with roles and expectations of the roles of others, and with commonly accepted classificatory schemes. (Simon, 1952, p. 1135)

2. *Variance*: actual action (or actual decision-making) is controlled on the basis of its deviation from prescriptive representation; what plays the key role in the representational approach, the engine of human and social learning, is the *reality-representation variance*:

if we accept the proposition that both the knowledge and the computational power of the decision maker are severely limited, then we must distinguish between the real world and the actor's perception of it and reasoning about it. That is to say, we must construct a theory (and test it empirically) of the processes of decision. Our theory must include not only the reasoning processes but also the processes that generate the actor's subjective *representation* of the decision problem. (Simon, 1986, pp. 210–211)

3. *Abstract logical models*: what is represented can be represented and prescribed because it conforms to logical structures; action or thought are logical (optimizing, satisficing) and thus representable through 'computable' (logically processable) models. Herbert Simon, the inventor of the 'procedural rationality' concept, bases representationalism on strong psychological hypotheses about the simple, logical and representable nature of human action and thought:

Human beings, viewed as behaving systems, are quite simple. The apparent complexity of our behavior over time is largely a reflection of the complexity of the environment in which we find ourselves. (Simon, 1969, p. 53)

While he recognizes the contextual complexity of action, because of the complexity of the action environment, he postulates that thought—at least useful thought—comes down to logical processing. As a result, in

the representationalist perspective, the only limit to knowledge is the limited capacity to collect and process information about the environment of action. This hypothesis discards creative thought (narrative imagination), the affective dimension (e.g. aesthetical dimension) and corporal involvement ('thinking with body'): thought identifies with cognition and action with conformity.

4. *Dualism thought/action*: thought about action is supposed to take place in a stable world and to precede action itself; the 'story' of collective action is pre-established and stable. There is no situated creativity, since situated action is either the execution of pre-established standards (substantive rationality) or the result of pre-established computing models (procedural rationality).
5. *Truth as correspondence*: in classical rationalism ('scientific management'), representations are 'true models' of the best practices. March and Simon's (1958) procedural version of the concept of representation is still consistent with the epistemology of 'truth as correspondence', in other words, the belief that knowledge of the world consists of developing models that correctly and distinctly represent situations from outside:

The first task of administrative theory is to develop a set of concepts that will permit the description, in terms relevant to the theory, of administrative situations. These concepts, to be scientifically useful, must be operational; that is, *their meanings must correspond to empirically observable facts or situations*. (Simon, 1947/1997, p. 43, my emphasis)

Rationality is bounded but nevertheless rational, in the classical acceptance of rationality as 'correspondence': imperfect correspondence, but still correspondence.

Frederick Taylor had pursued a project of calculability: quantitative comparison, variance, addition of workloads. Simon clearly links his representationalist choice with the use of the powerful technology of computers:

Now the salient characteristic of the decision tools employed in management science is that they have to be capable of actually making or

recommending decisions, taking as their inputs the kinds of empirical data that are available in the real world, and performing only such computations as can reasonably be performed by existing desk calculators or, a little later, electronic computers. Models have to be fashioned with an eye to practical computability, no matter how severe the approximations and simplifications that are thereby imposed on them. (Simon, 1979, p. 498)

In today's practice, most common management systems are designed within a representational perspective: 'ballistic' planning tools which are supposed to determine future action and are oriented towards variance-based control, standard tasks and costs, production scheduling and measurement. Procedural approaches leave more space to situated inquiries. For example, while Taylorist cost–variance analysis examines ready-made causes (volume variance, productivity variance, price variance, etc.), the causal tree (i.e. 'fishbone diagram': hierarchical analysis of cause–effect links to explain some defect) used in quality management does not deliver ready-made causes, but imposes a logical model of analysis, which assumes, for example, that causes are separable (hence the 'tree' structure), can be abstracted from any temporal (no chronological scenario, the tree is temporally flat and synchronous) or spatial framework, and that causes follow a sequential cause–effect structure with no feedback loops and no overlapping. The causal tree does not represent standard classes of problems coupled with standard classes of solutions, since it can be applied to many different types of problems, but it represents standard reasoning procedures about problems.

In academic research, many theoretical streams are explicitly or tacitly based on representational assumptions: classical rationalism, cognitivism and knowledge-based systems, organizational learning based on 'theories of action' (Argyris & Schön, 1978), routine theory and the performative/ostensive duality (Feldman & Pentland, 2003), critical perspectives on accounting and control (Hopwood, 1990). All those theoretical frameworks opt for an elementary unit of analysis of the type 'representation—actual—variance' (Table 1).

Table 1 Summary of representationalism

Epistemology	Dualism thought/action, truth as correspondence.
Type of tooling	Logical, abstract representations.
Sociality	Sharedness (commonality): representations are simultaneously mental and artificial, they are shared by actors.
Learning	Variance control.
Practical examples	Budget and planning, variance analysis, causal tree.
Theoretical examples	Cognitivism and knowledge-based systems, critical research on accounting, organizational learning (Argyris & Schön), routine theory.

Problems and Shortcomings of Representationalism

Representationalism is based on a rather simplistic psychology, which assimilates thought with rational cognition and complexity with computational complexity. No wonder then that representationalism meets problems, in particular in uncertain and complex situations characterized by the multiplicity of meaning-making perspectives and their mutability. It can hardly give a theoretical account of situated creativity, of evolving and complex systems in which there is no overlooking observer or planner (interactional/transactional complexity, autopoietic systems) and of unplanned and indeterminate temporality.

Furthermore, the representational approach has heavy practical implications whose dangers can be observed in today's business practices. It often leads to an excess of confidence in formal models, experts' analyses, abstract systems and quantified evaluations, while operational experience tends to be disdained and the actual complexity of field activity is often under-estimated. 'Learning' is then equated to 'model complexification'. More and more detailed and sophisticated systems are imposed as incontestable revealers of collective performance.

However, a 'good' (accurate, precise, detailed, exhaustive...) *representation* can prove a bad *mediation* to support collective sense-making and trigger action, as Swieringa and Weick (1987) show in the case of ROI (Return On Investment). They admit that ROI is a bad representational instrument with a lot of 'biases': confusion between long-range and short-range considerations, evaluations strongly influenced by

accounting conventions, short-termism, etc. Nevertheless, they observe that ROI is generally understood and accepted by managers, is easy to use and ends up constituting a sort of common language within the organization. In spite of its representational shortcomings, it often proves an effective mediation of collective action, precisely because it is not too precise, too exhaustive, or too complex, and it is quite effective at triggering collective action.

At the core of the problem we find the relationship between management tools and practices. Representationalism gives a simplistic account of this relationship, based on the dualist separation between thought and action: thought is supposed to consist in designing representations and action in using them. It is a temporal (designing and then using), epistemological (learning consists in designing new representations) and social (different classes of actors are devoted to designing and to using representations) separation. It leads to viewing management control and the research about management techniques as a science of design that obliterates activity and any theory of complex social action.

Now collective and situated activity, thus neglected, gets its revenge when managers actually lose any real control of performance and risk. In the past twenty years there has been an accumulation of disasters in the organizations that followed the representational and controlling model most strictly. Hence the focus of new research streams on the relationship between management tools and techniques on the one side, and practices on the other side. They often refer to relational ontologies and epistemologies: intelligent action and performance neither result from the use of excellent management tools nor from the clever improvisation of actors who get rid of instrumental constraints. They rather emerge from the dynamic relationship between tooling and modelling, on the one hand, and situated activity, on the other hand.

From Representation to Semiotic Mediation

In accounting, management accounting and control research, the concept of semiotic mediation provides an alternative to the representationalist view. Numbers (Denis, Langley, & Rouleau, 2006) are then viewed

as *signs* mediating situated activity and performing practical effects (Muniesa, 2014). What does ‘mediation’ concretely mean here?

On the one hand, a sign is singular and situated. The cost of an activity, for example, is dated, located and contextual. It changes overnight. It is different in two distinct places. The meaning of a sign involves the unique context of its use. On the other hand, the sign points to generic laws. The cost of an activity points to accounting rules and definitions, the chart of accounts, past costs, planned costs, the costs of other activities elsewhere. As a result, signs have two faces. They simultaneously (1) participate in a concrete and unique situation and (2) refer to socially constructed classes of meaning abstracted from the situation. This ‘double face’ is their constitutive characteristic: they relate a specific and singular experience with ‘off-the-situation’ elements, absent and yet present ghosts of the situation; and habits, the past of action in progress or more generally past experience, the future of action-in-progress (anticipations of next steps, immediate goals, but also the distant motive of action and its final sense, the relationship between immediate goals and final motive), spatial ‘elsewheres’ and social ‘otherness’ (events and action taking place elsewhere that can impact the action taking place here and now). The mediation broadens the definition of the situation from the immediately observable and experienced to a wider temporal, spatial and social setting, and due to that widening, new options for action appear and the situation is transformed.

Management tools are specific types of mediations. They are ‘valuating’ mediations (Dewey, 1939; Muniesa, 2014): they are particularly devoted to attributing values—efficiency, effectiveness, quality, risk level, profitability, reactivity—to organizational activities. Attributing values is not a kind of automatic reading. It is a complex process, due to the multiplicity and frequent contradictions of potential value judgements about activity. Management tools are involved in this complex valuating process, which is a social practice. Hence the more recent research streams about ‘control as practice’, ‘accounting as practice’. Controlling, measuring performance, evaluating, is a practice, and a specific type of practice: a valuating practice.

In particular, this has a major temporal consequence. Performance management based on representationalism is primarily oriented towards

the past: implementation of previously established models and plans, application of previously designed standards and expert systems, deviation from previously negotiated objectives, etc. Performance management based on the concept of mediation is primarily oriented towards the future. It is the first and main role of management tools to instantiate the final and distant motive of social activity into the present situation: are we developing the new product in ways which prepare its commercial and economic success, though we do not know yet what the market, future customers' behaviour and the competition moves, will be? Are we treating patients in ways which lead to their future satisfaction and recovery? The distant motive is strong—it is strategic, existential—but often moving and fuzzy. It is not an immediate goal. It is also the role of the management tools to establish immediate and often quantified goals that are supposed to be coherent with the distant and final social motives. The main role of management tools is relational: they relate immediate goals and distant motives. This link is always hypothetical. That is why, in a mediational perspective, the ongoing reading and interpretation of management tools oriented towards the exploration of potential futures is much more important than the past-oriented control of variances.

First, such semiotic mediations (Peirce, 1932) can have a representational or mimetic link with actual situations; this is often the case with management systems. Then they are said to be *iconic*. Second, they can also have an *indexical* relationship with situations, meaning that they can be traces of what took place or what is taking place, some often invisible events and actions generating performance or counter-performance. Sometimes traces are enigmatic and call for an inquiry to make them intelligible. For example a quality indicator which unexpectedly deteriorates does not 'represent' any process likely to explain that worsening of quality. It is a trace of something which happened or is happening, and still needs to be deciphered. Third the mediating sign can be *symbolic*, meaning that it can point to some meaning through a purely conventional connection, established by institutional mechanisms, for example accounting rules and conventions. In ordinary life, the linguistic signs (the ordinary vocabulary) or the knot in the handkerchief are classical examples of symbolic signs: they do not replicate any phenomenon and they are not traces of some event either. They have a conventional link

with specific meanings. In management systems, the investment depreciation of an item of production equipment has no logical or physical link with any actual phenomena; it is neither the measurement of the physical wear of the device nor the actual economic preparation of its future replacement. It is a social convention which mainly involves tax reduction, because it was so decided by fiscal authorities.

There should be no confusion between representations and signs. First, a semiotic mediation is not necessarily iconic and can be indexical or symbolic. When management systems generate indexical or symbolic mediations, they are obviously not representational. Non-iconic signs play a major role in organizational meaning-making processes, for example in accounting (omnipresence of conventional rules) or in performance management (importance of analysing deviations as indexes/traces of unknown problems to investigate). Second, even when a sign is iconic and takes the shape of a mimetic representation, for example, the cost of an activity which mimes its resource consumption, it is not a 'representation' in the sense of representationalism or cognitivism. It is not based on the epistemology of 'truth as correspondence' and the dichotomy 'representation/reality': it is neither supposed to replicate a real phenomenon in accurate ways, nor to dictate reasoning procedures. It is just a heuristic support and a meaning-making aid for actors' attempts to understand and enact the situation. It does not derive from its iconic link any normative or prescriptive status. If the cost of the activity increases, what judgement and what action should it trigger? Nothing here is pre-determined. The situation must be understood first. Iconic mediations are not supposed to give an exact image of their object, but to make themselves intelligible through the similarity of shape. They do not *determine* action by modelling it. They are *resources*, not the *sources*, of organizational action.

In the mediational approaches then, the actual meaning of situations is continuously built by actors in the situation, through the situated construction of the narrative meaning of acts and events: that is what happened before, leading to what is happening now, and anticipating what will happen next and in later phases of action. The intelligibility of situations is thus based on the continuous adaptation of a narrative giving sense to present activity. This ongoing narrative process takes place

through the interpretation of mediating signs pointing to the past, future (next step, immediate goals, distant motives), elsewhere and otherness of here and now activity, in particular management systems.

Mediational approaches no longer refer to the epistemology of ‘*truth* as correspondence’, but to an epistemology of *meaning* for the continuation of work and life experience. The management tools are primarily expected to allow relevant action, not necessarily true representation. No more is there any dualist separation between thought and action: experience is made of the intricate integration of imagining (to tell the story of what happened, happens and will happen), reasoning (if that is what happens, then we should act in such ways), actively testing and trying hypotheses in practice. It is an epistemology of inquiry. The elementary unit of analysis can no longer be focused on the representation/reality dichotomy. It must be focused on the acting/thinking/inquiring process.

However, mediational approaches now meet the problem of sociality. In representationalism, sociality was based on representation-sharing. The critique and rejection of the representation concept and its replacement with semiotic mediation brings back the question: how is sociality built? Two different classes of ‘mediational’ approaches bring two distinct types of responses: interpretivism suggests a subjectivist response, dialogism rather proposes a social response.

Interpretivism appears as a subjectivist version of the mediational approach. Management tools are viewed as semiotic mediations of individual subjects’ action and thought and the heuristic support of subjective reflexivity. But then the issue of sociality is particularly difficult to overcome: how can subjective interpretive processes lead to the social coherence of collective activity and meaning? In many cases interpretivist authors cannot avoid *returning to sharedness*—and then to some form of representationalism. In that case, interpretivism generates an inconsistent mixture between representational and mediational frameworks: on the one side the subjective autonomy of thought and learning is strongly asserted, but on the other side sociality and the organizational dimension are based on shared representations, including shared mental representations. The concept of mediation seems incompatible with subjectivist frameworks.

Dialogism and Process Perspective: Management Tools as Semiotic Mediations of Conversational Practices

Management Tools and Semiotic Mediation

This view retains the concept of semiotic mediation, but disconnects it from subjectivism and considers semiotic mediations of social action, considering that any action is actually social, and the Self itself is social, according to such authors as Mead (1934) and Vygotsky, (1934/1986); they are conveyors of social and cultural classes of meaning involved, not in solitary individual processes, but in dialogical /conversational exchanges. In this perspective, management tools appear as a form of language that mediates the action and meaning-making of social groups (Lorino, 2013), a resource for situated social meaning-making, which can also be analysed as a Goffmanian 'frame' (Lorino, Mourey, & Schmidt, 2017; Vollmer, 2007).

Management systems instantiate in the present situation the past of action in progress, its future (immediate goals, relationship between distant motive and immediate goals), spatial 'elsewheres' and social 'otherness', but in a social arena in which an ongoing dialogue involving two or more participants takes place. Management systems play their mediating role through iconic, indexical or symbolic links with the situation. The actual meaning of situations is continuously built and rebuilt in the situation through dialogues in words and acts, through the situated construction of the narrative meaning of acts and events: that is what happened before, leading to what happens now, and anticipating what will happen next and later.

Ethnomethodology, Weick's analysis of collective sense-making, pragmatist perspectives, activity theory and ANT-inspired research in management accounting can be considered as approaches basically referring to this kind of dialogical and mediated construction of meaning, management tools being the key mediation connecting situated dialogues with the broader narrative thread of activity, including its final motives. Actually, the most coherent versions of such perspectives assert that sociality is an inherent characteristic of human self, who builds her/himself through the exchange with others—and seeks and discovers the

Table 2 Representational versus mediational frameworks

	Representation	Mediation
Epistemology	Dualism thought/action, truth as correspondence	Experimentalism, pragmatism, thought/action integration in semiosis processes
Type of tooling	Logical, abstract	Narrative, temporally, spatially and socially situated
Sociality	Sharedness	Dialogism
Learning	Variance control	Inquiry (abduction)
Practical examples	Budget and planning, causal tree	Narrative Event Analysis (NEA), collective activity analysis
Theoretical examples	Cognitivism and knowledge-based systems, critical research on accounting, organizational learning (Argyris & Schön), routine theory	Pragmatism, Goffman-inspired research on accounting (frame), practice theory, ethnomethodology ANT on management tools, Weick

meaning of proper acts and speeches through others' responses. From a methodological point of view, the elementary unit of analysis must then be relational, including the use of management tools within the act—response—response to response dynamics. Such approaches to organizing processes (Garfinkel, 1967; Tsoukas, 2009) so far are little focused on the mediating use of management tools (except Swieringa & Weick's (1987) paper about ROI) (Table 2).

Mediation: The Key to Sociality

In the dialogical and mediational approach, sign and mediation are not psychological but social concepts: beyond its apparent author, a sign retains the marks of other beings: what others did or said, the responses they are expected to make in the future. Every act, every speech, every sign shows traces of social groups, addressees, co-actors. Mediation is thus the key to dialogism, what makes speeches and acts socially addressed and addressable:

In a thought process there has to be some sort of a symbol that can refer to [a] meaning, that is, tend to call out this response, and also serve this purpose for other persons as well. (Mead, 1934, p. 146)

It is then precisely the function of management systems to generate significant signs in Mead's acceptance, allowing social communication and actors' development of thought about organizational performance.

Mediation: The Key to Temporality

Orientation towards the *future* is a key characteristic of signs. It is contingent, since possible futures are multiple. Semiotic mediation is closely linked with the view of action as an emergent and continuous effort to imagine and project some future experience, for example strategic objectives, or the social mission of collective activity.

The mediating sign also involves the past and historical experience: similar situations already encountered, usual interpretations, tested habits of action. It evokes experienced ways of doing things, social 'how to do' (Taylor & Van Every, 2011, p. 23), past anticipations, and expectations. But mediation is also a move from the future to the past, the re-reading of the past in light of anticipated or desired futures, and a process of iteration between past and future, a bi-directional dialogue between yesterday and tomorrow in which meaning is never a given.

Conclusion: Reassessing 'Sociomateriality' in the Case of Management Systems

If 'the social and the material are considered to be inextricably related—there is no social that is not material, and no material that is not social' (Orlikowski, 2007, p. 1437), then why continue to base analysis on the dualist system of terms 'social/material' or to suggest exploring 'the deep intermingling of materiality within practice' (Orlikowski, 2007, p. 1446)? This raises the issue of the elementary unit of analysis. Is it the encounter of 'materiality' with 'human agency', or should we find a radically different elementary unit of analysis, intrinsically relational and dialogical?

The dyadic view of 'materiality plus human or social agency' is coherent with Aristotle's hylomorphic model: to create anything, Aristotle

reasoned, you have to bring together form (*morphe*) and matter (*hyle*), in which we could easily identify materiality with ‘hyle’ and social or human agency with intentionality, i.e. some intended form, ‘morphe’. Ingold (2010), in coherence with the pragmatist and semiotic view, suggests that we should drop entitative units of analysis, which conceptualize movement as an exception to stability, and prefer relational units of analysis, referring to relational epistemologies and ontologies. To analyse the properties of water, the elementary unit of analysis is not the molecule of hydrogen or oxygen, but the molecule H₂O of water. The semiotic and dialogical mediation framework conveys a radical critique of all kinds of dualism, for example:

- ‘explicit’ versus ‘tacit’ knowledge: so-called ‘explicit knowledge’ is made of mediating artefacts (texts, drawings, computer software, mathematical models) whose mediating dynamics must be analysed as such, as the dynamic involvement of so-called ‘explicit’ in so-called ‘tacit’ and vice-versa, leading to the move from moment 1 to moment 2;
- ‘human factor’ versus ‘technological factor’ in nuclear or aeronautic safety management: incidents result from organizational processes involving dialogical meaning-making processes mediated by semiotic technological, discursive, regulatory artefacts; the traditional duality of ‘technological’ versus ‘human’ factors leaves the organization aside, while the incident situation is an organizational process!
- ‘measurements’ versus ‘events or objects’: performance management

implies exploring the associations between technologies, inscriptions, devices, human actors, and calculations, rather than endlessly debating about the best measures ‘here’ for objects ‘out there’. (Dambrin & Robson, 2011, p. 447)

In a relational framework, materiality no longer appears as a given and stable attribute of things. What is the materiality of a management system? Is it the form of a curve on a diagram, the mathematical algorithm used to calculate product full costs, the data encoding in the accounting software, the textual description of accounts, the room in which the

management system is used every month during business reviews? In the very moment in which the management system is engaged, for example in a meeting, there is no established understanding of the situation, no stabilized meaning, and even no fixed boundary between what the management tool allows and what it does not allow, but just a manifold of possible applications and effects, some of them unknown and unrecognized by any actor *ex ante*.

Thus, concerning management systems, the category of ‘textility’ proposed by Ingold (2010) may be more adequate than the category of ‘materiality’ proposed by the sociomateriality approaches. Ingold analyses the movements of a kite in the sky:

flyer and kite should be understood not as interacting entities, alternately playing agent to the other as patient, but as trajectories of movement, responding to one another in counterpoint, alternately as melody and refrain. (Ingold, 2010, p. 96)

Ingold refers to Heidegger (1971, p. 181), who explains that the thing presents itself ‘in its thinging from out of the worlding world’. Thus textility appears as a particular interweaving of purposeful—teleological—movements, in which meaning-making social groups literally make/fabricate situations as ‘material’ situations, by exploring the intimate structure of so-called matter:

‘It’s a flowing’, says Berger, and at the same time, a ‘continuous correcting’ (Berger, 2005, p. 124–125). The draughtsman with her pencil, just like the carpenter with her saw, must feel where she is going, and must continually adjust her gestures so as to maintain alignment with a moving target. Moreover, as with the mountain path, the buzzard’s flight or the tree root, the drawn line does not connect predetermined points in sequence but ‘launches forth’ from its tip, leaving a trail behind it. Or, as Klee famously put it, the line ‘goes out for a walk’ (Klee, 1961, p. 105). Ingold (2010, p. 99)

The forms of object arise within relational fields of force and flows. Interventions in these force-fields continuously build and modify the

action potentials (for example through the fibre structure of wood or the wind movements) and at the same time modify the fields of forces themselves, in the same way as a magnetic load moves in a magnetic field, and by moving, modifies the magnetic field. Inquiring performance then appears as a practice of weaving together the informational structure of systems, the experiential knowledge of actors, the evolving requirements of customers or potential customers, the technological phenomena, the segmentation of activity to generate quantified measurements, etc. ‘in an ongoing generative movement that is at once itinerant, improvisatory and rhythmic’ (Ingold, 2010, p. 99).

While a builder handles bricks and mortar to construct a house, a gardener soil and plants, a cook ingredients and cooking tools, a manager handles figures, diagrams and tables as symbolic but resilient textile structures, hampering or accelerating specific movements and shapes. *Management tools are not objects, in the sense of already formed and meaningful things, but materials to elaborate and to construct new forms, and principally narrative materials to build narrative forms*—as the example of nuclear experience feedback showed us.

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Part IV

Managerial Techniques as Collective Activities

Imbrication in Operational Control Practices: Evidence from a Complex Process Industry Setting

Fazlin Ali and Alan Lowe

Introduction

This chapter seeks to illustrate the emergent nature of control practices that result from the interaction(s) between two agencies (material and human) which in this chapter refer primarily to the control technologies and refinery process operations staff. The concept of imbrication (Leonardi, 2011; Leonardi & Barley, 2010; Leonardi, 2013b) is used to illustrate the interaction(s) that take place as people seek ways to maintain a balance between the organization's concerns to meet desired product quality while achieving targeted yield (and production cost). These targets were set during the annual strategy and budget-setting process

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that took place over a period of several weeks, based on prior statistics on operational and marketing knowledge. The annual budget stipulates what is required of the refinery in great detail from the production operations but the critical targets for the refinery are around product quality, cost and volume of production of key product categories.

The research focuses on brief episodes of imbrication processes that we observed taking place in operational control practices during refining and fractionation at a Malaysian palm oil production facility. Our illustration of the processes highlights several aspects of operational control practices in the organization and how they are implicated in work practices. We consider key aspects of the work practices of the team of operators and supervisors who have different lengths of experience in a highly automated production facility as they constantly respond to reports from the laboratory staff who provide test facilities to check the product quality of incoming raw material, processed and part-processed palm oil. Focusing on such interactions contributes to our understanding of the operational controls and the role these systems play within areas of intersection between work groups and different organizational activities (Baxter & Chua, 2008; Nama & Lowe, 2014).

Studies in the management accounting and information systems literature have mostly focused on the implications of the materiality of control systems such as Enterprise Resource Planning (ERP) (Dechow & Mouritsen, 2005; Quattrone & Hopper, 2001; Wagner, Moll, & Newell, 2011). These studies have often examined systems at a more macro level looking for evidence of longer-term effects of changes resulting from implementations or effects on organizational culture (see Quattrone & Hopper, 2005). In contrast, the focus in this research is on the micro level and the day-to-day actions related to or prompted by operational and managerial controls that impact on short-term production planning and performance.

Similarly to these studies (Dechow & Mouritsen, 2005; Quattrone & Hopper, 2005; Wagner et al., 2011), this research considers the materiality of production and control technology and artefacts, but takes a different focus (i.e. the advanced production technology and other artefacts relating to the production activities in the organization). In doing so, the findings provide valuable insights into the explanation of the situated

functionality of (management) accounting and control practices (Ahrens & Chapman, 2007; Jørgensen & Messner, 2010; Nama & Lowe, 2014). This is achieved by emphasizing the complex relations and processes of entanglement between bundles of people, materials and technology within the organization that constitute or influence management accounting and control practices.

Our research aims to examine how operational controls are constituted. We adopt a sociomaterial lens to help focus attention on the unanticipated nature of the complex processes and outcomes that characterize the case site. We believe that our findings foreground the essentially 'human' and social nature of production at the palm oil refinery. Findings from our case study suggest that the variable and unpredictable nature of raw material inputs and the highly automated production environment in processing industries, such as palm oil, produce a complex environment that necessitates flexibility in control actions. Flexible decision-making and control actions that respond quickly to the need for intermittent and unpredictable adjustments to the production process and plant have to be taken on a very short-term basis to respond to material changes in inputs and processing variables. While we focus our analysis on the imbrications that occur as human agency encounters technology in the form of process equipment and computer control systems, we feel that our contribution helps to emphasize the essentially constructivist nature of human agency of the plant operators. Our contribution is intended to offer an alternative to the typical expressed concerns about how to control processes more tightly. Instead, we seek to emphasize a more enlightened view of controlling where employees typically act to make the production process work effectively. Our examples demonstrate the success of production because of the willingness of operational staff to compromise and to work with (imbricate if you will) sometimes imprecise technology to get the best outcomes they can.

This chapter is organized as follows. The next section outlines the relevant literature on sociomateriality and explores its relevance in examining organizational control practices. We then introduce the case organization and describe the methods deployed in the research. In the following section we illustrate aspects of control practices and production arrangements and apply our theoretical lens in order to make sense of the

interactions we describe. The final two sections offer discussion and conclusions. Here we describe the empirical and theoretical contribution of the research.

Sociomateriality and Its Influence on Management and/or Operational Control

A number of authors (D'Adderio, 2008; Howard-Grenville & Carlile, 2006; Leonardi, 2013a; Nicolini, Mengis, & Swan, 2012; Orlikowski, 2007) argue that looking at predominantly social interactions and focusing on social construction provides only partial understandings of organizational reality (Dechow & Mouritsen, 2005; Orlikowski, 2007, 2010a; Wagner et al., 2011). Thus, practice theory researchers in organizational studies, information systems and technology have developed an increasing interest in the role that material artefacts and technology play in organizational practices (Bijker, 2001; Carlile, 2002, 2004; de Vaujany & Mitev, 2013; Leonardi, 2011, 2012a, 2012b; Leonardi & Barley, 2008; Nicolini et al., 2012; Orlikowski, 2007, 2010b; Orlikowski & Scott, 2008).

