

Thou shall not underestimate the power of a Gant diagram! - An STS approach to PM

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Introduction

In this paper we propose that posthumanist and constructivist insights and methods from the field of Science, Technology and Society studies (STS) can contribute to Project Management (PM) research. We argue that a focus on performativity, materiality, power and empirical studies of practice – all central to STS – provides novel approaches to PM. The primary point in the paper is that we in our analysis and understanding of PM should pay attention to how tools, methods and discourses are adapted in the actual PM practices. We argue that we should be equally critical of both the instrumentalist and functionalist ideas of rationalist and managerial approaches to PM, but also of the critiques of those approaches since they may tend to overemphasize the strengths of rationalist approaches in actual practices. Based on this discussion we speculate on the role of PM research and suggest that maybe we should develop a discourse that is more ‘problem’- than ‘solution’-oriented.

STS is concerned with the sociological study of science and technology, and encompasses traditions such as the sociology of scientific knowledge (SSK), post-structuralism, symbolic interactionism, pragmatism, and actor-network theory (ANT). STS challenges the notion of boundaries between scientific, technical environments and society, and the production of knowledge and technology is considered to be on equal footing with other forms of social practice (Biagioli, 1999; Jasanoff, Peterson, & Markle, 2001). Consequently, STS seeks to develop methods for understanding practices without resorting to dichotomous a priori distinctions such as theory-practice, subject-object, real-constructed, social-technical, micro-macro etc. (Latour, 2005; Law, 2004). Instead, these distinctions are considered consequences of practices, rather than causes. Further, STS is concerned with the study of science and technology as performative and material practices in which a

range of heterogeneous actors and entities are associated and as a consequence produce facts and technologies (Fleck, 1981; Knorr-Cetina, 1999; Latour & Woolgar, 1986; Pickering, 1995). STS thus seeks to produce non-reductionist, anti-essentialist, anti-determinist and arguably adequate understandings of reality (Haraway, 1997; Latour, 1987). In accordance with STS, we consider PM as a performative and material practice in which a range of actors and entities produce 'projects'.

STS implies attention to the complicity and intricacy of human and technological agency. One of the primary insights in STS is that this relationship is anything but simple. What human beings are capable of and similarly what tools, technologies, texts and theories do, is not a settled matter or a priori determined. Instead it is a consequence of relations with other things and beings. Such an irreductive ontological assumption, obviously complicates matters and certain assumptions and ways of reasoning become challenged (Latour, 1993). For instance, an approach to PM can be said to be rationalist and reductionist when analysed as a text, but it cannot be assumed that it will re-produce its rationalism and reductionism when it is practised. Accordingly, our hopes (and fears) concerning tools, texts and techniques regardless of whether they are rationalist or the opposite should be moderate. The very idea of developing tools for others to use based on the assumption that these tools will work in accordance with the intentions of their designer, is naïve, when we follow posthumanist constructivist STS. But the knife cuts both ways. Not only shall we be sceptical of rationalist approaches to PM, but we shall be equally sceptical of the critiques of those very approaches, when they read the rationalist approaches by the letter, as if they actually succeeded in doing what they promise.

These understandings are consequential for the way we engage with the problem of the gap between theory and practice and how to bridge this gap, as proposed in the call for papers, specifically how theoretical research may contribute to the practice of doing PM (Hodgson & Cicmil, 2006a; Winter, Smith, Morris, & Cicmil, 2006). Although, a noble and in many ways a reasonable concern, we wish to question the implied separation between theory and practice implied in this concern. Wanting to bridge gaps not only reiterates dichotomous and representationalist understandings of the world as

divided into separate realms. But it also implicitly holds that a fitting together of different practices and places into some sort of homogeneity is both possible and preferable. Wanting to bridge gaps has been a longstanding concern in the field of Information Systems research. We propose that it might be more fruitful to do away entirely with gaps between theory and practice.

The purpose of the paper is to present and discuss what is implied by posthumanist constructivist STS and relate it to PM research. First, we provide an overview of the position of STS within PM and the 'Making Projects Critical' field. Second, the present four central characteristics of STS studies and their implications for PM research: empirical studies, power, performativity and materiality. We conclude by discussing the implications of this and the role of research in PM.

The ontology of posthumanist constructivist STS

This section presents the ontological premises of posthumanist constructivist STS. We consider the role of processes and materiality and the concept of performativity as it has been formulated by central figures in the field of Science, Technology and Society studies (STS).

The turn to practice implied in approaches to the study of science and technology, such as actor network theory and feminism, are rooted in an equal discontent with positivist realist accounts of reality with their Cartesian subject-object epistemology as well as with social constructivist versions of the same. Accordingly, actor-network theory is based on the so-called generalised principle of symmetry that considers any knowledge claim, entity or subject to be a product of the association of heterogeneous elements. Consequently, this has led Bruno Latour to suggest the - to many - impossible and contra-intuitive statement: "the more constructed - the more real" (Latour, 2003). But Latour's point is exactly that the common and widely accepted distinction between 'constructed' and 'real' is basically flawed because it does not pay due respect to the processes and practices involved in knowledge and technology production. We accept that to build solid and grand constructions such as buildings, bridges and SAP IT-systems requires much work, great expertise and the employment of numerous persons, tools

and technologies. But facts about nature, on the other hand, are assumed to emerge ex nihilo and by themselves. Latour is fundamentally sceptical of this obvious shift in explanatory registers. Instead, and following thinkers such as Alfred North Whitehead and Gilles Deleuze, he argues for a consistent, monistic ontology, where every being, whether fact or object, is produced under similar conditions, namely conditions where the agency of both social actors and their constructs such as people and instruments as well as the agency of material elements such as animals, crystals, molecules and what have we, intervenes and co-constructs reality and knowledge.

