

Maybe Bacon had a Point: Knowledge and Power in Collaborative Inter-Organisational Activities

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Introduction

“Knowledge itself is power, not mere argument or ornament”

Francis Bacon (*Meditationes Sacrae*, 1597)

One of the frequently used slogans of the knowledge management movement is “knowledge sharing is power” (e.g. Roth, 2000; Skyrme, 1997). While being a dubiously witty rejoinder to Francis Bacon’s famous dictum, it is altogether too facile a reading of the relationship between power and knowledge. It also represents a limited interpretation of the point Bacon was arguably trying to make. Frustrated with the speculative philosophising of the Scholastic School, he was concerned with reconnecting knowledge and action. Four hundred years or so later many of the issues he raised are still relevant. In debates on organisational knowledge, they can be detected in the encounters between those who promote the formalisation, codification, and disembedding of knowledge and those who emphasise its inseparability from specific contexts of action. However, while the protagonists of context-dependency - drawing upon practice-based approaches such as situated learning, situated action, distributed cognition, and activity theory - have made crucial contributions in challenging the static, object-like, and transparent depictions of knowledge associated with the supporters of codification, the power-knowledge nexus remains more as an adjunct to the debate than a central consideration.

This paper represents an initial attempt to integrate an explicit conceptualisation of power into contextual theories of knowledge. Firstly, we examine some of the main influences on which practice-based approaches to organisational knowledge have drawn. In common with other theorists in the field of organisational knowledge (e.g. Blackler, 1995; Brown and Duguid, 1991; Cook and Brown, 1999), we support the view that it is inadequate to focus solely on the abstract, codified, and explicit properties of knowledge, and that it is also crucial to understand how the process of ‘knowing’ takes place in organisations (Bertels and Savage, 1998). According to proponents of this view, knowing can be conceptualised as being socially situated (Lave, 1991), distributed (Hutchins, 1995) and orchestrated through practice (Cook and Brown, 1999). However, we suggest there is a crucial blind-spot in the practice-based literature on knowledge concerning the theorisation of power. In attempting to address this absence, we turn to examine alternative conceptions of power. Here a particular distinction is drawn between conventional conceptions of power which treat it in personalised, repressive, and zero-sum terms, and Foucauldian-inspired approaches which emphasise the impersonal, discursively-constituted, and productive character of power. We consider some of the strengths and weaknesses of these approaches and how far they are commensurable. From this we suggest a number of dimensions which an adequate conceptualisation of power arguably needs to consider.

Finally, we attempt to trace out some of the interactions between these dimensions, using material from a study of inter-organisational collaboration in the telecommunications sector. The particular focus is on a series of engagements between an equipment supplier and a network service provider during the delivery of a major software project for providing new functionality to telephone exchanges. This two year project formed one of the main subjects of an ethnographic study conducted by one of the authors. For the purposes of this paper, we examine the later stages of the project during which the software was tested and progressively integrated on the network. During this phase a temporary monitoring team was established comprising representatives from both supplier and customer. Given the complexity and

criticality of this activity, it involved an intense period of interaction, much of which occurred through daily audio-conferencing meetings between all members of the team. We look in detail at these interactions and attempt to illustrate the power dynamics that were involved.

The limited treatment of power in practice-based approaches to knowledge

In this section we outline some of the main theoretical perspectives that espouse socially embedded, action-based, and context-sensitive approaches to theorising knowledge, and consider how far each perspective contributes to our understanding of the knowledge-power nexus in an organisational context. To give a flavour of this tradition we examine the following approaches: situated learning (Lave and Wenger, 1991); situated action (Suchman, 1987); distributed cognition (Hutchins, 1995); and developmental activity theory (Engeström, 1987). In each case, it will be seen that the concept of power, although not entirely absent, makes only an unsystematic and secondary appearance. This seems to be more due to a failure to develop a fruitful lens through which to analyse, in any coherent fashion, the interconnections between power, knowledge, and action, than to a lack of awareness, or even denial, of its relevance.

Situated learning

The focus of situated learning is on work-context, learning, and human interaction. Proponents of situated learning (e.g. Lave and Wenger, 1991; Cook and Brown, 1999) suggest that the activity in which knowledge is created is inextricably linked to learning and cognition. The notions of shared understanding and common practice are pivotal to the concept of situated learning. It is through active participation in a community of practice that a member will eventually gain the skills and expertise that are necessary to become a master practitioner. The concept of community of practice is central to this perspective as it regarded to be the locus for knowledge creation and learning. Communities evolve just as human relationships do. There are certain critical characteristics, however, that differentiate communities of practice from other forms of community (Adams and Freeman, 2000; Lave and Wenger, 1991). These include: involvement in a common activity; legitimate access; peripheral participation; the dynamic roles of leader and learner; and the overlapping of communities. The notion of practice is critical since learning is only achieved by practising one's craft or participating in an activity. This perspective emphasises the importance of informal, experienced-based learning through active participation in a community of action or through apprenticeship. Participation is not just observing or imitating. It is interactive and dynamic within the community of practice. For Lave and Wenger (1991), a community of practice is not an isolated entity. It is a dynamic set of relationships and activities that over time overlap with other communities of practice.

Situated learning is particularly interested in the processes through which individuals are progressively accepted into communities of practice. Legitimate access refers to the process of initiation that a newcomer undergoes on entry to a community. The examples provided by Lave and Wenger (1991) indicate that legitimisation can be formal, as in the case of apprentices joining a community of trade professionals, or informal, such as when an alcoholic joins Alcoholics Anonymous. Intrinsically linked to legitimisation, peripheral participation is used to indicate the level of engagement and participation with the community. It describes the triadic group relations between 'old timers', 'journeymen' and 'newcomers'. Newcomers are initially restricted to more straightforward, peripheral

activities through which they are introduced to the various aspects that make up a particular practice. As they develop a requisite mastery over these activities they are gradually permitted to approach closer to the centre of the community of practice. Over time the newcomer through active practice and by interaction with other members learns the social values, meanings and skills required to become a full member of the community.

Issues surrounding legitimisation and peripheral participation appear to offer a promising route in to thinking about power relations within communities of practice. In their earlier work, Lave and Wenger do indeed consider aspects of power, albeit in a rather unsystematic fashion. Clearly, it is difficult to consider the processes through which individuals are permitted access to a community without acknowledging the typically asymmetrical power relations between its three groups. The more experienced old-timers are central in establishing the division of activities based on assessments of accomplishment, not to mention defining the criteria for what constitutes requisite mastery. Old-timers can also determine the rate at which newcomers gain centrality to the community, as they are also responsible for monitoring the newcomer's acquisition of expertise. Knowledge is closely linked to these relations of power since it is through the collective recognition of experience and expertise that an individual's legitimacy within the community of practice is established and reproduced. The interweaving of power and knowledge is evident in the struggles which may emerge within the three groups over alternative interpretations of what constitutes their practice, as well as differing definitions of the basis of expertise. In this sense, the power relationship between leader and learner may be reciprocal. It is not only the newcomer that learns through legitimate participation. Old-timers also have the opportunity to review their practice and learn new ways of working by interacting with newcomers.

However, while this earlier take on situated learning within communities of practice offered numerous tantalising glimpses of how issues of power might be incorporated, these remained largely under-developed, postponed for future consideration. As Lave and Wenger (1991, 42) themselves recognised, "unequal relations of power must be included more systematically in our analysis". Unfortunately, as Fox (2000) and Contu and Wilmott (2000) have noted, this promise has thus far not materialised. Indeed, in more recent work, direct consideration of power issues is even more elusive than previously, remaining puzzlingly unconnected to questions of meaning negotiation and identity formation which now take centre stage (Wenger, 1998, 2000). This is intriguing because, as well shall see, much of the more recent theorising on power is concerned precisely with understanding the links between power, discourse, and identity. Other authors who have been inspired by the notion of communities of practice have also tended to drop the suggestive, if piecemeal, concern with power relations evident in Lave and Wenger's earlier work (e.g. Adams and Freeman, 2000; Hildreth *et al.*, 2000).

Situated action

The work of Suchman derives from the discipline of human and machine interaction. In her seminal book *Plans and Situated Action* (1987), she proposes that human action is emergent within situations. She challenges the rational planning model, that suggests user support software, such as help screens on photocopiers, should be based on a reciprocal relationship between the human and machine. Furthermore, she rejects the view held by adherents of the planning model that action is achieved through structured conversation. Suchman argues that face-to-face communication is a fundamental and highly developed system for accomplishing mutual intelligibility which is orchestrated through the exploitation of linguistic,

demonstrative, and inferential resources of communication (Halloran, 2000). Accordingly, system failure is viewed to be the result of behavioural asymmetry between machine and humans, as they are differently equipped with the resources of face-to-face communication. Suchman's situated action is concerned with co-operative action. Such action is based on the resources available within a situation, and it is through interacting in the context of a particular situation that humans are able to derive meaning, make sense, and act accordingly. She suggests that situations are unambiguous and 'transparent' and that human reasoning is a retrospective sense-making activity that follows action, rather than an activity that is necessary to determine future action. This point is clearly debatable given that some situations, far from being transparent, are complex, ambiguous, and unfamiliar. Situations of this type have to be negotiated for meaning prior to action (Halloran, 2000), and can involve complex processes of experimentation and improvisation (c.f. Baumard, 1999).

