

# **Learning and change in interorganizational networks: The case for network learning and network change**

Louise Knight and Dr. Annie Pye  
School of Management  
University of Bath  
BATH BA2 7AY

[l.a.knight@bath.ac.uk](mailto:l.a.knight@bath.ac.uk) +44 (0)1225 383130

Fax: +44 (0)1225 383223

[a.j.pye@bath.ac.uk](mailto:a.j.pye@bath.ac.uk) +44 (0)1225 386128

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## **Abstract**

The ALBA 2002 Call for Papers asks the question ‘How do organizational learning and knowledge management contribute to organizational innovation and change?’. Intuitively, we would argue, the answer should be relatively straightforward as links between learning and change, and knowledge management and innovation, have long been commonly assumed to exist. On the basis of this assumption, theories of learning tend to focus ‘within organizations’, and assume a transfer of learning from individual to organization which in turn leads to change.

However, empirically, we find these links are more difficult to articulate. Organizations exist in complex embedded economic, political, social and institutional systems, hence organizational change (or innovation) may be influenced by learning in this wider context. Based on our research in this wider interorganizational setting, we first make the case for the notion of network learning that we then explore to develop our appreciation of change in interorganizational networks, and how it may be facilitated.

The paper begins with a brief review of literature on learning in the organizational and interorganizational context which locates our stance on organizational learning versus the learning organization, and social, distributed versus technical, centred views of organizational learning and knowledge. Developing from the view that organizational learning is “a normal, if problematic, process in every organization” (Easterby-Smith, 1997: 1109), we introduce the notion of network learning: learning by a group of organizations as a group. We argue this is also a normal, if problematic, process in organizational relationships (as distinct from interorganizational learning), which has particular implications for network change.

Part two of the paper develops our analysis, drawing on empirical data from two studies of learning. The first study addresses the issue of learning to collaborate between industrial customers and suppliers, leading to the case for network learning. The second, larger scale study goes on to develop this theme, examining learning around several major change issues in a healthcare service provider network. The learning processes and outcomes around the introduction of a particularly controversial and expensive technology are described, providing a rich and contrasting case with the first study.

In part three, we then discuss the implications of this work for change, and for facilitating change. Conclusions from the first study identify potential interventions designed to facilitate individual and organizational learning within the customer organization to develop individual and organizational ‘capacity to collaborate’. Translated to the network example, we observe that network change entails learning at all levels – network, organization, group and individual. However, presenting findings in terms of interventions is less meaningful in an interorganizational network setting given: the differences in authority structures; the less formalised nature of the network setting; and the importance of evaluating performance at the network rather than organizational level.

Academics challenge both the idea of managing change and of managing networks. Nevertheless practitioners are faced with the issue of understanding and influencing change in the network setting. Thus we conclude that a network learning perspective is an important development in our understanding of organizational learning, capability and change, locating this in the wider context in which organizations are embedded. This in turn helps to develop our appreciation of facilitating change in interorganizational networks, both in terms of change issues (such as introducing a new technology), and change orientation and capability.

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## **Introduction**

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However, empirically, we find these links are more difficult to articulate. Organizations exist in complex embedded economic, political, social and institutional systems (Granovetter, 1985), hence organizational change (Lane, 2001) (or innovation) may be influenced by learning in this wider context. Based on our research in this wider interorganizational setting, we first make the case for the notion of network learning which we then explore to develop our appreciation of change in interorganizational networks and how it may be facilitated.

The paper begins with a brief review of literature on learning in the organizational and interorganizational context which locates our stance on organizational learning versus the learning organization, and social, distributed versus technical, centred views of organizational learning and knowledge. Developing from the view that organizational learning is “a normal, if problematic, process in every organization” (Easterby-Smith, 1997: 1109), we introduce the notion of network learning. We argue this is also a normal, if problematic, process in organizational relationships (as distinct from inter-organizational learning), which has particular implications for organizational and network change.

Part two of the paper develops our analysis, drawing on empirical data from two studies of learning. The first study addresses the issue of learning to collaborate between industrial customers and suppliers, leading to the case for network learning. The second, larger scale study goes on to develop this theme, examining learning around several major change issues in a healthcare service provider network. The

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## **Research Context**

The concept of organizational learning (Easterby-Smith, 1997) became firmly established in management studies literature in the early 1990s (Crossan and Guatto, 1996). There is now a substantial body of knowledge on the subject that exhibits a wide range of perspectives (Easterby-Smith and Araujo, 1999), as indicated by Dierkes et al’s recently published Handbook of Organizational Learning and Knowledge (Dierkes, Berthoin Antal, Child and Nonaka, 2001). The purpose of the brief review that follows is to identify some of the key dimensions that define the different perspectives and so enable us to locate our own stance on the subject.

Crossan et al (1995) propose that authors’ conceptions of organizational learning vary on three dimensions. First, they show that the agent of organizational learning is variously taken to be: the individual (e.g. Simon, 1991); the group – notably the organization’s senior management (e.g. Daft and Weick, 1984); the organization – organizational learning is seen as more than the sum of its members’ learning, and as indicated by changes to organizational level properties. Second, authors often focus on cognitive or behavioural outcomes. Third, analysts make various assumptions about the relationship between learning and performance (Huysman, 1999). A

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further distinction often drawn, which also relates to learning outcomes, is between ‘orders’ of learning (Argyris and Schön, 1978; Argyris and Schön 1974; McGill, Slocum and Lei, 1992; Senge, 1990). Lower-order learning is seen to be ‘within the frame’, and is about adaptation, whereas higher-order learning is more radical or fundamental.