In accounting research, efforts have also been made to recognize the role of material objects and technologies in understanding accounting control systems (Dechow & Mouritsen, 2005; Nama & Lowe, 2014; Quattrone & Hopper, 2005). For example, Dechow and Mouritsen (2005) incorporated the technological dimension (in the context of ERP systems) and its interactions with human actors and the way they affect each other in achieving integrated control practices in two case study organizations. They examined 'the connections that can be traced by exploring how actors are related to other actors of various kinds [such as technology] and swap competencies' (Dechow & Mouritsen, 2005, p. 696). They found that the 'infrastructure' of the technology matters as it 'force[d] other actors to take its categories seriously' in the effort of implementing and using the ERP system to provide integrated control practices, and that 'these effects of technology [...] have significant consequences for future approaches to technology mediated accounting research' (Dechow & Mouritsen, 2005, p. 730).

Control Practices and Materiality

Quattrone and Hopper (2005) examine the effects of an ERP system implementation in two subsidiaries of a multinational organization in terms of how information technology affected order, distance and control in the organizations. They found that as the actors employed different strategies in their implementation efforts, the configuration and usage of this ERP system was substantially different at Japanese and American subsidiaries. These differences significantly affected control arrangements between the head office and the subsidiary. It is important to appreciate that technology is flexible rather than fixed, where the same system can provide alternative but nevertheless effective control solutions across space and time.

Where material artefacts and technology have been examined in accounting research (often these studies use ANT, which treats management accounting controls [MACs] as technology), authors suggest that they basically only 'seek to explain order by looking at how entities ('actants') connect to each other [...] they do not rely on the idea of practice as a distinct ontological category' (Jørgensen & Messner, 2010, p. 186). Actor network theory studies have promoted the idea that material objects and technology may explain operational control practice phenomena in organizations. In a discussion of ANT studies and the role of technology in control systems, Justesen & Mouritsen (2011, p. 174) conclude that technology is precarious, flexible and fluid and 'move[s] management agendas in surprising ways'. They also remark that 'technology is not stable; it does not produce stable organizational practices' (Justesen & Mouritsen, 2011, p. 174).

Studies such as Dechow and Mouritsen (2005) and Quattrone and Hopper (2005) indicate that interactions between various actants may significantly explain work practices, such as how the configuration of controls affects the way they are exercised. The way in which the materiality of such technology/materials works and how the social reacts to this materiality remains unexplored. It is important that this question is explored in order to understand how practices emerge from the interactions and negotiations between the human and non-human (material/technology) to produce different practices in different contexts and at different times.

Recently, researchers from information systems studies (Leonardi, 2012a; Orlikowski, 2007, 2010a; Orlikowski & Scott, 2008) have suggested that in order to understand the organizational reality fully, one should theorize organizational practices (such as management accounting practices) as sociomaterial practices. Instead of looking at either humans or materials and technology separately, or giving primacy to either one, or just looking at materials and technology as mediating the work practice, they propose that the researchers should examine organizational reality from the relational ontological perspective, which means social, material and technology are constitutively entangled. The sociomateriality approach provides a different perspective for looking at MACs as 'it provides a way to understand how meanings and materialities are inextricably related and influence the form of (accounting) practice[s]' (Wagner et al., 2011, p. 183). Although similar to the argument made by ANT in terms of giving symmetrical importance to the human and non-human actors, the sociomateriality approach helps uncover the process in which control practices emerge from the entanglement between the two agencies (i.e. human/social and material/technological aspects of organizations) (Leonardi, 2011, 2012a) by opening the black-box of the entanglement process to show the 'what' and 'how' of these interactions.

Some research has sought to employ a sociomateriality approach in explaining practices and change (Wagner et al., 2011). Wagner et al. studied the changes in the ERP (re)configuration over a period of ten years resulting from particular assemblages between the users of the technology and the technology itself. However, though portraying the general idea of sociomateriality (i.e. control practices emerge from an entanglement of the social and material), the study has a macro focus and consequently does not seek to detail the capability of each agency and how one enables and/or constrains the other in the dynamics of the imbrication process. Therefore, the intersection points at which these agencies engage and the processes through which the (management) accounting and control practices emerge remain hidden and unexplained (Dechow & Mouritsen, 2005). In other words, the conclusion leaves us with the idea that the outcomes of the entanglements produce the specified practices but the process that produces these outcomes remains a 'black-box'.

Sociomaterial Practice and Imbrication

Leonardi (2012a, 2012b) argues that the material and social are entangled, but very little is known about how this intertwining occurs. Building on the work of Ciborra (2006), Sassen (2002) and Quinn (2014), he suggests that the metaphor of imbrication is a useful operationalization tool to explain the entanglement process. In picturing the imbrication metaphor, Leonardi frequently refers to the simple construction of an ancient and still used type of roof tile which comprises ‘tegula’ and ‘imbrex’ (two different shapes of tile) arranged in such a way that interlocking occurs, leading to waterproofing of the roof. He also makes use of several other images to try to clarify or provide metaphors for the imbrication process: the settlement of rocks in riverbeds offers a less-structured image than that of ancient roof tiles. Here Leonardi seeks to emphasize the idea of natural patterns rather than that of the outcome of human ingenuity. Both can be seen to show something of how imbrication comes to influence action.

Leonardi illustrates the imbrication idea with tiles, rocks or bricks that when arranged in certain ways create a pattern or structure whose outcome illustrates some kind of functionality, such as the waterproof roof, the riverbed or a wall. There are at least two distinct elements involved in this imbrication idea; the individual elements are arranged (or imbricated) in an interlocking or intertwined manner with each other; and second, the outcome of the arrangement forms some kind of pattern so that the structure performs a specific function. This metaphor can be related to the work practices in organizations: ‘referring to the image of the roof structure, the tegula and imbrex [the social and material agency] have distinct contours and through their imbrication they come to form an integrated organizational structure’ (Leonardi, 2011, 2012a, pp. 36–37; Taylor, 2001). Figure 1 (see also Leonardi, 2012b, p. 43) provides an illustration of the imbrication process.

Two distinct elements are involved in the imbrication process. This understanding differs from the notion of constitutive entanglement associated with Orlikowski and Scott (2008). The imbrication perspective argues that human and material agency has inherent capacity for action.

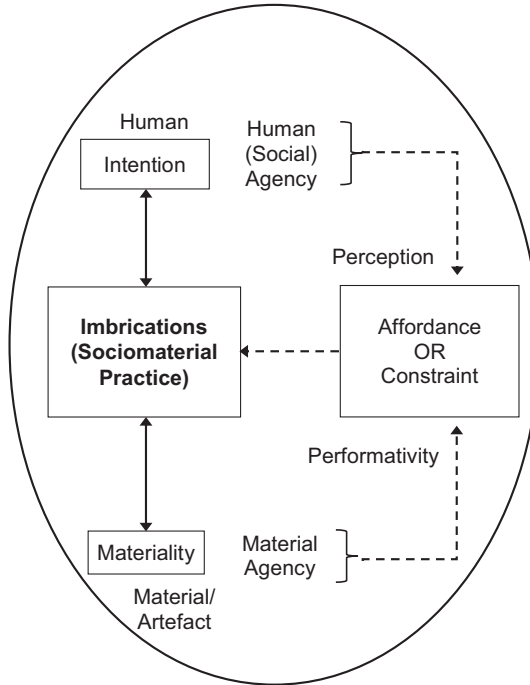


Fig. 1 Imbrication process (Authors' own, adapted from Leonardi, 2012b)

According to Leonardi (2012a, 2012b, see also Latour, 1987), social and material agencies have the capacity to act by themselves. Leonardi stresses that in examining the 'communication patterns and technology features ... [one would find that they] are made up of the same building blocks: social and material agencies' (Leonardi, 2012a, p. 45). This indicates that rather than the material and social being inherently interdependent and indeed inseparable, as suggested by the notion of constitutive entanglement, the imbrication concept holds that these two agencies are distinct, independent entities.

Figure 1 is intended to illustrate the imbrication process. It shows the way in which sociomaterial practices emerge from the interweaving of the human and material agencies (on the left side of the elliptical boundary, or context). The two inherently distinct elements with their own capacity for action, just like the tegula and imbrex, become entangled and emerge

as a sociomaterial practice. Human agency is expressed through its intentionality (that is, to form and achieve certain goal(s)), while the material expresses its agency through performativity (that is, the functionality that the material inherently has). The way in which humans decide on how to use the materiality of the material is based on the perception of affordance or constraint that the material can perform. This entanglement or imbrication of the two agencies happens in the space where the sociomaterial practice is enacted and forms a pattern that can be repeated and serves a specific function. We later use a modified version of Fig. 1 to help explain the empirics we present around an imbrication process affecting an operational control process we observed at the site.

Similarly to Pickering (1995), Leonardi (2012b, p. 35) defines human agency as the 'ability to form and realize one's goal'. He further says that human agency has 'intentionality [that is] formed in partial response to preconceptions of a technology's material agency' (Leonardi, 2012b, p. 42). This means that people exercise their ability to act by pursuing their goal in response to their perception of the material's agency or attributes.

Leonardi defines material agency as 'the capacity for nonhuman entities to act absent sustained human intervention' (Leonardi, 2012b, p. 35). This means that the non-human entity (i.e. the material or technology) has its own capacity for action without having to interact with humans. It is temporally constant over time and context. It is there and will be 'activated as humans approach technology with particular intentions and decide which elements of its materiality to use at a given time' (Leonardi, 2012b, p. 42). The material exercises its agency through its performativity, that is, 'through the things they do that users cannot completely or directly control' (Leonardi, 2012b, p. 36). For example, whether or not somebody is using it, a calculator has its own program which does not change. The calculator program performs its job to calculate a maths exercise when approached by a human who keys in the numbers. However, the human does not have control of how the programming works. Although the material's agency is activated by a human, the artefact (in this case the calculator) itself has its own performativity that is not controlled by a human. Therefore, Leonardi concludes, human agencies and material agencies 'represent capacity for action, but they differ

with respect to intentionality... [that is] even though social and material agencies might be equally important in shaping one's practice, they do so in qualitatively different ways' (Leonardi, 2012b, p.36). In explaining the manner in which human and material agencies become entangled, Leonardi (2011, 2012a, 2012b) employs the concepts of affordance and constraint.

The concept of affordance, introduced by Gibson (1986) in the field of ecological psychology, suggests that the affordance of material lies in the perceptions of users. He suggests that even though the material has its own properties, humans may interpret/perceive these properties and affordances differently according to the context. In contrast to Gibson, Norman (1999, 2013), who brought the concept of affordance to research on the design of technology, suggests that it is the job of the designer to make technology affordance obvious for the users to perceive and use (Faraj & Azad, 2012; Leonardi, 2011; Robey, Raymond, & Anderson, 2012). He suggests that affordance is built into the technology itself which is waiting for the users to engage with it and perceive its affordability. This is where he differs from Gibson's definition of affordance—they are similar in saying that affordance lies in agency, but while Gibson suggests that affordance lies in the perception of the user, Norman claims that it lies in the material itself.

For Hutchby (2001), affordance is seen as not being inherent in humans or material but emerging from the possibilities of action that users perceive the technology to have. In terms of the concept of affordance, Leonardi takes such a relational perspective where humans 'draw attention to the material [and/or technology] constraints on social action that cannot be removed through social interpretation' (Faraj & Azad, 2012; Leonardi, 2011; Robey et al., 2012, p. 222). Following this relational view, Leonardi argues that the perception of either affordances or constraints is constructed when people attempt to use such material to pursue their goal(s). As they approach the materiality of the material to achieve their objective, the perception of affordance (or constraint) is constructed and, based on that, imbrication will happen. Sociomaterial practice(s) emerge in the space in which human and material imbricate as a result of the perception of affordance or constrain.

Method and Case Setting

This chapter seeks to show the emergent nature of control practices that result from the interaction between control technologies and process workers. In this section, we introduce the case organization and describe how we went about obtaining our data and insights into the palm oil refinery production process.

Case Organization

The operations of this company (Golden Crop Co.) are carried out at several dispersed geographical locations. The head office is in the capital city of Kuala Lumpur. The production facility is located in the southern part of Malaysia, at Pasir Gudang, Johor, which, consists of the mid-stream and down-stream production facility (see Fig. 2 for an organization chart). In Fig. 2 we have highlighted the parts of the organization that are the focus of this chapter.

The refinery processes the Crude Palm Oil (CPO) to produce Refined Bleached Deodorized Palm Oil (RBDPO), Refined Bleached Palm Olein (Olein) and Refined Bleached Palm Stearin (Stearin). The finished products (Olein and Stearin) are stored before being packed into smaller packs and being transported to smaller storage facilities at depots across the country, or sold in bulk.

In total this production facility covers ten acres with approximately six being utilized for mid-stream activities (refining and fractionation plants), while the other four acres are for (down-stream) packing production and storing facilities.

Data Collection

The formal data collection procedure commenced in early June 2012 and lasted into September 2012. This was followed up by a further visit of two weeks in April 2014, mainly at the refinery. During the initial field work, time was spent at the company's head office, the distribution depots

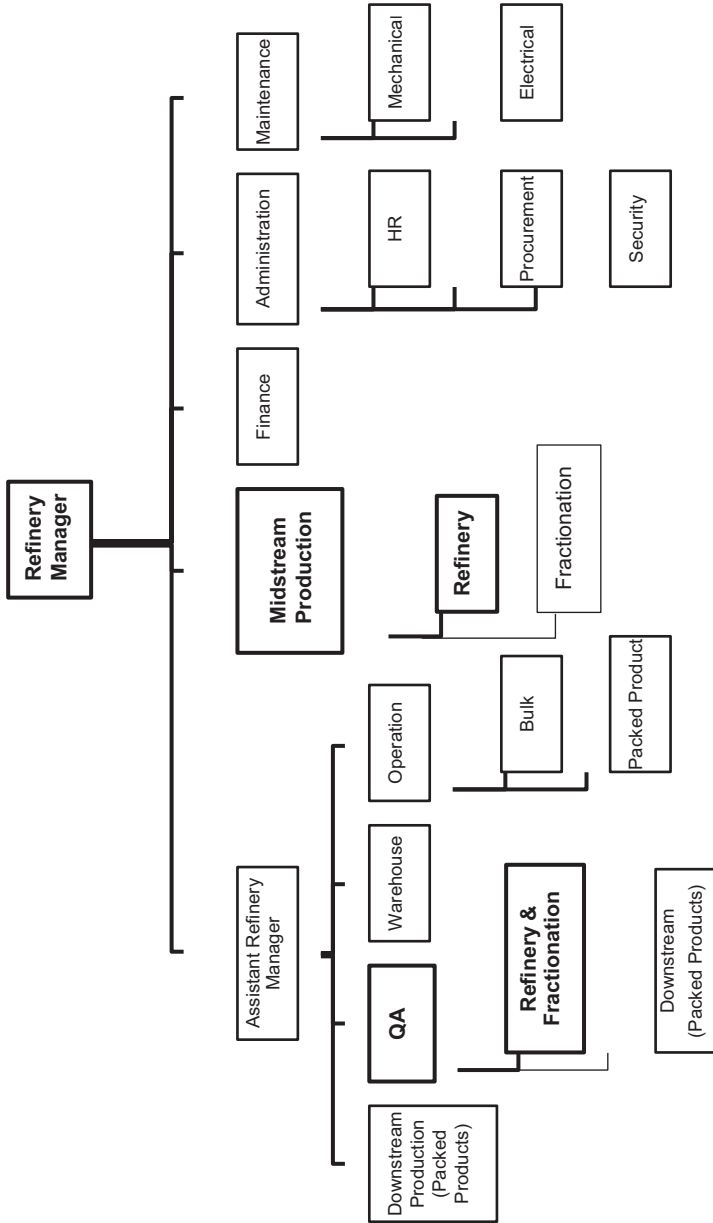


Fig. 2 Observation of organizational chart at Golden Crop Co. Refinery

plus several days observing at a budget and strategy retreat. The longest period, in excess of six weeks, was spent at the palm oil production facility which includes mid-stream (refinery and fractionation plants) and down-stream (packing plant) production. The data from the practices at the refinery will be the focus of this chapter. After the initial round of visits, observations, interviews and document identification, data were analysed to identify themes. While doing so, some further questions were raised which led to the arranging of a later visit to the refinery. This also provided the opportunity to identify any changes that had happened during the eighteen months between the first and second visits. Extensive data were collected during both visits.

Interviews and less formal conversations were conducted at multiple locations which included the head office, refinery and all depots. Interviews at the refinery were with plant operators and supervisors in various different sections. In addition, production executives, engineers, factory managers and other administrative executives were interviewed. A total of sixty-nine formal interviews were conducted out of which twenty-five interviews were at the refinery, sixteen at the depots and twenty-eight at the head office in the first round of data collection. A further ten interviews at the refineries were conducted during the second visit in 2014.

Data Analysis

In line with the interpretive philosophical stance and sociomateriality perspective employed in this research, the data analysis processes were designed with the aim of making sense of the interactions between actors (human and material) and the meaning attached to their everyday activities within the context (Ahrens & Chapman, 2006; Ahrens & Dent, 1998; Chua, 1986). A broad approach was taken to understanding and defining what constituted control practices in the day-to-day activities of the organization.

All interviews were recorded and transcribed. Both theoretical and empirical themes were identified by careful and repeated reading of the

interview data collected and field notes made. Recurrent themes related to operation process flow, quality issues and controls, and manual and electronic documentations processes. These themes and others were often repeated across interviews conducted at the refinery and at head office.

Control Practices in the Refinery: Bleaching and Filtration

The mid-stream processing of CPO consists of two steps. The first process is the refining process where CPO is processed into Refined Bleached Deodorized Palm Oil (RBDPO). The goal at this stage is to refine the CPO by removing the gums and impurities, bleach the reddish colour and deodorized the unpleasant smell of the oil. The second step is at the fractionation plant where the RBDPO will be fractionated into two elements, or products, namely Olein and Stearin.

In running these operations, there are several important concerns that the people involved have to consider which include maintaining the quality as required by the industry standard, achieving yield as targeted in the budget, as well as working within budgeted production costs. The day-to-day operational controls exercised in the production site mainly centred on these accounting and operational target figures in the annual budget as the management has to report the production performance (especially on the yield and production cost) on a monthly basis to head office. To strike a balance in achieving these multiple production goals, the production workers work closely with the laboratory staff who provides them with reports on the quality of raw material received as well as the on-going production and condition of oil in the production process.

The following sections provide an illustration of the imbrication processes observed at the refinery plant. The illustration describes the part of the process that has recently seen the implementation of a computerized Production Control System (PLC).

Affordance and Constraint: Changes in Control Practices

A key part of the production process in refining is the use of bleaching material (for colour removal) and filtration (to remove particulates). The main purpose of the bleaching plant is to trap gums and foreign particles and also bleach the CPO to produce lighter coloured oil. The CPO is allowed to flow to a vacuum bleacher tank for the bleaching process. There are various control measures for this stage but we will focus on a particular aspect of the plant as an illustration.

Bleaching earth is added or 'dosed' at an appropriate amount varying from 0.5 to 2.0 per cent per metric ton of oil depending on the quality of the CPO. At this stage, the mixture of oil, phosphoric acid and bleaching earth is called slurry oil. This slurry oil will be in the bleacher tank for approximately thirty minutes undergoing continuous agitation. The flow rate plays an important role, as it does in other parts of the refinery plant. The right setting of the flow rate will ensure the right amount of time needed to maintain the contact time between the oil and the bleaching earth will be able to capture all, or an optimal amount, of the gums, that also need to be removed. Besides monitoring the flow rate to control the oil going into the bleacher tank, the vacuum and oil level in the tank is also monitored. The operators set maximum and minimum levels and if the oil reaches the set level, the alarm will sound and the operators can take appropriate action. These settings influence the flow rate and the processing environment in the bleacher tank.

In addition to controlling the flow rate, the other important control at this bleaching stage is to monitor the dosage of bleaching earth dosed (the volume) into the bleacher tank. The PLC system allows the bleaching earth dosage to be set at a specific kilogram per oil volume. For example, the operator may set 1 kilogram of bleaching earth per every 1 metric ton (MT) of CPO. With this setting, the system should release the bleaching earth appropriately.

At the initial stages of implementation of the new automated control system (PLC), an incident occurred where although dosage readings provided by the system seemed to indicate settings were correct, results from

the lab, over a period of time, continuously showed an off-quality outcome. Other settings were checked (such as the vacuum level, flow rate, etc.) and everything appeared to be fine. Eventually, they contacted the supplier of the PLC, who advised that the sub-material dosing system was designed to show a reading to indicate that a batch has been dosed in accordance with required settings based on an automated valve mechanism, controlled by a human operator, opening for a set period of time. The PLC provided its reading based on a correct opening of the bleaching earth silo valve but was not measuring actual material flow into the tank. The control system simply senses how long the valve is open. Any blockage affecting the dosing machine is not sensed by the PLC system. Consequently, product quality is not achieved as anticipated. Two operators were present during the incident and were in agreement about the event and the outcome:

We still have to go and check the bleaching earth dosing physically [manually]. We do it [the checking rounds] every hour. Earlier, when we started using this plant [PLC system], we had this problem...the reading on the screen shows bleaching earth was dosed but the lab report (did not support this). We couldn't understand...and [eventually] called the supplier [who advised us about the way the PLC sensors operate to monitor]...the valve...not the physical bleaching earth [flowing from]...the silo. (Refinery Operator, Interview, PG035, 1 April 2014)

The PLC system records and then indicates on the PLC control screen the time the valve is open. The problem arose because the state of the bleaching earth can vary and cause it to flow poorly, or more slowly at times, which causes the dosing rate to be affected. The control system was not designed in a way to effectively measure the volume of bleaching earth physically fed into the bleaching tank.

This incident of a significant 'off-quality' [off-colour] outcome resulted in the operators realizing that the figures and settings in the PLC system and displayed on screen, could not always be relied upon. The materiality of the 'dosage detector' is seen, in this instance, as constraining the operators in achieving their goal. Thus, rather than relying on the information on the screen, they changed their routine by going to inspect the dosage

physically/manually at the bleaching earth silo. The work practices have evolved as perceptions of the affordances/constraints of the control system develop over time. The entanglement of human action and perception is constructed alongside understandings of the technology as the operators become increasingly familiar with the plant. In the context of this problem, control practices are changed and 'visual' inspection re-emerges as a required control action. So one aspect of the automated PLC system is seen to be a potential constraint in producing a quality product and operators return to earlier practices, pre-automation, to seek to achieve their goals.

We argue that our evidence demonstrates an imbrication process taking place as the operators and technology intertwine and perceptions of affordance/constraint emerge through the performativity of the dosing activity and the PLC screen. The practice of monitoring the bleaching earth dosage figure on the screen happens as the outcome of imbrication between an operator's objective and the performativity (in this case a failure) of the dosing reader. This is a clear illustration of control as socio-material practice whereby the practice of controlling emerges as the outcome of entanglement between the people (operators) and the technology/system (dosing reader) through the perception of affordance or constraint.

The chain of imbrications described above is conceptualized in Fig. 3. In this illustration, the operators and supervisors at the refinery were focused on the goal (intention) to process CPO to achieve the desired colour by mixing the specified amount of bleaching earth to reduce the oil colour, while the performativity of the PLC system materializes around how to 'calculate' the timing and opening of the valve so that the bleaching earth can be mixed into the oil.

In Fig. 3 the left ellipse indicates the initial imbrication process that happens between the operators and supervisors and the PLC system when the system was newly implemented at the plant. As the perception of affordance (towards the mechanism of the dosing reader) was constructed, the operators relied solely on the information provided on the screen to monitor that the bleaching earth was dosed accordingly. The act of controlling this measure by monitoring the report on the system's screen is the sociomaterial control practice that emerged as a result of

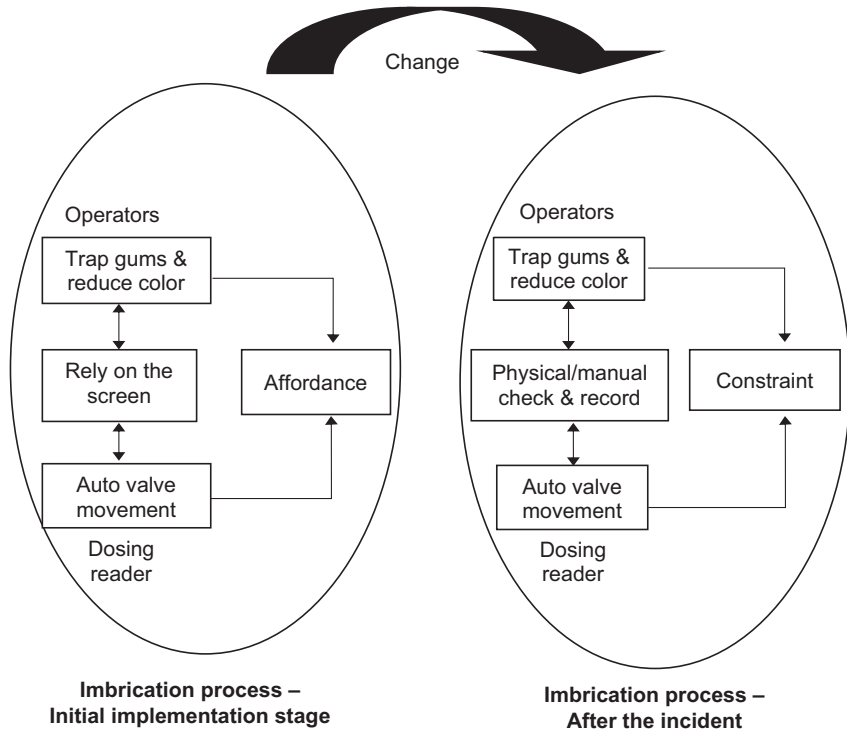


Fig. 3 Example of a chain of imbrications: control of bleaching earth dosage

perception of affordance towards the capacity of the PLC system by the operators and supervisors in achieving their intention (goal) of lightening the oil colour to achieve an outcome in the desired range.

After the incident took place, the operators started to manually check the dosing hopper at the tank (as indicated in the right ellipse of the imbrication process in Fig. 3). Having the same intention, but this time as they approach the system, new perceptions of constraint were constructed, and thus different control practices emerged, i.e. doing the manual check and perhaps engaging in a manual intervention or interventions instead of relying only on the screen report.

It is also important to note that the second imbrication depicted does not happen in isolation. It is influenced by the first imbrication—i.e. the

failure of the system to provide the operators with accurate information just by relying on the information on the screen. Here the control practices have developed/changed in an unanticipated manner. The work practices do not simply revert to earlier manual operations but become a mixture of the affordance provided by the PLC system interleaved with a modified control practice.

This is a small illustration within a complex automated production system where process controls vary and develop over time across the refinery. Some of this may be reflective of different workers who take a more or less conscientious approach. In other instances, like the one we describe, aspects of the PLC system offers alternative ways of working that the people begin to appreciate and take advantage of.

Differing Perceptions Among Workers and Work Groups: The Construction of Affordance and Constraint

In spite of the level of automation and the computer control environment, important elements of the production process rely on human judgement such as in the refining production process flow at the bleaching and filtration stage. One example is setting of the amount of bleaching earth to apply to each metric ton of oil processed. The dosage amount is decided based on the judgement of the operators and supervisor at the bleaching plant. This decision is based on the lab results of the incoming Bleached Palm Oil (BPO)—i.e. the output of the plant following filtration. The input quality of the Crude Palm Oil (CPO) changes the amount of bleaching earth usage and also requires evaluation. If the lab result shows the BPO colour is relatively dark (deeper colour) than the set target, more bleaching earth will be added and the flow rate will be reduced to maintain longer retention times in the bleaching process. This in turn will result in higher gum absorption and a lightening in oil colour. As highlighted earlier, this can be achieved by changing the PLC settings for a production batch which alters the dosing to reflect the new settings in the flow rate. The interview quote below shows how the reports from the

laboratory assist the operators and supervisors to make adjustments of materials usage into the system:

We actually run the production like blind people. We rely 100 per cent on the lab result to maneuver our production process. When we get results from the lab then only can we see what actions we can take. Let's say the lab test shows a good colour of 2.2—that's very good, right? Our target is 2.3 or 2.4. That means we don't need that much bleaching earth. From 10kg/MT maybe I can reduce to 9kg/MT and maybe I can also reduce the phosphoric acid usage. Some savings on cost can happen here. All this is based on the lab results. If the results show off-quality, then we maybe have to reduce the flow rate, increase bleaching earth and phosphoric acid and so on. (Refinery Supervisor, Interview, PG033, 20 June 2012)

Along with the monitoring measurement mentioned above (temperature, vacuum, sub-material dosage), operators will also intermittently look at the 'side glass' of the tank to check the steam sparging by observing the agitation of the oil. This manual activity is important to make sure that the bleaching earth is properly mixed with the oil and is able to capture the gums at an optimal level. This practice is more likely among the more-experienced operators who have worked in older semi-automated or fully manual refinery systems. The less-experienced operators, who have only been working at the plant since the PLC system was installed, tend to rely more heavily on the PLC system and the control screens. One of the supervisors notes that:

We old timers will check at the side-glass and make sure it is working okay and that the agitation of oil is good. But you know, all these new operators, they just sit in front of the monitor and control from there. If any indicator looks concerning, only then will they go down there and check it. I will... go and see for myself rather than 100 per cent relying on the indicator provided by the system. (Refinery Supervisor, Interview, PG014, 1 April 2014)

An observation side-glass is situated on the sparging tank where the operator will go and check the oil colour and level of agitation. The observation point should have become redundant following the installation of the new production line and implementation of the PLC system.

