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DEGREE OF D.PHIL. IN MANAGEMENT

ANALYSING TECHNOLOGY & INNOVATION IN COMPLEX NETWORKS:
PROCESSES, DYNAMICS, AND DEVELOPMENT OF MULTI-LEVEL
INTERORGANISATIONAL NETWORKS

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Abstract

There is still very little known about network dynamics (Bell et al., 2006), especially when focusing on interorganisational networks (Provan et al., 2007). There is also limited empirical evidence on leadership within these complex network contexts (Davenport, 2005; Osborn et al., 2002). This thesis addresses these limitations by developing a theoretical framework for process leadership in the complex, often unpredictable and turbulent context of the interorganisational networked ecosystem. Understanding the complexity of networks and leadership is crucial to advancing network research, which this study aims to accomplish. Although previous studies indicate leader characteristics and behaviours (Huxham & Vangen, 2000), less evidence on the processes and dynamics of leadership within networks exists. Few studies have longitudinally examined the multiple boundaries and multi-level interactions within a complex interorganisational network, as the unit of analysis, as this thesis achieves. Moreover, little research has been conducted to understand network leadership processes, which represents a major gap in the network theory and complexity leadership literatures. In order to address these gaps as well as the gap between the two literatures, this thesis presents a comprehensive, longitudinal case investigation of network process leadership (NPL) within an interorganisational network embedded in the British National Health Service (NHS). By analysing processual dynamics, this thesis’s contribution is the foundation of a preliminary NPL framework.

Based on analysing a public sector healthcare network over time, the findings emphasise four dominant thematic constructs surrounding NPL that emerged as highly significant: leveraging strategic system stressors and turbulence; adopting focal and non-focal roles; maximising social proximity; and the complementary, reciprocal formal and informal co-production of leadership. These constructs provide the empirical and analytical grounds to help explain the critical leadership processes that drive a complex, interorganisational public sector network. Significantly, social capital dimensions underlie these interrelated higher order themes; thereby affecting wider inter-organisational network processes. As a primary contribution of this thesis, I argue that social capital is the critical concept linking network and complexity leadership theories, in order to provide a better understanding of NPL.

The findings suggest network leadership calls for NPL and its relational, collective, facilitative approach involving social capital among multiple participants in a complex interorganisational network context. This is highly differentiated from studying unidirectional effects of a hierarchical, central leader within a single organisation. Theoretically, I argue the importance of social capital in the complex nature of leadership processes within interorganisational networked contexts. The research contributes to an understanding of how networks and social capital can be adapted or created by formal and informal leaders within networks to reflect changing processes to shape practices and network-wide development over time. Finally, I offer several operational mechanisms policymakers and network leaders could pragmatically employ to manage, lead, and facilitate interorganisational network processes. Overall, the significance of this study involves: filling gaps in the literature, offering a longitudinal case study on an interorganisational network over time, providing a foundation for theoretical development on leading in networks, illuminating insights into professional leadership within networks, and identifying policy and practical implications for leaders and managers.

Keywords: complex interorganisational networks, network theory, complexity leadership, network process leadership, social capital, technology adoption, National Health Service
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List of Abbreviations

The following abbreviations are used in this thesis:

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<th>Abbreviation</th>
<th>Meaning</th>
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<tr>
<td>A&amp;E</td>
<td>Acute &amp; Emergency</td>
</tr>
<tr>
<td>AMC</td>
<td>Academic medical centre</td>
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<td>ANT</td>
<td>Actor Network Theory</td>
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<td>CAS</td>
<td>Complex adaptive systems</td>
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<tr>
<td>CLT</td>
<td>Complexity Leadership Theory</td>
</tr>
<tr>
<td>CT</td>
<td>Computed tomography</td>
</tr>
<tr>
<td>DoH</td>
<td>English Department of Health</td>
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<tr>
<td>GP</td>
<td>General Practitioner</td>
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<tr>
<td>ICT</td>
<td>Information communication technology</td>
</tr>
<tr>
<td>IS</td>
<td>Information systems</td>
</tr>
<tr>
<td>IT</td>
<td>Information technology</td>
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<td>KT</td>
<td>Knowledge transfer</td>
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<tr>
<td>LAN</td>
<td>Local area network</td>
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<td>LMX</td>
<td>Leader-Member Exchange</td>
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<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
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<td>NHS</td>
<td>National Health Service</td>
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<tr>
<td>NIC</td>
<td>National Improvement Centre</td>
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<tr>
<td>NICE</td>
<td>National Institute for Health &amp; Care Excellence</td>
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<tr>
<td>NOP</td>
<td>Networks of Practice</td>
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<td>NPL</td>
<td>Network process leadership</td>
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<td>NSF</td>
<td>National Service Framework</td>
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<td>NTAC</td>
<td>NHS Technology Adoption Centre¹</td>
</tr>
<tr>
<td>PCT</td>
<td>Primary Care Trust</td>
</tr>
<tr>
<td>PBV</td>
<td>Practice-based view</td>
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<tr>
<td>PSKN</td>
<td>Public Sector Knowledge Network</td>
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<tr>
<td>QIPP</td>
<td>Quality, Innovation, Productivity and Prevention</td>
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<tr>
<td>SDO</td>
<td>Service Delivery and Organisation Programme</td>
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<tr>
<td>SHA</td>
<td>Strategic Health Authority</td>
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<tr>
<td>SNA</td>
<td>Social Network Analysis</td>
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<tr>
<td>TIA</td>
<td>Transient ischaemic attack</td>
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<td>UK</td>
<td>United Kingdom</td>
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¹ In late 2012, NTAC moved to the National Institute for Health and Care Excellence (NICE) as the Health Technologies Adoption Programme.
Chapter 1: Introduction

1.0 Research Summary

Health system infrastructure, financial development, and service and technology innovations are rapidly changing in the current global economy. Delivering high quality healthcare to large populations while adopting new, innovative technologies at a politically acceptable cost has placed, and continues to place, profoundly challenging demands on those overseeing and operating such healthcare systems. Demands for financial, human and social capital are ever increasing in these complex environments. These demands also include delivery of complicated, redesigned clinical processes and pathways that require the integrated application of specialist skills, knowledge and expertise from different professions, organisations and individuals. Collaboration, rather than competition, among these constituent parts is particularly salient given the time-sensitive, life-critical outcomes of such systems.

The network is an organisational form that is prima facie attractive to situations where organisations or society requires the combination of different knowledges that are traditionally siloed or cut off from one another. Networks are flexible structures that enable the integration of knowledge, expertise and decision-making across conventional boundaries while allowing the professional, organisational and institutional structures that define these boundaries to continue to operate. The network form has become increasingly widespread and is a particularly useful structural lens through which to analyse large, multi-level complex health systems such as the National Health Service (NHS). Network theory, as defined by prior research, has concentrated on cross-sectional snapshots of structural characteristics, such as types (e.g. enclave), size, nodes and ties. However, networks must be active and adaptable to fulfil their potential for integrating knowledge and expertise. Network theory has somewhat neglected network dynamics (i.e. what happens in active networks). It provides limited evidence and theorising about the processual
nature of these dynamics, and tells us little or nothing about how such processes can be shaped and orchestrated to achieve overarching network objectives over time.

Network theory has also remained relatively quiet on the structure and dynamics of interorganisational networks. In a complex system such as the NHS, most networks span multiple organisations and/or professions. This poses numerous challenges including lack of shared identity and culture, lack of shared authority structure, diverse organisational and professional objectives, and limited innovation adoption potential. This prompts the principal research question:

What characteristics, behaviours, and processes are involved in the dynamics, development and orchestration of complex, interorganisational public sector networks?

This question and related sub-questions align with the study purpose (Section 1.1). Given the nature and challenges of interorganisational networks, one can expect to see efforts to shape and lead the networks that might be somewhat different from those observed in more traditionally hierarchical bureaucratic organisations. Therefore, to shed light on interorganisational network dynamics, different lenses through which to observe them may be needed.

Complexity leadership theory (CLT) is an emerging theory that offers such a lens. It is characterised by a non-hierarchical relational approach to leadership, viewing leadership as an emergent interactive dynamic. CLT focuses on leadership in contexts of dynamically changing networks of informally interacting agents and argues that network leadership is leadership of change that enables emergent collective action. It is a promising lens because the kinds of situations for which networks are thought appropriate (i.e. the combination of different knowledges and types of expertise) are often also characterised by high complexity. This applies even more strongly in interorganisational networks; however, CLT has not been applied previously in this context.

This thesis draws upon other lenses such as framing and knowledge transfer. However, a principal objective in addressing the research question will be to demonstrate not only the applicability of
complexity leadership, but also to explain why it is so appropriate based on the joint foundation of social capital that it shares with a proper understanding of interorganisational network dynamics. The Stroke Network case (see Section 1.2.1) characteristically needs knowledge and expertise to be shared across professional and organisational boundaries in conditions of high complexity, particularly in the context of new technology adoption. It is therefore an appropriate locus in which to examine the problematic, often uncertain, nature of interorganisational networks, specifically:

- the dynamics of interorganisational networks
- how the dynamics are facilitated, shaped, and led.

The study of the Stroke Network case therefore enables this study to fill gaps in our understanding of the dynamics, processes and leadership of interorganisational networks, and enables the thesis to contribute by extending both network and complexity leadership theories to the interorganisational context. Furthermore, the thesis links the two literatures through the identified common theme of social capital, which is a significant finding.

The study of the Stroke Network was undertaken from three perspectives that emerged from analysis of the empirical evidence:

- Framing
- Knowledge transfer, informal networks, and boundaries
- Network process leadership (NPL).

Based on the three analyses from these perspectives, four themes are distilled:

1) Applying strategic system stressors and turbulence
2) Adopting focal and non-focal roles
3) Maximising social proximity
4) Complementary, reciprocal formal and informal coproduction of leadership.

These themes are consistent with CLT, which suggests that relational, distributed yet collective, non-hierarchical leadership is appropriate in the shaping and development of interorganisational networks. Why does this make sense? The dynamics and processes observed in the Stroke Network case hinged on social capital, specifically the process of developing social capital (i.e. capacity building) over time within the interorganisational network and its exploitation. CLT’s focus on relational, non-hierarchical leadership is predicated on the importance of encouraging
collaboration through its power to develop and mobilise social capital. Therefore, social capital and its processes appear to be a crucial foundation of the leadership required to facilitate, orchestrate and develop interorganisational networks such as those commonly found in the NHS.

As researchers draw upon what is known about social capital to develop a framework for NPL, it enables us to extend our ability to analyse interorganisational network dynamics and development and to improve CLT’s applicability to such complex networks. Another key consideration of this thesis is how the concept of NPL can be operationalised from pragmatic policy and professional standpoints. NPL furthers an understanding of network leadership as contextually localised and facilitated through processes, so it is important to understand how to apply NPL in a given context. Chapter 10 provides operational mechanisms for leaders and managers to address its application.

Following this summary, the chapter is organised into three main sections. First, I discuss the research context by providing an overview as well as addressing the domain, topic and institutional context. Second, I identify the research problem, research questions and overall contributions. Following a discussion of the problem, questions, study purpose and scope, I offer a detailed description of the research’s significance. Third, I discuss the overall research approach and outline the organisation of the thesis.

1.1 Purpose of the study

Networks are a complex yet adaptive organisational form, and change in interorganisational networks is about harnessing the adaptive capacity of the entire network. The inherent complexity of network dynamics involves distinctive and appropriate complex leadership processes occurring among participants. This ‘non-centric leader’ approach demonstrates the importance of overcoming the fragmentation over time of trust, power, knowledge, learning, innovation, etc. Network processes are driven by informal leadership processes and the orchestration by formal leaders of those processes to ensure that the integrity of an interorganisational network’s trust, power, knowledge, etc. is maintained. My central thesis is that a relational approach to complex
network leadership and change – one based on a synthesis of network theory and complexity leadership – could provide the foundation for a multi-focal approach to understanding network processes and functioning in interorganisational public sector networks.

1.2 Research context

1.2.1 Research overview and domain

This section provides an overview of my research context and the importance of the study domain, since research on healthcare networks could potentially make a significant contribution to society. Building upon the work of others who explore complexity in healthcare (Agranoff, 1991; Ferlie et al., 2003, 2009b; Huang & Provan, 2007; Joshi et al., 2009; Nembhard, 2009; Milward et al., 2010), and investigating how information technology (IT) enabled projects can be managed to contribute value to an entity (Reich et al., 2012), my research focuses on interorganisational network dynamics in the case of technology adoption in the healthcare context. It emphasises multi-level network characteristics, leadership mechanisms and processes driving network change. Innovation in medicine is a complex process that unfolds unevenly in time and space. It is characterised by radical uncertainty and is emergent from innovation systems that are highly distributed across countries, competencies, organisations and networks. Research is needed that concentrates on the relevant micro- and macro-innovation networks, and the mechanisms through which these evolve along change trajectories shaped by the search for solutions to interdependent problems.

My work is grounded in empirical evidence collected from a longitudinal case study analysing stroke telemedicine (telestroke) adoption in the NHS, which demonstrates innovative new change processes within clinical pathways and the challenges, dynamics and patterns that emerge during the technology adoption process. The NHS is particularly difficult to study due to a multiplicity of organisations and professions, associated business models and cultures, diverse populations and increasing dependence on advanced technologies in the broader contextual environment. There is an unprecedented UK government IT investment, guided by an over-arching political agenda.
(Wainwright & Waring, 2000); however, major NHS IT programmes have been laden with problems and hindered progress on implementation timelines and goals (Sauer & Willcocks, 2007).

Extensive literature on interorganisational networks in business examines how varying degrees and quality of interconnectedness among firms and other organisations condition their performance and innovation potential. The basic issue of identifying agency-level embeddings and relationships, and how those affect performance, is dominant in the public sector literature with which this study engages. In the public management literature, the focus on services integration has given way to a broader focus on interorganisational networks (Agranoff, 1991; Provan & Milward, 1995; O'Toole, 1997; Graddy & Chen, 2006; Herranz, 2008). This requires a more systematic effort on the part of organisations and their managers to engage in such activities as services co-location, joint programs, liaison procedures, common client referral procedures and information sharing. Although conclusive research on the impact of networks on client outcomes has been scarce, the general belief is that collaborating service providers will enhance overall effectiveness by efficiently utilising resources, better recognising and treating client problems, and facilitating access to information and expertise (Provan & Milward, 2001). Although client-focused outcome indicators of effectiveness are important, networks are likely to produce other outcomes that may be critical to overall network functioning. In particular, since networks are essentially social systems, they are likely to generate social outcomes related to network participants. In many publicly funded networks, non-profit, public and even for-profit organisations are embedded in extensive networks of exchange involving referrals, contracts, joint projects and information sharing. These ties are developed to enhance the level of services provided to clients. But such ties also have implications for how organisations relate to one another and could explain why organisations choose to interact with some providers over others. Importantly, my research examines the related underlying processes of interorganisational network change over time.
According to Huang and Provan’s (2006) macro-level perspective, government agencies will likely be limited in their capacity to affect network activity, even if they control access to funding. Their findings align with Keast et al. (2004), suggesting that the key role for policymakers in a network structure is to lay the foundation for members to operate, and then pull back to allow them the kind of flexibility they need to achieve goals. Evaluating the information flows of networks, Littlejohn and Foss (2005) posit that organisations are driven and redesigned by a series of communication and knowledge transfers. My study illuminates the particular importance of informal communication to enhance knowledge transfer and leadership processes. With unpredictable patterns of interaction, the evolution of organisations is similar to that of complex adaptive systems (CAS), requiring a new approach to strategy, organisational behaviour and leadership (Stacey, 2001; Pearce & Conger, 2003; Hewitt, 2005). These CAS do not have a single, fixed image (Littlejohn & Foss, 2005), and leaders should not attempt to design their organisations for an unknown future (Cross & Parker, 2004).

Complex networks are dynamic and influenced significantly by many factors, including organisational culture, context, structure, content, functions, values, measurements and task performance (Brass et al., 2004; Cross & Parker, 2004). Today’s turbulent environments cause both intraorganisational and interorganisational boundaries to become more permeable (Vaill, 1996), and it is essential to manage network linkages (Powell et al., 1996; Brass & Krackhardt, 1999), as my research analyses. Working across boundaries, the ability to lead in networks is instigated by the ability to shape and reposition the network objectives according to different changes in the internal and external environment (Shortell et al., 2002). Finally, healthcare remains an important aspect of contemporary societies with many challenges and opportunities related to network infrastructure and architecture, innovation adoption, network dynamics and processes, and broader network change and development. Research into this domain has the potential to make significant contributions to society.
1.2.2 Topic: The interorganisational network form

Following the above description of the nature of the research and its domain in public healthcare networks, this section describes the specific study topic focusing on the interorganisational form and its definition. The network literature provides a basis for the development of a conceptual framework that may be used to better explain complex issues arising from the adoption and assimilation of innovations and technologies within healthcare organisations. In order to expand the limited understanding of network dynamics, processes and development across multi-level analysis, my study spans the continuum from the individual to the interorganisational level. There are numerous definitions of networks and interorganisational relationships in the extant literature (Oliver, 1990; Alter & Hage, 1993; Dickson & Weaver, 1997; Jones et al., 1997; Podolny & Page, 1998; Barringer & Harrison, 2000; Brass et al., 2004). Some even question whether networks are a unique organisational form (Borgatti & Foster, 2003), suggesting that organisations are already embedded in a broader network of social and economic relationships (Granovetter, 1985; Podolny & Page, 1998). Given recent advances, most would argue that networks are indeed a unique organisational form, even if considered a hybrid organisational form (Williamson, 1991). The lack of a standard lexicon for studying the construct leaves researchers in the field to deal with multiple meanings and definitions. There is now a trend in frequently cited papers that goes from merely relying on uniplex, ego network-based and dichotomous data to a more encompassing approach with which my research is aligned, relying on multiplex and interorganisational conceptualisations and valued relational data (Bergenholtz & Waldstrom, 2011). Provan et al. (2007: 482) provide a comprehensive review of the empirical literature on interorganisational networks at the network level of analysis and focus on a specific type of network ‘that has been frequently discussed but only infrequently researched, a whole interorganisational network consisting of multiple organisations linked through multilateral ties’.

A whole [interorganisational] network is viewed as a group of three or more organisations connected in ways that facilitate achievement of a common goal. The networks are often formally established and governed and goal directed rather than occurring serendipitously (Kilduff & Tsai, 2003). Relationships among network members are primarily non-hierarchical, and participants often have substantial operating autonomy. Network members can be linked by many types of connections and flows, such as information, materials, financial resources, services, and social support. Connections may be informal
and totally trust based or more formalised, as through a contract. Examination and analysis of a whole network includes organisations (nodes) and their relationships (ties), the absence of relationships, and the implications of both for achieving outcomes. However, unlike traditional network research, the focus is on the structures and processes of the entire network rather than on the organisations that compose the network. (Provan et al., 2007: 482)

This definition is slightly limited in that it does not account for emergent pluralistic networks.

Since this definition is the most comprehensive conception of an interorganisational network to date, I will use this construct inclusive of emergent network inception. Building on prior research theorising about networks (Galaskiewicz & Wasserman, 1994; Faulkner & de Rond, 2000; Kilduff & Tsai, 2003; Monge & Contractor, 2003; Galaskiewicz, 2007), Provan et al. (2007) assert that research on networks is based on bidimensional categorisation: the independent variable being utilised for the study and the dependent variable or outcome focus adopted by the research. They develop a typology that demonstrates four possible types of network research (Table 1.1). I agree with Provan et al.’s (2007) important categorisation, since they account for relational and network variables beyond traditional organisational variables and the organisation as the unit of analysis.

My research postulates that network relations and variables (e.g. processes) matter, particularly across organisations and among network interactions.

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My research corresponds to the bottom right quadrant, focusing on relational and network variables among a collectivity of organisations. This quadrant presents a context that illuminates the study goals, since my research questions target network dynamics, processes, and development...
and their interrelationships as critical network variables. Given its public sector categorisation, the next section describes the NHS.

1.2.3 Institutional overview: The National Health Service

This section provides an institutional overview of the British NHS and lays the foundation of the wider study context. The NHS is one of the largest organisations in the world and the largest in the UK. Its budget for 2011-2012 was £106b, with the NHS in England comprising the largest part of the system, catering to a population of 52m and employing more than 1.4m (NHS Choices, 2011). Paradigmatic changes, mainly a movement toward a ‘profit and loss philosophy’ (Button & Roberts, 1997: 142) and an emphasis on health outcomes (Klein, 1995), served to drive private sector practices and ideas closer to the NHS in a context of incremental financial pressure, rapid pace of change and uncertainty about the future (Klein, 1995). While historically the NHS has been dominated by clinicians (Ackroyd, 1996; Ferlie et al., 1996), these changes have also initiated an on-going sense of management prominence. As a result of the introduction of business managers in the core of NHS governance (Button & Roberts, 1997), professional boundaries (e.g. between physicians and managers) have been understood as determinants in knowledge transfer processes (Llewellyn, 2001). These different professions ‘exhibit greater commonalities in meanings and knowledge patterns…but would be less likely to collaborate across them’ (Currie & Suhomlinova, 2006: 5). This dichotomy between clinical and managerial knowledge realms is constantly re-formed through the integration of medical and managerial knowledge (Llewellyn, 2001). These two sources are embedded in completely different sets of cultural and epistemological meanings. Medical knowledge is perceived as fundamentally tacit, judgemental, experiential and professional (Dopson, 2005) compared to managerial knowledge. This understanding of medical knowledge has traditionally explained the balance of power within the NHS, whereby power typically lies at the periphery and medical professionals experience autonomy (Klein, 1995: 72). ‘Medicine, in particular, is notable for having strong closure mechanisms in the form of various bodies that strictly control access to the profession and
negotiate on behalf of doctors with the government’ (Barron & West, 2013). As a result, NHS management has attempted to make professional knowledge more explicit and measurable.

Since 1997, network-based models of service delivery have been an increasingly important mode of organising in UK public services alongside the alternative forms of bureaucracies or markets. Network forms allowed for improved integration and coordination of healthcare service delivery using shared objectives and collaboration rather than competition. Within the NHS, managed clinical networks were introduced to streamline and standardise care across boundaries and to diffuse evidence and best practice across the health economy. Networks were well placed to accomplish this, since the NHS grounded them in shared financial and human resources that promoted cross-collaboration and coordination of services. According to Ferlie and Pettigrew (1996), the following emerged as important fundamental concepts to define the characteristics and skills needed within NHS network-based management forms: trust, reciprocity, understanding and credibility. ‘There is thus an important interpersonal component to network-based forms of management’ (Ferlie & Pettigrew, 1996: S89). In 2001, the NHS Confederation (2011) reiterated that networks were an appropriate model for coordinating clinical services, where members of the network need to ‘surrender sovereignty’ to achieve shared objectives. Numerous studies emphasise the importance of network management (Powell, 1990; Nohria, 1992a; Ferlie & Pettigrew, 1996; Addicott et al., 2006) as well as its relational component. Yet the involvement of key stakeholders is dramatically affected and progress constantly mired by the political context in which networks reside, particularly given recently proposed NHS reforms that occurred during the study. As the next section demonstrates, fluctuations in the political and economic environment designate the NHS a complex, turbulent evolving network, which suggests that adaptability and complexity leadership are crucial to sustainability.

1.2.4 The political context: National Health Service reforms

In the early 2000s, the NHS growth rate rose to over 7% a year, but the 2008 recession brought austerity to the NHS. Over the previous decade, policymakers indulged in repeated organisational
changes, but better systems of providing care ensured appropriate service provision as required.

The current Conservative–Lib Dem coalition government aims to make further modifications, outlined in a White Paper, *Equity and Excellence: Liberating the NHS* (Department of Health, 2010), published during the middle of this study by the then Secretary of State for Health, Andrew Lansley. This contentious paper created a ripple effect within the sector, producing further organisational and network changes by shifting the locus of dominant purchasing power to General Practitioners (GPs) and abolishing Strategic Health Authorities (SHAs) and Primary Care Trusts (PCTs). The SHA involved with this study was, and still is, affected – evidenced by movement toward managerial upheaval and numerous terminations. As the publicity of the White Paper’s publication became national news, managers recognised:

> Serious changes are coming … the DoH is making SHAs obsolete. Many of my colleagues are scrambling, wondering if they’ll be made redundant. I might not have a job here next year and certainly not in a few years. (SHA Cardiovascular Network Deputy Manager)

The previous SHAs were clustered into four groups that will become part of the NHS Commissioning Board.

> The Board will be established in shadow form as a special health authority from April 2011. In 2011/12 it will develop its future business model, organisational structure and staffing. It will be converted by the forthcoming Health Bill into a statutory body, with its own powers and duties, and will go live in April 2012. (DoH White Paper, 2010: 32)

SHAs are set to ‘be abolished as statutory bodies during 2012-2013’. PCTs are being clustered and superseded by clinical commissioning consortia responsible for planning and securing health services and for improving the health of the local population. These will be accountable to the NHS Commissioning Board and advised by a variety of local bodies, in particular Health and Wellness Boards that will coordinate commission by local authorities and the NHS. The next section outlines the case study setting, focusing on the target network’s regional governing body.

### 1.2.5 Case study setting: regional Strategic Health Authority

The longitudinal case study examined, as the unit of analysis, an interorganisational stroke network that was managed by a regional SHA. SHAs manage the NHS locally and provide an
important link between the DoH and NHS. The main responsibilities of the SHA in the study included:

- Providing strategic leadership to the local NHS, ensuring national policy implementation
- Leading organisational and workforce development, ensuring organisational purpose and training
- Managing performance of local Trusts to ensure effective operations and improved delivery
- Promoting regional innovation as a legal duty

The SHA holds PCTs and Trusts to account for their performance against key targets, and in turn SHAs are held to account by the DoH to ensure the local NHS is implementing health policy. In the study region, there were eight PCTs associated with 37 hospitals and clinical organisations as well as a regional Ambulance Service under the SHA’s remit.

Organisations within the Stroke Network collaborated to serve strategic ends, directed by SHA network leaders. When environmental changes occurred, the network reconfigured. Gulati and Gargiulo (1999) show that when organisations seek to reconfigure their network to address emerging changes, they refer to existing contacts with which to connect. The seriousness of this predicament is made evident with research showing that organisations often seek out partnerships with which they already have an affinity (e.g. Uzzi, 1997; Walker et al., 1997; Ahuja, 2000). Kilduff and Tsai (2003: 8) refer to this as the ‘perils’ of current links determining future ones.

While this may be appropriate for organisations in environments that change in a predictable fashion, it can be problematic in turbulent settings. Turbulent conditions involve discontinuities, which means that completely new links might need to be forged outside existing networks, or new network configurations will take shape. At the study’s outset, the initial context – centred on the SHA – provided a core foundation and functional basis on which the Stroke Network operated. However, structural reconfigurations caused by national healthcare reforms and other system stressors had implications for dynamics and development of the network over time. The threat of SHA abolition generated uncertainty within the network as it evolved. Although the SHA structurally remained intact, and maintained links with Stroke Network participants, by the conclusion of the study ambiguity about the role of the SHA and Stroke Network sustainability
persisted. Initially acting as a significant device for innovation in the NHS – serving as a channel for telestroke dissemination – the network gradually underwent a period of stasis and subsequently experienced turbulent periods. This chapter, and the thesis more broadly, explores how the contextual relationship with inner and outer environments affects the function, change processes, development and stability of an interorganisational stroke network.

1.2.6 Stroke Network history

In December 2007, the DoH launched the National Stroke Strategy, which was designed to modernise services and deliver the latest treatments for stroke. The Strategy was intended to set a clear direction for the development of stroke services in England over the next decade.

    Networks for stroke have real potential to improve the way that services are planned and delivered for both individuals with stroke and staff … Organisations join networks because they can do what they need to do more effectively together than if they operate alone. (DoH, National Stroke Strategy, 2007)

The NHS Improvement – Stroke team was established to provide national support for improving stroke and transient ischaemic attack (TIA) services. Its functions and remit were defined in the National Stroke Strategy, the implementation of which was the central aim. According to the National Stroke Improvement Programme:

    effective networks improve care for patients: networks encompass the entire stroke pathway by connecting different organisations and teams involved along the patient’s trajectory, so individuals experience coordinated management from the first contact that extends to lifelong support as a survivor. Networks involve stroke survivors and carers as active partners in coordinating and supporting service development. (National Stroke Improvement, 2008)

Prompted by the DoH announcement of national funding for stroke totalling £105m in May 2008, each regional SHA was allocated £2.4m over a three-year period. Over the next five months, the study SHA and PCTs restructured the wider network and transitioned into a Cardiovascular Network including development of a Stroke Steering Group. As one network veteran stated:

    The network was in constant flux … first it was cardio, then vascular, then they decided on a combined cardiovascular network. Those of us involved were still trying to do our jobs while all these changes were happening … We wondered how everything would come together, what the funding arrangements would be, and who would be overseeing things. (Commissioner and clinician)
During this period of uncertainty, the network was reconfigured to meet the needs of the SHA in addressing the National Stroke Strategy. The evolution of previous network structures, participants and processes involved several dynamic re-formations encompassing the wider, complex interorganisational network. The network’s concentration on structural reconfiguration may have marginalised educational and knowledge transfer activities (Addicott et al., 2006) and also hindered technology adoption, as my study shows. In August 2008, the National Director for Heart Disease and Stroke and Chief Executive of the SHA agreed upon broad objectives for use of the new NHS stroke funding allocation:

- Target poor performing areas and/or areas of deprivation
- Demonstrate joint working
- Build in monitoring and evaluation
- Involve the networks
- Aim to achieve sustainability.

The DoH representative identified that the new time-limited money (three years) was to be used on acute stroke services. Each SHA was required to agree with its constituents on how to spend the money, and as such the regional Cardiovascular Network agreed with the DoH that a portion of funding could be used on telemedicine to focus on telestroke service provision. In October, the SHA Cardiovascular Stroke Steering Group outlined a proposal for stroke funding to the DoH, indicating broad areas of potentially fundable networked activity with associated costs. The money did not follow immediately, and the SHA and DoH agreed to roll the money forward into 2009-2010. As of December 2008, the regional Cardiovascular Network gained a level of independency from its regional SHA and was given accountability and line management arrangements. The next section looks at the benefits of the structural form and composition of the network under study.

1.2.7 Network structure

A fast-emerging alternative management model that assumes that the best organisations are networks and not hierarchies is steadily redefining the ways in which large numbers of people work together. Formal networks are organised with a quasi-centric managerial core, rather than traditional bureaucratic, hierarchical structures. This drives collaboration, coordination and
progress across silos. Unlike matrix structures, formal networks organise work through shared interest and are therefore based on collaboration. Unlike informal networks, formal networks have access to real resources (i.e. they submit budgets based on specific innovative plans) and support infrastructure (e.g. assigned network managers) operating with clear objectives. Contributions of network participants against these objectives serve to inform individual evaluation processes to create accountability for the resources invested.

Networks in the NHS bring together patients, clinicians, carers, commissioners and others from organisations across primary, secondary and tertiary care in order to improve patient services. In the NHS, a network is defined as:

Linked groups of healthcare professionals and organisations from primary, secondary and tertiary care working in a coordinated manner, unconstrained by existing professional or organisational boundaries to ensure equitable provision of high quality effective services. The overall purpose of a clinical network is to facilitate a whole system approach to service delivery and modernisation, thereby adding value to what individual organisations can deliver. (NHS, 2008)

NHS networks involve commissioners, providers and service users from health and social care working together to create services that meet patients’ needs. Several benefits have been attributed to clinical networks in the NHS, including: integrated and standardised care – promotion of excellence through protocols/guidelines, benchmarking, and audit; cost-effective use of specialised staff and equipment; working together to manage risk; education, training, and shared knowledge management; improving clinical outcomes and quality of care; and providing better support for delivering National Service Frameworks (NSFs) and NHS plans. The next section provides a description of the specific Stroke Network structure, objectives, and functions.

1.2.8 Stroke Network

The longitudinal case study at the core of my study targeted the regional multidisciplinary, interorganisational Stroke Network comprising eight PCTs under the remit of the regional SHA. It focused on 10 hospitals within the region that provided some level of stroke care, which is discussed further in Chapter 4. Organisational boundaries are a central phenomenon that have been
viewed with a multiplicity of theoretical lenses (Thompson, 1967; Pfeffer & Salancik, 1978). This study subscribes to the view that boundaries are the demarcation of the social structure that constitutes an organisation (Dutton et al., 1994; Kogut, 2000); however, I extend this to the interorganisational form. Activities within the network operate under a specific logic of identity that shapes how things are done in the network and sets the rules for inclusion. In this case, the 10 organisational Stroke Network members fell under the remit of the regional SHA and were united by their shared financial resources and objective to improve acute stroke service provision, which reinforced local identity, quasi-hierarchy, and rationality. Following the description of the study’s network, the next section describes research questions and contributions.

1.3 Research questions and contributions

1.3.1 Statement of the research problem and research questions

In globalised, interconnected, matrixed, virtual and knowledge-intensive organisations, attempts at sensemaking can no longer use organisational charts or formal structures as the exclusive guide. A new paradigm must be explored. Network theory and its implications affect ‘management, strategy, organisational behaviour, human resources management, entrepreneurship, alliances, knowledge and learning, and international business’ (Parkhe et al., 2006: 567). Change processes possess blurred boundaries of beginning and end, involving numerous stakeholders, organisations and networks in shaping an innovation, while unfolding in complex, multi-layered social contexts. Such a conceptualisation of healthcare innovations, as studied here, requires a research approach that supports process-orientation and multi-level analysis of the contexts in which innovations unfold. Contextually, I study clinical innovation targeting ‘life-critical processes’. Scholars today often ‘regard the interorganisational network [rather than the firm] as the basic unit of analysis’ (Powell, 2001: 59). Since few studies provide empirical evidence of an interorganisational network over an extended period of time, my research not only aligns with this view but also seeks to make a theoretical contribution linking the network and leadership literatures. The primary research question pursued in this study is:
What characteristics, behaviours, and processes are involved in the dynamics, development, and orchestration of complex, interorganisational public sector networks?

Furthermore, what drives network processes? How do interorganisational networks change and develop over time? How does leading in complex interorganisational networks affect the network?

I aim to understand how processes, particularly leadership processes, affect the network along its developmental trajectory by analysing the implications and dominant interorganisational impact.

The primary research question emphasises the importance of understanding network dynamics and development, a process that is significant for identifying and evaluating leadership processes in a complex, interorganisational network.

1.3.2 Scope

Taking into consideration the exploratory nature of the research question (Yin, 1994) and the significant role that inner and outer contexts (Pettigrew, 1987) play in the interaction across occupational groups, this thesis relies on a qualitative longitudinal case study approach to explore interorganisational network processes with a focus on leading in complex healthcare networks.

Although some studies analyse the leadership beliefs and behaviours that promote relationships and ties between actors in organisational networks, this study concentrated on other factors and processes that affect the network and collaboration among organisations (Cross & Parker, 2004; Nebus, 2006). This study did not examine the total field of networks or the total field of leadership, only the dimensions, dynamics and processes in a public sector healthcare network. There is a particular interest in processes that shed light on leading in networks, since there is limited understanding of this realm both empirically and theoretically in the extant literature. As this study and future research evolves, a theoretical foundation for NPL may emerge. Researchers tend to build on existing models instead of reinventing or challenging them (Kuhn, 1970), which has the unintended effect of narrowing the focus of future research (Pearce & Conger, 2003).
1.3.3 Significance of the research

This section outlines the significance of my contribution as it relates to the overall thesis. In this section, I focus more on my contribution to network theory and proposed links with the complexity leadership literature rather than emphasise a dominant focus on technology and innovation management. I position the contribution of the thesis as one that draws upon the key concepts and theories from my extensive literature review to address questions that identify gaps in the literature and present a foundational NPL framework. An original contribution of this work is that it extends our current understanding of leadership, particularly leadership processes, in complex, interorganisational networks. The thesis explains why an understanding of network complexity is crucial to advancing research on networks. Leadership is the critical ingredient to successful, sustainable networks beyond what is currently known. The primary gap in the literature I aim to fill relates to interorganisational network processes and dynamics from a longitudinal study, since very little is known, especially empirically, about interorganisational network leadership. Cross-sectional studies have not illuminated this problem, and my study addresses these limitations.

1.3.3.1 Linking network and complexity leadership theories to establish a foundational NPL framework

One of the primary contributions of this study is that it addresses the individual agency v. collective leadership processes within complex, interorganisational networks by evaluating processes, dynamics and interactions among individual, social, professional and organisational sub-network levels. It further fills voids in the network theory and leadership literatures as well as bridging the gap between the two bodies of literature by linking network theory and complexity leadership through a social capital theoretical lens. The study provides valuable, original empirical evidence addressing the individual agency v. collective leadership process, which emphasises collectivities within a multiplicity of network forms. The research identifies interorganisational network characteristics, complex dynamics, and processes that occur over time, in the context of emergent medical technology adoption and pre-implementation that affect performance and ultimately determine network change. It explores the structure, summarises the characteristics and
identifies the dimensions of network process effects across multiple levels within the network. The study indicates the elements that create, encourage and shape an interorganisational network within a highly matrixed and knowledge-intensive ecosystem. This exploratory yet pragmatic study (Nebus, 2006) reaches its goal of providing a foundation for a socially constructed understanding of network processes, particularly as they relate to network development and shaped practice. The research reveals how NPL facilitates and mobilises network participants and wider network functioning, ultimately affecting network changes such as shaping practice and sustainability. Also, by providing a better understanding of how network framing processes, knowledge transfer, and informal networks are facilitated, for example, this study could generate valuable policy implications (e.g. for standard-setting).

1.3.3.2 Offering a longitudinal case study on an interorganisational network over time

This case study is unique because it provides empirical evidence on the dynamics and processes within an interorganisational network over a three-year period, whereas most reports are related to static, point-in-time case studies. In addition, the study analysed a period of turbulence within a public sector healthcare network given several critical factors that occurred concurrently in the network. The study findings revealed that conditions of high uncertainty, ambiguity and turbulence dramatically affected interorganisational network processes and development in ways previously unexplored (e.g. boundaries as enablers).

1.3.3.3 Theoretical contribution: a foundation for theoretical development on leading in networks

The discourse presented in this study draws theoretical and empirical links between network theory and complexity leadership, thereby initiating research and inviting leadership and network scholars to elaborate the literature in this interstitial domain. I identify critical processes and develop foundational constructs surrounding network leadership processes, bridging the theory–data divide in order to provide a foundation for theoretical development pertaining to leading in networks. Building upon these constructs, I highlight several previously underexplored
relationships (e.g. reciprocal interrelationships) among interorganisational network dynamics, processes and development. Asserting the significant argument that the coproduction of leadership between the formal and informal dialectic is needed to drive network processes, I link the network theory and complexity leadership literatures through a social capital lens. I propose the foundation for an interorganisational NPL framework. Although it is only a foundational framework, my study will serve as a basis for future research on leading in networks and the growing body of research that continues to evolve.

1.3.3.4 Professional leadership within networks

The study highlights a unique setting in which to analyse leadership dynamics within both homogenous (e.g. medical professionals) and heterogeneous (e.g. interdisciplinary) professional networks. The collaborative efforts of these professional sub-networks working on a techno-social innovation identified various forms of leadership. Contrary to traditional hierarchical forms, analysing the developmental and evolutionary network process revealed how professionals shaped frames, transferred knowledge, facilitated informal networks and crossed boundaries while adopting a new technology within an interorganisational network. Illuminating the significance of NPL and social capital, analysis of this paradigm shift allows for the creation of alternative management strategies within the complex, interorganisational context. The identified operational mechanisms could have useful implications for leadership development programmes.

1.3.3.5 Policy and practical implications

As the research is contextually based in the NHS, a public sector healthcare system, it has wider implications for generalisable healthcare system restructuring, governance and development. As many emerging economies, developing countries, and even developed countries consider designing highly networked structures that efficiently utilise innovations and technologies across boundaries while appreciating the multi-layered context, this research offers practical implications for strategic development of such systems ranging from the micro- to macro-level. My study is relevant to the analysis of innovations in underexplored contexts as well as in policy analysis, and
it will further the understanding of policy making in different settings. Furthermore, the study concludes with several pragmatic implications targeting both policymakers and network managers.

1.4 Research approach

1.4.1 Approach

Several different methodologies and sources were used for gathering data, following the practice of previous works in the sector (Ashburner et al., 1996; Ferlie et al., 1996; Thorne, 1997; Kitchener, 2000; Llewellyn, 2001). Data originated from field interviews, observations, meeting transcripts and archival sources. Semi-structured interviews constituted one of the primary data sources for the study; therefore this study deemed the informants knowledgeable and capable of giving articulate insights about the network, but also recognised the value of examining the discourse deployed by professionals (Fournier, 1999; Evetts, 2006). I also conducted non-participative observations of network and sub-network meetings for a period of two and a half years, as well as attended eight site visits. This method allowed me to capture impressions of the enactment of professional practices and social interaction within the interorganisational network, which has been described as ‘the common starting ground for all the social sciences’ (Bales, 1951: 31). Lastly, I supplemented the interviewing of informants, non-participative meeting transcripts, and site visit observations by gathering archival data. I collected public and proprietary documents, internal and external to the network, which enabled me to contextualise and triangulate the findings. I primarily based my analyses on the methods proposed by Miles and Huberman (1994), though I did take some recommendations from Rubin and Rubin (1995) on interview analysis. I started by examining the data and looking for themes and topics associated with the research questions and their operationalisation. Through the iterative method of building the case and contrasting its findings with that of the literatures reviewed, I initially focused on the different practices at the sub-network level, followed by an exploration of analyses and theoretical implications at the interorganisational level. The details of my methodological research design are discussed in Chapter 3.
1.4.2 Organisation of the study

The remainder of the thesis is structured as follows. Chapter 2 presents a detailed review of the network and complexity leadership literatures to which this thesis aims to contribute. I conduct an in-depth structured analysis of these two streams, and the focal section of the review targets network theory. The analysis identifies the gap in the literature that I aim to fill by evaluating network processes and dynamics from a longitudinal study. Very little is known about leadership in interorganisational networks, and I provide an explanation of why understanding network complexity is crucial to advancing research on networks more broadly. I argue that complexity leadership is a key ingredient to successful, sustainable networks beyond what is known, since cross-sectional studies have not shed light on this problem. Then I move on to analysing the findings of these streams of research on the means for, and barriers to, leading in networks. I offer a critique of historical approaches in my comprehensive literature review and provide a characterisation of leadership as it is to be used in the data analysis. Finally, I summarise the contributions to our understanding of the gaps in the literature and introduce my intentions for the proposed theoretical framework.

Chapter 3 explains the research design and methods. The justification for, and the implications of, adopting a single, longitudinal case design and associated methods are discussed. The chapter further describes the sampling strategy and, after discussing the data collection and procedural elements, explains the data quality and analyses. I summarise by highlighting the study’s methodological contribution.

Chapter 4 illustrates the narrative of the interorganisational Stroke Network longitudinal case study. Accounting for several years of fieldwork, this chapter illuminates the comprehensive, detailed story of the network under study. Although this chapter provides data throughout the narrative, data pertinent to the results themes is also provided and analysed in Chapters 5–7. Chapter 4 begins with the data collected at the start of fieldwork, describing the network’s overall dynamics and processes. The dominant storyline includes various activities, events, policies and
processes that shaped the network’s development over time, which emphasises the importance of the temporal dimension of the case. I address concurrent events in the Stroke Network’s inner and outer contexts, which tended to create destabilising effects on the interorganisational network as a whole. The network faced several stressors, which meant that it had to operate in a turbulent environment. Throughout the narrative, I depict how the network operated and adapted to manage contemporaneous issues. I then identify the implications of such disruptive effects.

Chapter 5 is the first of three analytical results chapters – focused upon framing processes – based on themes emergent from Chapter 4’s case narrative. Through analyses and ample data provision, I describe how primary frames were formulated and propagated, subsequent discourse processes, and actions and practices that were shaped as a result of framing. The purpose of this chapter is to develop a framework for network leaders with analogous interdisciplinary compositions and functions and to understand practices that could affect the progressive development of interorganisational networks. Antecedents to uncertainty that generate network-wide turbulence are identified in this chapter to uncover leadership processes that help us better understand the dynamics of operating and managing within a complex network. To accomplish this, I analyse the theme of framing within the network during periods of turbulence: analysing framing formulation, propagation, discourse dynamics and the shaping of practices. The chapter provides original empirical evidence surrounding these issues and establishes a basic framing framework in interorganisational networks.

Chapter 6 is the second of the results chapters, which provides new insights into the knowledge processes of the network form by drawing on the longitudinal case study. The focus of the chapter is on the interrelated themes of knowledge processes, informal networks, and boundaries within interorganisational networks. I present an in-depth examination of knowledge processes to illustrate knowledge transfer; detailed accounts are provided to help convey the complexity and richness of the phenomenon. Chapter 6 first defines knowledge, knowledge transfer, background on knowledge in NHS networks, and knowledge processes. It then offers an overview of
organisational, professional knowledge and epistemic boundaries based on the extant literature with which this study aligns. Importantly, it focuses on the presentation of three results sections, including an analysis of informal networks, boundaries as both knowledge barriers and enablers, and network leaders’ mobilisation of professional and organisational interactions. A boundary as knowledge-enabling is a particularly significant finding, since it defies traditional conceptualisations of boundaries as barriers. Chapter 6 provides evidence suggesting that there remain gaps in network theory surrounding knowledge management, and that knowledge transfer theory is limited regarding understanding the professionalised, interorganisational network context.

Chapter 7 is the most significant of the results chapters, and centres on interorganisational NPL. This chapter discusses how leadership facilitated and enacted processes discussed in the prior three chapters. Chapter 7 builds upon Chapters 4–6 to present relevant, new empirical evidence on NPL and identifies four dominant leadership process themes. I discuss leadership in this complex, interdisciplinary, multi-layered context and identify: (1) mobilising influence across informal networks; (2) maximising social proximity; (3) focal v. non-focal roles; and (4) formal and informal leadership reciprocity. These factors could be enacted and facilitated by both formal and informal leaders engaging in social capital utilisation and capacity building to encourage network processes. After providing detailed original data on each of the themes, I then discuss their interrelatedness pertaining to network leadership and the cross-cutting theme of social capital. As its focus, Chapter 7 presents data and leadership process themes to lay the foundation for a discussion in Chapter 8 of higher order NPL thematic patterns, pertinent critical conclusions and theoretical analysis.