Easterby-Smith et al (1999) distinguish two conceptions of organizational learning as a technical process, and as a social process. “The technical view assumes that organizational learning is about the effective processing, interpretation of, and response to, information both inside and outside the organization.” (Easterby-Smith and Araujo, 1999: 3). In the technical view, learning is seen as centred on the individual, whereas in the latter “the perspective on learning is not based on the individual, but on the social practice of organizational life. The bare thought of reifying social structures and processes is impossible, as they continuously are being produced and reproduced, interpreted and reinterpreted. In other words, the perception is focused on *change* rather than order and regulation.” (Elkjaer, 1999: 80, italics in original).

Finally, writers reviewing the field have identified a number of perspectives about the application of the term organizational learning, and its counterpart – the ‘learning organization’. Those who study the latter are interested in developing learning capability within and of the organization (Elkjaer, 1999; Easterby-Smith, 1997). It is a perspective that is much favoured by consultants, and one that is susceptible to being regarded as a management fad. “On the other hand, the literature on organizational learning is analytic and concentrates on understanding learning processes within organizational settings, without necessarily trying to change those processes...” (Easterby-Smith, 1997: 1086). Though organizational learning is a problematic process, it is a normal one that occurs in all organizations. (Easterby-Smith, 1997: 1109).

Prior research largely focuses on organizational learning within organizations; little research addresses what Lane (2001) terms “external learning”. This gap in research was also identified by Crossan et al (1995) who noted that there was a developing body of literature on groups or pairs of organizations that are pro-actively co-

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operating. This led them to propose a fourth level of organizational learning (adding to the individual, group and organization-centred perspectives) which they termed 'interorganizational'. Review of work on this subset of learning research reveals a potentially confusing use of terminology; Knight (2002 in press) has sought to distinguish between interorganizational learning, network learning and learning networks.

Interorganizational learning is taken to be learning that takes place in the interorganizational setting; the learning entity might be an individual, a group of individuals, an organization (in the sense of a legal entity), or an interorganizational network. Network learning is defined as learning by a group of organizations as a group. The learning entity is the network collectively, and learning outcomes are indicated through changes to properties of the network such as network level or network wide routines, strategies, culture, processes, and systems. According to Lane (2001) a learning network is a network that learns effectively, akin to the concept of the learning organization. Dixon (1999) regards learning networks as networks whose purpose is to learn.

Given this terminology, organizational learning can thus be defined in two ways: (a) learning by any level of entity (i.e. learning in the organizational domain); (b) learning by an organization. For the latter, the learning entity is seen as the organization, and learning outcomes are indicated through changes to properties of the organization such as organizational routines, strategies, culture, processes, and systems. For the sake of clarity, from this point forward in the paper the latter will be termed organization learning, and 'organizational learning' is used in the generic sense.

This attempt to delineate between different system levels of learning entity might be regarded as suggesting we are adopting a technical, actor-centred view of learning. What follows demonstrates that we in fact favour a more relational, situated (Elkjaer, 1999) perspective. The definitions are proposed to provide conceptual clarity because the distinctions are important if we are to develop and apply effectively the concept of learning in studies of interorganizational networks (which are termed networks, from this point forward in the paper).

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Researchers are concerned with the development and performance of many forms of network, from small groups of organizations in joint ventures (e.g. Jarillo, 1988) or which deliver public services such as mental health services (e.g. Provan and Milward, 1995) to groups of numerous, more loosely interconnected organizations such as policy networks (Kickert, Klijn and Koppenjan, 1997a: 1), regional networks (Chapus and Raymond, 1999), industrial sectors (Spender, 1989) and supply networks (Harland and Knight, 2001: 479). For convenience, we term the former ‘strategic networks’ and the latter ‘wide networks’.

Whatever the theme that links the organizations – polity, geographical proximity, industry, supply – the network is characterised by certain structures and patterns of exchange and interaction between network actors. Over time these will change as a result of external and internal pressures. We suggest that, in certain instances, this change and process of changing might be usefully conceptualised as network learning. In the following section, we develop our analysis, drawing on empirical data from two studies of learning in the interorganizational setting.

## **Empirical Investigation of Learning**

The first study (Knight, 2000; Knight, 1997) was an investigation of learning to collaborate between industrial customers and suppliers. Its inclusion in this paper serves a number of purposes. It provided the empirical basis for the distinction described above between organization, network and interorganizational learning. It describes the attempts within one organization to organize for collaboration with key suppliers, and as such provides insights to organization learning and change, and learning to collaborate.

The second, larger scale study is described in greater depth. This study covers several major change issues in healthcare service provider network; its aim is to explore the notion of network learning. The focus here is on the learning processes and outcomes around the introduction of a particularly controversial and expensive technology. By comparing and contrasting this case with the first study, insights into organizational learning and change, in particular network learning and network changes are identified and discussed.