But this proved not to be the case, as operators went back to placing some reliance on the visual inspection of the BPO. Work practices are altered following imbrications with the technology and change again to reflect the new affordances on the PLC. The system failed and control practices are altered to ensure that the production process and oil quality are maintained.

This illustration (see also Fig. 4) shows that different operators with the same goals (i.e. to control the agitation of the oil to break and capture the particles), but differing experiences of the refinery plant and technology, may form alternative perceptions (of their operational context) as they engage with the system. They imbricate with the system differently.

Even though the information on the indicators is available on the monitor screen, the ‘old timers’ perhaps approach the system with the mentality of the old technology, with much less confidence (a perception more of constraint than positive affordance of the PLC) that the control system and plant are doing what is being recorded. The ‘closed system’ is meant to be controlled from the depiction of the processing displayed on

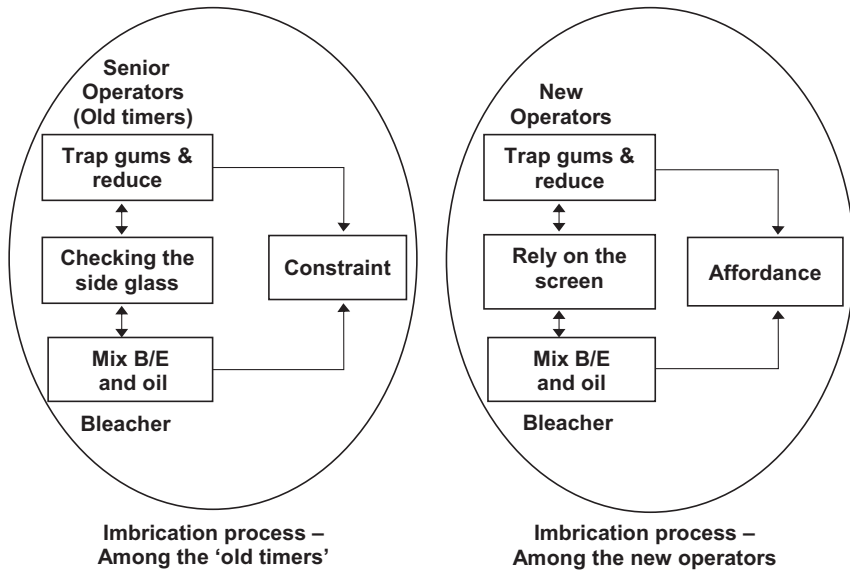


Fig. 4 Example of imbrication processes: the different perceptions of affordance vs. constraint

the monitoring screen. However, because of this perception of constraint, the more experienced operators/supervisors requested a light to be put at the side glass so that they could 'access' or look at the agitation of the oil in the vacuum system. Thus, this leads them to establish a routine of going round to see the agitation at the side glass once every few hours. Most of the new staff rely more heavily on the PLC system.

In this discrete illustration we can see that different perceptions are constructed as individuals try to use the technology. As different perceptions occur, the imbrication process happens differently for different operators. These changes are an example of how at the micro level, control processes are not stable across populations of workers but are likely to vary from one set of individuals to another. While there is a consistent focus on quality and oil colour, the set standards can be achieved in different ways possibly using: more or less bleaching earth; different processing times; degrees of reprocessing and/or missing with the prior batch of processed oil, etc.

Discussion: Control Practices and Imbrication

The above descriptions have shown aspects of the entanglement between the people and material artefacts at the production plant that influence control practices. Interactions continually take place between groups of people with different levels of engagement with the production control system and technology such as the PLC system. Many of these interactions are prompted by various reports such as those from the laboratory. These interactions reflect similar imbrications taking place at other sites (around the plant, laboratory or production planning office). The interactions impinge on other groups as they seek to adjust to the requirements of other actors.

Empirical Implications

Accounting and other performance targets trigger the intentions of people (in this case achieving the quality and yield target as well as production cost stipulated in the budget) as and when they engage with materials

and plant material within the refinery site. The imbrications between operators/supervisors with the raw material, production and control systems and other artefacts during production provide a way to align the output and quality of palm oil with both the accounting numbers and operational control targets.

An important point that emerges from the findings is how the human/social and material/technology have a distinct agential capacity for action. It is only through this engagement or the imbrication of the two agencies that control practices emerge and become more or less permanent or transient. Clear examples of this point can be seen from the descriptions of control practices at the refining plant where the PLC systems and the people have their individual capacity/performativity but only together are they able to effectively manage and control the balance between the conflicting objectives of quality, yield and cost of production. While the process is relatively highly automated, the production process and the raw material and processing ingredients are variable in nature. In the refinery context, this makes human intervention and oversight an essential element. We have tried here to describe some elements of the refinery process that show how the joint agency between human and material combines in these, at times, complex interactions.

It is also vital to note that each imbrication at any space or time cannot be seen in isolation. The effects of a prior imbrication may always influence what comes later and, in turn, present combinations of human and material agency will also influence the way future imbrications occur. As intentions are (re)formed, people approach the materials and other artefacts differently. As the two agencies come together, either a perception of affordance or constraint will be constructed and, based on the perception of affordance and constraint that they have in the ability of action of the material's agency, a certain kind of imbrication will occur with control and other work practices emerging from this socio-material imbroglio. An example of it is reflected from the change that happened in the control practices due to the 'off-quality' oil incident illustrated above. The way in which the imbrications and control practices plays out is based on the perception of affordance and constraint possible at particular times and in specific contexts but is influenced by previous imbrication(s). We can briefly point to more or less obvious changes affecting the production

process here. The changes in the cost or quality targets and standards which occur will feed through to disrupt current/past production practices. Less reprocessing may be desirable to meet cost targets and these changes will occasion production operatives and supervisors to change how they interact with the production process. The new production standards may be more or less easy to achieve, perhaps prompting more intervention from the laboratory and additional chemical testing. Changes in these variables inevitably impact operational standards and the balance of accepted boundaries around production and operational product targets. For production staff, and chemists, acceptable production quality, cost and output are seen in terms of ranges of outcomes for each variable. These will shift depending on the strategy around import/export quality, cost and production volume.

Theoretical Contribution

The underpinning framework of this research draws on a sociomaterial practice theory perspective that reflects a relational ontology in which both human and material agencies play a role in determining action. To reflect this ontological perspective, this research theorizes the work practices in the case organization, specifically the operational control practices, using the concept of imbrication advocated by Leonardi (2011, 2012a, 2012b; see also Kallinikos et al., 2012; Orlikowski & Scott, 2008; Orlikowski, 2010a, 2010b). This perspective provides a potentially powerful and interesting alternative lens for understanding control practices within a range of activities in organizations. Instead of attempting to understand the operational controls from either a 'purely' or largely social perspective or an interpretation based on a deterministic view of material/technology, the sociomaterial practice approach is able to unfold the entanglement of meanings and materiality that influence the way control practices emerge (Wagner et al., 2011). As will be described below, the concept employed has helped explain several aspects of our understanding of control practices and how these relate to other organizational work practices.

The imbrication process provides a tool to lift the veil of operational control practices to see how the social and material, which are the two

building blocks of organizational practices (such as the different shape of tiles ‘tegula’ and ‘imbrex’ whose arrangement forms a waterproof roof structure, see Leonardi, 2011, 2012a), become entangled and facilitate the dynamic development of control practices. In general, the sociomateriality perspective argues that, fundamentally, practices are constitutively composed through successive interactions among people and material agencies. Leaving either one of these elements out of an explanation of organizational practices will exacerbate the deficiencies in our understanding of organizational reality (Leonardi, 2012a, 2012b; Orlikowski, 2007; see also Wagner et al., 2011). This is similar to the point made by Wagner et al. (2011) and other MACs researchers employing ANT theory.

The findings also illustrate that operational control practices do not emerge independently of the other activities within the organization. Each of the MAC practices that emerge at a specific time and space are influenced by the previous events, solutions and problems that arise in the normal flow of production and control practices. Cumulatively, they form operational and management controls practices (Ferreira & Otley, 2009; Otley, 1999). This can be seen from the illustration of changes in the control practices before and after the problem of ‘off-quality’ oil occurred, as well as the different ways in which workers imbricate with the system due to the different backgrounds that they have with the automated/manual production system.

That being said, an important contribution revealed by this case study is that the modification of control practices is very much influenced by the affordance and/or constraint posed by the materiality that is relationally perceived by the people in each of the contexts (or functions) where (management) accounting as well as control practices are practised.

Conclusion

This research has examined how operational controls or, more generally, management controls are constituted. The descriptions of control practices, which draw on the empirical material collected during this research, indicate that the ‘practising’ of management control is the outcome of complex assemblages of human and material agencies. In the case com-

pany, these assemblages consist of various human plant operators and supervisors together with a number of artefacts such as the lab reports and objects of technology. These sociomaterial actors include the process equipment, automated and computer control systems, and the raw material that constitutes the work in process and eventually the processed product. All these non-human elements significantly influence the imbrication process.

Due to its naturally organic and fluid character, palm oil processing offers an inherently complex raw material production environment. The nature of the oil is continuously changing during processing. Thus the natural aspects of the product also come to influence actions and practices. The production process alters the crude palm oil through refining. These changes play a central role in orchestrating the actions and control practices which surround the stages of production and various laboratory interventions. This assemblage is apparent, at varying degrees of complexity and detail, in each of the control practices in the micro-organizational activities we describe and illustrate. At times, the activity of the operators is to the fore while at others it may be the product quality that is prompting the operators to consider particular actions. In other instances, the laboratory tests could be at the core of a new imbrication, or a change of direction in the refining or fractionation system.

The affordances and constraints offered by the bundle of materials (such as the PLC system, the various elements of the production plant and the raw materials) influence the way in which people engage and imbricate in applying controls and modifying practices. Each of the imbrications that happens at a specific time and location (such as at the production sites) is based on the capacity of both human and material agencies for action in the context that presents itself.

The constructs of affordance and constraint delineate the point of departure between the sociomaterial approach employed by Wagner et al. (2011) and this research. The framework of this research takes the view that although control practices (or work practices, for that matter) emerge from the entanglement of social/people and material/technology; they are still distinct and identifiable at the level of the individual actor whether human or material. The practices only emerge as the two agencies imbricate, and this happens, or is a response to, the perception of affordances

and/or constraints that are constructed as the agencies become entangled through action, or in action. The implication of this view is that a researcher who engages with practices in specific contexts could 'see' (by tracing the processes) how the two agencies imbricate in creating control practices in the setting or site (Schatzki, 2005). The imbrication process approach to explaining sociomateriality sensitizes the researcher to be aware of how entanglement acts to produce day-to-day activities and associated control practices (Leonardi, 2011, 2012a).

In line with the debate in the interpretive management accounting and control research literature, the findings of this research suggest that control practices are complex and inseparable from other organizational practices. It is through the continuous interactions, actions and discourse among the actors (human and non-human) within the organization that operational and other control practices emerge. They are shaped by the organizational context and, in turn, shape the organizational context and organizational practices (Ahrens & Chapman, 2007; Lowe & Jones, 2004; Nama & Lowe, 2014; Preston, Cooper, & Coombs, 1992). Much interpretive management accounting and control research has given primacy to the role of human/social agency in translating or determining operational control practices (i.e. controls are socially constructed). In contrast, this research, through the lens of sociomateriality, emphasizes that complex control systems are constituted just as much of social elements as they are of material (i.e. they are socio-materially constituted, see Dechow & Mouritsen, 2005; Lowe & Koh, 2007; Quattrone & Hopper, 2005; Wagner et al., 2011).

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How the Materialization of a Managerial Model Contributes to its Take Up: The Case of 'Liberating Management' in France

Patrick Gilbert, Nathalie Raulet-Croset,
and Ann-Charlotte Teglborg

Introduction

In a business context where there are increasing constraints on performance and where digital techniques are creating new opportunities at the same time as they are generating fresh risks, companies are looking for models of organization and management that are likely to satisfy their demands. Constantly on the look-out for managerial innovations, they are looking to borrow best practices from companies on which the media have focused, which raises the question of the way managerial models are disseminated.

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Today this issue still has an element of mystery. The most widespread approach among practitioners is to consider these models as movements of ideas whose dissemination depends on their strength and the rhetorical talent of their defenders. Some practitioners, who are generally favourable to the ideas in question, insist on the first point while others, who adopt a more critical position, highlight the second. The academic literature does not move too far from this dual vision yet proposes rather more subtle analyses, for example, by mobilizing the theory of the diffusion of innovations (Rogers, 1962) or the theory of management fashion (Abrahamson, 1996; Midler, 1986).

The theory of the diffusion of innovations stresses the ideas and factors that influence the degree to which they are adopted by individuals. The approach of management fashion is firmly centred on the human actors and their discourse. The aim of this chapter is not to develop these contributions further, nor to reject them, but rather to propose a complement via the sociomaterial approach, which underlines the role played by ideas that are inscribed in a material form.

There is long-standing interest in managerial techniques and their effects on the behaviour of organizational actors. This research analyses, from different perspectives, the non-neutrality of managerial tools in organizations. Following Berry (1983), several authors have shown that managerial tools create an 'invisible technology' or a 'management engine' (Girin, 1983) that structures or determines human behaviours. They have shown that managerial techniques may influence human action by bypassing their original objective, developing an 'agency' effect (Chiapello & Gilbert, 2016). If their writings have stressed the underlying rationalities of the tools, they have not focused specifically on the consequences of their materiality (de Vaujany, Hussenot, & Chanlat, 2016).

We propose to explore the hypothesis that the materiality of management tools amplifies their agency, as it leads to combining the determining effect of the tool, and the strength relative to its materiality. In fact, materiality induces 'shaping' in the sense of Thévenot's (1985) *mise en forme*, often accompanied by irreversibility effects (Callon, 1991). From that perspective, we propose to analyse the progressive materialization of a management model, which is constituted from an

innovative practice through a set of material elements that ‘solidify’ it (Bayart, 1995), and more particularly ‘solidify’ the articulation between its different proposals.

To analyse this solidification, we focus on socio-material assemblages (Orlikowski, 2007) and use the concept of the *dispositif*, defined as a heterogeneous ensemble of material and discursive elements (discourses, institutions, architectural layouts, rules, etc.). We show that the management model gradually takes the form of a formalized *dispositif*. We focus on the *dispositif*'s materiality, and explore to what extent this materiality influences the transposition of the *dispositif* in the new context.

Our chapter develops three cases. The first is Favi, a firm that has developed and gradually mobilized a management model, and is considered an emblematic case representing ‘liberating management’ in France; the other cases are Poulton and Chrono Flex, whose management models are explicitly inspired by Favi.

We analyse the extent to which the materialization of the original management model has contributed and orientated its transfer from one firm to the other.

The chapter is organized as follows. First, as a theoretical framework, we propose a conceptualization of the managerial model as a *dispositif* (Foucault, 2001). Second, we explain the model of the liberated company based on our analysis of the three companies studied. We then explain our empirical results showing how the materialization of a model within a leading company (Favi), as it becomes more solid, favours its implementation in other companies. We end with a discussion of our analysis.

The Managerial Model and its Materialization

Between the Ideal and the Material

We define an organizational and managerial model based on the definition given by Veltz and Zarifian (1993) which conceive organizations as a specific articulation of the technical, social and economic dimensions of

a production universe. According to these authors, the idea behind this model refers to 'a group of framing principles materialized in forms as diverse as instruction manuals, accounting systems, action reflexes, flow charts, etc. [that] end up dominating the scene over a given periods and becoming a reference point' (Veltz & Zarifian, 1993, p. 6).

It is currently thought that a model is by nature abstract and remains somewhat ideal. We propose that during its existence it materializes and becomes somewhat material. This solidification is necessary for the propagation of the ideas it carries. This passage from the ideal to the material highlights the specific elements of the model. This was illustrated by Bayart's (1995) case of the statistical theory of control cards. Bayart showed that the objects that materialize this theory, for example, graphic cards, highlight certain properties of the theory, making it easily manipulated and enabling it to intervene with the real. In the same order of ideas, we speculate about the effect of the materialization of a managerial model on its diffusion.

An Approach Using the Notion of *Dispositif*

To work on the materialization of a managerial model, we propose examining it as if it were a *dispositif*. Our hypothesis is that the materialization of a managerial model is realized by using a *dispositif*, which besides rules and discourses, brings together structures, management tools, formalized written notices and methods in an articulation that encourages diffusion. Thinking of a managerial model as a *dispositif* means taking an interest in the importance of this articulation between its various elements, both those that preceded the founding ideas of the model and those that arise from materialized elements.

Indeed, for Foucault, a *dispositif* is a heterogeneous ensemble of material and discursive elements (discourses, institutions, architectural layouts, rules, etc.). 'The *dispositif* itself is the network between these elements' (Foucault, 2001, p. 299). Taking inspiration from Foucault, Actor Network Theory (ANT) researchers (Callon, 1986; Latour, 1987; Law & Hassard, 1999) have developed the notion of the *dispositif*, defining it as an action programme coordinating an ensemble of complementary roles played by non-human and human actors.

The existence of these connections and complementarities bestows complexity on the *dispositif*, which can ultimately evolve in different ways and sometimes take unexpected directions. Because of this, as the materialization solidifies connections it also inevitably reduces the possibilities for the unexpected development of a *dispositif*(agency). For some, these may remain flexible. However, suppose that one of the elements in a *dispositif* meets with resistance in a context; if the connections are firmly solidified, the *dispositif* could show resistance. In fact, *dispositifs* in management can, like all human beings, resist change (Teglborg, Gilbert, & Raulet-Croset, 2015).

The materialization of the model therefore depends on the elements that constitute it (its internal structure) and at the same time on the way they are interlinked (its functioning). The dissemination is both allowed and limited by materialization, which makes the model more concrete and more approachable and simultaneously resistant to over-radial attempts at transformation.

Analysing a Managerial Model

As with any management tool, a management model can be read in three ways (Chiapello & Gilbert, 2013):

- structurally, aiming at making an inventory of the elements of the managerial model, and what constitutes it, its apparent structure;
- functionally, in terms of agency, which allows us to see how ‘solidified ideas’ produce their effects;
- procedurally, which shows how, through its dissemination, the model builds and updates itself in local use.

Hatchuel and Weil (1992) have identified three elements in interaction in what they call ‘managerial techniques’: a technical sublayer, a management philosophy and a simplified vision of organizational relations. This structural reading relates to the anatomy of the model. It is completed by the functional reading, which supposes that a managerial model has implicit functions that express management philosophy and the simplified vision of organizational relations underpinned by the sublayer. Here it is a question of the agency of management tools expressed through the combination of the three combined functions (see Table 1).

Table 1 The agency of managerial models

(1) Epistemic function	Managerial models are the bearers of a vision of the world that they produce and reproduce. They propose/impose their knowledge on humans.
(2) Pragmatic function	By facilitating and constricting, managerial models equip action; in return they form the norms, frameworks, direction and orientation of activities.
(3) Political function	Managerial models intervene in relational influence between individuals.

Authors' own, adapted from Chiapello and Gilbert (2016)

The procedural approach articulates the two previous functions and is concerned with the genealogy of the managerial model, the way it is created and how it develops over time. It shows that if materialization is the result of human choice, it creates irreversibility little by little as the model solidifies and acquires its own mode of existence.

It is this analytical framework that inspired our study of the model of the liberated company and which we take as the point of application in our analysis.

Presentation of the Liberated Company: Specificities of the Organizational and Managerial Model

The Liberated Company in Managerial Texts

Is the movement of 'liberated companies' part of a specific organizational and managerial model? A growing number of French businesses claim they belong to it. It has enjoyed growing media coverage in France since 2012 and the publication of Getz and Carney's *Liberté et Cie* (Getz & Carney, 2012), about companies that claim to belong to this movement. In France, Favi has been a kind of precursor and Jean-Francois Zobrist, the creator of the 'Favi model' describes it as articulating a mode of production and innovation that targets human and social relations within the organization. The social dimension of the model is particularly highlighted and it orients the way production is organized. Zobrist

frequently refers to McGregor's Theory Y, a conception of management centred on employees' engaged vision (enjoying their work, seeking responsibilities, creative and self-managing); this leads to a form of management founded on participation in the goals, challenges and delegation of responsibility. Those who promote this model insist on the notion of freedom in management. A precursor, Tom Peters, published an appeal in *Liberating Management: Necessary disorganization for the nanosecond nineties* (1992). In 2009, Getz proposed the formula 'liberated company', 'freedom form' or 'F-form organizations' based on a study of eighteen companies, three of which were French. This was about 'organizational forms in which employees have complete freedom and responsibility to take actions that they, not their bosses, decide are best' (Getz, 2009, p. 34).

In the liberated company the chief mission of the manager is to remove the characteristics of the classic hierarchical organization and create a work environment that encourages the freedom to act, based on the intrinsic equality between individuals and favouring self-motivation.

Returning to the definition of the organizational and managerial model, it seems that these companies are seeking to formulate a response to social expectations (democracy, liberty, autonomy, generations Y and Z) with technical and economic developments. At first, this model was focused on a kind of 'management philosophy' (Hatchuel & Weil, 1992), based on a vision of people at work, their motivation and their power relations within the organization.

The model might simply remain theoretical but its implementation implies it is taking shape, a solidification that will simultaneously 'fix' it in a certain meaning and then orientate its dissemination, as we shall show.

Three 'Liberated' Companies

Our research is based on the analysis of three cases—Favi, Poult and Chronoflex—whose directors say they were inspired by reading authors such as Hamel (2011), Getz and Carney (2012), or Peters (1992). Favi is a kind of founding model for the other two whose directors state explic-

Table 2 Enquiry into liberated companies

The enquiry was carried out at two levels: the micro level of the three companies, considered individually, and the macro level of the liberated companies' movement.

At the micro level, the data collection took place over five days of observation, on three sites, through a series of interviews (forty-four individuals, four focus groups) as well as an extensive documentary analysis (internal documents, press articles, websites and videos).

To complete this analysis at the macro level, we also took part in meetings held by different think tanks on managerial innovations where these were discussed and we attended presentations made by liberated companies in different contexts. Finally, we put together a collection of documents with the aim of analysing the movement (books, academic and professional press articles, blogs, videos, etc.).

itly that they were inspired by Favi's example. For each of these cases we carried out a series of interviews, collected documents and made observations within the companies (see Table 2).

Favi, the first company we analysed, is seen in France as the initiator of the model. We start by analysing the 'shaping' that it progressively built up on the basis of its initial ideas. We then turn to the transposition of the model into Poulst and Chronoflex.

Favi, the Initiator of the Model: Constructing the Model

Favi is a French die-casting pressure company specializing in copper alloys. Favi's work system is based on a series of mini-factories dedicated to specific clients. This work organization has been gradually rolled out over a period of twenty-five years and has been progressively enriched by many incremental work organization innovations and a well-developed, employee-driven innovation approach.

The story of the transformation of Favi into a liberated company began in 1986 when Jean-Francois Zobrist was appointed Chief Executive Officer(CEO). He had a specific vision for the future of the company. On arrival, he considered that the structure was not reactive and even paralyzing. For example, the sales agents, the only organizational actors in contact with the clients, had to wait for weeks for a response

from the research office to know whether it would be possible to answer a client's request. Zobrist thought that this traditional organization, with a technical director, workshop supervisors, team leaders, workers and support departments was too centred on the internal functioning of the company. However, his desire to develop the company had a favourable context. In 1989 a commercial opportunity came up: Peugeot decided to order gearbox parts, which represented 20 per cent of company turnover at the time. The immediate question was how this growth would be handled.

The new director was convinced that success for Favi would depend on what he defined as the liberation and intelligence of the terrain, the territorial roots and listening to the customer. So, he proposed to define Favi's ambition as the desire to do 'always more, better for less, for the love for our clients, in Hallencourt, respecting the land of our children'. This ambition relied on the cooperation of young staff members who supported this vision.

The first materialization was the creation of mini-factories and the suppression of hierarchical levels. It was decided to create an autonomous unit of about twenty-five people for the manufacture of the gearbox parts in order that Peugeot's interests could be focused on without disturbing the rest of Favi's production. Over the next few years this model was reproduced and new mini-factories were set up as new contracts were won. Each mini-factory had a dedicated team of 20–35 operators led by a former operator (coopted by his or her peers), a director, and a marketing director, who was the customer's sole and special contact. Clocking on and off and similar controls were deemed inappropriate for the newly autonomous operators; the organizational structure was flattened and Favi now had only two hierarchical levels, the factory director and the leaders of the mini-factories.

Subsequent materializations followed with different innovations and customers' entry into the organization. Innovation was equally part of the new dynamics of the company, which combined a series of product innovations with a novel management system based on mini-factories dedicated to specific customers. This organizational innovation was rolled out incrementally from the end of the 1980s. Clients became increasingly key figures with a structural role in the company's organization.

Today the new CEO, Dominique Verlant (DV), is continuing with this model, and has the support of the social body at Favi, where he started his career.

Poult—Moving Towards ‘Total Innovation’

Present in many countries in Europe and Africa, the Poult group is a leading producer of own-brand biscuits for large and medium-sized supermarkets, hypermarkets and hard discount stores. The biscuit firm is recognized as one of the most innovative French companies in terms of management, a kind of laboratory of the hyper-modern company.

- Introducing a model based on innovative devices

In 2006, the future of a factory in the Poult group, located in Montauban in southern France, was threatened by negative operating results. Instead of initiating a new series of redundancies, the CEO, Carlos Verkaren (CV), decided to undertake a root and branch transformation of Poult. For him ‘innovation is the only long-lasting competitive advantage’ and that comes about through what he calls ‘total innovation’, the combination of strategic innovation (creation of a new business model), product, managerial and process innovation. To make Poult an innovative business CV committed the company to major changes, carrying out a managerial and organizational transformation. The adventure began in 2006 with the Cap’Org project, dedicated to transforming the Montauban factory. The new approach spread to the Poult head office in Toulouse and other industrial sites.

CV was interested in the management of innovative companies, particularly through what he knew of experiments at Favi, in France, Gore and associates, Google and Pixar in the United States as well as Semco in Brazil, run by the charismatic Ricardo Semler (1989) with no managers. He was very attentive to the democratization of companies and was inspired by Hamel’s (2012) work on the importance on igniting passion by federating teams around values and an ideology.