Latour thus proposes the incongruous term *factish* to designate a world filled with hybrids in place of a world bifurcated into 'pure', 'unconstructed', 'natural' beings on the one side and superficial, constructed ones, on the other (Latour & Stark, 1999). This monist ontology, however, does not mean that how hybrids come into being is in any way simple and uniform. On the contrary, the concrete and specific conditions under which they are produced is inextricably complicated, which is why these processes must be studied empirically.

The role of materiality is accordingly of both great interest and complicity, since materiality is considered to possess agency, but not in any immediate and simple manner. Materiality is not simple and lawful matter as depicted in positivist and realist understandings, such as Newtonian mechanics, nor is it a 'blank slate' upon which socially constructed meanings is imprinted (Butler, 1993). Donna J. Haraway refers to materiality as 'trickster and coyote':

"Actors come in many and wonderful forms. Accounts of a 'real' world do not, then, depend on a logic of 'discovery', but on a power-charged social relation of 'conversation'. The world neither speaks itself nor disappears in favour of a master decoder. The codes of the world are not still, waiting only to be read. The world is not raw material for humanization." (Haraway, 1990, 198)

Similarly, Andrew Pickering in his book *The Mangle of Practice* emphasizes the agency of materiality:

“The world, I want to say, is continually doing things, things that bear upon us not as observation statements upon disembodied intellects but as forces upon material beings” (Pickering, 1995:6)

Pickering contrasts a representational and a performative understanding of the world, where the former is the classical idea of a representational world consisting of finite, enclosed objects and phenomena that obey specific laws, the latter, in contrast holds that every entity is an emergent and relational outcome of uncertain and unfolding processes consisting of multiple heterogeneous elements and forces (Deleuze & Guattari, 1997). Science is thus a practice that together with the object of study produces knowledge and facts. This notion of a performative world entails that different elements and actors are caught up in dances of agency. The dance of agency constitutes the relational, dynamic and open-ended becoming of actors, entities, intentions and subjects. In such a performative ontology what becomes is thus always a surprise and a progeny of many parents with no clearly determinable heritage. It follows that existence or being is processual. Or in other words Being is actually becoming, only brought to a stop and thus reductionist and simplistic, but also - we might add – a practical way of managing existence as process. We are reminded of Baruch Spinoza famous statement: “No one knows what a body can do”. Spinoza’s point was not that the reason why we do not know what a body can do, is because we have incomplete knowledge, which at some point will be remedied. No, the point is that the body – any body - human, object, entity etc. is in a state of flux and continuous engagement with other bodies, through which it is formed and transformed. Consequently, a body is never and will never be a settled matter, since novel interactions with other bodies may become its vocation at the next instance. As Gilles Deleuze puts it:

“Bodies are not defined by their genus or species, by their organs and functions, but by what they can do, by the affects of which they are capable – in passion as well as in action. You have not defined an animal until you have listed its affects. In this sense there is a greater difference between a race

horse and a work horse than between a work horse and an ox.”(Deleuze, 2002:60)

But what follows from this, is, not only, that things, knowledge, facts and subjects are constructed, but also that they are continuously being constructed and re-constructed and therefore prone to transformation. In science and technology studies, organisational studies and information systems research, there is a widespread tendency to focus on the formation and construction of specific relations and orders, as if when established they continue to persist (Berg & Timmermans, 2000). However, this focus overlooks the recursive and reiterative aspect related both to the continuous maintenance work and efforts that must be executed for things to continue to exist, but also to the fragility, partiality and multiplicity related to orders and structures and to the intertwinement of orders and disorders (Berg & Timmermans, 2000). Annemarie Mol contributes to this recent orientation towards complexity and performativity in actor network theory also named Post-ANT (Gad & Jensen, 2010; Law & Hassard, 1999). In her book *The Body Multiple*, Mol not only shows the intertwinement of practices and their objects, but also that objects themselves - not our perspective on them! - changes relatively to the practices they are part of (Mol, 2002). Objects are enacted and thus multiple. But despite that the object – in Mol’s specific case atherosclerosis – is not the same object in different medical practices (the clinic, surgery, pathology and so on), but takes on different qualities and attributes, still the treatment of atherosclerosis across the medical specialities, succeeds. Actually, and surprisingly, in some instances treatment succeeds, not despite, but because of the multiplicity of the object. Mol refers to her approach as praxiography and empirical philosophy and her contribution is of metaphysical proportions, since it radically challenges established ideas of a world in which things are essentially singular and where they either exist or not; and where partiality and multiplicity leads to contradictions, conflicts, chaos and thus eventual fragmentation and dissolution. Mol’s work as Gad & Jensen point out, suggests instead that: “...the world is seen as constituted through processes, which can tolerate middle stages, as exemplified by Latour’s notion of relatively, or partially, existing objects” (Gad & Jensen,

2010:58). The world is thus conceived of as a pluriverse as William James suggested, that is as consisting of multiple, partially connected worlds and our practices can be seen as world creating in the sense that they enact their objects and subjects.

The above-sketches notions of performativity and materiality and their mutual relation have important implications for the study of PM practices. Practices must be studied as manufacturing specific objects, subjects and problems. Technologies, materials, non-human actors contribute to orders as well as disorders and they act upon human actors in unanticipated and surprising ways just as human actors on them. Different worlds are not by definition in conflict, but may in some situations be and in others not be. Breakdowns in practices should not be assumed to be due to differences although differences may be used as the explanations for breakdowns. It may just as well be that differences and lack of consensus, is what makes things run smoothly.