Chapter 8 further builds upon Chapter 7 to explore higher order thematic patterns of leadership behaviours, processes and functioning within the interorganisational network. Importantly, it also reviews NPL findings from prior results in Chapters 4–6, then synthesises these previous findings with those from Chapter 7 to reiterate where the dominant higher order thematic patterns surfaced. The overall analysis concentrates on four higher order themes: (1) system stressors and turbulence;
(2) focal and non-focal leadership roles; (3) maximising social over spatial proximity; and (4) the reciprocal coproduction of formal and informal leadership. Following a detailed discussion of these synthesised NPL themes, I apply a complexity leadership lens to the predominant findings, discussing its advantages for linking the network and complexity leadership literatures, which is a contribution of this thesis. These critical, higher order NPL themes are then linked with CLT while emphasising the interorganisational context. This chapter points to the emergence of network leadership processes and practices that were conceptualised in terms of a relational, distributed yet collective, complexity leadership approach. Importantly, Chapter 8 extends the examination of CLT to interorganisational networks, which is unexplored in the extant literature. Following an engagement in theoretical discussion to provide an informed, critical understanding of synthesised results, the final section concludes with NPL contributory findings that are elaborated upon in Chapters 9 & 10 to establish a foundational NPL framework.

Chapter 9, the discussion centred on theory building, unites the empirical observations and evidence of network functioning, leadership behaviour, and processes with social capital as the linking theme. It describes ways in which leaders in the complex network utilise, adapt and build social capital to establish characteristics and processes to drive network processes and functioning. A closer analysis of the study’s higher order NPL themes reveals emergent propositions that are identified. To conclude, I reiterate the theoretical arguments and address the interconnectedness of the four salient theoretical themes. Across the four constructs, a closer analysis reveals that a common theme among these findings relates to social capital dimensions. Each of the four propositions ties in some way to the utilisation or capacity building of social capital. Social capital as the significant linking theme is discussed in detail. Lastly, I elaborate upon the means by which empirical observations and evidence of network processes and leadership functioning with social capital as the linking theme is an original contribution of the thesis.

Chapter 10 is the final thesis chapter addressing overall conclusions and research contributions. I begin by outlining the contributions that are key to my thesis, including a clear diagram detailing
these points. I then introduce the foundation of a complex interorganisational network process leadership framework. Presented as the primary contribution of my thesis, I detail how my main contribution is to network theory by introducing a preliminary Network Process Leadership framework. Extending the theoretical contribution, I describe how the research fills gaps in the extant literature. I then acknowledge the study limitations and discuss its generalisability. Importantly, I describe the significance of the proposed theoretical contributions for future research and conclude with a discussion of practical implications that these insights have for policy and professional practice.
Chapter 2: Literature Review

2.0 Introduction

This chapter interweaves a review of the network and leadership literatures with an argument that as interorganisational networks demonstrate complexity, study of the leadership of such networks can also be illuminated by CLT. CLT is therefore applied due to its theoretical applicability to help shed light on the case study results and support analyses. In the process, foundational concepts are identified that will assist in the empirical analysis in this study, and gaps are identified which the study may be able to help fill. Broadly, my research touches upon network theory and leadership. Despite the diversity and breadth of my approach, delving into multiple bodies of literature that inform my thesis, the primary focus here is on network theory. This literature review outlines fundamental concepts and key areas I have studied in relation to the research problem by generally describing network theory, its classifications and forms, dynamics, complexity leadership, and social capital in networks. The subsequent sections outline these issues to provide the theoretical foundation of my research study.

The research questions presented in Chapter 1 are addressed by the literature review, and they help raise further questions that are unanswered as well as identify gaps in the literature to address. To reiterate the primary research question, this study examines: ‘What are the characteristics, behaviours and processes involved in the dynamics, development and orchestration of a complex, interorganisational public sector network?’ This question emphasises the importance of understanding network dynamics and development, which is important for identifying and evaluating processes in an interorganisational network, particularly in a complex, turbulent environment.

The literature provides a basis for describing, understanding and analysing a longitudinal study, while I concurrently revisit the theories and concepts to further develop the network theory and
leadership literatures, thereby taking an iterative approach to theory development (Eisenhardt, 1989a, 1989b; Miles & Huberman, 1994; Langley, 1999). I initially surveyed several theories – networks, structuration, contextualism, and leadership – that might assist in explaining data gathered from the network. Following data collection, I focused on network theory, complexity leadership and social capital, since these literatures better illuminated the longitudinal case. Ultimately, this study aims to offer concepts that will bridge the gap between network theory and complexity leadership through a proposed foundational theoretical framework – with social capital as a linking theme – applicable to an extended domain beyond public sector healthcare networks.

2.1 Public service networks

Public service networks of the type with which my study engages and is interested in possess the following characteristics: interorganisational, multi-level, knowledge-intensive, professional, and relate to complex tasks. These criteria are discussed below to introduce foundational network dynamics.

2.1.1 Public service network dynamics

In order to understand how such networks could be effective, an understanding of their dynamics is necessary. Organisations within an interorganisational network relationship are mutually dependent in the exchange of resources, and it is critical to gain a better empirical and theoretical understanding of such relationships. Klijn (2003) demonstrates several important network dynamics in the public sector. First, the context exhibits pressure and increasing complexity of societal problems and political uncertainty. Second, there exist tight interdependencies, and the substitution of actors is not usually possible. Third, in terms of the nature of relations, there is joint problem and solution finding for social and administrative problems. Goodwin et al. (2004) view NHS networks as valuable, argue that they require significant skill to develop and manage, and healthcare systems must allow different types of networks to co-exist and to serve different functions. They offer several suggestions for effective network management, which reaffirm themes relating to interorganisational collaboration. Overly large networks should be avoided.
because they are more likely to become inert, and networks should be inclusively designed and
developed rather than having their form and regulation mandated. It is important to engage
professional leaders to promote networks among their peers, and also critical that networks are not
captured by any professional, managerial or organisational interests. They also suggest a central
position within the networks is important for network managers, and boundary-spanning roles and
IT can be helpful in connecting networks. Finally networks must demonstrate their value and that
they maintain a favourable cost-benefit outcome (e.g. time and resources).

The multi-level network perspective is an important focus of my thesis, as scholars call for future
research focusing on this complex issue. Rhodes (1997) differentiates three levels of analysis – the
macro level focusing on inter-policy network relations, the meso level examining organisational
linkages, and the micro level focusing on participant behaviours. The interaction of the macro and
meso levels is important for explaining changing patterns of the network and the distribution of
resources, such as power, within a network. Crossan & Apaydin (2010) propose a unifying
theoretical approach on a meso level that links managerial action with innovation as a process and
outcome of the organisational level. However, more theoretical development is needed to link
those to macro levels. Other research uses network, learning and knowledge theories, yet they did
not fully integrate across levels. While knowledge- and capabilities-based researchers argue that
the locus of new value and knowledge rests at the organisational level (Barney, 2001), Felin and
Hesterly (2007) challenge this conceptualisation and propose a more individualistic foundation of
value creation. Felin and Foss (2005: 441) argue that ‘to fully explicate organisational anything –
whether identity, learning, knowledge, or capabilities – one must fundamentally begin with and
understand the individuals that compose the whole, specifically their underlying nature, choices,
abilities, propensities, heterogeneity, purposes, expectations and motivations.’ A small proportion
of academic papers in this space operate on the individual level as compared to more than half on
the organisational level. Felin and Foss (2006) call for the linking of organisational level variables
with their micro-foundations. Crossan and Apaydin (2010) respond by combining micro and
macro levels of theorising by suggesting the application of a recently emerged practice-based view
(PBV), which could combine the individual, firm, contextual and process variables prevalent in the network literature.

It is a contemporary theoretical perspective that has gained momentum since the 1980s in order to overcome divergence of the field between ‘individualism’, favouring human action while ignoring macro-forces, and ‘societism’, focusing on large social forces while discounting individual action (Whittington, 2006). PBV considers the activities that organisational members conduct, their consequences for organisational outcomes, and the feedback-loop from contextual and organisational variables back to members. Johnson et al. (2003) argue that this approach does not replace traditional management theories (e.g. resource-based view, institutional theory), but rather offers a mechanistic explanation for them (Bunge, 1997). By extending upon these studies and targeting the interactions among individual, organisational, professional and interorganisational network levels, my study aims to shed light on multiple levels to develop a process-based framework targeting whole interorganisational network level effects. In Chapter 3, I elaborate on the stratification of levels as defined in this study.

In terms of knowledge dynamics, it is important to understand the context in which network forms reside. Ferlie and Pettigrew (1996) emphasise the significance of clinical networks in the NHS, which are commonly dominated by GPs and consultants. Currie and Suhomlinova (2006) indicate that government policies relating to learning and knowledge sharing in the NHS fail to appreciate its professionally dominated institutional context. Professional power is grounded in its tacit knowledge (Freidson, 1994; MacDonald, 1995), and Ferlie et al. (2005) find that epistemic differences between professions in healthcare hindered sharing of evidence-based medicine and best-practice. Professionals working in networks, especially medical professionals, may deem other professions unable to understand their knowledge or be reluctant to collaborate and share knowledge with different groups and professionals with whom they compete for jurisdiction (Abbott, 1988) within healthcare.
By contrast, networks bring similar professionals together who would otherwise be unknown to one another and enable them to exchange knowledge by virtue of membership. By bringing disparate professionals together, networks may enable knowledge to overcome the barriers among different professions. Since the introduction of new public management in the 1980s, managers have attempted to reduce professional power by making their knowledge more explicit, measurable and manageable. This has had varied and debatable success (Ferlie et al., 1996).

Participants within ‘interstitial communities’ (Seely-Brown & Duguid, 2001), such as medical-managerial hybrids (Exworthy & Halford, 1999; Hoff, 1999; Fitzgerald & Ferlie, 2000; Montgomery, 2001), also likely facilitate knowledge transfer. By simultaneously participating in multiple professions and understanding both languages and identities, they may be able to translate knowledge between the two. Hybrids who are able to span boundaries play a pivotal role in networks (Goodwin et al., 2004; Fitzgerald et al., 2006).

With regards to network process benefits, Harris et al. (2000) find that inter-firm networking can facilitate the innovation process, but it will not necessarily lead to innovation success. Dynamic capabilities research targeting innovations (Prahalad & Hamel, 1990; Teece et al., 1997; Eisenhardt & Martin, 2000) focuses on organisational resources and capabilities, but does not comprehensively incorporate the role of the agent or investigate how organisational processes transform inputs into outputs, which is encompassed by organisational process theory (Engestrom, 1993; Van de Ven & Poole, 1995). Within healthcare innovations research, three key success factors of healthcare quality improvement collaborations include: (1) the capacity and motivation of participating teams, particularly leadership and team dynamics; (2) the motivation and receptivity to change of the organisations they represent; and (3) the quality of facilitation, especially the provision of opportunities to learn from others in an informal space (Øvretveit et al., 2002; Greenhalgh et al., 2004). Building upon these network dynamics, the next section delves into a deeper foundation in network theory.
2.2 Networks

2.2.1 Network theory overview

Many social science studies are alleged, often correctly, to represent cross-sectional snapshots rather than to capture processes that deal with important changes over time. Network studies are not exempt from this criticism. Recently, longitudinal research has become more common in network research, since there is only a limited amount that can be known about networks when focusing on their static properties. Despite this, there is still little known about network dynamics (Bell et al., 2006), especially when focusing on interorganisational networks (Provan et al., 2007). Analysing processes introduces time as a variable and allows for the study of dynamic changes of the phenomena in question. Crossan and Apaydin’s (2010) review of the network literature produces a clear picture of a fragmented field with several theoretical streams emerging. While learning and knowledge theories are prominent, other management theories are underutilised. The multiplicity of dimensions and variation in recognition across the literature as well as theorising, have led to fragmentation and lack of interconnectedness among different analytical levels, which suggests synthesis opportunities. A more recent study calls for future research that could stimulate greater integration of management research in order to bridge both the micro–macro gap and the science–practice gap (Aguinis et al., 2011). My study aims to tackle these challenges, recognising that networks cover a spectrum of classifications spanning micro to macro dynamics.

2.2.2 Classification of networks

The background and definition of an interorganisational network construct most pertinent to my study of networks was provided in Section 1.2.2. Networks can be seen from different epistemological perspectives, for example as socially constructed (Hacking, 1999) or from a realist Foucauldian view linking different discourses or ordering patterns (Kittler, 1990). I provide a comprehensive, systematic description of the 10 primary clusters of theoretical networks in Table 2.1 (adapted from Goodwin et al., 2004), highlighting a range of network perspectives from the disciplines of sociology, politics and economics.
Table 2.1: Theoretical foundations for the study of networks

<table>
<thead>
<tr>
<th>Theory/Perspective</th>
<th>Seminal Papers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rational choice and transaction cost theories</td>
<td>Coase, 1937; Williamson, 1985; Aoki, 1990</td>
<td>Argue the form of network is shaped by the maximisation of individual utility subject to the balance of transaction costs: networks are managed mainly by modulating transaction costs since utilities are assumed to be given. These theories posit that at least in the medium term, the results of individual and organisation pursuit of interests will typically be efficient, except for very special circumstances (Williamson, 1994). Pure rational choice theories argue that only individual level interest or utilities explain action and reject the notion that structure of ties can have any independent causal force (Dowding, 1995).</td>
</tr>
<tr>
<td>Organisation competency and learning theories</td>
<td>Prahalad &amp; Hamel, 1990; Kogut et al., 1993; Powell &amp; Smith-Doerr, 1994; Powell et al., 1996; Colombo, 1998</td>
<td>Consider organisations to be driven less by cost minimisation than by maximisation of benefits; especially the benefits of enhanced competencies and capabilities. The links firms seek to form with others will be ones that enable them to enhance their core competencies and generate efficient and effective divisions of labour with partners to secure the competencies that the focal firms do not need to cultivate internally. A recent development relates to the concept of communities of practice, or networks created to develop and share learning (Wenger, 1998; Tsoukas, 2002), which is informing NHS policy (Bate &amp; Robert, 2002; McNulty, 2002).</td>
</tr>
<tr>
<td>Neo-Simmelian perspectives</td>
<td>Granovetter, 1985; Burt, 1992, 1997</td>
<td>Regard organisations as embedded in networks of social individuals (Tilly, 1996); influencing organisational networks depends on influencing networks of natural persons (Simmel, 1971 [1907]).</td>
</tr>
<tr>
<td>New institutionalist perspectives</td>
<td>Powell &amp; DiMaggio, 1991; Orru et al., 1991; Scott &amp; Meyer, 1994; Fligstein, 2001</td>
<td>Propose the form of the network is fixed by institutional constraints, path-dependence, historical period and inertia, which leaves limited scope for macro-management.</td>
</tr>
<tr>
<td>Ecological perspectives</td>
<td>White, 1981, 2001; Hannan &amp; Freeman, 1989</td>
<td>Argue network forms are selected in ‘niches’ or temporarily combined and available vectors of resources. Changing the structure of niches is the key to managing networks. Similar to rational choice and transaction cost theories, these theories propose that networking is fundamentally driven by the need to control niches defined as vectors of resources. Such approaches take path-dependence seriously, since the means by which organisations can secure their positions are more limited by the inherited patterns of networks than would be for rational choice and transaction cost theories.</td>
</tr>
<tr>
<td>Problem/technology contingency perspectives</td>
<td>Galbraith, 1973; Perrow, 1999 [1984]</td>
<td>Argue network form would ideally be shaped to solve particular problems with prevailing technology – were it not for institutional forces and bounded rationality. Managing networks involves overcoming those institutions.</td>
</tr>
<tr>
<td>Macro-economic and technological determinist perspectives</td>
<td>Castells, 1996</td>
<td>Claim network forms are relations of production that change when the forces of production change. The information economy is calling for a new dominant network form, implying limited scope for management. Castells claims the dominance of network forms of economic organisation are similar to a distinct historical ‘mode of production.’ These network forms are driven by collective interests of fractions of capital and social movements rather than individual interests and technology.</td>
</tr>
<tr>
<td>Theory/Perspective</td>
<td>Seminal Papers</td>
<td>Description</td>
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<tr>
<td>Weberian perspectives</td>
<td>Weber, 1961, 1976, 1978; Mann, 1986; Simon, 1997 [1945]</td>
<td>Argue that macro-social rationalisation produces more efficient and transparent organisational forms. Network management relates to the constant constitution of authority through routinised institutions. In Weberian theory, social organisation is driven by interests but strongly mediated by institutions, which are the product of prevailing ideas and worldviews (Schluchter, 1981). However, interests are defined at very high levels of aggregation rather than by particular vectors of resources; therefore, Weberian theories classify network forms according to their different institutional forms.</td>
</tr>
<tr>
<td>Sociotechnical perspectives</td>
<td>Bijker &amp; Law, 1992; Law &amp; Hassard, 1999</td>
<td>Regard artefacts, technologies, individuals, and organisations as nodes in ‘actor networks’, where management is limited. Actor Network Theory embodies these perspectives.</td>
</tr>
<tr>
<td>Neo-Durkheimian perspectives</td>
<td>Douglas, 1982a,b; Mars, 1982; Gross &amp; Rayner, 1985; Thompson et al., 1990; Thompson, 1996</td>
<td>Identify four basic solidarities, each which possesses a distinct network form and specific strengths and weaknesses. The neo-Durkheimian approach argues that the distinct basic forms of social networks are rooted in distinct informal institutions, and elementary forms of network structures are emblematic of those underlying institutions.</td>
</tr>
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</table>

Each network has a different context for the making of meaning, understanding, recognition and sensemaking around management activities, since not all networks exhibit a single pattern of relationships among the member organisations or individuals. Contrary to arguments claiming that network forms are wholly distinct from those of markets and hierarchies (Powell, 1990), many empirical studies use the term ‘network’ to describe patterns of relationships between organisations or individuals. Networks can comprise individuals, organisations or both. My research focuses on professional, organisational and interorganisational network forms in healthcare. Since the study aims to demystify the issue of agency v. leadership within interorganisational processes, I next outline a critique of one of the dominant theories related to organisational studies.

2.2.2.1 Structure v. agency

My intention is to move this thesis beyond the limitations of the structural focus and of the cross-sectional research design toward understanding the dynamics and processes of networks. In order to accomplish this, I need to adopt, in part, an agency perspective. One of the prevalent theories on this topic is Actor Network Theory (ANT), considered the sociology of translation, which asserts
that ‘social relations’ are not independent of the material and natural world (Latour, 2005). The contribution of ANT to organisation studies lies in recognising that there is no purely social actor or purely social relation. This contribution is significant in helping to bring the ‘missing masses’ (Latour, 1987, 1992) of non-human actors into the frame, which was considered an important and timely move given the influence of the linguistic turn in organisation theory. Despite its historical importance, there is a recent shift away from applying ANT as an organisational theory. Whittle and Spicer (2008) argue that ANT relies on a naturalising ontology, an unreflexive epistemology and a performative politics. Although this does not completely dismiss ANT as a useful approach to studying organisations, it does question the contribution of ANT to developing a critical theory of organisation, particularly one extended to complex, interorganisational networks.

ANT is not pertinent to the development of this study, since my thesis focuses more on agentic properties of leadership processes, whereas past studies focus predominantly on structure. ANT is not applicable here because it insists upon the agency of non-humans and does not account for pre-existing structures. In accordance with other critics, I argue that intentionality fundamentally distinguishes humans from non-humans (e.g. artefacts). Instead, my study offers more traction than ANT to understand this complex, social, processual field in networks, and it adopts a more relational approach than either purely structural or agentic approaches provide.

2.2.3 Knowledge networks and networks of practice
Transferring knowledge among organisations involves increased complexity due to the multifaceted nature of the boundaries, cultures and processes involved. It is therefore an interesting domain for further theoretical investigation. This thesis responds to both theoretical agendas and practical concerns, including the increasing requirement of organisations and networks to manage processes of interorganisational knowledge transfer and the growing evidence that interorganisational knowledge and learning processes can serve as an advantage in terms of innovativeness, performance and competitiveness. The significant concept under investigation here is the knowledge network rather than the network of practice (NOP), both of which are described
below. NOPs are less relevant since they offer a limited conceptualisation for my study of network processes involving knowledge transfer across multiple boundaries; hence my study privileges the concept of knowledge networks.

Tsai (2001) demonstrates the importance of gaining access to knowledge through interorganisational networks, and contributes to the literature on networks and innovations (e.g. Ibarra, 1993). The structure of the interorganisational relationship pertains to the context in which knowledge transfer occurs and the transfer mechanisms that are established within that context. Organisations often have to be in some form of strategic alliance before there is any significant knowledge flow from one to another. A key factor in knowledge transfer is absorptive capacity, which is the ability to recognise the value of new knowledge and to assimilate and use that knowledge (Cohen & Levinthal, 1990). Research suggests that, regardless of the interorganisational relationship’s structure, informal, social ties between members of the same organisation (Hansen & Lovas, 2004) or different organisations (Bell & Zaheer, 2007) are superior conduits for knowledge flow between geographically distant locations. This is a salient point, since my study analyses processes involving both social and spatial (i.e. geographic) proximity.

Scholars have demonstrated the importance of having lateral linkages among organisational sub-units for effective knowledge sharing to occur. A sub-unit’s information-processing capacity is enhanced by lateral inter-unit integration mechanisms (e.g., Galbraith, 1973; Egelhoff, 1993; Gupta & Govindarajan, 2000). Innovation knowledge flows more efficiently through established relationships spanning sub-unit boundaries (Tushman, 1977; Ghoshal & Bartlett, 1988; Nobel & Birkinshaw, 1998; Hansen, 1999). Best practices are transferred more easily when there is a positive relationship between the two transferring parties (Szulanski, 1996).

Contextually analysing the public sector, Dawes et al. (2009) suggest the creation of ‘public sector knowledge networks’ (PSKNs). Unlike other types of networks, PSKNs treat information and knowledge sharing across traditional organisational boundaries as a primary purpose as they try to
address public needs that no single organisation or jurisdiction can handle alone. PSKNs are sociotechnical systems in which human, organisational and institutional considerations are in a mutually influential relationship with processes, practices, software and other IT. They have emerged in tandem with the adoption of advanced networking technologies and the development of e-government (Dawes et al., 2009).

Networks are often used to generate, enhance and diffuse incremental and complex innovation. Within each categorisation, both technical and non-technical innovations disseminate throughout networks. Brown and Duguid (2001) describe professional/occupational networks as ‘networks of practice’, which are crucial to innovation because emerging local knowledge of specific groups is available to others within the broader epistemic culture (Ziman, 1967; Brown & Duguid, 2001; Swan et al., 2002). Although NOPs promote this accessibility and flow of knowledge, they could concurrently hinder knowledge flows across networks. Radical innovation requires changes in work practices that traverse existing NOPs and epistemic cultures (Knorr-Cetina, 1999); hence my focus is on the importance of knowledge networks across multiple internal interorganisational boundaries. Knowledge transfer (Winter, 1987; Szulanski, 1996; Argote, 1999) has its foundations in the information-processing approaches to boundaries in organisation theory (Lawrence & Lorsch, 1967; Galbraith, 1973). In the healthcare domain, Coleman et al. (1966) assert that physician networks drive innovation diffusion, since physicians are more convinced by peers’ subjective experiences than by scientific evidence, highlighting the significance of opinion leaders. My research uncovers similar findings relating the subjectivity of physician experience with network leadership processes. The complex interrelationships among knowledge, network dynamics and innovation suggest a processual approach to studying network effects. Analysing these processes across organisational and professional boundaries within the interorganisational set is critical.
2.2.4 Network forms

Networks come in different forms. They differ in terms of types of actors involved, network boundaries, and the presence and absence of different types of links. It has been demonstrated that the structural form of a network has consequences for what the network can actually achieve (Baker & Faulkner, 1993; Provan & Milward, 1995; Cross et al., 2002; Burt, 2005; Table 2.1). Many networks simply lack the functionality to produce certain types of outcomes, which is a matter of design. This does not imply that certain networks are inherently dysfunctional, but rather that they are designed and organised in ways that are best suited to particular actions and practices but not others. Network forms can be changed; however, this can be a difficult and time-consuming process, thereby limiting what each network form can reasonably accomplish (Kenis & Provan, 2009). In order to better comprehend the complexities embedded in the interorganisational network form, this study analyses the nuanced interactions and processes within and between the complex network levels.

There has been a fundamental shift in management research and practice from the tradition of examining the organisation as the primary unit of analysis to emphasis on the network form. Agile, flexible networks are being superimposed onto hierarchical, bureaucratic, vertically integrated organisations (Bennis, 1999; Brass & Krackhardt, 1999; Miles & Snow, 1986; Nohria, 1992a; Parkhe et al., 2006). Networks span multiple boundaries, operate virtually, use matrix management, and tend to involve knowledge-intensive work, placing additional importance on relationships (Brass & Krackhardt, 1999) and flexible communication linkages (Contractor et al., 2006). Advancing the literature, Provan et al. (2007) promote exploration of the interorganisational network form. I adopt the enhanced definition of the construct described in Section 1.2.2, which is inclusive of emergent network inception as defined there. Although the interorganisational level is the study’s target unit of analysis, the organisational and professional network levels are considered to provide a multi-level perspective. Given the public sector healthcare study context, I next explore the networks literature in this domain.
2.2.5 Networks in the healthcare industry

A comprehensive review on networks in healthcare emphasises the variation between ‘top-down imposed’ and ‘bottom-up emergent’ networks in the NHS (Goodwin et al., 2004). There are three types of networks in the UK healthcare system:

(1) Enclave networks: useful for sharing information among professionals with a common interest; may exhibit instability.
(2) Hierarchical networks: possess an organisational centre that regulates and provides member oversight.
(3) Individualistic networks: constructed by an individual or organisation that develops a loose affiliation of associations that are responsive to change and successful for exploring innovation.

Goodwin et al. (2004) suggest that certain typologies of networks are more effective than others under different circumstances, and that there is no dominant network type. Catalysts of organisational learning and competence drive different network forms. My study involves analysis of enclave professional networks as well as quasi-hierarchical, interorganisational NHS networks.

According to Turrini et al. (2010: 545), ‘network leadership is fed by the ability to patch and reposition the network objectives according to the different changes in the external environment (Shortell et al., 2002)’. Various managerial and leadership competencies influence network performance over time and at various levels by altering and reshaping the structure of the network itself. ‘Facilitating network process and procedure on one side, and working as network leaders on the other, do not only directly influence network effectiveness, but they preserve and develop what might be considered the real sources of superior advantage in networks’ (Turrini et al., 2010: 546).

My theoretical foundation resonates with Turrini et al.’s (2010) work, and my study aims to extend their work further by exploring leadership processes in complex interorganisational networks.

Although extensive research has been conducted on large, complex public sector networks (Benson, 1982; Bardach, 1994; Provan & Milward, 1995; Wagner, 2000; Addicott et al., 2006, 2007), little attention has been paid to leadership processes within the interorganisational setting. Following a systematic review of the literature, Turrini et al. (2010) present a unified, integrated
framework of network effectiveness by building upon Provan and Milward’s (1995) preliminary ‘theory’ on network effectiveness and Provan and Sebastian’s (1998) model, considering them as benchmarks in assessing determinants of public network effectiveness. Despite the comprehensiveness of their framework, they mention ‘network leadership’ only once. Their framework and the literature more broadly forego examining the interactive relationships among leadership characteristics and network processes.

Addicott and Ferlie’s (2007) findings contribute to a theory of network power and suggest that the distribution of power within managed clinical networks is concentrated within a dominant coalition of medical professionals, who bargain together to enact organisational change in their favour. Analysing this context further, Currie et al.’s (2008) study exposes the interactions of institutions, organisations and individuals and provides insights on work and employment relations challenges of new forms of organisation. Theoretically, they promote an understanding of the implementation of networks in healthcare. Currie et al. (2008: 558) emphasise that ‘inter- and intra-professional relations are tightly interwoven with inter-organisational relations within the healthcare setting, and these create challenges for work and employment relations.’ Given evidence on power differentials characterising relationships, they highlight the interdependence of professional groups as there are shifts toward dominance within the network setting.

Currie et al. (2009) advocate advocating an institutional approach to leadership by treating leadership as a concept that can be used both to describe and to prescribe specific activities. In their interpretation of distributed leadership within the public sector network context, they identified the ‘boundary conditions’ for the impact of institutional pressures by specifying how the immediate organisational environment limited or enabled the distribution of leadership. Their study provides a counterargument to essentialist versions of leadership by highlighting the socially constructed and contested attribution of leadership. Similar to Currie et al. (2009), my research resonates with the growing literature on distributed leadership in healthcare (Brooks, 1997; Buchanan et al., 2007; Denis et al., 1996, 2000, 2001; Pettigrew et al., 1992). Although
governmental policies seem to be promoting distributed leadership, regulatory institutions reinforce the accountability of individual leaders (Ferlie et al., 2003). Currie et al.’s (2009: 1754) analysis demonstrates that ‘public sector leaders find themselves in a Catch-22 situation, struggling to respond to the contradictory pressures and hence enacting the ‘weak’ form of distributed leadership, which allows them to satisfy often incompatible demands’. My study focuses on the internal dynamics and processes within the interorganisational network, providing empirical evidence on the processes of distributed leadership that operate within the network to collectively drive network change.

Martin et al. (2009) report similar findings, noting that despite the known challenges to networked governance and distributed leadership in the public services, a careful alignment of objectives with managerial agenda fosters success to service provision reform. They find that a combination of clear benefits to stakeholders within the network, and distributed and dispersed leadership, can enable effective collaboration and establishment of reforms, through structural integration and the harnessing of agency. My study aligns with their finding that networks compound the need for distributed leadership in public-service contexts, since they create new loci of power that could be influenced by a more dispersed form of leadership. Whereas their study adds to a growing literature on leadership practice and the role of public-service networks and brings these literatures together, my research expands our understanding of complexity leadership in interorganisational networks by introducing the critical linking theme of social capital.

According to Currie et al. (2011), leadership and networks should complement one other, with the less hierarchical logic of the network allowing leadership of change to develop, distributed among network members rather than led from dominant organisational role. The authors determine that as a consequence of bureaucracy, power differentials among network participants, and a strong centralised performance management policy regime, a relatively scant form of distributed leadership is enacted in practice. My study extends upon their findings to provide evidence on the processes of distributed leadership within an interorganisational network that facilitate change and
network wide development. I theoretically focus specifically on linking networks and complexity leadership, drawing upon Complexity Leadership Theory to help explain the nuances of network process leadership. Currie et al. (2011) acknowledge that their analysis of the dynamic interaction between networks and leadership is a contingent one and suggest there is a temporal dimension to the development of distributed leadership as a network matures. They suggest longitudinal studies of the dynamics of leadership in networks, to which my study responds. The rich, in-depth longitudinal case study I present allows for the analysis of distributed leadership processes over time to determine how leadership among network participants extends beyond Currie et al.’s (2011) findings of ‘devolved leadership’ to collective leadership.

Fitzgerald et al. (2013) have greatly extended the work on distributed leadership in networks, identifying three key themes from a multi-comparative case study. They find that a pattern of widely distributed change leadership is linked to delivering improved service outcomes. Managerial hybrids perform critical lateral facilitation activities by adapting and extending their roles according to their organisational context. Lastly, they find that a foundation of good pre-existing relationships underpins the capacity of distributed leadership to implement service improvements. Fitzgerald et al. (2013) contribute to the literature by establishing links between situated patterns of distributed leadership and service improvement outcomes based on the cumulative effects of network participants at multiple organisational levels. They determine that effective leadership at just one level is insufficient to effect improvement. I build upon this strong foundation of leadership in networks to extend it further by integrating network and complexity leadership theories through the crucial linking theme of social capital. The empirical evidence from my study supports their findings and furthers our understanding of strong relationships, facilitative processes, linkages between formal and informal leaders to propose a foundational framework of Network Process Leadership grounded in social capital dynamics.

Building on Provan et al.’s (2009) study, Milward et al.’s (2010) results demonstrated the importance of formal structure in shaping other relationships in the networks and that higher levels
of trust within the network developed from prior relationships. They employed social network analysis to highlight the structural dimensions of the network, whereas my study delves more deeply into the processual elements of the interorganisational healthcare network. Martin et al. (2012) find that cases embedded within complex organisational contexts involving a multiplicity of stakeholder groups from across healthcare sectors, a network of ‘champions’ and ‘sponsors’ from different clinical and managerial backgrounds was crucial. They analyse the importance of interactions among setting, leadership, stakeholder contributions around the network and the nature of the innovation to show how, in different challenging contexts, those leading innovation could work to secure sustainability. My study builds upon this by introducing the importance of social capital in the networks development as innovation is adopted in the NHS. Martin et al. (2012) understand sustainability as a continuum requiring continued effort that can be facilitated through the nurturing of clinical and managerial champions and networks, through integrating services in clinical pathways, and through alertness and responsiveness to shifting agenda and expectations. Similarly, as my study depicts the development of the Stroke Network over time, it demonstrates the importance of network process leadership and social capital dynamics.

Provan and Huang (2012) find that network organisations are extensively linked to one another when resources are intangible and knowledge based, and these relationships were diffused throughout the network. At the macro level there was stability over time for shared information; however, there was considerable instability at the micro level (i.e. individual ties). Building upon the detailed network dynamics observed by Provan and Huang (2012), my study shows the different ways social capital is used to share information and facilitate interactions throughout the interorganisational network – from micro to macro level. Provan and Lemaire (2012) argue that public network scholars have contributed in key ways to an understanding of goal-directed whole networks, including their management and governance. My research responds to their call for further research on network evolution and wider network–environment relations on the capacity of networks to function effectively under turbulent conditions.
Sheaff et al. (2010) find that differences between several healthcare networks appear to reflect differences of leadership. The informal leaders of the self-care network were indifferent to NHS reforms, since they were not related to core activity. They did not depend on government or NHS management for resources, goodwill or legitimation, and daily network activity provided them with minimal exposure to formalised managerial work. Contrary to other networks they produced few managerial artefacts. The self-care network’s macroculture was the most resilient in face of health system reform because its external resource dependencies were few. National priorities and targets, managerial norms and formalised managerial techniques primarily drove the mandated networks. Unexpectedly, senior hospital physicians adopted these norms as well. All three mandated networks moved towards a managerial formalisation of network culture, irrespective of the different care groups served. Sheaff et al. (2010) argue that large networks are more likely to contain a ‘mosaic’ of localised cultures. In an analysis of medical professional organisational challenges, Waring and Currie (2009) show how professionals such as physicians can themselves become managerialised as they seek to dampen managerial encroachment. Rather than seeing professionals as being drawn into management roles or bureaucratic ways of working, Waring and Currie (2009) suggest that managerial techniques and jurisdictions are also strategically drawn into professional practice and identity. Their study reveals how doctors, within established collegial networks or departmental enclaves, respond to organisational change by demonstrating a commitment to learning while also defending against unwanted managerial scrutiny and maintaining professional autonomy.

More specifically, Addicott and Ferlie (2007) show than an elite coalition of medical professionals from teaching hospitals dominate decision-making and benefit in network resource distribution. They argue that this reflects historical power relationships within the NHS, a model dominated by the medical profession. ‘The influence of this bounded pluralist model was restricted by an overriding centralised accountability framework, based on audit and performance management’ (Addicott & Ferlie, 2007: 402). Similarly Currie, Finn, and Martin (2007) find politics to be significant in its influence on knowledge sharing across sector, organisational and professional
boundaries. They argue this can be mediated by addressing human and social aspects of the context in which knowledge sharing takes place. My study extends their work by also building upon Dopson et al.’s (2008) work on context such that I evaluate the processes of knowledge transfer across professional and organisational boundaries among three dominant interorganisational professional specialisms. By delving into the rich contextual analysis of the stroke network, I build upon their conceptual foundation to develop the groundwork for a network process leadership framework that emphasises the significance of social capital. Buchanan et al.’s (2007) analysis of distributed change agency show that different contributions were significant at varying times as responsibility ‘migrated’ from national, to regional network, to a local level. The changes were driven and sustained by a pair of dominant leaders, a small core group of leaders, and numerous other supporting roles. My study explores the interactions among different leaders and network participants at different interorganisational network levels to determine the process that facilitate network wide change.

Harris et al. (2012) importantly find evidence contradictory to prior research on geographic barriers to collaboration in interorganisational networks. Taking a social network analysis approach, they determine that geographic distance is not a significant barrier to collaboration, and that once organisations are working together, geographic distance is no longer viewed by members as a barrier. Harris et al. (2012) indicate collaborative science is a new, developing field and there exists limited information regarding effective partnership building. From an organisational change standpoint, Ferlie et al. (2011) call for the reinforcement of major drivers in the policy arena. Specifically, they ‘suggest cross-organizational ICTs/knowledge management and interorganizational learning are areas for policy attention, as well as developing broader leadership (Martin et al. 2009)’ (Ferlie et al., 2011: 322). My study extends these findings in that I examine the effects of spatial (i.e. geographic) and social proximity on interorganisational collaborative and leadership processes. The Stroke Network case offers an investigation into social capital dynamics that influence these processes over time as the whole network aims to achieve shared goals.
2.2.5.1 Network realities: Management and leadership dynamics in healthcare networks

Research on leadership in large, complex networks is limited. An investigation into healthcare management within NHS networks identifies the polycentricity and diffuse nature of network-based organisations, as compared to the vertically integrated organisational form (Ferlie & Pettigrew, 1996).

In the case of the NHS, clinical networks exercise an important role in interorganisational communication as well as managerial networks, and remain outside direct managerial control. The professional college represents a traditional mode of organisation in healthcare and one which continues in importance. (p. S93)

Organisations are embedded within the context of the overall network in which patterns of interactions and alliances influence future behaviour. It is crucial to analyse the interorganisational network to examine how ties are constructed and maintained. My research adopts a study of the interorganisational set (i.e. group of organisations) to investigate these ties and, importantly, the processes surrounding their interconnections. In healthcare in particular, clinical and managerial networks are critical, as they commonly comprise a small group of key stakeholders who play multiple roles in various settings. Drawing on other studies in support of a focal role (Thorelli, 1990), their findings suggest that a ‘broker’ is needed to catalyse and sustain a network. Network management requires increased knowledge sharing, learning, and organisational development and matrix management. Rather than a traditional ‘command and control’ style of leadership, this style involves catalysing integration and driving collaborative change within the network. Networks require enhanced management and leadership styles that entail working across professional jurisdictions, especially given the nature of professional groups possessing distinct languages, epistemologies and cultures (Dopson & Fitzgerald, 2005; McGivern & Dopson, 2010). Therefore, the clinical-managerial hybrid role is essential in facilitating interorganisational boundary-spanning (Fitzgerald et al., 2006). Managers (non-clinically trained) also seem to maintain a powerful brokerage role within networks (West & Barron, 2005).

Creating a collaborative advantage is difficult due to the complexity and dynamism of collaborations, which require highly skilled senior leadership within the collaborating
organisations (Dopson & Fitzgerald, 2006). Goodwin et al. (2004a, 2004b) argue that NHS networks can be of value, although development requires extensive leadership skill to develop and manage. They suggest several ways to improve network effectiveness: inclusively designing and developing rather than imposing form and regulation; engaging professional leaders to promote networks among peers; ensuring a central position within the networks is assumed by network managers; and supporting boundary-spanning roles and IT to connect networks. Knowing how networks function is now important, as collaboration is required across functional, social, demographic, professional and organisational boundaries (Charan, 1999; Cross & Parker, 2004). My study examines the nuanced, dynamic functions and processes of the interorganisational network over time to uncover and better understand these interactions. As these dynamics are multi-levelled, the next section organises a framework of the different network levels.

2.2.6 Organising framework of network levels

The application of network theory and analysis to organisational contexts and increasingly interorganisational contexts has seen greater interest recently. I suggest that not only does the network or structural perspective add explanatory power to scholarly understanding of organisations’ behaviour and development, but that it expands the universe of observed phenomena from an autonomous to a relational view for studying and explaining interorganisational action and change. I develop an organising framework based on three levels of network analysis: organisational, professional and interorganisational. Given the relational view extended here, I also describe informal networks that are intrinsic within the three specified levels.

2.2.6.1 Organisational Networks

The traditional unit of analysis has been the organisation. My study extends this view to assess the continuous interactions among multiple organisations comprising an interorganisational network over time. The network as a whole is driven in part by the organisational adaptive capacity of internal networks. Networks in organisations involve almost every aspect of human behaviour (Cross & Parker, 2004). Kilduff and Tsai (2003) agree, stating:
The study of social networks in and between organisations encompasses just about everything that is of interest concerning human behaviour in such settings. … The study of such relationships is therefore the study of human nature itself. (p. 131)

They suggest that network research reaches across diverse disciplines including ‘anthropology, psychology, sociology, mathematics, and management’ (p. 128), and that there is ‘considerable exportation of network ideas into existing organisational theories’ (p. 37). That exportation has resulted in social network research contributing to organisational cognition, behaviour, theory, strategy and leadership at all levels in the organisation and between organisations. Kilduff and Tsai (2003) address how social relationships and organisational networks affect individual identity, perceived power, individual and organisational performance, resource sharing and a host of other organisational constructs. My study is especially aligned with the relational influencing effects.

Although leadership is detailed in Section 2.4, it is worth pointing out here that leadership approaches and paradigms, such as trait, behavioural, situational and transformational, have tended to ignore the important role of organisational networks in leadership (Bass, 1990; Burt, 1997; Brass & Krackhardt, 1999; Brass, 2001; Yukl, 2002; Northouse, 2004; Bono & Anderson, 2005). Effective leadership requires more than just individual knowledge, skills, and attributes, it also requires the development of relationships with others (Barnard, 1938; Newcomer, 1955; Mintzberg, 1973; Greenleaf, 1977; Burns, 1978; Kanter, 1982; Kotter, 1982; Luthans et al., 1985; Geletkanycz & Hambrick, 1997; McGee-Cooper & Looper, 2001; Avolio & Kahai, 2003; Locke, 2003; Pearce & Conger, 2003; Cross & Parker, 2004; Eisenberg & Goodall, 2004; Grayson & Baldwin, 2007; Ibarra & Hunter, 2007). To better understand an interorganisational network’s complex layers, the next section discusses professional networks.

2.2.6.2 Professional networks

Professional networks are a means to look beyond hierarchical forms to collaborative connections and arrangements. Although professional networks are based on trust and credibility, they are also ripe with the interplay of power dynamics and influence; the latter often leading to epistemic culture clashes among professions (McGivern & Dopson, 2010). My study explores the often
misaligned perspectives and interactions among clinical, managerial, technical and financial disciplines and professions in the Stroke Network. As noted by Ferlie and Pettigrew (1996: S90), achieving ‘an inter-professional consensus is difficult in settings where each professional group remains rigidly attached to inherited and uni-professional modes of working’. This is particularly salient in my study, where medical professionals tend to dominate, and the history and knowledge of the medical profession is ingrained. According to McGivern and Dopson (2010: 1669):

Medical professionals have historically dominated healthcare through the ‘indeterminate’ (Jamous & Peloille, 1970; Boreham, 1983), tacit, or judgement-based nature of their knowledge, practice, and autonomous collective organisation (Abbott, 1988; Freidson, 1994). The introduction of public managers and regulators challenged medical jurisdiction attempting to make healthcare more transparent and governable (Ferlie et al., 1996).

Part of the purpose of interorganisational networks is to harbour collectivism among professionals from care protocols and pathways to provide the same level of services (NHS SDO Report, 2009). Interorganisational and professional networks serve not simply to transfer and disseminate knowledge, but also to commodify and validate it. A highly centralised managerial approach is, however, unlikely to be acceptable in enclave networks where professional autonomy and clinical freedoms are essential (NHS SDO Report, 2009).

Ferlie et al. (2005) argue that complex organisations contain many different professional groups, each of which may operate in a distinct community of practice, which introduces a new theory of the retarding impact of conditions of multi-professionalisation on the spread of innovations. This argument contests prior work presenting professional networks as positive facilitators of innovation (Coleman et al., 1966; Robertson et al., 1996). My study analyses the role professional boundaries play in adopting telestroke technology by providing evidence of the coalitional struggle among disciplines. Robertson et al. (forthcoming) suggest that the dynamic interplay between professional network structures and interpersonal networking activities shapes the nascent phase of the innovation process. By analysing the formal and informal social network interactions inherent in network processes, my study illuminates this interplay between professional networks and interpersonal networking.
IT has been found to be a key enabler in the creation of networks of geographically dispersed professionals to enhance learning and innovation (NHS SDO Report, 2009), as was the case in the Stroke Network. Good examples of how IT has been used to coordinate professional expertise and enhance performance are the use of telemedicine and videoconferencing, such as telestroke. Consultant physicians were happy to be a part of the system because they gained access to specialist medical expertise and peers with high professional reputations. Hence, this IT-based, virtual, informational network enabled professional networks to co-exist within a managed system aiming to improve quality and control rising medical costs (NHS SDO Report, 2009).

In terms of professional leadership, respected professional leaders are necessary to promote networks to peers (NHS SDO Report, 2009). Although professional engagement appears to be a prerequisite in networks, there is risk for potential network capture by, for example, dominant professional elites such as medical professionals. The lack of connectivity among professional views has been regarded as the ‘biggest obstacle’ to the network, leading to a lack of ‘corporate discipline’ (NHS SDO Report, 2009). The homogeneity inherent in a dominant professional network risks the heterogeneity and cognitive diversity of the wider network. My study explores these characteristics and effects on the interorganisational network.

2.2.6.3 Interorganisational networks

While a substantial amount of what has been written about networks has been atheoretical, discussing the advantages of networks or examining issues of measurement and analysis, considerable theory-based research has also emerged (e.g., Cook, 1977; Burt, 1980; Granovetter, 1985; Jarillo, 1988; Williamson, 1991; Cook & Whitmeyer, 1992; Larson, 1992; Provan, 1993). Scholars today often ‘regard the interorganisational network [rather than the firm] as the basic unit of analysis’ (Powell, 2001: 59; see also Jones et al., 1997; Podolny & Page, 1998; Helper et al., 2000; Smith-Doerr & Powell, 2005), with which my study aligns. Mizruchi and Galaskiewicz (1993) argue that network analysis has contributed to both interorganisational analysis and organisational theory in general. Interorganisational network analyses have demonstrated a
correlation between centrality and power, concluding that the more central the organisation, the
greater its reputation for influence in the overall network (Laumann & Pappi, 1976; Galaskiewicz,
1979; Miller 1980; Boje & Whetten, 1981; Knoke, 1983; Perrucci & Lewis, 1989). However, it is
not necessarily the level of resources that determine an organisation’s power, but rather ‘the set of
resources that actors [have capacity to] mobilise through their existing set of social relationships’
(Galaskiewicz, 1979: 151). This point is particularly salient in my study, where informal social
networks and social capital play an important role.

Although it is currently underdeveloped, interorganisational network analysis allows us to
understand the ways in which organisational processes are embedded in social structures at the
interpersonal, professional, organisational and interorganisational levels. Network leaders are
enmeshed in an elaborate network of social relations and power interdependencies within and
across organisations and professions. Responding to recommendations for analyses of the benefits
of interorganisational arrangements (Powell, 1990; Milward & Provan, 2003a), my study explores
the network processes of a complex network over a multi-year period.