The treatment of power in situated action is limited to the role of artifacts as representations of power. In her study of the work of airline ground operations at an American metropolitan airport, she illustrates how the spatial and temporal arrangement of artifacts in the environment serve to shape action. In the operations room she identifies a division of labour that assigns different responsibilities for communication, via various technologies, with other relevant locations. One consequence of the division of labour is that workers were found to 'differentiate' their attention during co-operative work to focus on different technologies in the room, creating 'structures of participation'. Suchman suggests that an individual's access and control over artifacts can create and reinforce differential power relations. Suchman (1997), for example, refers to a study conducted by Jordan (1992) in an American obstetrics ward to illustrate this point. Jordan found familiarity with relevant technologies to be unevenly distributed across participants. The more authoritative and knowledgeable personnel tended to have access to technologies that were perceived to require higher levels of expertise and competence for their operation than their less senior colleagues. In this context, action and artifact use were inextricably linked to symbolising structures of authority grounded in expressions of expertise. While this provides interesting insights into the symbolic nature of artifacts and how they serve to reinforce representations of power, situated action generally avoids any systematic consideration of the dynamic aspects of power relations. The analysis considers the material embodiment of power in particular situations at given points in time, but fails to elucidate how representations of power emerge, are reproduced, and change in collaborative social situations.

Distributed cognition

Distributed cognition is a theoretical and methodological approach that conceptualises cognitive activities as situated and embedded within the work context in which they occur. Hutchins (1995) and his colleagues developed this approach to study the development of co-operative work performed by groups, such as marine navigation teams and airline flight crews. Distributed cognition challenges the notion that cognitive processes are intra-individual by conceptualising them as distributed across individuals and artifacts. This implies that the cognitive processes involved during co-operative work are not restricted to the heads of different actors, but include physical tools and the interaction between tools and actors. Furthermore, the cognitive properties of the entire system are viewed to be different and super-ordinate to any individual component (Halloran, 2000). Proponents of this approach view knowledge possessed by a functional system as highly variable and redundant. On the one hand, individuals working in a functional system are likely to possess different kinds of knowledge which they are able to combine when they work together. On the other

hand, much knowledge is shared between individuals. This 'redundant' knowledge refers to knowledge overlaps between individuals. This common knowledge is regarded as essential for communication between members and for the co-ordination of complex work activities.

Distributed cognition tends to avoid issues of power, treating it as a static entity that contributes little to understanding work activities in complex functional systems (Rogers and Ellis, 1994). That power is not considered especially relevant by proponents of distributed cognition can probably be traced to their reliance on a computational model of cognition that suggests human cognition can be reduced to an algorithm. The computation analogy is part of a metaview that treats people as information processing systems (Halloran, 2000). The information processing approach is concerned with processing inputs through algorithms to outputs. For distributed cognition to build complex constructs such as power relations into its framework is likely to add a confounding variable which would disrupt the mechanistic view of human cognition on which it is based.

The following study of error checking by Hutchins and Klausen (1996) reflects distributed cognition's restricted treatment of power as a static, background variable. The setting for this study is an airline cockpit where the Captain is found to be responsible for a breakdown in the system while making a request to Air Traffic Control (ATC) to fly at a higher altitude. On making the request to ATC the Captain is told to contact the high altitude ATC, who are on a different frequency. The Captain does not make the expected immediate acknowledgement to this direction as he does not know which frequency to switch to. Changing frequency would signal his acknowledgement. The breakdown is recovered from, when the First Officer (F/O) correctly interprets a look from the Captain as a request for the frequency. Hutchins and Klausen (1996, 24) interpret the recovery from a potential breakdown in terms of *intersubjectivity*. "This interaction depends on the intersubjective sharing of representations of aspects of the situation that were never made explicit by either of the interactants. There was no conversation about what each other knew about what the other knew".

This scenario indicates how knowledge that is distributed across different media is shared between actors, and how these shared representations acts as inputs for outcome behaviours. In other words, the Captain's failure to acknowledge the radio frequency at the expected time caused the F/O to respond immediately with the frequency. This analysis does not, however, consider how the power relationship between the Captain and the F/O did not constrain the less senior crew member from quickly taking charge of a situation when it became evident that the Captain was failing to make the expected response. An alternative power relationship between Captain and F/O, which granted the Captain absolute control of the flight deck, could have resulted in a different outcome. This example serves to illustrate how power helps to shape individual action in co-operative work environments. Distributed cognition tends to avoid the influence of power by treating it as a benign influence. This risks providing a distorted view of collaborative work, depicting it as always unproblematic and free from conflict and dissension. In contrast, the notion of conflict or contradiction is pivotal to the work of Engeström (1987) in his conceptualisation of activity theory. This approach we will discuss next.

Engeström's activity theory

The underlying ideas of activity theory were initially formulated in the early twentieth century by Russian psychologist Vygotsky in his concept of tool mediation and Leont'ev in his notion of activity. Inspired by this work, Engeström (1987) has developed a

contemporary version of activity theory that reflects the collective and collaborative nature of work. This approach provides a theoretical framework for analysing human practices as developmental processes, whereby the individual level of analysis is inextricably linked with the social level (Kuutti, 1996). Activity or ‘what people do’ is reflected through changes in human practice as people interact with their environment over time. Furthermore, activity theory is concerned with historically specific local practices, their objects, mediating artifacts, and social organisation (Cole and Engeström, 1993). Engeström’s (1987) theoretical framework provides a general model of human activity as an expanded activity triangle (see Figure 1). The activity triangle model incorporates the components *Subjects*, *Object*, and *Community* and mediators of human activity: *Tools*, *Rules* and the *Division of Labour*.

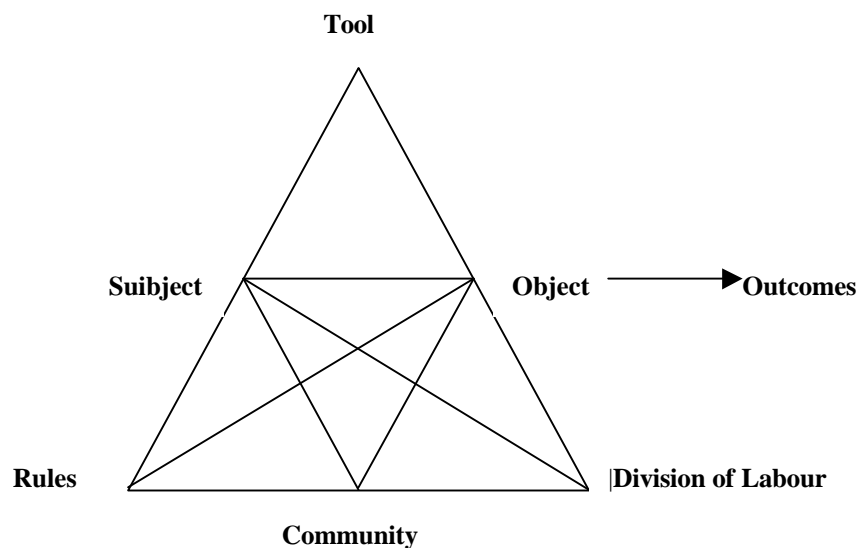


Figure 1. Model of activity theory system (Engestrom,1987, 78).

The *Subject* component refers to individuals or groups who are orientated to satisfy the object. It is the person or persons involved in the activity (Halloran, 2000). The *Object* reflects the motivational and purposeful nature of human activity that allows humans to control their own behaviour. Christiansen (1996) depicts the object as an ‘objectified motive’, and Hasan (1999) refers to the object as ‘the object of the exercise’. The subjects’ relationship with the object is mediated through the use of tools. The *Tools* component portrays the mediational aspects of human activity that can be physical, psychological, or skill based. Tools are used to handle or manipulate the object to produce *Outcomes* that can be intended as well as unintended. The *Community* component locates the analysis in the social and cultural context in which the subject operates. The community consists of multiple individuals who share the same general object and who construct themselves as distinct from other communities (Halloran, 2000). The *Rules* refer to the implicit and explicit regulations, norms and conventions that affect the action and interaction within the activity system. Finally the *Division of Labour* refers to both the horizontal division of responsibilities and variations of job roles of the members of the community, and the vertical division of power and status, e.g. decision making powers.

While the essential task of analysis is to grasp the systemic whole of an activity, not just separate components, Engeström’s model enables the analysis of a multitude of relations

within the triangular structure of activity. The concept of contradiction is crucially important as it deals with breakdowns in the activity system. A contradiction reflects an incongruent relationship between two components of the activity system that prohibits the development of a shared outcome. Engeström argues that the resolution of a contradiction enables learning to take place, allowing the system to develop. During contradiction-resolution actors have to renegotiate and redefine alternative action, both practically and intellectually.