In the sections to come we present and discuss the above presented ontology in relation to the field of PM. But first follows a literature review of STS related contributions to PM.

Theoretical positions within the field of PM

In this section we review the literature relevant to the paper. We acknowledge that the PM tradition is diverse and consists of many different approaches and research contributions that do not easily add up to a consistent whole. Similarly, we find that the critique posed at the 'mainstream' PM literature is diverse and multifaceted. Consequently, we are selective in our readings and we attempt to contribute to the field of PM in general and avoid reductionist grouping together of positions in the field. We consider our argument to move across and challenge contributions from both 'mainstream' PM and the critical tradition.

PM is an academic field spanning several different theoretical positions or schools of thought (Söderlund, 2011a; Söderlund, 2011b). This academic diversity has been documented in various literature studies (Turner, Pinto, & Bredillet, 2011; Packendorff, 1995; Crawford, Pollack, & England, 2006;

Söderlund, 2004; Söderlund, 2011b; Söderlund, 2011a; Ford & Randolph, 1992). Some argue that the academic field of PM is in a state of pre-paradigmatic crises as the research community has failed to mature, stabilize and agree upon a normal science in a 'Kuhnian' sense (Kuhn, 1996). A counterargument found in various forms in the PM literature is that the theoretical pluralism is productive as it provides a diverse conceptual toolbox for practitioners (Sauer & Reich, 2007; Söderlund, 2011a; Söderlund, 2011b; Winter, Smith, Morris, & Cicimil, 2006) Moreover, it also indicates that the academic field is dynamic (Söderlund, 2011b). Also, Hodgson and Cicimil (2006b) warn against attempts to standardize and naturalise the concepts of PM drawing upon Bowker and Stars work on standardisation (Bowker & Star, 1999). A black-boxing of these concepts could remove the ethical and political questions from the research agenda resulting in a loss of reflexivity (Hodgson & Cicimil, 2006b:48).

With the expansion of the field of PM, both academically and in practice, several scholars have argued that a discussion of the field's theoretical foundations is urgent. Koskela and Howell (2002) point out that the current theoretical foundations are obsolete that a paradigm change is long overdue, and that the development of an explicit PM theory is the single most important issue for the community onwards. Turner (2006a; 2006b; 2006c; 2006d) calls for a unified theory of the project and PM, while Sauer and Reich (2007) propose to develop specialized and positivistic theories. In opposition to attempts to develop positivist theories stand what may be characterized as the critical approach to PM¹. Several proponents of the critical approach defined themselves as being in opposition to 'mainstream' PM theory, which is defined as instrumental and positivistic theories. As Söderlund (2011a) has demonstrated, while this mainstream is largely oriented towards a positivist ontology, it is not a homogenous body of PM theories. The theoretical foundations of PM span from multiple theories and draws inspiration from different fields such as economy, psychology and political science. One should then exercise care about characterizing mainstream as a singular theory or point of view.

¹ Departing from two workshop held at Bristol Business School with the explicit goal to make projects critical (Cicimil & Hodgson, 2006:1).

STS PM Literature review

Though there are already several contributions from STS-based studies to PM, the links between STS and the main PM journals seems weak. A search in Project Management Journal (PMJ) yields 12 results, but only four papers have STS as a central concern or contribution to PM (one in 2007, 2010, 2011 and 2013)². None of these have been extensively cited within this journal or the International Journal of Project Management³. The same search in International Journal of Project Management (IJPM) yields 24 results, but only 9 papers with STS as a central concern or contribution. As with the former set of papers, neither have been cited extensively in IJPM or PMJ . The most cited is Blackburn (2002), who analysed the project manager and the project through actor-network theory (ANT) proposing that while:

“Project managers place themselves at the centre of their project stories [...] their performances depend on choreographing the contributions of heterogeneous actors, enrolling them into the dance, away from the steady march of operational roles.” (Blackburn, 2002:203)⁴.

A search in the “International Journal of Managing Projects in Business” similar to the ones conducted in PMJ and IJPM reveal three papers in the only existing six volumes (compared to 44 volumes of PMJ and 31 volumes of IJPM). Optimistically, if this trend was to continue, IJMPM might become a main venue for STS contributions to PM.

The greatest collection of STS-related papers on PM seems to arise from or inspired by the anthology “Making projects Critical” (Hodgson & Cicmil, 2006a). Here, Molloy and Whittington (2006) drawn on Bruno Latour’s proposal that social science struggles with five uncertainties: uncertainty about group formation, about agency, about objects, about matters of fact versus state of affairs; and about epistemology. Based on this, they analyse a process of reorganization and conclude that:

² Search for the four main authors within STS studies: Latour OR "john law" OR Bijker OR Callon OR "social construction of technology". The former being the most prominent and widely cited authors within STS.

³ The exception is the one from 2010 which mentions Latour and Callon as part of methodological consideration. This paper has 15 citations with PMJ and 8 citations in IJPM

⁴ The most cited is Blackburn 2002 which is cited 4 times in PMJ and 9 times in IJPM

"[...] reorganisation activity comes into view as the sophisticated recognition, construction, connection and association of diverse entities. Further, reorganisation practitioners appear as savvy engineers of these connections - building and dismantling simultaneously - with a wide repertoire of skills, tools, techniques and methodologies at their disposal." (ibid:187).