In the non-profit sectors, where a public interest motive is involved, network outcomes are
especially prominent, and the rationale for organisations cooperating to accomplish system goals
rather than organisational ends is often stronger than in the private sector, even when specific
incentives to integrate and cooperate are weak. For external stakeholder groups such as
policymakers and funders, as well as for service professionals and patients, emphasis is often on
achieving outcomes that enhance the overall well-being of patients, without regard to whether the
goals of individual provider organisations are met (Provan & Milward, 1995). This overarching
alignment around patient outcomes aligns with my findings on framing processes in Chapter 5.

Overall, my study considers the inner and outer contexts of the Stroke Network to better
understand processual effects as the network attempts to achieve its goals, and appreciates multi-
level benefits. Within each of the aforementioned network levels are relational, informal networks
as discussed below.
2.2.6.4 Informal networks

The informal structure of the organisation – the network of informal linkages through which communication and information pass – has long been recognised as an important concept in organisational processes (Barnard, 1938; Blau, 1964), and network analysis reveals this informal structure (Littlejohn & Foss, 2005). This sub-section briefly introduces and defines ‘informal networks’, and synonymously ‘informal social networks’, as referred to in the thesis. In contrast to ‘formal’ network leaders who were placed in their positional, authoritative roles, the term ‘informal’ pertained to more emergent roles and networks that were not authoritatively intentional. For example, informal social network linkages emergently developed among network participants through relational exchanges (e.g. social capital capacity building). The relational power of informal networks, with emphasis on trust, reciprocity and mutuality provides the mechanism to join previously dispersed and perhaps competitive parties in a collective venture (Mandell, 1994; Kickert et al, 1997; Mandell & Harrington, 1999; Agranoff, 2003; Agranoff & McGuire, 2003; Considine, 2004; Koppenjan & Klijn, 2004). Braithwaite et al. (2009) assert that healthcare quality improvement efforts can increase effectiveness by exploiting social capital inhering in the informal social ties that naturally form and evolve over time. West and Barron (1999) find that professional socialisation and structural location are important determinants of social networks, which could usefully be considered in the design of strategies to inform and influence clinicians. Given its multi-level considerations, my study accounts for the informal social network level within the wider interorganisational network. Informal, professional and organisational networks are not mutually exclusive, since, for example, a network participant could maintain a link with another participant who belongs to both the same informal and professional networks. The next section provides a summary of networks addressed thus far.

2.2.7 Networks summary

In summary, prior research has taken a static view without examining how networks’ functional dynamics and effects might be achieved. Despite the aforementioned potential drawbacks of the different network levels, there are numerous benefits to exploring the multiplicity of these
interactive, complex interorganisational layers. Analysing networks allows for a more relational approach to comprehend dynamics and processes in practice. Within the interorganisational network, the professional and organisational networks remind us of the importance of the human factors and social dimensions. My study applies a current theoretical lens while concurrently providing operational mechanisms for how to pragmatically manage and lead in complex, turbulent networks. In addition, the networked approach offers a new way of looking at systems (Uhl-Bien et al., 2007). Given the nature of my study, it demands a processual approach that extends beyond a ‘structure v. agency’ argument by building on more recent studies that are expanding our comprehension of network development and evolution (Provan et al., 2007). The next section addresses the dynamics of networks that have become increasingly important as large networks are analysed.

2.3 Dynamics of networks
Like much extant management research, social network research is often criticised as being static, but due to multiple calls to include more dynamic research in the field, there has been a shift from cross-sectional to more longitudinal studies of networks (Brass, et al., 2004; Greve, & Tsai, 2004; Parkhe et al., 2006; Ahuja et al., 2008). While collecting longitudinal data for any type of research is challenging, such research is important for deepening our theoretical insights on network dynamics and change (Ahuja et al., 2009). The shift from static to dynamic has prompted a transition from single-level to cross-level analysis, inspired by the realisation that networks are affected both from below (e.g. individual characteristics) and above (e.g. external contexts) (Watts, 1999; Brass et al., 2004). Brass et al. (2004) determine the intersection of individual-, unit-, and organisation-level characteristics and processes. This also highlights the importance of investigating the connections among cross-level network phenomena for unravelling complex network dynamics in organisational settings. Gulati and Gargiulo (1999) present a seminal, endogenous model of network evolution that demonstrates how past networks influence the formation of new ones and find regularities in such behaviour across three industries. Still, there
are many issues to be addressed in order to better understand how networks change, and my study takes a cross-level analytical approach.

Within the complexity leadership literature that is discussed below, network dynamics refer to the range of contexts and mechanisms that enable leadership. According to Uhl-Bien et al. (2007), adaptive ideas emerge and interact similar to pairs or groups of agents interacting within interactive, interdependent networks. Dynamics encompass networks of interaction, complex patterns of conflicting constraints, patterns of tension, interdependent relationships, rules of action, direct and indirect feedback loops, and rapidly changing environmental demands. Dynamics have also been shown to include catalytic behaviours (Kauffman, 1993), generation of stable and unstable behaviours, dissipation of accumulated tension as phase transitions (Prigogine, 1997), nonlinear change, information flow, and pattern formation. Complex network dynamics include the emergence, combination, divergence, and extinction of ideas, all of which conflict with one another, adapt, and change with increasing complexity (Uhl-Bien et al., 2007).

Furthermore, leadership is an appropriate perspective on the dynamics of the types of networks in which I am interested. Given the characterisation of public service networks as highly complex and impacted by inner and outer contexts with changing dynamics, I expect to gain insight through examining leadership behaviours and processes. The leadership literature provides a useful lens for understanding how network dynamics are shaped, actions facilitated, and practices changed.

2.4 Leadership
2.4.1 Traditional leadership approaches

Traditional approaches to leadership are likely to illuminate only a limited set of behaviours. Relational and informal approaches are more likely to be inclusive of the range of behaviours you would expect to find in professional networks and networks that span organisations, and hence where formal authority holds little sway. This section outlines several traditional approaches to leadership, targeting: hierarchical, transactional v. transformational, leader–follower, relational,
and leadership in public sector networks. Since not all leadership approaches could be covered in detail, I emphasise these traditional leadership approaches as they provide the strongest foundation related to the processual and relational nature of my study and its research questions.

2.4.1.1 Hierarchical, bureaucratic approaches

Traditional leadership research focuses predominantly on hierarchical leadership (Zaccaro & Klimoski, 2001) and formal, positional roles. The dominant paradigm in leadership theory addresses formal, hierarchical organisational structures and leaders’ influence of others toward preferred objectives within such constructs (Zaccaro & Klimoski, 2001), primarily examining individual and organisational level units of analysis. It is necessary to extend our understanding beyond formal leaders and control inherent in traditional bureaucratic mindsets (Heckscher, 1994) in order to expand the applicability of leadership theories (Stacey et al., 2000; Streatfield, 2001).

Early leadership scholars Likert and Likert (1976) suggested that power in the future would be derived from a new leadership role called ‘linking pins’. That is, influence would collectively be given to linking-pin leaders based on their ability to link the resources and objectives of the various groups and the overall organisation into a cohesive system. The linking-pin’s objectives were to transcend self-interest and seek resolution based on the higher objectives of the organisation or society. The Likerts’ linking-pin concept was one of the forerunners of network leadership. Their overall framework was similar to the transformational leadership concepts that were concurrently emerging (Burns, 1978), and their suggested new role for leaders was echoed by others (Cooper & Gulick, 1984; Schwandt, 1993). Over time, the leadership literature focuses on situational factors (Fiedler, 1967), leadership styles (Bass, 1967; Blake & Mouton, 1985; Hersey et al., 1988), charisma (Conger & Kanungo, 1987), traits and personality attributes (Bass, 1990; Black et al., 1999). Investigations beyond leadership qualities and behaviours present human relations models aimed at alignment and control (Gronn, 1999; Huxham & Vangen, 2000) and interactive models such as lateral relationships (Sayles, 1989) and relational leadership (Drath,
One of the debates that has dominated the field, however, has been that between transactional and transformational leadership.

2.4.1.2 Transactional v. transformational approaches

Transactional leadership occurs when one individual takes the initiative in contacting others for the purpose of an exchange of something valued; whereby a leader approaches followers with the intent of exchanging (Burns, 1978). Bass (1985) applied Burns’s (1978) ideas to organisational management and argued that transactional leaders mostly focus on marginally improving and maintaining the quantity and quality of performance, as well as the means to substitute one goal for another, reduce resistance to particular actions, and implement decisions. According to Burke et al. (2006), transactional leadership behaviour based on contingent rewards positively affects subordinate satisfaction and performance (Hunt & Schuler, 1976; Klimoski & Hayes, 1980; Podsakoff & Schriesheim, 1985). Contrary to the type of exchange that transactional leadership signifies, transformational leadership involves collective momentum towards goals.

Transformational leadership is characterised by a meaningful and creative exchange between leaders and subordinates in order to bring about vision-driven change in people and context (Bass, 1985). Transformational leaders take calculated risks to proactively seize opportunities and solve organisational problems (Tichy & Ulrich, 1984). This type of leadership adopts a balanced approach, whereby leaders facilitate followers’ efforts to solve complex problems while concurrently developing subordinates so they are more prepared to address future problems (Bass et al., 2003). Burns (1978) argues that these leaders focus on transforming followers’ motivational states to higher level needs, such as self-actualisation. More recent research identifies characteristics for a transformational leadership climate (Walter & Bruch, 2010). A substantial amount of empirical evidence supports the relationship between transformational leadership and performance (Bass, 1998; Avolio, 1999; Bass et al., 2003) as evidenced by several meta-analyses supporting the linkage between them (Patterson et al., 1995; Lowe et al., 1996; DeGroot et al., 2000). These findings are particularly useful for understanding network processes, as the
foundation of my proposed theoretical contribution establishes a relationship between network
theory and the relational component of complexity leadership.

2.4.1.3 Leader–follower approaches
A recent approach targeting leader–follower dynamics is Leader–Member Exchange (LMX)
theory, which focuses exclusively on the relationship between leader and follower (Cogliser &
Schriesheim, 2000). Its central principle is that leaders develop different exchange relationships
with their followers, whereby the quality of the relationship alters the impact on important leader
and member outcomes (Gerstner & Day, 1997); however this excludes other actor interactions.
LMX served as a building block for CLT; hence LMX is slightly outdated in comparison to CLT.
The leader–follower dynamic relationship is less relevant to my study investigating network
processes at the interorganisational level. Given my conceptualisation of complexity leadership in
the relational, collective sense, I focus less on leader–follower dynamics and more on the
reciprocal interactions of formal and informal leaders involved in network leadership processes by
uncovering how actions and practices are shaped.

2.4.1.4 Relational approaches
Investigations beyond leadership qualities and behaviours present human relations models (i.e.
agency) aimed at alignment and control (Gronn, 1999; Huxham & Vangen, 2000) and interactive
models such as lateral relationships (Sayles, 1989) and relational leadership (Drath, 1996).
Network leadership falls under the relational approaches to leadership, as suggested in the
concepts of transformational leadership (Burns, 1978), servant leadership (Greenleaf, 1977) and
shared leadership (Pearce & Conger, 2003). Several studies demonstrate that the role of a
‘boundary-spanner’ is crucial to network functioning (Tushman, 1977; Rogers, 1995; Barnsley et
al., 1998; Ferlie et al., 2001; Greenhalgh et al., 2004), as this individual coordinates activities,
facilitates, and builds consensus among social, professional and interorganisational networks. This
role is particularly important in the healthcare context, where multiple disciplines frequently
interact. This study examines network managers as significant leaders whose skills and role need
continuous cultivation, and the review in this chapter outlines the literature on interorganisational
networks and complexity leadership as related to one another. Leadership is relational, and those interactive linkages need to be explored at the interorganisational level. That is, the leadership literature has not adequately considered the interorganisational network effects of leadership processes, which my study addresses empirically and theoretically. Given the targeted focus of my study, the next section discusses literature on complexity leadership.

2.4.2 Complexity Leadership Theory

Understanding complexity leadership is important for understanding leadership processes in interorganisational networks. This section describes why these concepts and theoretical constructs are privileged compared to other topics and themes within the broader leadership literature. Specifically, it describes CLT as an emerging approach that is appropriate to this context although it has not been applied to interorganisational networks specifically. Complexity science suggests a different paradigm for leadership such that it frames leadership as a complex interactive dynamic from which adaptive change emerges (Uhl-Bien et al., 2007). This approach extends beyond traditional hierarchical, bureaucratic applications by drawing from complexity science, considered by Conveney (2003: 1058) to be the ‘study of the behaviour of large collections of … simple, interacting units, endowed with the potential to evolve with time.’ A complexity lens enables researchers to analyse the nature of interactions and interdependencies among network participants, their ideas, actions, hierarchical divisions, organisations, and the wider external environment. Importantly, a complexity leadership perspective requires that scholars distinguish between leadership and leaders (Uhl-Bien et al., 2007). It differentiates between leadership as a process and leaders engaged in that process.

Developed by Uhl-Bien et al. (2007), CLT is a framework for analysing emergent leadership dynamics in relation to ‘bureaucratic superstructures.’ It identifies three types of leadership including adaptive, enabling, and administrative (Table 2.2), and suggests that they vary based on where they occur in the larger organisational hierarchy.
Table 2.2: Types of leadership according to CLT (adapted from Uhl-Bien et al., 2007)

<table>
<thead>
<tr>
<th>Leadership type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative leadership</td>
<td>The actions of individuals and groups in formal managerial roles who plan and coordinate organisational activities. This leadership is the bureaucratic function.</td>
</tr>
<tr>
<td>Adaptive leadership</td>
<td>An emergent, interactive dynamic that is the primary source by which adaptive outcomes are produced in an organisation.</td>
</tr>
<tr>
<td>Enabling leadership</td>
<td>Serves to enable (catalyse) adaptive dynamics and help manage the entanglement between administrative and adaptive leadership. This is mainly done by fostering enabling conditions and managing the innovation-to-organisation interface.</td>
</tr>
</tbody>
</table>

CAS is the unit of analysis within CLT, which exist throughout the organisation and are intertwined with and inseparable from bureaucratic functions. CLT highlights CAS as providing an adaptive capability for the organisation and that bureaucracy provides an orienting and coordinating structure. Enabling leadership, as they define it, effectively manages the entanglement between administrative and adaptive structures and behaviours in a way that enhances the overall flexibility and effectiveness of the organisation (Marion & Uhl-Bien, 2007; Uhl-Bien et al., 2007). By focusing on emergent leadership dynamics, CLT indicates that leadership only exists in, and is a function of, interaction. Despite this, roles exist for individual leaders in interacting with (i.e., enabling) the dynamic.

2.4.2.1 Complexity leadership and networks

I emphasise the most crucial concepts within CLT that apply to interorganisational networks and why CLT is highly relevant to my study. This section reviews what little is known about leadership in complex networks. Recent work is moving towards a more comprehensive understanding of leading in complex contexts; however, the focus still rests primarily on the dyadic rather than multiplicity of relationships among and within network levels comprising the whole network. In their CLT, Uhl-Bien et al. (2007) propose that leadership should be seen not only as position and authority but also as an emergent, interactive dynamic – a complex interplay from which a collective impetus for action and change emerges when heterogeneous agents interact in networks in ways that produce new patterns of behaviour or new modes of operating (cf. Heifetz, 1994; Plowman & Duchon, 2007). The CLT model focuses on leadership in contexts of dynamically changing networks of informally interacting agents and argues that network
leadership is leadership of change that enables emergent, collective action and promotes learning that fosters productive responses to volatility. Schreiber and Carley (2008), who build upon CLT, focus on two types of change leadership: leadership of context and leadership in process. They define network leadership as a new paradigm for leading learning and adaptability in the rapidly changing and dynamic landscape of the knowledge era.

From a complexity vantage point, there are both formal (e.g. positional) and informal leaders fulfilling diverse functions (Simon, 1957; Likert & Araki, 1986; Uhl-Bien et al., 2007). CLT examines leadership as a process involving networks of highly interactive, interdependent members leading to collaboration, creativity, innovation and other outcomes needed for organisational adaptation. This perspective also allows for the multi-level examination of networks as discussed in this study’s results chapters. CLT introduces new roles and requirements surrounding administrative, adaptive and enabling leadership, recognising formal, informal, and integrative, facilitative broker roles. Recent studies are aligned with CLT and prior complexity research set within a networked perspective (Hanson & Marion, 2008; Schreiber & Carley, 2008), most recently asserting that ‘an informal “leader” fulfils an enabling role’ (Hanson & Ford, 2010: 6594). Hanson and Ford (2010) suggest that complexity leader competencies relate to managing organisational dynamics and enabling informal initiative as well as transferring control willingly and harnessing the generative, collective mind to address emerging issues. Network leaders face challenges to ensure survival in an environment that is, or is expected to become, dynamic, unpredictable and increasingly complex; hence an understanding of influencing or managing turbulence is relevant. Building upon this salient framework of complexity leadership, the next section describes the characterisation of leadership applied in my study to clarify among conceptualisations.

2.4.3 Characterisation of leadership

As discussed in this chapter, my study aims to understand leadership processes in complex, interorganisational networks. Since one cannot discuss all conceptualisations and definitions of
leadership, my study focuses on a particular definition and operationalisation of leadership, considering leadership as the process of reciprocal influence and relationships among participants at the individual, professional, organisational and interorganisational levels. Leadership was characterised as demonstrating influential, facilitative, mobilising processes among a complex network of interacting, interdependent network participants. It accounted for both formal and informal leadership as described in CLT. I adopted a complexity leadership lens to analyse the empirical evidence and understand the means by which leadership is identified in the collected data. Finally, the activities (acts of leadership) and related processes were explored across multiple levels as they affected the whole network.

As previously discussed, my study adopts a view of complexity leadership, which suggests a form of relational, distributed leadership (Brown & Gioia, 2002; Gronn, 2002) that does not rest with a specific person but rather in an interactive dynamic within which any network participant will participate as a leader or a follower at different times and for different purposes. It is not limited to a formal managerial role, but rather emerges in the systemic interactions between heterogeneous agents (Marion & Uhl-Bien, 2001, 2003). Management experts suggest that elite professionals benefit from the possession and use of high social capital within networks (Ferlie et al., 2010). As discussed, relational approaches are dominant in the leadership literature, and thus one may expect social capital to play a role. Social capital indeed relates to both informal and formal leadership approaches and is discussed in Chapters 5–9. My study explores the central field of public sector healthcare networks, which is where I am empirically working. Social capital is an interesting linking theme and fascinating lens, and a review of its literature is discussed below. It will also be emphasised in the empirical evidence, analytical synthesis and theory-building chapters.

2.5 Social capital

Both the relational approach to leadership and what is known about professional communities suggest that social capital could be an important resource for leadership in such contexts. This
section provides a commonly used definition of social capital and also discusses it as applied to interorganisational networks.

2.5.1 Defining social capital

Despite the vast history and influential writings on the concept of social capital (Bourdieu, 1986; Coleman, 1988, 1990; Borgatti & Foster, 2003; Burt, 1992; Putnam, 1993, 1995; Nahapiet & Ghoshal, 1998; Portes, 1998; Woolcock & Narayan, 2000), a consensus on its definition has not been reached (Coleman, 1990; Putnam, 1995; Adler & Kwon, 2002; Szreter & Woolcock, 2004; Nahapiet, 2008). Given the complex nature of its taxonomy, I use the definition of social capital proposed by Nahapiet and Ghoshal (1998: 243) to operationalise the construct, defined as:

The sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilised through the network.

According to Nahapiet (2009), strategic management research supports the view that social capital is both emergent and can be encouraged. Based on the suggestion of several scholars (Maurer & Ebers, 2006; Dolfsma, 2008; Nahapiet, 2008), this study addresses how the capacity building and utilisation of social capital can be accomplished.

Although the productivity of social capital has long been recognised in other disciplines (Coleman, 1988; Putnam, 1994; Becker, 1998; Portes, 1998), it is relatively new to literature on clinical organisation and processes, and limited with regard to interorganisational networks. Targeting research on professions (Crane, 1972; Freidson, 1979; Abbott, 1988; Rhodes, 1997; Leicht & Fennell, 2001), Ferlie et al. (2009) emphasise the importance of professional social networks in generating jobs and income as internal labour markets shrink. Braithwaite et al. (2009) assert that healthcare quality improvement efforts can increase effectiveness by exploiting social capital inhering in the informal social ties that naturally form and evolve over time. Beyond the healthcare context, Meltzer et al. (2010) argue that network teams should optimise both human and social capital by selecting individuals based on their internal and external connections. The empirical
discovery of my study builds upon the literature and explores the strategic mobilisation of informal networks, framing processes, intricacies of knowledge transfer, and leadership dynamics to contribute to network theory on interorganisational networks. There is no useful theory of network leadership, and there remains an unfilled gap between network theory and complexity leadership. I leave open to future researchers the extent to which NPL supplements the implicit hierarchical view and the extent to which it challenges it.

2.5.2 Social capital as applied to networks: an overview of the literature

Literature is emerging on social capital and leadership, and these concepts are related to the topic of networks as reinforced by my study. A brief overview of social capital, as applied to social networks and leadership, is discussed in this section. Plickert et al. (2007) suggest that social capital in a network view can be called ‘network capital’. Schumpeter’s (1934) description of entrepreneurs was that they implemented new combinations of existing processes and goods. Likert and Likert (1976) propose that leaders serve as ‘linking pins’ within organisations. Burt (1992, 2005) applied both of these ideas to networks, using the terminology of brokerage and social capital. He suggests that networkers add value by brokering and coordinating across boundaries within and between organisations. Baker (2000: 1) argues that social capital allows leaders to access the resources they need when they need them, positing:

> Social capital refers to the resources available in and through personal and business networks. These resources include information, ideas, leads, business opportunities, financial capital, power and influence, emotional support, even goodwill, trust, and cooperation. The social in social capital emphasises that these resources are not personal assets; no single person owns them. The resources reside in networks of relationships.

In contrast, human capital is what people know, the sum of their knowledge, education, skills and experience. Social capital is whom they know, their personal and professional networks – including people they do not know – and people who are connected to them via their networks (Baker, 2000). The term ‘capital’ suggests that social capital is productive: it allows individuals to create value, accomplish their objectives and contribute to society. Thus the term ‘social capital’ summarises some of the outcomes of organisational networks: reciprocity, knowledge transfer and access to resources. Laird (2006: 2) asserts:
Social capital makes connections and connectability possible. ... [social capital is] all those social assets that enable one to attract respect, generate confidence, evoke affection, and draw on loyalty in a specific setting. Social capital exists in and flows through personal connections and individuals’ potential for making connections.

That is, social capital relies on relationships and cannot exist in the absence of a dyadic, reciprocal relationship. The concept of social capital is built on social exchange theory (Blau, 1964), defined as trusting that unspecified, roughly equivalent obligations will be discharged over time. Seibert et al. (2003: 179) suggest, ‘Social exchange relationships are likely to involve frequent and extensive information sharing, multiple types of resources flows, trust and mutual obligations, and social support and approval’. One of the ways in which social capital is created is through the concept of brokerage. Burt’s (1992) early work defined the concept of structural holes, the gap that exists in a network structure between individuals or groups. Similar to Bloom’s (1956) taxonomy of learning, Burt (2005: 61) later defined ‘four levels of brokerage through which a person could create value’. The first and simplest act of brokerage is when an actor makes others (across a structural hole) aware of information. A second and higher level of brokerage is transferring best practices across structural holes. The third level is to ‘draw analogy between groups ostensibly irrelevant to one another’ (p. 61). The fourth and highest level of brokerage is synthesis, where the broker draws ideas or constructs by combining elements from disparate groups. Closure – densely connected networks in which every actor is connected – is contradictory yet interdependent with brokerage, and both provide network benefits (Burt, 2005). Brokerage provides value through variation and new information, whereas closure provides value by orchestrating behaviour in networks. Closure is based on transactive memory theory (Wegner, 1987; Moreland, 1999) and is the mechanism that allows network participants to discover ‘who knows who’ and ‘who knows what’, leading to performance. Thus brokerage and closure encourage collaboration. Brokerage enables collaboration across boundaries, whereas closure forces collaboration via reputation and alignment within a cohesive network.

Granovetter’s (1973) seminal work introduced the concepts of strong and weak ties and linkages between individuals. These concepts are fundamental to understanding both networks and social
capital. Strong ties are considered as friendships, or similar to friendships, whereas weak ties are simply acquaintances. Granovetter differentiated strong ties from weak ties using frequency, reciprocation, importance and positive affect. Strong tie actors are typically more credible, trusted, motivated and accessible. Strong ties build loyalty, mutual respect and emotional attachment among participants, enabling groups and teams that are cohesive and that exhibit high morale. Thus formal leaders may use strong ties within their organisation to accomplish interorganisational objectives. In addition, formal and informal leaders may establish strong ties and network centrality outside of their immediate sub-network to gain access to valuable organisations and external networks, as was observed in the case study. Time constraints prevent the formation and maintenance of many strong links across spatially scattered and unconnected participants; hence maximising social proximity in interorganisational networks is crucial. It is also advantageous for the formal leader to form weak relationships (i.e. social capital capacity building) and to connect those who are unconnected (i.e. social capital utilisation). Weak ties can become strong ties over time as value, reciprocity and trust build among the actors (Brass & Krackhardt, 1999), as was evidenced in this study. My findings reinforce the importance of managing the reciprocal field between formal and informal leadership through social capital utilisation and capacity building.

Strong ties result in highly cohesive units; however, new and diverse information is more likely to come through weak ties from acquaintances. Leaders who are centrally linked tend to act as bridges or brokers between different groups (Granovetter, 1973), passing on diverse and novel information and resources as demonstrated by the Stroke Network key leaders. Reagans et al. (2004) find that structural holes provide information benefits by representing points of contact into different networks. This linking of diverse networks results in the small-world effect. Brass and Krackhardt (1999: 185) posit the advantage of this role, stating that ‘other things being equal, a leader with a greater number of links will be more central and more powerful than a leader with a fewer number of links.’ Inkpen and Tsang (2005) describe three types of networks: (i) intra-corporate networks, (ii) strategic alliances between firms and (iii) district-wide networks. They examine how social capital affects knowledge transfer within the networks and the different
elements of social capital: (a) structural (network configuration, ties, stability), (b) cogitative (culture and goals) and (c) relational (targeting trust). They argue that the extent to which networks facilitate knowledge transfer is actualised by the different characteristics of social capital within the different network types. Knowledge transfer increases with interaction frequency (Tsai, 2002), except under conditions where network members are in competition. Inkpen and Tsang (2005) conclude that different types of social capital are more effective in knowledge transfer in different circumstances; researchers need to divert from a one size fits all analytic approach to social capital.

Having multiple connections to members of the same group, who are well connected to each other, will be redundant. Maintaining the links is time-consuming (Brass, 1995; Sparrowe & Liden, 1997), yet little new and differentiable information is available due to the redundancy of the connections. In other words, most information is well known among members of a group, and communication among the members is frequent. Diverse and new information seldom erupts among the members, and strong-tie groups may be resistant to outside information and to change (Brass & Krackhardt, 1999). So strong-tie groups may not be as effective in solving novel problems due to their insular, homogenous exchanges. These are important points when operating within an interorganisational context. Burt (2005: 56) finds that ‘performance increases with brokerage, especially at high levels’. He largely attributes that performance increase to the vision advantage possessed by leaders who span boundaries. For example, study results showed hybrids David and Graham facilitated framing processes to ensure network participants’ agreement on the collective dominant frame to adopt telestroke technology. Brokering, boundary-spanning leaders encounter and develop good ideas as they are exposed to continually new, diverse, even contradictory information and interpretations. Therefore, chance encounters or lucky opportunities often occur because of intentional, dynamic social capital micro-processes. What was presumed to be random or chaotic is not. ‘Social capital is essential to good leadership’ (Brass, 2001: 147) and ‘the social capital of leaders is perhaps the most ignored, under-researched aspect of leadership’ (Brass & Krackhardt, 1999: 180), particularly in the interorganisational context. Brass and
Krackhardt (1999: 180) emphasise the connection among social capital, social network analysis, and leadership, saying:

Social capital is at the heart of social network analysis. The social network perspective begins with the assumption that actors are embedded in a complex web (or network) of interrelationships with other actors. These networks of relationships provide the opportunities and constraints that may be the causal forces of leadership.

Brass (2001) suggests that leaders model and encourage network building by connecting those who are not connected, building accurate perceptions of the network structure, embracing diverse others and linking disconnected individuals and groups (i.e. social capital utilisation and capacity building). He contends that these activities are leadership as viewed from a social capital perspective, with which my study aligns.

The discussions in this literature overview suggest that organisations and leadership are moving towards a network perspective. Leadership practice is becoming network-centric as organisational leaders focus on harnessing key relationships within networks (Avolio & Kahai, 2003; Eisenberg & Goodall, 2004). Beyond the organisational unit perspective, my study extends existing findings, presents new evidence and develops the foundation of a framework based on the interorganisational network context accounting for multi-level leadership processes and dynamics. Conventional wisdom has traditionally placed networking in the context of sales, job hunting and socialising. However, social capital capacity building by networking is indispensable as a leadership skill. A strong and viable network provides access to others, to information and to resources, and those connections assist in solving problems, creating new opportunities and driving interorganisational processes and momentum.

This section summarises the literature that supports the transition to leadership as networking, grounded in a social capital perspective. More than ever in network environments, leaders are still needed (Bennis, 1999; Pearce & Conger, 2003), and those leaders need to ‘place greater emphasis … on promoting social networks and seamless collaboration within organisations’ (Cross & Parker, 2004: 132). Importantly, my study extends this to understanding the collaboration among
organisations given the interorganisational nature of the complex Stroke Network. The process of leadership is inherent in the relations among individuals and organisations; it is not simply a characteristic of individuals (Burns, 1978; Fernandez, 1991; Sparrowe & Liden, 2005). Thus acts of leadership can occur at all levels of an organisation and in any direction – top-down, bottom-up, or peer-to-peer (Kanter, 1982; Fernandez, 1991) as well as across organisational boundaries in the interorganisational network – via processes – as demonstrated by my study. Work ‘gets done’ through diverse, informal networks of people and organisations over which leaders have little traditional control (Cross & Parker, 2004). The study argues that formal leaders can influence and mobilise informal interactions to facilitate network processes. In addition, formal leaders can and should reciprocally coproduce leadership with informal leaders. Leaders are dependent on others for information and resources to accomplish their tasks and goals (Grayson & Baldwin, 2007); hence the network process perspective accounts for relational interactions and interdependencies. It has been argued that many organisations will establish leaders of networks in addition to leaders in networks (IBM Center, 2006). Network-based leadership will be increasingly employed in all organisations, regardless of the extent to which those organisations operate as network organisations spanning multiple boundaries. NPL will be crucial to operating in such an environment, especially given the growth of interorganisational contexts.

Leadership processes should nurture potential relationships, ‘putting the right people together in the right place at the right time’ (Brass & Krackhardt, 1999: 180), while realising that these combinations will be rapidly and continually evolving. Grayson and Baldwin (2007: 7) claim that ‘Leadership networking is about building relationships and making alliances in the service of others … and in service of the organisation’s work and goals’. Ibarra and Hunter (2007: 40) define leadership networking as ‘creating a fabric of personal contacts who will provide support, feedback, insight, resources, and information’. As leaders move to higher levels in the network, more networking is needed. Moving beyond functional specialties requires leaders to address strategic issues involving relational tasks rather than analytical and functional tasks. Ibarra and Hunter (2007) suggest that many leaders think networking and relational interactions are a
distraction from their work, when in reality, networking is ‘at the heart of their new leadership roles’ (2007: 40).

2.6 Summary

The approach I take in this thesis seeks to move beyond static analyses of networks and to examine a more complex form of network. It seeks to examine dynamics from within a distinctively applicable view of leadership. It aims therefore to contribute to the literature by developing a more fine-grained account of CLT and positing a theoretical underpinning in social capital.

In this final section, I summarise several crucial points pertinent to my study. As introduced in Chapter 1, the primary research question pursued in this study is: What characteristics, behaviours, and processes are involved in the dynamics, development and orchestration of complex, interorganisational public sector networks? This principal question emphasises the importance of understanding dynamic leadership processes in interorganisational networks, which is significant for identifying and evaluating change processes, especially those leadership processes within a complex network that promote sustainability over its developmental trajectory. Furthermore, I sought to understand what drives network processes; how networks change and develop over time; how leading affects the complex interorganisational network; and finally how leadership processes affect the network along its developmental trajectory. In exploring these questions, the contribution I intend to make will draw upon the key concepts and theories I’ve identified as salient thus far. This chapter established several crucial building blocks from the review that are used throughout the thesis, including:

- Definition of a complex interorganisational network and its related sub-networks (e.g. professional, organisational, informal social)
- Relational exchanges and reciprocity
- Social capital
- Conception of leadership
  - Develop a new way of thinking about leadership in interorganisational networks, one that looks at the process of leadership rather than individual leadership traits
  - Apply a useful CLT lens that illuminates the case study and helps with analysis.
Importantly, I applied CLT because it elucidates case study results and provides a useful theoretical lens for facilitating analysis. It helps bring the applicability of complexity leadership into sharper focus by highlighting its potential for integrating existing interorganisational network research into a structured body of knowledge. Overall, my study provides a foundational framework linking network theory and CLT for generating new theoretical constructs relevant to leadership processes in current networked settings. CLT, as the primary underpinning support, not only bridges the gap between network and leadership theory but also raised additional research questions. As discussed above, there is as yet no useful theory of network leadership. What is implicit from the literature review is a non-leader-centric, relational approach to leadership, which gives reason to apply different forms of leadership, skills, and competencies within networks. The next section describes areas that remain unfilled in the literature.

2.6.1 Gaps in the literature

Although the current literature has evolved from the dominant paradigm of agentic leadership, with its emphasis on leadership styles, dialectical roles (e.g. leader v. follower) and the individual or organisational unit of analysis, it could usefully be extended to interorganisational networks. My research addresses this challenge by recognising that leading in networks is complex and demands an analysis of the dynamic, relational capabilities embedded in interorganisational networks. Although interactions among certain leadership variables (e.g. power) can be found in any leadership context, their dynamics are intensified in an interorganisational context due to the interplay and interdependence among various networked levels; thus my study underscores the reciprocal relationships and reactive processes that are constantly interacting. As a contribution to the network and complexity leadership literatures, I focus on exploring and identifying the strategies, processes and patterns that foster network change and development, which are grounded in the multiplicity of interactions previously unexplored in this complex context. Importantly, fostering network change and development contrasts with management to get work done. By analysing network dynamics, the study shows that despite this contrast, work does get accomplished within the interorganisational network.
Based on the literature review, I identify several gaps in the literature. Networks are affected by acts of leadership and related processes, and my study investigates the characteristics, behaviours and acts of leadership that drive interorganisational processes. By extension, I investigate the leadership processes that facilitate change and shape practices. By exploring and offering empirical evidence surrounding these questions, I aim to fill the gap between the network and complexity leadership literatures. There is only limited theoretical work on the drivers of change, specifically process drivers, in interorganisational networks. Similarly, there is limited theoretical and empirical work linking the network theory and leadership literatures to achieve a better understanding of leading in networks. Lastly, there is no empirical evidence on NPL within complex, interorganisational networks. Building upon the extant literature and evidence collected throughout my longitudinal case study, this thesis addresses these gaps and provides significant evidence to connect the network and complexity leadership literatures. Extending the analytical findings, I propose the foundation of a theoretical framework for complex, interorganisational NPL. Based on these unfilled gaps in the literature and theory development, I also present pragmatic applications of the research extensible to policymakers and managers.

There are practical implications of better understanding the limitations of the extant literature. Managers and leaders have the ability to shape networks into favourable contexts for future action (Coleman, 1990; Madhavan et al., 1998; Galaskiewicz & Zaheer, 1999; Ritter & Gemunden, 2003); however, pragmatic tools to deploy actionable solutions for existing management and leadership problems are limited. Operationalisable frameworks that can be applied by network leaders and managers are scarce: ‘Theories of change in the fields of management and organisation studies must face the double hurdle of scholarly quality and practical relevance (Pettigrew, 1997)’ (Pettigrew et al., 2001: 697). Whittington et al. (2001) examines the future of strategy research in management and suggests that scholars regard theory and practice as a tightly linked duality, arguing that ‘greater sensitivity towards practical complexity will prompt a more comprehensive notion of rigour’ (Whittington et al., 2001: 486). My study aligns with this view to translate theory
into practice by providing both operational mechanisms related to NPL as well as a description of how to operationalise the theoretical framework developed in the final chapters.

2.6.2 Toward a foundational theoretical framework

Based on the study goal of investigating complex network dynamics, the aforementioned key building blocks and gaps in the literature, the basis of the theoretical framework will take the shape of integrating specific network leadership processes with underlying facilitative dynamics (e.g. social capital) analysed through a CLT lens.

The literature describes how leadership is changing from individual and dyadic relations to multiple, collective relationships across numerous boundaries. Networks are changing to turbulent, evolving organisms as scholars suggest that network leadership is leading between (not within) organisational units and that organisational performance is primarily a result of the effectiveness of cross-functional processes. Thus a better understanding of the concepts of network processes and complexity leadership will provide value to interorganisational networks. This review outlines the literature on networks and complexity leadership and the potential linkages between them. Two essential topics are described. The first is that leadership is relational, and those relational linkages need to be explored at the interorganisational level. That is, the leadership literature has not adequately considered the processual leadership dynamics within interorganisational networks. Second is the integration of networks and complexity leadership; the literature suggests that there is a relationship between the two fields that calls for further research and understanding.

Building upon the literature, empirical evidence collected in my study, and analytical findings, this thesis seeks to establish the skeletal basis for an NPL framework. Analysis of the various leadership characteristics, behaviours and processes found in the case study generate a set of theoretical constructs that serve as early underpinnings of the framework, which pertain to factors affecting network change and shaped practice. The proposed foundational theoretical framework could be applied to understand how leading in complex, interorganisational public sector networks
shape and are shaped by a dynamic interplay of relations, actions and reactions that operate both within and across organisational and professional boundaries. It can assist in explaining: (1) how network processes shape and are shaped by the shifting boundaries, interactions and turbulence of the interorganisational network; (2) how leadership processes and dynamics affect network processes; and (3) how the multiplicity of processes affect the development and ultimate sustainability of the interorganisational network. Chapter 9 lays the early groundwork for NPL theory-building and development, and Chapter 10 presents the basic foundation of a theoretical NPL framework demonstrating network leadership processes and their underlying dynamics. The next chapter shifts focus from the literature to explain the study’s research design and methodology.
Chapter 3: Research Design

3.0 Introduction

This chapter describes the research design and methods used in the study. The thesis draws on a single, longitudinal interorganisational case study and qualitative, inductive research methods. The justification for, and the implications of, this choice of research design and methods are discussed below. First, the strengths of qualitative research strategies in general and case studies in particular are discussed in the context of this thesis in the next section on research strategy and method. Second, the study design is described. Third, the criteria for the sampling selection of the case study for this thesis are outlined. Fourth, I discuss data collection involving the fieldwork related procedures. The fifth and sixth sections are on data quality and analysis respectively.

Processes and patterns of leading in complex, interorganisational networks are not well understood, and so exploratory and inductive research is needed to address the gap in the literature (Eisenhardt, 1989a). Leadership and networks are pluralistic (Wellman & Frank, 2001; Flick, 2002) and also occur at multiple levels. Since the primary research question sought to investigate the characteristics, behaviours and processes involved in the dynamics, development and orchestration of a complex, interorganisational network, it was important to gain an understanding of the individuals, organisations, sub-networks and relationships among participants. Thus a case study approach was an appropriate research strategy to explore the phenomena under investigation within a rich, multidimensional context (Yin, 2003). Yin (2003) suggests that a case study design is necessary when both the phenomenon and the context are important to understanding the proposed concept, as was the case with this study. Given the scope of my research, the case method was appropriate for studying the nuances of the individuals, organisations, processes and activities (Creswell, 2003) in the interorganisational setting. The study design was well placed to capture interorganisational processes. It considered leadership as the process of influence and relationships among participants at the individual, professional and organisational levels. Finally,
the study design characteristics described made it possible for patterns of leadership processes to be revealed as they affected the interorganisational network.

Mason (2002) argues against thinking of a research design as a single blueprint document or as an \textit{a priori} design and strategy decision (Mason, 2002). Decisions about design and strategy should be on-going and grounded in the content, context and process of the research itself, rather than being a contract fixed at the start of research. This is particularly true for my study, where the Stroke Network and its adoption of telestroke innovation was followed for two-and-a-half years. Research questions and themes were modified and refined, and the approach was designed as the research unfolded, particularly amid newly instituted and directly impactful NHS reforms. Despite this emergent and evolving nature of the research, the overall design maintains consistency by aligning research elements such as research questions, topics, assumptions and research methodology, which must be met for rigorous research (Mason, 2002; Cho, 2007).

3.1 Research strategy and method

The original intention of the study was to conduct a dual comparative case study on telestroke implementation and adoption between two NHS regions in England. The initial study design included both qualitative and quantitative methods, which offered me the opportunity to take a robust mixed-method approach. However, due to funding issues within one of the regions, the telestroke adoption process came to a grinding halt and serious timing challenges impacted the resultant methodological approach. Following six months of delays, I flexibly redesigned the research study to shift my methodology to a single, longitudinal, qualitative case study. This would ensure I could complete my thesis within the requisite University timeline. The paragraphs that follow detail the process that led to the focus on a single case, use of qualitative methods, and the way in which the adoption of telestroke no longer remains a dominant focus.

At the outset of my thesis study design, I intended to undergo fieldwork that would compare Region 1 and Region 2 within the NHS as they adopted and implemented telestroke.
Methodologically, I aimed to conduct a dual, comparative case study as well as collect quantitative survey results from each region. I sampled several regions throughout the NHS England and selected two that were in the final stage of receiving funding for telestroke adoption. Studying the regions as they concurrently adopted and implemented telestroke enabled me to observe and analyse processes over time in a comparative manner that held the temporal variable consistent. I sought to cross-reference rich, qualitative case study data with quantitative survey data in each region in order to analyse and discuss mixed-method based results.

Within the first two months of commencing my fieldwork, Region 1 was granted SHA funding for telestroke equipment. My network collaborators kept me apprised of developments to continue observational work of the interorganisational network as I prepared for case study interviews. The network management and clinical collaborators helped me identify network members to serve as potential interview participants. Meanwhile, Region 2 experienced severe funding delays due to growing controversy between the NHS funding body and SHA network leaders. As these delays progressed, I focused my efforts on attending Region 1 network meetings for observational analysis and began interviewing key managerial and clinical collaborators. Several months later, Region 2’s funding had not yet been approved. Following the six month delay in securing telestroke funding, which would severely delay the adoption process, I re-evaluated the practicalities of conducting a comparative case study. With input from supervisors – particularly regarding the appropriate timeline for conducting DPhil fieldwork – I decided to proceed with a single, in-depth longitudinal case study focused on Region 1.

Progressing with the single case, I continued with documentation, observational, and interview analyses. I had the opportunity to observe and research a European tender process as Region 1 selected its preferred telestroke equipment supplier. Unfortunately, the procurement process was wrought with problems. While the network managers, clinicians, and IT experts attempted to select a telestroke vendor, two new challenges arose. First, a new SHA Executive came into leadership who did not agree with the proposed use of telestroke funding. Second, National Sentinmel Audit results revealed that Region 1 was the worst performing NHS region in terms of stroke services.
These two issues combined resulted in the SHA Executive halting telestroke funding and delaying adoption for six months. During this turbulent episode, I was able to collect data on the network dynamics and processes as they slowly progressed. Network leaders instituted unique system stressors in order to induce network change that led to stroke service delivery improvement in the region. Unfortunately during this time, the UK coalition government proposed broad-sweeping NHS reforms. The Health Secretary, Andrew Lansley, published a white paper in 2010 calling for drastic management reform efforts that included SHA closures. These changes also had a detrimental effect on my research, since many of my key collaborators and network participants were employed by the regional SHA. Several participants were demoralised and grew apathetic about participation in the research study. In addition, three network members were made redundant. I accounted for these issues by taking a broad sample of network participants for interviewing purposes. Overall, these challenges led to serious delays with my fieldwork over time. That said, a crucial advantage of conducting a single, longitudinal, rich, in-depth case study during this period meant that I could observe network processes over time during a turbulent period for the NHS. The single case illuminated technology adoption within an interorganisational network during a period of ‘high policy drama’ (Ferlie & Pettigrew, 1990), which was previously unexplored.

In addition to methodological changes that occurred during my study, I also shifted focus across a wide range of literatures. During the very early phase of my research, I was influenced by prior coursework at Harvard and MIT and immersed myself in the networks, technology diffusion, structuration, and contextualism literatures. As I experienced the challenges and observed processes within the interorganisational network, particularly what was causing network-wide changes, I turned my attention to the networks, complexity leadership, and social capital literatures. As my study organically evolved over time, I adjusted the emphasis on literatures that my data exposed in real-time. Network dynamics and processes began to highlight the key role of network leaders in the facilitation of processes and impact on network development. Social capital emerged as a key linking theme between the network and complexity leadership literatures. As
such, my study progressed toward a view of network processual change and development, network process leadership, and social capital dynamics rather than emphasising technology adoption. As the study unfolded, Region 1’s funding was approved for use toward telestroke equipment. However, the network leaders decided to re-do the entire European tender process to procure a preferred vendor. As a result of these delays, I ultimately was unable to research technology implementation. The processes underway merely completed the technology adoption process by the end of fieldwork, when I witnessed the first telestroke unit delivered to the first pilot site. The case study offered me the opportunity to analyse the various processes involved in the adoption process, yet I focused theoretically on making a contribution to network theory rather than technology adoption and diffusion. Understanding how dynamics and processes affected the interorganisational network as a whole was my primary research question. I continually adapted and redesigned my study as needed to respond to challenges and revealed case study results. The challenges with funding and timing also detrimentally affected my ability to conduct both qualitative and quantitative research. Initially I had intended to send out a survey to network participants in order to collect quantitative data that could be cross-referenced with the case data. Due to the loss of several participants from the study, limited resources committed to conducting the in-depth case study during turbulent periods, and the need to finish fieldwork in time to begin thesis write-up, I began to reconsider a mixed-method approach. Following guidance from supervisors and faculty, I decided to forego survey analysis and instead focus my efforts on collecting the rich qualitative case study data, triangulating documentation, observational, and interview analyses over a 2.5 year period.