Although Engeström's (1987, 1991, 1993, 1995) theoretical framework has turned its attention to the tensions and contradictions within activity systems that threaten to result in breakdowns, this has surprisingly not been accompanied by any explicit consideration of power relations. This is perhaps because the emphasis is on how these breakdowns are avoided or contained, how tensions are resolved, and how such disturbances can stimulate innovation. Most of the examples drawn upon by Engeström to illustrate activity theory have a redemptive quality. They tell of problems emerging due to mismatches between the different elements of activity systems, but also how these are solved through a collective determination to address the disturbance. In his exploration of primary healthcare clinics in Finland, for example, there is frequent reference to tensions between doctors, patients, nurses, laboratory staff, and administrators, yet there is little acknowledgement that unequal power relations are likely to play more than a minor role in how these tensions are worked out.

As an example, he considers encounters between doctors and patients in which there is a mismatch in their respective conceptions of a particular health problem (Engeström, 1990). What is required, he suggests, is to find ways "to enable the doctor and the patient to engage in working out shared models or representations of the object - i.e. of the patient's health problem" (Engeström, 1990, 128). Since the problem is framed as one of a divergence of meaning it naturally follows that the solution is depicted as the search for shared understanding. However, there is no guarantee that doctor and patient will be equally committed to reaching understanding. Furthermore, even if shared understanding is achieved, this by no means implies agreement. As Rorty (2000, 13) has suggested: "Both sides may agree that, although they understand what each other says perfectly well ... there seems no prospect of reaching agreement on the particular issue at hand". It would also seem to be difficult to think about the doctor-patient relationship without considering asymmetries in the value accorded to different types of knowledge. These asymmetries are simultaneously defined by and defining of relations of power. Encounters between doctors and patients are characterised by the meeting of two quite distinct knowledge domains: the professionally legitimised, specialist, scientific knowledge of the doctor and the personalised, direct, embodied experience of the patient concerning their health. Typically the former domain is prioritised over the latter.

There is nevertheless some acknowledgement within activity theory of the importance of power. Engeström (1999, 402), for example, has suggested that the 'creative reconstruction' involved in problem-solving "often involves questioning, confrontation, and debate. If this is overlooked, the important dimension of power will be artificially separated from object-oriented collaborative work and innovative learning in work organizations and teams". However, this identification of the importance of the power dimension is unfortunately not reflected in any direct attempt to engage with theorising what this might mean. Blackler (1995, 1039) has argued that "activity theory is weak in the analysis it offers of the relationship between knowledge and power". He suggests that this is a serious drawback because "issues of domination and subordination are fundamental to the development of a general theory of knowing as praxis" (Blackler, 1995, 1042). However, yet again we are

offered the promise of an approach to theorising organisational knowledge that brings power to the fore without supplying any real indications how this might be achieved.

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We have argued that theories promoting a socially embedded and action-based view of organisational knowledge typically fail to provide an adequate analytical lens to investigate the dynamic relations between power and knowledge that are inherent in collaborative work. While the majority of these accounts do make some reference to issues of power, the focus tends to be on one or two limited dimensions without any systematic consideration of the relationships between power, knowledge, and action. There have been some more recent attempts to address this situation. Blackler and McDonald (2000), for example, have attempted to tackle the question of power head-on. Reiterating the challenge that action-based theory needs "extension to accommodate issues of power more explicitly", they are nevertheless confident that "given their focus on the complexity of actual interactions this should not be too much of a problem" (Blackler and McDonald, 2000, 837). To meet the challenge, they propose "to study power as *both the ongoing product, and the medium, of collective activity*" (Blackler and McDonald, 2000, 835, emphasis original). This is all well and good, except that the action research project reported on in the paper does little to illuminate the conceptual claims put forward. There is a disconnect between the theoretical case for studying power and the way that the empirical material is presented.

We would suggest that the inability to bring together theory and evidence in this instance has more than a little to do with the level of generalisation at which power relations are conceptualised. The suggestion that power is both product and medium of collective activity is a good starting point, but it does not get us very far without considering the specific strategies, techniques, and dispositions through which it is exercised. This more detailed perspective on power is probably missing because there has not been a great deal of cross-fertilisation between the extensive literature on power in social theory and the literature on organisational knowledge and learning. Moreover, it will soon become clear that the theorisation of power is by no means a straightforward and uncontested matter. It is obviously over-ambitious to hope to remedy this absence in any comprehensive way within the scope of this paper. However, the time is ripe to move beyond simply recognising that power is an important dimension of organisational knowledge practices actually to thinking about how it can be satisfactorily conceptualised in relation to such practices.

Alternative conceptions of power

Attempts to theorise power within the wider literature on organisation theory appear to have undergone something of a miniature renaissance in recent years. Having said that, it has not been a topic that has received that much attention in mainstream circles. LaPalombara (2001), updating the earlier work of Kotter (1979), has noted that there were only fifteen papers in the 3,000 or so published in the *Harvard Business Review* between 1960 and 1999 which included power in their title. Nevertheless, especially in critical management circles, the debate on power has been reinvigorated, particularly because of the growing interest in the insights on power offered by Foucault (1977a, 1977b, 1980a, 1980b), as well as, to a lesser extent, those derived from actor-network theory (e.g. Callon, 1986; Latour, 1986; Law, 1991). These bodies of theory have suggested a number of fruitful avenues for investigating organisational power relations. They have been taken up by organisation theorists, especially

those concerned with trying to overcome what was arguably an impasse in the debate about control and resistance in the labour process (e.g. Ball and Wilson, 2000; Brocklehurst, 2001; Knights, 1992; Townley, 1993). These new conceptions of organisational power stand in sharp contrast to earlier thinking on the subject. It is important to understand the differences between earlier, orthodox theories of power and more recent accounts because they have a strong bearing on where to look for power in interpreting concrete social relations. As Marsden and Townley (1995, 11) have argued, “[p]ower’ is a concept of causes. Every concept of power, therefore, comes attached to an understanding of causation and ontology”.

The clearest point of distinction between earlier and more recent approaches to power is that the former tend to regard power solely in repressive or prohibitive terms, while the latter conceptualise power as productive. Most orthodox approaches to power are influenced by the formulation offered by Weber (1958, 113) whereby it is portrayed as “the chance of a man or of a number of men to realize their own will in a communal action even against the resistance of others who are participating in the action”. Dahl (1957, 202-203), for example, replicates this formula in suggesting that “A has power over B to the extent that he can get B to do something B would otherwise not do”. In this sense, power is thought of in personalised terms as a property of individuals or groups. Moreover, it tends to be regarded as a zero-sum game to the extent that its possession by one individual or group is necessarily mirrored by its absence among those over whom this power is exerted. Power, then, “is seen as a disputed commodity; increments of it pass back and forth across a ‘frontier of control’ as a result of struggles between parties with particular locations of ‘interests’” (Bloomfield and Coombs, 1992, 466).

The exercise of power is portrayed as inseparable from conflicts of sectional interest. Indeed, the analysis of observable conflict became the cornerstone of the so-called pluralist view of power most closely associated with Dahl (1957). There is a methodological difficulty with analysing power because it “is one of those things, like gravity and electricity, which makes its existence apparent to us through its effects, and hence it has always been found much easier to describe its consequences than to identify its nature and its basis” (Barnes, 1988, ix). For the pluralists this led to an emphasis on the outcome of concrete decision-making episodes where there are conflicting preferences between actors (e.g. Merelman, 1984; Polsby, 1980). The assumption was that those individuals and groups who are most successful in achieving their preferred outcomes are, by implication, more powerful than those who fail to do so.

The pluralist view has not remained unchallenged, but the alternatives offered still do not question the prohibitive, zero-sum conception of power. Instead, they focus on criticising the pluralist dependence on observable instances of overt conflict and the outcomes of concrete decision-making processes. Bachrach and Baratz (1963; 1970), for example, drawing on the notion of *mobilisation of bias* (Schattschneider, 1960), suggested that it is important not only to examine decision-making but also *non*-decision-making. In other words, power is not only manifest in active decision-making choices between clearly defined alternative courses of action. In addition, individuals or groups exercise power to the extent that they are able to influence which issues are considered within the decision-making agenda and which are excluded or suppressed. Such non-decision-making is “a means by which demands for change in the existing allocation of benefits and privileges in the community can be suffocated before they are even voiced; or kept covert; or killed before they gain access to the relevant decision-making arena; or, failing all these things, maimed or destroyed in the decision-implementing stage of the policy process” (Bachrach and Baratz, 1970, 44). Despite

expanding our understanding of power to include both overt expressions of control and covert manipulations, it is still portrayed as a range of mechanisms and practices through which one person or group secures the compliance of others.