In the same anthology, Linde and Linderoth (2006) engage another central author within STS, Michel Callon, and his proposal to describe projects through the concepts problematisation, interessement, enrolment, inscription, and mobilization. Applying these concepts to two cases - a redesign and implementation of the PM model PROPS at Swedish Customs authority and a telemedicine project – projects are conceptualised as translation processes: the delegation of roles and function between various human and non-human entities and the establishment of relatively stable relationships between these (See Elbanna (2010) for a similar approach to IS project boundaries).

Other STS-based studies of PM have been published in other journal⁵. However, there are overall few articles within the traditional PM journals with contributions from STS. As we will outline below, we do think that STS can, and we hope that it will contribute to this field.

Critical studies of project management

In their characterization of critical PM research, Cicmil and Hodgson point out that such research should include critical social theory (Cicmil & Hodgson, 2006) in order to counterinstrumental theories (ibid:12). Of central importance such a critical approach is:

"[...] to explore how the relationships between individuals and collectives are being constituted and reproduced in the context of , and how asymmetrical power relations create and sustain the social reality of projects." (ibid:13).

According to Cicmil & Hodgson, we should not answer the question 'what is a project?', but rather instead be concerned with 'what do we do when we call something a project?' (Hodgson & Cicmil, 2006b:32). This points to an ontological difference between the positivist and critical approach, the difference being that the former see projects as pre-existing entities with

⁵ For example, a series of papers by D. Sage, A.R.J Dainty and N.J. Brookes

essential properties whereas the latter see projects as emerging entities. PM. Studying what happens when something is called 'a project', is related to another central concern of critical PM studies, namely the distribution of power.

STS/ANT - a radical approach to practice

According to Cicmil and Hodgson (2006), the aim of the critical school should be to emancipate the field from instrumentalism by acknowledging the voices of practitioners (ibid:13-14). The ambition to emancipate is reflected in several contributions to the Making Projects Critical movement (Cicmil & Hodgson, 2006; Lindgren & Packendorff, 2006; Nocker, 2006; Thomas, 2006). The ambition to emancipate entails a preconception about how PM theory and techniques distribute power, and throughout the critical management literature these theory and techniques are described as control devices (Lindgren & Packendorff, 2006; Thomas, 2006). Emancipation means liberation of project practitioners from the control devices promoted by the instrumental mainstream literature. The concern with liberation of practitioners from mainstream theory is problematic from an STS perspective, as it is premised by a determinist understanding of how mainstream theories affect practices. In contrast, posthumanist constructivist STS implies that PM theories, tools and techniques do not configure practices, instead they become part of heterogeneous practices consisting of multiple and diverse actors. Practice is fundamentally unpredictable, in the sense that neither researchers nor practitioners can fully know or anticipate how the project will unfold in practice and how 'theories' and 'practices' affect each other and are adapted to one another. To understand what happens when we call something a project requires thick descriptions of specific and material practices are developed. As Molloy and Whittington (2006) point out project practitioners', just like social scientists', struggle to reconcile and connect theoretical categories and classifications (ibid:187). To reconcile and connect theoretical categories to practice is concrete, material and unpredictable:

“How, why and when some configurations occur and not others – in theory or practice – is precisely what is interesting as it enables the question of who things could be otherwise to be asked.” (ibid:188).

Therefore we should be careful to think of PM as a dominant discourse that configures projects and organisations. PM is most likely one among multiple discourses. It is not even a unified discourse in its own. By the same token, Smith (2006) describes how the techno-rational discourse of PM may serve as a resource in some instances. Smith describes how the ‘science’ of PM was summoned to fix a situation in an organisation (ibid.). In coexistence with multiple discourses and various material objects like organisational charts, the PM discourses make certain things possible. Smith demonstrates that project success and failure is not determined by gauging the project in strict accordance with the conventional project triangle, as it is defined in the techno-rational discourse. Projects are subjected to interpretations and a project delay could be re-interpreted as a success, shifting into a story about, how the project team saved the project from absolute disaster through a heroic effort (ibid.).

Exploring practices

‘Making Projects Critical’ (Cicimil & Hodgson, 2006) begins with a quote by Alvesson and Deetz (2000) stating that concepts developed by academic communities, must be recovered from textbooks and reconnected to the ways of the world (Cicimil & Hodgson, 2006:1). Taking an STS based approach the aim is not to recover and reconnect theories with practices, but to explore the connections between concrete theories and concrete practices. On behalf of the critical PM studies, Cicimil & Hodgson express ambitions to assist in the creation of knowledge that is communicable and relevant to project practitioners (ibid:3). This sort of relevancy is something academics can hope for, but it cannot be achieved by design, since this would require a privileged view from nowhere overlooking the complex relations between multiple theories and practices (Haraway, 1997). In our view STS offers an analytical approach to understanding project practices as multiple and specific practices consisting of heterogenic actors, that constantly work to establish

and uphold multiple connections. STS is committed to the study of concrete and multiple project practices in all their complexity, and not a strategic approach that can be applied to manage projects as it has been suggested elsewhere (Linde & Linderoth, 2006:169).