Overall, the numerous issues I experienced throughout fieldwork enabled me to illuminate rich processual changes and developments within an interorganisational network. As I flexibly adapted my research approach over 4.5 years of DPhil work, I tried to find the appropriate balance of methodological rigour and pragmatism to complete a time-constrained DPhil. The longitudinal nature of the study revealed previously unexplored processes over time and periods of turbulence within the NHS, for which limited empirical evidence exists at the interorganisational level. As
such, I am seeking to make a contribution to network theory as it relates to complexity leadership and social capital within complex interorganisational networks. Despite its limitations as will be discussed in Chapter 10, the qualitative, longitudinal case study was an appropriate research method to employ. It addresses my research questions and the processual nature of interorganisational network development over time.

It is agreed that qualitative research is not a unified set of techniques or methods (Markus & Lee, 1999; Mason, 2002), and it is difficult to define being qualitative (Mason, 2002). Mason lists the least common denominators of qualitative research, while emphasising the rich variety of qualitative research strategies and techniques. First, qualitative research is grounded in a philosophical position that is broadly interpretivist in that it is concerned with how the social world is interpreted, understood, experienced, produced or constituted. Qualitative research is most commonly associated with the ‘interpretivist sociological tradition’ (Mason, 2002). Second, it is based on methods of data collection that are both flexible and sensitive to the social context in which data are produced. Third, it is based on methods of analysis, explanation and argument building that involve an understanding of complexity, detail and context.

Qualitative research is appropriate for this research study because of its characteristics of being exploratory, fluid and flexible, data-driven, and context-sensitive (Mason, 2002: 25). Mason (2002) argues that qualitative research has the following advantages, which suit the other research elements of this study. First, it is better to investigate wide dimensions of the social, including the texture and inter-relations of everyday life, the understandings and experiences of our research participants, the ways social processes, institutions, discourses, or relationships work, and the significance of the meanings that they generate. Second, qualitative research emphasises the strategic significance of context in the development of our understanding and explanations of the social world. It is capable of producing well-founded, cross-contextual generalities by examining how things work in particular contexts. Sayer (1992, 2000) also suggests qualitative analysis as one of the typical methods for ‘intensive’ research whose common research questions include:

My research responds to Pettigrew et al. (1992: 6), who make a ‘plea for more process-based and “contextual” mode of research where the organisation is seen as embedded in its social, cultural, political and historical context,’ noting that organisational studies have been ‘preoccupied with the intricacies of narrow changes rather than holistic and dynamic analysis of changing’. Furthermore, qualitative procedures allow temporal evaluations and have been used in complexity studies (Bradbury & Lichtenstein, 2000; Uhl-Bien et al., 2007), with which this study aligns.

My research used the case method, since qualitative case studies are regarded as particularly relevant when it is important to consider the effects of organisational (and network) context on heterogeneous groups (Dougherty, 1992a, 1992b). Case studies are endorsed and employed by researchers with many different philosophical views (Eisenhardt, 1989a, 1989b; Brown & Eisenhardt, 1997; Eisenhardt & Graebner, 2007; Martin & Eisenhardt, 2010). In the field of healthcare public sector management in particular, single case study research has centred on, for example: a healthcare organisation’s response to a new disease amid action constraints (Ferlie & Pettigrew, 1990), a hospital’s decision processes (Slovensky et al., 1998), and evidence to inform public policy (Macintyre et al., 2001). The case study methodology has been used and promoted from many different philosophical viewpoints, such as interpretivist studies (Walsham, 1995a; Klein & Myers, 1999; Walsham, 2006), and comprehensive reflections on case methods like Yin’s are widely cited by researchers from varying philosophical backgrounds (Walsham, 1993; Easton, 2000). The case study is regarded as a major research method for social sciences, helping to explain how objects act in certain contexts and under certain conditions (Easton, 2000; Cho, 2007). It is also widely acknowledged that a case study is suited to understand the interactions between IT-related innovations and contexts.
One of the most used definitions of a case study is that it is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2003). Case studies have some distinct advantages over other methods. Fundamentally, the need for case studies arises out of a desire to understand complex social phenomena (Yin, 2003). Generally, case studies are a preferred way of research when how and why questions are being posed. Moreover, it is the most common research method for qualitative studies (Benbasat et al., 1987; Darke et al., 1998), particularly those focused on IT innovations (Benbasat et al., 1987; Walsham, 1993; Darke et al., 1998; Kaplan & Duchon, 1998; Yin, 2003). Such advantages of the case study method perfectly match the themes and phenomena of my research, which is process-oriented and focused on understanding a contemporary phenomenon in context (Cho, 2007).

A single-case design is appropriate for a longitudinal case study where the research focuses on how certain changes occur over time. Single-case studies can richly describe the existence of a phenomenon (Eisenhardt & Graebner, 2007; Siggelkow, 2007) as will be described in this dissertation. In my research, a single case study is appropriate to gain a comprehensive understanding of processes related to the adoption of the telestroke innovation and complexity leadership processes across the adopting network amid turbulent NHS reforms. Although case studies do not always lead to generalised results (Pinto & Covin, 1989), the richness of the data and grounding in empirical reality in a case study lends itself well to investigative research (Eisenhardt, 1989a).

### 3.2 Study Design

A longitudinal case study was planned to examine an interorganisational public sector healthcare network to uncover complex process-oriented phenomena (Benbasat et al., 1987; Walsham, 1995b; Darke et al., 1998; Yin, 1999, 2003). The study focused on understanding the dynamics, complex processes and patterns within an NHS regional, interorganisational Stroke Network. Process research aims to identify trends or patterns of association rather than predictive laws (Pawson &
Tilley, 1997) and suggests that because processes are embedded in outer or inner contexts, the interaction between context and human action should be the focus of the study. It was also desirable since I did not have control over the events and sought to understand interactions between network contexts and leadership. This study built upon recent scholarship on healthcare processes (Ferlie et al., 2010; McGivern & Dopson, 2010; Exworthy et al., 2011) and followed the markets, hierarchies and costs within an NHS regional stroke network with the interorganisational network as the unit of analysis. A complete description of the network, including network diagram, is included in Section 4.1. An important element of study design is the multi-level analysis conducted throughout the research.

3.2.1 Multi-level analysis

The multiplicity of network levels within an interorganisational network is important, since it presents heightened complexity. Some scholars assert that more work gets done through linkages in organisational networks than through organisational chart structures (Cross & Parker, 2004), which is limited by the jurisdictional boundaries at the organisational level. They suggest that the number of linkages, attributes of linkages and the ‘right linkages’ seem to affect an organisation’s ability to improve cohesion and facilitate the transfer of knowledge (Levin & Cross, 2004). Given that this study evaluates telestroke technology, an information communication technology (ICT), I also drew on the information systems (IS) literature. In a study that considers the wider impact of IT, Walsham (2002) addresses multiple levels of analysis with complicated networks of players and encourages a broadening of the scope of analysis in IS research. Drawing links to extend the network and complexity leadership literatures, I delve heavily into network theory, which provides a basis for understanding the impact of multi-level actions and structures on network processes and change at the whole network level.

Enhancing the understanding of multiple sub-networks (e.g. social, professional and organisational) provides an opportunity to methodologically innovate, similar to the work done on multiple team membership (O’Leary et al., 2011). Innovative multi-level analysis (Klein &
Kozlowski, 2000) is significant due to the non-independence of sub-networks in interorganisational contexts. The complex interrelationships among knowledge transfer, learning, network dynamics and innovation suggest a processual approach to studying whole network effects. Since the research aims to analyse multi-level interorganisational network dynamics and processes, it is necessary to define the multiple levels of analysis demonstrated in this study (Table 3.1). The ‘levels’ below are identified for structural purposes, and the remainder of the thesis will refer to the compositional elements (e.g. professional sub-network).

Table 3.1: Redefining multi-level analysis

<table>
<thead>
<tr>
<th>Level</th>
<th>Composition</th>
</tr>
</thead>
</table>
| Micro | • Individual  
       | • Social sub-network  
       | • Professional sub-network |
| Meso  | • Organisational level:  
       | - Organisational sub-network (internal)  
       | - Organisation as a unit (entity) |
| Macro | • UK NHS regional interorganisational network level |
| Meta  | • UK NHS national interorganisational network level |

These levels are not mutually exclusive; however, the stratification across multiple levels in this manner is needed in order to more thoroughly define and investigate the complex, intricate dynamics and interactions across these dimensions. This study examines the different levels in its analysis, targeting the overall processual effects at the macro interorganisational network level (rather than single organisation level), and future research could draw on these units of analysis separately and collectively to better comprehend interorganisational network processes, performance, outcomes (e.g. financial, productivity gains) and other phenomena (e.g. diffusion, social innovation). Given the layers of complexity within interorganisational networks and the sites available to conduct research, the next section explains the study’s sampling method.

3.3 Sampling: Selecting a regional case site

In accordance with Eisenhardt and Graebner (2007: 27), ‘The purpose of the research is to develop theory, not to test it, and so theoretical (not random or stratified) sampling is appropriate.’

Theoretical sampling simply means that the case was selected because it is especially suitable for
illuminating and extending relationships and logic among constructs. The case was sampled for revelation of an unusual phenomenon and elaboration of the emergent theory. Theoretical sampling of single cases is straightforward. They are chosen because they are unusually revelatory, extreme exemplars or opportunities for unusual research access (Yin, 1994). Single-case research typically exploits opportunities to explore a significant phenomenon under rare or extreme circumstances (Eisenhardt & Graebner, 2007). In this case, the Stroke Network under study was adopting a new technology in the midst of newly imposed and concurrently implemented NHS reforms directly affecting network and management infrastructure; at the same time the network was revealed as the poorest performer in terms of stroke outcomes in the NHS. This case study explored these important themes further ‘within a context of high policy drama’ (Ferlie & Pettigrew, 1990: 199). The study analysed periods of heightened turbulence within a public sector healthcare network, given several critical stressors that occurred concurrently in the interorganisational network.

### 3.4 Data collection

This was a process study where the goal was to reveal patterns in network processes and also to understand how leadership processes affected the interorganisational network. In order to answer the research questions, this study used multiple data sources (Miles & Huberman, 1994), including the primary source of repeated semi-structured interviews across various professions and disciplines (Walsham, 1993, 1995b), to enable triangulation (Yin, 2003). These interviews enabled me to obtain in-depth views and experiences across disciplines, professions and organisations within the interorganisational network. In total, I attended 73 network meetings from 2009-2011, conducted 54 interviews between mid-2010 and late-2011, attended eight hospital site visits to observe telestroke utilisation, and collected and reviewed numerous archival materials covering the network from 2006-2009. Qualitative procedures allowed temporal evaluations and have been used in complexity studies (Bradbury & Lichtenstein, 2000). During the study, I observed and interviewed stakeholders regarding the regional network (see Table 3.2) and also took the opportunity to debrief them occasionally over time about broader, relevant experience. Inevitably
their wider experiences will have influenced their perception of the current case, reinforced by observable concrete instances related to interviewees’ backgrounds; enabling me to use such experience to further support points argued in this thesis. To strengthen the reliability of the process of theory building in my thesis, I relied on different methods of data collection: semi-structured interviews, extensive meeting transcription, non-participative observations and unobtrusive measures, and archival data. Triangulation of data collected from numerous sources at multiple times strengthens confidence in the findings’ accuracy (Jick, 1979).
Table 3.2: Semi-structured interviews conducted

<table>
<thead>
<tr>
<th>Role</th>
<th>Specialty</th>
<th>Pseudonym2</th>
<th>Affiliation</th>
<th># Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Lead for Stroke</td>
<td>Managerial</td>
<td>Joanna</td>
<td>SHA</td>
<td>1</td>
</tr>
<tr>
<td>Network Clinical Lead for Stroke</td>
<td>Clinical-managerial hybrid</td>
<td>David</td>
<td>Community hospital</td>
<td>1</td>
</tr>
<tr>
<td>Network Clinical Lead for Stroke</td>
<td>Clinical-managerial hybrid</td>
<td>Graham</td>
<td>AMC</td>
<td>1</td>
</tr>
<tr>
<td>Cardiovascular Network Manager</td>
<td>Managerial</td>
<td>Cardiovascular</td>
<td>SHA</td>
<td>1</td>
</tr>
<tr>
<td>Stroke Network Clinical Adviser</td>
<td>Clinical-managerial hybrid</td>
<td>Clinical Adviser</td>
<td>Network PCT</td>
<td>1</td>
</tr>
<tr>
<td>Stroke Specialist</td>
<td>Clinical</td>
<td>Stroke Consultant</td>
<td>AMC</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Network PCT</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community hospital</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>District hospital</td>
<td>2</td>
</tr>
<tr>
<td>Stroke Unit Manager</td>
<td>Managerial</td>
<td>Stroke Manager</td>
<td>AMC</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Network PCT</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community hospital</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>District hospital</td>
<td>1</td>
</tr>
<tr>
<td>SHA Programme Director of IT</td>
<td>Technical</td>
<td>Director of IT</td>
<td>SHA</td>
<td>1</td>
</tr>
<tr>
<td>Director of Hospital Information Systems</td>
<td>Technical</td>
<td>Director of Hospital IS</td>
<td>AMC</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Network PCT</td>
<td>1</td>
</tr>
<tr>
<td>IT manager</td>
<td>Technical</td>
<td>IT manager</td>
<td>AMC</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Network PCT</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community hospital</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>District hospital</td>
<td>1</td>
</tr>
<tr>
<td>Network Commissioner</td>
<td>Financial-clinical hybrid</td>
<td>Commissioner-clinician</td>
<td>Network PCT</td>
<td>2</td>
</tr>
<tr>
<td>NHS Service Development &amp; Improvement Manager</td>
<td>Managerial</td>
<td>Service Development &amp; Improvement Manager</td>
<td>NHS National Improvement Centre (NIC)</td>
<td>1</td>
</tr>
<tr>
<td>National Improvement Lead for Stroke</td>
<td>Managerial</td>
<td>National Improvement Lead for Stroke</td>
<td>NIC</td>
<td>1</td>
</tr>
<tr>
<td>Link Manager</td>
<td>Managerial</td>
<td>Link Manager, NTAC and NIC</td>
<td>NTAC and NIC</td>
<td>1</td>
</tr>
<tr>
<td>NHS Technology Adoption Centre (NTAC) CEO</td>
<td>Managerial</td>
<td>NTAC CEO</td>
<td>NTAC</td>
<td>1</td>
</tr>
<tr>
<td>Former NHS CEO</td>
<td>Clinical-managerial hybrid</td>
<td>Former NHS CEO</td>
<td>NHS Executive</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>54</td>
</tr>
</tbody>
</table>

2 Pseudonyms rather than real names are provided for the Core Group in accordance with NHS ethical approval commitments.
3.4.1 Fieldwork and timeline

In terms of study fieldwork, Table 3.3 outlines the work that was undertaken. As previously discussed, the study aimed to collect evidence on interorganisational network processes, including the macro (external to the network under study; e.g. policy changes) and micro (internal to the network under study) perspectives. In addition, Table 3.4 illustrates the overall network timeline, ranging from several years prior to the collection of empirical evidence and throughout the study.

Table 3.3: Longitudinal case study fieldwork: data sources, research, and levels of analysis

<table>
<thead>
<tr>
<th>Data source</th>
<th>Work completed</th>
<th>Level(s) of analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archival research</td>
<td>Analysis of a range of archival material dating back three years (2006–2009), both formal (network reports, SHA annual reports, meeting minutes) and informal (emails). Review of 958 pages archival documents.</td>
<td>Macro and micro</td>
</tr>
<tr>
<td>Meetings</td>
<td>Attendance (non-participative observations and transcription) at meetings (73), tracking all the Cardiovascular Network’s and Stroke Network’s acute stroke service processes during the period of fieldwork, including attendance at Project Board meetings, all regional and sub-regional clinical Stroke Network meetings, all Stroke Network Project Meetings, all Regional Stroke Network meetings, and all meetings related to the Regional Stroke Network’s European Tender process for stroke telemedicine vendor selection from February 2009 - June 2011. 2,937 pages of meeting transcripts and notes, minutes, meeting documents, and external communications were collected.</td>
<td>Macro and micro</td>
</tr>
<tr>
<td>Reports</td>
<td>Collection and analysis of DoH and NHS reports, SHA network reports (clinical, financial, managerial, and IT), websites, and other public and Stroke Network proprietary reports. Review of 873 pages of external and internal reports and documents.</td>
<td>Macro and micro</td>
</tr>
<tr>
<td>Interviews</td>
<td>Semi-structured interviews (54) with respondents drawn to represent different interest groups, professions (i.e. clinical, managerial, IT), disciplines, and hierarchical levels in the interorganisational network, as well as external agents such as Regional SHA administrators, UK NHS National Stroke Improvement administrators, an NTAC executive, and a former NHS CEO. Interviews began in June 2010 and lasted, on average, for one hour. Digital audio recorded interviews were fully transcribed, rendering a total of 5,049 paragraphs of interview transcripts available for analysis using NVivo qualitative analytical software.</td>
<td>Macro and predominantly micro</td>
</tr>
<tr>
<td>Site visits</td>
<td>Site visits (non-participatory observations) in hospitals (8).</td>
<td>Micro</td>
</tr>
<tr>
<td>Informal discussion</td>
<td>Informal conversation, observation, and email exchanges throughout the 2.5 year longitudinal case study, including but not limited to stakeholder and interviewee feedback discussions.</td>
<td>Macro and micro</td>
</tr>
</tbody>
</table>
Table 3.4: Stroke network timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2007</td>
<td>• SHA establishes a regional Vascular Network</td>
</tr>
</tbody>
</table>
| December 2007       | • DoH issues the NHS Stroke Strategy  
• Network Manager of the Vascular Network leaves post                                                                                                                                 |
| January 2008        | • Network Management Lead for Stroke assumes the first post within the Vascular Network as a manager |
| March 2008          | • Three clinical stroke leads join the Vascular Network                                                                               |
| May 2008            | • Announcement of national funding for stroke totalling £105m: £2.4m to each SHA                                                      |
| June 2008           | • New Network Manager of the overall Vascular Network assumes post                                                                     |
| July–November 2008  | • Regional SHA and PCTs restructure the networks  
• Regional Vascular Network transitions into the Cardiovascular Network  
• Cardiovascular Stroke Steering Group is formed                                                                                     |
| August–September 2008 | • National Director for Heart Disease and Stroke, Chief Executive of the regional SHA, and the regional Cardiovascular Network agree broad objectives for the use of the new NHS ring-fenced funding for stroke  
• DoH representative identifies that these funds are to be used in acute stroke service  
• Each SHA must agree how to spend the money, and the regional Cardiovascular Network agrees with the DoH that a portion of funding could be used on telemedicine. |
| October 2008        | • Regional SHA Cardiovascular Stroke Steering Group outlines proposal for stroke funding to DoH  
• Confirmation from the DoH with Memorandum of Understanding confirmed  
• Money did not follow immediately. SHA and DoH agreed to roll money forward into 2009-2010.                                        |
| December 2008       | • Regional Vascular Network transitions formally into the regional Cardiovascular Network and focuses only on cardiac and stroke        |
| January 2009        | • Cardiovascular network identifies participants in the Stroke Network, assigning managerial and clinical leads to specific oversight roles |
| February 2009       | • Clinical stroke networks (sub-regional) host stroke telemedicine supplier presentations to familiarise them with the technology and determine whether stroke telemedicine could potentially be utilised in the network |
| March 2009          | • SHA Cardiovascular Network approves telemedicine as a network-funded project, allocating £400k to purchase equipment for the Stroke Network to improve acute stroke services |
| April–June 2009     | • IT leads and clinicians undertake site visits at other hospitals with telemedicine equipment  
• 2009 project initiation document developed along with specification for the tender process. Clinicians and IT leads are consulted on content  
• Stroke telemedicine project underway within the regional Cardiovascular Network, led by the Stroke Steering Group  
• Project Board established to oversee the telemedicine procurement element  
• Clinical stroke networks discuss acute stroke services provision and thrombolysis administration |
| July 2009           | • Supplier bids are submitted and reviewed, and a select group of companies are invited to present their telemedicine equipment           |
| August 2009–January 2010 | • Tender process stopped due to concerns over funding availability  
• Discussions arise surrounding capacity within the network to offer quality acute and hyper-acute stroke service provision |
| February 2010       | • Following confirmation of funding, the tender process recommences (Round 2)                                                        |
| March–May 2010      | • New round of supplier bids is reviewed  
• European tender process continues                                                                                                       |
| June 2010           | • Round 2 shortlisted supplier presentations and demonstrations occur; suppliers are scored  
• Decision to implement telemedicine in all hospitals is reviewed as the SHA realizes the region is the worst performer in stroke throughout the NHS and begins to recognise a void of quality acute stroke service provision across the region |
### 3.4.2 Procedures

#### 3.4.2.1 NHS ethical review process and approval

Since the study interviews were conducted with NHS employees, I was required to pursue approval directly through the NHS Research Ethics Committee route with sponsorship support from the University of Oxford. Due to the management-related nature of the study and corresponding minimal ethical issues, I pursued and completed the expedited NHS Proportionate Review Service scheme. Following submission of extensive documentation, my study application was approved by the Proportionate Review Sub-Committee of the South East London 3 Research Ethics Committee to begin conducting interviews as of 14 June 2010 (see Annexe 1).

#### 3.4.2.2 Meetings and interviews

All procedures took place at network participants’ locations. No ethical issues were encountered in this study (Creswell, 2003). All participants were given full disclosure, and the researcher’s role was revealed during all researcher-attended meetings, site visits and interviews. The study objectives were clearly articulated, and the participants were informed about the various data collection activities. Prior to engagement in the study, all interviewees were provided with an invitation letter and consent form. All data and discussions were anonymised and codified. No pressure or financial incentives were used to encourage participation in the study or in the project.
The study participant consent form, information sheet, and guideline interview questions are provided in Annexes 2-4.

3.5 Data quality

This section explains how the data have been checked as well as why the data collected are valid data from which to undertake analysis. As described in Section 3.4.1 and Table 3.3, the study incorporated multiple data sources for purposes of complexity and triangulation: interviews, meeting transcripts, observations and documentary (both archival and in-case) analysis. The study aimed for data rigour and robustness but avoided ‘data asphyxiation’ (Pettigrew, 1990) with regard to the information collected, given the longitudinal, processual nature of the case study and the importance of the temporal dimension. Through a rich, whole, longitudinal narrative, I included stories and constructs (Eisenhardt, 1991), as well as validation with stakeholders in feedback meetings. I initially presented a review of my findings followed by an open discussion where 76% of involved network participants had the opportunity to correct and/or deepen my accounts, which also served to test the quality of the data supporting them (Miles & Huberman, 1994). Furthermore, I met regularly with the network’s core leadership group and my direct collaborators to receive updates and feedback: information that was included in data collection for further validation. Internal validity was achieved by providing a sensible, plausible account of events in context, describing their meaning and showing how they were linked to one another (de Vaus, 2001; Patton, 2002). Along with data from the case selection process, validity was supported by attempting to develop a full account of the phenomena from the view of multidisciplinary participants in the network. As an inductive study, it was sequential (de Vaus, 2001) and built upon itself throughout the process, resulting in learning by the researcher and the respondents. The open and quasi-hierarchical nature of the network reassured data quality and triangulation with unobtrusive methods, as the network’s formal leaders had to regularly and transparently provide information to different stakeholders within the network and wider NHS. The next section builds upon data collection and reveals analytical elements.
3.6 Data analysis

3.6.1 Operationalisation of the characterisation of leadership

As discussed in Chapter 2, this study aims to understand leadership processes in complex, interorganisational networks. Since one cannot discuss all conceptualisations and definitions of leadership, I focused upon a particular definition and operationalisation of leadership in my study.

This thesis seeks to develop a new way of thinking about leadership in interorganisational networks, one that looks at the process of leadership (e.g. facilitation) rather than individual qualities of leadership (e.g. charismatic). It considered leadership as the process of reciprocal influence and relationships among network participants at the individual, professional, organisational and interorganisational levels. For example, the evidence demonstrated how formal, authoritative leaders worked closely with informal leaders to frame ideas in order to shape network actions and practices. Also, exchanges and feedback reciprocation among network leaders and participants across organisational and sub-network boundaries generated interorganisational knowledge transfer. Leadership was characterised as demonstrating influential, facilitative, mobilising processes among a complex network of interacting, interdependent network participants. As outlined in the previous chapter, my study adopted a view of complexity leadership suggesting a form of distributed leadership (Brown & Gioia, 2002; Gronn, 2002) that does not rest with a specific person but rather in an interactive dynamic, within which any network participant will participate as a leader or a follower at different times and for different purposes. It is not limited to a formal managerial role, but rather emerges in the systemic interactions between heterogeneous agents (Marion & Uhl-Bien, 2001, 2003). For example, the analyses of network participants’ interactions revealed how leadership could be fostered collectively to gradually change network-wide processes. Finally, the multi-level activities and processes were explored as they affected the macro interorganisational network as the dominant unit of analysis.
3.6.2 Determination of key results themes

The analytical features of the study involved an illustrative narrative to simplify, display and code data, identify patterns and compare them to determine emergent themes and finally conclusions. The analysis was based on the iterative qualitative methods proposed by Miles and Huberman (1994) and interview analysis by Rubin and Rubin (1995). Following multiple stages of inductive examination of participants and network processes (see Table 3.5), I found several types of network processes affecting interorganisational network change and development. Below I describe the data analysis stages carried out in the research study and briefly introduce the three dominant thematic results that emerged, which are fully analysed in subsequent results chapters.

Table 3.5: Brief summary of stages of analysis

<table>
<thead>
<tr>
<th>Stages</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop a detailed description of dominant network processes and integrate them in the case study</td>
<td>1. Code interviews, observations and archival data</td>
</tr>
<tr>
<td></td>
<td>2. Analyse network processes, characteristics and influencing elements</td>
</tr>
<tr>
<td></td>
<td>3. Develop analytical descriptions of processes</td>
</tr>
<tr>
<td></td>
<td>4. Preliminary integrating practices</td>
</tr>
<tr>
<td>2. Contextualise processes</td>
<td>1. Address feedback</td>
</tr>
<tr>
<td></td>
<td>2. Integrate all the analysis of processes within the case context</td>
</tr>
<tr>
<td></td>
<td>3. Identify common patterns in the case</td>
</tr>
<tr>
<td>3. Identify main characteristics affecting processes</td>
<td>1. Cluster process data</td>
</tr>
<tr>
<td></td>
<td>2. Derive other potential understandings from the data</td>
</tr>
<tr>
<td>4. Integrate first-order codes and create second-order categories on (3.)</td>
<td>1. Integrate first-order codes into second-order categories of network processes</td>
</tr>
<tr>
<td></td>
<td>2. Identify critical processes per category</td>
</tr>
<tr>
<td>5. Aggregate theoretical dimensions</td>
<td>1. Assemble second-order categories into aggregated dimensions</td>
</tr>
<tr>
<td></td>
<td>2. Label the dimensions based on emergent concepts or on existing ones found in the literature review</td>
</tr>
<tr>
<td>6. Analyse case</td>
<td>1. In-depth case analysis</td>
</tr>
</tbody>
</table>

I began by examining the plethora of collected data and looked for themes and topics associated with the research question and its operationalisation in the interview schedule. To begin the analysis, I initially developed a provisional list of codes (Miles & Huberman, 1994) composed of concepts and themes drawn from the research questions, exploratory work and literatures reviewed. I finally completed it with a set of recurrent concepts and themes grounded in the longitudinal case data. A list of structured codes (see Annexe 5) was developed as a coding protocol in order to analyse the data. Overall, I coded 5,049 paragraphs that corresponded with my
coding list referring to network processes, complexity leadership, and related themes. Synthesised results did not include details on the topics of technology implementation and execution due to the delayed progress of telestroke adoption. Using NVivo qualitative analysis software, I analysed the data in accordance with the coding protocol by matching the passages with the coding list and identifying dominant cross-cutting themes in order to critically assess constructs and emergent patterns. I integrated interviewees’ accounts and examined these preliminary descriptions through triangulation with abundant meeting transcripts, observational notes and archival data (see Table 3.3). I then explored the interviews for coincidences and divergences in the understanding and assessment of the different processes for each interorganisational level. I coded data in line with certain theoretical structures based on the coding list and used the outcomes from these coded data to demonstrate certain key facets of network processes in order to accomplish my analytical goals.

I then developed detailed descriptions of framing, knowledge transfer, boundaries, network process leadership, complexity leadership, and social capital capacity building by integrating the multiple network participants’ accounts, and examining these preliminary descriptions through triangulation with observational notes and archival data. I conducted a case oriented analysis using a case-based matrix to enhance the development of more sophisticated descriptions on network processes. Secondly, I complemented this analysis with a more concept-oriented analysis by searching for and analysing patterns (Gibbs, 2002) of network processes, particularly leadership processes, in order to enrich the understanding of the underlying phenomena. Based on these qualitative analyses, I used the empirical evidence to demonstrate a useful interpretation of my findings. Three dominant themes emerged from the analytical findings: (1) framing processes; (2) knowledge transfer, informal social networks and boundaries; and (3) NPL. These key themes are elaborated upon in the results chapters (Chapters 5–7) following the next chapter describing the case narrative.
Chapter 4: The Interorganisational Stroke Network Case Study

4.0 Introduction

The purpose of this chapter is to provide the comprehensive narrative of the interorganisational Stroke Network longitudinal case study. Taking into account two-and-a-half years of fieldwork, this chapter tells the overall story of the network under study, providing data points interspersed throughout the narrative. The subsequent results chapters, Chapters 5–7, exhibit data and quotations collected throughout the case to provide more in-depth analyses across the emergent themes. Data specific to the results themes are provided and analysed in subsequent chapters. This chapter is structured as follows. The next section revisits the overall interorganisational Stroke Network form and identifies critical network stakeholders, reiterating the unit of analysis and identifying key network participants. The sections that follow commence the Stroke Telemedicine Project case study narrative, which includes four sub-sections: the procurement process, telestroke procurement review and reconsideration, the next telestroke procurement process, and stroke specifications. The final section presents chapter conclusions and the important identification of emergent results themes that will be detailed in subsequent chapters.

4.1 Stroke Network

The purpose of this section is to review the original configuration of the interorganisational Stroke Network and identify key stakeholders involved in the study. The longitudinal case study targeted the regional multidisciplinary, interorganisational Stroke Network composed of 10 network hospitals linked to PCTs under the remit of the SHA. Among the regional network’s eight PCTs, 10 hospitals out of the affiliated 37 provided some level of stroke service. The Stroke Network focused upon during this study pertains to these 10 organisational participants (Figure 4.1), comprising one AMC, one district hospital, one community hospital and seven larger hospitals.
Figure 4.1: Interorganisational Stroke Network configuration (unit of analysis in study)

Table 4.1: Key for Figure 4.1

<table>
<thead>
<tr>
<th>Organisation type</th>
<th>Total # in study</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHA</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PCT</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Stroke Network member hospital</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

The network’s regular operations were overseen by the Network Deputy Manager, who was employed by the SHA and also served as Network Lead for Stroke and reported to the Cardiovascular Network Manager. The region was split into two sub-regions, and the Network Lead for Stroke worked closely with two sub-regional Clinical Leads for Stroke. These three key players comprised the core group of formal, positional ‘network leaders’. More broadly, the network consisted of stroke specialist doctors (i.e. consultants), managers, hospital IT representatives, and commissioners, as outlined in Table 4.2. The Stroke Steering Group comprised representatives from across these disciplines. Given this summary of the Stroke Network form and critical stakeholders, the next section reviews the contextual state of the Stroke Network at the start of the case study before commencing the narrative.
Table 4.2: Stroke Network core leadership group and participants

<table>
<thead>
<tr>
<th>Participant Categorisation</th>
<th>Post</th>
<th>Name</th>
<th>Medical professionals</th>
<th>Other professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke Network Core Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiovascular Network Deputy Manager and Network Lead for Stroke</td>
<td>Joanna</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>Clinical Lead for Stroke in sub-region 1</td>
<td>Graham</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>Clinical Lead for Stroke in sub-region 2</td>
<td>David</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Stroke Network participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular Network Manager</td>
<td></td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Specialist stroke consultants from each hospital</td>
<td></td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Neurologists from selected hospitals</td>
<td></td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Stroke unit nurses at each hospital; 1 nurse representative served on the Stroke Steering Group</td>
<td></td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Manager from each hospital</td>
<td></td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>IT representatives from each hospital</td>
<td></td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>SHA Informatics/IT Director</td>
<td></td>
<td></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Regional Commissioners (2 Commissioners were trained medical doctors)</td>
<td></td>
<td></td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Procurement specialist</td>
<td>Procurement representative (assigned to network)</td>
<td></td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
4.2 The Stroke Telemedicine Project: Pre-adoption decision-making

In January 2009, with £2.4m of time-limited funds to spend on acute stroke services, the Cardiovascular Network’s Stroke Steering Group began discussing requirements for providing acute and hyper-acute stroke services within the interorganisational network. In the study region, the broad principles for funding allocation were such that £400k was allocated to fund telemedicine, and the remainder to fund primary percutaneous coronary intervention and other small projects. The stroke clinical pathway is outlined in Annexe 6.

The Stroke Steering Group discussed the requirement to provide 24/7 thrombolysis (i.e. stroke treatment) service across the network and reviewed two options for thrombolysis – treatment administration at hyper-acute centres or at local hospitals. There was a consensus that the region’s approach should be to upskill each local hospital to provide thrombolysis 24/7 and that telemedicine was the preferred model for achieving this aim; all of which was in line with strategies being developed by individual PCTs. Essentially, telestroke would enable multiple network organisations to collaborate on stroke care. If a particular hospital did not provide appropriate hyper-acute services, their patients could be virtually diagnosed by a stroke specialist from another hospital via the telestroke system. Employing this method of virtual working also raised concerns of trust, accountability and liability, since stroke specialists would be diagnosing a patient and recommending thrombolysis to be administered by a clinical team elsewhere, potentially involving individuals with whom they were unfamiliar. While the Steering Group turned its attention to telestroke solutions for diagnosing and treating stroke, little attention was paid at this point to the existence, capacity and quality of acute and hyper-acute stroke services within the Stroke Network. A comprehensive understanding of acute stroke service pathways and overall provision was overlooked due to the concentration on securing telestroke intervention solutions for the entire region with the time-limited funds.

Pursuing a telestroke agenda in January 2009, the Steering Group developed the 2009 Stroke Telemedicine Project initiation document, along with a preliminary technological specifications.
template for the European tender process (i.e. telestroke vendor selection). The specifications related to the nature of telestroke equipment, including audio, video, software and other composite requirements they deemed necessary for potential telestroke vendors to meet. The Group established a Project Board to oversee the telestroke procurement element, which was composed of the Cardiovascular Network project sponsor, Joanna, Graham, David, the SHA IT Lead and a requisite procurement specialist. Despite the interdisciplinary nature of this group and intentions to orchestrate the Stroke Telemedicine Project, the Board only held two meetings throughout the duration of the case study. With regard to the telestroke technology of interest, clinicians and IT leads were regularly consulted on content to develop the technological specifications that would go out to tender. It was originally identified that there would be one telestroke machine for each hospital in the network. This was increased to two machines in each hospital, one for the Acute & Emergency (A&E) Department and one for the Stroke Ward, plus up to six pieces of software for configured laptops for each hospital. Given this contextual description of the early phase of telestroke adoption in the network, the next section commences the case study narrative.

4.3 Stroke Network case study narrative

This section marks the beginning of the longitudinal, interorganisational network case study narrative. Commencing with the origination point of my fieldwork, it describes the network’s dynamics and processes over a two-and-a-half-year period. While I illuminate the core storyline from this first sub-section, numerous activities, events and policies shaped the dynamics and development of the network over time; hence the temporal dimension of the empirical evidence provided is significant. These contemporaneous undertakings occurred in the Stroke Network’s inner and outer contexts, often causing destabilising effects on the whole interorganisational network. The network faced numerous system stressors, which required it to operate in a turbulent environment during several periods. In subsequent sections, I describe how the network operated and adapted to manage concurrent problems and identify the implications of such disruptive effects.
4.3.1 The procurement process

Given the Stroke Network’s structural configuration, it operated under a quasi-hierarchical, ‘mandated collaboration’ paradigm of participation. It was unified by the common objective to improve stroke service provision, directed by managers at the regional SHA level, and by the members’ shared financial resources. The regional SHA created the roles of Cardiovascular Network Chair, Network Manager, and Deputy Manager (Joanna), who were given responsibility to oversee the Cardiovascular Network, involving 10 hospital organisational members throughout the region. Since stroke was high on the DoH agenda, given the National Strategy for Stroke and National Stroke Improvement Programme, the Cardiovascular Network created a Stroke Network comprising participants from those 10 organisational members involved with clinical stroke pathways. Within this network, there was a high level of professional diversity and interdependence, including three dominant disciplinary communities: clinical, managerial and technical. The financial function was present given the involvement of commissioners, but was not dominant during the study. The network also included several hybrid professionals who sat at the interstitial domain between two professions, mainly clinical leads who served as stroke consultants, assuming managerial responsibilities, as well as commissioners who were also clinicians. These network participants spanned professional and organisational boundaries and played key roles in network-wide knowledge transfer, so these hybrid roles maintained a significant role in network leadership processes within the healthcare context.

The interdisciplinary nature of the interorganisational network demonstrated functional differentiation among the complementary professions. This attribute was both a strength and a weakness for the overall network, since it made possible cross-functional collaboration beyond the typical silos, but it also resulted in inefficient communication with the use of conflicting terminologies at times. Several studies have shown that knowledge sharing is problematic across more traditional professional groups (Ferlie et al., 2005; Currie et al., 2007). As discussed in Section 4.3.4.1, new pressures and reforms make public sectors more ambiguous for professional
practices, redelineating both the boundaries of interactions across occupations and the professional identities of their members.

The core group responsible for managerial and clinical leadership within the Stroke Network consisted of the Cardiovascular Network’s Deputy Manager, Joanna, who also served as the Network Lead for Stroke, as well as the two sub-regional Clinical Leads for Stroke, Graham and David (specialist stroke consultants). Joanna was employed by the SHA and assigned to this post as part of her Deputy Manager duties. In terms of others’ involvement, Graham indicated that he put himself forward for the role to prevent another physician he deemed less qualified to perform highly in such a managerial role from securing the post. He also indicated career progression as an additional reason for his decision. David mentioned his passion to improve the quality of stroke care for patients in his region as his primary motivation for taking the post. This team frequently interacted to ensure communication of critical information regarding stroke services, drove the telestroke project, and oversaw wider network issues.

As fieldwork commenced in February 2009, the Stroke Network’s clinical constituency was in the midst of hosting telestroke supplier presentations to better understand how this technology could be used in clinical pathways to provide acute stroke services more efficiently and improve patient care. The dominant concerns expressed by clinicians during telestroke demonstrations related to: clinical specificity (primary factor), physician mobility, maximum technical flexibility and quality of the clinician–patient interaction with telestroke equipment (see additional data in Annexe 7 – Table 1).

We know [Supplier A] can do this [implement telestroke] and has done it all over Germany in the clinical setting. I’m comfortable proceeding with them. (David)

Joanna was responsible for spending the SHA’s allocated £2.4m on acute stroke services in the region and had earmarked £400k for telestroke. Pursuing a telestroke agenda would involve the interorganisational Stroke Network selecting one vendor to meet the needs of the entire region such that each hospital would receive the same solution and then operationalise that product
solution locally. A month after two successful demonstrations that sparked interest and debate among stroke specialists, the Cardiovascular Network approved telemedicine as a network-funded project. The network organised an operational meeting with the PCTs’ IT services to develop the procurement specification. Joanna needed to appease multidisciplinary stakeholder groups and reach consensus to finalise specifications before proceeding with the tender process. Working across multiple organisational and professional boundaries, she assumed the primary boundary-spanning role in an effort to make linkages and integrate decision-making among stakeholder groups by permeating boundaries to drive processes. Contemporaneously, the network set out to revisit discussion around thrombolysis services within the region, since PCTs (as opposed to clinicians) were evolving different views on how they wished to proceed and how telestroke could facilitate their service. There was an interesting temporal dimension to these discussions. Rather than occurring in sequence, such that the network’s acute stroke service provision was well understood and clinical pathways at multiple sites were mapped prior to a telestroke adoption decision being reached, the two discussions occurred in parallel. Although telestroke could not successfully be implemented and executed within hospitals until service coverage of thrombolysis administration was finalised and clinical pathways were redesigned, the network pursued telestroke adoption concurrently rather than sequentially.

During a quarterly clinical Stroke Network meeting in May, the network stroke specialists discovered that there was high variability in acute service provision across the region due to the lack of a systematic approach to thrombolysis treatment. Graham stated, ‘Across the network, we need a standardised set of service hours’. Among his clinical colleagues, Graham framed the solution to existing variability as a need for standardisation to improve service quality and patient outcomes, calling for standardised service rotas and clinical approaches. This illuminated a scenario within the network when framing processes were employed, which emerged as a dominant results theme: ‘Currently there are too few hours to provide a robust service at multiple sites’ (Graham). Many hospitals only provided acute stroke services from 9.00 to 17.00 Monday to Friday, with little or no coverage out-of-hours and over weekends. A specialist commented,
‘Without telemedicine we could possibly move forward. We may find it’s not that essential. It depends on geographic proximity and pathways on the ground’. In contrast, a stroke specialist from a smaller district hospital indicated, ‘We have no plans to move toward an out-of-hours service. Telemedicine would be needed for support if one of us is away’. Graham asserted, ‘We need to understand how it [telestroke] will change the service we deliver. First, there’s the introspective use of telemedicine within a site, and second, there’s the network view of key stroke services facilitated by telemedicine’. David recognised that telestroke would allow for ‘rapid assessment within our own hospital and inter-hospital assessments within the network’; however, it was evident from several other meetings that the majority of stroke specialists did not understand how telestroke would affect their clinical pathways or those of the wider network. Several IT professionals reinforced this logic (also see data in Annexe 7 – Table 2):

> Telemedicine is about enabling a clinician to work remotely, providing specialist advice remotely. They need a team that is embedded and dedicated. … Right now the multi-organisational components of this are not agreed across the organisations. It will be a success when it’s integrated across the wider network. Right now it’s not there … Most of the issues come down to the human factor, since technology issues are easily surmountable. Getting people to use it and trust each other to get telemedicine to work will be the challenge. (Director of Hospital IS, AMC)

According to IT professionals, understanding technical equipment was a non-issue. IT departments seemed comfortable with learning about new equipment, as IT professionals conveyed their ease with implementing new technologies, reinforced by the view ‘that’s our job’. However, they suggested that in the early stages there were problems with organisations’ – particularly clinicians’ and managers’ – comprehension of the nuanced complexities of telestroke’s effects on the local and distributed clinical team as well as on network processes and patients. This highlighted the different disciplinary logics and epistemic culture clashes across professional boundaries within the interorganisational network. In this example, professional and epistemic boundaries hindered knowledge transfer and telestroke adoption within the network.

Another critical component of telestroke involved the regional ambulance service. Graham suggested negotiating directly with the ambulance service to ensure coverage, noting that it was an ‘untapped resource that could be used to pre-vert and screen stroke patients in the community’.
By comparison, the other sub-region within the network had finalised their relationship with the ambulance service by this time and made use of ambulance responders’ skills to treat TIA during out-of-hours periods. Despite the important role the ambulance service could play when using telestroke, not one representative from this institution was included in network meetings.

Moreover, the topic of collaborating with the ambulance service arose during only two network meetings throughout the study, which raised issues about stakeholder engagement and traversing disciplinary boundaries. Lastly, the stroke specialists argued for establishment of a standard medical history form that would enable clinical staff assessing stroke to prioritise patients:

> It takes responsibility away from the doctor to remember – so they don’t miss things. We want something self-explanatory, interactive, user-friendly … You want the standardised information regardless of seniority – it’s about standardised data. (Stroke Consultant 1)

Given the need for a generic medical history form specific to stroke, consensus building among the clinicians was crucial as they attempted to institutionalise such knowledge objects into existing clinical pathways. Knowledge transfer, particularly across multiple boundaries, emerged as a dominant theme throughout the case.

From April to June 2009, network clinicians and IT representatives undertook site visits at other hospitals utilising telestroke equipment within the wider NHS. Familiarising specialists with the equipment in the clinical context was valuable to drive the adoption process, particularly since several insisted that any equipment the network purchased must be proven in a clinical setting. The stroke specialists were encouraged to interact with consultants who were comfortable utilising telestroke equipment. This framed their perception of the innovation as clinically acceptable as they shared knowledge with medical colleagues, which alleviated concerns about adoption. This cross-boundary-spanning and communication allowed for knowledge transfer across organisations.

With clinician and IT input, Joanna created the 2009 Stroke Telemedicine Project initiation document, along with technological specifications for the European tender process. For several months the telestroke project was underway, led by the Stroke Steering Group that established a Project Board to oversee the telemedicine procurement element. By June, a final set of telestroke specifications were agreed between clinicians and IT representatives, and the Project Board –
inclusive of a requisite procurement specialist – initiated the European tender process. Following standard tender procedure, expressions of interest were collected, supplier bids submitted and reviewed, and a select group of companies were invited to present and demonstrate their equipment. Representing the network to review demos and score the supplier presentations, a team of multidisciplinary network participants joined the panel, including Joanna, Graham, David, a stroke consultant, a stroke nurse, the SHA Director of IT, another IT representative and a network manager. As alluded to previously, the decision-making process was predominantly contingent on clinicians’ choices. IT’s presence ensured that the equipment met regional NHS IT infrastructure and functionality standards; however, the ultimate decision rested with clinicians.

Following all supplier presentations, the review panel met as a group to discuss scoring and collectively assign final scores to each supplier. In order to follow standard European tender protocol, the procurement team was asked to guide the overall process. The procurement representative did not weight the questions that were used to score the suppliers, so the Project Board later learned that there were issues with the scoring of suppliers’ bids and presentations. In addition to this error, the procurement representative who was supposed to guide the panel through the final supplier selection discussion did not attend the meeting. It was intended that she would lead the meeting with the Stroke Network review panel as well as guide the overall tender decision-making process. With this individual and her expertise missing, Joanna questioned whether they should proceed with any supplier at this stage. One of the preferred suppliers had been unable to present on their scheduled demo day due to a breach of the rules. Another smaller supplier was excluded because it provided the same equipment as a larger supplier but was significantly more expensive with fewer customer service offerings. This ultimately left the group with two supplier options: a large supplier that was unproven in the clinical context but had impeccable technology, and another supplier that had just satisfactory technology but was proven in the clinical environment. At this stage the review panel preferred the latter supplier but had developed many more questions than answers, and they decided to postpone their decision until discussing details further with the absent procurement specialist. Joanna enquired with
procurement as to whether or not the team could ask the preferred supplier to make slight technological adjustments to meet their needs. She was told there could be legal ramifications, since both suppliers had met the original technological specifications, and the non-preferred provider could pursue legal recourse. At this point, Joanna discussed the possibility of halting the entire procurement process with the Project Board. Following a meeting to discuss this option and the impending legal complications if the process proceeded, the entire Board agreed that the team should indeed halt the telestroke procurement process.