According to Lukes (1974), both the pluralist approach to power and the non-decision-making critique share an excessive behaviourist and individualist orientation. In each case, power is about observable behaviour, whether overt or covert, by individuals actively and consciously pursuing what are assumed to be clearly defined sets of interests. For Lukes, this ignores the collective and systemic nature of power. It runs the risk of voluntarism because all manifestations of power are reduced to conscious attempts by individuals to achieve their preferences. In contrast, there are many instances of collective activity where outcomes are not attributable to any particular individual's behaviour, but rather to the interaction of multiple decisions within the collectivity. Moreover, outcomes may be the consequence of system-level or organisational effects, socially structured and culturally patterned behaviour, which can not simply be treated as the sum of individual actions. Lipps (1991, 5) offers an extreme expression of this position in suggesting that individuals "more or less unaware of the structure of power that surrounds them, participate, maintain and are limited by that power structure". Lukes also criticises pluralist and non-decision-making approaches for their treatment of intentionality, offering two main arguments. Firstly, activity is not always driven by conscious, goal-directed behaviour and expressions of power may be the result of unintended consequences. Secondly, and perhaps more interestingly, power relations are not only a matter of one person getting somebody else to do something they do not want to do. Power is also exercised where the very wants and desires of individuals are themselves shaped and influenced. In this sense, power slips below the surface because it appears that there is an ostensible identity of interests between the powerful and those who are dominated.

Unfortunately, it is only a short step from suggesting that preferences can be moulded and values shaped to arguing that such influences represent a distortion of individuals' 'true' interests. It is on this issue that Lukes' view on power has been most vigorously criticised. Knights and McCabe (1999, 202), for example, approve of Lukes' insight that "power can operate to define reality so that consent gives the false appearance of the absence of any contest or alternative viewpoint", but then go on to argue as follows:

The danger here is of collapsing into an essentialist view of interests, identity or subjectivity, as if they existed independently of power at one point only to be corrupted by it at another. Apart from the contradiction of being 'free' of power and yet controlled by it, the idea of 'real' interests or subjectivity is simply another version of the neo-Marxist thesis of 'false-consciousness'.

(Knights and McCabe, 1999, 202)

Not unlike Rawls' 'original position' or Hobbes' 'state of nature', the problem of order, or in this case power, is depicted as something superimposed over an underlying, more pristine and authentic state. It is therefore not surprising that power, in this formulation, is regarded wholly in negative terms as something that prohibits and distorts. Wandel (2001, 375) has usefully encapsulated the critique of the ideology/reality dualism and is worth quoting at length:

The notion of power as a negative force - one that violates, censors, obstructs - suggests that the absence of that force would allow a natural order of things to flourish in its true, raw being. Negative power is trickery; an evil, spellbinding force that distorts and manipulates, casts dark shadows on a pure, innocent reality. Only the disinterested scientist, equipped with pure reason, possesses the truth serum that contains the formula with which to tear off the mask of power. But as long as this language and this notion of

negative power is employed, the critical theorist is in effect helpless. Stuck with ontic oppositions between appearance and reality, subject and object, the only strategy available against objective claims of a revelation of an absolute truth, hidden in the secret depths of consciousness or reality, is to counter it with new claims of having unmasked even deeper truths, truer, so to speak, than the truth posed by the object of the critique.

The negative view of power also derives from the continuing identification of power with attempts by one individual or group to achieve the compliance of others. Despite criticising the behaviourist and voluntarist assumptions of earlier approaches to power, Lukes still appears to be largely trapped within the traditional Weberian formula, as evident in the following definition: “A exercises power over B when A affects B in a manner contrary to B’s interests” (Lukes, 1974, 34).

It is in opposition to such negative conceptions of power that more recent arguments concerning the productive nature of power, predominantly inspired by Foucault, have emerged. However, it is worth bearing in mind that attacks on the negative view of power are by no means a wholly recent phenomenon. Parsons (1960), for example, criticised the zero-sum conception of power, making Mills (1956) the target of his criticism, and suggested instead that it is better viewed as a *circulating medium* produced within social systems. According to Parsons (1960, 221), power “is a generalized facility or resource in the society. It has to be divided or allocated, but it also has to be produced and it has collective as well as distributive functions”. However, despite sharing an opposition to negative, zero-sum conceptions of power, there is little overlap between the structural functionalism of Parsons’ approach and more recent Foucauldian-inspired theories. Parsons treats power solely as a system property for regulating and achieving collective goals, shifting the emphasis away from power as constituted through relations between individuals and groups (Giddens, 1968). In contrast, Foucauldian theories are interested precisely in how power is constructed, reproduced, and resisted through social relations. At first glance this does not appear to depart greatly from Dahl’s invitation to “agree that power is a relation, and that it is a relation among people” (Dahl, 1957, 203). However, the crucial difference is that traditional approaches tend to consider power as something possessed by individual actors to be used as a resource in guiding social relations, whereas the Foucauldian perspective focuses less on the capacities of individuals and more on the webs of relations in which they are caught up.

There is an interesting parallel here with debates about organisational knowledge. Just as Cook and Brown (1999) have criticised the tendency to treat knowledge purely as something that is possessed, thus downplaying any understanding of knowing as practice, Foucault (1977a, 26) argued that power “is exercised rather than possessed”. In each case it becomes important to focus not on properties but on detailed practices and relations through which power or knowledge are constituted. As Foucault (1977a, 26) put it, power should be “conceived not as a property, but as a strategy, that its effects of domination are attributed not to ‘appropriation’, but to dispositions, manoeuvres, tactics, techniques, functionings; that one should decipher in it a network of relations, constantly in tension, in activity, rather than a privilege that one might possess”. Consequently, “power has to be re-thought as a problem of connectivity and consistency rather than of possession and organization, as a force of trans-relationality, crossing lines and opening borders rather than as a power of gathering resources and defining limits” (Beddoes, 1997, 34). It is here that the connection between the so-called *micro-physics* of power and the notion of power as productive intersect. If power is a property of relations, rather than a relation of properties as in the traditional view, then all those participating in the network of relations are implicated in its production.

This leads Foucault (1977a, 194) to issue the following call: “We must cease once and for all to describe the effects of power in negative terms: it ‘excludes’, it ‘represses’, it ‘censors’, it ‘abstracts’, it ‘masks’ it ‘conceals’. In fact, power produces; it produces reality; it produces domains of objects and rituals of truth”. This begins to indicate the crucial interplay between power and knowledge, which becomes inseparably connected in the couplet power/knowledge. According to Foucault (1980b, 52), the “exercise of power itself creates and causes to emerge new objects of knowledge and accumulates new bodies of information ... the exercise of power perpetually creates knowledge and, conversely, knowledge constantly induces effects of power ... It is not possible for power to be exercised without knowledge, it is impossible for knowledge not to engender power” (Foucault, 1980b, 52). The detailed techniques of disciplinary power are grounded in and productive of discourses which “inscribe and normalise not only individuals but also collective organized bodies” (Clegg, 1989, 100). It is through the production of particular forms of knowledge based on classification, codification, categorisation, and measurement that individuals and institutional practices are rendered knowable (Townley, 1993). Closely connected to this is the argument that power/knowledge and processes of identity formation are intimately linked. As Deleuze (1988) has suggested, “just as power relations can be affirmed only by being carried out, so the relation to oneself, which bends these power relations, can be established only by being carried out ... The relation to oneself will be understood in terms of power relations and relations of knowledge”. For Knights and McCabe (1999, 203), this means that “power can be theorized as a medium of ‘relations’ in which subjectivity, as a complex, contradictory, shifting experience, is produced, transformed or reproduced through the social practices within which such power is exercised”.

While the Foucauldian view has helped to shed new light on the conceptualisation of power, it is not without its detractors. In part this is because Foucault’s writing on power by no means presents a wholly coherent and unified theoretical programme. Instead, it is often contradictory and ambiguous. For Hardy and Clegg (1996), there is the concern that Foucauldian-inspired organisation theory is excessively distant from practical concerns. It does indeed appear that there is a tendency within this literature to remain at a high level of theoretical abstraction. However, this is perhaps more to do with how Foucault’s ideas have been translated into the study of organisations. The difficulty of doing justice to the intricacy and interconnectedness of his thinking means that it is tempting to latch onto those individual concepts which are seemingly more amenable to application in organisational settings, the exemplary case being the notion of the panopticon (c.f. McKinlay and Starkey, 1998). Yet, in following the spirit of Foucault’s concern with understanding the detailed practices and techniques of power/knowledge there arguably lies the basis for a situated investigation of how power, knowledge and action interpenetrate within given contexts.

The difficulty, of course, is in generating conceptual lenses through which to make sense of actual practices. Taylor (1984) criticises Foucault for never adequately explaining how disciplinary power/knowledge practices actually operate. Ironically, it is traditional conceptions of power, with their view of power as something to be possessed or traded, that have been more concerned with identifying specific sources of power. Typically this has taken the form of a list of attributes or capacities. The typology offered by French and Raven (1959) often forms the basis for such lists. In their view there are five primary bases of power: 1) coercive, based on punishment or negative reinforcement; 2) reward, based on being able to deliver something the receiver wants; 3) legitimate, based on hierarchical position; 4) expert, based on specialist knowledge, and 5) referent, or influence based on acceptance and admiration for a leader by subordinates. Other similar typologies have been

presented by Astley and Sachdeva (1984), Fuqua *et al.* (2000), and Pfeffer (1981). Of course, the identification of sources of power, as presented in these accounts, is wholly congruent with a static, entity-based view which regards power as deriving from command over a range of material and symbolic resources (c.f. Bacharach and Lawler, 1980).