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In describing the data from both studies, efforts are made to conceal the identity of the actors. Where relevant, their names have been changed. Aspects of the second study have been the subject of national, mainstream media attention. Because of this, and the unique role and contribution of some actors, we cannot fully anonymise the cases. This demonstrates the situated nature of change and learning; we cannot divorce the process of learning and change from its situation. Mindful that it is the underlying principles that matter most, we have sought to achieve an appropriate balance between sufficiency of detail to provide readers with an understanding of the empirical basis for the arguments that follow and limiting details that may be sensitive to network actors.

### ***Learning to Collaborate***

This empirical study was centred on one large public sector utility organization (TRANSPORTCO) and its relationship with two key suppliers, one of which had contracts to provide and maintain a key engineering asset (EQUIPCO), the other providing cleaning services for operational areas (SERVICECO)<sup>1</sup>. The core data were provided by semi-structured interviews with key personnel in the relationships and in the organization's central purchasing department, backed by informational residues (Lincoln and Guba, 1985) from participation in assessment, training and development of purchasing personnel in the firm.

Taking collaboration to be purposeful cooperation over time (after Spekman, 1988), the study addressed two questions:

- \* What are the features that characterise collaborative relationships?
- \* How can individuals and organizations learn to collaborate with suppliers?

In the mid-1990s the notion of partnerships with suppliers was coming into vogue in the world of UK public sector purchasing. Within TRANSPORTCO the rhetoric was for changing supplier relations. The motivation for the study was to investigate the apparent gap between the great enthusiasm for supplier partnerships and the reality of day-to-day practice.

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<sup>1</sup> For a more detailed account of the data and analysis, see Knight (2000).

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Considering first TRANSPORTCO at a corporate level, changes in corporate structure and strategy were making the organization increasingly dependent on increasingly important suppliers. The relevance and need for long-term, cooperative relationships with the supply base was growing. There was the incentive for organizational and individual learning to collaborate.

Second, at a local level, there was also evidence of more effective working with suppliers, even though it was patchy in the EQUIPCO relation. Certain individuals were relating less adversarially, and there were some axes of particularly close cooperative working across organizational boundaries. Together, SERVICECO and the TRANSPORTCO operating unit team with which it dealt had succeeded in transforming the relationship, and had begun to achieve performance standards that were consistently higher than previously. The relationship with SERVICECO was conducted within the parameters of a detailed and innovative contract, which offered a mechanism for institutionalising the change. Interorganizational learning was occurring at three levels of learner – the individual, the organization (though very limited), and the dyad.

It was at a third level, between local and corporate, that there seemed to be a major gap in learning. In terms of working with the supply base (the cross-organization management of the purchasing and contracts management process), it was possible to identify many initiatives relating to issues such as performance measurement, risk sharing, partnerships, whole life costing, value / supply chain management, relationship management. However, successful implementation was not common. More significantly, the underpinning purchasing policies, procedures and culture were not being adapted. They continued to reflect the traditional reality of price-based competitive tendering, savings targets, win-lose negotiation and adversarial, mistrusting relations with suppliers. Supply management practice was not developing in accordance with the rhetoric, and it did not seem likely that it would do so. The conditions were not right for more collaborative working with suppliers to become common practice in the organization. The organization learning necessary to develop collaboration capability – embedding changes to practice in supply systems, policies, etc. – was blocked.

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This case helps to illustrate the distinction between learning in an interorganizational setting and learning by pairs or groups of organizations, dyad and network learning, respectively (see Table 1). Subsequent investigation of literature on learning in the interorganizational context (e.g. Crossan et al., 1995; Levinson and Asahi, 1995; Croom and Batchelor, 1997; Larsson, Bengtsson, Henriksson and Sparks, 1998; Dyer and Nobeoka, 2000; Osland and Yaprak, 1995; Morrison and Mezentseff, 1997; Lane, 2001) revealed very little research on network learning. Given the rapidly increasing interest in interorganizational networks and networking this seemed to be an important omission. It is one we have begun to address through the study described next.

Type of learning	Relevance to the empirical case
Interorganizational learning	TRANSPORTCO organization learning and learning by individual personnel engaged in the relationships with EQUIPCO and SERVICECO
Dyad learning	Learning by TRANSPORTCO and EQUIPCO, and TRANSPORTCO and SERVICECO, about working together in a collaborative manner.
Network learning	Would occur if and when TRANSPORTCO's key suppliers learnt to work with each other.

Table 1: Distinguishing different forms of organizational learning

## ***Network Learning in Healthcare***

### **The Study**

This second study is in its closing stages; the findings presented here are therefore preliminary. An exploratory approach has been adopted to examine learning processes and outcomes in interorganizational networks. Data have been gathered on three networks. Given the space constraints of a conference paper, we focus here on one network, the English prosthetic service.

The data sources include participant-observation since 1997, semi-structured interviews and documentation. Based on early analysis of the data, five key themes for change in the network became apparent, which provided the basis for five cases for analysis, one of which has been selected for more detailed description below. First, though, the broader context is provided with a description of the structure and operation of the prosthetic service network in England.

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**The Network**

The key network actors in the English prosthetic service are represented in the illustration of the network below (see Figure 1). In England, most amputees and people with congenital limb defects receive care funded by the National Health Service (NHS). NHS patients attend one of 34 specialist Disablement Service Centres (DSC), where personnel from a range of professions provide care. Service contractor employees (prosthetists and technicians) are part of the clinical team, along with NHS employed doctors, nurses, therapists and rehabilitation engineers. Most of the professions have an active professional association.