4.3.1.1 SHA restructuring

Contemporaneously, the regional SHA was restructuring, with new leaders joining the management ranks. Although the regional PCTs within the network previously agreed to have telestroke in all hospitals, a newly assigned SHA executive questioned the entire decision regarding allowing hospitals to provide thrombolysis. He attempted to shift the direction of processes already in place by arguing that only hyper-acute centres should maintain responsibility for this level of stroke service provision, remaining resolute despite the objectives which the SHA was already following. As a result of his newly proposed approach, the status of the Stroke Network’s funding was uncertain. Joanna met with members of the SHA Board and provided an alternative to the hyper-acute model, which otherwise risked the Board challenging the Stroke Network’s decision to pursue telestroke. The Board required further evidence to make a final decision about telestroke and eventually approved it rather than enforcing the new executive’s proposed route of hyper-acute centres, thus re-approving telestroke funding. These turbulent episodes presented opportunities for network leaders to present alternative framing, manage risk, permeate boundaries, manipulate social capital among constituents and develop mechanisms for managing system stressors. The next section addresses a period of great uncertainty caused by a reconsideration of telestroke that led to heightened network turbulence.
4.3.2 Telestroke procurement review and reconsideration

In the interim, facing a potential situation involving the risk of a legal battle with a supplier, Joanna exerted leverage on the SHA’s challenge of the decision to pursue telestroke in the network’s favour. Rather than disseminating information to the network about the crossroads the telemedicine project team had reached with the two suppliers, Joanna emphasised the SHA’s unsupportive approach to telestroke. She framed the situation and communicated to the Stroke Network that the SHA had temporarily suspended funds for telestroke while they were making a decision on telemedicine v. hyper-acute models, knowing this was the only way to avoid legal ramifications with the suppliers involved in the European tender. ‘The official line is that we stopped the procurement process because there’s no money available from the SHA’ (Joanna).

Information disseminated throughout the network was framed in accordance with this ‘official line’, which raised questions surrounding the nature (e.g. content and accuracy) and selective transparency of transferred knowledge. Since knowledge was localised, embedded and invested in practices (Carlile, 2002), it subsequently had implications for network processes. In this example, framing was developed and facilitated by the network lead. The Stroke Network’s innermost leadership team experienced a period of crisis management that was localised at the core group, suggesting important lessons for network leaders’ collaborative processes. The clinical leads supported the approach to stop the tender process, since they wanted to ensure that the network selected a truly preferred supplier rather than one that merely met the baseline technological specifications. Joanna proceeded by recommending a reassessment of the specifications, ensuring that the telestroke equipment they ultimately chose would incorporate the more nuanced specifications with which they were now familiar and deemed crucial. A final decision forcing this strategic redirection of the network’s processes would not be decided upon by the Project Board for several months.

Although the original project timeline aimed for the telestroke adoption phase to be complete by the end of 2009, this latest development caused severe delays. In addition, the external Procurement Solutions group restructured, and a change in assigned personnel to the Stroke
Telemedicine Project required an amended timeline. Calling for interdisciplinary meetings including clinicians and IT to refine the specifications, Joanna said:

We tried to get people engaged last time at the outset, but they were remote and disengaged. Then when the specifications went out, people gave feedback and started questioning everything. This restart will allow everyone to get involved in the process, so we get it right this time. (Joanna)

She optimistically suggested that the network could complete the new procurement process in half the time because it only involved the second round of specifications; however, proceeding with the typical timeline would give other suppliers the opportunity to participate, which was seen as an advantage by allowing additional vendor options for the network. The project team estimated three months before a final supplier would be selected.

A month later, in September 2009, the Telemedicine Project Board held a meeting with the project sponsor (i.e. Cardiovascular Network executive) to discuss next steps. Despite the issues and processes that had transpired over prior months, the sponsor’s Project Chair sent a substitute in his place. There was confusion within the meeting group over who would be listed as the primary accountable party, and ultimately the group agreed it should be the Project Chair – despite his absence. The meeting served to finalise numerous reports that had been drafted on the objectives, functions, risk, timescales, constraints and processes in place with regard to the project. Several of these issues had not been raised prior to Round 1 of the European tender process. Although a substantial amount of time was spent discussing constraints and risk assessments, at no point were contingency plans addressed to manage risky scenarios and potential alternative outcomes, indicating a lack of scenario planning. In addition, the substitute Project Chair was merely told by the Board that the Stroke Network was in the middle of a European tender process, which completely avoided discussion of issues about specifications, funding, legal concerns and potentially halting the European tender process altogether. Instead, the Board addressed its identity and description, membership, governance arrangements and terms of reference. In addition to inadequacies on the project sponsor’s part, the procurement specialist in attendance also felt there had been a void, since he was never involved in the original telestroke conversation with the DoH.
The project was handed over to him during the Procurement Solutions group restructuring. Other issues pertaining to stakeholder involvement and network participant turnover arose, highlighting the implications of network reconfigurations. Addressing issues of scalability within the network, Graham pointed out the lack of engagement by clinical stakeholders: ‘I can give them advice, but I can’t help them. They will have to make final decisions about their organisations’ processes’.

Furthermore, it was brought to the attention of the Board that ‘This is only about implementation of the IT/telemedicine, not a discussion around thrombolysis. We can’t even begin to discuss that’ (Joanna). Although the sensitivity over this matter had waned due to the SHA’s support of telemedicine, the provision of acute and hyper-acute services would emerge as a turbulent episode in the network’s future. At this stage, the Chair assured the Board:

Anything to do with money relates to the [Cardiovascular] network – all these financial issues devolve to the network. The sole responsibility you have relates to making a final decision [on telemedicine]. (Telemedicine Project Chair)

The Board agreed on a transparent communication strategy to share decisions with the wider network, and Joanna volunteered to disseminate information. They concluded the meeting by confirming the need for only one more Board meeting – given busy work and holiday schedules – to make further executive decisions as the primary leadership group. Overall, observations revealed that only two key Board players participated and contributed to the discussion, whereas the majority did not raise questions and concerns or offer input during the meeting. Even at the core of the project, a few dominant network participants drove discussions and processes forward.

The point of accountability was juxtaposed with the source(s) of driving change. Despite the hierarchical nature of the group, with the sponsor’s Project Chair identified as primary lead, the interactions and dynamics within this core group reflected collective leadership processes at play.

In Fall 2009, the clinical Stroke Network continued its regular meetings to address issues such as TIA, thrombolysis, telestroke, rehab, long-term care, palliative care, workforce and metrics. At this stage, however, Graham made an adjustment to meeting operations. Rather than lead the meeting as he traditionally had, he asked Joanna – a more neutral party as perceived by medical professionals – to lead the meeting. It was later revealed that several network stroke consultants
felt the large AMC was driving its own agenda led by Graham. There existed a competing
dichotomy between network organisations that were academic and those that were clinical in
nature. As an external objective observer of the network remarked:

Some of it is how Graham behaves and some is because he comes from a large AMC, so
people don’t want such an institution telling them what to do … That affects how they deal
with the network. It’s parochial. (NHS National Improvement Lead for Stroke)

Discord within the network was increasing, and Graham sought to reduce this dissension by
removing himself from focus. This approach to network leadership (submergence) is explored
further in Chapter 7. Observations from these meetings revealed that dominant network
participants provided input and shared feedback, whereas the majority remained silent, despite
encouragement to contribute. This raised issues around the dialectics of both the emergence v.
submergence of leadership as well as active v. passive engagement in network processes. Although
action throughout the network was predominantly clinically driven, a minority of clinicians
participated in formal discussions at such meetings. Interviews with several network participants,
particularly doctors, revealed that informal discussions and networking were very active in the
background. This was a sentiment demonstrated by several consultants (see additional data in
Annexe 7 – Table 3):

I use both [social and professional networks] equally. … It has been useful to call on
colleagues that I trained with over the years, fellow specialists working on stroke within
the wider network, and even discuss unique clinical abnormalities with the neurologists. I
acquire information, provide my perspective, then apply relevant input to working in my
local context … These exchanges are very valuable (Stroke Consultant 2)

From a more macro perspective overlooking the wider network, the Improvement Lead
collaborating with the Stroke Network noted:

Commissioners and clinicians are affected by their external [professional] networks, which
affect how they get along with others in their stroke network … Commissioners
sometimes do not get along with managers or clinicians. People are held back by their
organisational [and professional] cultures. A formal network is useful for providing a
process or forum for sorting out issues. (NHS National Improvement Lead for Stroke)

These professional and underlying epistemic boundaries often affected knowledge transfer,
framing and priority-setting at different network levels. Based on these findings, the value of the
formal network was attributed – by network participants – to the fact that it mobilised informal
network interactions that developed, grew and most importantly generated actionable change and
further planning. In line with Dickinson and Ham (2008), engagement in formal organisational roles was a useful and symbolic mechanism, and the complex sub-cultures in healthcare organisations and networks, as well as the role of informal leaders, was also important. Findings such as this became relevant to Graham’s view on consensus building within the network. Although the lack of formal involvement by specific clinicians presented potential problems for their organisation’s representation and contribution to discourse within the network, it became clear that the informal discussions held among medical professionals from other organisations within the network allowed for their voices to be heard. These informal processes also became crucial as the Stroke Network discussed potential projects on which to spend the remaining funds allocated to regional stroke services.

In contrast, the CEO of the NHS Technology Adoption Centre, who provided guidance to Graham, was more critical of medical professional and social networks:

Social networks are used oddly and are bad at sharing within the NHS … Social networking can work but also sometimes introduces competition … Because of peer pressure, social networks rarely lead to the long-term change needed. They are not sustainable because they don’t make the systemic changes. Relying on only a peer-based approach is not enough … Peer pressure resulting from social networking foregoes the systemic clinical pathway change process and ignores the ‘now what?’ element … You need to get a Trust to a place where it understands system processes. … Can’t negate the people dimension, but also if systems aren’t aligned people get frustrated. (CEO, NTAC)

Further empirical evidence from a reflective thought leader introduces pragmatism from the NHS Executive level that actions a systems approach to healthcare transformation:

If you have to manage in a complex system, it’s about trade-offs, systems, what you need other people to do. … People talk about management as if it’s a thing. It’s a process, but it’s really context-specific. Trying to manage a small practice is very different than managing care for a population requiring a wider scale of system management with different types of players. (Former CEO, NHS)

These executives cautioned against exclusive reliance on the role of social and professional networks and suggested that a whole systems approach is ideal. The case study presented here does not call for an in-depth analysis of the CAS literature, and although this study will not argue that transferring theoretical models about complex networks across fields – even when there is no strict isomorphism among the empirical phenomena to be explained – is theoretically correct, it suggests
that there are several similarities between the whole systems and interorganisational network approaches (Pathak et al., 2007). In particular, the primary unit of analysis in this study is the complex interorganisational network, which as a macro-level unit exhibits demonstrable similarities – in terms of purpose and functional characteristics – to a complex system. Complex systems and networks share congruent management characteristics such as integration among multiple stakeholders, collaboration across organisational boundaries and complex process management. Analysing the multi-level interorganisational network as demonstrated in this study is critical to a better understanding of specific and collective processes within a complex network for which prior evidence is inadequate across a multiplicity of levels. Subject to further research building upon the theory development linking networks and complexity leadership presented here, applying a theoretical complex systems approach in conjunction with additional empirical evidence could be used in the future to more specifically evaluate systems-based interpretations.

As for the telemedicine project, an adjudication meeting was held in November 2009 to finalise a decision regarding the European tender process (Round 1) and determine the next steps. Led by the Cardiovascular Network Manager, the meeting included Joanna, Graham, David, the SHA IT Director, a stroke nurse, and an additional IT representative. A procurement specialist possessing data on the previously scored supplier presentations – including all the evidence on which to base their discussion and decision – did not attend the meeting. In his absence, the group considered rewriting the technological specifications and questions they could pose to suppliers. Considering what the specification criteria included, a participant asked, ‘Should we rewrite to potentially exclude others or isolate one vendor in particular?’ Joanna pointed out: ‘We are spending a significant investment of public money, so we need to make sure we do it right. It’s OK to delay for six more months if necessary, so we can put the right equipment into the hospitals’. Although severely behind adoption schedule, the previous round of the tender process rendered several lessons learned that shaped discourse going into the strategic direction discussion. David feared that changing the telestroke technological specifications at this stage could potentially result in specification demands that no supplier could meet. In addition, it was clear that clinical drivers
were dominant throughout this process, as David communicated his perspective, which was shared by several clinical colleagues (see data in Annexe 7 – Table 4):

[Supplier A] didn’t demonstrate they could use the solution clinically. They’re using it elsewhere, but not within clinical processes. They are unproven and using [equipment] that has been adapted and didn’t give me comfort that I could get from [Supplier B]. Yet [Supplier B] doesn’t give me the comfort that they’ll give us the personal touch, since they’re so large. (David)

The discussion focused primarily on clinical viewpoints; however, IT was highly involved in raising issues about IT infrastructure, broadband network specifications and hospitals’ equipment requirements. There existed little management perspective to provide business planning oversight regarding such issues as costs, long-term planning, utilisation and maintenance of equipment. Although the procurement specialist never arrived, Joanna, Graham, and David failed to raise these latter issues during this phase of the tender process. Given the overall dissatisfaction within the group over the existing procurement process status and lack of answered questions from the procurement specialists and suppliers, the group decided to stop the European tender at this stage. By completely halting the process, they were free to restart Round 2 of the tender in early 2010.

4.3.3 The next telestroke procurement process

In February 2010, following confirmation of funding from the SHA and Cardiovascular Network, Round 2 of the Stroke Network’s European tender for telestroke began. An enhanced set of technological specifications invited supplier expressions of interest from the final two Round 1 companies as well as two additional companies that were unable to compete in the first round. As the tender process progressed, Graham and David continued with clinical Stroke Network meetings within their respective sub-regions.

The clinical pathways are stable at network hospitals because there’s relatively little will internally to move them. There’s variability in service delivery, and the main thing that drives things is to increase quality and improve services. There are several Trusts where that’s not the case. Without a champion at the local level, we’re just wasting time to force them along. Other network members are not necessarily all that enthusiastic about telemedicine – there’s a range. (Graham)

Graham expressed a need to ‘force a timeline for the whole network ... there’s mutually assured inertia’. Aside from stroke clinicians’ hesitation – and in some cases renewed scepticism – about
telestroke adoption, there were a variety of other issues raised within the network. In the external environment, the National Sentinel Audit affecting Royal College physicians established metrics at the most standardised level following the National Stroke Strategy implementation.

The Sentinel Audit is a national audit covering England and Wales. It’s sent out nationally, and the results are collated on a national level, then published in the public domain. This audit is rather important, since Trusts take it seriously. Each department nationally is ranked, so there’s competition. That audit drives change since it’s high profile and out there for everyone to see the results and performance, and it’s run by a Royal College.

(David)

Graham described it as ‘futile data collection … it’s self-assessed and everyone responds favourably’. Some metrics were being piloted, and the National Audit Office was collecting stroke data. In addition, the tariff for stroke was being adjusted by higher quality targets. The NHS is known for continually changing and setting targets; however, the clinical stroke leads thought it would be better to drive an organic process rather than strict metric requirements, yet recognised that such an approach was unrealistic within the existing NHS environment. Driving an organic process was less likely, due to problems that would be encountered disseminating information among clinicians, since standardisation and evidence-based medicine were fundamental to practice. Going a step beyond evidence-based decision-making, the NTAC CEO asserted that an outcomes-based, systems approach was critical:

The biggest problem is pilots … there are so many. There are no commitments, no change in patient outcomes … We need to move beyond ‘innovation’ to outcomes. Instead, I focus on having strong evidence for good outcomes to incorporate processes into the standard of care … You need a multidisciplinary approach and have to create links … get Trusts to a place where they understand system processes. An overall whole systems approach is crucial. (CEO, NTAC)

Despite the likely success of such an approach to network management, the reality in the Stroke Network was that this may have worked in theory, but certainly not in practice. The human factor, referring to those participants, managers and leaders within the network, played a significant role that could not be underestimated. The momentum of the network had driven the telestroke tender process forward; however, inertia began to hinder network dynamics during this period.

Although Round 2 of the European tender process commenced in February 2010, it was not until May that the suppliers’ bids were reviewed and initially scored. The procurement process dragged
on for nearly four months, since the project group was concerned with making the ultimate ‘right selection’. By June, the shortlisted suppliers were invited to present and demonstrate their equipment, with two suppliers returning as Round 1 veteran presenters. Numerous project documents (e.g. scoring, Q&A sheets), as well as meeting observations, revealed that with meticulous precision, the multidisciplinary telemedicine project group responsible for scoring the suppliers reviewed and rereviewed the criteria, cross-referenced content against technological specifications, critically evaluated presentations and demos, and ensured that their questions were answered. Comments raised during the scoring meeting underscored the multidisciplinary nature of participants, including clinicians, IT experts and network managers. In order of importance, the group’s main concerns were: proven clinical utilisation, technological specifications and financial costs. To allow for a fair comparison before making a final decision, the group demanded that every supplier’s anonymised scores be disseminated to the entire group along with costing information. During this round, equipment cost was an important topic among group members, which was demonstrated by their comparisons of price per machine, package prices and overall return on investment for each supplier. As Joanna had highlighted, the awareness that they were spending public funds to purchase this technology for the long-term use of the network made costs an important topic as compared to Round 1.

4.3.4 Stroke specifications

The telemedicine project was soon paused due to more pressing matters within the network. Recently published NHS performance outcomes revealed that the region was the worst performing in the country with regard to stroke. The network overall was not achieving good performance outcomes, and in some cases not meeting minimum targets. Not one Trust or hospital in the regional Stroke Network was performing well according to outcome benchmarks. These disappointing results, in conjunction with pressure from the new SHA Executive leadership, created a sense of urgency and turbulence for the network. Clinical participants met to discuss how they might develop a framework of service specifications to go to commissioners and ultimately to the SHA Chief Executive, outlining a plan of action involving each organisation. Inadequacies
within the network had surfaced, and its formal management was forced to recognise the severe limitations of stroke service provision across the region. In response, the SHA Cardiovascular Network, led by Joanna, established a priority agenda that required every Trust and hospital within the Stroke Network to submit a pro-forma document outlining the organisation’s capabilities, capacity and resources for stroke service provision. The goal was to require all organisations to describe their stroke service specifications, collect and analyse these data at the network level, then create a standardised generic version that would be used to determine which organisations would be deemed acute and hyper-acute centres for stroke, with implications for finances and even possibly unit closures. The collective conversation that occurred when Joanna introduced this requirement resulted in reluctance and frustration among the 17 clinical and managerial attendees (Table 4.3).

Joanna initially framed the service specification requirement as a bureaucratic mandate from the SHA level as a means to achieve standardisation across the network. This frame gradually changed to one focused on the intention of improving patient outcomes as well as network and participants’ survival and sustainability, which highlighted framing processes that would be used down the line. Employing such processes to shape actions and practices represented mechanisms to reduce future network uncertainty. Due to the severity and priority of the service specification issues, the stroke telemedicine project was temporarily suspended. The timeline for the stroke service pro-forma submissions and review process continued from June 2010 until January 2011, halting telestroke adoption for over six months.
Table 4.3: Stroke service specification pro-forma discussion at the Stroke Network level

<table>
<thead>
<tr>
<th>Participant</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joanna</td>
<td>All providers are asked to submit a pro-forma on where you are on stroke treatment provision and identify the types of services you want to provide (acute, hyper-acute), and have PCTs support that. The service specification will go under review by the Stroke Steering Group to address stroke care provision throughout the regional network. 7 October is the completion date for PCTs to submit their applications regarding capacity for stroke service. The SHA is looking at the whole pathway overall. Whichever organisations want to provide stroke services must submit a pro-forma. We are following these steps to identify services:</td>
</tr>
<tr>
<td></td>
<td>- Map out hyper-acute across the regional network overall</td>
</tr>
<tr>
<td></td>
<td>- Are there gaps?</td>
</tr>
<tr>
<td></td>
<td>- Look at applications (submitted pro-formas)</td>
</tr>
<tr>
<td>Stroke Consultant 1</td>
<td>So to clarify membership of the review panel, it’s inclusive of the SHA managers, PCT reps, commissioners, and only one clinical adviser?</td>
</tr>
<tr>
<td>Joanna</td>
<td>Yes. If you can’t complete the pro-forma how can you provide the service? It’s simple.</td>
</tr>
<tr>
<td>Stroke Consultant 2</td>
<td>It’s not that simple! Assume some PCTs are reliant on others.</td>
</tr>
<tr>
<td>Joanna</td>
<td>Ultimately we’re in the climate of it is PCT-led. I was put in my place for saying PCTs are responsible for picking providers to offer the service.</td>
</tr>
<tr>
<td>Stroke Consultant 2</td>
<td>What carrots and sticks are commissioners using?</td>
</tr>
<tr>
<td>Joanna</td>
<td>The carrot is telemedicine to provide the service. It’s an enhanced approach.</td>
</tr>
<tr>
<td>Stroke Consultant 3</td>
<td>Telemedicine – does this pro-forma affect if we want the telemedicine carts?</td>
</tr>
<tr>
<td>Joanna</td>
<td>We discussed one v. two stroke telemedicine machines per site, but there is only the option for one piece of equipment per site, not two. We could always go back to the provider and say it’s time to order more.</td>
</tr>
<tr>
<td>Stroke Consultant 4</td>
<td>We could take on extra patients from others [other hospitals], but we’re not predatory of others’ patients.</td>
</tr>
<tr>
<td>Joanna</td>
<td>It’s a priority for all the PCTs, especially with advice from the SHA there.</td>
</tr>
<tr>
<td>Hospital Manager</td>
<td>We’re being asked to put together a pro-forma without knowing what other hospitals from which you’re trying to draw on. It’s also PCTs that we’re having conversations with.</td>
</tr>
<tr>
<td>Joanna</td>
<td>You should discuss with the PCT.</td>
</tr>
<tr>
<td>Graham</td>
<td>None of us know what the final specs will look like. We’re sceptical to allow slippage into the system.</td>
</tr>
<tr>
<td>Stroke Consultant 3</td>
<td>PCTs are not declaring their hand.</td>
</tr>
<tr>
<td>Stroke Consultant 4</td>
<td>Might be easier to submit one pro-forma for all sites together rather than one pro-forma per site.</td>
</tr>
<tr>
<td>Joanna</td>
<td>No, we need the different specs so we know what’s going on at each site. Absolutely need one pro-forma from each site, so we can make sure stroke standards are being met as well. We need the specs first.</td>
</tr>
</tbody>
</table>

4.3.4.1 Local effects of NHS reforms

Just a month after the network was confronted with these stressors, public policy reform within the NHS reared its head, causing increased turbulence at both the wider macro national healthcare and micro Stroke Network levels. In July 2010, the then UK Secretary of State for Health, Andrew Lansley, published the White Paper, *Equity and Excellence: Liberating the NHS*. This paper and its proposed changes had a profoundly negative effect on the overall region under study,
particularly given that the Stroke Network was managed by SHA leaders. Under the proposed reforms, SHAs were set to become obsolete during 2012-2013, and PCTs would be clustered and superseded by clinical commissioning consortia. Stroke Network participants were uncertain about the future of the overall network, especially its organisational members, management and leadership, service provision, funding and development, among other concerns. The formal network leaders employed by the SHA (e.g. Joanna, Director of IT) were worried not about whether, but when, their jobs would be made redundant. Graham and David, who collaborated closely with them, wondered how the restructuring would affect management and leadership within the Stroke Network, funding, and most importantly how it would affect the network’s and their individual organisation’s ability to provide stroke services. Reconfiguration of the network would have a dramatic impact on leadership and overall network sustainability. Consequently, the interdisciplinary network had to contend with significant and ambiguous changes to the national healthcare system and delivery (also see data in Annexe 7 – Table 5). For example, a manager commented:

I don’t have enough information now to know what will come next for me, but it’s clear the government is determined to abolish SHAs. I’ll deal with my own career prospects when confronted with the issue, but more pressingly I now have to manage the concerns, frustrations, and motivations of those I work with regularly within the SHA and network. (Cardiovascular Network Manager, SHA)

The network did not remain immune to these reforms, which were beset with inherent tensions (Pollitt & Bouckaert, 2000), ambiguity, contested conditions, and uncertain service realities (Noordegraaf & Abma, 2003). These adverse effects resonated in the background while the network pursued processes it had in place, namely pro-forma evaluations and telestroke. Although Joanna, Graham and David emphasised the need for interorganisational collaborative team building to drive network processes and achieve improved performance goals (e.g. national stroke standards), this proved difficult given the demoralisation of many staff as well as the termination of a highly involved and vocal Stroke Network commissioner. Despite instability in the external environment, the strict, mandated pro-forma evaluations – designed to determine which organisations would be deemed acute and hyper-acute stroke centres (with attached funding) –
spurred the network into action. In addition, the fact that funding allocated for the purchase of telestroke equipment was time-limited drove the project forward.

4.3.4.2 Concluding the telestroke procurement process

Following a month of supplier presentations, demos and scoring review and discussion, Round 2 of the tender process ended in September 2010 with the selection of the preferred supplier. During final contractual negotiations, however, the selected supplier became dissatisfied with the amount of equipment the network intended to purchase and withdrew from the contractual process. The preferred supplier refused to accept the terms and conditions the day before the equipment was scheduled to arrive at the first telestroke pilot site. When the network started out with the specification it was more inclusive, including additional work with a video bridge, which is considered very expensive equipment that requires maintenance and management. The telemedicine project group excluded the video bridge because they deemed it unnecessary, particularly given its excessive cost.

So we then had to go with the second supplier, which I think most of the clinical people were very happy with because we’ve seen it working in two hospitals now very well, and I have to say the supplier has come a long way since the previous round of procurement that we did. They’ve listened to some of the feedback that we gave, and they’ve changed their product to meet those specifications and requests we had. (Director of IT, SHA)

Despite this level of supplier adaptability, obstinacy among IT departments emerged during the adoption process. Communicating his observations of several reluctant network IT departments, another SHA IT representative noted, ‘The issues that we’ve had so far, subsequent to the original bidder, were around IT. IT groups [in each site] wanted to do things their own way’. Ultimately, each organisation was dealt with on a case-by-case basis; however, the consistent theme that was framed and that encouraged collaboration related to the fact that telestroke provided a quicker diagnostic and treatment response to stroke such that treatment could be delivered faster; rendering better patient outcomes, increased likelihood for higher quality of life and improved service efficiency. These frames are detailed in Chapter 5.
Following the European tender protocol, the network then selected the next preferred supplier and finalised contracts in October 2010. A month later, Joanna and project management assistants organised an environmental audit with the supplier and IT team at the first telestroke hospital site. The multidisciplinary group discussed connectivity, processes and how to move forward with implementation. They also conducted a technical analysis by walking through the clinical stroke pathway, following the hypothetical case of a patient arriving by ambulance to A&E, being scanned in Radiology, the site of thrombolysis administration, and finally moving to the stroke unit. The purpose was to determine where the telestroke carts would be stationed, and the location of available wireless access points, and their signal strength, and wired-LAN access points. In addition, the suppliers and IT team met with key consultants from A&E and Radiology who would be involved in the stroke care pathway, demonstrating the highly interdisciplinary nature of telestroke work processes. Confronted with the reality of telestroke, network consultants shared mixed views on its use (see data in Annexe 7 – Table 6):

We see telemedicine as a means to an end. We’re going to have to learn during that process. It’s daunting to do remote consult because you’re away from the patient; not confident from seeing the CT scan alone to thrombolyse patients. (Stroke Consultant 3)

The stroke specialists at the network’s first telestroke site, however, shared collective enthusiasm for the new technology:

We’re excited to be implementing the technology, as we’ve waited for a long time to use this more efficient system. It will help us better serve our patients. (Stroke Consultant Lead, pilot hospital)

In December 2010, the first telestroke cart arrived at the site, enabling local physicians and nurses to familiarise themselves with the equipment. Installation of the equipment and software on pre-configured laptops did not occur until March 2011, followed by training of clinical staff during the subsequent two months. It was not until July 2011 that the telestroke equipment was first utilised by the hospital clinicians to treat incoming stroke patients within their enhanced clinical pathway during a pilot phase. This study focused exclusively on the telestroke adoption process and network processes due to its the lengthy duration rather than on technology implementation and execution. Since the study did not aim to investigate post-adoption phases, fieldwork concluded in
June 2011. Although the Stroke Network concluded the telestroke adoption process, it continued to pursue formal evaluation of the network’s stroke service provision.

4.3.4.3 Stroke specification results

From October 2009 to January 2011, the Stroke Steering Group reviewed pro-forma submissions, conducted requisite provider presentations, and evaluated the overall status of stroke provision at each network organisation. Having developed strict guidelines for what would be considered an acute v. hyper-acute stroke centre, the review panel judged each organisation’s presentation and service specification accordingly. Assessing each organisation beyond the service specifications, dominant themes that emerged from evaluations related to clinical leadership and processes (i.e. clinical pathways) (see data in Annexe 7 – Table 7). For example, a participant noted:

For me it’s about how serious they are about the issues. They should be saying ‘I want to use this process’. If they want to be an acute or hyper-acute unit, there are certain measures and processes they must put in place. (Commissioner and clinician)

By January 2011, the review panel identified only six out of the ten organisations that met requirements for hyper-acute stroke services capable of providing thrombolysis treatment to patients (Figure 4.2, Table 4.4). One of the remaining four hospitals was granted time until 2012 to expand and refine their service to meet requirements. The final three hospitals were deemed unable to meet the acute stroke unit requirements, and patients in those sub-regions would be taken to a nearby site with telestroke that had been approved as a hyper-acute stroke centre. The resultant Stroke Network configuration illustrated the newly established collaborations among different PCTs and hospitals. The most significant outcome resulted in newly formed relationships between hospitals not deemed hyper-acute stroke centres and those that were granted this status, thereby providing improved stroke service delivery through the network for patients throughout the region.
Figure 4.2: Resultant interorganisational Stroke Network configuration

Table 4.4: Key for Figure 4.2

<table>
<thead>
<tr>
<th>Organisation type</th>
<th>Total # in study</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHA</td>
<td>1</td>
<td>🐺</td>
</tr>
<tr>
<td>PCT</td>
<td>8</td>
<td>🦌</td>
</tr>
<tr>
<td>Hyper-acute stroke service hospital</td>
<td>6</td>
<td>🎯</td>
</tr>
<tr>
<td>Non-hyper-acute stroke service hospital</td>
<td>4</td>
<td>⚪</td>
</tr>
<tr>
<td>New collaborative PCT partnerships</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>New collaborative hyper-acute stroke service provision partnerships between two hospitals (arrow direction represents stroke patient referrals)</td>
<td>4</td>
<td>←</td>
</tr>
</tbody>
</table>

This newly configured arrangement was determined to be the best approach for the Stroke Network in order to provide improved quality stroke services across the patch, and is in place today. By examining how the network functioned along with its relevant processes, it was evident that a central diktat of how the network should function was ineffective as a standalone management approach. Rather, what was required was an analysis of network processes involving multidisciplinary stakeholder input and feedback to determine what organisations needed to include in their remit. By mobilising processes, several network leaders facilitated the shaping of the network and its practices.

4.4 Chapter conclusions

In this chapter I described a longitudinal, exploratory case study of a regional interdisciplinary, interorganisational Stroke Network composed of 10 organisational participants. Operating as a quasi-hierarchical network employing mandated collaboration, formal management roles were tied
to the SHA and clinical leadership. The study aimed to link the content, contexts and processes of change over time to explain the differential achievement of change objectives (Pettigrew, 1990) at the interorganisational level. Addressing the outer context in which the network resided, a detailed description of the political environment and its evolving reforms were discussed. At the micro level, I explained network features of the structural, cultural and internal political environment through which ideas for change proceeded in the inner context (e.g. European tender process fraught with problems and challenges). The study examined the dynamics and processes within a complex, interorganisational network, demonstrating how large, formal networks mobilise and operationalise smaller informal networks. As further case results are undertaken in subsequent chapters, the most salient findings are highlighted in these concluding paragraphs.

4.4.1 Turbulence and networks

The contextual conditions under which this research was conducted, at certain periods during the study (see Table 4.5), reflected a turbulent environment (Emery & Trist, 1965). The onset of turbulence or the consideration of potentially emerging turbulence in an organisation’s or network’s environment has two significant, although related, consequences relevant to this discussion. First, an organisation’s existing networks may be made redundant by significant environmental changes. An example of a significant change was the proposal of national NHS policy reforms calling for the abolition of SHAs. Second, turbulence is the property of a field of organisations rather than a characteristic of an individual organisation (Selsky et al., 2007); hence turbulence is best addressed by collaboration among organisations as within a network. Combined, these two characteristics imply that the best way for organisations to address turbulence is to network and collaborate with others. A network perspective focuses on patterns of relationships among participants and seeks to understand how these patterns lead to certain outcomes (Kilduff et al., 2006). Nohria (1992b: 5) suggests that an organisation’s environment from this perspective can be viewed as a network: ‘The environment consists of a field of relationships that bind organisations together’. Trist et al. (1997) argue that organisations become field-related when the domain of shared concern highlighted by turbulence is foregrounded. These arguments are
supported by the empirical evidence and results provided in this study (see Figure 4.2, Tables 4.4 and 4.5). In addition, this study suggests an initial template for network-level changes within turbulent environments. Recent research exploring the work established by Emery and Trist (1965) asserts that in turbulent environments dynamic capabilities and competitive advantage shift from the organisation to field (network) level (Selsky et al., 2007). The impact of NHS reforms and other system stressors that occurred throughout the case, and subsequent turbulence, rendered the interorganisational network level highly salient. Therefore it is vital to find ways for networks to address, manage and anticipate turbulence – through collaboration and reconfiguration – at the whole network level.

**Table 4.5: Periods of uncertainty and ambiguity that created turbulence in the interorganisational Stroke Network**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Event</th>
<th>Characteristics</th>
<th>Implications for the stroke network</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2009</td>
<td>Pursuit of a stroke telemedicine solution</td>
<td>Initially pursuing a stroke telemedicine solution with the allocated SHA stroke funding; limited clinical buy-in</td>
<td>• Innovation&lt;br&gt;• Process redesign required (e.g. clinical pathways)&lt;br&gt;• Concerns over trust among network members raised&lt;br&gt;• Experimentation</td>
</tr>
<tr>
<td>August 2009 – January 2010</td>
<td>Stopping the initial European tender process</td>
<td>Halting and restarting the stroke telemedicine procurement process</td>
<td>• Risk taking&lt;br&gt;• Potential legal ramifications&lt;br&gt;• Negotiation&lt;br&gt;• Secured a preferred provider with knowledge of the clinical setting</td>
</tr>
<tr>
<td>July 2010</td>
<td>NHS policy reforms</td>
<td>Health Secretary proposes healthcare reforms calling for NHS restructuring and abolition of SHAs</td>
<td>• Fear of obsolescence&lt;br&gt;• Requisite reconfiguration&lt;br&gt;• Adaptability&lt;br&gt;• Concerns over network stability&lt;br&gt;• Mechanisms and processes put in place for network sustainability</td>
</tr>
<tr>
<td>July 2010 – January 2011</td>
<td>Stroke specifications</td>
<td>Poor regional stroke performance results leading to pro-formas required from all network organisations outlining stroke services provision</td>
<td>• Variability&lt;br&gt;• Network survival and sustainability&lt;br&gt;• Standardised level of hyper-acute stroke care&lt;br&gt;• Conflict management&lt;br&gt;• Negotiation among network members&lt;br&gt;• Resultant reconfiguration and new collaborative partnerships</td>
</tr>
</tbody>
</table>
4.4.2 Emergent themes

Three dominant themes emerged from the overall case study, which are introduced here and analysed in extensive detail in forthcoming chapters. The research design process by which I determined that these three themes were dominant was addressed in Section 3.6.

First, the issue not just of network framing, but of how frames disseminate throughout the network, arose as a key theme, as it relates to network-wide discourse, importantly recognising how these frames shape practices. The study illuminated the story of two rounds of the European tender process, which involved multiple stakeholders in a turbulent decision-making process. As Network Lead for Stroke, Joanna took a risk in halting the first procurement process, and then had to manage negotiations among a multiplicity of stakeholders to restart and conduct the second procurement process, enlisting David and Graham as clinical leads to influence the medical professionals within the Stroke Network. Collective dominant frames surrounding the telestroke procurement process, preferred suppliers, and ultimately final supplier contractual negotiations were developed. Chapter 5 investigates the framing phenomenon more closely, looking particularly at the restart of the procurement process.

Second, interorganisational network boundaries ripe with power interdependencies and knowledge boundaries were evident from the lines of professional and organisational demarcation and differentiated social epistemologies. Boundary-spanning across interstitial domains among organisations and professions revealed implications for knowledge transfer at the interorganisational level. The results suggest that healthcare networks could improve quality and other outcomes by enhancing their capabilities for knowledge transfer; network boundaries affect knowledge transfer, as do network leaders who permeate boundaries and facilitate processes. This knowledge sharing requires coordination and facilitation by network leaders from multiple professions – particularly informal network leaders – who appreciate the interdependencies among individuals, teams, task flows, pathways and cultural meanings. Original evidence and analysis surrounding knowledge transfer and boundaries are discussed in Chapter 6.
Third, network leadership processes, at both the formal and informal levels, were constantly underway, coproducing leadership collectively through competing and complementary leadership processes. These leadership processes are analysed further in Chapter 7. The findings suggest that leadership is distributed broadly as the network organisations try to increase their capacity for knowledge transfer and change while attempting to flourish and remain sustainable in a complex, turbulent and rapidly evolving environment. Following a synthesis of leadership process results, an in-depth discussion surrounding NPL as an overarching theme is addressed in Chapter 8, conceptualising critical processes and applying a complexity leadership lens to the findings.
Chapter 5: Results – Interorganisational network framing

5.0 Introduction

This chapter is the first of three analytical results chapters based on themes emergent from Chapter 4’s case narrative. In this, the first analytical results chapter, I evidence original empirical findings on framing in the interorganisational context during periods of heightened turbulence, and provide analytical discussion surrounding the case data grounded in theoretical foundations. Framing emerged as a dominant theme because it helped explain the network’s decision-making processes. It involved negotiation processes across network levels that shaped actions and practices. A primary contribution of this chapter is to portray framing in network decision-making as highly processual, contested yet collective, and tightly intertwined with relational development involving social capital. Targeting the phenomenon of framing that arose, this chapter helps answer my primary research question by identifying network processes and leadership processes. It does this at a macro and micro level. At the macro level it demonstrates that framing is part of the interorganisational network’s operational dynamics and is involved with how the network is led; at the micro level it shows various framing micro-processes (e.g. negotiation). Driven by the study’s empirical evidence, I focus on framing here and present all the data that support my contention. Framing is just one process analysed and does not provide a complete explanation of how processes are driven and practices are shaped in the interorganisational network. I introduce complementary processes in subsequent results chapters.

Descriptively, framing is a process that involves the leadership and participants of the network, and I investigate framing’s role in the overall leadership of a complex, interorganisational network. The purpose of this chapter is twofold. First, it describes a four-stage framework that demonstrates the framing process in the network. Second, it addresses underlying questions about the influencing role framing plays within network leadership processes.
Framing is interesting because it is brought about by those involved – participants engaged in the process with their own frame repertoires – and allows leaders to minimise, to some degree, what could otherwise be dissonance among different network levels, individual perspectives, logics, etc. Managing the process of framing – the four stages – effectively, allows network leaders to create structure around what could otherwise be a complicated, discordant interorganisational network across different organisational, professional, and informal network levels.

The longitudinal case study explored two rounds of the European tender process involving interdisciplinary stakeholders during periods of heightened turbulence. This chapter develops a framing framework for network leaders with analogous interdisciplinary compositions and functions and to understand practices that could affect the progressive development of interorganisational networks. This is important because it identifies underlying social capital that helps facilitate network processes and shape practices.

Within the interorganisational Stroke Network, I found that participants’ frames were the products, not only of their professions, organisational groups and network involvement, but also of numerous other facets such as their backgrounds. Therefore it is useful to conceptualise participants’ frames as the encoding of various prior experiences, including: career histories, work experience, functional and professional membership, position in the hierarchy, and contexts including their organisation, the network, the industry, and the relevant technological paradigm. Each factor possessed an institutional logic that guided views and behaviour (Thornton & Ocasio, 1999) and contributed to a repertoire of institutional logics and knowledge accumulations (Bourdieu, 1977, Gioia, 1986, Zerubavel, 1997). These frame repertoires functioned as toolkits from which actors constructed cognitive frames in responding to specific situations (Campbell 2005, Swidler, 1986, Tarrow, 1994). This understanding of frames has two implications: (1) that actors could construct different frames in different contexts and (2) that certain elements in repertoires could be shared within [an organisation] by dint of common past experiences of individuals, but could be enacted differently by each person (DiMaggio, 1997). (Kaplan, 2008:738)

Network leaders can act purposefully to shape the frames of others to mobilise support for (or decrease the resistance to) (Goffman, 1974; Benford & Snow, 2000) a key network decision. Beyond the
origination of frames, it is important to understand which frames were discarded, which used, and why. Frames employed during the framing process were dependent upon the specific context, temporal dimension and network participants involved in framing formulation, propagation and discourse processes. I discuss and define these latter terms in the next section.

During the study there were periods of heightened turbulence caused by external policy changes as well as internal pressures, which resonated among network participants (see Annexe 8 for examples). I focus on key decision periods in the network’s trajectory that led to turbulence within the interorganisational Stroke Network, examining framing during turbulent periods to understand how network-wide actions and practices were ultimately shaped. This context had the added benefit of uncovering processes that would not have surfaced nor have been revealed during periods of stability (Meyer et al., 2005; Kaplan, 2008). To provide empirical evidence regarding the specific nature of framing within a turbulent environment, I explore two key decision periods that arose during the study: initially pursuing a stroke telemedicine solution, and assessing interorganisational network stroke service provision demanding requisite specifications and pro-formas. The next section describes framing as applied in this study. During each decision period it was apparent that there were four phases: (1) framing formulation, (2) framing propagation and communication, (3) framing discourse, and (4) framing results: shaped actions and practices. Based on study evidence, I developed a framing framework that is applied here as a structural lens to analyse the Stroke Network’s framing processes.

5.1 The fundamentals of framing
The analytical strategy of this chapter focuses on instances in the developmental trajectory of the network where there was interdependence among network participants, uncertainty related to framing discourse, and the practices that were shaped as a result of framing processes. Once a primary frame was formulated and propagated, the next phase was ‘framing discourse’. Discourse here is interpreted as a process of negotiation (Strauss, 1978, 1982) to achieve a collective consensus, where not only the content of the primary frame but also the different interests,
commitments, perspectives, positions and negotiations of the network of interacting players influence discourse processes, development of the collective dominant frame, decision results of framing in practice, and emergent social and network structures that shape future practice. Beyond this interpretation, I address and define several concepts that are critical to my approach. First, I discuss framing below, which is followed by my working definition of discourse, a discussion on the interplay between power and control in framing and finally a description differentiating primary and dominant frames.

To date, the most complete conceptualisation of how strategic choices are made derives from Kaplan (2008). She argues that frames are used to ‘make sense of ambiguous signals from the environment’ (Kaplan, 2008: 732; see also Fligstein, 1990; Beckert, 1996) and assesses the ways in which the ‘frames available in relevant actors’ “frame repertoires” affect patterns of alliance and thus of coalitional struggle’ (Kaplan, 2008: 738). I align with social movement research on framing that suggests a way to demonstrate the actions and processes taken to shape the frames of others, which is based on Goffman’s (1974) articulation of frames as guides to interpretation and constructed through interaction. Frames shape how participants recognise their environment, and framing is ‘an active processual phenomenon that implies agency and contention at the level of reality construction’ (Benford & Snow, 2000: 613). According to this perspective, social movement participants engage in framing activities in an attempt to mobilise others around a particular point of view. While this research has predominantly been conducted at the organisational level, I use these theories to highlight framing within an interorganisational network.

5.1.1 Discourse

The recent study of discourse focuses on ways in which actors draw on, reproduce and transform discourses. By doing so it produces a social reality made of discursively constituted objects and ideas, involving research on the processes through which discursive objects are formed in organisations, the ways in which those objects constitute the social world, and the consequences of
those discursive processes and objects for organisations (Hardy et al., 2005) and networks. According to organisational discourse theory (van Dijk, 1997a, 1997b, 1997c; Grant et al., 1998; Phillips & Hardy, 2002), discourse is defined as a set of interrelated texts (e.g. speech acts, written documents) that, along with the related practices of text production, dissemination and reception, bring an object or idea into being (Fairclough, 1992; Parker, 1992; Phillips & Hardy, 1997). Discourses therefore help to constitute a material reality by producing ‘identities, contexts, objects of value, and correct procedures’ (Taylor et al., 1996: 28), which lead to particular practices through the way they shape what can be said and who can say it (Deetz, 1992; Fairclough, 1992). Heracleous and Barrett (2001: 758) describe the relationship between discourse and texts as analogous to that between social structure and action: ‘Just as the structural properties of social systems are, according to Giddens, instantiated as social practices, so the structural properties of discourse are instantiated in daily communicative actions’. Hardy et al. (2005: 58) build upon this and argue that ‘interorganisational collaboration can be understood as the product of sets of conversations that draw on existing discourses’. An understanding of how discursive constructions are formed may open the way to understanding that there are some discourses that constrain the production of knowledge, dissent and difference and others that enable new knowledge and difference(s). In this study, I align with Hardy et al.’s (2005) interpretation and specifically use the term ‘discourse’ to refer to the following micro-processes that occur during ‘framing discourse’: discussion, debate, negotiation, coalitional struggle, social capital utilisation and capacity building, consensus building, and collective dominant frame development. The social capital dynamics in particular reappear later in the thesis as important concepts that draw the overall findings together. The underlying dynamics of power and control are also present during these framing processes as discussed below.