When studying project practices the 'bigger picture' must be considered:

"The PMBOK Guide, I would suggest, has little real academic credibility as a representation of what project management is, however popular the PMI and its certification programmes are. It is just a portion of the bigger picture (Morris, 2001; Morris and Pinto, 2004). Criticising this model with all the weight of modern deconstructionism or critical theory is totally valid but hardly fair to project management as a practice."(Morris, 2006:337)

We should be careful not to romanticize emancipation on behalf of the practitioners, but acknowledge their competencies to manage the complexities of projects. It is on those premises we believe the academic field of PM should remain open and reflexive. In that light, we welcome the ambition to expand the field and challenge what Packendorff (1995) has described as the "common assumptions" of PM. However given the diversity of the field (Crawford et al., 2006; Ford & Randolph, 1992; Packendorff, 1995; Söderlund, 2011a; Söderlund, 2004; Söderlund, 2011b; Turner et al., 2011) it is important not to dichotomise the field and some care should be exercised when rendering large parts of the field mainstream or critical.

Empirical practice-oriented approaches

In order to describe and analyse scientific and technological practices STS studies often apply ethnographic studies and qualitative methods. Due to the focus on the processes and accomplishments of practices and a critical stance towards classical sociology, ethnomethodology and grounded theory is a main inspiration (Garfinkel, 1967; Strauss & Corbin, 1990; Strauss & Corbin, 1997). The basic tenet is to study people and practices, not as governed by rules and structures, but as producers of rules and orders through their very practices. This focus delegates competence and knowledge to the practitioners, whereas the researcher is delegated the role, not of explaining and theorizing action, but of describing and reflecting on the intricacies of action.

It is characteristic of many studies in STS is that they are based on detailed, empirical studies focusing in practices of doing science or technology – often by the use of ethnographic or qualitative methods. This is due to STS' critical stance towards a view of science as rational and representing the world. In contrast, ethnographic studies within the field of Sociology of Scientific Knowledge (SSK) showed how the production of knowledge is interwoven with local contingencies and decision-making processes. Conspicuous sites to study the making of scientific facts and knowledge in the making are laboratories (Knorr-Cetina, 1995). However, ethnographic studies have been used in broad variety of contexts (For an overview, see (Beaulieu, 2010; Hess, 2001). Given that a major thrust within STS is to discover and describe how technologies, science and sociality are interwoven and co-construct each other, it is not a surprise that approaches particularly suited to conduct exploratory studies such as ethnography and qualitative methods have been widely applied. STS shares this exploratory approach with and is inspired by, for example, ethnomethodology (Garfinkel, 1967) which started out as a critique of established sociologies of societies (e.g. Talcott Parsons) who provide elaborate a priori theoretical frameworks through which to approach a phenomenon. Parsons, according to Garfinkel, perceives action as actors' rule-following, and hence disregards the reflective and competent abilities of actors to make assessment of a situation, deciding how to define it, which rule to follow, and figuring out what following a rule in a given situation might mean. The same situated and critical approach was applied within SSK to get away for established theories of scientific knowledge (e.g. Merton, 1973). Today, many STS studies prefer a 'grounded' approach when working out theories and arguments based on detailed, empirical, qualitative methodologies rather than on a priori concepts and frameworks (Strauss & Corbin, 1990), because researchers should not assume that they know what a situation and practice is about, before having looked closely. One may use 'sensitizing concepts' to guide where to look and what to look for, but not at the expense of silencing generated data, actors, and materialities. The sociologist should travel with only a light conceptual toolbox (Latour, 2005)

Empirical, practice-oriented studies within PM

Empirical studies of projects management have been called for since at least the 1990s by Packendorff (See also Cicmil, 2006; 1995). In addition to having a strong structural stream of research focusing on best practices, models and techniques, the field of PM has also had a stream of research focused on process and empirical descriptions (Hällgren & Söderholm, 2012). Cicmil et al argue for “taking seriously practitioner’s lived experience of projects” (Cicmil, Williams, Thomas, & Hodgson, 2006:675) and for studying actuality: “Researching the actuality of projects means focusing on social process and how practitioners think in action, in the local situation of a living present.” (ibid:676). The ethnographic and exploratory approach of STS, as outlined above has clear similarities these approaches. Hence, the ‘projects-as-practice’ approach deviates from the structural stream of PM research by striving to describe and understand the situatedness of PM without preconceived ideas about social structures. The aim is to pay attention to the complexities of organizing and treating a “project as a constantly renegotiated sum of the individuals involved whereas a processual approach tends to treat a project as something that an organization has” (See also Blomquist, Hällgren, Nilsson, & Söderholm, 2012; Hällgren & Söderholm, 2012:503). Further, the ‘projects-as-practice’ approach also makes a distinction between espoused theories such as those within textbook versions of PM and actual practices, which may take guidance from PMBoks and BestPractice advice, but will always have to be applied situated in contingent circumstances. An approach that resonates strongly with Lucy Suchman’s ethnomethodological study on plans and situated action and Andrew Pickering’s concept of ‘mangle of practice’ that both are central works within STS (Pickering, 1995; Suchman, 1994).

Approaching the world(s) as continually becoming and where human and non-human actors co-constitute each other, empirical studies of how technologies, models, humans, etc. are brought into temporarily stable configurations, is a core enterprise for a STS approach to PM. Rather than criticizing the gap between rationalistic models and tools and practice, such an approach would rather study how and when actors apply normative best practice tools and how and when they deviate from those tools; how they

decide what rule to follow, and how they arrive at knowing what it means to apply the PM norms. At the same time, research would investigate what non-human actors such as PM tools and best practice guides do and enable actors to do.