- Management rules and new decision-making

CV was also inspired by Getz and Carney (2012), who invited directors to liberate their companies, and Naya (2011) whose watchword was

‘the workers first and foremost’. As a result, he developed strong convictions that encouraged him to reject the classic company. ‘Neo-Taylorist systems (hyper competition, control of information, etc.) are no longer suited to our world, no more than liberal hyper capitalism’, CV declared in a press interview. Similarly he rejected management styles that infantilize personnel: ‘Often, when staff come through the door they are greatly infantilized and subsequently there is not much enthusiasm. How can we create this enthusiasm?’ His ambition is to create ‘a kind of island’ and to ‘open the door to a little democracy, liberty and desire in the company’. He explained:

...all the very concrete things that you do in classic management to manage the organization. You make a list and with that list you have two pages. We took that and we put it in the waste bin and we said, OK we’re going to do things differently. How we recruit, how we decide, how we fire people, how we draw up budgets, how to make plans. All the decisions that you take daily, about the good conduct of business, I was going to say, we’ve listed them all and we threw them in the bin and we said, now, we’re going to do things differently. (Carlos Verkaren, CEO Poult, Interview, 11 July 2014)

- The suppression of hierarchical levels and the promotion of autonomy

With the Cap’Org project, the Montauban factory dropped from four levels of hierarchy to two. Several directors’ positions, including Human Resources (HR) and production, were abolished as were some line managers’ posts. From then on, the factory was under the supervision of a director (site leader) and was organized in four autonomous units comprising 65–120 employees. The autonomous units are organized around different types of biscuits that require particular technologies:

...filled biscuits, tartlets, cake containers and chocolate-covered biscuits. Within each unit there are two or three production lines that can make varieties of each kind of biscuit... [B]ut we completely changed the organization. What I mean is that today we are no longer organized in departments but in transversal teams, families of products. (Carlos Verkaren, CEO Poult, Interview, 11 July 2014)

Each unit works on two- or three-shift systems and is headed by a production animator. The aim is for each unit to function in autonomy and to get all the employees involved in the responsibility for cobuilding the future of the factory. Besides the classic operators, each unit includes three experts (maintenance, quality and process innovation), two technicians (progress, maintenance) and OPACs (*opérateurs à compétences*, or skilled operators). The management of quality, maintenance, planning, lighting the ovens and leading the teams, tasks that used to be carried out by the line managers, are now the responsibility of the OPACs. The role of the OPAC was suggested during Cap'Org working meetings: 'People said it would be a good thing if there were operators responsible for the quality, maintenance and so on within each unit, that it would be better because they are people from the shop floor who know the problems of the production line,' said a union official.

Chrono Flex: Putting Confidence at the Centre

- An innovating company that experienced a crisis

Chrono Flex defines itself as the emergency service for hydraulic hoses. Under the leadership of its CEO Alexandre Gérard (AG), this Nantes-based Small and Medium-sized Enterprise (SME) provides a 24/7 maintenance service to any company that uses hydraulic equipment. Hydraulic hoses are indispensable for the operation of many types of machines and vehicles used in the construction industry, transport and agriculture. The company was started in 1995 by three construction entrepreneurs who were regularly faced with the problem of broken hydraulic hoses on diggers and nacelles, which caused stoppages on costly building sites. Today, Chrono Flex carries out 75,000 interventions each year in France with 10,000 customers in all sectors using hydraulics. Its main clients are construction companies, builders, companies that operate lifting and handling equipment (thermal and electric forklift trucks, aerial platforms and cranes), companies in the rail and maritime transport businesses, industry

(steelworks, platurgy, boiler-making, agri-foodstuffs), the agricultural sector and waste management. Today the company employs 200 technical sales representatives who intervene to carry out repairs.

This service, which has enabled the global costs of a hose breakage to be halved, is based on a process that relies on two innovations: highly specified intervention vehicles and a computer system that integrates geo-tracking—the real spinal column of the concept' (AG)—because this enables a high degree of reactivity. Since its creation the company has grown strongly. However, in 2008 it underwent a crisis following the global banking and financial crisis and this caused a marked loss of clients and seriously weakened the company.

- New rules to put confidence and initiative at the core

Given this context, to create a new energy in the company the directors drew up a new managerial model, which they developed from 2010. They were directly inspired by the example of Favi, having attended talks given by Zobrist, and having read Getz and Carney (2012). Having studied Favi, AG explained that he became aware of two managerial stumbling blocks. Thus far, his management had not had confidence in their coworkers or recognized their ability to take initiatives and make decisions.

Most company relegations are made for the 3 per cent of employees who break the rules (theft, damage). I was managing the company for those who didn't respect the company regulations. Those who put a bit of pro diesel in their private cars, for example [...]. That sent a message to the other 97 per cent that I didn't trust them [...]. Little by little these rules were neutralizing any initiatives. What's more, decision-making was strictly reserved to the management. Before, I just used one brain—mine—to take decisions. Now I use 300 and things are better. (Alexandre Gérard, CEO Chrono Flex, Interview, 14 August 2015)

- The suppression of hierarchical levels and mobilization of collaborative spaces

An important structural reform was also implemented. The three regional directors were replaced by 'speed boat captains', coopted for

three years; the CEO was installed among the personnel in an open-plan office while titles and signs of status were removed everywhere. The structure now includes three hierarchical levels, described by AG as follows:

First of all are the most important, the 290 crewmembers, those who do the job, then come the forty-five team leaders (including thirty captains), who are at the service of the crews, and finally there are four members of Team Inov-On who lead the group. (Alexandre Gérard, CEO Chrono Flex, Interview, 14 August 2015)

Each team is led by a ‘captain’ while volunteer technicians take on the roles of ‘four specialists’: ‘Mr Security’, ‘Mr Recruitment’, ‘Mr Marketing’ and ‘Mr Competition’.

Empirical Results

In this section, we present the main results according to our analysis grid of the managerial model:

- a structural reading in which we examine the characteristics of the model;
- a functional reading showing how agency effects support the model;
- a procedural reading that summarizes the way in which materialization occurs.

Elements of the Favi System Copied by the Other Companies

The following elements constitute both the central characteristics of the Favi experience and also the model that inspired Poult and Chrono Flex:

- the reduction in hierarchical levels (from five to two);
- the reintegration, within the basic operational teams of a group, of tasks that had previously been scattered among functional departments (quality control, maintenance, HR, etc.);

- the substantial diminution of hierarchical control and the suppression of a hierarchical authority structure in favor of a hierarchy of competences;
- the creation of spaces for negotiation (mini-factories) where the focus was on production, quality, organization and work conditions;
- the decentralization of operational decisions;
- all operational activities linked to the purpose of the company through concern for quality and customer service;
- a strong culture, formalized and spread throughout the company (the Favi system).

However, as we shall see in the procedural analysis below, the materialization of these principles took different forms in the different companies. These elements, which are easily observed, are held together only by the agency of the model.

The Agency of the Model of Liberated Companies

The Epistemic Model: A New Vision of Relations at Work and in the Company

The heterogeneous elements that structure the model are articulated around a vision of an organizational world, values that include the conception of people at work (based on ‘goodness’, creative liberty and the search for happiness at work through autonomy) and a search for ‘freedom’ or ‘democracy’ (each company stressing one or other of these terms).

These principles of life at work are associated with managerial principles (autonomy, few rules or formal means of control; smaller, autonomous units; functional skills that become transversal) and a different concept of the manager. The new leaders are coopted by their peers and adopt a new management role. These ‘theoretical’ models are found in the three companies analysed. In each case, we find that at the basis is an idea of the nature of human beings, linked to principles of autonomy and increased responsibility that are translated in terms of struc-

ture by the suppression of signs of traditional hierarchy. In parallel, the companies are characterized by the encouragement of innovation (product, service, managerial), encouragement of individual and collective apprenticeship and the recognition of initiatives. This goes hand-in-hand with another conception of management power, based on the directors standing back.

The adoption of these new ways of working is not limited to meeting the goals of economic performance. It integrates a social dimension, according to the CEOs of the three companies studied: for Favi it is 'the livelihood of 200 families at Hallencourt', for Poult, 'Reenchanting the company world' and for Chrono Flex, 'companies contributing to social refoundation'.

A Pragmatic Function: Redistribution of Payments and Forms of Recognition

The liberated companies model does not just influence ideas, or convey knowledge gained from the experiences at Favi and the companies Favi inspired. It also has concrete effects through which it standardizes and frames managerial action. It prompts protagonists to make certain choices.

At Favi, the emphasis on teamwork has led to the disappearance of individual bonuses and a loosening of control, with the removal of time-clocks and timekeeping. For example, a mini-factory leader who did not think he was sufficiently innovative asked his own manager if he could leave that role to devote himself to a task where he thought he could contribute more. Jean-Francois Zobrist tells of how on her own initiative, Christine, a cleaning lady, took one of the company cars to go and fetch an important client who was arriving late at night at Roissy airport (a round trip of about 300 kilometres).

This attempt at structuring is accompanied by an effect of selection/distribution of company assets and advantages: deserving employees are honoured publicly. The CEO of Poult tells of how, at Montauban, 'an excellent colleague, Véronique, developed a product that is a tart base (and we called it "Vero's tart")'.

A Political Function: Redefinition of Relations of Influence

From the point of view of its political function, the model of the liberated company contributes to the redefinition of methods of control and influence between social actors, according to various modalities. In every case we observe both the reinforcement and the obliteration of managers in direct contact with the operational structures with which they leading the change. Work collectives also take on different forms and contribute to the redefinition of relations of influence.

- A new relation to hierarchy

A new relation to hierarchy develops and can differ from one company to another. At Poult, it is considered that there is less hierarchy than at Favi:

Apparently it's more hierarchical at Favi, they have a factory director, a director of production and also leaders and loads of little units, which means that the leader manages about twenty people. But, today, there are some here who manage 120 people. (Poult Process Expert, Interview, 12 July 2014)

A process expert of Poult explained this when comparing his company with Favi:

This management, it comes from Favi. But we don't do the same jobs, us, we move around a lot, yes, things really move, the biscuit process moves a lot, we do lots of stuff for things whereas at Favi apparently, they make mechanical pieces for a week or for a day, or two whole days they make gear boxes. Here with us, it's the dough-making process and that is always on the move. When you've got flour arriving that is less...how shall I put it? You have a hard time, it never stops raining or else it's too hot, really, and they compare themselves with us, and we say 'Don't compare Favi, which makes gear boxes for Volkswagen, let's say for one or two days, and us, because it's different.' We have manual payments, we have batches, well, we have everything, you know, it's totally different. (Poult Process Expert, Interview, 12 July 2014)

At Chrono Flex, the team leaders who are substitutes for the executives have lost their traditional authority in favour of roles as administrators, translators of the strategic vision on a daily basis and bearers of the company's values. Auto-control and mutual adjustment have replaced hierarchical supervision. The boss likes to use the familiar 'tu' form of address and is broadly in favour of the removal of any sign that marks a difference in status.

- A new role for the manager

A considerable amount of reflection takes place in different companies about the position and the role of the manager. Leaders of the liberated companies we studied have refocused their actions on preparing the future and creating a work environment that is the most suitable for employees. At Poul:

In fact, I believe that the role of executive managers, if you like, is mainly to think about what the company will be like in five or ten years' time. That's their role. It's to give direction. It's not to control what their neighbour is doing. On the contrary it's to give them freedom, create the environment, and create the context so that their coworkers will give their best in fact. That's the role of the executive manager and as for the rest, they have to be outside because if they don't take part actively in the definition and the implementation of what the firm will be like in five or ten years, then what use are they? (Carlos Verkaren, CEO Poul, Interview, 11 July 2014)

At Chrono Flex, the role of the manager is defined as:

[I]t's our role to do the job, to accompany the captains, to help them acquire skills, to help the support teams such as the operating advisers acquire skills or to help anyone who is supposed to accompany the teams, and then to interview that person and try to understand what's happening at that point in time and from a structural point of view, and then to try to find answers together... We should not intervene if they don't need us, our aim is not to give answers, but they should find the solutions on their own. (a Member of Team Innov, Chrono Flex, Interview, 4 June 2015)

Similarly, there is reflection about the role and position of the captain: ‘The difficulty for the captains is finding the right position...Because there are connotations of freedom in everything they want to do, and that’s not what it’s about. It’s about becoming responsible.’ (Member of Team Innov, Chrono Flex, Interview, 4 June 2015)

- The Nature and Justification of Work Collectives

Poult is very centred on innovation and has a strong marketing culture. It is not the production unit that constitutes the basic operating team but the family of products, which includes the marketing, commercial and production teams, all of which are involved in a specific product type, for example, tartlets or filled biscuits.

At Chrono Flex the specificity of their activity is such that the ‘captains’ are most often on site behind the wheel of their vehicle and thus often isolated. Because of this, thinking about the collective is deemed crucial by managers: ‘The collective takes precedence over the individual’. The changes in rules ‘aim to put the emphasis on the collective part’ (Member of Team Innov, Chrono Flex, Interview, 4 June 2015).

A Progressive and Contingent Materialization

A Double Movement: From the Material to the Ideal and Vice-Versa

We reconstitute the model’s materialization process, from the first managerial practices that emerged at Favi, breaking with the preceding coordination mode, to the transposition of the model at Poult. The model is transposed in an articulated way, as the different investments in shaping (Thévenot, 1985) have solidified the articulation between the different proposals of the model (informal relationships, horizontal links between members, incentives for innovation and initiative-taking, reward system, etc.), which have been created over a long period of time.

Thus, in the case of Favi, in the empirical section we have shown that the model was built progressively by associating blocks that materialize the underlying philosophy. A first phase of materialization consisted in the creation of autonomous mini-factories and the removal of hierarchical levels; a second phase followed with the setting up of devices for innovation and different ways of associating the client with the functioning of the organization.

The Favi model, which has developed progressively, has attained a kind of coherence and materializes the philosophy of the model in a particular way. It therefore remains to be seen how the underpinning theory can intervene in the real. The different devices progressively set up by Favi (remember that this happened over a period of thirty years) have contributed to creating and disseminating a specific managerial philosophy while they have also given it a visible shape and materialized it. So, it seems to us that there is a double movement. On the one hand, this materialization makes the theory visible and so contributes to its dissemination; on the other, it means it is seen from a specific angle, since the materialization is particular to the company, its context and its managerial strategy. Finally, the question of the materiality in the model's dissemination illustrates its importance because it not only makes it visible and reveals the theory but also, because of the constraints linked to the specific form of the materialization, it limits flexibility during the dissemination of the materialized model.

To develop this double role of materialization in the dissemination of the model, we show how Favi translated the model into a group of elements that were adopted by other companies; that the form taken by these elements can nevertheless vary according to context; and that the power of materialization sometimes brings about innovation by withdrawal, the removal of something that exists rather than the addition of new elements.

A Different Context Leads to these Different Elements of the Model Taking on a Specific Shape

Poult and Chrono Flex were explicitly inspired by Favi, as we were told by CV and AG. However, the detailed analysis of the development of the model shows that, for those elements that appear as the foundation of the

model, implementation may be different, for reasons of context and also because the intention can vary from one manager to another, which is translated into adaptations of the model.

Dumez (2009) discussed the notion of *dispositif*, and insisted on the point of studying both its heterogeneity and its development: the *dispositif* has an objective at the outset but it also acts autonomously and can have unexpected effects; the *dispositif* can also be manipulated according to objectives other than its initial ones and so the intentionality behind it can evolve over time. So, for Favi, the territorial anchoring and the role of the client are fundamental for the analysis of the model (Gilbert, Raullet-Croset, & Teglborg, 2014), whereas these two elements are not present in the other two companies. At Favi, the customer's presence in the company is down to the nature of the production and the desire to be as close as possible to the client. This intentionality is different in the other companies, which nevertheless claim to have been inspired by Favi. We have therefore identified different materializations of the 'theory' of the liberated company in particular concerning relations with the hierarchy, the role of the manager and the nature of work collectives.

A Process for Implementation of the Model by 'Withdrawal'

The process for implementing the organizational and managerial model has not been the same in the three companies. At Favi its construction was spread over thirty years in a kind of progressive assembly. The two other firms, inspired by the Favi model, wanted a speedier result. Because of this we sometimes find forms of 'innovation by withdrawal' (Goulet & Vinck, 2012). Since the materialization of the model arising from Favi cannot be adapted either for reasons of difference in context or intentionalities, the heads of the two other firms explain that they first looked to remove all the elements of classic management then posed the question of how to go about things. This is not without certain difficulties. As the CEO at Poult explains:

In any case, there is a bit of a vacuum effect in a few places, in fact, by saying that there are no more controls, no more reporting, no more budgets, no more goals, no more managers in the classic sense of the term, there are

a few places where we have in fact left a void. And so, in some spots we might find that behaviour has degenerated, with people who have confused autonomy and independence. People who have understood autonomy but who haven't necessarily understood responsibility and so there are zones, if you like, where clearly we have to improve things. (Carlos Verkaren, CEO Poul, Interview, 11 July 2014)

Conclusion

The liberated company may be seen as a managerial model as it is composed of a relatively stable group of elements, which we have highlighted. We have analysed this model by considering the importance of its dissemination from one company to another, because it seemed to us that the group of so-called liberated companies is still relatively restricted and is developing in a field of shared knowledge.

We have considered the model as a *dispositif* as Foucault describes it, made up of a group of material, organizational and discursive elements, and we have identified the specific circumstances for the transposition of the model from one company to another. In France, the liberated companies model is strongly linked to the role played by a 'leading light' company, Favi, which built this model over more than thirty years, progressively implemented it and so materialized it. This progressive materialization of the model at Favi, and then with a few pioneering companies, has contributed to its dissemination. We have shown that the model is composed of a *dispositif*, constituted of interrelated material elements that give it an effect of specific agency: the model transmits itself as a whole with an internal coherence but it also includes a certain flexibility in the agency of its elements, which then allows it to take on differentiated forms according to context.

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Schatzki and Techno-Organizational Practice

Anna Morgan-Thomas

Introduction

Focusing on the ontological principles of practice, this chapter explores a possibility of an activity-based view of sociomateriality. Although practices have been central to our understanding of techno-organizational phenomena and research on sociomateriality extensively draws on practice theories (Barad, 2003, 2007; Latour, 2005; Schatzki, 1996, 2002), the application of practice theory to sociomaterial enquiry has been somewhat partial for at least three reasons. First, the treatment of practice and the corresponding debates have tended to prioritize epistemology over ontology. That is, discussions on how to research sociomaterial phenomena have dominated (Orlikowski & Scott, 2015) and insufficient attention has been devoted to the metatheoretical dimension of practice and its philosophical assumptions (Cecez-Kecmanovic, 2016). Metatheory concerns the metaphysical principles that inform the very

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basic assumptions behind the theory, assumptions that define the notion of reality, existence, humanity, society and the entities within it (Burrell & Morgan, 1979). Whilst significant effort has aimed at explicating sociomateriality and setting it apart from competing paradigms in information studies and beyond (Leonardi, 2012, 2013; Orlikowski, 2007, 2009; Orlikowski & Scott, 2008, 2015), scarce emphasis has been paid to its metaphysical assumptions and their consequences. In particular, there are limited efforts explicating the metaphysical dimensions of practice theories and the implications of the contrasting assumptions within competing theories of practice (Schatzki, 2002).

Second, whilst drawing on the theories of practice, sociomateriality has tended not to recognize the differences in metaphysical assumptions between the practice theories of actions (Reckwitz, 2002, 2012; Schatzki, 1996, 2002, 2010) and theories of arrangements (Barad, 2003, 2007; Callon, 1991; Latour, 2005). The former conceive of practices as nexuses of 'doings and sayings' whilst the latter frame practices in terms of constellations of actors that include non-human actors. These distinctions seem somewhat obscured in sociomaterial enquiry and key authors tend to cite multiple theorists of practice without drawing attention to significant differences between their conceptions of practice (see e.g. Orlikowski & Scott, 2014).

Third, whilst drawing on the broadly conceived theories of practice, sociomaterial research tends to favour theories of arrangements (Barad, 2003, 2007; Latour, 1992, 2005). That is, empirical studies tend to focus on the assemblages of different actors that include non-human entities and networks of relationships between the actors that produce practice. In general, within published research, the works based on the theories of arrangements dominate and the theories of actions remain overlooked in sociomaterial research (e.g. Mazmanian, Cohn, & Dourish, 2014; Scott & Orlikowski, 2014).

Unquestionably, the conceptual orientation towards epistemology of objects (Knorr-Cetina, 1997) and arrangements (Latour, 2005) has strengthened sociomateriality research and has provided a useful theoretical lens for the empirical study of the technology-practice nexus. Nonetheless, the shift towards arrangements deflects attention from metaphysics of practice and downplays the implications of activity for

technology in the organizational practice. As a consequence, our understanding of how individual actions with technology convert into sustained manifolds of organizational activity, how the actions of multiple individuals with multiple technologies come to bear on the unfolding of organizational realities over time and across space, and how shared understanding, meanings, human intentions, emotions and affect practice with/in/through technology remains only partial.

In an attempt to rebalance the theoretical repertoire within organizational research on technologies, the current chapter explores the possibility of an activity-based theory of sociomateriality. In extending Schatzki's (1996, 2002, 2010, 2013) practice theory to the study of techno-organizational phenomena, the specific objectives here are to examine the ontological status of practice in sociomateriality research and to offer an activity-based conceptualization of sociomaterial practice. The key argument advanced in this chapter is that a theory of actions may address sociomaterial 'doing' and account more fully for the role of technology in organizing. Schatzki's theory of practice (2002) seems particularly well suited to the task because its detailed specification of practice provides a comprehensive metaphysical and metatheoretical account of sociality that defines practice, stipulates a range of relationships between materiality and action, and offers the possibility of adding specificity to the material, discursive and symbolic relations between technology and organizational practice. Admittedly, whilst promoting one view of practice, the chapter also acknowledges that this is but one theory and that diversity of approaches is warranted and indeed desirable. The purpose here is to enrich rather than seek conceptual closure for the study of sociotechnical phenomena.

The chapter aims to make three contributions to the study of techno-organizational phenomena. First, by examining how theories of practices have been conceptualized and analytically deployed in the study of sociomateriality, the chapter provides important insights concerning the metaphysical status of practice and the implications of metatheory of practice for techno-organizational research. Second, by explicating how Schatzki's treatment of practices differs from alternative approaches and how its use may be advantageous in the study of sociotechnical phenomena, the chapter challenges the assumption that an activity theory does not lend

itself to the study of technologies in organizing. Third, by extending Schatzki's theory of practice to the study of techno-organizational phenomena, the study offers a novel application of an activity theory.

Conceptual Background

Although sociomateriality research acknowledges the centrality of practices as the ontological building blocks of organizational realities (Orlikowski & Scott, 2015) and practices represent a common concern in empirical research (Jones, 2014; Jung & Lyytinen, 2013), a closer reading of the literature reveals an important fault line. Studies tend to analytically privilege either entities or actions and the scholarship seems split between studies relying on theories of arrangements (Barad, 2007; Callon, 1991; Latour, 2005) versus those sympathetic to theories of activities (Feldman & Orlikowski, 2011). The former conceive of social life as essentially revolving around arrangements of entities where social phenomena are organized in configurations and connections: humans and non-humans are interlaced into arrangements, which exert influence on other configurations and through relations perpetuate social life (Barad, 2003, 2007; Latour, 1992, 2005). The latter, theories of actions, explore situated actions in contexts (Reckwitz, 2002; Schatzki, 1996, 2002) and their focus is on patterns of activities across groups of individuals.

The emphasis on the theories of arrangements is much evident in recent sociomateriality research. For example, the work of Orlikowski and Scott (Orlikowski & Scott, 2014; Scott & Orlikowski, 2013, 2014) builds on Barad's philosophy (Barad, 2003, 2007) and focuses on entanglements of humans and non-humans, the social and the material (Orlikowski & Scott, 2008). Similarly, past research that draws on Actor Network Theory (ANT) (Mazmanian et al., 2014; Østerlie, Almklov, & Hepsø, 2012) provides important extension of the arrangement theme. Concepts such as 'imbrication' (Leonardi, 2011), 'assemblage' (Suchman, 2007), 'mangling' (Venters, Oborn, & Barrett, 2014) or 'configuration' (Mazmanian et al., 2014) all draw on the notion of arrangements of entities. Evidence of metatheories of arrangements can be also found in

sociomateriality's metaphysical assumption—the relational ontology. Following Barad (2003, 2007), past research has assumed that phenomena do not pre-exist but tend to emerge through relations in practice (Orlikowski & Scott, 2015) and material and non-material entities perform practices in an ongoing fashion. Contrasted with the research on arrangements, to date, only a few studies have attempted to explore techno-organizational phenomena using the activity lens (e.g. Fayard & Weeks, 2014; Jones, 2014; Jung & Lyytinen, 2013; Leonardi, 2011). Considering the number of studies in top journals, the focus on arrangements seems to dominate the current sociomaterial thinking.

Despite its success in redirecting attention to the situated and emergent nature of technology in organizational practice and the significant strides in rebalancing human–non-human relations in technology research, the shift to theories of arrangements in techno-organizational research has been extensively criticized (Faulkner & Runde, 2012; Jones, 2014; Kautz & Jensen, 2012, 2013; Mutch, 2013). For example, the sociomaterial search for balance between human and non-human actors seems to be met with only partial success. Human actors tend to dominate empirical evidence because they are the only ones that speak (Mutch, 2013). Yet paradoxically, in order to make room for objects, the sociomaterial efforts to equalize humans and non-humans within assemblages tend to suppress humanity. As a result, the implications of human intentions, emotions and affects are largely missing from current studies (Jones, 2014), in spite of their mattering for practice (Reckwitz, 2012).

There are problems concerning specificity and generalizability of insight. The preoccupation with specific narrowly defined settings brings difficulties in accounting for broader symbolic and social elements of practice that include the implications of the past (Mutch, 2013). The entanglements between humans and non-humans are necessarily situated in specific, narrowly defined contexts (e.g. call centres, TripAdvisor) and the specificity makes it difficult to extend the findings and generalize across other situations and context.

The analytical efforts to move from individual actions with objects to sustained patterns and manifolds of activity—across groups of individuals and underlined by shared understanding and meaning—are yet to develop into comprehensive theories of organizing (Fayard & Weeks,

2014). The micro-emphasis on networks of human–non-human relations seems to offer an individualistic locus of practice and ignores both the complex webs of cultural knowledge and rules that accompany technology use across groups of individuals (Hutchby, 2001) and the social construction of technology impacts on practices. Assemblages do not recognize the broader fields of practice (Bourdieu, 1977, 1990) or the broader networks of relationships in a group and society that create the conditions for practice (Fayard & Weeks, 2014).

Further difficulties concern relational emergence. Sociomateriality claims that practices emerge through relations and that everything that exists is continually created and recreated through relations (Barad, 2003, 2007). Yet, when addressing technology in organizing, studies tend to resort to pre-existing categories and emergence does not seem to be easily accommodated either empirically or conceptually (Faulkner & Runde, 2012; Mutch, 2013). The critics of sociomateriality have claimed that ‘many if not most of the boundaries and categories we live by in our day-to-day lives are generally quite stable, at least relative to our life-histories, and that the same is true of most of the objects classified within them’ (Faulkner & Runde, 2012, p. 60). The concurrent notions of entanglement and emergence are proving difficult to implement in empirical analysis (Mutch, 2013).

Past efforts to address these criticisms and move the field forward have involved expositions and critical syntheses (Cecez-Kecmanovic, 2016; Jones, 2014; Orlikowski & Scott, 2015). For example, significant efforts have concerned decomposing the sociomateriality programme to explicate its principal components and contrast with alternatives (Leonardi, 2012, 2013; Orlikowski, 2007; Orlikowski & Scott, 2015). Alternatively, critical syntheses have addressed the programme from the epistemological perspective, highlighting how its principles translate into a body of research and what knowledge does such a programme generate (Cecez-Kecmanovic, 2016; Cecez-Kecmanovic, Galliers, Henfridsson, Newell, & Vidgen, 2014; Jones, 2014). For example, Jones (2014) has argued that though the principles of materiality, inseparability, relationality, performativity and practices, represent a radical departure from other research traditions, the level of adherence to these principles remains varied and marks the split within the field into weak and strong sociomateriality.

While these explanations and the ensuing recommendations are insightful and useful, they do not question the basic ontological premises underpinning the framework of sociomateriality. Paradoxically, neither the existing expositions of theory nor the critiques seem to offer a systematic treatment of metatheory, i.e. the fundamental ontological assumptions on which research is based and which drive epistemological decisions on what research problems to focus on and how research should be carried out. The outcome is a level of epistemological confusion as evidenced by the varied and selective application of sociomateriality principles (Cecez-Kecmanovic et al., 2014). The confusion also affects critiques of the programme because the act of bundling and evaluating theories that are incomparable because they belong to different metaphysical paradigms seems to trespass the principle of paradigm incommensurability (Burrell & Morgan, 1979).

In an effort to address ontological principles in sociotechnological research, the next section reviews meta-theories of practice. The review provides an opportunity to reassess metatheoretical principles and map out the sociomateriality programme more clearly. By explicating commonalities and differences using established categories, the chapter hopes to explicate the metaphysical principles in a systematic manner.