5.1.2 Power and control

Power is about relationships and can also both constrain and promote action. Participants with power can use it to exclude others (Gricar & Brown, 1981) in order to avoid extreme views (Warren et al., 1974). In addition, who maintains authority, which procedures are invoked, and
what coalitional groups are formed all have different implications; thus participants could use power to influence network linkages. At the interorganisational level, power interrelations among the multiplicity of participants generate an even more complex field of frames and discourse processes because of interdependency. Individual participants are members of multiple groups and sub-networks (e.g. social, professional, and organisational), which are not mutually exclusive as boundaries are often blurred. According to Agranoff and McGuire’s (2001) work on public network management, power ‘can inhibit or facilitate collective action, including action within networks’ (Agranoff & McGuire, 2001: 316). Similarly, Giddens (1984: 283) argues that power accompanies action, and control is the ‘capability that some actors, groups, and types of actors have of influencing the circumstances of others’ action’. Hence, the ‘subordinate’ tries to acquire control, and the ‘powerful’ attempt to maintain control, via social structures (rules and resources), the power alternating between levels of autonomy (e.g. directing others) and dependence (e.g. being directed) from one time–space episode to the next. Giddens’s concept of autonomy is therefore not a singular concept; rather autonomy is tied to an opposite element of dependence. It is through the continual fluctuating tension of autonomy and dependence that control manifests itself (Layder, 1994). Pettigrew (1973) demonstrates that power mobilisation around particular issues influences the direction of strategy. Power dynamics are at play during framing processes and affect the transition of a primary frame to a collective dominant frame in order to ultimately reach a strategy decision. The next section further explains these aspects.

5.1.2.1 Primary and dominant frames: differentiated through the framing process

Primary frames are formulated by a network participant and influencer, which in this case study tended to be network leaders who were the origins of primary frames at the start of each key decision period. As Goffman (1974) argued in his original conceptualisation of frames, they are not merely tools to deploy, but rather ‘schemata of interpretation’ that allow actors to make sense of ambiguous and varied signals. Thus frames shape how individual participants view the world and perceive their own interests. In this case, network participants made choices and acted from within that perception. Framing also allowed frame formulators to suggest what was going on to
others. This process was not necessarily seamless and inevitable (Kaplan, 2008). Goffman (1974) indicates that individuals have multiple frames from which they can draw at any particular moment; therefore, it is important to recognise the processual nature of framing rather than static depictions of strategic decision-making at a single point in time, particularly during turbulent periods. It is helpful to view the interorganisational network as a collective of participants, each with different conceptions of sensemaking and possessing different frames. ‘In pluralistic organisations with multiple objectives and diffuse power bases, a collective leadership is needed to effect substantive change’ (Pettigrew et al., 2001: 708). The framing processes of individuals and gradually formed coalitions ‘aimed at mobilising frames that were congruent with others’ interests or caused others to see their interests in new ways’ (Kaplan, 2008: 738). Transitioning from the primary frame to achievement of a collective dominant frame is the result of framing discourse micro-processes.

To simplify, a primary frame is formulated by a network influencer at the outset of a key decision period based on their predisposed internal views (shaped by various factors) and related frame repertoires; as well as the way in which they intend to communicate the objective needs of the decision period (e.g. to pursue telestroke) to their fellow participants. The primary frame is propagated and communicated to the target network participants involved in the framing process during that period. The participants involved then engage in dynamic discourse micro-processes to ultimately reach the collective dominant frame. These discourse processes are ripe with power interdependencies, such that key influencers and participants shape the power dynamics throughout discourse. In the context of this study, medical professionals who traditionally wield great power in the healthcare setting reinforced this logic. Following the interplay of power dynamics involving negotiation, coalitional struggles and consensus building, a dominant frame is agreed upon by multiple stakeholders and employed to reach a collective network decision. The significant results in this study, however, are the shaped actions and practices that emerge as a result of overall framing processes. Other complementary factors and processes are addressed in
Chapters 6 and 7. This sub-section concludes the theoretical background on framing, and the next section introduces the case study framing processes.

5.2 Framing dynamics and processes: case study key decision periods

Within the Stroke Network, an important role was played by network leaders capable of engaging across multiple boundaries. Their mediating and facilitative interactions were not simply required to transmit information and knowledge among participants that did not communicate, bridging a ‘structural hole’ in the network (Burt, 1992), but they facilitated the direct interactions among these participants and orchestrated framing processes. New generative relationships induced framing shifts that led to actions that in turn created possibilities for new relationships (Rossi et al., 2009), promoting consensus building and social capital capacity building. Network managers and clinical leads, who assumed formal leadership roles, were framing architects facilitating framing processes. Specific medical professionals also emerged as framing influencers who served as informal leaders. Informal channels of influence on which change agents – in this case network influencers and leaders – rely to build coalitions, overcome resistance and shift attitudes toward new ideas are important engines of change (Battilana & Casciaro, 2012).

I focus on two main decision periods that arose during the study, which created uncertainty that generated heightened turbulence within the Stroke Network: (1) pursuing a telestroke solution, and (2) assessing network stroke service provision demanding requisite pro-formas. The focus here is on periods of crucial decision-making and influence from the inner network context in order to target those turbulent episodes during which leaders and participants were involved in the origination of frames. I examine the key decision periods in light of formulation of the primary frame, propagation of the frame, discourse, and most significantly the phenomena of shaped actions and practices.
5.2.1 Key decision period 1: Pursuing a telestroke solution

First, I analyse framing surrounding the network’s pursuit of a telestroke solution to enhance acute stroke service provision. Network leaders’ and participants’ uncertainty surrounding the adoption of a new, unfamiliar technology, made this a turbulent period for the network especially given the time and financial constraints imposed by the SHA.

5.2.1.1 Framing formulation

Participants were predisposed to frames based on their functional expertise (e.g. clinical, technical), background experiences, professional and organisational sub-networks and career trajectories (Kaplan, 2008). Framing formulation was based on an interpretation of the collected data, and during this key decision period the primary frame formulator was David. He possessed a frame repertoire grounded in his training as a medical doctor, career as a hybrid clinician-manager, willingness to adopt new medical technologies and experience of doing so, and his network affiliations. His intention was to drive network processes such that the network would select a telestroke supplier during this decision period. In conjunction with other complementary factors at play, David employed framing to achieve his goal. Thus he formulated a primary frame that (1) helped him meet his objective for the whole network, and (2) induced buy-in from multidisciplinary network participants by appealing to their frame repertoires. The primary frame David chose – as opposed to those discarded – was one he thought would best meet these two criteria. He stated, ‘I need to get the majority on board to work toward our [network] goal, so I have to appeal strongly to the different groups [professional networks] and mind-sets. How I set this up at the outset will determine who buys-in and pushes back, so my initial approach is crucial to getting this done collectively.’ This is not to say that alternative frames were not possible, particularly since all participants possessed their own frame repertoires from which they could draw multiple frames. Rather, the significance of the primary frame is that it was chosen by David to mitigate ‘framing contests’ (i.e. competing frames leading to coalitional struggles; Kaplan, 2008) given the participants involved – predominantly medical and technical professionals – in this context during this period of time. David formulated a primary frame that he thought would
most successfully minimise coalitional struggle and enable him to drive network processes toward consensus building and collective dominant frame development, thereby using framing to facilitate the network’s decision to select a telestroke supplier. Evidence supporting his facilitation of the framing process is detailed below.

David was familiar with the predominant disciplinary and professional logics, experiences and backgrounds of his target participant cohort, since as a hybrid clinician-manager he shared the two social epistemologies. Given clinicians’ dominance, David appealed to participants’ existing frame repertoires: ‘It’s the specialists I need to convince. They’re the ones who will drive this forward. We [doctors] all want to do right by our patients, so there’s common ground’. He facilitated their involvement and welcomed their participation in the framing process. For example:

I knew Eric was pushing a service delivery improvement initiative at his site [hospital], so I reached out to him and asked him to speak at the next meeting about lessons learned. He’s become very engaged, and it’s really helped move things along. (David)

I’ve been speaking with key clinical champions at different sites, especially those willing to get involved and set an example for other units. By building upon what they’re already doing well, they’re more likely to help drive progress. (Graham)

Through relationship building (e.g. ‘reached out’, ‘speaking with’, i.e. using social capital to influence), the network leads empowered participants’ contributions to the framing process by providing input and buy-in to achieve the collective dominant frame and reach a network decision on telestroke.

During this turbulent key decision period of the network’s trajectory, several potential frames could have been considered and formulated as the primary frame. Frames were based on the internal frame repertoires of those network influencers (shaped by a variety of prior experiences), in this case network leaders, who formulated the primary frame to drive network processes. For example, one potential frame could have been preservation of the status quo. If many individuals had disproportionately aligned with the status quo (Samuelson & Zeckhauser, 1988), such a frame likely would have led to network inertia, hindered network development and marginalised stroke service provision. Additional alternative frames include a play for the redistribution of resources,
improvement in the speed of diagnosis and treatment provision, or preservation of local human and
capital resources. The frames formulated during each key decision period were dependent upon the
individuals and groups within the network during that period of time, since network participants
possessed their own frame repertoires from which they could draw multiple frames in a particular
context. Despite potential alternative options for driving telestroke adoption, the study’s framing
process followed a different course focused on improved service delivery for patients and
efficiency gains.

Framing around the pursuit of telestroke within the network was pioneered by the two clinical
leads, David and Graham. David was a strong proponent of telestroke and acted as the network’s
initial clinical champion, introducing telestroke as an option based on published medical evidence
and anecdotal reports from colleagues outside the region. He was well versed in the clinical stroke
literature, which included traditional and innovative models for stroke care, evidence on outcomes
from telestroke, effective thrombolysis treatment regimens, and increased performance of
interorganisational stroke networks on stroke indicators. David explained how formulation of the
primary frame regarding the network’s pursuit of telestroke originated: ‘In January 2008, I met
with my sub-regional stroke network to discuss the role of telemedicine take-up and determined it
was the way to go’. When asked what the reason was for adopting telestroke, he indicated that the
main driver was that

many hospitals have a small number of stroke clinicians … According to the DoH stroke
must be managed by stroke specialists. Yet there are limited [clinical] resources available
across regions within hospitals, particularly within my hospital. There are numerous
resource constraints. Telestroke offers an option to collaborate with others. (David)

In describing the limitations of specialist resources:

Over time thrombolysis has spread, and other doctors can [administer] it. Smaller hospitals
can develop systems internally. Here we are training acute doctors and geriatricians so
we’re not reliant on stroke specialists [alone]. (David; see Annexe 9 – Table 1 for the
detailed discussion)

This latter statement suggested that establishing interdisciplinary collaborative processes could
improve network operations by promoting organisational interactions and shared practices that
could reduce human resource limitations at the network level. David spent a substantial amount of
time within his sub-region facilitating discussions within the clinical stroke community to build consensus among doctors who were crucial to supporting a telestroke solution. In terms of initial framing within the network, as clinical lead he framed the pursuit and goal of telestroke as:

When the doctor is outside the hospital – at home – in a time-critical case, the patient gets medication faster by using telemedicine. There are efficiency gains. There is the provision of medical expertise at a distance to ensure diagnosis in time-sensitive cases. (David)

This patient-centric goal, inclusive of improved efficiency, served as the primary frame used by the clinical leads to influence the clinicians, IT professionals and managers within their sub-regional stroke communities. The primary frame was formulated to appeal to these disciplines, such that improvement in service delivery for patients would promote buy-in from medical professionals, and efficiency gains would appeal to managers and IT professionals. David did not define ‘efficiency gains’, since defining such terms was not common practice within the network; however, he stated this in conjunction with his statement ‘in a time-critical case, the patient gets medication faster by using telemedicine’, and relied on the cognitive dominant logics within each disciplinary profession to assume their definition in alignment with his meaning of ‘efficiency gains’ within the primary frame. Overall, framing promoted adoption (Thomas et al., 1993; Kennedy & Fiss, 2009) and network change. As demonstrated here, the power of language, meaning and sensemaking were critical to the framing process. By appealing to network participants’ frame repertoires, the leads invited participation in the framing process, thereby enabling network processes through framing.

Graham communicated closely with David and was affected by his fervour for telestroke to enhance clinical pathways and expedite thrombolysis provision, ultimately aiming to improve the quality of patient services. Having been influenced by David, he then referred to the literature to understand the medical evidence-base, which he later used himself to communicate and frame the discourse within his own sub-region. During a Stroke Network meeting, Graham shared with his clinical audience:
Christopher Price of Newcastle University conducted a systematic review to examine the effects of different models of thrombolysis treatment. His data show improved patient results in a networked system. (Graham)

This shows how he reached out for evidence to legitimise a decision path. In addition, Graham was cognisant of the operational process challenges that telestroke presented within the clinical setting. Although he recognised the significance of needing ‘to understand how it will change the service we deliver’ and needing ‘to work out how telemedicine will work’, this issue was not thoroughly addressed by consultants throughout the network during the early phase of adoption framing.

Stroke specialists discussed how telestroke could be used and what it could accomplish; however, discussions about clinical pathway process redesign did not emerge as crucial until the stroke service pro-forma specification period. An early clinical network meeting in Graham’s sub-region proceeded in this manner:

- ‘The regional SHA would like the network to agree a set of standard hours for stroke service. We should provide treatment for patients during specific hours set across the region. Currently there are too few hours to provide a robust service.’ (Graham)
- ‘Doctors could back each other up at distant sites. It’s not within my grasp to give you an answer of whether or not we could do it … The more people taking part, the less hassle for us.’ (Stroke Consultant 4)
- ‘We planned to use it to support each other on-site – focusing on patients in A&E.’ (Stroke Consultant 5)
- ‘What’s going on with the person on the other end? There’s a limited amount you’ll get out of things, especially since it’s based only on the person on-site. It’s not just a question of installing the equipment, but we would need a lot of training.’ (Stroke Consultant 6)

Despite engaging with the primary frame of enhanced service delivery for patients as well as increased efficiency, the specialists did not delve deeper into discussions of how telestroke would practically affect their daily operations. Due to network leaders’ framing, the focus of the network was on the selection of suppliers within the telestroke adoption process. When this issue was raised by the clinical leads within their respective clinical sub-networks, the medical professionals became fixated with more micro-processes such as standardising medical history reports across organisations. Since the discourse surrounding that issue took time, and subsequent priorities were placed on their meeting agendas by the clinical leads, the issue of pathway process redesign was not discussed. The clinical leads did not formulate a frame and facilitate discourse around this issue to resolve it at this stage in the network’s trajectory, suggesting that the absence of a primary
frame and related discourse to develop a dominant frame caused persistent ambiguity in the network on this issue. This led to uncertainty within the clinical community about the utilisation of telestroke solutions, which ultimately created turbulence within the network during the pro-forma period (Key decision period 2). Overall, the evidence demonstrated that as a network leader, David purposefully formulated a primary frame that had a patient-centric goal inclusive of improved efficiency. He and the other leaders championed this frame to facilitate the interorganisational network’s decision-making and actions toward the shared goal of telestroke supplier adoption.

5.2.1.2 Framing propagation and communication

In addition to framing the beneficial uses of telestroke within the medical professional network, David, Graham and Joanna propagated the primary frame (i.e. improved patient services and efficiency gains) and communicated it to develop the network’s dominant frame on the issue. The core group coordinated telestroke supplier demonstrations to an audience of interdisciplinary network participants aiming to convince medical and IT professionals of telestroke’s benefits. During each supplier demonstration, one of the network leads asked variations of the following questions to reinforce the dominant frame among participants: ‘How is your equipment going to help us improve care? How does it help our specialists improve clinical efficiency?’ The network leaders also arranged site visits to London-based hospitals utilising telestroke technology to show how it was being used in clinical settings and to facilitate participants’ interaction with clinicians using the technology in situ to reinforce the primary frame. Framing processes were employed to engender a shared purpose in the network, and propagation of the primary frame aimed to align participants’ frames around this collectively shared purpose. To frame the issue, network leaders offered suggestions for looking at the problem differently, providing alternatives beyond the status quo to initiate discourse and shape actions. For example, after one of the demonstrations in the second procurement round, several clinicians and IT professionals vocalised support for the large, global telestroke equipment supplier with the most advanced technological features. ‘[Supplier C] is well-known for its range of innovative products. They were very impressive’ (IT manager 2).
However, Supplier C had never placed telestroke in a clinical setting and responded insufficiently to questions surrounding clinical implementation. In order to propagate the primary frame:

[Supplier C] can dazzle us with their technology, but what we need are improvements we can make in the clinical setting. They couldn’t fully demonstrate that. I don’t get the sense that they truly understand how we deliver services, how their technology is going to change that. It’s not just about fancier kit but also about improving our clinical pathways and service to patients. (David)

Framing provided a basis for independent network members to participate and a set of principles around which to organise their efforts (Rethemeyer & Hatmaker, 2008).

Framing was used to initiate discourse and manage impressions and also aimed at getting the intended audience to see things differently and buy into the primary frame such that it would gradually become the collective dominant frame. Hence the network leads – commonly frame formulators – ensured that the primary frames appealed to a multidisciplinary audience.

Each site will receive telemedicine kit and choose how they want to use it. The key now is deciding on a single supplier to provide the technology. Keep in mind the reasons we’re doing this – improved services and efficiency. (Joanna)

Framing efforts were closely linked to both the network leads’ frame repertoires and that of other participants (e.g. Fiss & Hirsch, 2005; Kaplan, 2008). Framing processes invited network participants’ involvement; whether they were proponents of the primary frame possessing complementary frames or opponents with competing frames, they joined the discourse processes and coalesced to advance their own frames and interests. One vocal IT lead in particular possessed the frame whereby the selected supplier should have the most sophisticated technology. He argued: ‘This is our opportunity to pick the most technologically advanced equipment to ensure longer-term utilisation within the network’ (IT Manager 3). He presented a competing frame to the primary frame the core leadership group was propagating, which threatened consensus building among the participant audience. To progress the discussion:

Thanks for your expert insights, Steve. You raise a great point. If we want to ensure long-term usage of the technology in the network, we need to make sure it meets our main service delivery goals as well. Let’s revisit this at the next meeting. (Joanna)

As a result, interests shaped ideas, but frames also created contexts for action, contexts that then reciprocally shaped the interests that participants came to have (Kaplan, 2008). Participants such
as Steve took part in framing practices to influence the collective dominant frame and ultimate decision to pursue a telestroke supplier, resulting in changed actions and practices at the network level.

In addition to the primary frame centred on improved service delivery and efficiency, Graham and David propagated the frame such that consensus building would be a requisite component of adoption framing discourse. Following two supplier presentations within his sub-region, Graham communicated the following to clinicians:

"Our feedback will be relayed back to the SHA, which is responsible for buying one solution for the entire SHA stroke network. Each Trust gets the same [telestroke] solution, and each then develops how to operationalise that product solution. (Graham)"

Identifying the end goal as a single solution that each organisation could choose how to use framed the stroke specialists’ views on negotiation to reach a consensus on a single preferred supplier by the end of the procurement process. The social structure created survival advantages for network participants and the network as a whole by absorbing uncertainty and creating a ‘negotiated environment’ (Pfeffer & Salancik, 1978), and one function of network leaders was to reduce uncertainty and reach a ‘negotiated environment’. David reinforced this stating, ‘The purpose of this process is to formulate an approach we can all agree with at the network level. We had to work toward a specific shared objective, and my job was to get members to buy-into our approach. This involved back-and-forth negotiations to reach consensus.’ It is also important to note that Graham and David framed the ultimate outcome – selecting a telestroke solution – rather than framing the issue as one of whether or not the Stroke Network would be purchasing a telestroke solution. Hence the frame they propagated centred on adopting telestroke, and due to power dynamics within the network, they controlled the framing process. Although the absence of this decision did not create immediate uncertainty, the issue of how clinicians would incorporate telestroke into their existing clinical pathways later caused ambiguity, as discussed during Key decision period 2. To further drive the adoption process, Joanna told participants, ‘We want to be an early adopter and get things started’, following a telestroke demonstration, which created a sense of urgency among participants. Observational analysis, documentary evidence and informal materials (e.g.
emails) revealed the interdisciplinary negotiation process that occurred throughout the network to build consensus around telestroke, as discussed next.

5.2.1.3 Framing discourse

In this section, I present two different aspects of framing discourse. First, I demonstrate several of the micro-processes by which network participants developed discourse during Key decision period 1. Second, I analyse how the primary frame became dominant and how network participants generated that transition from primary to dominant. I showcase network processes and the transition from primary to dominant frame using study data. Although I address the decision reached, the significant empirical findings pertain to discourse processes.

First, I focus on the transitional process from primary to dominant frame. The primary frame was formulated to appeal to the network participants’ dominant disciplines. So David propagated the primary frame within the network: ‘Rapid assessment within our hospital and inter-hospital assessments are to be done as well in the future. This will enhance our service to patients’. As a fellow hybrid clinician-manager and network leader, Graham communicated the primary frame in discussions: ‘We need to determine what bits of [telestroke] kit people need for their service to determine optimal use and improve care’. The wider network framing discourse revealed alignment between each discipline and the primary frame. First, clinicians mainly focused on improved services for patients:

Telemedicine allows us to view what needs to be viewed on the patient to make the right diagnosis and provide the best treatment. (Stroke Consultant 7)

In addition to aligning with the ‘improved service delivery for patients’ portion of the primary frame, several clinicians also aligned with the ‘efficiency gains’ element. For example:

[With telestroke] I can get the neurologist to look at it because I don’t have a neurologist in [my district hospital]. It’s a fantastic facility to have … It would allow me to do my job better … It’s allowing us to give clearer information to our patients. (Stroke Consultant 8)

Timely availability of a neurological specialist in the absence of local specialist resources increases efficiency within the local organisation as well as the wider network. Similarly, a few
managers and IT professionals, who were involved at the more macro-network level, bought into both components of the primary frame.

Telemedicine would ensure the patient is assigned to the right area, the CT scan done in a timely fashion, then the patient goes somewhere to be monitored 100% of the time, improving their likelihood of survival. (Service Development and Improvement Manager, NHS)

The reasons for doing this [adopt telestroke] is to get people in the right place at the right time. It’s about the relevant stakeholders…We need to ensure organisations work together if we’re going to prioritise patients’ needs. (Director of Hospital IS, AMC)

Efficiency gains appealed to the majority of IT professionals, for example:

We then have to ensure it works properly and accomplishes what it is supposed to … improve efficiency of services in-house. (IT Manager 1)

[Consultants] won’t have to jump in the car and drive to hospital and then drive all the way back home again. Instead, things get done in a timely manner. (IT Manager 5)

Network participants’ frames were typically differentiated based on their discipline, and primary frames were gradually propagated within the disciplines as well as across boundaries due to cross-disciplinary and cross-organisational interactions within the interorganisational network. As shown here, elements of the primary frame were adopted and communicated by participants during the discourse process, leading to the collective dominant frame aligned with the primary frame. All participants’ frames shared at least one of the components formulated in David’s original frame of utilising telestroke to improve service delivery for patients and achieve efficiency gains. Critical framing discussions occurred among core leaders Joanna, Graham and David. In addition, their campaign for supplier selection led them to communicate their primary framing of the issue within formal clinical and non-clinical network meetings.

Next, I focus on the discussion, debate, negotiation and social capital-related micro-processes of framing during this decision period. The agenda at numerous meetings included the topic of telestroke; however, much of the framing propagation and discourse occurred in the background informally across multiple network levels (see also Annexe 9 – Table 2). For example:

The [informal] networking I do is mainly after [clinical stroke] network meetings. It’s about discussing the issues, especially following the debates that occur during meetings when our ideas aren’t aligned, and getting everyone to coalesce around the issue at hand. Each hospital is different, as is each stroke unit, so there are always strong, multifaceted
opinions. It takes time, and there’s a lot of back-and-forth posturing, but eventually we come to agreement on what’s best for the majority. (Stroke Consultant 3)

Not everyone sees eye to eye on telemedicine. Everyone is looking out for their own unit, so we debate a lot on what works best for the majority … By the end, following some intense discussions and convincing, we’ll find a comprehensive solution. (Stroke Consultant 8)

Here, the stroke specialists highlighted the micro-processes of discussion (e.g. ‘discussing the issues’), debate (e.g. ‘back-and-forth posturing’, ‘we debate’), and negotiation (‘come to agreement’, ‘convincing’). Through leverage of social capital and consensus building during negotiations, network participants could ‘come to agreement’ as demonstrated by Graham: ‘I spend time with key colleagues in each unit to ensure they’re on board. They then talk to local colleagues to get them to buy-in in advance of the meetings’.

First, the medical professional network was the most significant level across which discourse occurred.

Well I think the informal discussions certainly are important. The corridor discussions [at network meetings] are about ‘here is my situation, this is what worked best for us, what do you make of this?’ And by getting a feel for what would be useful for smaller units, you sometimes discover that actually the big directive objectives cannot be delivered into all places locally. … And so whilst you’re trying to see which bit of this big network machine you are fitting in and where you are going to deliver your little function within the big network machine, you can work more closely with people. (Stroke Consultant 2)

In this case, a specialist at a smaller district hospital raised the importance of local agendas fitting into the wider network agenda, and more importantly addressed how this was accomplished through informal exchanges (i.e. social capital capacity building) and consensus building (e.g. ‘work more closely with people’) during framing discourse across the interorganisational clinical stroke community. His comment also highlighted the dialectical issue of smaller v. larger units, which in this context referred not only to smaller district hospitals compared to larger Trusts, but also to the power dynamics between academic and clinical organisations in the healthcare context. Despite shared membership in the wider medical profession, clinicians from each organisational type often maintained distinctly different cultures. Epistemic culture clashes between AMCs and exclusively clinical-focused organisations are common (McGivern & Dopson, 2010), and this case suggested that framing within interorganisational networks needs to appeal to participants in both
types of organisations if the framing process is to successfully shape actions and practices. The
next example illustrates how frequently informal exchanges occurred during framing discourse and
resultant decisions that affected the wider network, which resonated among many medical
professionals.

Sometimes it’s discussions at conferences, sometimes it’s at these [Stroke Network]
meetings. So it’s all extremely varied. I think big meetings, big network meetings can
help. Yes, there’s an agenda, but they are also places that you discuss with colleagues …
so it makes it easier to have the informal discussions outside these meetings. And I think
that goes on quite a lot and a lot of big changes and plans come out of those informal
meetings. (Stroke Consultant 9)

This example emphasises the framing discourse that occurred informally among clinical
colleagues, whereby discussion, debate, negotiation, informal exchanges, and consensus building
achieved a dominant frame among network doctors. Through framing discourse processes, the
primary frame transitioned to a dominant frame. That dominant frame was shared among medical
professionals to ultimately reach their collective position and make a decision on issues such as
telestroke. The study highlights the importance of both formal and informal exchanges during
framing discourse and also suggests dynamic power shifts between formal and informal network
influencers when informal exchanges occurred. Although network leaders possessed greater power
and control over formal exchanges during the framing process, they maintained less power and
control during informal exchanges.

Extending beyond the disciplinary frames that propagated within the professional network, a
macro analysis of the interorganisational Stroke Network revealed framing at two other stratified
levels, organisational (i.e. within hospitals and Trusts) and interorganisational levels. This
stratification reinforced the whole network’s layers of complexity. Organisational level analysis
revealed framing discourse within network hospitals.

I think with [my district hospital] our biggest problem was that there was never really
enough of us doing stroke for us to have a full up-and-running 24/7 stroke rota. So to have
a hyper-acute, the national guidelines for that are telemedicine facility would be provided
to only those institutions providing hyper-acute stroke services, and we do not have a
hyper-acute stroke unit because we just don’t have the manpower to support it. And so for
that reason we discussed it here, are in support of it, and all the physicians who are
involved in stroke at [my district hospital] want to work within the network because of our
inability to deliver a hyper-acute service at present at our site. (Stroke Consultant 8)
Here, a district hospital consultant explained the limited specialist resources he and colleagues faced with regard to stroke service provision. They acknowledged their lack of capacity to cover a 24/7 stroke rota, internally discussed the best approach for their hospital, and following consensus building reached agreement on the dominant frame. Through these discourse micro-processes, they decided to support efforts within the wider inter organisational network to provide better patient services. All medical professionals agreed that improving patient service was crucial to their work and the shared goals of the network as a whole. By improving patient outcomes, they improved their performance results as physicians, which in turn enhanced both their personal as well as their organisations’ reputations for higher quality medical care. This suggests that framing discourse processes at the organisational level are important for shaping actions and practices at the inter organisational level, which is an important finding of this study.

Framing discourse also occurred at the inter organisational level. At the macro level of the three stratified levels analysed in the study, the importance of the inter organisational level rested in the cross-boundary interactions, power interdependencies and dynamics of framing discourse within the wider network. An example of these micro-processes is exemplified here:

Within the network the ability to get information to people fairly quickly and to get opinion from other people, but also to discuss the strategy and to discuss national and local agendas quickly, means that some of the burden is shared. In terms of the network, I think some of the national strategies have been difficult for us to get our head round, and so by having people like Joanna and Graham at some of these meetings, they help us to delineate the things that we should be measuring … help us to identify the areas that others are moving ahead of us and the areas where we need help with etc. So in terms of the usefulness of the network, that is fantastic. (Stroke Consultant 10)

The consultant described timely information flows across disciplines as well as an element of discourse (e.g. ‘get opinion from other people’) as benefits of the network. He also identified the role network leaders played in framing issues within the network, identifying key areas of attention for organisational members (e.g. ‘they help us to delineate the things that we should be measuring’). Joanna and Graham propagated and communicated primary frames across the network, which assisted multidisciplinary professionals and organisational participants in reaching
a dominant frame around critical issues. The consultant went on to describe the nuanced manner in which frames were propagated within the network:

Where our commissioners have been slow to react to our demands for certain services, they’ve [Joanna and Graham] said ‘well actually if you take this to the commissioners and say “this is the national target” then they have to commission these services’. So they’re giving us direction in terms of being available to help us formulate plans to influence commissioners and making sure we get some things done more easily than we would’ve done by ourselves. (Stroke Consultant 10)

Although it is common for dominant frames to be shared within a relevant group, such as medical professionals, the complexity of the network’s boundaries also raised issues about dominant frames. Given the different cultural and social epistemologies within the network, multiple complementary and competing frames were found among network participants. These frames pertained to the alignment of perceptions, interests and expectations surrounding participants’ discourse processes; dynamics of power and control were involved in this process. For example, one hybrid commissioner noted the dominance of medical professionals in reaching a consensus:

It’s also about pride in the service you provide … The majority of changes I’ve been involved with have generally been driven by clinicians and had a clinical consensus, and the clinicians are not averse to making those changes happen. They go for them for better care. Every one of them can agree on improving care for patients. (Commissioner and clinician)

Given the power that medical professionals commonly wield in this context, network leaders used frames that appealed to this cohort to promote their primary frame as the collective dominant frame, thereby affecting change in the network amid these power dynamics. There were inter-related power dynamics and resource dependencies that were mediated by conceptions of control, framing and other complementary factors (Zald & Berger, 1978; Fligstein, 1990; Davis et al., 2005; Kaplan, 2008), whereby the dominant frame emerged from discourse involving micro-processes such as consensus building. My findings revealed that when participants thought their input was valued and taken into consideration to reach the dominant frame, they were more inclined to embrace the primary frame, align with it, and build consensus around it so that it transitioned to the collective dominant frame. For example:

I find that getting a clear idea of where we’re going as a region and the wide Stroke Network is helpful. I discuss and share what we’re doing in our patch, as do my colleagues from other hospitals, and Joanna and David are great about absorbing that info and identifying lessons learned that work best for the network. …We all want to do what’s best
for our patients. At the core, we want to improve patient care. David gets that, and we know it’s what drives a lot of the network’s agenda. (Stroke Consultant 7)

Based on comments from multidisciplinary network participants, the project sponsor summarised the dominant frame during a telemedicine project adjudication meeting: ‘We’re working toward achieving best practice of cardiovascular pathways for our patients to receive services in a timelier manner and improve delivery’. Despite participants’ alternate frames involving financial concerns (e.g. ‘We’re looking to address the financial implications’) and IT implementation (e.g. ‘How will things work once the telestroke cart is delivered to our hospital?’), the discourse processes created a dominant frame aligned with the primary frame; that which had been formulated and propagated by the network leads focused on service delivery improvement for patients and efficiency gains.

Amid the cross-disciplinary discussions and competing and complementary frames that were negotiated throughout the discourse processes, David and Graham maintained essential roles in driving the formulation, propagation and discourse of the dominant frame. By creating opportunities to demonstrate the technology’s applicability and engaging in interdisciplinary consensus building, these pivotal roles shaped the network’s dominant frame – all were mechanisms used by network leaders that laid the foundation for a framework on interorganisational framing. The next section explains the most significant component of framing, which are the resulting shaped actions and practices.

5.2.1.4 Framing results: Shaped action and practices

This section focuses upon the interorganisational network’s shaped actions and practices resulting from the overall framing process. I describe the effects framing had in this case by analysing changed actions and newly instituted practices that resulted from framing during Key decision period 1. The results revealed details on the point of origin of framing and key influencers. During this period, the decision as to whether or not to pursue telestroke was initially driven by David. After formulating the primary frame, David built consensus within the core leadership group to facilitate framing on which telestroke supplier to select. He and Graham then approached their
clinical colleagues to propagate the primary frame. The primary frame propagated throughout multiple professional and organisational sub-networks (see data in Annexe 9 – Table 2). During discourse, network leaders influenced power and control by employing their primary frame that appealed to the dominant group of medical professionals. By using a frame focused on improving service delivery for patients, leaders could gain buy-in from clinicians as the collective dominant frame was shaped and developed at the interorganisational level. Framing, along with other complementary factors, allowed leaders to maintain greater power over the change process by getting clinicians’ frames and the collective dominant frame to align with their original primary frame, driving the network forward with a mutually agreed decision about telestroke supplier selection.

[The network] deliberated about telestroke for months, and once everyone understood we’re doing this to improve care for patients and have an all-round better service, we could get them to work out their concerns. We discussed, often debated … Through some give-and-take, Graham and I ultimately secured specialists’ agreement to adopt a solution. (David)

Graham reinforced this view: ‘It’s not easy to align multiple views and perspectives, but our ultimate goal here was to work toward improving care and our clinical pathways given the time critical nature of our work. David and I made the rounds, trying to get groups’ agreement with the approach to achieve our network goals.’ More significantly than the decision reached were the practices shaped as a result of framing. Results from this key decision period included two specific shaped practices: (1) strengthened communication linkages and networking, and (2) adoption of telestroke technology introducing a new way of interorganisational working.

In this case, the critical processes that changed related to the creation of communication links across disciplines within the network. Framing by network leaders – along with other complementary factors – involved participants from a multiplicity of organisations and disciplines, who came together both formally and informally to engage in discourse processes. Framing facilitated processes and involvement by participants, resulting in the formation of new and/or stronger communication linkages as well as interpersonal and professional linkages. For example:
These network telestroke discussions helped me verbalise what we’re doing at our hospital and learn what colleagues at other organisations are doing. We share challenges and ways to overcome the barriers we’re going to experience. It helps to get new ideas for how to improve things. (Stroke Consultant 4)

We established a weekly discussion group at my hospital so the different working groups can come together and discuss the best approach for us locally based on what we decide at the network meetings. (Stroke Consultant 5)

There were complementary issues at play here, such that framing, along with other corresponding factors – including the other results themes in Chapters 6 and 7 – affected participants’ engagement in network-wide processes. In addition, discourse surrounding telestroke supplier selection raised the issue of standardising clinical processes. For example, a specialist remarked:

We need to collect a comprehensive medical history that anyone could use, regardless of training level. So even if a junior collects history, we secure a complete report to diagnose remotely. (Stroke Consultant 6)

Consultants discussed the need for a standardised medical history form, which was introduced during framing discourse and instituted within the network at a later period. Framing was a useful mechanism for network influencers, particularly leaders, to shape future network practices. Two specialists at [Hospital D] developed an algorithm-based online medical history tool and mentioned it during the meeting. I recognised their efforts to standardise processes and encourage more widespread use. They offered to share it with clinical colleagues then and there to test it out before trying to incorporate it with telemedicine. (Graham)

The next section discusses framing during Key decision period 2.

5.2.2 Key decision period 2: Assessing the network’s stroke service provision – specifications and pro-formas

As discussed in Section 5.2.1.1, stroke specialists did not address how telestroke would practically affect their daily operations, since they were preoccupied with other discourse targeting telestroke adoption and supplier selection. They did not possess a clear understanding of their organisational clinical pathways, how telestroke would fit into those pathways, nor how it would affect patient care. This underlying uncertainty and ambiguity around clinical process design was exacerbated when published NHS performance outcomes revealed that the Stroke Network was the worst performing in the country. With poor performance indicators revealing that many hospitals in the
networked region were not achieving minimum targets, Stroke Network leadership was forced into action.

5.2.2.1 Framing formulation

In this section I describe the nuanced manner in which the primary frame was formulated within the network, demonstrating the process by which network leaders reconfigured the primary frame in order to facilitate participants’ involvement and ultimately met their objectives for the network as a whole. Unsatisfactory performance results, in conjunction with pressure from the new SHA executive leadership, created an environment of heightened turbulence for the stroke network. The network faced serious financial and managerial implications, particularly since this key decision period occurred amid sweeping NHS reforms. At this stage in the network’s trajectory, network leaders could have applied alternative frames to the situation. For example, SHA-based network leaders such as Joanna could have framed the issue around effective allocation of resources, preservation of local resources or perhaps reconfiguration of routines. As a worst case scenario, knowing her job might be terminated at any time due to NHS policy reform, she could have framed the issue to maintain the status quo, drawing the network into a period of inertia resulting in persistently poor network performance.

Rather than these potential alternative frames, Joanna initially framed the issue as a mandate from bureaucrats at the SHA and commissioning panel responsible for network financing. She, Graham and David then escalated the issue to frame it around Stroke Network survival and by extension Stroke Network participants’ survival. During this episode, the stakes were raised dramatically for network participants, since there was higher risk due to the financial implications and impending threat of stroke unit closures. Since this threatened network sustainability, Joanna introduced a system stressor (e.g. pro-forma) that brought participants together, such that survival was indeed the common goal. In contrast to network participants’ response to bureaucratic mandates and requirements, they more readily engaged with the ‘network survival’ framing process. During this key decision period, the primary and subsequent dominant frame transitioned from bureaucratic
mandate to survival of the network due to poor performance. Again, the power of language and meaning through frames played an important role in welcoming network participants’ involvement in framing processes during this key decision period. Framing was not about exclusion, but rather network leaders reframed the issue so the discussion was more inclusive. By framing the issue in a certain way (i.e. network and participants’ survival and sustainability), the network leaders were able to gain participants’ buy-in, input and participation in framing processes to achieve network goals and ultimately shape practice. This framing process shifted the network to acknowledge the serious consequences of stagnation and lack of collaboration that could result in an unsustainable network, demonstrating how alternative framing led to alternative consequences and thus alternative futures. This latter point is discussed in the Conclusion, and below I discuss the framing analysis of Key decision period 2 in detail.

Stroke Network leaders urged clinicians within the network to meet and discuss how they might develop a framework of service specifications to go to commissioners and ultimately to the SHA Chief Executive. They were told to outline a plan of action involving each organisation within the Stroke Network. Insufficiencies within the network had surfaced, and its leadership was forced to recognise the limitations of stroke provision throughout the network. For example, as Joanna mentioned, ‘These performance results are horrendous, and I’m getting a lot of pressure from my boss and the exec leader to do something about it’. As a result, the SHA Cardiovascular Network management, overseen in the stroke network by Joanna, established a priority agenda that required every Trust and affiliated hospital within the Stroke Network to submit a pro-forma document outlining the organisation’s capabilities, capacity and resources for stroke service provision. Joanna communicated this mandate to network clinicians:

In terms of service specifications, everyone should be working on pro-formas, which are due on 7 October. That’s the completion date for PCTs to submit their applications regarding capacity for stroke service/treatment. On 13 October, a panel will review submissions, since the SHA is looking at the whole pathway overall throughout the network, hyper-acute at QIPP [Quality, Innovation, Productivity and Prevention] basis provision. Whichever organisations want to provide stroke services must submit a pro-forma. (Joanna)
The goal was to require all hospitals to describe their service specifications for stroke, collect and analyse these data at the network level, then compare them against a list of developed criteria to determine which organisations would be deemed acute and hyper-acute centres for stroke, if at all. The pro-forma requirement was a new tool that Joanna and the SHA panel, with Graham’s and David’s approval, used to activate change within the interorganisational Stroke Network. Pro-formas were not a standard practice previously employed, but rather a key mechanism devised to understand stroke services within the region as well as create a sense of urgency and generate change among network participants given the poor performance outcomes. Language such as ‘must submit’ reinforced framing of the issue around a bureaucratic mandate. In this case, the network leaders consciously chose to disrupt the status quo to shock the network out of its inertia. However, as discussed during the discourse phase, network participants grew angry about the mandate and resisted this change. To combat resistance, Joanna, Graham and David reframed the issue and system stressor around the network’s, and hence network participants’, survival. For example, Joanna told participants: ‘The risk is that there will be stroke unit closures throughout the network’. Building upon this risk and vulnerability, Graham told his clinical colleagues:

They’re threatening unit closures, which will have a severe impact on the network overall. Hospitals and Trusts will be adversely affected if this happens. Groups are going to need to work together to demonstrate stroke services in our patch. (Graham)

By reframing the issue around network survival, the network leaders created an opportunity for network participants to band together and collaborate across organisations and professions in order to salvage network sustainability, thereby initiating interorganisational momentum.

5.2.2.2 Framing propagation and communication

As Joanna told clinicians during a meeting: ‘If you can’t complete the pro-forma, how can you provide the service?’ Clinicians pushed back, arguing ‘It isn’t that simple’, and even requested to submit one collective pro-forma for the entire network, primarily to avoid transparently revealing local service specifications. This resistance illuminated the power dynamics within the framing process. If a clinical majority had joined in the resistance, network leaders would have faced an alternative outcome; however, the power differential remained favourable for network leaders.
Joanna asserted and framed the issue as such: ‘No, we need the different specs so we know what’s going on at each site. We absolutely need one pro-forma from each site to make sure stroke standards are being met’. The negotiation process was quickly thwarted when Joanna and Graham indicated that the SHA would be requiring the service specification process to determine the financial implications and use of telestroke at the hospital sites, noting the potential for unit closures if service criteria were unmet. Unit closures threatened the survival and sustainability of the network and its participants; hence the specific language and meaning inherent in the primary frame had implications for participants’ sensemaking as well as their involvement in framing processes. During this key decision period, pressure to submit service specifications generated significant turbulence within the organisations throughout the network, since they knew their services and finances could be at risk. In addition, the mandatory nature of the pro-forma process suggests that network leaders asserted their power and control in this quasi-hierarchical interorganisational network. Joanna framed the issue around the mandatory submission of the pro-formas, employing a system stressor to instigate action within the wider network. Disseminated by the core leadership group, the formal requirement framed the issue as severe with serious implications for each organisation if pro-formas were not submitted.

5.2.2.3 Framing discourse

In this section, I exhibit a range of micro-processes by which multidisciplinary network participants were involved in discourse and through which the primary frame became dominant. Of note during this key decision period is the complementary employment of a system stressor to drive network processes. I also describe how the primary frame transitioned to the dominant frame based on involvement from multiple stakeholders. I highlight network processes and demonstrate the transition from primary to collective dominant frame by providing empirical evidence from the study. During this key decision period, network leaders reframed the issue so the discourse processes were more inclusive; thus framing enabled participation in network processes.
During the pro-forma review period at the Cardiovascular Network Steering Group level, the data and content of the documents were thoroughly reviewed by a panel of network managers, commissioners (including two hybrid clinician-commissioners), a clinical adviser, the Cardiovascular Network Director, and Joanna. Graham and David did not participate to avoid conflict-of-interest issues. Due to the lack of thorough pro-forma completion in some instances, the Director noted, ‘I thought the whole point of this meeting is to commission stroke services in our area. Why would we commission a place that isn’t planning to operate over the long-term?’ Based on observational analysis of the seven-hour meeting, she took a very conservative stance with pro-forma approvals, such that she would only approve a hospital if it met every criterion. By contrast, one of the other vocal panellists took a less rigid approach. As a result, debates and negotiations among panellists ensued during the lengthy meeting over which hospitals would be approved. Network participants stated:

If they can’t provide a service, they can’t provide it! Ultimately it’s up to providers if they provide it or not. They’re putting patients at risk. To me that’s the whole point of the process … can you meet this specification and provide this service? If not, what’s your plan? (Stroke Manager 4)

A hybrid clinician-commissioner panellist argued:

We need to consider all the factors. Perhaps they don’t have the right mix of resources. We can’t just close an entire unit without carefully considering all details … there are repercussions! (Commissioner and clinician)

Joanna expressed her concern that she would have to be the one to prompt critical discussion and analysis of the pro-forma submissions. She was glad that the commissioners were holding each other accountable and entering into debate as a group. Despite their engagement in the framing discourse processes, she was aware of the broader coalitional struggle whereby clinicians external to this meeting were calling into question the panellists’ intentions. Joanna commented: ‘A few consultants are looking at this as an ‘us v. them’ situation and digging in their heels about the pro-forma implications … David is going to reason with them from a clinical perspective.’ In this way, network leaders employed social capital capacity building and consensus building. Critical discussion and debate of pro-forma submissions with insufficient information, lower quality standards and so on were negotiated by the panel to make difficult decisions about the different
organisations’ capabilities and capacities to provide quality stroke services. It became obvious throughout the discourse that several hospitals provided insufficient stroke care and did not have the clinical processes in place to manage an acute or hyper-acute stroke service.

Observations and some interviewee responses pointed to the existence of heterogeneous, multiple levels, and places for framing (especially discourse processes) where a collective, unanimous opinion was not always present. Despite the positive intentions of the primary frame, the initial framing approach used by network leaders – mandating pro-forma submissions – generated dissatisfaction among network participants. Discourse among participants who completed pro-formas revealed their differing critical views on the mandate:

The conversations have been forced to take place. Actually, what this has forced us to do is to try and have a more constructive dialogue with some of our commissioners and to really tease out what they want from us, because I don't think that’s always been very clear. (Stroke Manager 6)

Despite their critical views, the network participants’ frames aligned with the primary frame of network survival. For example, as one stroke consultant noted:

This is a serious process because we’re at risk for potential stroke unit closures in our region. It’s unclear what this will mean for specific hospitals, but many are concerned about what will happen to our hospitals and the network. (Stroke Consultant 13)

Another specialist at a smaller district hospital said, ‘If we get shut down, I could be relocated’.

With similar perspectives shared by many interdisciplinary Stroke Network participants, whether motivated by their internal desire for personal survival within the network or for the interorganisational network’s sustainability overall, the dominant frame grew from these concerns, transitioning from the primary frame through discourse to a dominant frame focused on network and participant survival. Commonality between the network leaders’ primary frame and the collective dominant frame was evident.