Power

In much PM literature the project manager is described as a single, competent, responsible, autonomous and informed individual, who by a set of resources, technologies and expert knowledge possess “the power” to run a project based on these privileges. From an STS approach this does not only ascribe power to PM tools beyond any social context, but it also reflects a Parsonian and rational understanding of the project manager as the omnipotent subject of control. Whereas the rest of the project organization are subjected to the power delegated to the project manager in order for projects to be successful. This reflects an understanding of agency and power of managers and stakeholders that sees power as a force that someone is possessing, and is able to diffuse. But evidently there are limits to the power of the project manager. Projects fail, budgets exceed, and the power of managers is not certain and simply executable (Flyvbjerg, 2012).

Moreover, research in the “lived experience” of projects has also made evident the negative side of power in project organizations (Cicmil, Hodgson, Lindgren, & Packendorff, 2009).

The analysis of power in projects is thus highly relevant for PM research, but the question remains in what ways, and from whose perspectives?

The notion of “power” has been a core element of sociology, psychology and organizational theory for a long time, and is still one of the most controversial topics in contemporary social research (Foucault, 1980; Giddens, 1984; Weber, 1947) and management theory (M. Alvesson 1956-, Bridgman, & Willmott, 2009; Mintzberg, 1983). Within sociology, the study of power in organizations is concerned with how management, knowledge and control mechanisms is embedded in social practice and shapes organizational politics (Clegg, Courpasson, & Phillips, 2006). The work of Michel Foucault has been very influential in developing a relational understanding of power,

which implies that power is depended upon an arrangement – a dispositive – of things and actors in order to function. Accordingly, power is just as much something that we subject ourselves to as well as something we are subjected. Last, the execution of power is thus fragile and requires work and effort to maintain (Foucault, 1977; Foucault, 1980).

Studies of power in PM research

As part of the new directions in PM research there is a growing interest in trying to displace the project manager as the centre of research and study projects as organizations (Packendorff, 1995). This has led to several research contributions that seek to understand the social reality of projects in which the notion of power has also emerged in PM research. In particular, contributions from Flyvbjerg (Flyvbjerg & Sampson, 1998; Flyvbjerg, Bruzelius, & Rothengatter, 2003) who have analysed power and the social strategies involved in shaping rationality in collective decision making. These efforts have been part of a new direction in PM research in which contributions from sociology are becoming more and more influential (Morris, Pinto, & Söderlund, 2011) One of the main efforts of the MPC movement has been to mobilize a critical approach to the study of power in projects (Hodgson & Cicmil, 2006a; Marshall, 2006). The main contributions are based on a notion of power as an instrument to control and dominate project organizations, and power is studied from the perspective of the "lived experience" of projects and how the social life of projects is enacted in terms of whom is excluded and included in decision making processes (Cicmil et al., 2009). Other contributions discuss how new organizational structures such as the "post- bureaucracy "... is shaping power and control in projects in different ways (Hodgson, 2004). The notion of power in projects in PM research have been insightful and constructive and PM but more studies of the enactment of power in projects is relevant. We suggest that STS can contribute to the study of power in projects by providing a set of concepts to understand the agency of artefacts and management tools.

Power and agency in STS

The concept of power in STS is inspired by the works of Foucault, but over the past decades researchers in the STS field has evolved Foucault's relational understanding into ethnographies of social practices in order to expose the performative enactment of power (Latour & Woolgar, 1986). This situated approach to the analysis of power has become known as the actor-network theory (ANT) and emerged during the early works of French sociologist Bruno Latour. As part of the investigation of the construction of science and technology Latour introduced the notion power as distributed in actor-networks (Latour, 1987). In ANT studies the concept of power in organizations is not considered as a source, or an attribute of an actor, but as a consequence of a specific social configuration. Power only exists when it is exerted through a network of human and non-human actors, and power as agency becomes a social material practice when it is inscribed into artefacts. Artefacts not only become part of the network, but they become actors partaking in producing agency, knowledge and realities. The methodological approach in the investigation of power in organizations is to analyse power as performative and look for the strategies and actors involved in ordering and configuring the network. Finally, since empirical studies are fundamental in STS, power cannot be studied from a distant outside of organizations, but must be investigated by following specific projects and how power is enacted by the participating actors.

The socio-material enactment of power in project organizations

Turning the STS approach towards PM will make us aware of a world of actor-networks, and, as John Law claims in his paper "The Manager and his powers" (Law, 2003), that if we take away the materials of the manager he is without the ability to plan, document, communicate, to act, and to manage. Power in PM is then composed during the process of building networks of power related to the project, and the strategies involved in associating them with the project manager. In this process a network of heterogeneous actors is enrolled, such as team members, stakeholders, project models, plans and diagrams, technologies and process tools, and all of them are brought into

play in the process of enacting power. Power is then distributed into a network that becomes the social configuration that makes a project work. Or not work. Understanding social dynamics of power in projects is also tightly coupled with project ontologies. In the fluid and unstable notion of ontology in STS project realities is not ready-made, but always in the making. In that sense PM is not just the case of 'smooth' implementation, but becomes a matter of making projects manageable as an on-going negotiation process towards the construction of many different and possible project realities. In that sense power is invoked in stabilizing multiple realities, and to perform a 'closure' around the negotiations (Callon, 1986; Mol, 2002). The outcome and effect of a project is then never a question of the cause of power, but of the consequence. Such a grounded and empirical study of power in project organizations may help researchers in PM to overcome ideology as the critical stance. So instead of turning toward ideologies as sources of power, then STS studies suggest that we look at the socio-material networks of humans, plans, tools, charts and expertise that are configured in the work of making projects work.