However, there is nothing necessary about the connection between an entity-based view and the recognition of multiple sources or bases of power. It is equally possible to view these forms as part of a relational view of power. This means ceasing to treat such features as hierarchical authority, charisma, or expertise as unproblematic or immutable categories that can simply be ticked off on a checklist or balance sheet of power. Instead, it is crucial to see how they are constructed, reproduced, or undermined through a variety of material and discursive practices. There are certainly dangers attendant on such attempts to synthesise different accounts of power, not least because the different approaches follow largely incompatible ontological and epistemological assumptions. It is for this reason that efforts to synthesise theories on power have often been less than persuasive. Heiskala (2001), for example, does not treat different views on power as ‘hostile alternatives’ and attempts to incorporate them all on a unified ‘scale’ of power. Attempts such as this, which try to effect a wholesale integration of different perspectives, are likely to run up against theoretical incompatibilities. However, what we are suggesting is a much more modest and partial attempt to recast existing concepts in the light of the theoretical problematic we have been outlining here.

The recognition of multiple bases or forms of power also helps to address some of the criticisms aimed at Foucault’s apparent *pancratism*, or the tendency to relate all aspects of social action to the exercise of an all-embracing and totalising disciplinary power (e.g. Dews, 1984; Feldman, 1997; Merquior, 1991). These criticisms have principally challenged the Foucauldian analysis of power on two inter-related issues; firstly, for its treatment of agency, and secondly, concerning the question of resistance. Giddens (1995, 265), for example, goes so far as to accuse Foucault of promoting a ‘subject-less history’. Similarly, McCarthy (1990, 1993) is concerned that Foucault tends to exclude all questions about who exercises power, who benefits and who suffers, by focusing more on the ‘how’ than the ‘who’ of power. By reducing the individual to “an effect of power” (Foucault, 1980b, 98), which is, moreover, an anonymous and impersonal power, McCarthy (1990, 449) questions how “we can gain an adequate understanding of most varieties of social interaction by treating agents simply as acting in compliance with preestablished and publicly sanctioned patterns - as what Foucault calls ‘docile bodies’ or Garfinkel calls ‘cultural dopes’”. For defenders of Foucault this is all a big misunderstanding (e.g. Knights and Vurdubakis, 1994). They point to a number of instances where Foucault recognises the potential for resistance against the power of normalising discourses. For example, Foucault (1980b, 142) suggests that “there are no relations of power without resistances; the latter are all the more real and effective because they are formed right at the point where relations of power are exercised”. However, one can not help but sympathise with the following commentary by Merquior (1991, 114-115):

How can readers avoid the impression of an omnivorous power monolith when, for each sporadic reassuring clause granting that power does not embrace everything, they stumble over scores of totalist expressions such as ‘disciplinary society’, ‘disciplinary generalization’, ‘general tactics of subjection’, ‘generalized carceral system’, ‘carceral continuum’, ‘carceral texture of society’, ‘society of surveillance’, and so on? How can they readily discard the idea of an omnipotent domination when they are told that our schools and hospitals and factories are essentially mirrors of the prison, our lives being everywhere ‘normalized’ from cradle to tomb?

Taking a relational perspective on the multiple strategies and techniques through which power is operationalised also makes it difficult to avoid the conclusion that different expressions of power may be distributed unevenly and not all clustered around the same institutions, groups, and individuals. Power is not a monolith; it assumes a multiplicity of forms, both anonymous and personalised, concentrated and diffuse. Furthermore, while forms of power may be co-producing and self-reinforcing, they may equally come into tension.

There are two final areas in which Foucauldian theories of power could be useful augmented and supplemented. Firstly, there is some uncertainty about the relative status of repressive and productive notions of power in the writings of Foucault. At times we appear to be asked to dispense with negative notions of power altogether, while at others there seems to be a recognition that power operates both to produce and repress and, furthermore, that production and repression are interlinked; individuals are produced as the effects of power before subsequently being repressed. This has led some commentators to consider both the repressive and productive exercise of power, the first concerned with denying or excluding alternative identities or interests, and the second with producing subjectivities (e.g. McCabe, 2000).

The second area concerns the treatment of material practices and non-human agents in the work of Foucault. The standard critique here is that he equates all power relations to discursive relations (e.g. Taylor, 1984). However, this is by no means self-evident. Foucault was preoccupied with how institutions, such as prisons, asylums, schools, barracks, and hospitals, exercise power over the body and employ technologies for ordering, disciplining, isolating, regulating, and observing activity. There is a crucial material dimension to these technologies without which the discursive construction of power relations would be meaningless. In this sense, there is, perhaps surprisingly, not that much to separate this from Bhaskar's comment that "[b]eing in prison or fighting a war is not just (or even perhaps necessarily) possessing a certain idea of what one is doing: it is being physically separated from the rest of society or being party to an armed conflict; and without the separation and the conflict, the concepts would lack the material substrate, as it were, essential for their correct application" (Bhaskar, 1998, 136). However, it is sometimes easy to lose sight of the materiality of practice within Foucauldian analysis.

There have been some attempts to extend Foucault's theorisation of power to make it more sensitive to the material mediation of power relations by drawing on actor-network theory. Both actor-network theory and Foucauldian approaches share a productive and relational view of power. Latour (1986, 265), for instance, has suggested that power "is not something you may possess and hoard ... Power is, on the contrary, what has to be explained by the action of the others who obey the dictator". However, actor-network theory does not limit itself to relations between human actors. The *actants* in actor-network theory are not just people but also non-human entities; animals and plants, chemicals, materials, tools and artifacts, which all come together in heterogeneous associations. As Callon (1987, 93) has suggested, actor-networks are "composed of a series of heterogeneous elements, animate and inanimate, that have been linked to one another for a certain period of time". According to Munro (1999, 430, emphasis original) this means that "power is accomplished less through matters like leadership and hierarchy and much more through a distribution of materials. In brief, the argument of Actor-Network Theory is that individual action becomes 'translated' ... through a *mediation* of materials and cultural devices". Non-human entities have an influence on power relations by being in alignment with or offering resistance to processes of

translation; in other words, by helping to delimit the ‘margins of manoeuvre’ of translation (Callon, 1986). This focus on the material mediation of power relations is an important element of any attempt to investigate concrete practices, as Fox (2000) has shown in drawing on actor-network theory to construct a critique of situated learning.

Having outlined some of the main controversies in the debate on power, it is now possible to summarise what we feel are the main elements of a satisfactory conceptualisation of power. In the next section, we will attempt to illustrate these elements with reference to the case study material. The main components are as follows:

1. Power is both productive and repressive; it establishes boundaries and constrains action, but it also produces identities, discourses, and activities.
2. Power is relational; it emerges in the interstices between human and non-human actants, it is continually constructed and reconstructed from moment to moment, and therefore it is potentially fragile.
3. Power is never totalising; there is always some scope, however small, for resistance.
4. Power is not monolithic; there are multiple practices and techniques of power which may be mutually reinforcing or come into tension.
5. Power is both material and symbolic; it is mediated through artifacts and symbolic structures.
6. Power is both personalised and anonymous; it involves relations between people with some degree of intentionality, but it is also distributed, normative, and systemic.
7. Power and knowledge are inextricably linked; power shapes and is constituted through alternative discourses and competing knowledge claims.

Inter-organisational collaboration in the telecommunications sector

So far we have seen that practice-based approaches to organisational knowledge, despite making important contributions to our understanding in this area, either tend to evade questions of power altogether, or provide only an incomplete and inadequate conceptualisation of power relations. Drawing on the literature concerning power, we have attempted to indicate some of the key issues and problems in theorising power. In the remaining sections of this paper we will try to illustrate these points with reference to an empirical study of the relationship between a network provider and an equipment supplier in the telecommunications sector. As we have already noted, there is a major methodological challenge in studying power because of its intangibility. As Barnes (1988) has suggested, it is easier to describe the consequences of power than to identify the nature of its operation. This helps to explain the reliance within pluralist approaches on measuring power according to the outcomes of explicit conflicts. There is an important drawback to such approaches. This is partly because, as Lukes (1974, 123) has argued, “the most effective and insidious use of power is to prevent overt conflict arising in the first place”. However, the submergence of power relations does not always have this conspiratorial flavour of intentional manipulation and subterfuge. There is also a sense in which power is less than consciously constructed through the sedimentation of rules and routines, normalising discourses and regularities in

interaction. The challenge, therefore, is to attempt to represent the multiple facets of power in both its personalised and systemic, explicit and covert forms. In the spirit of the Foucauldian project of tracing the micro-physics of power, we would suggest that this demands a detailed investigation of the techniques, dispositions, and interactions of power within concrete social relations. In light of this, an in-depth ethnographic style of approach was considered the most appropriate for the purposes of this study.