Metatheories of Practice

Practice theories represent a rich theoretical terrain that permeates research in multiple fields of management and organizational studies (Feldman & Orlikowski, 2011). In general, practice theories seek to explain the relationship between specific and situated human actions and the broader social context in which these actions take place (Schatzki, 2002). Although the theories vary in their explanation of the principles and mechanism that link individual action with the broader social context, they share a focus on actions, reject dualism and accept the principle of mutual constitution (see Feldman & Orlikowski, 2011 for a good overview). Practice theories assume that social life is composed of everyday actions and that manifolds of actions across groups of individuals create practices (Schatzki, 2002). In denying dualism, practice theories reject oppositions (e.g. structure and agency, individual and institutional, cog-

dition and action) and call for the construction of dualities that accommodate the polar extremes (Reckwitz, 2002). Finally, practice theories assume mutual constitution to claim that phenomena always exist in relation to each other. For example, social orders depend on the human agency that produces them and conversely, human agency is shaped by social orders that determine its structural conditions (Feldman & Orlikowski, 2011).

Despite similarities, practice theories differ in their metatheoretical assumptions. A key shared assumption is that any form of social life transpires through practices, or organized patterns of human activities, and that practices are the fundamental blocks building social life in multiple domains (Orlikowski & Scott, 2015). However, although all theories of practice focus on situated activities, they differ by privileging of either entities or actions and theories of arrangements (Barad, 2003; Latour, 2005) can be contrasted with theories of actions (Bourdieu, 1977; Reckwitz, 2002; Schatzki, 2002). The division is important because it underlies fundamental metatheoretical differences that pertain to the conception of social life and the role of objects. The two streams within practice theories take an opposing stance regarding the emergence of practice and the relative position of humans within that emergence. As a result, the two strands adopt contrasting views concerning humanism, nominalism and the emergence of practice (Schatzki, 2002).

The first distinction concerns humanisms versus post-humanism. Humanism tends to privilege humans over non-humans and assume that although objects, entities and non-human phenomena (i.e. wind) may act and exert influence, they do not have agency because agency is uniquely human involving intentions. Whilst acknowledging the importance of matter, humanism maintains the superiority and primacy of humans over non-humans. By contrast, post-humanism (Knorr-Cetina, 1997) attributes central features of human agency to non-human entities and downplays the uniqueness and significance of human agency. The key distinction between the two strands of practice theories is that theories of actions defend the privileged position of human agency whereas theories of arrangements equate human and non-human agency.

The second difference concerns nominalism versus contextualism. Whilst nominalism contends that sociality can be explained solely

through properties and relations among particular things, contextualism assumes that these matters must be referred to in a context that is different from these entities. Nominalists deny existence of context and to them, systems, structures or social orders either do not exist or are merely configurations of arrangements that are infinitely reducible to arrangements. By contrast, conceptualists acknowledge the importance of a wider context and recognize broader structures as well as the historical dimension of practice. Importantly, the theories of actions adhere to contextualism whilst theories of arrangements follow nominalism.

Nominalism has important implication for the substantive status of practices. Denial of context and focus on ongoing relations conveys the rejection of substantivism (preoccupation with the real) and attention to relational ontology and performativity where practices are an ongoing accomplishment that is continuously unfolding and becoming. Though stabilization may be achieved temporarily, neither the practices nor any other entities involved in their productions are ever ‘completed’ or fixed (Barad, 2007). By contrast, theories of actions seem more aligned with substantivism and emphasize ‘the real’ and ‘the actual’. Though practices may be an ongoing accomplishment that is coconstituted by multiple actors, the theories of actions argue that the presence of practice can be objectively and independently detected because practices have relatively stable and detectable characteristics that are independent from their observer.

Taken together, post-humanism and nominalism that characterize theories of arrangements bring certain challenges to the study of techno-organizational phenomena. For example, the focus on unfolding, unstable and unbounded assemblages of human and non-human entities means that it becomes analytically difficult to separate them in what is being examined (Kautz & Jensen, 2012, 2013) and there are issues concerning the empirical locus of concrete analyses. A related problem concerns indeterminacy. For example, the notion of ‘relationality’ advanced by Barad (2003, 2007) provides little specificity to the multiple types of relations between the social and the material (Faulkner & Runde, 2012). Concurrently, the focus on immediate objects (like TripAdvisor in Orlikowski & Scott, 2014) comes at the expense of the more generalized theoretical propositions that apply beyond the immediate empirical set-

ting (Mutch, 2013). Consequently, the debate as well as the search for alternative lenses continues (Cecez-Kecmanovic, 2016). The section below exposes Schatzki's theory of practice as a possible new direction for sociomateriality research.

Activity-Based Theory of Sociomateriality?

Schatzki (1996, 2002) offers but one theory of practice. Similar to other practice theorists (Bourdieu, 1977; Latour, 2005; Reckwitz, 2002), Schatzki assumes that practices are the key ontological units of which sociality is composed. Similar to other theorists of practice, Schatzki rejects individualism and individualist ontologies and supports the principle of mutual constitution where sociality envelops though manifolds of activities across groups of individuals and where activity is constitutionally bound with matter. Contrasted to other theorists, Schatzki makes a strong emphasis on actions—'doings and sayings'—and conceives of practices as 'manifolds of actions'. Building on Heidegger and Wittgenstein, he further assumes that action takes primacy over meaning.

According to Schatzki (1996), practices are organized bundles of human activity, evolving domains of doings and sayings that are linked by and orchestrated through arrays of understandings, rules and teleo-affective structures. Practical understandings denote the skills, abilities and capacities that inform and help execute the specific actions that compose a practice. Understandings are accompanied by sets of rules, i.e. formulations, principles or instructions that orient, direct and determine the course of activity. Finally, teleo-affective structure of practice consists of a set of ends, projects, tasks, beliefs and emotions that are expressed in doings and sayings that compose the practice. Unlike rules, teleo-affective structure tends to be implicit and suggestive of normativity and hierarchy within a practice; when it exists, there is a general agreement about rightness, 'oughtness' or acceptability of action. A bundle of activities becomes a practice when it displays the three features discussed above.

Although the thrust of Schatzki's theory concerns social aspects of practice, materiality and technology form an integral part of his thinking

because 'activity is inherently entwined with objects and it proceeds amid entities that mold it and to which it is constitutionally bound' (2002, p. 124). Practices are intrinsically entangled and interwoven with objects and materiality has compositional significance for practice. That significance is reflected in later definitions of practice where 'social life, that is human coexistence, inherently transpires as part of nexuses of practices and material arrangements' (Schatzki, 2010, p. 124). According to Schatzki (2010), material arrangements are sets of entities that include humans, artefacts and organisms. Similar to other thinkers (Leonardi, 2012), he understands that materiality is broader than physicality and refutes the notion that materiality forms but a background condition for social practice, as sustained in mainstream sociology (see e.g. Garfinkel, 1967 or Giddens, 1979).

How are objects entwined with practices? There are four mechanisms that tie practices and material arrangements: causality, constitution, intelligibility and pre-figuration (Schatzki, 2010). Causality captures the direct influence of actions on objects, objects on actions and objects on objects. Human activity may lead to changes in objects: humans may create new objects, for example, alter objects, and rearrange objects. Similarly, material entities may exert causal effects on human actions and lead them to perform activities, follow tasks and pursue ends. Finally, objects maintain causal relations among themselves, for instance, an app may cause a heating boiler to switch on.

The second mechanism concerns constitution and practices and material arrangements are coconstitutive in that without objects a practice may not exist or take a completely different form. First, objects may be essential for practice in that it may be impossible to carry out activities that compose practice without certain objects. For example, the practice of online valuation is made possible through digital algorithms and immaterialities that support it. Online valuation occurs only when these materialities are present and functioning in a satisfactory manner (Orlikowski & Scott, 2015). Second, objects may be pervasively involved in particular practices at particular times and places. Jones (2014), for example, notes that though it is not essential to use objects in medical practice, the contemporary medical practices are pervasively entangled with objects. Coconstitution works in the opposite direction too: with-

out the practices that involve objects or are carried out among objects, many material arrangements would not exist. For example, a typewriter is now an obsolete object within the contemporary writing practice because more efficient writing tools (word processors) have emerged.

The third type of relation between practices and arrangements is that of intelligibility. Intelligibility ‘governs action by specifying what an actor does next in a continuous flow of activity’ (Schatzki, 2002, p. 75) and denotes how things make sense (what are they understood to be) and which actions make sense—what makes sense for people to do. The material arrangements within practice carry interwoven understandings of that practice: a set of technologies for online valuation carries the understanding of valuation (Orlikowski & Scott, 2015). To say that objects and practices are tied through intelligibly is to assume that objects articulate the meaning of practice and signify the actions to perform, i.e. they help to channel ‘the flow of unreflective action onto the performance of particular actions’ (Schatzki, 2002, p. 122).

The final type of mechanism that ties practices and objects is pre-figuration. Objects pre-figure practices by shaping, influencing and affecting the future actions that compose practice, specifically, in the very immediate future. Though pre-figuration may be conceptualized through the notion of constraint or possibility, or fields of possibilities, Schatzki argues that such formulations unduly minimize its influence on practice because pre-figuration is only to a small extent a matter of constraint/affordance and exclusion/possibility (Schatzki, 2002, p. 225). To understand pre-figuration is to appreciate the multiple ways that the mesh of practices and arrangements ‘makes courses of action easier, harder, simpler, more complicated, shorter, longer, ill-advised, promising of gain, promising of ruin, disruptive, facilitating, obligatory and proscribed, acceptable or unacceptable, more or less feasible’ (Schatzki, 2002, p. 231). Pre-figuration is not about opening or closing paths for action but is best understood ‘as a qualification of possible paths of action on such registers as easy and hard, obvious and obscure, tiresome and invigorating, short and long, and so on’ (Schatzki, 2002, p. 103).

Whereas objects are pervasively implicated in practices in multiple domains, Schatzki refutes the notion of ontological equality of humans

and objects, argues against taking these notions too far and defends ‘residual humanism’. Specifically, for Schatzki, there is a distinction between ‘centredness’ (Knorr-Cetina, 1997) and being ‘tied to’ or ‘moderated by’. In opposition to Knorr-Cetina, he argues that colonization of objects of multiple arenas of contemporary practice does not entail centredness. Objects are very rarely the focus of practice. Practices serve tasks, projects and ends that go beyond objects and are not centred on the objects *per se*. Instead, objects play role in practices due to their usefulness in meeting ends, projects and tasks that the practice stipulates.

Implications

As an alternative lens for viewing sociotechnical entanglements, activity theory has implications for technology research. From the ontological perspective, the theory provides a complete metatheory that systematically accounts for all aspects of practices thus offering the possibility of addressing criticisms concerning theories of objects. For example, contrasted with Barad (2007), Schatzki (1996, 2002, 2010) provides a more complete understanding of materiality and sociality by specifying what practices are, why they matter and how they differ from entities. His rich philosophical account of practice provides detailed guidelines for identifying and analysing practice–materiality nexuses. The rejection of nominalism means that it becomes possible to separate the empirical focus from the research context; it becomes easier to locate, exclude and prioritize research settings and thus avoid the fallacies of infinite regress and indiscrimination. A key advantage of the focus on practice is that it allows for theorizing about multiple technologies, technological meshes and technology choice that seem to increasingly form an intrinsic feature of contemporary organizational technologies (Jung & Lyytinen, 2013).

These advantages become more apparent when viewed from an epistemological perspective and the distinction between practice and phenomenon (Barad, 2007) becomes important here. In contrast with the difficult of locating seemingly boundary-less phenomena (particularly when viewed thorough Barad’s compounded onto-

epistemological standpoint), the focus of activity-based practice seems to offer more precision. In particular, definitional precision means that it may be easier to observe and refute practices than phenomena. Contrasted with phenomena, practice seems to have a set of qualifying features that are not entirely dependent upon the observer. Because the observation of practice separates an observer from the object of observation (practice), it avoids the indeterminacy of phenomena where the agency of observation and the observed are combined (Faulkner & Runde, 2012).

How may an enquiry be facilitated by activity theory? The starting point would involve identification of practices and associated material bundles. Using Orlikowski and Scott (2015) as an example, an investigation that contrasts offline and online valuation practices would still occupy the middle ground position in terms of rejecting duality and determinism. However, the empirical design would place greater emphasis on doings (valuations) in terms of understandings, rules, structures that would implicate materialities of different practices (including digital and non-digital objects) and their relationships with tasks, projects and ends. These relationships would stipulate how materialities are implicated in the different castings of valuation practice through causality, intelligibility, coconstitution and pre-figuration.

Some disadvantages of activity theory have to be acknowledged. Unlike the theories of arrangements, the activity view has not been developed with objects in mind, not least the quasi objects of digital type (Faulkner & Runde, 2009) and translating its propositions into the realm of technology and organizing is not an easy undertaking. The difficulty is compounded by the theory's emphasis on ontology and almost absolute absence of epistemological guidelines. By his own admission, Schatzki (2002) is not preoccupied with epistemology and thus provides little assistance in extending the theory to empirical designs. Beyond these concerns, the major issue is agential humanism and the somewhat diminished role of objects that follows from activity theory. These ontological assumptions run contrary to the principle of equivalence between humans and objects which represents a key attraction of the sociomateriality programme.

Conclusion

This chapter aims to advance techno-organizational research by offering an activity perspective on human-object relations. By revisiting the notions of post-humanism and nominalism and exploring the activity-based view of sociomateriality, the chapter offers a revised option of practice theory that may be used by organizational scholars in technology studies. The chapter argues that the activity view offers advantages by providing boundaries to the phenomena under investigation and by accommodating the context of practice and thus sets new avenues for empirical research on techno-organizational phenomena. Given the increasing proliferation of multiple organizational practices with information technologies such work seems highly warranted and urgently needed.

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Social Impact Measurement as a Dynamic Process: A Study in a French Non-profit Organization

Julien Kleszczowski and Nathalie Raulet-Croset

Introduction

Social impact measurement has been an important issue in the non-profit sector for several years (Maas & Liket, 2011; Paton, 2003). Most researchers are interested in the specificities of the tools that can be used for social impact measurement. The specificity of these tools is linked in particular to their responsiveness to different influences: on the one hand, those relating to the mission and values of the non-profit sector and, on the other hand, the goals of measurement and efficiency that are typically related to the for-profit sector. As a result, the tools for measuring the

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social impact of non-profit organizations (NPOs) are hybrid in nature, as they have to meet different expectations.

Substantial research has focused on the contrast between quantitative and qualitative approaches to social impact assessment (Kanter & Summers, 1987; Ormiston & Seymour, 2011). Still, other contradictory forces can be identified that contribute to the hybridization of measurement tools. We argue here that social impact measurement cannot be reduced to the implementation of an existing tool. Social impact measurement can be considered as a process which is built step by step and is influenced by different contextual forces. In some cases, existing social impact measurement tools are adapted to the context of measurement. In other cases, *ad hoc* tools are built.

Thus, social impact assessment processes respond to the demands of different actors with specific and sometimes contradictory expectations. Social impact evaluation is situated between the internal and external issues of non-profit organizations. It can be requested by external stakeholders for accountability reasons (Ebrahim, 2003), and it can serve internal needs such as strategic management or activity improvement (Carman & Fredericks, 2008). Another identified tension is that the simplification of reality linked to the use of a tool will lead to the expression of these contradictions. Accordingly, every management tool and social impact assessment relies on simplifications of reality while also trying to maintain a sufficient level of complexity (Moisdon, 1997).

Our research focuses on the building process of social impact measurement in non-profit organizations, and aims to identify the contradictory forces resulting from the use of management tools to implement this measurement, as well as the reciprocal impact of management tools on the process and its structure. We seek to understand: how the building of social impact measurement tools is influenced by its positioning at the border between internal and external issues; and how the processes and results of social impact measurement are designed through the search for simplification and complexity, which are inherent to the measurement tools themselves.

Our methodology is based on action research in a French non-profit organization dedicated to childcare, professional training for children and young people facing social problems, and support for parents. This organization includes approximately 200 services and has an annual budget of more than €350 million. Empirical data come from the analysis of two embedded case studies conducted by one of the authors, who was also the project manager in charge of implementing social impact measurement at the organization.

Each process was analysed along two dimensions: the influence of expectations of the different actors and the phenomenon of simplification inherent to the management tools. From this empirical analysis, we highlight two types of movement: closing movements that reduce the evaluation spectrum of some activities, and opening movements that broaden the spectrum of evaluation.

As a first result, we show that the social impact assessment tools, which meet the expectations of both the external funders and the internal leaders of the organization, must find a balance between the rationale of external comparability for funders and the internal steering mechanisms of internal managers. Achieving this balance occurs during phases of freezing/closing followed by opening until a satisfactory balance is reached for the different stakeholders. More precisely, our findings show that external expectations match with closing movements, while internal challenges correspond with opening movements.

Second, we find that social impact measurement has also evolved through phases of simplification and increasing complexity due to the nature of the tool. Accordingly, we observed a pendulum movement, as excesses of simplification or complexity were corrected by reverse movements to achieve a balanced result.

These results suggest the possibility of co-existing divergent objectives and rationales within one social impact measurement process, and emphasize the dynamic aspect of implementing the measurement of social impact.

Theoretical Framework

Measuring the performance of non-profit organizations has become increasingly important during recent years. Many studies agree that financial indicators are largely insufficient to measure the performance of these organizations because of their specific objectives (Paton, 2003; Speckbacher, 2003). Instead, performance has to be measured by assessing the social effects on stakeholders and outcomes of organizational activities (Baruch & Ramalho, 2006; Mitchell, 2013).

Many tools and methods to measure social impact have emerged during recent years (see Cordery & Sinclair, 2013 for a classification of existing tools). However, there is no consensus on the best tools for social impact measurement (Maas & Liket, 2011). Some scholars suggest that each organization must find its own way of measuring (Stievenart & Pache, 2014), especially since several studies have emphasized the multi-dimensional nature of performance in non-profit organizations (Bagnoli & Megali, 2011; Bouchard, 2004; Forbes, 1998; Lecy, Schmitz, & Swedlund, 2012).

The term 'effectiveness' has been widely used in academic work to describe performance (Forbes, 1998; Herman, 1992). The concepts of 'social value' and 'blended value' have also been used by some scholars (Emerson, 2003; Mook, 2013; Nicholls, 2009). A term that has emerged more recently and seems to have established itself today is 'impact' or, rather, 'social impact'. This term was first used by practitioners (Clark, Rosenzweig, Long, & Olsen, 2004; Wainwright, 2002) and has progressively been adopted into academic work (Arvidson & Lyon, 2014; Barraket & Yousefpour, 2013; Ebrahim & Rangan, 2010; Maas & Liket, 2011).

Social Impact Measurement between Internal and External Issues

The reasons why organizations measure their performance are numerous and context dependent (Cook, Vansant, Stewart, & Adrian, 1995). Nevertheless, the literature distinguishes two types of issues that explain measurement development and, accordingly, the emergence of new dedi-

cated tools. First, they highlight external reasons, and second, they identify pressures arising from internal needs.

External Reasons for Social Impact Measurement

Social impact measurement is considered the central aspect of non-profit organization accountability (Ebrahim, 2003; Edwards & Hulme, 1995). Indeed, many studies note that reporting to funders is the main reason why non-profit organizations measure their social impact (Campos, Andion, Serva, Rossetto, & Assumpção, 2011; Costa, Ramus, & Andreaus, 2011; Ebrahim, 2005; Moxham, 2013). MacIndoe and Barman (2013) show a positive correlation between the level of funder influence and the methods that organizations use to measure their social impact. Non-profit organizations may also seek to attract new funders or, more widely, to promote the organization to the public (Carman & Fredericks, 2008). Some researchers found rising funder demands for accountability in recent years (Carman, 2010). This trend can be explained by the growing influence of private and public for-profit funders and their rationales. For private funders, the 'new philanthropy' logic seeks to maximize the effectiveness of spending money and increasingly envisages donations as investments (Anheier & Leat, 2006; Bailin, 2003; Frumkin, 2003; Katz, 2005). For public funders, the emergence of 'new public management' has led to stronger monitoring and the search for optimization of public spending (Hood, 1991; Hood & Margetts, 2007). These rationales affect the organizations funded by these actors.

Social Impact Measurement as a Response to Internal Issues

However, several researchers point to risks in measuring social impact only to satisfy funders. Costa, Ramus and Andreaus (2011) consider that this can detract from accountability to other stakeholders with similar importance to NPOs. These stakeholders include employees, volunteers and beneficiaries (Costa et al., 2011). Chemin and Gilbert (2010) also note that the use of evaluation tools imposed by funders leads to neglecting other dimensions of organizational performance. Similarly, O'Dwyer

and Unerman (2008) explain that accountability driven by a particular group of stakeholders, such as funders, may lead to a focus on the narrow dimensions of NPO performance at the expense of broader perspectives. According to them, this mismatch can jeopardize the fulfilment of the NPO mission (O'Dwyer & Unerman, 2008).

In fact, many researchers also stress the fact that social impact measurement should meet objectives other than reporting only to external stakeholders (Ebrahim, 2005). They argue that it should also respond to internal issues. Assessment of social impact can be used as a strategic management tool (Carman & Fredericks, 2008), or as a source of information to improve activities and organizational learning (Ebrahim, 2003, 2005). The evaluation process may also be a reflective tool for internal actors regarding the values and identity of the organization (Bouchard, 2004).

Social impact measurement is therefore an important issue for the NPO, both in its relations with external actors and in relation to its internal needs. Measuring social impact therefore appears to be at the boundary between the internal and external sides of the non-profit organization. We propose an exploration of how this positioning influences the design of social impact evaluation tools.

The Management Tool between Simplification and Complexity

As seen previously, social impact measurement requires tools and methods to measure the impact of NPO activities. We propose to address this question in the broader context of management tools within organizations.

A field of literature on management tools emerged in France approximately thirty years ago. According to some of the researchers, a management tool is defined as

a set of reasonings and knowledge formally linking a certain number of variables arising from the organization, whether quantities, prices, quality level or any other parameter, and intended to instruct the various classic acts of management. (Moisdon, 1997, p. 7, our translation)

Hatchuel and Weil (1992) describe three dimensions of a management tool: the technical substrate, the management philosophy, and the simplified representation of the actors involved in its operation. This distinction underlines the assertion that management tools are not neutral. Rather, they bear an underlying vision which can influence their environment. Several authors have analysed the roles of the tools that organizations build and use to implement different management actions (Chiapello & Gilbert, 2013). Early scholarly works showed the perverse effects of these tools, leading, for example, to irrational behaviours and under-optimization (Berry, 1983; Riveline, 1991). They considered that managers perceived these tools as ‘abstract[s] of truth and good’ (Berry, 1983; Riveline, 1991), or as ‘simplified representation[s] of reality’ (Moison, 1997), often forgetting how approximate these tools were as representations for the activities they are supposed to model.

They further highlight the conforming effect of tools and examine how and to what extent the agency of the tools determines human agency.

However, some researchers argue that changes occurred in the way tools were used in organizations, and explored how the interaction between humans and these tools resulted in learning and exploration. The agency of the tools was then considered not as causing conformity but as leading to exploration. Moison (1997) observed that management tools had become increasingly less stable and more malleable. He listed new features of these tools, including flexibility (to adapt to the changes they regulate), fragility (tools regularly disappear and others appear freely), interactivity (tools are a starting point for feedback and revision of choices), questionability (role of structuring negotiations rather than prescribing choices in advance) and decentralization (tools are not always centrally designed but are also built within operating units for their own needs). Moison (1997) explains these developments through the evolution of the internal and external contexts of organizations (acceleration of time, adaption required) and the awareness of stakeholders about the limitations of these tools. In the same perspective, Hatchuel (1994) observed that management tools consist of a ‘provisional representation around which stakeholders undertake mutual learning’ (Hatchuel, 1994). More recently, researchers have focused on the interaction between the

conforming effect and the exploration effects of these tools. Chiapello and Gilbert (2016) have proposed several tool functions, including: the pragmatic function, which highlights their structuring effects; the political function, which focuses on their power effects; and the epistemic function, which explores how tools contribute to knowledge creation. Teglborg, Gilbert and Raulet-Croset (2015) have explored the resistance effects of tools and devices, which can be both obstructive and productive in that they can generate learning experiences.

These perspectives also relate to research on the interaction between material and human agencies (Leonardi, 2011; Orlikowski, 1992, 2007). However, the latter research emphasizes the material aspects of objects and tools, while the research on tools also considers their rationality and practicality. Some authors seek to characterize the nature of the interaction between human agencies and tools. Orlikowski discusses interpretive flexibility, which refers to 'the degree to which users of a technology are engaged in its constitution (physically and/or socially) during its development or use' (Orlikowski, 1992, p. 409). Moisdon (1997) proposes that 'management tools have two sides: one related to conformity, as a requirement or incentive, and the other related to knowledge' (Moisdon, 1997, p. 43). On one side, a management tool simplifies reality, and on the other, its flexible and evolutionary aspects will maintain a more nuanced, multi-dimensional view in order to play the roles of exploration and learning (Moisdon, 1997).

We argue here that social impact measurement is based on a specific management tool which has both rational and social ambitions. We hypothesize that social impact measurement tools are structured, as with any management tool, by conformation and exploration objectives. We aim to deepen our understanding of how the interaction between these two objectives structures the ultimate shape of social impact assessment tools.

Research Question

Our research question combines the two questions raised by the literature review to understand how the different tensions that influence

social impact assessment structure the design of managerial tools. To this end, we focus empirically on the different processes of social impact measurement tool construction within organizations. Most scholarly work on the measurement of social impact in the non-profit sector has the dual objectives of building optimal methods to measure social impact and analysing actors' positions and general practices of social impact measurement. However, building and implementation of social impact measurement processes within organizations has received little attention. From our point of view, detailed observation of developing and operating social impact assessment processes can provide new insights by revealing the different forces underlying the construction and design of social impact assessment tools. We aim to answer the following research questions:

- What is the influence of the different kinds of stakeholders interested in building social impact assessment tools on their design and evaluation process? In particular, do internal and external stakeholders have a specific influence on their design?
- Considering that social impact assessment is implemented through managerial tools, what is the influence of the rational and explorative dimensions of management tools on social impact assessment design?

Methodology and Description of Case Studies

Empirical data come from two case studies of social impact measurement in two separate entities of the same non-profit organization. The organization is a major French foundation (annual budget of circa €300 million) with approximately 200 establishments and services in the fields of education, childcare and professional training for children and young people facing social problems. The foundation also provides support for parents.

The research is based on a particular form of action research methodology (Argyris, Putnam, & Smith, 1985; Lewin, 1951) called intervention research, where the researcher is involved in a process of

change and implementation (David, 2012). One of the researchers, a PhD student, was a project manager for social impact measurement within the organization for three years. He performed several tasks during his tenure, including the monitoring of five evaluations of different organizational entities (projects, services), and observing participation in the development of social impact measurement within the organization. Data collected for the research consisted of a log-book for each evaluation, interviews with key actors and secondary data (meeting minutes, emails, document collection and analysis of information for evaluating social impact).

The two case studies presented in this chapter were selected from the five cases of evaluation processes conducted in the organization. Each process was developed in one organizational entity (project, service). We chose two cases for this chapter that can be considered opposites in terms of initial measurement tool selection. The first case was characterized by implementation of a pre-existing quantitative tool, whereas in the second case, the evaluation was developed through progressive and *ad hoc* construction. Therefore, the cases represent the extremities of a continuum, whereas the other three cases were characterized by a mix of pre-existing quantitative tools and qualitative tools.

For each evaluation, all actions were reconstituted in a chronology. A coding process allowed us to identify particular stages of stabilization, where the actors suspended the evaluation design, as well as stages of openness, when they reopened the design process to include new influences on the evaluation process. We called these two stages 'closing' and 'opening' movements, respectively. A closing movement reduces the scope of the evaluation, which 'freezes' the dimensions of social impact of the evaluated entity. The objective of this movement is to obtain a simplified representation of social impact to make the assessed entity comparable with others which are similarly evaluated. By contrast, an opening movement is an effort to expand the evaluation scope by identifying as many different outcomes as possible and introducing nuances and complexity, thus emphasizing the specificity of the evaluated service.

Case 1: Families' Listening Service (FLS)

Presentation and Context

Created in 2001, the Families' Listening Service (FLS) is a hotline that receives phone calls from anyone facing difficulties with a child or a teenager. The callers typically are parents or other adults (other family members, school workers, social workers) who need information, advice and/or support regarding a young person. Most discussions focus on behaviour, school requirements, choices related to studies, parental challenges in their educational role, disabilities or relationships with social childcare services. Approximately 2500 situations are managed each year, and each call lasts twenty minutes on average. The staff is composed of a manager and six 'listeners' with various profiles (psychologists, special educators, social workers in childcare or social and professional integration, etc.). The service is mainly funded by non-dedicated private donations (public grants represent less than 10 per cent of the budget).