Gantt charts, their heritage and affects in practice

To illustrate the above we consider the Gantt chart as a concrete example to outline an STS-approach to PM tools and theories. We find the Gantt chart to be well-suited to illustrate our approach as it is one of the most popular PM tools in practice (See Besner & Hobbs, 2008), but also because the chart was invented as part of Scientific Management over 100 years ago, and has managed to continue to be relevant to practice, which is in itself an interesting observation.

The Gantt chart was first published in 1903 (Gantt, 1903) in 'American Society of Mechanical Engineers Transactions' alongside Frederick Taylors work on shop management (Taylor, 1903). Both the Gantt chart and Taylors work is to be considered as an integrated system for production management (Geraldi & Lechter, 2012; Wilson, 2003). Originally intended for production planning the Gantt chart was part of Scientific Management, it was developed as a balance sheet to track the actual production output against the planned

output (Gantt, 1903). Later graphical versions of the Gantt chart were developed, and the chart was adopted by project management to assist scheduling activities (Geraldi & Lechter, 2012; Wilson, 2003). The genealogy of the Gantt chart undoubtedly connects the chart to Scientific Management (Barley & Kunda, 1992; Hodgson & Cicmil, 2006b; Wilson, 2003). In line with the ideas of scientific management, the concept of decomposing work and projects into tasks can be observed, in both the original and the newer graphical versions of Gantt charts (See ANSI & PMI, 2008; Gantt, 1903).

How to deal with Gantt charts and their rationalistic heritage? Inspired by STS Jensen and Lauritsen (2005) have devised an analytical strategy called 'reading with the text', according to this strategy: '[. . .] it is less interesting to consider how to interpret and criticize a text (or any other entity) than it is to see where it goes and what it does' (ibid:353). In opposition to 'reading with the text' is 'reading against the text,' with reference to critical cultural theories (e.g. Bloomfield & Vurdubakis, 1994). The critical strategy (reading against the text), analyzes or deconstructs texts and other entities to expose their concealed ideological assumptions and repressed meanings (Jensen & Lauritsen, 2005). A symmetrical approach to the relationship between Gantt charts and project management practices entails an investigation of where the Gantt charts go and what they do in practice, rather than deconstructing and criticizing Gantt charts for their rationalistic assumptions. Gantt charts are, in this view, material-semiotic actors that connect with various practices in ways that are unpredictable. Applying the symmetrical approach or strategy does not mean the actual Gantt chart becomes irrelevant; however, it becomes less central as it is the relationship between content and practices that is the central object of study. If we 'read with' the Gantt charts and perceive them as material-semiotic actors, it is actors that seek to order projects practices by assigning specific roles to other human and non-human actors, ordering projects in activities and defining critical paths in a seemingly logical and coherent structure.

Gantt charts represent a specific worldview or ontology, which may be comparable to the way a map is used to visualize a landscape (Linehan & Kavanagh, 2006). However, just as it would be absurd to claim that the map controls the traveller's movements in the world (Suchman, 1994), it would be

wrong to assume that Gantt charts shapes and orders activities in practice in a specific rationalistic way. Gantt charts are not (by themselves) capable of configuring practices consisting of human and non-human actors in a specific way, and thereby creating a rationalistic order of practice. Gantt charts do affect practices, and have managed to stay relevant to practice for more than 100 years, which is quite an achievement. As the genealogy demonstrates the Gantt chart has managed to transform and adjust itself over the last 100 years while staying the same. The Gantt chart continues to travel and have spread to diverse practices such as batch production, military logistic and project management (ANSI & PMI, 2008; Geraldi & Lechter, 2012; Wilson, 2003).

To summarize the Gantt chart is based on rationalistic assumption and was invented to manage routine operations, but (perhaps surprisingly or at least unforeseeable) it has turned out to be adaptable and relevant to various practices. One way to explain the success of the Gantt charts is to consider them as resources for situated actions (Suchman, 1994). The charts act as projective and retrospective accounts of action, which offer accountability and acts as a boundary object or a resource for communication, planning and coordination (Star & Griesemer, 1989). As material-semiotic actors Gantt charts attempt to order practices in specific ways that can be traced to scientific management, these attempts to order and manage project practices should be taken into consideration. But we must be careful not put too much weight on the actual content of the Gantt chart, but study the Gantt charts in practice. Since practices are heterogeneous and consist of multiple actors, that may 'read', translate and use Gantt charts according to their own agendas. We cannot know in advance how Gantt charts acts out in practice this is in the end and continuously an empirical question.

Discussion

In the preceding sections we have presented and discussed the merits of posthumanist and constructivist STS in relation to PM. In this last section of the paper, we discuss the implications of this in relation to research in PM. First of all, what follows from STS is that projects must be assumed to be messy and wildly rather than simple and orderly. They may become orderly,

but that requires much work and the efforts of a heterogeneous network of actors, formulated in the terms of actor network theory. This also implies that the source of action always escapes us, who or what makes who or what act is uncertain and not easily decided. Action is not a quality reserved for any actor but a product of the association of actors. Materiality, technologies, tools, texts as well as human actors act upon each other, but in unpredictable and indetermined ways. What consequence a given method, text, diagram or well-articulated pep talk will have on an actor is uncertain. The transmission of any bit of information always implies a degree of translation and transmutation, which in the end, however minimal it may be, may have important consequences (Brown, 2002; Serres, 1982).

PM methodologies and tools are thus not simple tools to be picked up and used (although this may very well be what those that develop them hope and promise), but nor are they inconsequential. Tools and methods must be studied with the assumption that they affect, but not determine the practice. Similarly, the PM practices in which tools and methods are being used must be considered as continuously altering and adapting the tools and methods to the setting. The practices thus translate and transform the tools and methods, just as the tools and methods must be considered as affecting and transforming the practices. These processes are complex and may be difficult to follow and describe, but to do so is nonetheless important, if we wish to understand PM in practice.