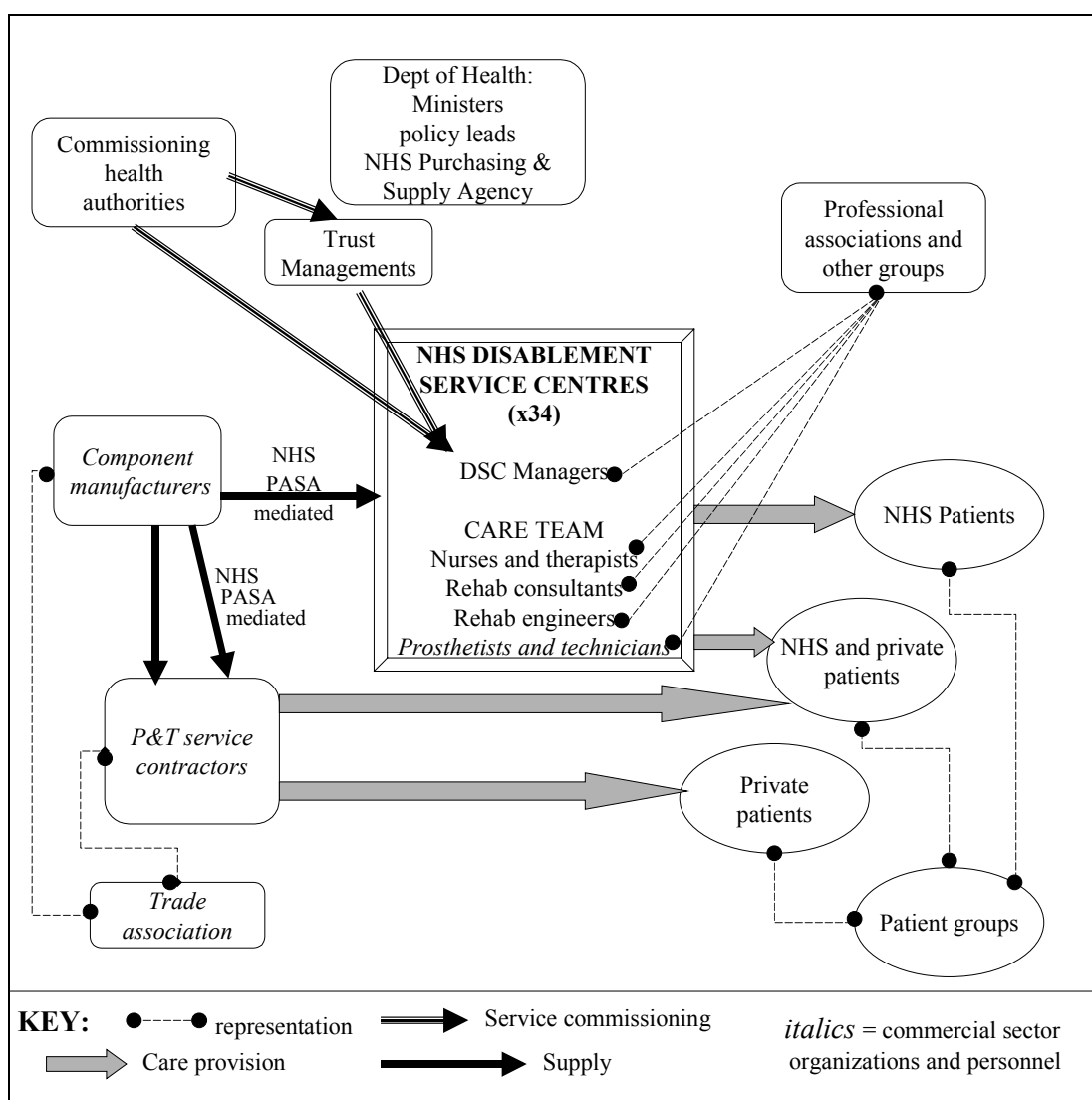


Figure 1 Illustration of the prosthetics supply network in England

Each Centre is based on a hospital site, and Centre Managers are accountable to their host trusts, and to the health authorities which commission services. Typically, a

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centre provides services commissioned by a number of health authorities, and many health authorities send patients to more than one DSC.

From the commercial sector, the prosthetic supply network consists of service contractors, component manufacturers and their trade association. NHS Purchasing and Supply Agency (NHS PASA) personnel are involved in all NHS contracting for prosthetic services and most purchasing of componentry. Four firms provide prosthetist and technician (P&T) services to NHS centres. These firms also manufacture and distribute componentry, and provide services to privately funded patients. Two other companies' business relates to provision of componentry, and of services to private sector patients. Rarely, some NHS patients are referred to these companies by some DSCs.

There are several organizations that represent limbless people. The largest of these is the British Limbless Ex-Servicemen's Association (BLESMA). Other organizations, though they have fewer members, have a higher profile in the network and in the media. A few individuals are particularly active campaigners with national profile with the media and Members of Parliament. At a local level, many centre managers have set up user groups, to aid consultation and communication.

From the data, a number of key areas of change in the network, which had implications for network properties, were identified and used as the basis for identifying 'network learning episodes'. Late in 1997 the new Labour Government published a White Paper with proposals for reforming the National Health Service including reorganizing the commissioning of health services. There was widespread concern that this would fragment the service and lead to loss of service quality. Actions and reactions since then to influence and improve the situation relate to the first episode on COMMISSIONING.