In 2013, the Service Manager (SM) asked the researcher to measure the social impact of the service. He made this request for two reasons. First, the service staff were starting an internal study of the service's strategic positioning inside and outside the organization, and it seemed appropriate to complete the study by analysing the service outcomes. Second, the SM was asked to find new funding to reduce the funds coming from the organization, and considered that a social impact measurement of the service might convince other stakeholders to support the service.

The First Closing Moment: The Choice of Evaluation Method

A set of different assessment methods and tools already exists in the literature, and these methods and tools have already been tested by different organizations. One of these methods is called the SROI (Social Return on Investment) methodology. This tool proposes to measure the social impact of a project or organization in monetary terms and then calculates a ratio by dividing the total monetary impact by the monetary resources

needed for the activity. The FLS decided to implement this method. The decision to use the SROI methodology was voluntary: no external actor requested evaluation using this method, and there was no prior plan to use this method (months earlier the steering committee on organizational social impact measurement even considered that this method was not relevant for future evaluations within the organization). The choice of measurement method was made during the first discussion between the researcher and the SM. Indeed, the SM noticed that funders were particularly interested in monetary figures. Accordingly, he calculated the cost of one call by dividing the total budget by the number of calls and thus gained the intuition that the derived cost could represent an economic gain. Anticipating that this reasoning was very similar to the logic of the SROI method, the researcher then presented the method and proposed assessment of the social impact of the service using this tool. The SM agreed immediately.

The SROI method involves a number of constraints. In addition to a number of steps recommended in the SROI methodological guides, it requires a definition of monetary value for each identified and measured impact. Therefore, the choice of evaluation method can be considered a closing phase in this first step because only the impacts with monetary value were considered in the evaluation. This decision was also made to meet the funders' requirements.

Identification of All Service Outcomes as an Opening Phase

The evaluation was conducted by the researcher between February 2014 and March 2015, with the support of two students during the first three months. The SM and one staff member followed the entire evaluation process.

According to the proposed methodological framework of the SROI method, the first step was to identify the stakeholders for which the service has outcomes and to name the outcomes. This work was based on internal service documents and meetings between those in charge of the evaluation and two staff members. Seven different stakeholders were listed and eighteen different outcomes were identified. This second step

was to open the evaluation scope by identifying stakeholders and outcomes previously unknown to the service staff. For example, while the service outcomes for recipients were obvious to the staff, the organizational outcomes in terms of greater external recognition were unknown. Therefore, this second stage was an opening phase which considered internal outcomes.

The Choice of Monetarily Valued Outcomes: A Closing Phase

The next step involved measurement of the identified outcomes and impacts, and required assigning monetary values to them. In agreement with the service staff, the team leading the evaluation suspended measurement of some of the identified outcomes because either it was too difficult to obtain information (for example, additional visibility for the organization) or the effects were too uncertain to be measured compared to the indirect action (such as effects on young people affected by the call). Thus, ten out of eighteen outcomes were not measured.

The choice of measuring certain outcomes and not others led to focusing the evaluation process on the most easily quantifiable aspects. The monetary valuation thus concentrated time and effort on only some of the identified impacts. Accordingly, we presume that ultimately, putting the valued monetarily impacts before other impacts led to minimizing or forgetting the non-measured impacts. This phenomenon results from the choice of the SROI method, which assigns a monetary value to impacts to obtain a final ratio.

Furthermore, translation of the measured impacts into monetary terms reduced them to a particular dimension. For example, the monetary equivalent chosen to value the improved well-being of parents who called the service was the price of a session with a psychologist. The need to assign a monetary value led to translation of some impacts in ways which were sometimes far from the reality experienced by the beneficiaries.

Therefore, this phase can be considered a closing phase due to the specificities of the chosen method. The evaluation of some impacts was abandoned, and the units for measuring others were restricted to a countable dimension.

Opening Caused by Undermining Monetary Valuation

In April 2014, a first version of the results was completed. Some impacts were valued monetarily for calculation of a SROI ratio. A presentation was made to the supervisor in charge of the service (the line manager of the SM). He challenged the way the highest amount (approximately 75 per cent of the total) was valued. He considered that the assumptions used for the calculation were over-estimated and asked for some more detailed calculations. The researcher followed these instructions, which led to a significant decrease in the total value of the impacts, and therefore of the SROI ratio (although it was still positive). Facing the disappointment of the service manager, the researcher tried to reconsider the monetary value of other non-quantified impacts. In a discussion with the SM regarding the content of some calls, a new quantifiable and valuable outcome was identified, namely, stress reduction for certain beneficiaries of the service. Monetary valuation seemed possible by estimating the avoided costs by public authorities and health insurance of stress-related diseases. This effect was never identified before by the service, but a revision of monetary valuation led a 'new' outcome, and the changed calculations were used to re-open the process.

A Balanced Evaluation Result

When all monetary value calculations were completed and stabilized, the last step was to prepare the final document containing the detailed results of social impact measurement. The SM then requested that the final result contained not only the presentation of the SROI ratio and all underlying calculations but also a qualitative dimension, that is, a description of the different outcomes for the identified stakeholders. For the SM, it was important to highlight not only the quantitative dimension of social impact measurement but also its qualitative dimension because it was thereby possible to emphasize outcomes without any monetary value. The first half of the final document therefore described in detail the identified quantitative and qualitative outcomes. The second half showed the calculations underlying the

monetary valuation of the eight outcomes and impacts. The document prepared for oral presentations also respected the separation between qualitative and quantitative dimensions.

Thus, the choice for presenting the final result opened the assessment process to aspects other than the financial ratio, as the result of both closing and opening of the previous phases.

Case 2: Support for Integration Service (SIS)

Introduction and Background

Support for Integration Service (SIS) is a service that hosts and supports young people aged 18–21 who were placed by public child welfare services, the agency in charge of child protection. SIS hosts young people just before they exit the child welfare system and aims to support their social and professional integration. The service is fully funded by the local council in charge of the child welfare system. Young people stay with this service for six months to three years (one and a half years on average). The service has thirty spaces. All young people are housed in apartments within the city where the service is located, either alone or with others. One service manager (SM) and three social integration support workers manage the service.

Social impact measurement became interesting for this service for two main reasons. First, the SM wanted to develop this type of service in other cities, and such an assessment would be decisive in his view to convince the local council to expand the service to other cities and to convince other local councils to fund services in other areas. Second, the SM was particularly motivated to objectify his feelings on the effectiveness of the service to promote it within the organization.

Evaluation before Social Impact Measurement: A Closing Phase

At the first meeting between the researcher and the SM, the latter reported that he had already calculated an ‘integration rate’ of the service two years

before. He counted the percentage of beneficiaries who left the service with a housing solution and training or employment. He performed this calculation by remembering the outcome situation of each beneficiary since the introduction of the service (2002). To the extent that he considered the service as primarily dedicated to supporting people towards employment and independent housing, the social impact of the service could be evaluated accordingly. He therefore proposed that the social impact measurement process should consist of calculating the same integration rate, considering the most recent beneficiaries and being somewhat more precise with calculations than he was two years earlier.

Choice of Qualitative Approach and Initial Data Collection: An Opening Phase

Given this perspective, the researcher proposed to extend the assessment to other types of outcomes, particularly highlighting more qualitative aspects (social ties, behaviour, etc.). This was accepted by the SM. Additionally, other outcomes were mentioned (effects on the neighbourhood, on firms hiring young people, etc.). However, it was agreed to focus only on the outcomes for beneficiaries.

The choice of evaluation methodology was not so easy. First, the desire to include qualitative outcomes in the evaluation made the choice more difficult. Second, the researcher found that the service had no written or electronic data on the status of beneficiaries. It was then decided to collect narrative histories of beneficiaries when they were receiving services. Staff members were collectively interviewed by the researcher to build these narratives. Such an approach would both 'create' data that was not recorded previously and capture qualitative outcomes. The methods for analysing these stories were not defined at this stage. Nonetheless, the researcher and the SM agreed to start by collecting a limited number of descriptions to see whether this approach would be relevant for measuring outcomes for young people.

A first meeting was organized with the staff, during which the paths of seven beneficiaries who had left during the previous year were collected.

For every young person, the researcher asked the staff to describe the state of the beneficiary upon entering the service, their evolution while receiving services and their situation upon leaving, as well as some time after leaving if staff had that information. In the unit, each youth was followed by a specific worker, although other members of staff might also have several contacts with each beneficiary (visits to their apartment, informal discussions, etc.).

A Closing Movement: Looking for Common Criteria

The notes taken by the researcher on each of the seven cases provided a basis to try to define common criteria to describe the situation of the beneficiaries when they arrived at the unit (level of education, administrative status, family status, etc.) and when they left it (housing, educational level, employment, social life, etc.) to facilitate linking the two situations (beginning and end) and thus describe the progress of each beneficiary.

Choice of Data Collection: Reopening

However, describing all the situations studied led to a very long list of criteria, and few were relevant to all beneficiaries. The researcher therefore gave up the idea of creating a common list of criteria for all situations and instead proposed to review all of the stories before deciding how they would be analysed. The manager and his staff accepted this proposal, and it was agreed to collect the path descriptions of all twenty-nine beneficiaries who left during the previous year.

Three half-day meetings with the staff were required to collect the stories of the remaining young people. During the descriptions, staff members were naturally led to compare some situations (e.g. 'Y comes from a family with the same characteristics as X, who we discussed before') and to distinguish general phenomena, which facilitated the creation of a number of categories.

Data Analysis Process: Closing Movement

The researcher then analysed the notes taken during all the interviews, compiling overlapping information (e.g. situation in terms of housing, employment and vocational training at the end of support), to create a typology based on initial challenges. Five categories were thus defined (problem with rules, 'prisoner' of his/her family, unstable administrative situation, heavy psychological problems, no particular difficulties). The researcher then attributed a 'grade' from 1 to 4 measuring the degree of resolution of the initial problems. This degree was determined by staff member judgement of the final situation of each beneficiary. Additionally, the grades were validated by the staff. Certain cases were identified and grouped under global labels (i.e. three beneficiaries were identified as taking advantage of the welfare system and were thus excluded by the service, and two beneficiaries exhibited deliberately dishonest behaviour towards the staff). Finally, the analysis led to categorization of each beneficiary according to their initial situation, assignment of a grade for the degree of problem resolution, and then aggregation of the final situation in terms of employment, training and housing to obtain a final percentage.

A Balanced Evaluation Result

We now describe the results of the social impact assessment:

- Result 1 focuses on the effectiveness of the service in terms of effective 'material' integration, represented by the percentage of positive cases. Of all the situations studied, 62 per cent had a home and a job or training after SIS.
- Result 2 aims to show the effectiveness of the service in social problem-solving; 43 per cent of those with significant difficulties had their problems solved (notes 3 and 4 on the problem-solving scale).
- Result 3 reports cases which illustrate the moral dimension of the relationship between the service and the beneficiary: a premature end to support was imposed for youth with inappropriate behaviour according to staff (e.g. taking advantage of the welfare system without any effort, religious radicalization, etc.).

Thus, the final results include both quantitative and qualitative dimensions, combining figures easily comparable with other support structures (Result 1), presenting quantitative data reflecting qualitative outcomes (Result 2) as well as special cases with subjective dimensions (Result 3).

Empirical Findings

Analysis of the two cases reveals that the social impact assessment tools are characterized by their processual character. Even during the use of a pre-existing tool (Case 1 with SROI), a building process was engaged to better match the characteristics of the unit's activity. Our findings help to characterize the different rationales that configure the social impact assessment and structure it in a dynamic movement of closing and opening phases. We consider that two logics are present in the *ad hoc* building of social impact assessment tools that we have observed at the origin of the opening and closing phases. Our findings help to identify these logics.

The first logic refers to the interaction between internal and external stakeholders, both of whom are interested in the social impact assessment, although for different reasons. The external requirements tend to close and freeze the movement, whereas internal requirements tend to reopen it to include more aspects in the evaluation.

The second logic refers to the forces of the tool itself, known as its agency. As Moisdon (1997) stated, a management tool has two different objectives. One is conformity and quick help to facilitate action, whereas the other facilitates exploration and learning. These two objectives, which may have contradictory influences on tool design, also contribute to it in two perspectives. One perspective consists of simplifying reality to satisfy the objectives of quick decision-making and comparison (Berry, 1983; Riveline, 1991). The other perspective involves complexification to better reflect the complexity of real organizational life (Moisdon, 1997) and to keep, as far as possible, interpretive flexibility, i.e. the possibility for users of a managerial technology to engage in its constitution (physically and/ or socially) during its development or use (Orlikowski, 1992).

From our two cases, we now develop these two structuring logics in detail.

A Structuring Dynamic Related to the Balance between External and Internal Stakeholder Pressures

Here we answer our first research question related to the influence of different stakeholders on building the social impact assessment process.

The positioning of the social impact assessment between internal and external issues is found in the two movement types we have highlighted. We have shown that external concerns are reflected in the closing movements, while integration of internal needs corresponds to opening movements.

In Case 1, the first closing movement that we identified was the choice of the SROI methodology to measure social impact. Such a choice involves monetary valuation. The unit manager decided to implement the SROI method rather than other measurement tools to convince potential funders, since he assumed that they would be particularly sensitive to results presented in monetary form. Conversely, the two opening movements in Case 1, consisting of identifying previously invisible outcomes, had internal effects, since they expanded staff members' understanding of the impact of their activities and improved their internal recognition. External recipients had no interest in a large number of significant effects, as a small number was easier to grasp.

In Case 2, analyses of beneficiaries' stories were identified as closing movements. These movements aimed at reducing the situations of beneficiaries to common criteria, thus facilitating an overview of the activity and calculation of the percentage of positive situations. These operations enabled a better representation of the outcomes for external actors. However, this categorization does not directly answer an internal need. The opening movements through path descriptions during the meetings were, in contrast, a time of learning for staff members. However, there were no external expectations regarding how data related to the assessment would be collected.

The correspondence between the external requirements and closing movements can be explained more generally. The external stakeholders' expectations consist mostly of obtaining readable information on the outcomes and impact of the unit evaluated. In this perspective, social

impact measurement helps those who have very limited knowledge about the unit activities. Social impact measurement must, therefore, produce summarized and simple information for those with little time to understand the unit performance. Therefore, the number of outcomes is necessarily reduced to those considered to be most important. These outcomes are translated into clear forms which are known and easily understood by external actors. For example, numbers and money are well-known by external actors. The closing movement performs exactly these functions.

Conversely, internal needs are intended for reflexivity, keeping as close as possible to the perceived reality. In the non-profit sector, the core activity is often provision of an individualized and well-calibrated service to meet the needs of each person. Therefore, the activity is often perceived by actors as intangible and difficult to categorize. The narrative format will naturally be used to report this reality, since it allows description of intangible aspects of this reality through examples and by providing nuances. Furthermore, most of the internal actors consider that every situation is special and that their activity is complex. From this perspective, internal actors will naturally seek to identify a large number of outcomes. This corresponds to the definition of an opening movement.

We have established a correspondence between closing movements and external expectations as well as opening movements and internal requirements. However, this does not mean that closing movements come from external actors or that opening movements are driven by internal actors. For example, the choice of the SROI method in Case 1 was not requested or even suggested by external actors. However, the unit manager made this choice, considering that it was a particularly suitable tool to address external stakeholders. Conversely, opening movements may be provoked by external entities or prior closing movements. In Case 1, identification of outcomes was prescribed by the SROI method. Nevertheless, identifying and retaining a high number of outcomes in the analysis responded to an internally driven logic.

In summary, we have shown that social impact measurement tools are designed to find a balance between internal and external issues and that we can identify both pressures while building the assessment process.

A Structuring Dynamic Related to the Purposes of the Tool: Balancing between Over-Simplification and Over-Complexification

This section provides an answer to our second research question related to the socio-material influence of the social impact assessment process and, in particular, the character of its managerial tool. What kind of influence has this ‘technological’ dimension had on social impact assessment? Our literature review of management tools highlighted, on the one hand, a tension between conforming and learning and, on the other hand, a tension between simplification and complexification of reality.

Our data analysis of the tool design process led us to consider the simplification versus complexification dynamic as structuring the tool design. The simplification and complexification phases are also related to the closing and opening movements that we have previously identified, as we can link simplification with external requirements and complexification with internal expectations. Nevertheless, this balance between simplification and complexification also involves the characteristics of the tool as an aid for action and decision-making.

We show that this search for balance amplifies the closing and opening movements that we have identified. Simplification corresponds to closing movements, whereas complexification contributes to opening the construction of management tool design. However, over-complexification is incompatible with the role of support for action and decision-making, thus leading to a simplification phase.

Looking in detail at the steps in these two cases, we observed that an opening movement was followed by a closing movement and vice versa. For example, in Case 2, the first closing movement (not considering the movement before the evaluation process), which is the search for common criteria, follows the opening movement, which is the collection of descriptions. Accordingly, after a period of maintaining complexity, the need was felt to summarize and simplify the description of each beneficiary. Subsequently, it was found that simplification of reality was not successful, and it was decided to continue to collect other narratives, which

resulted in a new opening movement. Then, a closing movement led to simplification of the reality which was relevant at that stage. The final result reintroduced both complexity and simplification.

Therefore, we observed a succession of simplification and complexification phases which we can link to the agency of the tool itself. At some times during the evaluation process, some considered that the complexity was too important and that it was necessary to simplify reality. At other times, simplification was considered too great or too irrelevant, and an opening movement was then engaged to reintroduce complexity. We then observed that imbalanced situations led to opening and closing movements. These several stages of imbalance and rebalancing movements led to the final evaluation result that we observed in both cases, which can be described as a compromise between simplification and complexity. The evaluation process seeks to reach a balanced result. To achieve that end, rebalancing movements occur during the social impact measurement process when the imbalance is too great.

It is interesting to note that the rebalancing movements do not necessarily originate from the will of the actors aware of the imbalance. Other tool constraints create this search for a balance. In Case 2, the first opening movement, which involved the choice of collecting descriptions of beneficiary paths, came from a unit-related constraint, namely, the lack of written data. It is difficult to say whether other methods were possible, but it is certain that many assessment tools were impossible to implement (including SROI, among other examples). However, this choice, initially made because of this constraint was considered by the actors as an opportunity to open the process, especially regarding the previous quantitative evaluation by the unit manager (before this social impact measurement process) that had neglected social impact. The constraint thus turned into an opportunity. In Case 1, the challenge of the first results led to an opening movement, thus identifying a new outcome. Indeed, the desire to increase the monetary value of the social impact led to reopening the process. The final tool helped both to respond to the difficulty and to expand the approach by identifying an additional outcome, thus strengthening process complexity.

In the end, we observed that the assessment of social impact was structured by the search for a balance between tool simplification and complexity, as well as by the search for a balance between external and internal requirements. This double equilibrium was achieved through the succession of opening and closing movements.

Discussion and Conclusion

A Processual Vision of NPO Performance Measurement

The first contribution is that the tools are constructed by a process. This calls into question the literature on NPOs (Cordery & Sinclair, 2013; Grieco, Michellini, & Iasevoli, 2015; Lacey et al., 2012), which ignores this construction process; we highlight here that different logics structure this process and contribute to tool design. Moreover, this processual vision leads to a combination of quantitative and qualitative approaches and shows that they are not mutually exclusive. The choice of measurement methods does not completely pre-determine the final results since actors maintain room for action throughout the assessment process. More generally, one may suggest that different types of evaluation logics as highlighted by some academic work (Hall, 2014) can be found within the same social impact measurement process.

Rethinking Stakeholder Influences in Social Impact Assessment

Research on social impact measurement has often presented the requirements of internal and external stakeholders as a dichotomy. A quantitative social impact measurement was considered as required by funders, whereas a qualitative social impact measurement was presented as a response to internal needs.

We have shown here that it is not so much qualitative and quantitative dimensions that are required by different stakeholders; rather, a broader expectation of representation and the possibility of comparison for financiers leads to a focus on identifiable criteria; and the most accurate

representation of reality (accuracy) for internal stakeholders. Assessment procedures could therefore combine quantitative and qualitative dimensions, both in the evaluation process and in the final results.

Agency of the Management Tool

Our results are also likely to contribute to the literature on management tools. Indeed, the literature on organizational management tools focuses primarily on internal tools. Our tool, located at the border between the inside and outside of organizations, opens largely unexplored areas of investigation (Lemaire, 2013).

The literature on management tools has shown that designing tools juggles conflicts, such as conformity versus exploration and simplification versus complexification (Chiapello & Gilbert, 2013, 2016; de Vaujany, 2006; Moisdon, 1997). We show that when building social impact assessment tools, we also find a tension between simplification versus complexification which structures the construction process. Our process approach shows that tool design results from a succession of simplification and complexification phases and that there is a transition from one to the other in the case of over-simplification or over-complexification. Many authors have worked on the agency of objects, tools and devices (de Vaujany & Mitev, 2013; Leonardi, 2011). We have taken a different look at the agency specific to management tools, highlighting that this agency, comes not only from the material dimension like any material agency, but also from the rational dimension inscribed in the tool. Using analytical insights from Hatchuel and Weil (1992) who propose a characterization of a management tool in the three dimensions of technical substrate, management philosophy, and simplified representation of the actors involved in its operation, our results show that the agency of the management tool comes not only from its technical aspects but also from its management philosophy and the system of actors involved with the tool. Finally, we have proposed another vision of the evolution of a tool. Because of its processual nature, it becomes apparent that the interaction between the agency of the tool and human agency provokes an evolution of the tool in the event of either over-simplification or over-complexification.

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Managing Knowledge Management: Managing the Manifold of Epistemic Objectives in Professional Health Care Organizations

Christian T. Lystbaek

Introduction

This chapter explores the multiplicity of epistemic objectives in knowledge management practices. More specifically, taking a large health care organization as an illustrative case, it explores how health care professionals engage in multiple knowledge management practices with diverse epistemic objectives that are mediated through diverse objects. The aim of the chapter is to develop a typology of knowledge management practices in professional health care organizations in terms of their epistemic objectives and mediating objects.

Today, few people seem to doubt that knowledge is of utmost significance for most organizations (Alvesson, 2004). Organizational practitioners, consultants and academics have all highlighted knowledge as a key dimension in organization and management, in particular in professional health care organizations, where ‘evidence-based practice’ has become an

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expectation and fashion (e.g. Bose, 2003). This is due not only to increased production of health care knowledge but also to the emergence of information technologies directed at storing and distributing knowledge as well as to the emergence of agencies that specialize in the evaluation and assessment of knowledge, such as the Cochrane Collaboration and other standard-setting governmental bodies at both national and local levels (e.g. Timmerman & Berg, 2003). However, at the same time as health care knowledge is spread across professional and organizational boundaries through a range of knowledge management practices, knowledge is also being contested. For instance, 'evidence-based practice' is often used to emphasize the grounding of practice in research-based knowledge that provides measurable evidence for best practice, but researchers from diverse research traditions are expressing a growing distrust of the supremacy of this kind of knowledge (Gabbay & le May, 2011).

According to critics, the route from research to professional practice is not straightforward for at least two reasons (Bose, 2003). First, research may lead to contrasting results and therefore generate unresolved questions rather than clear advice for practice (Moreira, 2005). Second, even if findings from research lead to general recommendations, the local contexts in which the findings are applied may vary and call for findings to be translated and even transformed by professionals in order to be transferred to local work (Nes & Moen, 2010; Stevenson, 2008). Thus, the notion of 'evidence' has become a complex and contested one, and as a consequence traditional conceptions and monopolies of knowledge are being challenged.

Today, then, health care organizations are permeated by knowledge processes of various kinds in which the handling of knowledge and 'best evidence' has become an issue (Mørk, Aanestad, Hanseth, & Grisot, 2008; Tanenbaum 2009). As a consequence, it is not only knowledge that is spreading but also different ways of engaging with knowledge that involves the production and evaluation of knowledge, historically associated with research (Knorr-Cetina 1999; Nerland & Jensen, 2014). For instance, health care professionals engage in audits, clinical reviews, supervision, mentoring and coaching in which they explore and evaluate the knowledge base of their work. Further, new technologies, new relationships with clients and new regulatory regimes that audit standards of professional work

all contribute to engaging health care professionals in exploring and evaluating knowledge resources in meetings, mails, protocols, databases, guidelines and much more. Moreover, as health care professionals are expected to work in interprofessional collaboration, the challenges of coordination and continuity engage health care professionals in knowledge processes that are distributed across organizational and geographical boundaries. Thus, a multiplicity of knowledge practices has been formed through which health care professionals get involved in knowledge and 'evidence'.

Extensive research has been conducted in the field of knowledge management in general (Akhavan, Ebrahim, Fetrati, & Pezeshkan, 2016) and in health care organizations in particular (Cases et al., 2013), however, there is little consensus on definitions and descriptions. Rather, the terminology has become confused and confusing, with words used interchangeably with little or no agreement in their meaning (Higgs & Andresen, 2001). Taking a 'practice-approach' Knorr-Cetina (1997, 2001) and others (Patriotta 2009; Nicolini 2011; Gherardi, 2014; Nicolini & Roe, 2014) have stressed that knowledge is being managed in a multitude of practices. Such knowledge practices may include making decisions about how to explore and evaluate the validity of knowledge, how to apply and assess it in practical contexts, how to distribute and circulate it across geographical, professional and organizational boundaries, etc. Studies of such practices allow for a focus on the networks that anchor the distributed and fragmented knowledge in organizations. Such networks consist of not only professional communities and organizational cultures but also of material artefacts and technological infrastructures. For instance, Knorr-Cetina (2007) has argued that the engagement in epistemic practices involves more than epistemic objectives; it also involves a variety of epistemic objects in terms of tools and techniques that are produced and used to promote the epistemic objectives of specific practices.

Practice studies, then, have contributed to stress the diversity of practices in which knowledge is an issue. However, while such studies have explored a variety of settings, most have focused on a particular knowledge practice, i.e. a single approach to knowledge management, or generic dichotomies in the management of knowledge such as formal versus informal knowledge management (Blackler, 1995), explicit versus tacit knowledge (Nonaka & Takeuchi, 1995), codification versus personaliza-

tion (Hansen, Nohria, & Tierney, 1999), etc. Little is known about the distinct objectives and objects of knowledge management practices and their interactions (Powell & Ambrosini 2012). The inherent complexity of many health care organizations means that epistemic practices are diverse and distributed, however at the same time they overlap and interact. Research is needed, then, into the multiplicity and dispersion of knowledge management practices in such settings.

In this chapter I will add to this field of research. The chapter will explore how health care professionals are engaged in multiple knowledge management practices. More specifically, I will explore how health care professionals engage in interrelated, both complementing and competing, knowledge management practices that are mediated by distinct epistemic objectives and objects. The aim is to develop a typology of knowledge management practices in professional health care organizations in terms of their epistemic objectives and mediating objects that can help us to analyse how knowledge management practices are diverse and distributed while at the same time relate to and interact with each other.

The remainder of the chapter is organized as follows. First, I describe the methodological point of departure in a practice-based approach. Second, I describe an illustrative case and the analytical framework of five sensitizing devices. Third, I describe the findings in a typology of four generic knowledge management practices, and finally I conclude by discussing the theoretical and practical implications and by identifying vistas for future research.

A Practice-Based Approach to Knowledge Management

Since the 1980s, knowledge has been subject to lively and sometimes heated debates in organizations as well as in organization studies. This is reflected in the large number of organizations that, over the past decades, have implemented formal approaches to knowledge management designed to facilitate knowledge and the debates about them in health care organizations and in general (Nerland & Jensen, 2014).

It seems obvious to say that knowledge is the *raison d'être* of knowledge management: however, looking across the literature it is clear that there is no general agreement as to its meaning. Rather, the literature provides a range of conceptions and definitions of distinct forms of knowledge, including scientific knowledge, technical knowledge, experiential knowledge, embodied knowledge, personal knowledge, practical knowledge, ethical knowledge, aesthetic knowledge and more. While these epistemological concepts are helpful in describing and analysing knowledge in different organizational settings, they are not clearly differentiated. There are many variations in the way they are described and applied in the literature, and these are not mutually exclusive. For example, personal knowledge can be embodied and ethical (Higgs & Andresen, 2001). And practical knowledge encompasses many of the other forms of knowledge (Stevenson, 2008). Thus, many of the epistemological concepts overlap in complex ways.