The critique of PM literature that comes from the critical management tradition is accordingly also transformed in light of posthumanist constructivist STS. An often-raised critique is that PM literature is rationalist and reductionist and that it does not adequately represent how things are in the 'real world' (this type of critique is often of course raised in a more sophisticated manner than we offer here, but bear with us). The implicit assumption of such arguments is ironically that a text can and should map onto the world perfectly. As Latour reminds us there is a huge different between the statement: "The cat is on the mat" and the actual event of the cat being on the mat. In fact, there is no resemblance between the two. The one is materialised through letters or sounds and the other is an animal located in a specific time and space. Latour's point is that this is where realists and

rationalists would point to the correspondence between language and real world events, but on the basis of too sloppy, presumptuous and inconsistent reasoning. Of course, there are huge differences between texts and real world events, the one do not and cannot come to resemble the other. Just as there are multiple other differences in the world, but this also means that texts, utterances and sound are part of the world not simply representing something in the world. Texts are not either in complete correspondence with the world and true or not corresponding and false. If this were the only two options for texts, they would be entirely superfluous, Latour argues. Texts are thus things of the world and they do things in the world – or at least they potentially do things in the world (again what they will do remains an empirical concern.). So the argument and critique of PM literature as non-representative is according to this argument badly premised. No text can ever fulfil this idealist obligation and it thus an unreasonable and unfair accusation. Instead the argument and the critique of PM literature becomes somewhat inverted. Texts acquire the status of actors. They along with other beings have risky existence and they have to ally themselves with other actors in order to exist. If no one reads them and passes them on by references, at some point they cease to exist.

A powerful way to ally yourself with others is to make promises. Much PM literature can be read as making the promise: “if you read and employ me then things will become easier.” In this respect, it is completely reasonable that the PM literature is prescriptive, rationalist and reductionist because this is exactly what their readership expect and want them to be, if we acknowledge that businesses, organisations and actors want to manage projects. They do not want texts that tell them it is close to impossible and that projects cannot be managed at least not in the manner imagined or dreamed of. The practices and the texts thus make a good match, which is also why the rationalist PM discourse is so widespread and should not be expected to easily go away.

Our point is not to applaud the rationalist PM literature, but simply to explain its existence and why critiques of the PM literature as rationalist and reductionist misses the target and remains mainly an argument for the already convinced. We, the authors, agree with the critical tradition on the diagnosis,

but we find the diagnosis to constitute a poor intervention in the field. Since as we know a diagnosis is not a cure.

The above argument has methodological consequences because when we consider the text as a performative actor, then what it does and does not do becomes a subject of inquiry. Instead of the text as having only two possible types of existence, either representing or not, it may have multiple roles and consequences. A loose and vaguely formulated methodological approach, which in the eyes of the critical interlocutor might be diagnosed as yes vague and with no or little specificity, may in a performative analysis be shown to be highly effective in practice because it can be generously interpreted and thus applied and used by many actors in many different settings and in this light a successful approach. Moreover, it becomes relevant to investigate how rationalist approaches becomes adapted and accommodated into practices. We may imagine how the failure to follow an approach by the letter leads the practice to manages differently and thereby the approach implicitly comes to contribute, although not in the manner intended.

Last, we consider STS to offer an important alternative understanding of our role as researchers of PM. Our role and ambition as researchers may not be to develop better tools for practice and to bridge gaps, because this imply both some sort of superiority of research over practice, as well as a determinist assumption about texts, tools and methods. Instead, our ambition might be to provide close and descriptive accounts of practices that acknowledge the competences and expertise of practitioners and the creative tinkering and adaptation of, for instance, 'rationalistic' PM tools that render them beneficial in some way or another. Furthermore, the role of research may not be to produce texts that based on representative adequate descriptions of reality provides answers to real life problems. Maybe, we as researchers should relieve ourselves from this ambition, since it also implies that we as researchers has some sort of privileged access and knowledge of the practices superior to the practitioners themselves. Less, might also in this case, be more. We think that we should take the idea of texts as performative actors seriously and resist the intrinsic instrumentalism that easily follows with the ambition of contributing to a practice. Instead we suggests that we as

researchers of PM should seek to develop rich discourses on the complicity and intricacies of PM practices on how things do not fit, of the twists and turns, surprises and unruly actors and technologies and thereby contribute to exposing practitioners to problems and complexity in order to increase their capacities for coping with and managing complexity. We could think of this type of literature as equal to a flight simulator or a martial arts training arena that exposes pilots or combatants to worst-case scenarios, so that they may act accordingly when faced with the unusual events of sudden failures or violent attacks. But also so that the every day practice of flying and training becomes smooth and unproblematic in comparison with the simulated events. Developing such a discourse would obviously imply explicating this kind of purpose of the paper to the reader.

What characterises the experienced project manager is a well-developed intuition and a huge repertoire of more or less tacit knowledge as well as confidence in own capabilities established through long experience. Existence is messy and experience as well and maybe the real critical approach is to establish and articulate a tradition that is deliberately and explicitly experimental. A discourse that do not have 'answers' and 'solutions' and refrain entirely from this ambition, in order not to 'pollute' good, rich and messy accounts with instrumentalist objectives. Text cannot substitute experience it is often said. Texts are part of experience, we say. Why not fully embrace this and write accordingly?

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