Government policy has also been an important factor influencing the second episode, the progressive 'PROFESSIONALISATION' of the prosthetics profession, from being more technical and craft oriented to being a formally recognised 'allied health profession'. Two highly critical reports in the mid and late 1980s led to substantial changes to the structure of the supply market. One major firm ceased trading in

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prosthetics and several new service providers were established. Throughout the 1990s there have been considerable changes to the methods and outcomes (in terms of supply market structure) of CONTRACTING between the private and public sectors, and these are taken as the third network learning episode.

The final pair of network learning episodes relate to the introduction and implementation of new technologies. The first is about CAD/CAM systems, and the implications their introduction has for the organization of production and fitting. The second is about the impact of the introduction of high-definition SILICONE COSMESIS to England, and is chosen as the focus for this paper because of the richness of the case. A silicone cosmesis is a high cost limb cover that gives a lifelike appearance. There has been much debate and controversy about whether the NHS should fund such products and, if so, about prescription criteria, given that demand is expected to exceed what can be afforded. An overview of this episode is provided next, highlighting the changes/learning, and the process of change/learning<sup>2</sup>.

**SILICONE COSMESIS: a case of network learning**

Traditionally, prosthetic component manufacturers have invested most of their R&D resources into developing products with increasing functional capability. In recent years, stimulated by pressure from patients and patient groups, there has been more interest in improving limb appearance by developing limb covers with a more lifelike appearance. One firm, Prosthetics Ltd, offers a spray-on product which provides a colour-matched finish over the limb cover. In the US, a much more sophisticated product was developed – the high-definition silicone cosmesis (HDS cosmesis). Each HDS cosmesis is crafted by an expert technician. The finished look includes hairs, veins, freckles, etc. This is an expensive product, of the order of £2500 per cover (as compared to less than £1000 for the remainder of the components for a limb). A HDS cosmesis is more fragile than more basic covers and typically lasts a couple of years.

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<sup>2</sup> At this stage in the paper, learning and change are intentionally used interchangeably, but will be distinguished in the discussion and conclusions.

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The technology was imported to the UK in the mid-1990s by Ortho Services, which provided limbs and covers to private patients, including two young women – a model and a former student – and a child who had a leg amputated following the bombing of a restaurant in South Africa, where she had been on holiday. The two young women and the child's father took leading roles in campaigning for the provision of better NHS prosthetic services generally, and NHS funding for silicone cosmesis in particular. The campaign included participation in national TV programmes and lobbying MPs and government ministers. Other patient groups were also lobbying and drawing attention to the importance of limb appearance.

Before the media campaign began, some DSCs had been working on improving limb appearance, both through use of the more basic technologies and by funding a very limited number of patients to attend Ortho Services. These innovations were regarded as similar to efforts to offer general improvements in limb function to many patients and to meet the special function needs of the few, for example providing sports limbs to amputees who had been athletes prior to the amputation or special limbs to enable people to continue in their profession. Since other centres refused to provide any HDS cosmeses, these attempts to meet special needs for appearance resulted in different care being provided in different regions ('postcode prescribing'). Since the Government was committed to ridding the NHS of inequalities in care provision (Secretary of State for Health, 2000), this placed campaigners in a powerful position.

Shortly after the TV programmes were transmitted, two suppliers announced their plans for cosmesis. One, Orthopaedic Company, set up a silicone cosmesis workshop having recruited the chief technician from Ortho Services, to produce low, medium and high definition silicone cosmeses. Orthopaedic Company's business strategy relied on many UK patients choosing to pay for their own cosmesis and in supplying international markets. Another company opted for a different strategy – large volume and low margin sales – and launched a more durable, low definition, and low cost (c. £200) product. Later, the chief technician originally at Ortho Services moved to P&O Products & Services which also set up production facilities.

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That meant all the major prosthetic component suppliers had entered the cosmesis market.

In the meantime, the considerable pressure from campaigners led the Minister to submit a bid for additional, national funding for silicone cosmesis. Eventually, a part of an investment programme for community equipment services was set aside for silicone cosmesis (£4 million over 3 years, from a £104 million programme). It is rumoured that this funding was only forthcoming because the government feared adverse media attention during the course of the 2001 general election.

Following the campaign, in reaction to the considerable media attention, the merits of silicone cosmesis were widely debated among all the professions in the network. There were areas of agreement, but also many caveats and source of dissent. For example, many agreed that young women would have a high priority, and that a model should have cosmeses since they enabled her work. Others believe it is wrong to focus on young women, as men and the elderly would also be interested in better appearance. It is argued that children should have HDS cosmeses, but also that children should not have HDS cosmeses since: (1) because they are growing the cosmeses would need to be replaced frequently, and funds for one child would meet the needs of several adults; (2) children should not be encouraged to conceal their disability. Some see the product as offering aesthetic benefits only and it should not take up scarce NHS resources that could be better applied to improving comfort for the many, rather than appearance for the few. In contrast, others emphasise the important psychological benefits of good limb appearance, and assert that cosmeses should be regarded as an integral part of care.