The specific subject of the investigation is a series of engagements between a telecommunications network provider and an equipment supplier. For reasons of confidentiality the names of these companies have been changed to Network and Phonocom respectively. Our illustration focuses on the activities of a project team comprising representatives from both organisations. This team was involved in a major two year project for the design, development and implementation of telecommunications software to provide additional functionality to telephone exchanges. For the purposes of this paper, we focus on the later stages of the project during which the software was progressively implemented and tested on selected telephone exchanges on the network. During this phase a temporary cross-organisational team was established to monitor the implementation of the software and correct any faults. This phase represents a critical period of the project since it is a prerequisite for customer acceptance that the software is stable and free from major faults by the end of the five-week monitoring period. While monitoring and testing are collaborative activities in which there needs to be close interaction between the customer and supplier for identifying and solving problems, this does not necessarily mean that everything proceeds in an entirely co-operative fashion. The later stages of the project are a tense period in which the potential for disagreement is high. Sometimes such disagreements erupt into overt conflict, while at other times they are dealt with in a much more quiescent manner. However, it would be a mistake to identify the exercise of power solely in instances of explicit conflict. Even the more consensual resolution of problems bears the traces of power in the way that interactions are normatively regulated through reciprocal expectations of behaviour. Our focus is on how these different styles of interaction unfold during the course of problem-solving activities and on the varying modalities of power that are associated with them.

Recognising the multiple forms of power in this context also raises important issues about how the nature of inter-organisational relationships is to be understood. There are two inter-linked dangers which need to be avoided. The first is the danger of adopting an excessively unitarist stance on inter-firm relations whereby each company is portrayed as a coherent actor whose behaviour is guided by calculations of strategic interest. Using the example of our case study companies, this would mean portraying Network and Phonocom as monolithic entities who use their varying resource endowments to attain favourable outcomes for the project. This ignores the internal differentiation of the two companies and the potential for alliances and shared identities to span organisational boundaries. The second danger is that of treating conflict and consensus as straightforward polar opposites, capable at any one time of characterising the entire nature of any given inter-firm relationship. Instead, they are better understood as emergent properties of a range of social relations, often coexisting to differing degrees, and potentially fragile and reversible. The two problems are closely connected. As soon as one challenges assumptions of organisational unitarism it becomes difficult to depict conflict or consensus as uniform categories. Different individuals and groups may be simultaneously involved in relationships exhibiting either quality to some extent. It will also be seen from the following account that the character of organisational relationships is constantly shifting. As the inter-organisational project team collaborated on joint activities there were some episodes where co-operation declined into conflict and others

where conflicts were successfully resolved. As an illustration of this dynamic we have selected a two week period in the implementation and testing stage of the project during which the team was attempting to solve a fault which had arisen on one of the telephone exchanges scheduled for upgrade. First, however, it is important to provide some background to the relationship between Network and Phonocom so that the context of this encounter can be understood.

Background

Network and Phonocom have a long-standing commercial relationship involving an almost continuous stream of projects over the last fifteen years. The case study project was the eighth in a linked series of projects for renewing and upgrading local telephone exchanges. This was a major project for both companies with a value of £21.9 million and a planned workload of 230,000 person/hours. It is perhaps tempting to look at the nature of the commercial interactions between Network and Phonocom as a way of identifying the relative power of each party to the relationship. This would be consistent with a conventional resource-based view on power. In this case, the balance of power between the two companies would be seen to be a result of the differing resources they are able to mobilise and the degree to which each depends on the other for access to those resources. On these grounds it would appear that there is a relative power symmetry between the two companies. Phonocom is strongly reliant on Network for access to project revenue because the latter controls a major share of its domestic market. This has become even more prescient with the recent slow-down in the telecommunications sector. However, Network also depends on Phonocom since it is one of only a handful of competitors for the supply of telecommunications equipment. This reliance has increased in recent years because Network has eroded many of its in-house technical capabilities through successive waves of outsourcing. Whereas formerly it had the necessary expertise to conduct certain project activities itself, it is now heavily dependent on suppliers such as Phonocom for access to that expertise. In addition, there would be significant exit costs associated with switching suppliers due to the proprietary nature of much of Network's technology, which is based on company-specific rather than industry standards. Over the years Phonocom has built up a close familiarity with Network's technology and working procedures. For Phonocom, this familiarity has been further promoted by employing Network employees made redundant during rationalisation exercises.

Given the relatively balanced dependency between the two companies, it might be thought that co-operation would be the most likely strategy. However, while the economic relationship between the two companies is by no means irrelevant, it would be mistaken to assume that there is a clear-cut commercial rationale on each side which is directly translated into action at the project level. Indeed, commercial considerations are only one of a range of competing influences. It is preferable to view the commercial situation of projects as one, albeit significant, pressure which helps to define some of the boundaries within which the project team operates. It is when these boundaries are approached or exceeded that there tend to be flash points from which disputes arise. Whether or not these turn into full-blown conflicts depends on how the issue is negotiated, the positions that each side adopt, and the techniques of power which they draw upon. Thus, while co-operation between the two companies may at times be threatened, the range of outcomes are relatively open-ended.

This can be illustrated by comparing the case study project with an earlier project in the two companies' ongoing programme of work. Both projects experienced some difficulties with

software failure. While these problems led to increased tension during the case study project, the dispute surrounding them did not escalate and a satisfactory resolution was negotiated. The project was judged to be a success by both companies; coming in on time and under budget. In contrast, the software failures which emerged on the earlier project prompted major arguments and their solution became more difficult as the relationship between Network and Phonecom deteriorated to such an extent that it was almost terminated. The project was massively over time and over budget. This raises interesting questions about the conditions under which disputes decline into destructive conflict compared with those where co-operation is restored. The difference between the two projects can partly be explained by the scale of the problems encountered, being much more serious on the earlier project where extensive rework was required. However, this does not mean that power was absent from the relationship during the later, more harmonious project. What can be said is that the character of power relations differed qualitatively between the two projects.

For the earlier project, displays of power became increasingly visible and confrontational as its problems intensified, encouraging a downward spiral of claim and counter-claim. This was particularly evident in a symbolically-charged move by Network which forced Phonecom to accept the appointment of a team of external consultants to conduct an audit of the latter's software engineering processes as a condition for being considered for future contracts. This was viewed by Phonecom's senior management as an embarrassing external intervention in the company's affairs, but they had little option but to comply or face losing a major stream of revenue. The outcome was a significant revision of Phonecom's procedures and the establishment of a high level steering group, comprising senior members of both companies, which was charged with monitoring the progress of joint projects. This latter development represented an extension of Network's direct influence over Phonecom's project activities. The balance of power, for the time being at least, had decisively shifted in favour of Network. In comparison, power relations during the later project were considerably more subtle, taking the form of shared and largely implicit expectations of behaviour rather than outward displays of coercion. The experience of the earlier project failure and its acrimonious aftermath had permeated the awareness of both companies' employees. For Phonecom's project members, the importance of avoiding a repeat of this situation had been repeatedly reinforced by senior management. By the time of the later project, accounts of the failure of this earlier project had entered the storytelling repertoire of the company, further reinforcing its significance. The pressures to avoid similar situations were primarily internalised, with the activities of Phonecom's team members being guided by this background knowledge.

However, this did not mean that Network refrained from exploiting the memory of this project failure in more direct ways. Indeed, Phonecom's senior management and project team were made painfully aware that Network would discontinue their business relationship if the later project suffered a similar fate as the earlier one. This demonstrates one important, but sometimes neglected, feature of power relations: that they do not take place in a historical vacuum. The earlier project failure is part of the collective memory of both companies. It is drawn upon by different groups to justify particular courses of action, being reproduced and reconstructed in the process. This shared history is particularly important for understanding the backdrop to the joint problem-solving activity which we now turn to examine.

Knowledge and power in a problem-solving engagement

So far we have examined the power dynamics of Network and Phonocom at a more general level. The starting point was a rather conventional resource-based approach to power. However, it quickly became evident that such an approach needs to be supplemented. In particular, the shared history of project activities undertaken by the two companies indicates that their relative resource positions are not uncontested objectivities which lead to predictable outcomes. Instead, they are fluid representations whose meaning is subject to negotiation and redefinition. In this sense, the negotiation of meaning is central to power relations. For example, Phonocom's employees only orientate their activities to the threat of customer exit to the extent that the resulting loss of business is perceived to be meaningful. If the loss of future revenue from Network was not regarded as relevant or significant, the power of such a threat would be lacking. Furthermore, it is not sufficient to remain at the level of abstraction examined so far, where the two companies are presented as unitary actors. Since the outcomes of power relations are relatively open-ended, influenced by the differing techniques of power and resistance to them, it is important to investigate the detailed interactions through which such relations are constituted. It is for this reason that we would now like to focus on one particular problem-solving engagement between the project team members of the two companies to illustrate the importance of a detailed treatment of power dynamics. It should also be evident in this account that power relations and knowledge are intimately related. As we shall see, much of the engagement we are about to outline centres around claims to expert knowledge in understanding the problem at hand and challenges to these claims. Here again, claims to expertise are not a static and uncontested power resource. They are continually constructed and negotiated, and they also interact with other techniques and expressions of power.