The network leaders facilitated the framing process, requiring pro-formas from network participants in order to shape actions around transparent communication of local stroke service capacity. They also endeavoured to ultimately shape clinical practices such that interorganisational
network stroke pathways and service delivery would improve. Despite these intentions, some managerial and clinical participants criticised network leaders’ approaches:

> It’s not having a clear direction and clear vision and leadership from the commissioners and saying actually ‘this is the model we want to deliver’. It hasn’t been very much driven by them actually, and I don’t necessarily think that’s the right way it should have happened. (Stroke Manager 3)

> They adopt new strategies without thinking through the implications, resource implications. And I think this is part of the reason that in our establishment we’ve been a little bit slow in picking up some of these things. I think a lot of the outcomes that are clinically driven are certainly useful outcomes to chase, but a lot of the outcomes that are top-down – yes, some of it is good, some of it is aspirational, some of it comes without any plan as to how it is expected to be achieved or delivered. (Stroke Consultant 14)

In addition to their critique of the processes underway driven by network leaders, their comments revealed the effectiveness of framing propagated by Joanna, Graham and David, related to meeting a standard requirement aiming to improve service delivery and outcomes for patients. By introducing the pro-formas as a system stressor and framing them as mandatory submissions, then reframing the issue as one of network and participant survival, network leaders generated momentum within the wider network across organisations and multiple professional levels, thus affecting processes at the interorganisational level. As evidenced by the data, framing enabled network participants’ involvement in framing processes. Whether contributing complementary or competing frames, participants became involved in network processes facilitated by network leaders.

The clinical adviser invited by Graham and Joanna to join the review panel recognised the importance of this overall process. Given the interepistemic culture clashes between academic and clinical organisations within the network (McGivern & Dopson, 2010; see also Sections 5.2.1.3, 4.3.1, 4.3.2), Graham felt it appropriate to remove himself from the process so as not to demonstrate a conflict of interest. Instead, he asked for guidance from an impartial clinical adviser from another region’s stroke network to provide clinical expertise and input during stroke service review meetings.

> The dynamics within the patch, as I learned from commissioners and informally from Graham, are strained. There exists an inability to trust to work together. They weren’t delivering the stroke strategy – trust played a major role. ‘We are who we are and not
changing’ are some of the responses I received. There was arrogance from the early doctors who were involved. (Stroke Network Clinical Adviser)

The clinical adviser’s presence during panel discussions reinforced the serious framing of the issue, since a respected, clinically and managerially proficient external party reviewed and critiqued the internal processes of the network. His involvement thus affected framing within the panel, since he was able to provide an objective perspective, and panel members wanted to be seen as being tough where necessary on insufficient service provision in their organisations. Following initial review of the pro-formas, the panel invited all organisations to present their case and detail current and intended stroke service provision. The clinical adviser noted his expectations:

Clinicians at the table need to be accountable to the panel. We expect clinicians to be included in teams to present to the panel as well as the high executive level to come present to the panel. Presenting to me directly as a clinician creates transparency at the commissioner level. It involves transparency and thus accountability at the clinician level. Essentially the presenters couldn’t get away with selling ideas to the panel that did not have a clinician present. I represented the clinician perspective and offered objective insight and guidance. (Stroke Network Clinical Adviser)

His presence at the meetings and expectation of having clinicians and high level executives present from each organisation framed the issue around accountability and transparency of stroke delivery as the network considered sustainability of its services. Organisational representatives realised the importance of these presentations for the future of their stroke units, particularly around funding allocations. Presentation groups from each organisation comprised multidisciplinary participants representing the clinical, executive, managerial and IT divisions. Thus network leaders driving the framing process and employing a system stressor during this key decision period facilitated interdisciplinary collaboration within organisations and across professions and disciplines. In the next section, I demonstrate that collaboration occurred not only within but also across organisations within the interorganisational network.

5.2.2.4 Framing results: Shaped actions and practices

By January 2011, the panel had identified which organisations within the Stroke Network met the standard requirements for providing hyper-acute stroke services, and decisions were taken about the hospitals that had failed to meet the requirements (see Section 4.3.4). The resulting Stroke
Network configuration revealed newly formed collaborations among different PCTs and hospitals (see Section 4.3.4). The most significant outcomes of the reconfiguration were the newly formed relationships between hospitals deemed hyper-acute stroke centres and those that were not, creating innovative collaborative links for improved stroke service provision throughout the interorganisational network.

Although it’s a tough realisation for some hospitals, the brand new links between those that can provide quality stroke services and those not granted hyper-acute status is a great benefit to stroke provision within the wider network. Telestroke is going to help maintain these links and improve services so our performance outcomes also improve. (Joanna)

In addition to the fresh, interdisciplinary, interpersonal and professional relationships that formed within organisations during the recent panel presentations, so too had new collaborative links been established among organisations to drive network development. The results of framing from this key decision period included four specific shaped practices: (1) strengthened, transparent communication linkages; (2) newly established interdisciplinary relationships at both the organisational and interorganisational levels; (3) clinical pathway redesign, closely aligned with (4) service delivery changes (e.g. service quality improvement); all affected at the interorganisational level.

Constructive change rarely happens passively, and in this case the evidence demonstrated that framing – along with other complementary factors – was used to shape actions and practices within the network. Change required network leaders to challenge the status quo, frame issues in such a way that network participants would get involved with the process, and find new mechanisms to further network goals (e.g. employ system stressors). Network leaders’ framing helped facilitate inclusive engagement of network participants in interorganisational network processes, demonstrating that framing was an enabling process. Even when change was viewed as positive, some form of resistance still needed to be addressed, such as negotiation and coalitional struggle during discourse processes. The network progressed when participants were able to express cognitive diversity and share heterogeneous frames from their frame repertoires, working toward consensus building to develop a collective dominant frame. Network leaders were assertive
in their framing and in creating an environment for less popular opinions that strengthened the
network by increasing participants’ ability to participate fully. By framing and introducing a
turbulent system stressor, they ultimately drove a mindful process of integration, alignment and
attunement. In the next section, I expand on the analyses from the two key decision periods to
more broadly discuss framing and leading in networks before recapitulating the final conclusions
of this chapter.

5.3 Discussion
The purpose of this section is to build upon the analytical discussions covered during the key
decision periods from a holistic perspective. I reintroduce relevant literature that reinforces the
analysis and findings from this study and conclude by commenting on the public sector healthcare
network context as well as potential applicable contexts. I follow this section with the final chapter
conclusions. These begin with a summary of the chapter’s key points, and then recommend a
proposed framing framework.

There are several different conceptualisations of framing. Many scholars in the field of framing
recognise that the ‘era of rapid social change’ makes organisations today more like episodic
movements than on-going bounded actors (Fligstein, 1990, 2001; Davis & Thompson, 1994; Davis
et al., 2005; Kaplan, 2008). My work aligns with this perspective and extends beyond
organisational movements to address the more fluid, complex interorganisational form. According
to some scholars, framing is used as a management tool when network effectiveness diminishes or
is sub-optimal (Agranoff & McGuire, 2001), suggesting that it involves establishing and
influencing the network’s operating rules (Gray, 1989; Mandell, 1990; Klijn, 1996), influencing its
values and norms (Kickert et al., 1997; O’Toole, 1997), and altering network participants’
perceptions (Termeer & Koppenjan, 1997). Interaction among participants, the perception of that
interaction as flexible and adaptive, and conscious change in those interactions through framing
catalysed the inert network into changed action and practice. The key influencers, who in this case
tended to be formal network leaders, offered suggestions for looking at problems during each key
decision period differently or recommended an alternative framing mechanism. Framing ‘gives shape to purposes, and … has great influence in the alignment of various forms of engagement’ (Stone, 1999: 7). Network leaders generated a shared purpose or vision (Mandell, 1988; Gray, 1989; Lipnack & Stamps, 1994; O’Toole, 1997) through framing processes to achieve a collective dominant frame and decision, and ultimately shaped network practices. This framing engendered a shared purpose in the network under study, and hence this alignment of framing in network processes and actions was exhibited. To frame the issue, network leaders offered suggestions for how to look at a particular problem and provided alternatives beyond the status quo to formulate and recommend a primary frame and initiate framing processes.

As demonstrated by the empirical evidence, there were several frames that were not visited, each of which held its own implications. For example, had David and Graham initially framed the telestroke adoption process around whether or not to adopt it rather than which supplier they would select, the network participants could have likely engaged with the effects on their clinical pathways at an earlier stage. Earlier engagement with these complex considerations could have reduced the uncertainty and turbulence caused by their lack of understanding of stroke service specifications and clinical pathway redesign during Key decision period 2. This example reiterates that framing is contingent upon network participants (e.g. their styles, personalities, perceptions, professional and organisational cultures); hence every network configuration will have customised and localised framing results. ‘The intelligence of a network lies in the patterns of relationships among its members’ (Lipnack & Stamps, 1994: 210), and framing manipulates this intelligence to create change in a network. To summarise, framing is contextually specific, and the temporal dimension of the interorganisational network’s trajectory is important, primarily because frames are processual, and processes build upon one another sequentially. Alternative frames lead to alternative consequences, and thus alternative futures. That said, the framing framework I propose in the Conclusions section is intended to help guide the framing process.
Framing in this case refers to the formulation, propagation and discourse components of network management, which provides a basis for independent network members to participate and a set of principles around which to organise the participants’ efforts (Rethemeyer & Hatmaker, 2008). In this case, framing contests (Kaplan, 2008) within the framing processes might have served the network better. Rather than the homogenous discourse and resultant consensus that typically occurred, framing contests involving greater cognitive diversity and opposing views would have shaped the network differently. What is significant from the study is an understanding that framing lends a contextualised process that ultimately leads to shaped actions and practices at the interorganisational network level.

The framing framework presented is of analytical and theoretical value. In addition to its usefulness in healthcare public sector networks, one could readily see that this mechanism might be extensible to other network types. Many private sector healthcare networks are similarly structured, as are several other disciplinary networks besides the dominant medical professional network focused upon in this study. Lessons learned here suggest that framing could be applied to other network contexts that share analogous, interdisciplinary features, compositions and functions.

5.4 Chapter conclusions

As demonstrated by the analyses, this chapter assisted in answering my research question by identifying framing as a dominant network process that facilitated other key network processes as well as leadership processes. At the micro level, it exhibited various framing micro-processes such as debate, consensus building and collective dominant frame development. At the macro level, it showed that framing is part of what is going on in the network and is involved with how the network is led. Framing processes helped shape actions and practices at the interorganisational network level.
This chapter focused on two key decision periods that involved uncertainty and ambiguity, which led to a turbulent environment within the interorganisational network. During periods of turbulence, framing by network leaders played a key role in shaping interorganisational actions, processes and practices. By contrast, network leaders used framing to create system stressors that generated turbulence within the complex network. The point here is not to assert directional causality, but rather to provide evidence within this complex setting on the bidirectionality of framing processes. Framing was used as a central mechanism to influence strategic choices (Kaplan, 2008) and drive collective discourse. Framing involved a negotiation process across multiple network levels within the whole network such that a dominant frame and strategy decision was reached at multiple times. Recalling the leadership literature discussed in Chapter 2, the observed dynamics and processes were suggestive of transformational complexity leadership in which the frame was formulated based on achieving a common goal throughout the network. Frames formulated by formal network leaders affected framing discourse, as they facilitated engagement of network participants in formal exchanges during processes of debate, negotiation, social capital and capacity building, and consensus building, formulating dominant network frames and ultimately shaping network practice. In addition, informal leaders helped shape network participants’ frames by influencing informal exchanges, which composed part of the on-going discourse processes. The data suggest that a new conception of leading in networks is needed to understand what drives complex network dynamics and processes within turbulent environments. It was evident that the formulated frames and dynamics of framing processes were contingent upon the network participants involved. The study demonstrated that network leaders control, manage and orchestrate framing processes; hence framing results such as shaped actions and practices were highly dependent on the type of network leaders as well as the dynamic levels of power and control they maintained. These findings suggest that a NPL approach is needed to facilitate processes in complex interorganisational contexts in order to shape practice.

Power in the interorganisational network was portrayed dualistically, as a property that both prevented and facilitated action. Consistent with Bourdieu’s (1977) and Giddens’s (1984)
conceptualisation of power as enacted by skilful actors, within the Stroke Network participants did not possess power, but rather power occurred in interaction through a network participant’s engagement in framing processes. By attempting to establish the legitimacy of a frame, or by realigning the frames in play, network participants sought to push the strategic choice/decision in the direction of their own frames and interests. This was commonly done by network leads in the study. Yet framing was not only an instrumental activity in which the network leads could simply select the most useful frame to support their own interests. Their predispositions defined the scope of action for their own framing formulation and processes. In this way, interests were not fixed, but rather transformed as a result of framing processes such that collectively achieved frames made other network participants believe that the proposed solution was in their own interests. If framing practices were successful, this process produced a dominant frame. This shaped how the problem and solution were defined and identified the strategic decision reached, and most importantly the actions and practices that were shaped as a result. Frames resulted in shaped practices to the degree that they were shared and collectively enacted.

Based on the findings from this chapter, I propose a framing framework that could be applied in turbulent, complex interorganisational networks that maintain shared goals (e.g. environmental networks, security alliance networks) (Figure 5.1). Framing overall is an influencing process that’s at work within the network, involving the leadership and participants of the network as evidenced throughout this chapter. Based on this framework, framing could be used as a central mechanism to influence strategic choices (Kaplan, 2008) and drive collective decision-making. Importantly, this framework highlights relational and social capital dynamics, such as social capital utilisation and capacity building that are micro-processes driving network-wide processes to ultimately shape practice. This is helpful from a NPL standpoint, as it aids in filling the gap between network theory and complexity leadership. The framework provides a means to understand dynamics that drive process change in complex, interorganisational networks, whereby framing involves negotiated discourse processes across multiple levels such that interorganisational network actions and practices are shaped. The value of this kind of analysis will be a useful partitioning of framing
activity and is discussed further in Chapter 8. Overall, this framing framework is useful because through this influencing process, leaders are able to shape the practices and actions of the wider interorganisational network. The four stages effectively demonstrate the process of framing that allows network leadership to create structure around what could otherwise be a messy, complicated, multi-level form including multiple organisations, professions, and individuals. Essentially, the framing framework provides a tool for network leaders to influence and impact network actions and practices.

**Figure 5.1: Framing framework in interorganisational networks**

<table>
<thead>
<tr>
<th>Framing formulation:</th>
<th>Framing propagation and communication</th>
<th>Framing discourse:</th>
<th>Framing results:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin of the primary frame</td>
<td>Process of disseminating the problem definition throughout the network to engage participants in the challenge ahead</td>
<td>Discussion, debate, negotiation, coalitional struggle, social capital and capacity building, consensus building, dominant frame development</td>
<td>Shaped actions and practices</td>
</tr>
<tr>
<td>Key leaders and influencers offer a definition of the problem they face and seek to address</td>
<td>Exploration and refinement or revision of the problem. Serves both to build consensus in support of a dominant frame and to develop and share strategies by which the network can tackle its problems</td>
<td>Key decision reached</td>
<td></td>
</tr>
</tbody>
</table>

First, framing formulation highlights key influencers, who are both formal and informal leaders within the interorganisational network that shape knowledge networks and network participants’ frames. The evidence showed a single point of origin that drove the framing process forward – a network lead who initiated the frame. There are multiple origins of framing formulation as well as propagators of framing within complex interorganisational networks rather than a single source.
Second, propagating and communicating the primary frame among network participants facilitated their involvement and engagement with framing processes and disseminated the frame across the target network. As the data showed, network leaders tended to communicate the frame across constituents to ensure the framed message was received. The propagation of frames is also reliant on social capital, since the ability to propagate is dependent on trust, interdependence, and relational interactions. Third, framing discourse was typically overseen and orchestrated by the network leaders, which indicates framing is a critical network leadership process. By facilitating debates and discussion surrounding the key decision, network leaders were able to influence coaltional struggles and orchestrate consensus building to ultimately align network participants with the dominant frame and reach a key decision. Framing can be about exclusion (e.g. of ideas or perspectives); however, as this case demonstrated, framing enables participation and involvement of network participants. As shown during the key decision periods, leaders’ framing and reframing of the issues created more inclusive discussion and discourse processes. By manipulating the power of language and meaning, framing affected network participants’ sensemaking around particularly relatable frames, such that they were invited to participate and engage in the framing process. As a result, I conclude that framing is an enabling process. Fourth, framing ultimately led to the shaping of network actions and practices, which suggests framing related network leadership processes influence the overall network by affecting how practices change and actions are shaped. Network leadership is therefore crucial for impacting the holistic interorganisational network.

To conclude, the agility of organisations, networks, and sub-network teams is constantly tested, particularly in turbulent environments. The proposed framework aims to provide a basis for a holistic overview of framing, regaining a three-dimensional perspective on the challenge, the problem and the solution of the network’s agility with a unifying architecture and framework. This foundational approach offers both a process framework as well as mechanisms that network leaders could employ to frame, influence, facilitate discourse, and achieve change by shaping practices in turbulent, complex interorganisational networks. The framework could be applied over short-, medium-, and long-term planning throughout an evolving network landscape with complex
dynamics, processes and moving targets, developing higher order strengths of network development. The purpose of the framework is to assist in replacing rigid routines with a reconfigured framing approach to achieve shaped actions and practices. This offers a new processual framing lens to suggest approaches to problem solving amid turbulence, manipulating multiple intelligences in action that affect a holistic network. Importantly, processes of social capital are how framing gets accomplished. The framing framework could be used as a central mechanism to influence strategic choices (Kaplan, 2008), drive collective decision-making and shape network practice. The framework has important implications for research on driving collective processes and shaping interorganisational network practice. It is important to note that framing itself is not the only process underway within the network, but rather there are several complementary processes underway that cocreate change. The other primary complementary themes are discussed in subsequent chapters.
Chapter 6: Results – The impact of interorganisational informal networks and boundaries on knowledge transfer

6.0 Introduction

The purpose of this chapter is to provide fresh insights into the knowledge processes of the public sector interorganisational network form by drawing on the longitudinal case study. Prior network research has not focused extensively on interorganisational network processes, hence this chapter aims to highlight this new and different context in order to shed light on interorganisational complexity and make a contribution to network process research. The interorganisational context is differentiated and more complex than the purely organisational context; therefore, this study demonstrates key processes, such as knowledge transfer (KT), that can be influenced and used by network leaders to facilitate changes at the interorganisational network level. This chapter highlights how processes, such as influencing KT and using social capital (e.g. across informal networks), are critical network leadership processes within the multi-layered complexity of an interorganisational context.

Chapter 6 connects to Chapter 5 in that framing helps to define the tasks and challenges that the network confronts, and knowledge processes are the means by which the network can bring its collective expertise to bear. As Chapter 5 demonstrated how framing shaped actions and practices, Chapter 6 demonstrates how KT acts as a means to shape network processes. This chapter focuses on the interrelated themes of knowledge processes, informal networks and boundaries within the interorganisational network. I present an in-depth examination of processes to illustrate KT, whereby detailed accounts are provided to help convey the complexity and richness of the phenomenon under study. Significantly, the results demonstrate four key KT findings: (1) formal networks act as a nexus from which informal networks are mobilised; (2) informal networks facilitate KT; (3) internal (to the network) interorganisational boundaries are both knowledge barriers and enablers; and (4) network leaders act as orchestrators of group interaction. The chapter provides empirical evidence demonstrating that there are gaps in the extant network theory.
literature. The evidence suggests that KT theory is limited with regard to understanding the professionalised, interorganisational network context such as the NHS and its processes.

The structure of the chapter is as follows. The opening sections describe definitions of knowledge, KT, and a background on knowledge in NHS networks and knowledge processes. I then offer an overview of organisational and professional knowledge and epistemic boundaries based on the extant literature with which this study aligns. The next major section focuses on the presentation of empirical results focusing on the four key findings outlined above, all of which constitute a conceptual basis for KT. Finally, the last section draws conclusions and presents the chapter contribution.

6.1 Knowledge

In order to effectively explore KT across multiple interorganisational boundaries, it is important to define what is meant by ‘knowledge’ in this study. I adopted a definition of knowledge based on Rooney and Schneider (2002) supported by Keenan et al. (2012), who suggest that knowledge is the result of the interrelated processes of knowing, which are an evolving and variable constellation of, for example: the conceptual, cognitive, intuitive, emotional, axiological, political and motor bases to achievement that are an emergent property of relations, and that are regarded as a reliable basis for action (Keenan et al., 2012). Importantly, this definition avoids some of the common ontological and epistemological flaws associated with the traditional understanding of the nature of knowledge as ‘justified true belief’ (Steup, 1996; Nonaka et al., 2000). This traditional definition fails to address the basic social, cognitive and cultural issues of what knowledge ‘is’ and how it ‘comes to be’ (Nonaka et al., 2000; Keenan et al., 2012). Instead, defining knowledge as the evolving, interrelated processes of knowing, renders knowledge and its application more understandable as a concept that is researchable in a network context. Knowledge is commonly described as an objective ‘thing’, rather than the outcome of the active process of knowing (Pfeffer & Sutton, 2000; Graham & Rooney, 2001; Stacey, 2001; Rooney et al., 2003). Rooney and Schneider’s (2002) definition
recognises that knowledge is the result of an essentially relational (including social) process of knowing, that it does not have an independent existence outside of this process, and that the unit of analysis should therefore be the (living) process rather than an inanimate object or highly abstracted nominalisation (Whitehead, 1978). (Keenan et al., 2012: 9)

My study aligns with this definition, given the processual and relational nature of the interorganisational network context.

Two different, interrelated forms of knowledge are conceptualised – tacit and explicit (Nonaka & Takeuchi, 1995; Rooney & Schneider, 2002). Tacit knowledge is subjective knowledge, which derives from individuals’ values, ideals, experience and emotions. It is individualistic, contextually specific, and typically difficult to formalise, express or share with others (Polanyi, 1967; Nonaka & Takeuchi, 1995). Tacit knowledge is also separated into two sub-categories – technical tacit knowledge, that is, skills and know-how, and cognitive tacit knowledge, that is, frames, ‘schemata, mental modes, beliefs and perceptions so ingrained that we take them for granted’ (Nonaka & Takeuchi, 1995: 8). Explicit knowledge is objective knowledge, which has been codified in a formal, systematic way (Nonaka & Takeuchi, 1995). It is knowledge that is demonstrated in symbolic form and able to be communicated, readily lending itself to electronic processing, storage and manipulation (Nonaka & Takeuchi, 1995). The classification of all knowledge aligns with these two dimensions. Given that knowledge is the result of the relational process of knowing that provides a reliable and justifiable foundation for action, and that KT refers to the exchange and sharing of knowledge, the importance of the applicability of knowledge in KT is clear. Knowledge is an action tied to the enactment of practices (Orlikowski, 2002) and processes. I suggest that knowledge is applied as the fundamental component of KT to exhibit cross-boundary processes in the interorganisational context.

The specific types of knowledge analysed in the study refer to professional and organisational knowledge. First, professional knowledge has been described as a central influence on the outcomes of a professional project (Begun & Lippincott, 1987). Professional knowledge allows workers to organise and control their own work (Freidson, 2001), to the extent that professions
claim freedom of judgement under two underlying assumptions: (1) the nature of their work is so specialised as to be inaccessible to those lacking the required training and expertise, and (2) such professional knowledge cannot be standardised. Through abstract knowledge typically based on academic knowledge systems, professions gain legitimacy for claiming jurisdiction, expand their domain of knowledge through research activities, and ensure the training and socialisation of their members (Abbott, 1988). Second, organisational knowledge is the ‘capability members of an organisation have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalisations whose application depends on historically evolved collective understandings’ (Tsoukas & Vladimirou, 2001: 973). Organisational knowledge in the study pertains to the lessons learned and best practices accumulated within an organisation. For example, an organisation could share knowledge on the best practices it has instituted to deal with challenges, such as process redesign (e.g. clinical pathway redesign).

6.2 Knowledge transfer

This study subscribes to Inkpen & Tsang’s definition of KT as the process through which one network member is affected by the experience of another (Argote & Ingram, 2000). Knowledge transfer manifests itself through changes in knowledge or performance of the recipient unit. (Inkpen & Tsang, 2005: 149)

Related to the network context specifically, Kotabe et al. (2003) find that organisational benefits can arise from KT between network firms. Since the interorganisational construct is crucial to my study, I also align with Lahti and Beyerlein (2000: 68), who consider KT as ‘conveying and diffusing knowledge within a firm and among different firms’, which I interpret and enhance as the diffusion of knowledge within an organisation and among different organisations and professions constituting an interorganisational network (i.e. within internal interorganisational boundaries). I subscribe to the ‘sociality thesis’ of KT (Dunn & Holzner, 1988), which asserts:

The production, transfer and utilisation of knowledge are social processes … The structure of social arrangements – societies, government, communities, organisations – affects the production, transfer and utilisation of knowledge. (Green & Johnson, 1996: S14)
Intrinsically, knowledge itself is not static, but is open to development and change. Extrinsically, knowledge uptake is affected by participants’ characteristics and their environment. Given this succinct, definitional overview of KT, the next section discusses knowledge in the NHS.

6.3 Knowledge in National Health Service networks

As a highly professionalised sector, the NHS is a locus of various professions (Savory, 2009) that range from classical (e.g. doctor) to novel (e.g. hybrid professionals) typologies. The same professional diversity implies some degree of interdependence and the consequent need for coordination and sharing of diverse knowledge across professions. As much research indicates, coordination and sharing of knowledge across classic disciplinary boundaries is cumbersome, and there are multiple knowledge barriers (Ferlie et al., 2005; Currie et al., 2007). Ferlie et al. (2005) find that professional social and cognitive boundaries act as inhibitors to organisational change and spreading new work practices. Strong boundaries between professional communities of practice act as barriers to knowledge sharing. In an NHS cancer network study, organisational learning and knowledge management activities were marginalised by the networks’ need to engage in prolonged restructuring activity and meet performance targets (Addicott et al., 2006). Individual organisations retained their own identity, agenda and culture rather than contributing to a common network identity and purpose. My study found results that were both similar and contrary in the interorganisational Stroke Network, since the multiple organisations and professions within the network shared common goals and worked across internal boundaries. Since KT is not static, but rather dynamic and processual in nature, my study is well-placed to examine interorganisational knowledge processes.

6.4 Knowledge transfer processes

Environmental turbulence has induced institutions to take the management of knowledge seriously, and in order to do so effectively they must consider network forms of organising (Bartlett & Ghoshal, 1993; Hedlund, 1994). Two differentiated types of knowledge processes exist between the network form and more traditional forms. First, organisational units may create and accumulate
knowledge with their own means and resources (cf. Nonaka & Takeuchi, 1995), typically applied at higher levels. In networks, knowledge is retained within the network. Secondly, knowledge in networks may be transferred among organisational units. This knowledge sharing capacity across organisational boundaries that benefits the network overall differentiates the network from other organisational forms and provides networks with the advantages of a distributed knowledge structure (Hedlund, 1994; Van Wijk & Van den Bosch, 1998).

Knowledge processes likely constitute the most significant difference between the (internal) network and historical organisational forms (Van Wijk & Van den Bosch, 2000). This chapter explores relationships between the different KT processes across the multiplicity of network levels over time, and identifies both the obstructive and enabling aspects of KT processes.

6.5 Boundaries

This section defines boundaries more broadly before identifying the boundaried levels within an interorganisational network. Networks span multiple boundaries, operate virtually, utilise matrix management, and tend to involve knowledge-intensive work, placing additional importance on relationships (Brass & Krackhardt, 1999) and flexible communication linkages (Contractor et al., 2006). The complex interrelationships among knowledge, network dynamics and innovation suggest a processual approach to studying network effects, with which this study aligns.

There is complexity at every boundary (Carlile, 2004), and the boundaries between organisational and professional sub-networks are often blurred since they are not mutually exclusive, as was true of the interorganisational Stroke Network. For example, doctors were participants within both their hospital (organisational sub-network) and the wider medical professional network. However, for the purposes of displaying data, I distinguish between organisational and professional boundaries within the interorganisational Stroke Network to illuminate significant findings. Enhancing the understanding of multiple network boundaries provides an opportunity to innovate methodologically, similar to the work done on multiple team membership (O’Leary et al., 2011).
Innovative multi-level analysis (Klein & Kozlowki, 2000) is significant due to the interdependence of organisational and professional networks within the interorganisational context. Within the Stroke Network, KT occurred due to the nature of dynamics, interactions and processes at multiple levels. I next focus on the multiplicity of network boundaries that impacted KT. There are several boundary levels within an interorganisational network, including organisational, professional, knowledge and epistemic boundaries. I briefly describe these latter boundaries in the next section.

6.5.1 Knowledge boundaries
This section discusses the importance of understanding the purpose of knowledge boundaries, highlighting the purpose of knowledge boundaries as sites for knowledge transfer; hence focusing on the processual aspects of these boundaries as aligned with the study research questions. Since knowledge has been considered one of the primary resources for professional competition, professional knowledge boundaries have been studied in their dual nature of limiting jurisdictional claims and securing jurisdictional domains against outsiders (Kronus, 1976; Abbott, 1981, 1988; Gieryn, 1983; Barley, 1996; Allen, 2000). This relationship between boundaries of knowledge and legitimacy of jurisdictional claims is clear in Abbott’s work: typically using abstract knowledge, professions construct problems into jurisdictions, and if they do so successfully, they can claim ‘certain rights – from others in the workplace, from the public, from clients, and from the state’ (Abbott, 1988: 278). Formal education represents an institutionalised mechanism for sharing knowledge within occupational communities, and it also provides a means for reinforcing jurisdictional boundaries (Begun & Lippincott, 1987; Abbott, 1988; Glazer, 1991; Halpern, 1992; Allen, 2000). For example, Kronus (1976) and Manley (1995) show how physicians, by elevating and formalising educational standards, reinforced professional boundaries by limiting the number of entrants and making the knowledge more esoteric.

6.5.2 Epistemic and social-epistemic boundaries
Epistemic and social-epistemic boundaries are a subtle extension of knowledge boundaries as is discussed in this section (Table 6.1). Within the interorganisational Stroke Network, knowledge
was formed through the integration of medical, managerial (Llewellyn, 2001) and IT knowledge. These three sources were embedded in completely different sets of epistemological and cultural meanings. For example, within the Stroke Network there existed multiple professional epistemologies (e.g. clinical, managerial, technical). Ferlie et al. (2005) posit that different professional groups develop distinctive knowledge bases, which in turn explain the emergence of epistemological and cognitive barriers across professional groups. Social-epistemic boundaries are more immediately grounded in professional ethoses and schemata. Social-epistemic boundaries foster divergent interpretations among participants, which are based on different states relating to belief and knowledge that are rooted in participants’ schemata. Since social-epistemic boundaries are blurry, they hinder knowledge sharing across participants’ sub-networks by limiting the awareness and understanding of others’ expertise and knowledge. The cross-occupational nature of the interorganisational network presupposes the existence of multiple social epistemologies anchored in professional knowledge. Given the subtlety of the distinction between epistemic and social-epistemic boundaries, the terms are used interchangeably within the thesis.

My study aligns with findings from several studies on KT in organisational and network contexts surrounding these boundaries (Table 6.1). The findings from my study cover the various weaknesses and strengths and will be useful in network leadership process development on KT. The findings offer pragmatic value in complex, turbulent, interorganisational networks that desire and require collaboration across organisational (Nebus, 2006), professional and epistemic boundaries. As collective entities, the organisations and professions represented in the overall network possess different epistemic states.
### Table 6.1: Relevant literature on organisational, professional, knowledge, and epistemic boundaries

<table>
<thead>
<tr>
<th>Type of boundary</th>
<th>Key findings</th>
<th>Supporting studies</th>
</tr>
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<tbody>
<tr>
<td><strong>Organisational</strong></td>
<td>Network functioning requires collaboration across functional, social, demographic and organisational boundaries</td>
<td>Charan, 1999; Cross &amp; Parker, 2004</td>
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<tr>
<td></td>
<td>Even in highly knowledge-intensive organisations, boundaries are ambiguous, permeable and difficult to determine</td>
<td>Marsden, 2005; Nebus, 2006</td>
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<td></td>
<td>Organisational networks are dynamic and influenced by many factors: organisational culture, context, structure, values, measurements and tasks</td>
<td>Brass et al., 2004; Cross &amp; Parker, 2004</td>
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<td></td>
<td>Turbulent environments cause interorganisational and intraorganisational boundaries to become more permeable. It is essential to manage these network linkages</td>
<td>Powell et al., 1996; Vaill, 1996; Brass &amp; Krackhardt, 1999</td>
</tr>
<tr>
<td></td>
<td>Networks within organisations are associated with positive outcomes: social identity, individual performance, teamwork, economic results, learning, innovation and organisational performance among others</td>
<td>French &amp; Raven, 1959; Granovetter, 1973; Coleman, 1988; Burt, 1992; Friedkin, 1993; Baker, 1994, 2000; Gulati, 1995; Tsai &amp; Ghoshal, 1998; Gargiulo &amp; Benassi, 2000; Hutt et al., 2000; Pfeffer &amp; Sutton, 2000; Cross et al., 2002; Monge &amp; Contractor, 2003; Dickson et al., 2003; Seibert et al., 2003; Berry, 2004; Cross &amp; Parker, 2004; Davenport, 2005; Rollag et al., 2005</td>
</tr>
<tr>
<td></td>
<td>Organisational networks successfully enable on-demand, just-in-time knowledge sharing and learning</td>
<td>Mintzberg, 1973; Cross &amp; Sproull, 2004</td>
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<td></td>
<td>Relationships with colleagues have a critical effect on what individuals come to know</td>
<td>Allen, 1977; Monge &amp; Contractor, 2003</td>
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<td></td>
<td>Networks of informal relationships also influence work and innovation as leaders who span boundaries are more likely to share information and ideas</td>
<td>Cross &amp; Parker, 2004; Burt, 2005</td>
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<td></td>
<td>Network ties of leaders positively affect organisational interaction and the financial results of the organisation</td>
<td>Mehra et al., 2006</td>
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<td></td>
<td>Cohesive groups outperform less cohesive groups – the ‘pattern of relationships among group members can have a major impact on the ability of a group to function effectively’</td>
<td>Seibert et al., 2003: 181</td>
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<td></td>
<td>Organisational boundaries could cause isolation, poor knowledge transfer, homogeneous decision-making, stunted organisational learning and lack of (open) innovation</td>
<td>Chesbrough, 2003</td>
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<tr>
<td><strong>Professional</strong></td>
<td>Professional boundaries have eroded and a more diffuse conception of professionalism has become pervasive in contemporary studies</td>
<td>Hwang &amp; Powell, 2009</td>
</tr>
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<td></td>
<td>Professional work more frequently occurs amid ambiguous and contested conditions and ambiguous service realities</td>
<td>Noordegraaf &amp; Abma, 2003</td>
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<td></td>
<td>Medical and health professions have contended with significant, ambiguous changes to healthcare systems and service delivery; varying across countries they share common attempts to increase competition, incentivisation, and disaggregation</td>
<td>Pollitt &amp; Bouckaert, 2000; Scott et al., 2000; Noordegraaf &amp; Van Der Meulen, 2008; Leicht et al., 2009</td>
</tr>
<tr>
<td>Type of boundary</td>
<td>Key findings</td>
<td>Supporting studies</td>
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<tr>
<td>Professional (continued)</td>
<td>Professionally based networks can produce barriers to the flow of knowledge, especially where many professions coexist in the same organisational arena</td>
<td>Seely &amp; Duguid, 2001; Ferlie et al., 2005</td>
</tr>
<tr>
<td>Knowledge</td>
<td>(Professional) knowledge boundaries have been studied in their dual nature of limiting jurisdictional claims and securing jurisdictional domains against outsiders</td>
<td>Kronus, 1976; Abbott, 1981, 1988; Gieryn, 1983; Barley, 1996; Allen, 2000</td>
</tr>
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<td></td>
<td>Formal education represents an institutionalised mechanism for sharing knowledge within occupational communities and also provides a means for reinforcing jurisdictional boundaries</td>
<td>Begun &amp; Lippincott, 1987; Abbott, 1988; Glazer, 1991; Halpern, 1992; Allen, 2000</td>
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<td></td>
<td>Doctors, by elevating and formalising educational standards, reinforce (professional) knowledge boundaries by limiting the number of entrants and making the knowledge more esoteric</td>
<td>Kronus, 1976; Manley, 1995</td>
</tr>
<tr>
<td>Epistemic (subtle extension of knowledge boundaries)</td>
<td>Knowledge is formed through the integration of medical and managerial knowledge in healthcare contexts</td>
<td>Llewellyn, 2001</td>
</tr>
<tr>
<td></td>
<td>Medical knowledge is perceived as fundamentally tacit, experiential, judgemental and professional</td>
<td>Dopson, 2005</td>
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<tr>
<td></td>
<td>Medical knowledge has explained the balance and locus of power within the NHS such that power lies at the periphery, and the medical profession has experienced a great level of autonomy. Social-epistemic barriers are more immediately grounded in professional ethoses and schemata</td>
<td>Klein, 1995</td>
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</table>

Minimal research has been conducted in relation to the nature of the knowledge and closely related epistemic boundaries that might affect interactions that occur across multiple organisations and cross-professional boundaries within an interorganisational network. This gap is more evident in the case of hybrid professional configurations, where limited empirical research has been conducted. The study presented here provides data on the complex KT processes across organisational, professional and social-epistemic boundaries, as well as the facilitative role network leaders played to overcome KT barriers.

Based on a foundation in the literature mentioned in Table 6.1, the next section presents empirical evidence derived from the case study. Opening with a brief overview, it proceeds with an analysis of the case study and closes with key chapter conclusions and contributions.

**6.6 Interorganisational stroke network results**

This section commences the provision of longitudinal case study evidence surrounding the dominant findings on the interrelated themes of KT processes, informal networks and boundaries.
within the network. Given the primary antecedents to KT within the interorganisational context, including different types of specialised knowledge, shared objectives and goals, and contextual conditions, the study’s evidence revealed four key KT findings. First, I provide data demonstrating that formal networks acted as a nexus to mobilise informal networks. Second, I evidence how informal networks facilitated KT and related processes. Third, I offer empirical descriptions of internal interorganisational boundaries as both knowledge barriers and, significantly, knowledge enablers. Fourth, I present data that illuminates how network leaders acting as boundary-spanners mobilised professional and organisational group interactions to facilitate KT. The following analysis mainly draws on network participants’ narratives and meeting transcripts complemented by direct observation of the enactment of such processes when possible. The materiality of such processes – embodiment and externalisation – together with the symbolic and material artefacts used by network participants, have been analysed as well. The latter scrutiny has been supported by collected documents.

6.6.1 Formal networks as a nexus from which informal networks were mobilised

The purpose of this section is to demonstrate how the formal Stroke Network acted as a nexus from which informal social networks were mobilised to facilitate KT. Formal network leaders, processes and functions created opportunities for informal social networks to develop and strengthen over time. Informal networks in this context refer to socially-based, relational exchanges and interactions among network participants that fall outside formal interactions. For example, formal Stroke Network meetings served their purpose – for participants to discuss a formal meeting agenda around certain issues facing the broader network. These formal gatherings also created opportunities for informal social networking before and after the meetings, whereby participants could engage in informal social networking.

I use both [social and professional networks] equally … Big network meetings can be useful. They let you connect during and especially after the meetings … Some people are reticent to speak up at big meetings, so it’s easier to have informal discussions elsewhere. (Stroke Consultant 2)
Here the consultant ascribed benefit and value to the formal network meetings because they enabled linkages to be made and/or strengthened, which emphasises the importance of informal exchanges and close social proximity during and after meetings. Another example from a managerial participant noted the learning (resulting from KT) and networking capacity of informal interactions both within the same discipline and across other disciplines that were enabled.

Meetings were a helpful time for education and to some degree networking. I could speak with a couple of other managers like myself and also learn about what doctors and IT guys from other hospitals are doing. (Stroke Manager 1)

Furthermore, a technical professional reinforced this logic by highlighting the establishment of an informal networking infrastructure upon which he could now rely for KT: ‘By discussing things offline with colleagues, hearing what their problems are and how they dealt with them is useful. I now have a pre-built infrastructure of who to go to’ (IT Manager 3). Lastly, a commissioner (i.e. financial function) commented on the benefits of KT during formal meetings by allowing her to ‘learn what each site is doing’ across the Stroke Network and follow-up informally outside the meetings:

This meeting enables us to learn what each site is doing, where they stand with regard to the pro-forma specifications, and how they are operating internally across departments. I follow-up with them more casually – by phone, email – outside these meetings. Stroke clinical pathways cannot succeed unless people are working across [boundaried] departments. (Commissioner 2)

Knowledge transfer activity was substantial and unconfined to a single site or single profession, as demonstrated by the multi-specialty input represented by the clinical, managerial, technical and financial specialisms. Additional interviews and meeting observations further supported these findings. After each of the 73 Stroke Network meetings observed, participants congregated in pairs and small groups in the meeting room and outer hallways. Discussion content immediately after the meetings related to topics and issues raised during the meetings or to the Stroke Network more broadly. Thus the formal network structure and its functions (e.g. regular agenda-based meetings) acted as a nexus from which a multiplicity of informal social networks were mobilised. Based on codified data analyses, this informal networking facilitated KT throughout the duration of the study, which is discussed in the next section. Importantly, the findings illuminated the processual nature of informal KT. Joanna reinforced this logic:
We hold these recurring network meetings to give members the opportunity to communicate and learn from each other. It’s a formal approach that leads to other conversations among the different groups [professionals] attending each month. (Joanna)

Collaborating with Graham and David, she promoted this formal knowledge exchange, understanding the value of the informal social exchanges, particularly as they occurred across disciplinary boundaries. These recurrent informal processes suggest that the formal network was deconstructed by informal social networks that enabled KT. By formal network deconstruction, I mean that the network’s formal linkages, exchange domains and formalised communication channels were supplemented by informal exchanges and linkages to diminish hierarchy and bureaucracy, whereby informal interactions, communication, exchanges and linkages facilitated KT across professional and organisational sub-network boundaries within the interorganisational network. Increased informal relations improved KT within the network, particularly in cases where formal interactions fell short.

The Stroke Network maintained functional formal and informal networks. Once the Cardiovascular Network designated collaborative organisational and professional relationships that were required to provide hyper-acute stroke services throughout the region, a network lead was assigned to follow-up to ensure the integrity and progressive coproduction of such informal interactions toward these objectives. Similar to Braithwaite et al. (2009), this case showed that clinicians worked best when their expertise was mobilised and they were empowered. The data presented here identifies ways in which network leaders managed these needs and the delicate reciprocity between traditionally hierarchical, formal networks and diffuse, informal networks as discussed by key managerial leads within the network.

We aim to make the service sustainable without high level centralised, formalised network involvement. (Service Development and Improvement Manager, NHS)

It’s quite a useful network. Clinicians connect to develop links then link with management teams … and suggest how we can fill gaps. We’ve had discussions with [other] hospitals on stroke and how we can support each other. (Stroke Manager 2)

Several respondents emphasised the need for interorganisational collaborative team building to meet network performance goals (e.g. national standards). Formal network leadership processes, therefore, were demonstrated by the ability to piece together and reposition the network objectives
according to different changes in the external environment, while driving informal leadership processes across professional and organisational networks, as this study’s data illustrates.

Now that the NHS is taking SHAs away, my role will transition into something else. ... If it’s not possible for me and [the Service Development and Improvement Manager] to be around, then users and organisations own the process and implementation of the technology. We are [putting processes in place] making our users accountable and creating project sustainability in the formalised network’s absence. ... Over time teams learn their own way and are gradually sustainably effective … Informal interactions help them achieve that. (Programme Lead ICT, NHS Directorate of Informatics)

Here the emphasis is on a core team of formal leaders developing stakeholders over time, building consensus within informal networks – through an organic process of informal meetings and discussions – to affect the interorganisational network. The Programme Lead underscored how ownership of the technology implementation process was transitioned to participants and organisations by increasing social capital among these stakeholders. The Lead assured transparency by sharing ownership of the process and gradually increased accountability of his users, devolving leadership such that the remaining informal network construct was operationally self-sustaining. Social capital capacity building and KT were stratified across interorganisational network levels. Therefore, formal leadership within the network facilitated collaborative problem solving within informal networks to promote interorganisational knowledge processes. For example:

You need to bring clinical teams together to implement technology and meet on a regular basis to discuss. We engage doctors and drive a network process. It stimulates momentum to discuss within a network process. (Link Manager, NTAC and NIC)

Contrary to Cross and Parker (2004), who claim that leaders have little traditional control over informal networks, this study showed that network leaders have influential capability over these informal processes. The interorganisational Stroke Network’s formal structure mobilised informal networks: that is, proximity, similar tasks, similar measurements, communication and other hierarchical components affected the establishment and growth of informal networks within the multiple organisations (cf. Burt, 2005). The network leaders noted:

I think there is a leadership quality around understanding communication, how people interact, and how people help each other. And that has nothing to do with an organisational chart; it is how work gets done. Consequently, the people that are most knowledgeable about what’s going on in the wider network are the people that are attending meetings and also discussing it [informally] among colleagues. (Graham)
I knew the manager, and it was handled like that. I did not have to escalate, I did not have to call the army out. I simply make a phone call, and based on my contacts [informal network] … it simply gets done. (Joanna)

Joanna, along with several other network participants, noted the means by which informal exchanges and KT occurred resulting from, or as a substitute for, formal exchanges. Stroke Network meetings were regularly used by participants as a means to discuss the network’s issues, but more importantly, provided a context where informal KT occurred.

The formal network acting as a nexus to facilitate informal networks also had implications for interorganisational network sustainability. As Joanna reflect upon her position as SHA Network Lead for Stroke and prior experience managing and leading in networks, she contemplated the crucial objective of complex, interorganisational networks:

Part of the role of the network should be to set up sustainable systems – put systems in place so it [formal network] doesn’t need to exist anymore. So you’re not running it from the top down any longer, you only have the informal network left. (Joanna)

Furthermore, since networks are an essential feature of organisations, largely responsible for organisational effectiveness and innovation (Cross & Parker, 2010), the study suggests that the multi-level examination of networks both within and between organisations presented here is needed to evolve the literature. Overall the most significant finding from this section suggests that the formal network acts as a nexus from which informal networks are operationalised and mobilised to facilitate KT, which helps build sustainability.

### 6.6.2 Informal social networks facilitate knowledge transfer

As shown in Chapter 5, informal communication and discussions were a significant part of framing processes. Many stroke specialists in particular commented on the benefits of networking within their professional and social networks to collectively (reach dominant frames to) make decisions and shape practices. As an empirical contribution of the study, this section demonstrates that informal networks facilitated and allowed for knowledge exchange processes across boundaries, which facilitated KT within the interorganisational network. In this section I identify
the informal networks that were analysed and knowledge that was transferred, provide data supporting the transfer processes, and show how informal networks facilitated the transfer.