The purpose of these examples is to provide an indication of the complexity that underlies an apparently simple decision about whether or not to provide patients with the latest technology. For government at a national level and for managers locally, there are issues of political pressure to be balanced against resource allocation choices. Clinical teams that are used to dealing with the physiological and mechanical aspects of caring for limbless people face a very challenging situation related to psychiatric care and counselling. Suppliers whose margins have been very



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low have the opportunity to increase turnover and profit, but only if there is a net increase on componentry spend (whether funded by the NHS or privately).

The first tranche of funding, about £5000 per Health Authority, was distributed to them for the 2001/02 financial year to support the introduction of silicone cosmesis. A framework agreement between suppliers and the NHS Purchasing and Supply Agency against which centres can order cosmeses was awarded in October 2001. There is concern amongst some that most Health Authorities had not passed on the allocation, and suppliers reported that some demand had actually fallen. In December 2001, a letter from the Head of Policy for Allied Health Professions to Health Authority Chief Executives and Finance Directors, copied to DSC managers, reminded them: that the funds had been allocated for a specific purpose; that patients know about the funding and have expectations for better cosmesis; that the NHS Purchasing and Supply Agency will be monitoring sales.

We continue to follow developments in this network learning episode, since it will be some time before the demand from patients and the balance of private to NHS funded provision becomes apparent.

## **Discussion**

This discussion draws together and compares insights from the two studies of learning in the (inter)organizational setting, relating arguments to findings of prior research. It begins with the findings from the studies and their potential application to practice. This is followed with consideration of the level and unit of analysis, and identification of the comparative richness of the network perspective of change and learning. Other facets that are discussed include the role and impact of leadership, orders of learning and change, and the relation of learning/change with collaboration, and with performance.

Through comparing the two interorganizational relationships in the first study, and the interpersonal relations within them, it was noted that collaboration could arise through personal or organizational capacity, or both. The features that characterise the two forms (Knight, 2000; Knight, 1997) are summarised in Table 2. Developing

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personal capacity entails both individual and organizational learning, as does the development of organizational capacity. For example, in features relating to personal capacity, organizational learning is relevant to role and reliance on the relationship; in organizational capacity, individuals' skills are critical to developing high quality communication.

Relating these indicators of capacity to collaborate to the state of the relationships at the end of the data collection phase, one could identify a series of measures that could be taken to promote collaboration. Possible interventions at the organizational level are presented in Table 3.

Personal capacity	Organizational capacity
High personal reliance on the relationship.	High organizational dependence.
Clear role.	Clear rules.
Positive (i.e. not defensive) attitude towards suppliers.	High levels of good quality communication between players, internally and with the supplier.
An understanding of the 'principles' of trust and mistrust.	Alignment between performance measurement of the players and of the contract and relationship.
High levels of influence (role and/or personal) and control.	Organizational proximity of players.

Table 2: Factors associated with capacity to collaborate

Looking across to the second study, we note that network learning outcomes (i.e. changes to network level properties) come about through learning at all system levels: individuals learn new skills; groups develop protocols; organizations are adapted to provide the new service; interorganizational practices are transformed. Collectively, these different threads of learning lead to changes to common practices (Spender, 1989), to co-ordinated practices (ways of working across organizational boundaries), to common cognitive structures such as shared values and frameworks, and to network structure (the network actors and their interconnections). The analyst can review the development of the network learning episode and make judgements about which factors appear to have hindered or facilitated the unfolding of the episode, but the findings do not necessarily lend themselves to presentation as recommended interventions.

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Relating to the context for collaboration	Relating to specific relationships
Develop criteria to help determine whether a collaborative stance towards a supplier is appropriate	Through performance management systems and the allocation of roles, ensuring that all players in a relationship have significant personal reliance on the contractor's performance and therefore have the incentive to collaborate
Reviewing policies, procedures and systems to ensure they do not constrain the (appropriate) development of collaboration	Develop a company-specific approach to analyse the current and desirable state of a relationship, and based on these to project manage appropriate relationship development initiatives.
Recognising the value of relationships where collaboration has <i>emerged</i> , not just those that are subject to formal 'partnering'	Where a collaborative relationship is based on a strong interpersonal relationship, develop organizational factors to underpin the relationship, to protect it from the consequences of personnel turnover (i.e. to institutionalise the relationship).

Table 3: Possible interventions to promote collaboration (based on Knight, 2000).

Presenting findings in terms of interventions is less meaningful in an interorganizational network setting, for a number of reasons: first, the differences in authority structures; second, the less formalised nature of the network setting; third, because of the importance of evaluating performance at the network rather than organizational level (Provan and Milward, 1995). The first study was about developing a specific capability – to collaborate effectively. In terms of practice, the value of the second study is broader. It can be seen as being about developing managers' awareness of and sensitivity to network learning. Through a network learning perspective, alternative interpretations of relationships between actors and between events over time can emerge, presenting new options for action. This theme of work is not directed at making recommendations relating to the specific learning episodes (though it could be), but to generating an understanding of network learning that might help actors in networks to develop more receptive contexts for change and learning (Pettigrew, Ferlie and McKee, 1992: 267-299).