The engagement in question covers a number of interactions between Phonocom and Network project team members over a twelve day period in response to a fault that was identified during the installation of a software upgrade to one of Network's telephone exchanges. The joint monitoring team for the installation stage of the project was in daily communication during this period, primarily using telephone conferencing facilities rather than meeting face-to-face. The use of this medium for interaction helped to define some of the constraints and possibilities within which the power dynamic between the different team members unfolded. In particular, it is important to note that Phonocom's team members were all located in the same meeting room during the telephone conferences, while those representing Network were geographically dispersed (some on site at the exchange, others at their main offices, others at home). This gave Phonocom participants a small advantage because they were able to communicate among themselves, both through gestures and facial expressions as well as by talking 'off-line' using the mute function. The telephone conferencing system did have the technical capability for Network participants to talk among themselves without anybody else hearing, but such functionality is cumbersome and tended not to be used. Although both groups had internal meetings before each conference, the result was that Phonocom team members should have been better able to co-ordinate their collective responses to Network's questions in an ongoing fashion and rapidly adapt to the situation as it evolved. Network team members' responses, on the other hand, might be expected to be more individualised and potentially in direct contradiction. In the following sections we trace the development of the problem-solving exercise chronologically and provide a commentary concerning some of the main issues that emerge.

Day 1

During the installation of new software on one of Network's telephone exchanges (Exchange A), Phonecom and Network engineers identify a fault. Details of the fault are automatically recorded in a log file by the exchange software. The installation engineers are unable to resolve the problem themselves and the Phonecom engineer reports details of the problem via e-mail to Phonecom's Customer Support Manager (PCSM). PCSM enters the fault on a 'fault registration document' (FRD), allocating a reference number to it. The FRD plays an important role in problem-solving activities. It is distributed to all team members and effectively structures the way in which problem-solving meetings are organised. It is a framework which is familiar to all concerned and participants orientate their activities accordingly.

Day 2

At the daily telephone conference meeting, PCSM reports to the joint monitoring team that the upgrade of Exchange A was abandoned due to a fault. The Phonecom monitoring team requests the presence of one of the company's technical experts at the meeting. This is partly because the monitoring team members do not have the necessary technical knowledge to understand and explain the problem themselves. It is also because they are keen to present a clear image of competence and expert authority in their dealings with Network. This is not too surprising given that expert knowledge is Phonecom's main currency in this relationship. The technical expert offers an explanation for the fault, suggesting that it is probably due to a frequency level being set too high. Since it is the responsibility of Network to set the frequency of their exchanges, Phonecom's technical expert is clearly attempting to apportion blame for the problem to Network. He tries to effect closure on the argument by not offering alternative scenarios. To underline the categorical nature of his response he unexpectedly leaves the meeting immediately after he has made his contribution rather than remaining to respond to any questions. This rather unusual behaviour is also suggestive of the relationship between different groups within Phonecom. The technical expert is not part of the project monitoring team, belonging instead to a separate technical group. Phonecom's monitoring team have the authority to engage technical assistance for problem-solving activities, and they interpret the technical expert's rapid departure from the meeting as a challenge to this authority and a sign that his loyalties lie elsewhere.

After the technical expert leaves the meeting, Network's Senior Technical Manager (NSTM) asks Phonecom for further information about the fault, including a recommendation for what the correct frequency setting should be. He is unwilling to accept the frequency explanation until further evidence is forthcoming. He also decides to delay the upgrade of another similar exchange (Exchange B) scheduled for that evening, postponing it until at least the following day. While NSTM does not have the detailed technical knowledge to disprove Phonecom's explanation, he nevertheless challenges their claim and calls for further justification. By postponing further implementation he is also exercising his authority and signalling the seriousness with which he is treating the problem. Although he is keen not to delay the project unnecessarily, he is adamant about receiving a satisfactory explanation for the fault before risking the upgrade of further exchanges. The ball is placed squarely back in Phonecom's court.

Day 3

The technical expert who attended the meeting the previous day is consulted again about the reason for the fault, and this time he suggests that it was caused by a hardware failure specific to the exchange in question. During the daily telephone conference, PSCM relates to Network the new explanation from the technical expert. This is met with further scepticism and the conversation returns to the question of frequency settings. At this stage Phonecom's monitoring team is still uncertain about what the correct frequency setting should be. To divert attention from this they argue that the problem could be due to Network's implementation procedures and that these may need to be modified. Again Phonecom's strategy is to pass responsibility over to Network. Network's response is not favourable and Phonecom's project manager steps in to attempt to calm the situation down. The project manager is respected by both sides of the joint monitoring team and has a reputation for being reasonable. This enhances his influence over the situation and as such is a personal and dispositional form of power (c.f. Clegg, 1989). Phonecom's project manager promises that they will bring in another more senior technical expert to work with the existing expert. This signals to Network that the Phonecom team is taking the problem seriously and is keen to resolve it. This is acceptable to the Network team and NSTM is prepared to go ahead with the postponed upgrade of Exchange B providing suitable precautions are taken. There is an easing of tension within the joint monitoring team.

Day 4

At the next telephone conference, NSTM happens to be visiting Phonecom's offices and so joins their team in the meeting room for the conference. The presence of a Network manager has an interesting impact on the dynamics within the Phonecom team. In contrast to the other conference calls, the Phonecom team members are more guarded among themselves and do not follow their usual practice of holding off-line discussions during the conference. There is also some dissonance within the Phonecom team on this occasion. PSCM has refused to attend the meeting, claiming that he has conflicting work obligations and has to attend to another project. Phonecom's project manager is not happy about this, particularly because it means that he is left to handle any questions coming from Network. He is not confident about his ability to cope with questions of a detailed technical nature, but nevertheless attempts to conceal this from Network by presenting a confident front.

The pressure is increased because a senior manager from Network is sitting in on the conference. This is symbolic of the increasing seriousness with which Network is treating the problem. Towards the end of the conference the senior manager asks why the fault no longer appears on the FRD. Phonecom's project manager replies that this is because the fault has since been discovered to be related to the previous version of the software. This is because the upgrade had not been switched-in when the system failed. In making this new argument, the project manager is passing responsibility away from the monitoring team and onto another part of Phonecom concerned with customer support. Network's senior manager challenges the explanation and asks whether it has been categorically confirmed. The Phonecom project manager assures him that this is the case. At this point the senior manager asks the Network monitoring team whether they are happy with this answer. There is silence until eventually NSTM expresses his support for the Phonecom project manager's assessment. NSTM is caught between two sets of loyalties here. On the one hand, he is responsible for ensuring a favourable outcome for Network and might be expected to align himself with the position expressed by the senior manager. On the other hand, the joint

monitoring team has worked closely together and through participating in joint activities has developed something of a shared identity. NSTM is expressing solidarity for the joint monitoring team in response to challenges from the senior manager who is perceived as an outsider. However, in subsequent encounters it will become clear that this shared identity is fragile as other bases for identity come to the fore. After the conference, Phonecom's project manager complains to a senior manager about the absence from the meeting of PSCM. He resorts to the exercise of hierarchical authority to ensure that PSCM is present at future meetings.

Day 9

Having apparently traced the reason for the fault in Exchange A to the previous version of the exchange software, this topic is no longer discussed during the next few daily conferences. However, Phonecom's monitoring team is thrown into confusion because the upgrade of another exchange (Exchange C) had to be abandoned on the night of Day 8, apparently under rather similar circumstances. During the telephone conference, PSCM reports that the Exchange C upgrade had to be abandoned. The Network participants immediately ask whether the causes of the fault are the same as those for Exchange A. PSCM is evasive and unwilling to admit that the failure of the two exchanges have any similarities. This is a clearly defensive move designed to shield Phonecom from blame. Members of the Phonecom monitoring team are, however, fully aware of the significance of this turn of events. They appreciate that Network are quickly losing confidence in Phonecom's ability to resolve the problem. Phonecom's project manager recognises this and informs Network that two senior technical experts (more senior than the two already involved) have been engaged to look at the problem. There is a kind of inflation in the currency of expertise as Phonecom attempts to mobilise ever greater expert status to counter the crisis of confidence that is emerging. While Phonecom participants attempt to recover Network's confidence by recourse to symbols of expertise, Network applies pressure by weaving a narrative of commercial logic. As a demonstration of their formal authority as the customer, NSTM discontinues all upgrades on similar exchanges until a satisfactory explanation has been found. Having previously given Phonecom the benefit of the doubt, aligning himself closely with the joint monitoring team as a collective enterprise, he now distances himself from the joint team, emphasising instead the separateness of the two companies. The jointness of the monitoring team begins to be threatened as the talk turns to respective rights and responsibilities.

While the Phonecom team is in a weak position to counter Network's position, this does not prevent Phonecom's project manager from testing the boundaries of their situation. He attempts to discover from NSTM what it will take to recommence the implementation phase. NSTM is not prepared to consider restarting the project until a definitive explanation is forthcoming. He also presses the Phonecom project manager further about whether the problems with Exchanges A and C were in fact similar. The latter is forced to concede that the two exchanges do share certain similarities. With two exchanges now exhibiting similar faults, it becomes clear to Network team members that the problem is Phonecom's responsibility and not theirs. They begin to use this to their advantage, insisting that Phonecom comes up with a full explanation. At this point, with their expertise being directly challenged, the Phonecom team is losing control over the situation. NCSM attempts to recover some influence by arguing that he is still confident in the original explanation about frequency settings, suggesting that it had not yet been disproved. This passes responsibility back to Network. However, Phonecom's project manager adopts a more conciliatory tone.