Due to the enormity and diversity of the literature, it is not possible to outline and review the literature in detail in the space of this chapter. Suffice it to state that according to some scholars, the concept of organizational knowledge has become fuzzy since it has come to 'cover both everything and nothing' (Alvesson, 2004). Others find that the wide range of terminologies creates 'an epistemological mess' (Higgs & Andresen, 2001, p. 35) that causes confusion and ruins effective communication and understanding among practitioners, educators and researchers. While I recognize the fear of confusion, I do not believe that eliminating the complexity is either desirable or necessary. It is not even possible. Knowledge is a multi-faceted phenomenon that has been explored and explained in a variety of disciplinary contexts; from philosophy and sociology, to psychology and cognitive science and to economics and management studies. Thus, as argued by Blackler (1995, p. 1032), we have inherited a conception of knowledge that 'is multifaceted and complex, being both situated and abstract, implicit and explicit, distributed and individual, physical and mental, developing and static, verbal and encoded'.

According to the practice-approach taken here, the specificity of knowledge in organizations lies in the pattern of collective activity, i.e. in the way in which knowledge is practised. A practice approach, which in

itself is not one approach but a family of approaches (Nicolini, 2012), is based on the intuition that 'phenomena such as knowledge, meaning, human activity, science, power, language, social institutions and human transformation occur within and are aspects or components of the field of practices' (Schatzki, 2001, p. 2). In other words, organizations are both the site and the result of work activities, and management is as a particular form of activity aimed at ensuring that these activities work more or less well in a way that reflects the structure of the organization and the nature of the tasks. Management, then, is not only carried out by formal managers but by all who engage in this activity. When knowledge management is studied through the lens of a practice approach, 'one sees the fine details of how people use the resources available to them, to accomplish intelligent actions, and how they give those actions sense and meaning' (Gherardi, 2012, p. 2). As a consequence, knowledge management is studied 'as something that is routinely made and remade in practice using tools, discourse and bodies' (Nicolini, 2012, p. 2).

Thus, taking a practice approach has epistemological and empirical consequences. Epistemologically, a practice approach goes beyond problematic dualisms of mind versus body, action versus structure, human versus non-human. Knowledge is seen not as an innate mental faculty or as an individual or structural phenomenon, but as a practice phenomenon, i.e. an interweaving of elements that are formed by being interconnected (Gherardi, 2012, p. 3). It involves mind and body, action and structures, human and non-human elements. A practice, then, is not a unit circumscribed by given boundaries and constituted by defined elements, but rather as situated processes of connection-in-action. Taking a practice approach, knowledge management appears as a vast set of activities made durable by being inscribed in minds and bodies, objects and texts, and knotted together in such a way that the results of one activity become the resource of another. Studying the link between knowledge activities implies looking at how such activities are inscribed and internalized in organizational practices that are interconnected and in flux, as the result of ongoing work. Boundaries around specific activities can be difficult if not impossible to draw, then, and as a consequence they can best be studied as parts of organizational practices with distinct objectives.

Empirically, this implies that ‘when studying practices, the researcher is interested in understanding how they are seen “from inside”, how conceptions and discussions form around the mode of practicing a set of activities’ (Gherardi, 2012, p. 2). Practices are sustained by normative conceptions, i.e. conceptions of what constitutes a good or successful practice. Although not everybody realizes them equally or fully, everybody relates to them, and they make themselves felt. Thus, a practice involves certain practice-specific emotionality, i.e. wanting certain things and avoiding other things. This means that the sense of what is right or wrong does not belong to individual human beings but to practices (Reckwitz, 2002, p. 254). However, it does not mean that the norms and forms of a practice are static or that they are subject of universal agreement. On the contrary, norms and forms change when someone finds better ways of doing, making and using something. Thus, the socially situated and culturally embedded nature of knowledge means that the norms or forms of correctness are open to change and to contestation. Competing conceptions of what constitute legitimate or proper practice can occur where different people develop incompatible and contradictory analyses of the same events. One of the main consequences flowing from this is that issues of power, politics and conflict become more important than many studies of knowledge management acknowledge. Mainstream research has been overwhelming optimistic and has mainly focused on knowledge as a resource (Storey & Barnett, 2000); however, a practice approach stresses that power and politics are an issue in knowledge management.

Since a practice approach provides the conceptual grounding for the study of knowledge management in health care organizations in this chapter, I will elaborate on it drawing on an empirical study of a large neurorehabilitation centre in the following section.

The Empirical Case: Neurorehabilitation

The field work took place at the Activity Centre, a large health care organization situated in the western part of Denmark that offers neurorehabilitation treatment to people suffering from an acquired brain injury.

Neurorehabilitation refers to many different kinds of specialized support and services that are offered following the early phases of brain injury treatment (DACEHTA, 2011). The cause of the brain injury is typically an accident (e.g. a traffic accident) or a cerebral infarction. Today, more people survive such trauma, and as a consequence more people are living with or at risk of having complex negative health effects after acquiring brain injury. These effects may appear as impaired physical, cognitive and social functioning. The acute treatment of acquired brain injury has been a focus both in Denmark and elsewhere for many years and organizations and professions carry out services targeting the physical, cognitive and social problems of neurorehabilitation patients. Brain injury rehabilitation thus includes numerous services targeting the injury and the person's life situation in order to reduce the negative effects of the trauma and to enable the person to achieve an independent and meaningful life. Some brain injury rehabilitation is offered as a programme in a clinical setting while others occur on an outpatient basis. The specific type of rehabilitation depends on the requirements of the person and the challenges they face. People with acquired brain injury are a heterogeneous group with very diverse and multi-faceted problems and rehabilitation needs.

At the time of my study, the Activity Centre had an enviable record of treatment successes and a high level of patient satisfaction, and it often had visitors and invitations to present their methods and results both nationally and internationally. The treatments consisted of different kinds of specialized, multi-disciplinary rehabilitation oriented towards continuing outpatient rehabilitation after discharge from hospital. It was based on the principle that an early discharge to continuing home-based rehabilitation provided by a clinical multi-disciplinary team has a positive effect, especially if it is oriented towards activity-based objectives that are determined jointly with the person with acquired brain injury and his or her relatives. However, new treatments and technologies are being developed continuously and hence the management and professionals are engaged in exploring the extent to which knowledge can be obtained and assessed about not only the effects of individual types of intervention but also the more general principles and conceptual frameworks that underpin and influence such interventions. For instance, although client-centred approaches are broadly recognized and incorporated into neurorehabilitation in various ways, there is no

agreement on how to define a client-centred approach. Various terms are used for client-centred approaches, which are often attributed different meanings. Further, multi-disciplinary teamwork is generally assumed to be a prerequisite for achieving positive results, but there is no agreement on how to define the content and nature of teamwork. Again, various definitions of multi-disciplinary teamwork cover different types of collaboration, such as working together closely or in parallel, and the multi-disciplinary teamwork on rehabilitation services are composed and structured in many different ways. Thus, many actors and agencies in the field are concerned with the evidence on the effects of the rehabilitation services in order to provide professional advice on how brain injury rehabilitation can be organized across organizations and professions such that the rehabilitation services are targeted appropriately for the people involved (DACEHTA, 2011). In the Activity Centre, this concern was at issue in a range of knowledge management activities directed at evaluating and implementing new knowledge from research findings, producing knowledge within the organization, distributing knowledge in the organization and more.

My field study focused on the knowledge management practices in and across the four units of the Activity Centre. Two units were residential treatment centres offering different kinds of home support and home-based training, and two other units were clinical centres offering different kinds of clinical treatment and training. Thus, the Activity Centre was offering rehabilitation services for both home-training on an outpatient basis and programmes in a clinical setting. In all units, the multi-disciplinary teams were working together on the rehabilitation services.

My orientation to data collection was exploratory, intended to generate insights into the contexts and conditions that constitute different ways of managing and handling knowledge. As part of the study, I spent time in all of the units during a period of one year. I did both participant and non-participant observations in each unit and conducted twelve interviews with the management and key members of staff, whom I interviewed twice. The interviews lasted from 40–95 minutes and were conducted one-on-one with the participants, either in their offices or in a meeting room (Table 1).

I also spent time talking to the participants informally, usually joining them for lunch during my time in the different units. The process of data

Table 1 List of interviews

Interview participant	Interview 1	Follow up: Interview 2
Manager	90 minutes	45 minutes
Sous chef	45 minutes	45 minutes
Occupational therapist	95 minutes	60 minutes
Physiotherapist	50 minutes	45 minutes
Social worker	60 minutes	40 minutes
Health care assistant	70 minutes	40 minutes

collection proceeded iteratively, with the early stages being more open-ended than the later ones, since this allowed for flexibility in the data collection and analysis, i.e. it allowed for themes to emerge and then be re-examined more deeply as relevant. After the interviews, I moderated two focus group discussions with key members of staff. The focus group discussions lasted from two to three hours and addressed the main issue from the observations and interviews. In addition to observations, interviews and focus group discussion, I collected data by reviewing some of the extensive documentation generated by the Activity Centre as well as descriptions of rehabilitation services generated by governmental offices at local and national levels, such as the Rehabilitation Forum in Denmark and the Danish Centre of Health Technology Assessment. Organizing structures, training and development programmes, methodologies and guidelines provided important contextual information on the knowledge management approaches and issues that were handled at the Activity Centre.

The purpose of this chapter is not to offer a comprehensive synthesis of these approaches nor a resolution to their discussion. The purpose is much more modest and is to explore how health care professionals engage in the multiple knowledge management practices that are mediated by distinct epistemic objectives and objects. The aim is to develop a typology of such practices in professional health care organizations.

Analytical Framework: Five Sensitizing Devices

The knowledge management literature has devoted far more space to knowledge than to management, and typically the nature of management is not examined but regarded as self-evident and unproblematic (Alvesson

& Kärreman, 2001). From a practice-based perspective, knowledge is not something that can be directly managed in a traditional control sense of the term. Rather, the active role of management is regarded as attempting to shape knowledge processes to involve specific kinds of interaction and communication between people. The managerial role in knowledge management is to encourage and facilitate communication and social interaction processes that will allow for different activities and practices in which knowledge is at stake. This can be done through an enormously diverse range of ways. As Tsoukas (1996, p. 22) has stressed, ‘the key to achieving coordinated action does not so much depend on those “higher up” collecting more and more knowledge, as on those “lower down” finding more and more ways to get connected and interrelating the knowledge each other has’. A simple transmitter-receiver model of knowledge management is inadequate because the sharing of knowledge does not involve a simple transferal of a fixed entity between people. Instead, the sharing of knowledge involves people actively inferring and constructing meaning.

A practice approach constitutes a departure from traditional ways of understanding organizational matters in that it takes practices, not practitioners (e.g. managers) as the basic units of analysis for understanding organizational phenomena (Schatzki, 2001). Thus, it offers a sensitivity to ‘what is going on’ that orients towards new objects of inquiry and eventually generates a new view of organizational matters. In particular, it allows for sensitivity to the objectives or ‘matters of concern’ of practices, i.e. what is relevant or pertinent to a given situation. When studying knowledge management practices from a practice-based perspective, the ‘point of departure is that practical knowledge is over-determinate by nature: multiple and often dissonant causes, forces, histories intersect at the point where practice is accomplished’ (Nicolini & Roe, 2014, p. 67). Thus, the adoption of a given *modus operandi* of knowledge management leads to the promotion of some aspects of knowledge and the suppression of alternatives.

The specific analysis of the data for this chapter is based on the five analytical characteristics or ‘sensitizing devices’ proposed by Nicolini (2012) that help to tap into a repertoire of actions with specific canons and conceptions of knowledge management.

First, according to Nicolini (2012, p. 3) taking practice as the unit of analysis implies foregrounding the importance of activity in organizational life. A practice is an ongoing routinized and recurrent accomplishment. This applies even to the most durable aspects of organizational life that scholars sometimes refer to as structures, such as institutions and authority. Such phenomena are constituted through recurrent material activities, and they only exist as long as those activities are performed.

Second, taking practice as the unit of analysis implies bringing to the fore the body and other material 'things' and objects in social affairs and activities (Nicolini, 2012, p. 4). Practices are routine activities made possible by the contribution of an array of material resources. Practices without material resources are not conceivable. Rather, objects make practices durable and interconnected across time and space. For instance, tables, chairs and the rest of the things in the room actively participate in both producing and perpetuating the activity of conducting a meeting. Using such objects, participants do not have to negotiate tasks and roles every time they have a meeting since the objects mediate much of this. Objects thus both participate in the accomplishment of a practice and make this practice durable over time.

Third, taking practice as the unit of analysis implies an analysis of agency and agents as both producing and produced by practices, i.e. as carrying out as well as carriers of practices (Nicolini, 2012, pp. 4–5). Individual actions take place and are intelligible only as part of an ongoing practice, however, a practice approach leaves space for creativity and critique. Creativity and critique are not only possible or desirable but necessary since performing a practice is not a mindless repetition of routines, but requires adapting to new circumstances. The focus is thus not on the performance of an individual but on the practice and the horizon of intelligible action that it makes available.

Fourth, taking practice as the unit of analysis implies conceiving of competence as the capacity to carry out a social and material activity. This does not only involve having learned how to act and how to speak, but also how to feel and how to ascribe meaning (Nicolini, 2012, p. 5). Participating in a practice implies accepting certain ideals, i.e. certain ways of feeling and wanting. What is right and wrong then does not belong to individuals but to practices. A practice approach is thus an

alternative to the extreme forms of materialism that reduce organizations to things, structures and conflicts of interest as well as extreme forms of textualism that reduce organizations to texts, signs and communication. A practice approach requires that we situate the discursive and symbolic with the material and technological.

Finally, taking practice as the unit of analysis implies an emphasis on power and politics. Practices are oriented towards specific objectives and interests, and put people in situations that allow them to do things and to think themselves in a certain way (Nicolini, 2012, p. 6). Practices, then, produce and reproduce power, but at the same time practices are also always open to contestation and this keeps them continuously in a state of tension and change. This issue is typically ignored or neglected by the majority of the knowledge management literature; however, it is important as knowledge management practices tend to produce and reproduce a landscape of not only possibilities but also impossibilities and inequalities in terms of the positions and privileges available for participants in specific practices.

A Typology of Knowledge Management Practices

The Activity Centre has several activities designed to manage knowledge, such as audits, mentoring, coaching, supervision and a range of mono-disciplinary and multi-disciplinary meetings in which not only the effects of specific interventions but also the value of more general principles and conceptual frameworks were described and discussed. Thus, the Activity Centre has a repertoire of knowledge management practices. The empirical insights from the study do not amount to a comprehensive synthesis of knowledge management practices but a more modest identification of different types of knowledge management practices with different objectives and matters of concern. More specifically, I identify four sets of knowledge management practices, i.e. four *modus operandi* of knowledge management, which are directed at distinct epistemic objectives and mediated by distinct epistemic objects. I label them normative knowledge management, formative knowledge management, reflexive

Table 2 Generic types of knowledge management

Analytical characteristics	Normative KM	Formative KM	Reflexive KM	Emotive KM
Main activity	Identification of the general standards and norms of best practice	Formation of practitioners in the image of expert practitioners	Sharing and creating ideas about new initiatives	Exploration of emotions in difficult situations
Key objects	Computers, databases, search engines	Objects of daily work, specific situations	Inspiring settings, roundtables, paper and pens	Quite room, chairs, time to talk without disturbance
Role of agents	Professional practitioners search and review the literature	Expert practitioners instruct less experienced practitioners	Reflective practitioners develop and test new ideas and initiatives	Colleagues support each other in dealing with emotions
Key competencies	Reviewing general norms of best practice	Forming novices in the field	Developing new ideas and initiatives	Taking care of destructive emotions
Political issues	The politics of research	The politics of tradition	The politics of innovation	The politics of transparency

knowledge management and emotive knowledge management respectively. The key characteristics of the four knowledge management (KM) practices are summed up in Table 2.

Normative Knowledge Management

One *modus operandi* of knowledge management relates to the normative aspect of knowledge, i.e. knowledge as a general norm or standard that knowledgeable professionals should follow and be accountable to. In the Activity Centre—and elsewhere—this kind of knowledge management is dominant in practices such as auditing and reviewing the literature for the best available evidence. The key objective of this kind of knowledge

management is to identify the norms of 'best practice'. Thus, this kind of knowledge management is directed at reviewing the body of available knowledge, mainly the research literature, in order to identify the general and impersonal prescriptions that define expectations of the organization in terms of task. These practices are mediated by objects and technologies such as computers, search engines and databases that contain documents, which facilitate communication and easy distribution of information. The role of agents in these practices is to search and review the literature, and hence professional practitioners should have competencies in assessing and evaluating the evidence. However, research-based knowledge is scientifically grounded and generated in a highly structured process that involves a detailed discussion of its generalizability, but it rarely provides direct solutions to practical problems. Thus, normative knowledge management involves contested political issues regarding both which kinds of research are given priority as well as contested issues regarding the relationship between research and practice.

Formative Knowledge Management

Another *modus operandi* of knowledge management relates to the formative aspect of knowledge, i.e. knowledge as a specific form or way of acting skilfully. In the Activity Centre—and elsewhere—this kind of knowledge management is dominant in practices such as mentoring, tutoring, etc. in which experts instruct others, mainly novices and apprentices, who observe and imitate. The key objective of this kind of knowledge management is to form practitioners in the image of an expert or master practitioner, in order to spread the practical and personal experience that define master practitioners. These practices are mediated by 'rich' social interaction and interaction with the objects and technologies of the knowledgeable activities itself through which somebody acquire knowledge through either undertaking a particular task or closely observing an expert who is carrying out the particular task. The role of agents in these practices is to have experts to instruct less-experienced participants via actually doing the job, i.e. carrying out work-related activities. The knowledge of the expert is to some extent embodied and

cannot be fully articulated and made explicit. Hence, the master and apprentice mostly interact, work and communicate together, typically over an extended period of time. Practical expertise is built up from personal experience, which is manifest in their practical skills and competencies regarding how to solve the problems that occur in specific situations in everyday work and life. This type of knowledge can therefore be difficult to access and communicate to others, and its context-bound nature limits its generalizability. Thus, formative knowledge management involves contested political issues regarding which kinds of expertise should be considered a role model in practice as well as when and where expertise is outdated and ineffective, for instance when new technologies are introduced.

Reflexive Knowledge Management

Yet another *modus operandi* of knowledge management relates to the reflective aspect of knowledge, i.e. knowledge is never infinitely 'settled' but an object of continuous reflection. A range of activities directed at facilitating reflection have been developed both in the context of education and in workplaces, in particular in the wake of Schön's (1983) seminal analysis of *The Reflective Practitioner*, which stresses that reflection represents an important and intrinsic feature of professional health care. For instance, caution has been raised that both research-based evidence and practical expertise without reflection may have unforeseen and potentially harmful effects (Nilsen, Nordström, & Ellström, 2011). In the Activity Centre—and elsewhere—this kind of knowledge management is dominant in practices such as coaching, interdisciplinary collaboration, etc. in which professionals who are faced with the practical concern of 'what to do next' are reflecting on and considering alternatives in interpersonal interaction and dialogue with others. The key objective of this kind of knowledge management is to reflect on and consider alternatives when faced with the practical concern of 'what to do next'. These practices are mediated by objects and technologies that stimulate reflection and discussion such as round tables, chairs, whiteboards, etc.

The role of agents in these practices is to engage in continuous reflection in terms of brainstorming and ‘imagineering’ (Marcos & Denyer, 2012), and participants, then, should be able and willing to engage in reflective perspective taking and perspective, for instance in collective problem-solving in interdisciplinary teamwork. Thus, reflective knowledge management involves contested political issues regarding which kinds of reflection should be considered relevant as well as which kinds of reflection should be the basis of decisions.

Emotive Knowledge Management

Finally, a fourth *modus operandi* of knowledge management relates to the emotive aspect of knowledge, i.e. knowledge about the emotions involved in work, in particular in difficult situations and conflicts with clients or colleagues. In the Activity Centre—and elsewhere—this kind of knowledge management is dominant in practices such as supervision, stress management, etc. The key objective of this kind of knowledge management is to deal with the emotions at work, in particular the potential destructive emotions relating to stress and threats. Patients in neurorehabilitation suffer from brain injuries, and some of them can be offensive and even dangerous. Thus, professionals in neurorehabilitation and in health care organizations in general often find themselves being threatened or in others ways stressed by the situations they find themselves in at work. Thus, emotive knowledge management is mediated by objects and technologies such as small group settings, ‘hot chairs’, etc. which allow participants an intimate and trustful space where they can share their experiences and emotions. The role of agents in these practices is to talk openly and honestly about their own feelings and emotions as well as to listen to and support colleagues; hence professional practitioners should have competencies in expressing and responding constructively to feelings and emotions. Thus, emotive knowledge management involves contested political issues regarding which feelings and emotions should be shared collectively as well as contested issues regarding how particular feelings and emotions are best taken care of and coped with.

Discussion of Theoretical and Practical Implications

It seems clear from the above that knowledge management practices at the Activity Centre are multiple. The suggested typology of knowledge management practices is not proposed to be exclusive or exhaustive but only illustrative of the main repertoires. Consider first normative knowledge management. Reviewing the best available evidence and the general standards and norms of best practice does not guarantee that they are implemented, and there may be good reasons for not following the general norms of best practice. However, identifying the general standards and norms of best practice does offer some guideline as well as some points of reference, if any redefinition or reconstruction of work practices is deemed appropriate. Second, formative knowledge management ensures ongoing instruction and training and thus serves to develop the capabilities and the depth of experience of the participants. Third, reflective knowledge management allows for a multiplicity of voices in discussions, deliberations and decision processes about what to do and in particular in innovation processes directed at developing new ideas and initiatives. Finally, emotive knowledge management invites participants to share feelings and emotions, and hence allows for support as well as for building and maintaining strong social relations among participants that generates trust, respect and mutual commitment.

The typology suggested here has several theoretical and practical implications. First, the typology can take account of the heterogeneous ways in which knowledge management is defined and practised. The types of knowledge management practices stipulated in the typology are ideal types and should be understood as over-determinate and overlapping. This helps to explain and understand that knowledge management practices are not simply a mechanical realization of a procedure or a routine. It may have patterns, but it is the continuous reproduction of such patterns anew that establishes a practice. Knowledge management activities, then, are not fixed or given practices, but are, rather, constituted in the ongoing and situated practices of the participants. The analysis indicates that knowledge management practices can intersect through the specific activities engaged in by the participants. The practices are pro-

duced and reproduced, dynamically and recurrently over time, when members of the organization engage in them. In the Activity Centre, professionals were found to change their focus because of the experience they gained from taking part in different knowledge management activities. What matters or counts in a given situation is something that participants negotiate and codefine. One manifestation of this is in the literature. Much research exists on different knowledge management activities, such as audits, clinical reviews, supervision, mentoring, coaching, and furthermore there are many variations in the way in which they are described and applied (e.g. Schultze & Stapel 2004; Garvey, Stokes, & Megginson, 2014). Thus, the typology suggests that knowledge management activities are necessarily provisional in the sense that they are never given, only achieved.

Organizations, then, preferably should arrange for different knowledge management activities that serve normative, formative, reflective and emotive purposes—and the objectives and mediating objects should be specified as well as the intersection between them. The intersection can be fruitful and different knowledge management practices can overlap when participants are invited both to consider the general norms of best practice and to learn from the specific and local forms of expertise—and these might be an object for reflection and discussion of their possibilities and limitations as well as the difficult situations practitioners might find themselves in.

Further, the typology suggested here can account for the importance of power and politics in knowledge management practices. Much of the knowledge management literature presents specific approaches and activities in a very positive light, suggesting that in relation to knowledge processes they are only beneficial for organizations. Much of the knowledge management literature has, then, provided a one-sided and unbalanced analysis of knowledge management activities. One manifestation of the neglect of power and politics is that knowledge management activities are typically described as productive social interactions where consensus is the norm. However, knowledge management activities may develop 'blinkers' which can inhibit other kinds of knowledge management activities. The limitation of this idealistic characterization of knowledge management activities is that it creates blindness to their potential negative

features and the range of ways in which they may inhibit organizational knowledge processes. A specific kind of knowing is also a 'not-knowing' (Orlikowski, 2002a, 2002b). In other words, while it is enabling it is also inhibiting. Thus, as organizational practices in general, knowledge management practices are both expanding and constraining the health care professionals' repertoire of conduct (Nicolini, 2012). On the one hand they expand the possibilities of what to do, say and even think by tapping into the repertoire of actions sedimented in a specific practice, and on the other hand they involve certain canons that automatically limit what is doable, sayable and even thinkable in specific activities. The adoption of a given *modus operandi* of knowledge management, then, leads to the promotion of some aspects of knowledge and the suppression of alternatives. As members of the organization draw on this repertoire of practices across situations and over time they generate and sustain a collective, organizational knowing of a specific kind. The enactment of a specific kind of knowledge, however, is not without negative consequences.

Thus, knowledge management activities have inherent tensions built into them. The tensions result from the different aspects of knowledge in health care organizations. This creates potential conflicts in the interpretation of activities and the participation in them. Issues of power and politics, however, can shape internal dynamics of knowledge management activities. The tensions that are an inherent aspect of knowledge management activities take on huge importance, when activities change—which inevitably they do. Change in activities requires people to adapt and this threatens the reproduction of existing activities and the interactions—and positions taken—in them. Thus, some participants in an activity may see a change as a threat to their position and status, whereas other participants may see it as an opportunity to develop and increase their knowledge, power and position in the activity. This implies that it cannot be assumed that all participants are equally interested in given activities, or that they will respond in the same way to changes in them. Knowledge management activities are always open to dispute, and as a consequence conflict can occur where individuals and groups develop incompatible and contradictory understandings of the same events, which may lead to conflict due to attempts by some to have their understanding legitimated.

Finally, the typology suggested here may account for the importance of material objects and technology in knowledge management practices. The knowledge management literature typically differentiates between technology-centred approaches and people-centred approaches. For instance, one of the earliest, but arguably the most influential typology of knowledge management was developed by Hansen et al. (1999), who differentiated between two broad strategies in knowledge management; codification and personalization. The codification strategy is concerned with storing and retrieving codified knowledge, whereas the personalization strategy, by contrast, is concerned with face-to-face sharing of knowledge between workers.

While the first strategy suggests that knowledge management is a matter of implementing a particular type of communication technology, the other focuses on managing the people who possess knowledge. Such simple distinctions, however, tend to end in either 'objectivist reification' on the one hand or 'subjectivist reduction' on the other (Orlikowski, 2002a, 2002b, p. 250). A benefit of the typology suggested here is that it pinpoints the interrelated nature of technology and people. It stresses that knowledge management activities are constituted by multiple and interrelated practices with distinct objectives and objects. Technologies are important means through which knowledge management is re-framed and re-ordered. They promote new activities and skills as well as alter the parameters by which knowledge is produced and used in organizations.

For instance, information technology enables persistence of text, images and sound when this is stored in a system where it remains over time and can be accessed later. Objects and technologies however do not only have a supporting role, but serve to coconstruct and transform the practices into which they are introduced (Cooren et al. 2012; Orlikowski, 2007). Thus, they enable and enact specific knowledge management practices. Things allow people to do things. Objects are typically created because they serve a functional purpose; however, this does not mean that all features of an object map directly to the outcomes imagined by the designers, or that users and designers share a similar understanding of potential functions. Specific features tend to be selected and used because of their usefulness, while other features may be disregarded.

The issues discussed above, however, should be studied further. I will end this chapter by suggesting three limitations in this study and suggest vistas for further research. First, the case, although illustrative, is limited to a single health care organization and hence is the conclusion. As with any study that attempts to conceptualize and incorporate complex and conflicting insights, the effort is not without its rough edges. Further research should test, explore and maybe expand the typology developed here.

Second, the political aspects are only described briefly in this study, and could be explored in more detail in further research. Research has demonstrated that professional practitioners negotiate with different modes of knowledge, when they discuss and construct practical standards of work (Nes & Moen, 2010; Nilsen et al., 2011) as well as when they organize supervision (Neufeldt, Karno, & Nelson, 1996), mentoring and coaching (Garvey et al., 2014); however based on the typology suggested here research could explore how different norms, forms, reflections and emotions influence such negotiation.

Third, the role of objects is described briefly in this study and could be explored in more detail in further studies. Research has demonstrated that certain objects serve as boundary objects (Star & Griesemeyer, 1989), i.e. objects that can be used in several settings, serving different needs. Boundary objects 'are weakly structured in common use, and become strongly structured in individual-site use' (Star & Griesemeyer, 1989, p. 389). Thus, boundary objects have different uses and meanings in different practices, but still their structure is common enough to make them recognizable, and hence to serve as a means of translation. One manifestation of this is that boundary objects are often involved when participants in knowledge management activities experience tensions and redirect the focus of attention in the activity. For instance, a document with a written description of best practice can be considered a general norm and, hence, assessed and evaluated in terms of its qualities as a general standard; however it can also be considered a specific form and, hence, be dealt with as a potential role model. Or it can be considered an object for reflection and, hence, be explored in terms of its perspective and possible alternatives, or an object of affection and, hence, dealt with in terms of the feelings and emotions it provokes. Knowledge management activities are always open to dispute, as are the objects that mediate them.