The network learning perspective allows the analyst to take a wider view of what is happening in the network, and why. This understanding can then be related back to the interests and context of the specific actor, or network sub-group. In the case of the SILICONE COSMESIS, taking a network perspective early on in the episode might have enabled the DSC managers to foresee the development of the inequality of provision and deal better with the unfavourable media attention. Local decisions and responses would have been considered in the context of what was going on, and prospective developments, in other centres and at a national level. Of course, this

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wider visibility and predictive capacity could also hinder change, with network members not acting as they seek to avoid the negative consequences of change. Generally, though, having a more holistic perspective of what is happening in the network and the (mis)alignment of different actors' interests would enable a player in the network to adopt a more influential role in shaping the change processes and outcomes.

The organizational learning perspective of the developments in the first study indicated that the plans for change had important omissions, which could have been resolved by senior managers of the purchasing function. In the case of a strategic network, the leadership of the network might be sufficiently unitary to form a body capable of acting on recommendations for interventions to facilitate learning, but in a wide network there is no focal actor to take on that role. It could be argued that central government ministers should adopt such a role in the case of the prosthetics network. They are at the top level of the health service hierarchy and, through centre-level contracts, govern much of the companies' business. However, this would assume a level of visibility and control over the operating of the NHS and a degree of alignment between different parties' interests that was not apparent. Centre managers, professional groups, patient groups, suppliers, politicians, and policy makers, Agencies and ministers from the Department of Health were all actively shaping the learning process and outcome through their interactions and attempts to influence and to resist. Formative events and actions include for example:

- Technical innovation mostly took place in the US. The import and subsequent diffusion of technical competence across the supplier community was significantly influenced by a very few individuals.
- Managers at some of the large, better funded centres decided to provide silicone cosmesis to a few patients. This generated a 'postcode prescribing' situation.
- Patients' campaigning obliged government to consider funding by the NHS. The weight of the campaigners' argument was much enhanced by the fact that some NHS provision was already occurring.

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- The Department of Health, with the NHS Purchasing and Supply Agency, organised the bid for additional funding and the national framework agreement against which centres can order silicone cosmesis from the suppliers.

Different actors made different formative contributions at different times to the network learning process relating to silicone cosmesis. In the case of SILICONE COSMESIS, network learning is not being managed in any sense of the term that implies centralised intent and co-ordination. Whilst we can identify influential agents for change/learning in the episode, none of them enacts the role of leader. Rather than thinking of (network) learning process in terms of managing or leading, we may make more progress by exploring processes of institutionalisation (Lawrence, Winn and Jennings, 2001; Barley and Tolbert, 1997; Lawrence, Hardy and Phillips, 2002).

The analysis could be centred on a particular network actor, or group of actors. In the SILICONE COSMESIS episode, organization learning has taken, and is still taking, place across the network. The implementation of silicone cosmesis production and provision to patients has implications for organization properties at suppliers and centres. We contend that a perspective that treats the organization as the unit of analysis and the network as context would provide an impoverished view of learning. Further, the network perspective allows us to take an integrated view of the organizations (in the sense of legal entities) such as individual suppliers and centres and the various professional and trade associations that play such a vital role in intra-network communication. In the prosthetics network, these associations are highly influential, providing formal input in terms of guidance for practice and contributing to working groups, consultation exercises, etc., but also acting as an informal hub for promoting or resisting developments.

There are, of course, other options for level of analysis of change and learning in the prosthetics service. Each of the P&T service suppliers serves a number of Centres. For some issues, for example administration and people management practices, the network of a supplier and associated centres might be the relevant unit. In terms of the story of the introduction and implementation of silicone cosmesis provision though, the actions of each supplier and each centre are so dependent on

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developments at the collective level that the 'local network' does not seem to be a particularly meaningful level of analysis.

Researchers who study change in organizations are often concerned with capability or performance or both, electing to focus on 'strategic change' (Pettigrew, 1987; Pettigrew, 1985; Pettigrew et al., 1992; Rajagopalan and Spreitzer, 1996). Pettigrew (1985: 438) defines 'strategic' as "just a description of magnitude of change in, for example, structure and organizational culture, recognising the second-order effects, or multiple consequences of any such changes". Pettigrew repeatedly stresses the importance of studying continuity and change, and emphasises the complex, non-linear nature of strategic change (e.g. Pettigrew and Whipp, 1991: 27). In organization studies, much emphasis is placed on how organizations differentiate themselves from their competitors, but authors such as DiMaggio and Powell (1983) and Spender (1989) draw our attention to change processes that lead to convergence. The strategic change literature offers many insights that are consonant with aspects of the data from both studies.

As indicated in the review of literature the notion of orders of change is applied to learning, with many authors focusing on transformational, or second order, learning, and third order learning, that is 'learning to learn' (e.g. Argyris and Schön, 1978). The distinction between first and second order learning (generative and transformative, respectively) is one that does not fit the data in a straightforward way. It depends very much on the perspective one selects. For Disablement Service Centres that had been providing some highly specialist, expensive products such as sports limbs to a few, carefully selected patients for some time the provision of silicone cosmeses is generative learning. Other centres need transformative learning to develop and implement the highly sensitive prescribing protocols for silicone cosmesis. Taking a network perspective, the technology itself seems less important than its implications for care objectives (fit and function 'versus' appearance), for funding priorities in the context of scarce resources and for the impact of campaigning and lobbying in Ministers' and local NHS managers' decision making.