He says that there is little more that they can do at this stage but leave it to the technical experts. He signals his empathy with the situation the Network team faces, helping to defuse the situation. However, there is also an air of finality about this statement which closes off further discussion. The conference comes to an end.

Day 12

There is another gap of a few days while Phoncom's technical experts prepare their report. The issue then reappears on the agenda of the telephone conference on Day 12. Phoncom's Senior Technical Manager (PSTM) participates in the meeting. As one of the most senior members of the technical group, his presence lends authority to the explanation and solution the Phoncom team is about to offer. Again Phoncom is attempting to portray an image of expertise and competence. PSTM reports that the faults on Exchanges A and C were caused by the upgrade procedure used on this type of exchange. He proposes that future upgrades should revert to an earlier procedure. While this has the disadvantage of being more time consuming, the possibility of software failure is greatly reduced. NSTM appears to be entirely satisfied with this explanation and agrees that the implementation schedule should continue. He requests that Phoncom put the explanation for the fault and details of the proposed solution in writing. This is not only a case of capturing technical knowledge about the fault for later re-use. It is also about protecting Network's position in the event that subsequent upgrades fail despite the change to procedures.

Analysis

The above engagement indicates the development and ultimate resolution of a conflict within the joint monitoring team. During the dispute, different participants draw consciously and unconsciously on a range of practices which are indicative of different modes of power. These encounters centre specifically around the promotion and challenging of various knowledge claims made in relation to the diagnosis of a software fault. For the Phoncom team, the validity of their knowledge claims is a key element in demonstrating its expertise. Its ability to construct an image of expertise is important because this is the primary basis on which it can influence the situation and it also helps to define its identity in the relationship. In other words, attempts to articulate expertise are central to the Phoncom team's detailed strategies of power. However, it is important to recognise that its claims to expertise, and therefore its basis of power, are not uncontested. Although Phoncom collectively has a more detailed technical knowledge concerning software implementation, this does not prevent Network team members from challenging the explanations put forward. Initially, Phoncom team members appear confident that Network will accept their expertise in the matter without question. However, when the Network team expresses dissatisfaction with the suggested diagnosis, it becomes clear that the Phoncom team is unable to rely purely on its reputation for expertise. As the challenges issued by the Network team intensify, the Phoncom team is faced with a diminution of its influence on the situation. In attempting to recover from this weakening position, it is interesting to note that the Phoncom team brings in ever more senior technical experts to suggest solutions. It tries to counter threats to its expertise through increasingly overt displays of technical authority.

Although the contested construction of expertise is crucial in understanding the power/knowledge dynamics within the engagement, this does not occur solely through the reasoned consideration of claims and counter-claims. Other forms of power interact with the constitution of expertise to guide the situation. The Network team is poorly placed to oppose

Phoncom's arguments at an equivalent level of technical sophistication. Consequently, rather than mirroring Phoncom's strategy of drawing upon ever greater expert input, it instead responds to the escalating situation through increasing symbolic displays of formal authority. This is evident during the instances where the Network team discontinues the implementation process. Here it is highlighting its formal contractual authority within the relationship, marking a step away from the shared decision-making which normally characterises the joint monitoring team. Formal authority is further exhibited by the presence of a Network senior manager at one of the conferences. The unfolding of the dispute is also guided by the different communicative strategies adopted by participants, which are another basis of power. On the Phoncom team it is particularly illuminating to compare the negotiation style of the Customer Support Manager with the Project Manager. The former adopts a more confrontational position and attempts to push forward explanations by offering them as definitive statements rather than open propositions. This tends to increase the friction within the encounter and promotes equally unyielding responses from the Network team. In contrast, the latter adopts a rather more conciliatory approach. Combined with a collectively acknowledged reputation for fairness, which enhances the sympathy with which his interventions are received, this approach tends to decrease tension and move the negotiation forward. Within this context, the communicative strategy pursued by the project manager increases his influence on the situation and, as such, it is an expression of personal power.

By looking in some detail at the power dynamics of a specific problem-solving engagement, it is possible to provide a finer grained analysis than appears in the essentially dyadic and zero-sum portrayal of power relations between Network and Phoncom with which we introduced the case study material. A series of key issues concerning the interactions between power and knowledge emerge from investigating the concrete practices and performances occurring in engagements between the two companies.

Firstly, the relative resource dependencies with which the two companies face each other in their commercial relationship help to structure power relations between them, but the manner in which they are enacted is somewhat open-ended and influenced by a range of other pressures. It is not possible to read-off the outcomes of power relations simply by cataloguing the different resources mobilised by each participant. Instead, different bases of power related to such things as expertise, formal authority, personal influence, communicative strategies, and so on, are brought to bear and interact in sometimes unexpected ways.

Secondly, power relations between the two companies should not be treated in excessively unitarist or monolithic terms. To do so would be to suggest that the members of each company conform entirely with a coherent set of interests and identify only with their own company. Instead, there are indications of a range of identity projects which are not always compatible. Thus, there are instances where members of the joint monitoring team are caught between loyalty to the team and having to be seen to protect the commercial interests of their respective companies. There are also indications that the two companies are internally differentiated, with conflicts and political manoeuvres occurring between groups within the two companies as well as between the two companies themselves.

Thirdly, the power dynamics between the two companies are crucially discursive and tied to particular knowledge claims. This is especially evident in the attempts by the Phoncom team to defend its image of expertise and in the challenges issued by Network against this.

Fourthly, depicting power relations in purely prohibitive and negative terms ignores the productive capacities of power. Power dynamics in this relationship are not simply about preventing action but also producing it. Indeed, the eventual outcome of the problem-solving encounter is favourable to all concerned. Without the coming together of different opinions about the causes of the software failure, and the varying strategies for promoting these opinions, it is unlikely that a satisfactory solution would have been reached. This is not dissimilar to the notion of *creative abrasion* suggested by Leonard (1995). However, as we saw in comparison with the earlier project which suffered serious failure, the degree of abrasion or conflict can reach such a level as to become destructive.

Finally, the context within which the problem-solving encounters took place, and particularly the mediation of interactions through telephone conferencing technology, helped to permit certain possibilities while limiting others. There is, however, no necessary relationship between the use of this technology and the manner in which the interactions within the joint monitoring team unfolded. It was suggested earlier that the Phonecom team possessed an advantage in how the meetings were configured because its members were located together during the conferences while the Network team was dispersed. This gave them the opportunity to co-ordinate their responses in an ongoing fashion. However, the technical possibility of greater co-ordination did not appear to be fully exploited. Despite being able to discuss their arguments prior to voicing them to the Network team, there were nevertheless points of divergence which came through.

Conclusion

This paper has attempted to address a blind-spot in the literature on organisational knowledge. There have been important steps forward in this area associated with the increased acceptance of practice-based approaches, drawing on such traditions as situated learning, situated action, distributed cognition, and activity theory. However, despite making some reference to power relations, these approaches only tend to do so in an *ad hoc* and secondary manner. Although power is a widespread feature of social action and interaction, it is often treated as an afterthought, bolted on to the main analytical framework rather than integrated as one among a series of central concepts. By interrogating the extensive literature on power, we have attempted to identify some of the key theoretical and methodological challenges associated with bringing this concept closer to the centre of any analysis. As a test-bed for these efforts, we then looked in some detail at the relationship between an operator and an equipment supplier in the telecommunications sector. While we believe we have made some small progress in problematising the relationship between power, knowledge, and action by highlighting the missing dimension of power, there are nevertheless a number of difficulties and avenues for exploration which remain.

Principal among these is the tendency to swing too far in the opposite direction by reducing all social relations to a question of power relations. Further efforts are required to provide a more balanced analytic which neither ignores power nor prioritises it. Another challenge concerns the possibility of developing a coherent theory of power. As we saw in our outline of debates on power, these are cross-cut by major lines of opposition which are difficult to reconcile. However, we believe it is a mistake to adopt an either/or approach to power where one has to come down on one side of the debate and reject the other. It is not so much a question of either/or – either power is personalised and repressive or impersonal and

productive – but of both/and; power is both personalised and impersonal, repressive and productive. Lash (2002, 39) puts the argument as follows:

Sociology has a very acute and alive tradition of addressing questions of organization and of power. A number of these theories foreground structure, and a number foreground agency or action. For structuralists, organizations are 'hierarchical systems of normative rules'. For action-analysts, organizations are 'playing fields of interacting, strategically acting and negotiating agents'. Very often structural analysts of power and organizations will find themselves locked in conflict with action theorists. Indeed, structuralists will argue that their perspective has more validity than the action perspective, while action theorists will argue that their perspective has the greater validity. I want to claim instead that the structure and systems theoretical and action-oriented theories of power and organizations are not just perspectives. I want to claim that they are true. They are both right.

The challenge comes in delineating how, if at all, different modes of power are related. It is difficult to avoid the pitfall of a piecemeal analysis which, like many conventional treatments of power, simply lists its different forms and then adds them together to provide a balance sheet of power. Greater attention needs to be directed at the way different forms of power are interwoven. The conceptual lenses required for such an exercise are likely to be varied. In this we only half agree with Hardy and Clegg (1996, 636) that power "requires understanding in its diversity even as it requires explanation in terms of a singular theory".

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