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Conclusion: What Next, What For?

Philippe Lorino

It is a challenge to write the conclusion of this book, which above all demonstrates the high diversity of situations: diversity in the types of managerial techniques or management tools involved (risk management, performance management, internal auditing, social impact measurement in non-profit activities, knowledge management and, surprisingly not so present, profit, return on capital or cost management...); in their functional orientation or practical effects (actors' control, actors' resistance, fairness and ethics effects, learning, social communication...); in the theoretical and methodological frameworks adopted (institutionalism, pragmatism, accountability, sociology of science, ethnography, practice theory...); and in the concerned activities (health care, public administration, nuclear waste management, museums, process industry, non-profit...). But, precisely through this diversity, the book demonstrates

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that the definition and the role of managerial techniques and the analysis of their material dimension are complex issues that, too often, theoretical models tend to over-simplify.

In the academic literature, management techniques with their material dimension are variously portrayed as a mechanism to deploy managerialist ideologies into organizations, as a magic weapon against bureaucracy in New Public Management (NPM) or, to the contrary, as the corruption of public interest, as the core of business ethics, as the symbol of market efficiency, or as a pretext for employees' moral harassment... This book shows how difficult it is to build general laws and how much situations matter. Nevertheless, on the basis of the research experiences presented here, it is possible to emphasize that managerial techniques are not only social and material, but also temporal. In other terms, they have a historical dimension, they are most often in the making, and they produce effects in a situation of collective, organized and transformative action that is itself in motion. Therefore static and entity-based analyses are often misleading, because they tend to ignore how complex and unpredictable the uses of managerial techniques may be.

Situatedness

Situatedness is thus a key characteristic of the uses of managerial techniques. It may seem paradoxical, since generally managers expect from them some form of generic relevance, overcoming the singularity of each particular situation. However, as it appears in several chapters of this book, the practical effects of managerial techniques do not mechanically result from the structural characteristics of managerial devices per se (e.g. the accounting structure, the cost drivers definition, algorithms for depreciation calculation, etc.), but rather from the relationship between these structural characteristics and the situated activity in which they are involved. Thus the performativity of managerial techniques and models, far from imposing straightforward social practices, appears as an ambiguous issue (MacKenzie, 2001): the effects performed by management techniques can prove surprising for all actors, including their designers.

In our analyses, we should not forget that, like the words of ordinary language, managerial tools are not unequivocal artefacts, but always have a double face. In the case of language, let us take the example of the word ‘congratulations’. It refers to a social and generic concept that a dictionary can try to communicate. But the angry boss telling her collaborator ‘Congratulations!’ after a serious mistake was made means quite something else, more or less the opposite of the dictionary meaning. It is an utterance that only the situation, the tone of voice, the knowledge of previous events, can make intelligible. The word is involved in a ‘speech act’ whose meaning depends on the circumstances as much as on the generic concept conveyed by the dictionary. The concept is just a resource for the accomplishment of a situated speech act.

Managerial techniques work in similar ways. For example, the ‘cost of non-conformity’ on the one hand is a concept: the concept of non-conformity, the conception of what configures the cost of non-conformity, underlined by a tacit causal model linking resource over-consumption with non-conformities; the translation of this model into computational rules and algorithms: as a socially agreed concept, the ‘cost of non-conformity’ becomes institutionalized, and may frame practices in organizations and in professional groups, such as cost accountants or quality managers. But, on the other hand, the ‘cost of non-conformity in June 2017 in the XYZ factory’ is a precise figure here and now. It is a meaningful object involved in a specific situation, a factual/physical element of the situation, an event which ‘occurs’ and may surprise all actors. This event takes the form of a number: it is a ‘number-act’, involving the ‘cost of non-conformity’ concept as a resource. Its meaning and impact depend on the social and material situation, what happened before and what actors expect to happen next. Therefore, due to situatedness, the meanings and practical effects of managerial techniques can never be taken for granted. They vary over time and across social space. They are continually involved in pluralist controversies and exploratory inquiries, even if inquiries and controversies can be tacit and invisible to external observers (which, by the way, raises methodological problems for researchers).

Pluralist Controversies

There are multiple views and competing frames, not only about the meaning of managerial signs and the resulting courses of action, but also about the very design of managerial techniques. Therefore the controversies about the design of management tools and controversies about their practical application are often analytically inseparable (Lorino, Mourey, & Schmidt, 2017). Numbers are redesigned to be used in a specific perspective, in response to a singular situation, and, reciprocally, the application of tools always takes their design into account. The redesign and the active engagement of managerial techniques are intricately integrated.

Exploratory Inquiries

Organizational action requires an ongoing assessment of ‘where we are, where we are headed, and where we want to go’. Another way to formulate such ‘navigational’ questions is more directly value-laden: ‘Are we doing well? Are we fulfilling expectations? Are we good at doing what we must do?’ Valuation—the attribution of such values as ‘good’, ‘right’, ‘fair’, ‘effective’ or ‘safe’ to action—is an omnipresent component of social life and of organizational processes. This active process of valuation (Dewey, 1939/1988), formal or informal, is instrumented by materialized signs, such as accounting and financial numbers, rankings, performance indicators, qualitative performance judgements, a boss’ or customer’s expression of satisfaction. These signs of ‘values’, produced through more or less complex procedures, algorithms and techniques, involve the use of data. Data themselves result from processes of definition, temporal and spatial bounding and dividing, selection, so that they are enacted rather than captured and stored; they constitute ‘a contingent performance’ rather than ‘an objective resource’ (Jones et al., 2017).

The processual nature of data is not a recent discovery: the statistician Walter Shewhart, the father of statistical process control and pioneer of quality management, had already theorized it in the 1930s, when he emphasized that *ex ante* data subgrouping was already laden with theory

and had a major impact on the intelligibility of situations. He concluded that statistical control is a judgement rather than a passive measurement (Shewhart, 1931). That is why such authors as Dewey (1939/1988) and Muniesa (2011) suggest operating ‘a shift in subject matter from value (or values) to valuation, considered explicitly as an action’ (Muniesa, 2011, p. 25).

The valuation practice is fundamentally temporal. It tries to relate immediate goals, ‘ends-in-view’—responding to the question ‘what next?’—and distant motives, existential imperatives—responding to the question ‘what for?’. Techniques of management are inscribed in time and always have a historical trajectory: they refer to past experience, and they are supposed to anticipate future consequences. Valuation continually rolls the desired future into the present situation and into the reinterpretation of past experience. It does not passively forecast next events but actively enacts the future. The enactment of the future leads to questioning past action, in an ongoing effort to understand trajectories and to make the most of experience.

This material and processual perspective on managerial techniques raises fundamental theoretical issues. In particular, it questions two dualisms that are strongly established in organization and management studies: the fact-value dualism, and the means-ends dualism.

The separation between fact and value has been already abundantly commented and debated in epistemology and social sciences. Hilary Putnam (2002), for example, without denying that the distinction between factual claims and value judgements can be useful and important, argued that it can also become harmful when it is transformed into a clear-cut dichotomy between ‘objective’ and ‘subjective’. The analysis of managerial techniques and their social utilization calls for a reflection by management and organization scholars about the relationship between facts and values.

‘Means-ends’ is another highly problematic dichotomy. It describes valuation as a logical and chronological sequence, starting with the stable establishment of final ends that transcend situations. Final ends and the related ‘system of values’ are then considered as static components of any situation, and managerial practices focus on the adequacy of means to pre-established ends. Management processes then appear as sequential,

with phases oriented towards the determination of goals, and phases oriented towards the control of means. This sequential separation is mostly misleading. It is well known that the road to hell is paved with good intentions... In practice, the conception of ends must grasp the course of action that should lead to their accomplishment. Actors continuously judge the relationship between means and ends and they act on both poles simultaneously. Hypothetical values must be translated into ends-in-view within the activity-in-progress. Reciprocally, actual performances and the feedback of experience fuel the reassessment of values, in a mutual process of cross-translation between values and activity. The process of valuation appears then as the process of redesigning and organizing activity through the mediation of its ends (thus imposing a trial, a form of testing, on activity, its relevance and its progress towards ends-in-view) and redesigning ends through the mediation of activity (thus imposing a trial, a form of testing, on ends and their coherence with activity and activity means), two inseparable dimensions of collective action.

To summarize, we may wish to study the material and temporal dimension of valuation processes rather than 'values' as objective or subjective entities: the move to outsourcing, the development of debates about nuclear values, the introduction of new auditing practices in public administration, accepting or rejecting new management ideas (NPM, 'liberating management') in public services or in private companies, reconfiguring information flows, following the transformation of management objects into systems, all the chapters of the book try to trace and follow movements, flows, transformations, organizations and society in the making.

Managerial techniques are involved in active valuation processes. Their tacit or explicit hypotheses about social action can become the relevant subject matter of social controversies and exploratory inquiries. Such an approach, by emphasizing the reflective role of actors, might provide an antidote against technocratic views of managerial techniques and practices, which over-value the role of experts. Valuation, instrumented with managerial techniques, is not a process situated outside of activity, for example the process of representing activity from an observer's position, but it appears as an integral dimension of activity itself, the process of 'thinking value within the work activity' (Vatin, 2009, p. 30). The key

debate is not about ‘true or wrong’ representation, resembling or not resembling, replacing or substituting reality, but it is rather about practical relevance, immediate and enduring effects: ‘what next, what for?’ Anyway, we already knew that the notion of ‘accurate’ or ‘true’ representation does not make much sense, as ironically expressed by the Argentinian novelist Borges:

In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied a whole City, and the map of the Empire, a whole Province. In time, those Immoderate Maps no longer satisfied, and the Cartographers’ College drew a Map of the Empire whose size was that of the Empire, and which exactly coincided with it. The following Generations, who were not so Fond of the Study of Cartography, understood that that vast Map was Useless, and not without some impiety they gave it over to the inclemency of Sun and Winters. (1946/1974, p. 847, my translation)

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Postface: The Jester Returns— Selected Readings and Eclectic Opinions on Sociomateriality Going Mainstream in Management and Organization Studies

Karlheinz Kautz

This book contains essays and contributions based on presentations given at the fifth Organizations, Artifacts and Practices (OAP) Workshop in Sydney, Australia, in December 2015. I had the pleasure to serve as cohost and to deliver a key note presentation. This postface is based on my keynote presentation with the above title.

The discourse about organizations, artefacts and practices of course goes far beyond the role of digital information systems (ISs), the related enacted practices and the encountered artefacts, or more general digitalization play in organizations of all kinds, but with a background in information systems and digital information technology (IT), my reflections

In 2015 when the fifth OAP workshop took place in Sydney, the author was with the Faculty of Business, University of Wollongong (UOW) and wants to acknowledge the sponsorship provided by UOW for the event.

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on ‘organizations, artefacts, and practices’ inevitably are grounded in the information systems discipline. The OAP workshop 2015 itself featured four thematic tracks: managerial techniques and materiality, space and spatial dynamics of management practices, epistemological and ontological views of materiality in management, and the sociomateriality of organizations and management.

In line with the last track, I focused my invited key note presentation on sociomateriality in management and organization studies, in particular in the information systems discipline. Referring to previous conceptual work and a literature review which I had performed with my collaborator Tina Blegind Jensen (Kautz & Jensen, 2013) under the title ‘Sociomateriality at the Royal Court of IS: A Jester’s Monologue’, I entitled my key note ‘The Jester Returns: Selected Readings and Eclectic Opinions on Sociomateriality going Mainstream in Management and Organization Studies’.

Some years earlier, puzzled by the concept of sociomateriality and our own roots in the Scandinavian sociotechnical tradition of information systems development and utilization, Tina and I had expressed our initial skepticism under labels such as (Kautz & Jensen, 2012a) ‘[Sociomateriality: New Vocabulary or Reformulation of Existing Theories?](#)’ at the Organization, Artefacts, and Practices workshop 2012 in Paris, France and more provocatively, as part of a rare ‘Alternative Genre’ (of Information Systems research) track at the European Conference on Information Systems 2012 in Barcelona, inspired by Sutton’s (2010) blog on the topic as ‘Sociomateriality: More than Jargon Monoxide? Questions from the Jester to the Sovereigns’ (Kautz & Jensen, 2012b).

In these writings we had analysed and critically questioned mainly Orlikowski’s and her collaborator Scott’s work (Orlikowski, 2006, 2007, 2009; Orlikowski & Scott, 2008; Scott & Orlikowski, 2009) and juxtaposed it with Leonardi’s—supported by Barley—position (Leonardi, 2010, 2011; Leonardi & Barley, 2008, 2010) on sociomateriality which hugely differed with regard to underlying ontology and theory, putting forward a relational ontology and a theory of agential realism, respectively a substantialist ontology and a theory of critical realism, as appropriate groundings for the concept.

Consequently they disagreed on the decisive issue of inseparability or separability of the human and social and the technical and material of sociomaterial assemblages and practices. At that point in time we however queried the very contribution and further insight—compared to a sociotechnical and systems thinking grounding—any sociomaterial based approach could make. Later then, and partly already in parallel, recognizing the contribution of sociomateriality, I was part of a team with Dubravka Cecez-Kecmanovic, which formulated these insights with regards to conceptualizing information systems success and failure from a sociomaterial and performative perspective (Cecez-Kecmanovic, Galliers, Henfridsson, Newell, & Vidgen, 2014; Kautz & Cecez-Kecmanovic, 2013).

In 2015—we had carried out our first selected literature analysis in 2010—the publication landscape on sociomateriality had further developed. Jones (2014) had produced a literature review and had found about 140 publications referring in some way to the concept of sociomateriality in well-established information systems and organizational science journals between 2007 and 2013; a closer look at 2012 and 2013 revealed eighty-five publications which had included the concept in their title or abstract, however forty-two of these only provided a mention of the concept in passing, whereas thirty-four provided empirical illustrations of the respective authors' understanding of the concept, and a mere nine were conceptual or critical to the concept.

I had started looking for inspiration in other disciplines and found some interesting work in the education and learning space, especially by Fenwick (2010) and Fenwick and Edwards (2013) who discussed activity theory, complexity theory and actor network theory as sociomaterial approaches to understand learning in particular at the workplace, which I contrasted with what Cecez-Kecmanovic, Kautz and Abrahall (2014) identified as roots of sociomaterial thinking in organization science and in particular the information systems discipline, namely actor network theory, practice theory and the socio-technical systems perspective.

In this context, some work such as that by Gaskin, Berente, Lyytinen and Yoo (2014), which did provide more than a mention in passing and was empirical, kept me wondering about the contribution of

sociomateriality, despite my own growing conviction about the value of a sociomaterial approach. They argued that

...in defining our approach, we do not draw a hard line between the sociomaterial position and the sociotechnical tradition...In our view, the sociomaterial view fulfils and perhaps matures the sociotechnical tradition with an emphasis on practice rather than systems, and adds nuance in some areas (e.g., ontological inseparability in practice, material agency, social construction, etc.). (Gaskin et al., 2014)

Other work openly doubted the value and foundation of sociomateriality with Mutch (2013) asking whether sociomateriality is taking the wrong turn and putting forward a critical realism perspective as a more suited grounding for studying information systems related phenomena. Along these lines Mingers and Willcocks (2014) propose an integrative semiotic framework for information systems that combines what they call the social, personal and material worlds. Faulkner and Runde (2012) also challenge the relational ontology of the sociomaterial approach and argue that technologies exist independently from their social positions and any identities they might (co)constitute. Their position which emphasizes the material agency of technology is based on a substantialist ontology and implicitly suggests abandoning the concept altogether.

In also criticizing the relational ontology of sociomateriality, Ramiller (2016)—as part of a debate on the usefulness and applicability of the concept of sociomateriality in information systems, started in early 2015, but first published in late 2016 in *The Data Base for Advances in Information Systems*—claims that a major problem of a sociomaterial approach is:

the difficulty...that when we start with people who are already accomplished users of technology in a particular work domain, we miss how they got there. If we blink, we can also miss how they repair the relations in their relational ontologies, when there are breakdowns. Sociomateriality, although championed as a starting-point for our academic inquiries, represents an end-point for users. (Ramiller, 2016)

This again might imply giving up the idea of sociomateriality.

Along similar ontological lines Leonardi (2012), but continuing his argument concerning his position on the relationship of materiality, sociomateriality and sociotechnical systems to provide some theoretical foundations for the study of sociomateriality, stresses the role materiality plays in social phenomena as constitutive for the concept of sociomateriality. As Cecez-Kecmanovic, Galliers, et al. (2014) argue, he:

is the most vocal in arguing for a view of sociomateriality that is grounded in substantialist ontology. He recognizes that materiality is present in each and every phenomenon that [organization scholars] consider ‘social’ (...) talking about sociomateriality is to recognize and always keep present to mind that materiality acts as a constitutive element of the social world and vice versa.

He also talks of sociomaterial practice as the:

space in which the social and the material become constitutively entangled. (Cecez-Kecmanovic, Galliers, et al., 2014)

Leonardi (2013) also persists and argues that a perspective on sociomateriality footed on agential realism treats sociomaterial practice as interpenetrated and as a coherent unit which for him means that researchers who use a sociomaterial lens cannot show how practices become sociomaterial, as a relational ontology posits that constitutive entanglement is simply the nature of any practice. He ultimately puts forward that studies of sociomateriality on the theoretical foundation offered by critical realism can overcome what he perceives as the practical problems created by a footing on agential realism.

At this point I need to disclose my ontological orientation of sociomateriality. In contrast to Cecez-Kecmanovic, Galliers, et al. (2014), who while asking whether sociomateriality is a battleground or a road to peace, recognize a substantialist ontology as a basis for sociomateriality, my performative view on sociomateriality is based on a relational ontology and a theory of agential realism which I see as irreconcilable with a critical realism and substantivist or substantialist position, as a substantialist ontology

assumes a world populated with independently existing objects; both humans and non-humans are separate and self-contained entities with properties (Riemer & Johnston, 2012). Within a substantialist ontology, these human and non-human entities can interact, as Faulkner and Runde (2012, p. 64) suggest that ‘technological objects are shaped by the activities of humans, [and] that technological objects in turn shape human activities’, but separability is always assumed.

While I argue that these positions are deeply rooted in a dualist worldview not compatible with the original ideas of sociomateriality, Jones (2014) takes another approach to find a compromise and middle ground to reconcile the otherwise irreconcilable positions on sociomateriality based on five core concepts and the idea of weak and strong sociomateriality.

As put forward in Kautz and Plumb (2016), Jones (2014) in line with Orlikowski and Scott (2008), identifies the following characteristics that define a sociomaterial approach to research:

- (1) Materiality—a concern to (re-)establish materiality as central to our understanding of contemporary organizations;
- (2) Inseparability—an ontological claim about the inextricable entanglement of the social and the material;
- (3) Relationality—an anti-essentialist rejection of the notion that entities have inherent properties, viewing these rather as relational;
- (4) Performativity—a view of the relations and boundaries between the social and material as being enacted rather than given;
- (5) Practice—a focus on practices, rather than discourses or cognition.

Jones (2014) distinguishes a strong and a weak account of sociomateriality which he argues still subscribes to some version of the five key concepts of strong sociomateriality while not endorsing all their claims. He puts forward that where materiality in strong sociomateriality means the materialization of entire phenomena, in its assumed weak version it would relate to the persistence of the arrangement of materials across place and time. Inseparability understood as mutual constitution of entangled entities in strong sociomateriality would only indicate mutual interdependency in the weak version of the concept. Relationality refers

to the form, attributes and capabilities of entities emerging only through interpenetration in the strong sort of sociomateriality; whereas the weak type would postulate that form, attributes and capabilities may pre-exist any relation and be independent of any intra-actions. In strong sociomateriality, performativity relates to the enactment of relations and boundaries, where in the weak form of the concept it may be used to describe independent non-human agency. Finally, practices in strong sociomateriality are embodied, materially mediated arrays of human activity rather than mere activities and processes as the weak form would argue.

I am not supportive of weak sociomateriality as it goes against the spirit of the original concept by largely accepting a dualist perspective. More truthfully, it should be considered as a sociotechnical perspective, as Gaskin et al. (2014) do in the argument referred to above. As expressed in Kautz and Plumb (2016), I support a concept of sociomateriality which Jones (2014) calls strong sociomateriality. It draws upon the work of Barad (2003, 2007) and entails subscribing to a fully relational post-humanist ontology, wherein social and material entities do not exist as independent self-contained ‘things’ but rather exist only in their relation to other entities through the performance of practices. In such a sociomaterial entanglement, agency lies with both the human and non-human entities; this agential realism permits the transcendence of the limitations of a dualist conception of agency as either located in humans or in non-humans.

This does not, however, mean that the concept of agency is extended to the point of symmetrical agency or what McLean and Hassard (2004) refer to as ‘symmetrical absurdity’; instead I follow Fenwick and Edwards (2013) who suggest that important influences in sociomaterial assemblages emanate ‘from nature, technology, objects and all manner of quarks, which may overlap and infuse what is human’.

This ‘mutual constitution of entangled agencies’ (Barad, 2007), which performs the world in practice, is known in Barad’s (2003) terminology as intra-action. It is through this intra-action that the practices delineate entities and enact their specific distinctions, boundaries and properties, a local resolution of determinacy which Barad (2003) refers to as an agential cut; intra-actions within a phenomenon enact local agential separability and agential cuts which effect and allow for local separation within

a phenomenon. Hence, within inseparable phenomena agential separation is possible. The sociomaterial entanglements involved in inseparable and mutually constituting discursive and material constructions turn visible and locally separable through agential cuts (Kautz & Cecez-Kecmanovic, 2013).

The ontology of strong sociomateriality according to Jones (2014) is 'strongly processual (Thompson, 2011), viewing organizations as in a perpetual state of becoming (Tsoukas & Chia, 2002)'; whereas weak process theories, locate change in changes of properties or arrangements of substantive entities (Riemer & Johnston, 2016). Strong sociomateriality can bring the social and the material aspects of information systems related practices together in a way that considers the human and the non-human to be entwined in the construction of everyday reality through iterative intra-action in practices. This perspective moves beyond a humanist anthropocentric (Introna, 2013) position, where the human actor is the dominant source of agency and causality of change, by decentering the human entity and recognizing the agency of the non-human material entities. It allows asking and answering 'how' questions related to information systems, and by way of that managerial and organizational phenomena. Without further arguing I therefore now rather direct the reader to some recent examples that show that researchers can demonstrate and explain how practices 'become' sociomaterial and that sociomateriality does not present an end point for inquiring into human engagement in sociomaterial practice.

Hultin and Mähring (2014) present a case study of the adoption of digital visualization boards as part of the introduction of lean management in health care management at a hospital emergency ward. They research the mechanisms underlying the mutual constitution of competing institutional logics and sociomaterial entanglements and practices by combining a sociomaterial lens with an institutional logics perspective. Based on a relational view on affordances they develop a model of institutional logics that integrates sociomaterial entanglements. Their study conceptualizes the adoption of lean practices as a process of sociomaterial entanglements and demonstrates the emergence of a sociomaterial assemblage by outlining the process of sociomaterial entanglements which occurs in the adoption of new technologies.

Scott and Orlikowski (2014) provide a case of comparing two phenomena in the travel sector: the British institutionalized AA accreditation scheme and the online social media website TripAdvisor. Their work explores and conceptualizes the notion of sociomateriality in information systems research by concentrating on the concept of entanglement in practice understood as the inseparability of meaning and matter that is produced in practice where entities emerge through their encounters and relations to and with each other in intra-action. The work details its grounding in a relational and performative ontology, and its use of agential realism. Theorizing relationality and performativity, Scott and Orlikowski explicate practices as material-discursive which enact phenomena in certain ways, including some things and excluding others, and which allows for agential cuts as local resolutions to the inherent ontological indeterminacy and inseparability. Applying these concepts, the analysis focuses on the emerging sociomaterial practice of producing anonymity in the two practices of hotel evaluation.

Venters, Oborn and Barrett (2014) offer an in-depth, longitudinal field study of the development, introduction and use of a computing grid infrastructure by the CERN particle physics community. This work develops a sociomaterial perspective on digital coordination based on Pickering's mangle of practice with a focus on temporality. It extends Pickering's (1993, 1995) work by introducing an approach to the temporal emergence of sociomaterial practices that offers an understanding of how sociomaterial agencies involved in coordination are embedded in the past, present and future where cycles of resistance and accommodation occur in the performativity of the mangle. The authors identify coordination tensions at the different temporal dimensions which they term as obtaining adequate transparency in the present, modelling a future infrastructure, and the historical disciplining of social and material inertias. The identified, temporally enacted process of sociomaterial entanglement explains temporally oriented tensions concerning resource distribution, accountability and predictability in coordinating the GRID Infrastructure.

With my collaborators Dubravka Cecez-Kecmanovic and Rebecca Abrahall (Cecez-Kecmanovic, Kautz, et al., 2014) I myself have worked on a case study of the development, implementation and use of information systems in an insurance company, an initiative which was considered a

success and failure at the same time. Based on a relational ontology we proposed a performative perspective that conceives IS success and failure as emerging relational effects that are performed by sociomaterial practices of IS project actor networks which we understood as sociomaterial assemblages. Our study revealed the inherent indeterminacy of IS success and failure and described the mechanisms by which success and failure emerge and become performed and thus determined by sociomaterial practices. This is explained by exposing various possible political reasons for enacting one kind of reality rather than another—what Law (2004) calls ontological politics—in the continual emergence, reconfiguration and decomposition of the IS project actor networks and the emergence and enactment of different practices and different agencies of assessment that performed both different IS realities and competing IS assessments. The analysis showed that IS development projects and the resulting implemented information systems as objects of assessment as well as their success and failure are not given and fixed, but are performed by the agencies of assessments.

Furthermore, together with Melinda Plumb, I researched another case study, this time that of the IT appropriation in an early childhood education and care organization (Plumb & Kautz, 2014). Drawing on a sociomaterial theory of IT appropriation based on a phenomenological, relational and practice-oriented ontology, the work reveals a continuous cyclical process of becoming of IT appropriation. The appropriation of IT is conceptualized as an emergent human engagement of early childhood education and care professionals in complex sociomaterial assemblages through a series of three sociomaterial practices; the way of being of the material IT entity changes as it transforms from when first encountered as an object in the practice of inspecting to determine its suitability, where it is in the foreground of consideration; to its enactment in fluent, transparent use in the practice of performing, where the individuals are carrying out their work practices using the equipment in order to achieve a purpose, at which time the IT has moved to the background of consideration. A middle-ground practice, referred to as place-making, which involves activity that disrupts the existing equipment holism, changes the sociomaterial practices as well as the being of the existing and of the new technology where IT is considered as a tool.

The sociomaterial theory of IT appropriation underlying this research was developed by Riemer and Johnston (2012) in their work on place-making based on Heidegger's (1927, 1962) analysis of equipment. They originally illustrated their theory with a case study of social media appropriation of the enterprise microblogging service Yammer into the consulting practice at a large multi-national company. It used and analysed self-referential conversations of the consultants that were captured within the technology and that provided access to direct evidence of the appropriation phenomenon. Their work contributes a nuanced sociomaterial account of the simultaneous transformation of IT and practices that emerge during the introduction and uptake of IT.

All these readings, which admittedly have been selected in a biased manner—but then, I am the jester—are examples of past eclectic opinions on sociomateriality, which are becoming more and more mainstream in management and organization studies, and in information systems research. They counteract Jones' (2014) lament that:

IS research that employs a conception of sociomateriality that is comparable to that in the literature from which it claims to be drawing or that questions this conception is in short supply.

While the hype of using the concept—unreflected or just in passing—might be on the decline, there is now a growing body of work combining constructive critical, conceptual and empirical research to in-depth contributions which extend sociomaterial theory with insights for practice. That work—true to the original concept and sources—establishes that sociomateriality does not represent an end point for academic inquiry into organizational and IS-related phenomena, but in actual fact is a starting point. It also demonstrates that a strong sociomaterial stance is not unable to explain the emergence of sociomaterial assemblages and practices, indeed quite the opposite; it provides detailed and convincing empirical evidence and accounts with strong explanatory power. The OAP 2015 workshop contributed to this line of work with many other examples of this type, which are included in this volume.

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