A key aspect of effective collaboration is developing awareness of when it is an appropriate form of relating. Much of the interest in collaboration and

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interorganizational learning is based on the potential impact they have on corporate competence and hence competitive performance (e.g. Larsson et al., 1998; Osland and Yaprak, 1995). Collaboration can be regarded as an important aspect of third-order learning, which is central to the notion of the learning organization. The shared objectives and/or means and the quality of dialogue between actors in a network or organization characterised by high levels of collaboration are promising indicators of a learning network or organization, respectively. It is worth noting however that collaboration is not a pre-requisite for first and second order learning. Changes to organization or network level properties can be driven as much by conflict and dissent as by co-operation and consent.

Turning to the issue of performance in the two studies, we observe that, whilst the local network is a relevant unit for assessing performance in terms of patient care, the achievement or otherwise of other objectives and interests such as delivering care in the social (c.f. medical) model and equal access to health care by different groups in society and across regions are better assessed at the ‘wide network’ level. The prosthetics network will soon be delivering a service/product package – NHS-funded silicone cosmeses – to a limited number of patients. The network has a new capability. We cannot tell yet, and may never be in a position to do so, whether this will be judged as leading to performance improvement. Whilst some patients may be more satisfied with their care, others are likely to suffer dissatisfaction when their request for a high-definition cosmesis is rejected. The distribution of funds to centres may reduce the pressure on government ministers and centre managers from campaigning MPs and patient groups, but a wider evaluation of performance would need to consider the opportunity costs of the allocation of resources to cosmesis.

## **Conclusions**

Our focus in the empirical work has clearly been on learning and change. Thus we refocus the question posed in the Conference call for papers to ‘How does organizational learning contribute to organizational change?’ There are a couple of ways of interpreting this question. The first is about the relationship between learning and change. The second relates to how our understanding of learning

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contributes to our understanding of change, and vice-versa. The discussion covered aspects of both, as does this final section, in summarising and concluding the paper.

The definitions of organization and network learning adopted here are that learning is the processes and outcomes associated with changes to organization and network level properties, respectively. On that basis, one might argue that wherever there is organization/network level change, there is organization/network learning. This calls into question the value of the concept of learning by organizations and networks. Why bother with the notion of learning if it is the same as change and changing?

Based on the preceding discussion, we can now draw a distinction between learning and change. In advocating the usefulness of the concept of learning, we suggest that network learning is not just about any network level change. Learning has a capability focus. In bracketing change and changing as learning, the analyst is making a link to network capability. This is not the same as assuming that learning is linked to performance since factors other than capability affect performance outcomes and opportunities to use the capability may not arise. Conversely, the studies clearly indicate that in analysing change in organizations or in networks, we should consider learning at all levels – network change arises through individual, group, organization and network learning.

There is an important difference between much of the literature on strategic change and our notion of network learning. Though strategy may not be realised, there is a sense of intent, or direction, in the case of strategic change. There is usually a problem to be addressed, an opportunity to be exploited or a policy to be implemented, and one or more groups or individuals within the organization formulate some (more or less) explicit objectives for doing so. There is a sense that change can be managed or led, with a focus typically, but not exclusively, on the role of the executive: “The critical leadership tasks in managing change were more fragmentary and incremental than the popular images of ‘business heroism’ allow, and could involve action by people at every level in the business.” (Pettigrew et al (1992: 20) summarising findings in Pettigrew et al (1991)).



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In a wide network, there is no clear locus for change or learning leadership, and many different interests and objectives shape the evolution of an episode. In the episodes studied in prosthetics, the change can be regarded as strategic in so far as it is high profile, important and has ‘deep’/2<sup>nd</sup> order effects. However it is not strategic in the sense of being intentionally radical or transformative; the change is not led as one would conceive it to be in an organization setting. The study of learning is the study of significant change and continuity – divergence and convergence – and the processes of changing and institutionalisation, where the significance is determined by those engaged in the network or by the analyst.

Many authors argue persuasively for a network perspective on organizations and organizing (e.g. Håkansson and Snehota, 1995; Kickert, Klijn and Koppenjan, 1997b). This paper offers a description of an empirical case of learning in an interorganizational network. Through the case and subsequent discussion, we illustrate and elaborate the conceptual differentiation of interorganizational and network learning. This argument is relevant whether one adopts a technical or a social view of learning. Many factors – the ‘decentered’ character of network learning; the highly political and emotive nature of the case; the complex structure of the network (involving organization, profession and social bonds); the opaque learning process; the importance of the learning outcomes relating to values and service culture and priorities – suggest to us that the latter view of learning has more to offer both researchers and practitioners. This perspective, variously termed social (Elkjaer, 1999), constructionist (Tsoukas, 1996), or network (Powell and Smith-Doerr, 1994), emphasises the embeddedness of actors, events, etc. and addresses the criticism repeatedly raised by Pettigrew (e.g. 1995) that much organizational research is ahistorical, aprocessual and acontextual.

Academics challenge both the idea of managing change (Weick and Quinn, 1999) and of managing networks (Håkansson and Snehota, 1995). Nevertheless practitioners are faced with the issue of understanding and influencing change in the network setting. Thus we conclude that a network learning perspective is an important development in our understanding of organizational learning, capability and change, locating this in the wider context in which organizations are embedded.

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This in turn helps to develop our appreciation of facilitating change in interorganizational networks, both in terms of change issues (such as introducing a new technology), and change orientation, receptiveness and capability.

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