First, the informal networks analysed here refer to informal social sub-networks composed of participants within the interorganisational network. Participants belonged to a specific organisation and maintained a particular professional affiliation, thereby participating in both organisational and professional sub-networks. In addition, participants engaged in informal social networks that traversed these sub-networks; thus these three sub-networks were not mutually exclusive. Processes occurred and work was accomplished through diverse, informal social networks of interorganisational participants. Second, the knowledge that was codified and analysed as ‘transferred’ in the study pertained to explicit organisational and professional knowledge. Organisational KT related to instances in which participants exchanged knowledge about lessons learned and practices from within their own organisations (e.g. ‘it worked well within our unit’). At the simplest level, professional knowledge pertained to instances in which participants exchanged knowledge related to their profession (e.g. a doctor describing a stroke patient case, an IT rep discussing IT capacity issues with fellow colleagues). Third, two key micro-processes evidenced the actual KT processes: communication and knowledge sharing. Fourth, informal social networks facilitated KT through social capital capacity building. These third and fourth points are discussed in detail below.

Communication was a critical process by which KT occurred, especially within informal social networks; thus communication was an enabling process of KT. There were different means of communication within the interorganisational network, which tended to reinforce professional boundaries and occupational closure (cf. Coleman, 1990; Kitchener, 2000). An SHA leader commented:

You assume it [information] will actually be disseminated down. Quite often it isn’t and what I often find is … it’s very difficult trying to keep a communication channel open with some people because they want everything to come to them. (SHA IT Lead)
Despite a few instances of a lack of communication, different means of interaction reinforced access to information as diffuse communication prevailed within the network. Joanna noted, ‘Professional groups occasionally used these [network] meetings as opportunities to liaise with their colleagues, where some time before and after the meetings was spent informally communicating’. Several stroke consultants voiced support for both intraprofessional and interprofessional informal networking, including:

> It’s really about hearing from other people. Often times I don’t know what IT is doing or how up to speed my unit manager is. Discussing their respective tasks after the network meetings is helpful … I pick up about their [disciplinary] work and try to figure out how we can benefit each other. (Stroke Consultant 5)

Beyond network leaders’ facilitation of intraprofessional and interprofessional communicative exchange, the communication of information across the entire network was also crucial. During a telestroke project board meeting, the interdisciplinary leadership team decided it was necessary to draft a formal communication plan. The group agreed that there needed to be a function that related to communications from the Stroke Network Lead whereby she would regularly record and communicate the status of telestroke adoption to the wider network. Furthermore, several respondents indicated that the formal network leaders facilitated interdisciplinary communication across channels that would have otherwise been unlikely to interact, creating informal opportunities to develop social capital among network leaders and participants. For example:

> In terms of the way that I work with my clinical colleagues, we’ve got a very clear clinical lead for stroke and any communication in the work I do is jointly predominantly with them. These [informal] discussions followed network meetings, and the knowledge flows are much better now. (Stroke Manager 1)

Joanna, David and Graham facilitated informal communication among participants to drive KT processes at the interorganisational level.

Knowledge sharing across informal social knowledge networks exerted great influence on decision-making processes and reinforced the existence of underlying communication and KT structures. Network participants engaged in numerous informal meetings as a means of knowledge sharing via informal KT. As one consultant stated:
Well I think the informal discussions certainly are important. Those discussions are insightful about what works for one hospital over another … Sometimes it’s discussions at conferences, sometimes it’s at these meetings. … So it makes it easier to have the, if you like, informal discussions outside these meetings. And I think that goes on quite a lot and a lot of big changes and plans come out of those informal meetings. (Stroke Consultant 1)

Informal social network interactions enabled knowledge exchanges (‘what works for one hospital over another’) and led to ‘big changes and plans’ at the interorganisational level. Graham’s view supported this, as he told Joanna:

We need to ensure there’s a decent level of knowledge sharing coming out of these meetings, otherwise what’s the point. It’s not just about us providing updates, but they need to discuss, learn from each other … after the meetings one-on-one or in groups. At the end of the day, they’re the ones who are going to have to do the work in the trenches. It affects the network as a result. (Graham)

Knowledge sharing was an important process that facilitated KT among informal social networks.

Furthermore, informal social networking (i.e. social capital capacity building) facilitated KT among participants, especially clinical colleagues. Spatial proximity established a basis for social proximity, and over time network participants increased their social proximity through various communication channels, such as phone calls and emails, and then reinforced their informal social interactions during informal face-to-face discussions after Stroke Network meetings. Simply put, attending the same formal network meeting at a particular site allowed for informal social networking that increased social proximity among participants even after they returned to their respective organisations. Existing linkages were strengthened and new linkages formed, based on these informal networks, which further enabled the exchange of ideas and KT over time. A specific example of informal networking demonstrated KT processes:

I think as far as I’m concerned a lot of the networking that I do is within a group just here [clinical Stroke Network meeting] and it’s really comparing what I’m doing to what my [medical] colleagues are doing, then taking this [knowledge] back to my organisational colleagues. (Stroke Consultant 8)

The consultant emphasised the importance of networking (i.e. social capital capacity building) to pick up lessons learned from his Stroke Network colleagues that he could then share with his organisational colleagues. Informal networking enabled him to transfer knowledge from colleagues at the Stroke Network meeting to his organisational colleagues.
Across professional and organisational boundaries, knowledge was promoted by the collaborative ethos of the network working toward, for example, a single telestroke solution rather than competition for network resources. Joanna, David and Graham facilitated informal social capital capacity building among interdisciplinary participants in order to transfer knowledge among the multiplicity of organisations and professions. For example:

> I reached out to my counterpart at [Hospital C] to get him on board with this telemedicine initiative. I asked him to reach out to his colleagues at [Hospital D] because he knows them better. He’s providing introductions and setting up a meeting, so I can know what [Hospital D]’s challenges are and what they have planned … I’ll take this [knowledge] back to our core group to devise overall strategy, sharing lessons learned to drive this project. (David)

Here David showed how his outreach to a contact (i.e. networking), who maintained closer social proximity to colleagues at Hospital D (i.e. ‘knows them better’), facilitated social capital capacity building that then facilitated KT. Importantly, an antecedent to KT in this context pertained to the network’s shared objectives. As discussed in Chapter 5, David, Graham and Joanna primarily framed the goal of the network to achieve improved service quality for patients and increased efficiency, which later transitioned into the collective dominant frame of the network upon which decisions were based and practices shaped. During a discussion regarding her thoughts on technology and innovation management in the NHS more broadly, a former executive at the NTAC stated: ‘The social network link drives things – such as new technologies and innovations – through, especially across doctors and execs/management to doctors’. In reflecting on her leadership role, she recognised the value of informal sociability within professions and across their boundaries to achieve technology and innovation goals. Building upon this and additional data, an important finding of this study is that informal social capital capacity building facilitates KT within the interorganisational network.

Informal social networks increased social proximity among participants, since they facilitated KT interactions among participants that would not otherwise exist. For example, Consultant 1 regularly exchanged knowledge with Consultant 2 and Manager 1. Consultant 1 and Manager 1 were based at Hospital A, while Consultant 2 was at Hospital B. Consultant 3 was based at
Hospital C and IT Rep 1 at Hospital A, but neither exchanged knowledge with Consultant 1. Each participant belonged to his or her respective organisational network by virtue of working within those organisational boundaries. Thus Consultant 1, Manager 1, and IT Rep 1 all belonged to the same organisational network, but the other two consultants did not. All three consultants were affiliated with the medical professional network, since they were all trained medical doctors; however, Manager 1 and IT Rep 1 belonged to different professional networks. The regular knowledge exchange and interactions between Consultant 1 and Consultant 2, as well as between Consultant 1 and Manager 1, were due to informal social network linkages. Even though Consultant 1 and IT Rep 1 were both members of Hospital A’s organisational network, they did not interact because no informal social link existed. They had no social proximity. Similarly, although Consultant 1 and Consultant 3 were members of the same professional network, they did not interact and thus had no social proximity. Importantly, social proximity and KT were facilitated by informal social networks because they traversed internal interorganisational boundaries.

Overall, this section demonstrated that informal social networks facilitate KT through communication, knowledge sharing, and social capital capacity building across internal interorganisational network boundaries. These informal social networks were not limited to rigid specialist structures and configurations, and their inclusivity and fluidity allowed for processes that enabled KT facilitation. Informal social sub-network boundaries traverse professional and organisational boundaries and are embedded within complex, interorganisational networks. The next section builds upon this finding and shows how internal network boundaries both hinder and enable KT.

6.6.3 Internal interorganisational network boundaries as both knowledge transfer barriers and enablers

As discussed in Section 6.5, internal interorganisational network boundaries include organisational, professional and social-epistemic boundaries. It was also shown that by traversing
professional and organisational boundaries, informal social networks facilitated KT. In this section, I argue and demonstrate that internal interorganisational network boundaries act as both barriers and enablers of KT. Traditional research on boundaries supports the notion that they are indeed barriers; however, my study significantly demonstrates that social-epistemic boundaries are also knowledge enablers.

6.6.3.1 Stroke network organisational boundaries as barriers to knowledge transfer

This section specifically focuses on the manner in which organisational boundaries hindered KT within the Stroke Network. In alignment with Levin and Cross (2004), hospitals’ relationships affected their ability to improve cohesion and facilitate KT. Within the Stroke Network, organisational boundaries adversely affected interorganisational collaboration. The Stroke Network’s composition included hospitals that were both solely academically-focused and clinically-focused, which made them epistemically opposed; thus working across organisational boundaries occasionally proved challenging. Ingrained cultures and perceptions among the organisations hindered collaboration at times, which affected KT exchange potential. The most salient finding on this point relates to the academic v. clinical dialectic. The AMC within the network was perceived by some participants as driving its own agenda, while other participants’ perceptions were that the AMC was ‘telling us what to do’. Conflicting cultures and professionally misaligned perceptions created barriers among the AMC and other hospitals. For example, one of the stroke specialists at a clinically focused hospital designed an algorithm to improve efficiency in taking patients’ medical history. Nearly eight months passed from the time he and organisational colleagues began using the algorithm within their electronic medical records before others within the Stroke Network were made aware of its existence. This withholding of information from the Stroke Network was due to the fact that the non-AMC specialist wanted to assert his organisation’s ability to develop useful tools, despite not being an AMC. He stated: ‘We tend to get the short end of the stick because we’re a smaller hospital. The big guys at [AMC] usually get the credit, take the glory. We developed the tool in-house and wanted to implement it first’ (Stroke Consultant 9). Underlying issues around credibility, legitimacy and power dynamics were evident. The critical
point here was that the territorial nature of AMCs v. clinical-only hospitals made their organisational boundaries act as barriers against knowledge exchange and transfer.

This was summarised by a stroke unit manager, who noted:

> Diagnostic information is simple within one organisation. It’s more difficult to work across organisations. We need to ensure the organisations work together. The problem is that one organisation’s priority is not necessarily another’s priority. (Stroke Manager 3)

This logic was reinforced by a consultant involved in the Stroke Network meetings:

> We’ve not been able to crack where we would collaborate, and we’re still in discussions right now with other hospitals. You can tell during these meetings that people agree along organisational lines. (Stroke Consultant 4)

At a smaller, community district hospital, clinician members were required to work with larger hospitals and Trusts providing hyper-acute stroke services. This also raised the issue of trust between two collaborating organisations.

> The other difficulty is across organisational working. Telemedicine is simple if one is used to working with people to get them to trust each other. If the service wants to work across different hospitals it will be difficult. If [the AMC] wants to work with other hospitals, it needs to build up that trust. Our clinicians need to feel comfortable with those people working with them [from another site]. (Director of Informatics, AMC)

Competence-based trust (ability) and benevolence-based trust (vulnerability) both played a significant role in KT across organisational boundaries. During one of the stroke service specification pro-forma panel discussions, a commissioner argued:

> We should go so far as to talk to the leads of each organisation and tell them they need to talk to each other … If we only tell one to talk to the other and not tell the other, then they will not talk. We need to force their hand. I really think we should come down forcefully as commissioners and say ‘this is what we want for our patients’. The knowledge is there, and they need to start working amongst themselves. (Deputy Medical Director and Commissioner)

Her comments highlighted the need for boundary-spanning, social capital capacity building and collaboration across organisational boundaries in order for KT processes to occur.

From a more strategic, macro perspective, a director of IT offered insight into the protective behaviour caused by organisational boundaries:

> At a Trust level they don’t share information because they're looking after their own organisation. Whereas we’re looking at a more strategic picture, and particularly for some
of the infrastructure stuff. I sit on some of the national boards that we have in development projects to look at what we can do for them based on our local experience of what people are asking for, how people work in local Trusts and what information sharing could be of benefit to them. (SHA Director of IT)

This input suggests the importance of sharing localised knowledge among organisations within the overall network due to the obstructive effects of organisational boundaries. Similarly, the Stroke Network’s clinical adviser illuminated the localised decision-making that occurred within the network, raising concern around context and social v. spatial proximity.

It’s about small groups from the different organisations working together. It needed to be local and required flexibility. At first, some people were territorial and couldn’t get over these barriers. Once people started working across hospitals, they began to accept the process and get on board. It became clear flows were better among the sites. (Stroke Network Clinical Adviser)

As shown, organisational boundaries served as barriers to knowledge sharing within the network.

The next section focuses on professional boundaries hindering KT.

6.6.3.2 Stroke Network professional boundaries as knowledge transfer barriers

Professionally based networks produce barriers to knowledge flows (Malin, 2000; Seely & Duguid, 2001), especially where many professions coexist in the same organisation. Ferlie et al. (2005) suggest that professional social and cognitive boundaries act as inhibitors to organisational change and spreading new work practices. Beyond the organisational unit, evidence from my study demonstrated that professional boundaries acted as knowledge barriers during various time periods, which inhibited KT within the interorganisational network. There is strong support for the notion that professional boundaries were decisive in knowledge sharing across the Stroke Network. Such boundaries generated jurisdictional domains ingrained in underlying specialties that made it difficult to transfer knowledge. From the interviewees’ narratives, meeting transcripts, and researcher observations, two elements were most salient regarding the hindering effects of professional boundaries on knowledge.

First, medical professional dominance and clinical demands greatly impacted knowledge sharing within the network. Throughout the telestroke adoption process, it was evident that the physicians
were the driving force behind KT. Homogenous interactions and networking among medical professionals reinforced the boundaries around occupational groups. A clinical lead said:

We will be reliant on opinion from other clinicians, understanding how they’ve used telestroke in the clinical setting. They will share their experiences and knowledge with our clinicians so that they get more comfortable with the equipment. (David)

This point was reinforced by a stroke specialist:

I talk to my colleagues, rely sometimes on their opinions, and if they’ve used the equipment somewhere else. That’s helpful for me to know it’s working in the clinical setting. Knowing other colleagues are using it, listening to their input, it demonstrates it [telestroke] can be used in the clinical environment. (Stroke Specialist 8)

Even the AMC’s Director of Informatics noted, ‘It’s primarily clinician-led. They disseminate information among each other. We [IT] just ensure it’s operational and provide implementation and maintenance advice’. During the initial telestroke adoption decision-making process, medical professionals often acted in an insular manner, focusing primarily on interactions with other physicians. Exclusive networking among physicians was very common. For example, ‘I think as far as I’m concerned a lot of the networking that I do is within a group of [medical] colleagues, and it’s really determining their views on telemedicine and how they see this moving forward. (Stroke Consultant 3).

Second, there were competitive rather than complementary tendencies among the three dominant occupational groups (i.e. clinical, managerial, technical) that hindered KT. Several managers expressed frustration over the lack of managerial engagement by physicians. For example:

I think there’s a lot of discussion clinically, which hasn’t really gone anywhere because there’s not been that involvement at management level. I think we [managers] would like to do this, we think the service would be excellent if it was delivered this way, but actually because the clinician hasn’t involved the management, it isn’t going to come to fruition. It isn’t actually viable to deliver the service that way. (Stroke Manager 4)

This point reinforces the aforementioned dominance of medical professionals and their tendency to engage in homogenous interactions within the boundaries of their profession. Furthermore, data highlighted the competition between clinicians and managers, for example:

I think internally there’s a bit of a testy relationship between managers and clinicians around understanding telemedicine. We don’t really talk about the real concerns with each other. I’m often not part of those discussions, since I’m excluded. (Stroke Manager 5)
An additional insight revealed by the data extended beyond the traditional medical–managerial divide to include the IT professional perspective. ‘IT groups wanted to do things their own way. We’ve got our own way of doing things, and usually the clinicians don’t want to hear it’ (IT Manager 4). Although perhaps a more critical comment, one IT manager expressed his insight on the dynamics among the three professional groups:

People don’t challenge clinical people, because they’ve got their own little club, so if you’re clinical you’re in the clinical club and they’ll look after each other. The managerial non-clinical people, they won’t challenge the clinical people because they don’t want to upset them. The managers and IT guys, they certainly do not dare challenge the clinical people. (IT Manager 3)

The non-deviating nature of homogenous professional boundaries was reinforced by network participants being unwilling to cross them due to perceptions upheld by different professionals. These competitive tendencies diminished cross-professional communication at times and hindered KT processes, thereby demonstrating that professional boundaries within the interorganisational network acted as barriers to KT. Thus, networks do not overcome all barriers. By contrast, the next section shows that social-epistemic boundaries enabled KT at times.

6.6.3.3 Social-epistemic boundaries as enablers of knowledge transfer

Traditionally, social-epistemic boundaries have been known to hinder knowledge sharing across group members by limiting the awareness and understanding of others’ expertise and knowledge. Given the diversity of professions in the Stroke Network, there were multiple epistemic frameworks present, rooted in the different professional schemata. These different epistemic components allowed multiple representations to coexist within the interorganisational network. The cross-occupational nature of the network presupposed the existence of multiple social epistemologies anchored in professional knowledge. As collective entities, the different professional sub-networks represented in the overall network possessed different epistemic states. As a result, participants not only developed diverse interpretations and expectations around knowledge and KT, but also attributed to them different degrees of legitimacy:

The key challenge is that people have different points of view because of their career background, because of their personal and professional experience. And I think that could
potentially be the major challenge. What’s useful is finding a way to bring them to the table and work together because they see a common goal. (David)

That said, most participants, regardless of their professional affiliation, seemed to be able to adjust their communication and occupational terminology to make it both accessible for the rest of the network participants and appropriate to the operational nature of the issues discussed in the network during that time. Social-epistemic barriers, those immediately rooted in a participant’s professional ethos and schema, proved to be significant in the case analyses.

Contrasting with data demonstrating that organisational and professional boundaries acted as KT barriers within the interorganisational network, case evidence revealed that social-epistemic boundaries acted as KT enablers. Since this finding is in contrast to traditional scholarly views of boundaries as knowledge barriers, it is one of the more salient study findings. The most significant time during the study that revealed these findings was after the pro-forma submissions were announced as a requirement – a period of heightened turbulence – and multidisciplinary members of the network collaborated to ensure network survival. For example, one manager commented:

The doctors meet at the network meetings and bounce ideas off one another of what service structures they currently have and actually how they would look to develop some links that would then link in with the management teams, then they come back [to our hospital] and suggest how we can look to fill some of our [medical–managerial] gaps. (Stroke Manager 6)

This medical professional networking, occurring across social-epistemic boundaries primarily in an informal context, facilitated cross-professional interactions and linkages among organisations, and enabled knowledge sharing between medical and managerial functions. Another manager said:

The network seems more positive, in terms of it is absolutely interdisciplinary. I think it’s got a good representation of clinical staff, managerial from the acute side as well as IT and commissioner involvement from PCTs. (Stroke Manager 3)

Contrary to the homogenous thinking that occurred within professions, as previously discussed, the turbulent pro-forma period demonstrated increased facilitation of heterogeneous KT and cross-disciplinary working.

I think we do tend to get things done more collaboratively with different colleagues and working groups; more information is getting shared now, which is where I think they’ve come into their own, rather than being territorial around some hierarchical mandate. (SHA Director of IT)
This comment made by an IT professional highlights the importance of the triangulation across the 
three social-epistemic boundaries within the interorganisational Stroke Network. Rather than the 
duality of the medical–managerial divide, this case on telestroke adoption demonstrated the 
importance of this triangulation among social-epistemic jurisdictions beyond the traditional chasm in the context of network technology adoption. More importantly, the study identified the enabling aspects of social-epistemic boundaries.

My [sub-regional network] has a more diverse, comprehensive network including stroke specialists, nurses, therapists, PCT leads, IT, users – more broad and encompassing than the [other sub-network]. We disseminate information within the network across these specialisms because people are willing to listen and understand each other. They’re on board, working across disciplines, because we’re all working for survival here. (David)

The study’s findings revealed that informal networks facilitated KT across social-epistemic boundaries. Exhibiting direct outreach to network participants outside his organisation, one specialist commented:

When I’m having difficulty getting my hospital [clinical] colleagues on board, I talk with Joanna to get her view on key target and performance knowledge issues because as network manager she knows what’s going on more broadly in the network. She has experience putting out fires at other hospitals. (Stroke Consultant 1)

This comment suggests that proactive outreach to those outside one’s immediate social epistemic boundaries is beneficial for seeking insightful knowledge. More importantly, it demonstrates that epistemic boundaries – by virtue of the differences in the underlying medical v. managerial areas of knowledge – facilitated KT. Given the contextual turbulence of the period, the social-epistemic boundaries presented the clinical consultant with an opportunity to access managerial knowledge from Joanna, which reinforces these boundaries as enablers. Similarly, a neurologist noted, ‘I find that by doing your bit within your patch, and comparing that with stroke specialists and managers, and trying to find where the collaborations can take place, it helps you to deliver what you set out to deliver’ (Neurologist 2). The social-epistemic boundaries (e.g. between neurology and stroke specialists and neurology specialists and managers) within the network presented opportunities for communication, knowledge sharing, social capital capacity building (i.e. networking), and collaboration among different network participants. Furthermore, a manager commented:

We’ve become much better at communicating with other hospitals. There’s an openness and willingness to discuss topics and issues that affect all of us working on stroke. The
lessons from those discussions and information that’s shared is valuable to us as we work on this [survivability]. (Stroke Manager 6)

This sentiment resonated among numerous network participants from various disciplinary backgrounds. Overall, social-epistemic boundaries enabled KT at the interorganisational level amid heightened turbulence.

Taking a more macro perspective on the network, the National Improvement Lead for Stroke noted that ‘People in that Stroke Network] are improving on working relationships. People from different disciplines are forging links with others across the network’. This comment raises the additional importance of the relationship between social-epistemic boundaries and boundary-spanning. As hybrid-role professionals, David and Graham were well versed in the epistemic cultures and values of medicine and management. Thus they had the ability to understand, cognitively, behaviourally, and lexically, both clinical and managerial perspectives, which enabled them to facilitate KT across these social-epistemic boundaries. Diverse understandings and epistemic values were negotiated across the Stroke Network. As facilitators of negotiation processes and coalition building, network leaders’ ability to mobilise professional and organisational group interactions enabled KT, particularly by adopting boundary-spanning roles. Moreover, their comfort with boundary-spanning, openness, and leadership stakeholding in the network also caused them to interact and facilitate knowledge processes with the technical professionals. This was particularly true during the telestroke supplier selection phase, where technological specifications were critical to decision-making by the clinicians involved. David and Graham relied on their informal professional networking across all three disciplines to communicate, exchange information and facilitate KT such that a telestroke supplier selection decision was reached.

In summary, when the network’s organisations started to face highly turbulent challenges (e.g. survivability), they began to realise that they had to seek help and knowledge elsewhere. Organisational and professional boundaries acted as KT barriers; however, social-epistemic
boundaries signalled sources of assistance during periods of uncertainty and turbulence. Sharing social-epistemic views and participants’ familiarity with the boundaries of their knowledge and that of others illuminated where boundaries existed and thus acted as jurisdictions that could be crossed to seek out or gain new knowledge. The key contribution of this section is empirical case evidence that suggests that the existence of social-epistemic boundaries in the cross-occupational, interorganisational network could facilitate the recognition, understanding and transfer of expertise and knowledge.

Evidence from the case study suggests that social-epistemic boundaries ease the coordination of diverse knowledge by: (1) facilitating anticipation of value held by other members of the group (Nahapiet & Ghoshal, 1998) and by extension their credibility; (2) enhancing processes of understanding other participants’ specialist knowledge bases; and (3) developing confidence and competence-based trust in other participants’ abilities. Boundaries represent either material or immaterial limits, and this conceptualisation is useful in that it facilitates the perception and identification of participants’ knowledge and competence that inhabit the jurisdictional domains encompassed by such boundaries. A major example of this facilitation of knowledge exchanges by clear social-epistemic boundaries occurred among network participants during the pro-forma specification period. The interdisciplinary participants went into network survival mode such that they rallied around the collective goal of keeping the interorganisational Stroke Network operational as well as keeping their organisational stroke units open. For example:

It’s do-or-die time. We have to develop a strategic plan and describe our comprehensive services. The only way forward is for us to work together across specialties and disciplines within the hospital. (Stroke Consultant 6)

In order to complete the pro-forma review period and gain approval for their units, participants in each respective organisation had to immediately come together to collaborate, devise strategies and provide input into the pro-forma submission, and develop a collective presentation for the review panel. Joanna reinforced this:

To meet the pro-forma requirements, each unit has to work with appropriate parties within their organisation, seeking help from those outside their immediate departments and units to bring together the collective knowledge to completely answer the questions. (Joanna)
The high level of uncertainty and turbulence (e.g. stroke unit and network survivability) enabled clinical, managerial, and IT specialisms to seek out help and knowledge expertise across social-epistemic boundaries to reach their goal of achieving survivability/sustainability.

In summary, evidence from the case extends previous understanding of organisational and professional boundaries as knowledge barriers. During periods of stability and low turbulence, social-epistemic boundaries may be unclear (e.g. lacking demarcation) and hinder knowledge sharing among network participants by limiting the awareness and understanding of others’ expertise and knowledge. However, during periods of high uncertainty and turbulence, where participants relied on multi-disciplinary colleagues to achieve a crucial imminent goal, social-epistemic boundaries may act as established and recognised barriers that help to identify other credible specialist knowledge. Enabling social-epistemic boundaries facilitate participants’ confidence in each other’s competence and credibility, and these boundaries could signal concrete expertise and KT across network participants. The novelty of these findings calls for theoretical elaboration, which is addressed in Chapter 9. The final sub-section focuses on the role of boundary-spanners in KT facilitation.

6.6.4 Network leaders as orchestrators of group interactions

There is a gap in the literature on hybrid professional role configurations (e.g. clinician-manager), where limited empirical research has been conducted. The study presented here provides data on the complexity of organisational and professional knowledge boundaries as well as the facilitative role played by network leaders and hybrid professionals within the network to overcome KT barriers. Participants’ social-epistemic communities, such as medical-managerial hybrids (Fitzgerald & Ferlie, 2000), facilitated sharing beyond the classical professional boundaries (Ferlie et al., 2011). By sharing language, identities and goals, network leaders such as Graham and David were able to span boundaries and enact a key role in knowledge sharing and transfer. This section demonstrates that network leaders who adopt boundary-spanning roles across sub-networks can influence and mobilise participants’ interactions in order to facilitate KT processes.
One of the most salient comments made on this topic originated from a well-established, highly respected NHS IT Director collaborating with the network:

The broker role within the network is one of the most important aspects of the cross-boundary role. In the network there are clinical drivers, supplier drivers, but many of them don’t understand the clinical context. So a cross-boundary-spanning broker who is knowledgeable about context and has credibility and availability to take on this role, maintain it, and be an innovative pioneer is critical. (Director of IT)

Within the Stroke Network, David and Graham acted in facilitative functions: communicating across clinical, managerial, and during certain periods technical, languages and acting as two- and even three-way windows. For example, Stroke Network meetings were regularly attended by clinicians and managers from the various organisations’ stroke departments. Graham and David led these meetings in their respective sub-regions, oscillating between medical and managerial lexicons to ensure participants’ understanding and engagement in discourse. Furthermore, they both admitted to effort and time spent contacting managers and clinicians outside these meetings, to follow-up on local initiatives and make introductions to other relevant, helpful contacts. For example:

Sometimes it’s that people don’t know about others working through similar problems in other organisations, and other times managers might not be aware that the doctors and nurses in their own units have a solution. Part of my role is helping colleagues talk to the right people to get things done. Why recreate the wheel? (David)

Due to David and Graham’s ability to view the network from a macro perspective and knowledge of wider activities and contacts, they facilitated processes that enabled knowledge exchange via strengthened or newly formed links. This was evident from observational analysis during and after network meetings. For example, before one of the Stroke Network meetings, Graham identified two connections he had established for the purposes of sharing lessons learned (i.e. knowledge exchange): one between a stroke specialist and a neurologist and the other between a stroke specialist and a network manager. He indicated that each pair had not known each other the previous month; however, after the new links were established, the two pairs were observed in informal discussions after several subsequent Stroke Network meetings. By spanning boundaries both within and between the medical and managerial specialisms, Graham and David facilitated
new interactions and linkages among network participants, which helped promote KT across organisational, professional and social-epistemic boundaries within the whole network:

Because we’re a smaller hospital, Graham has helped us determine lessons learned from other [organisations’] units. We don’t have to start from scratch wheel to improve our service and can build upon other successful units. (Stroke Consultant 10)

I remind the unit managers to regularly reach out to their providers. It’s important for them to discuss issues with the doctors and nurses to drive the network agenda … I push them along and try to link up some of the managers with consultants after network meetings. (Graham)

We have a very interdisciplinary unit. Everyone has different views. Part of my job is making sure they communicate and share knowledge. (David)

Further analysis of the comprehensive data revealed that Graham, David and Joanna’s collaborations – across their own social-epistemic boundaries – as network leaders enabled them to orchestrate opportunities for participants’ interactions, which fostered relationships built on trust, respect and knowledge sharing. Their target audience of KT activity was not homogeneous groups. They facilitated participants into smaller heterogeneous groups – across professional and organisational boundaries – and identified the most appropriate methods of reaching them. The methods were determined by their different needs and resulted in different information or methods of transfer based on the timing in that local context.

Under some circumstances, however, it was not just a matter of translating different meanings or making linkages, but of negotiating interests and making trade-offs among participants. As discussed in Chapter 5, Graham and David facilitated framing processes ripe with negotiations and coalitional struggles in order to develop collective dominant frames. Section 5.0 describes participants’ frames/frame repertoires in terms of the encoding of prior experiences, such as career histories and work experience, functional and professional membership, and discusses how frame repertoires provide cognitive frames enabling actors to respond to specific situations (Kaplan, 2008).

The occupational, functional, and professional membership elements relate to social-epistemic boundaries, since they are grounded in different sets of epistemological and cultural meanings (e.g.
medical practice) (Section 6.5.2). Institutional logics, knowledge accumulations and cognitive frames relate to knowledge boundaries, since knowledge is inherent in these elements (Section 6.5.1). Thus frames are linked to knowledge and social-epistemic boundaries, and framing processes relate to knowledge processes. Furthermore, network leaders needed to span social-epistemic boundaries (a sub-set of knowledge boundaries) in order to facilitate framing formulation, propagation and discourse processes, which allowed for knowledge sharing within internal interorganisational network boundaries that would not have likely occurred. This point is supported by a comment expressing a view shared among medical professional participants:

Graham and David have really helped us come together. They’ve shown us where the gaps are and created opportunities for us to learn from each other during the network meetings. … They do a bit of hand-holding, especially when it comes to crossing the [disciplinary] aisle, by raising different perspectives [frames], facilitating discussion, and gradually coming to agreement on what’s best for the network. They ensure we all stay on track … work toward the same objectives. (Stroke Consultant 8)

Moreover, the boundary-spanners assisted in overcoming conflict between professional groups:

I think commissioners could have spent more time understanding other clinical networks. That is our [managers’] view. Instead, Graham communicated with them and tried to get them to understand the bigger picture. (Stroke Manager 7)

Acting as boundary-spanners, the core network leaders enabled interdisciplinary communication and KT across channels that would not have otherwise interacted, catalysing cross-communication opportunities to develop social capital capacity among participants. In order to orchestrate group interactions, network leaders managed, influenced and built social capital proactively while taking into account the interdependencies and identities of multiple players and interorganisational networks. Importantly, Graham and David orchestrated social capital capacity building across organisational, professional and social-epistemic boundaries, which mobilised new interactions and knowledge exchanges to facilitate KT within the expansive network. NPL involved the development of boundary-spanning relationships with others outside the immediate dyads in order to promote KT. Drawing a conclusion from these data, the study found that network leaders acted as boundary-spanners working across multiple jurisdictions, using brokerage role capacity to mobilise interactions that facilitated KT.
The network’s turbulent periods – characterised by heightened uncertainty – caused internal boundaries to become permeable. This made it essential for network leaders to facilitate and manage knowledge flows across multi-level linkages in order to ensure that KT took place across the interorganisational network. Having built sources of influence and power, Graham, David and Joanna linked and enrolled other parties within the network’s activity. At a macro-network perspective, for example:

Communication across the different domains within the network, knowledge exchange and transfer are crucially important to the boundary-spanning role, which is a requirement for sustainable network effectiveness. The benefits of this are starting to be seen in the Stroke Network. (Programme Lead for ICT Infrastructure)

Reinforcing this point, David commented, ‘I’m working across groups and organisations to keep knowledge flowing around the network’. Engagement by network leaders was helpful in permeating the jurisdictional boundaries within the wider network in order to promote interdisciplinary communication and knowledge. Graham and David, as boundary-spanners, interacted with multidisciplinary participants as well as mobilising others’ interactions in feedback loops that enabled KT. Effectively managing knowledge across the various types of boundaries in the interorganisational network was possible due to the network leaders’ increase in social proximity. By manipulating and building social capital among participants (i.e. social proximity), network leaders orchestrated participant interactions. For example:

‘David is very helpful because he knows the right people, reaches out, and makes sure I’m speaking with them to better understand how their organisations are handling similar challenges’ (Stroke Consultant 9).

David and Graham are phenomenal at working across organisations and the specialty groups because of their dual roles. They’re highly respected, so when they make recommendations to liaise with others, colleagues respond willingly. (Joanna)

Importantly, a significant result of the study was that by permeating boundaries, the boundary-spanning, social capital building, assistive role adopted by network leaders enabled them to mobilise interactions, which facilitated KT at the interorganisational level. Extending the facilitative aspects of this discussion, I now address the power interdependencies underlying these network processes.
6.6.5 Power interdependencies

A discussion of interactions and KT across organisational, professional and social-epistemic boundaries would be incomplete without addressing dynamic power interdependencies. Knowledge was formed through the integration of medical, managerial, IT, and to a lesser degree financial commissioning knowledge within the network, and these four sources were embedded in completely different sets of epistemological and cultural meanings. The data analyses showed numerous instances in which power played a critical role in affecting KT across organisational and professional boundaries. As previously discussed, physicians dominated the telestroke adoption process. Even as a hybrid clinician-manager, David stated early on in the adoption process, ‘The clinicians are driving this’. In addition to the power dynamics evident among the three dominant professional groups, interactive power dynamics were also evidenced between the network core leadership group and other network participants. Chapter 5 demonstrated how network leaders framed key issues to align with their primary frames and ultimately shaped practices. This chapter showed that network leaders could orchestrate interactions and facilitate access to the expertise and relevant information of others. By accumulating knowledge from within the network and external environment, network leaders were able to transfer power from the dominant medical professionals to their inner core leadership locus. Maintaining centrality, they were more knowledgeable, had better access to resources, and had relevant information that they transferred to others. The power dynamic was also successful due to the hybrid professional roles that David and Graham maintained. Their own knowledge domains traversed multiple social-epistemic boundaries, which gained them respect from these two occupational groups. David, Graham and Joanna facilitated interactions among the three main professional groups by frequently scheduling interdisciplinary meetings, promoting communication and KT across boundaries and orchestrating framing processes. For example, Joanna vocalised the importance of interdisciplinary communication and contributions during meetings:

It’s important that, beyond a stroke specialist, each hospital have a manager and IT rep present at these network meetings. We need input from the different [disciplinary] groups to take things forward. If you’re missing one of those here today, make sure they are at the next meeting. I’ll also follow-up off-line. (Joanna)
They often used social capital to navigate the power interdependencies in order to accomplish this. The study showed that power, credibility and influence played critical roles in navigating boundaries.

The use of different means of communication and terminology among the predominant disciplines, partially guided by the varying perception of credibility, tended to reinforce jurisdictional boundaries and closure. The different means of communication also reinforced asymmetrical access to information and reproduced power structures, as diffuse communication prevailed within the wider network:

Colleagues in my hospital underestimate the effects informal, personal relationships and even informal meetings have on decisions that we think are made at network meetings. You end up finding that people had corridor conversations and that those discussions affect decisions we make as a larger group. These relationships and who knows or talks to who in their area of expertise could help but could also hurt the network. It seems to work when Joanna gets involved and helps get things done. (Stroke Manager 8)

In this example, a network manager reinforced the presence and importance of social and professional networks, indicating that they directly affected network decision-making. Moreover, she illuminated Joanna’s role as network leader in facilitating processes by networking, such that power dynamics were shifted due to her influencing capabilities.

To conclude, this section demonstrated that network leaders acting as boundary-spanners mobilised participants’ – mainly informal – interactions to facilitate KT. The proactive establishment of new interactions and linkages formed by network leaders involved social capital development and capacity building, as well as influencing processes ripe with power interdependencies. These interactions precipitated knowledge exchange activities throughout the network, which ultimately facilitated interorganisational KT processes. Drawing overall conclusions, the next section summarises the chapter’s key findings and contribution.
6.7 Conclusions

6.7.1 Summary

Current network research reveals limited data about interorganisational network processes, dynamics, and practices. This chapter analysed interorganisational complexity, contributing to a better understanding of interorganisational network processes that are differentiable from standalone organisational or professional networks. The context is different and more complex, therefore, this study demonstrates key processes, such as KT, that can be influenced and used by network leaders to influence and shape the overall interorganisational network. By focusing on interorganisational network complexity, linking to the prior chapter on framing as well, this chapter demonstrates not only how the environment is new and different but importantly what actions leaders could take related to KT that impact the interorganisational network as a whole.

The key findings of this chapter are fourfold, and each is an original contribution to interorganisational network process research. First, formal networks acted as a nexus from which informal networks were mobilised. Second, informal social networks facilitated KT. Third, internal interorganisational boundaries – inclusive of organisational, professional and social-epistemic boundaries – were both barriers to and enablers of KT. Specifically, the former two boundaries hindered KT, while, significantly, social-epistemic barriers enabled KT. Fourth, network leaders as boundary-spanners mobilised professional and organisational group interactions to facilitate KT. In summary, the evidence demonstrated that communication and knowledge sharing across informal networks facilitated KT. Knowledge sharing surrounding lessons learned from across organisations and multi-disciplinary professions helped promote knowledge processes. The findings theoretically imply that the network literature is of limited utility in explaining observed processes of KT facilitation within turbulent, complex, interorganisational networks. Importantly, the study shows meaningful ways network leaders could influence KT to affect change at the interorganisational network level.
Evidence from the case extends previous understanding of organisational and professional boundaries as barriers of KT by demonstrating that these boundaries – as internal interorganisational network boundaries – hindered KT. Established and recognised barriers may help to identify other knowledge, as such boundaries might signal concrete expertise and knowledge across network participants. Significantly, the research supports a highly salient finding, namely that social-epistemic boundaries could act as KT enablers. Case evidence showed that the existence of social-epistemic boundaries eased the coordination of diverse, specialised knowledge both by facilitating anticipation of the value of expertise held by other members of the network, and by enhancing processes of understanding of others’ roles in the network. The complex nature of the interorganisational form in this study, in conjunction with other factors such as shared goals and leaders’ facilitative processes, supported the interorganisational network’s internal social-epistemic boundaries as sites of KT.

The study found that the function of permeating boundaries, especially boundary-spanning and brokering, were crucial to the role of a network leader, which facilitated KT at the interorganisational level. Network leaders mobilised how professional groups interacted, often using social capital development and capacity building to navigate the power interdependencies in order to promote participant interactions. This latter point relates to complexity leadership aligned with emergent, relational, distributed interactions, and collective leadership processes. These findings seem to be a relevant area for theoretical elaboration in the next chapter on network leadership processes.

6.7.2 Chapter contribution

The chapter provided evidence demonstrating that there are still gaps between the network theory and knowledge management literatures, particularly regarding exposure of interorganisational network processes. Furthermore, KT theories offer limited understanding of the highly complex, processual, professionalised interorganisational context such as the NHS. The significance of this chapter is a better understanding of the processes that hindered and enabled KT within a complex
public sector healthcare network, as well as providing an illustration of how formal and informal leadership in interorganisational networks could better manage these dynamic processes. It shows how KT processes used by network leaders could be used to influence change at the interorganisational level.

The next chapter delves into a detailed analysis of network leadership processes in order to develop and iterate the significant theoretical contributions of this thesis. Essentially, this chapter concludes that existing power relationships among the medical profession, managers and IT professionals inhibited KT and, as a result, pose problems for mainstreaming specialist knowledge. By contrast, the evidence importantly demonstrated that social-epistemic boundaries, in conjunction with other processes and particularly during periods of heightened turbulence, enabled KT at the network level. In such a context, KT is influenced by boundaries but also facilitated by informal social networks. Therefore, the research contributes to network studies research by providing conceptual and empirical understanding into how informal networks, internal interorganisational boundaries – particularly underexplored social-epistemic boundaries – and network leaders as boundary-spanners facilitate KT in a highly professionalised, public sector context. Furthermore, it links the network and complexity leadership literatures by emphasising the importance of the facilitative leadership roles and processes (e.g. informal leadership, boundary-spanning) that drive KT in the interorganisational context. The study also contributes to management practice and government policy making by providing an evaluation of knowledge processes in the NHS. The next results chapter further elaborates on NPL with the reiteration of prior evidence and provision of original empirical evidence on this theme.
Chapter 7: Results – Interorganisational network process leadership

7.0 Introduction

Chapter 7 discusses how leadership facilitated and enacted interorganisational network processes such as framing and KT discussed in the last two chapters. This chapter builds upon Chapters 4–6 to present data on NPL. It specifically focuses on empirical evidence, to lay the foundation for Chapter 8, which includes a discussion of separate emergent NPL patterns, pertinent critical conclusions and theoretical analysis. Leadership is a dynamic, complex enterprise that is processual in nature, and this chapter moves beyond assumptions made about the leader–follower relationship to emphasise leadership that is not leader-centric (i.e. it is distributed yet collective). This study considers leadership as the process of influence and relationships among interorganisational network participants.

A review of historical leadership reminds us that the individual leader within an organisation was traditionally the primary unit of analysis. Barnes and Kriger (1986: 15) suggest that previous leadership theories are insufficient as they ‘deal more with the single leader and multi-follower concept than with organisational leadership in a pluralistic sense’. They contend that leadership is not found in one individual’s traits or skills but is a characteristic of the entire organisation, in which ‘leader roles overlapped, complemented each other, and shifted from time to time and from person to person … [implying a] more inclusive concept of leadership’ (p. 16). This concept of leadership in an organisational context has not been examined as closely as the investigations of individual leadership traits and behaviours. My study aligns with this view of complementary, distributed yet collective, inclusive, processual leadership and is one of few to account for the interorganisational network setting. Four dominant NPL contributory findings from this chapter relate to: (1) leadership influence in the network and related influencing processes; (2) maximising social over spatial proximity among network participants; (3) formal network leaders adopting focal and non-focal roles; and (4) formal and informal leadership reciprocity involving
complementary leadership processes. Importantly, each of these NPL themes leads to the facilitation of interorganisational network processes. For example, as discussed in the last chapter, network leaders acted as orchestrators of group interactions to facilitate network-wide processes. As these themes pertain to leadership processes, they are all interrelated, an aspect which is discussed in detail. The primary contributions of this chapter are the provision of original empirical evidence on leadership processes in an interorganisational network and identification of critical, foundational concepts related to the above four findings for a NPL framework linking network theory and complexity leadership.

There is a clear progression in the research literature from static to dynamic considerations of leadership (Pearce & Sims, 2002). This evolution leads to questions surrounding the characteristics and patterns of leadership processes in networks. ‘Network leadership is leadership of change … Networks are conduits of change and network leadership is leadership of change’ (Schreiber & Carley, 2008: 292, 295). Sydow (1998) found that network firms require careful interpersonal relationship management that must be monitored. Overall, a review of the general leadership literature reveals that the field is evolving to a more holistic view that encompasses the wider network rather than a single leader. Increasingly, leadership is being distributed and shared in organisations, and leadership is being viewed as a complex and emergent practice (Avolio et al., 2009). This chapter’s analysis responds to a recommendation from Alvesson and Spicer (2012) for leadership scholars to examine the contextual conditions wherein leaders interpret and construct their context.

The next section discusses the study’s definition and operationalisation of leadership. I present Stroke Network leadership case results covering a variety of network leadership processes. Drawing on original empirical evidence covering the four dominant NPL themes, I then discuss their interrelatedness and its importance for NPL. The final section identifies brief chapter conclusions and critical contributions targeting NPL within the interorganisational context.
7.1 Operationalisation of leadership

It is not possible to discuss all conceptualisations and definitions of leadership here. As addressed in Section 3.6.1, the particular definition and operationalisation of leadership on which I focus is leadership as the process of reciprocal influence and relationships among interorganisational network participants at the individual, professional and organisational levels over time. The activities (acts of leadership), at individual, professional and organisational levels, were explored as they affected the interorganisational network as the dominant unit of analysis. Since networks are affected by acts of leadership, the study explores the acts, behaviours, characteristics and processes of leadership that drove wider network processes. The next section begins the presentation of primary data on leadership processes, based on the analyses conducted.

7.2 Stroke Network leadership process results

This section presents original empirical evidence relating to four dominant NPL themes that emerged: influencing processes, maximising social proximity, focal v. non-focal roles, and formal and informal leadership reciprocity. In the study, generalised reciprocity is defined as transitive trust and trustworthiness among complex, interorganisational network participants, comprising many overlapping sub-networks, who have either prior personal acquaintance or do not (Van Oorschot et al., 2006). The data illuminate significant network leadership processes at the interorganisational level. For simplicity, each theme is presented below separately, and the interrelatedness among the four NPL themes is described in Section 7.3.

7.2.1 Leadership influence in the network

First, in this study, I use ‘influencing’ in the context of an individual or individuals (i.e. core leadership group) effectively influencing a network participant or group of participants. Second, ‘networking’ refers to relationship building and development, whereby leadership networking involved (1) using existing relationships to influence and strengthen ties, or (2) the establishment of new relationships that could facilitate further influencing. Social capital dynamics were inherent in the processes of influencing throughout the network, such that networking and the embedded
processes of influencing involved social capital or capacity building. First I address the reasons behind network leaders’ influencing processes. Second, I offer a foundation to explain the importance of the network leadership processes used in accomplishing these actions.

7.2.1.1 Reasons for network leaders’ influencing

The data pointed to three dominant reasons why leaders exerted influence among network participants. First, the contextual conditions of the interorganisational network were such that network leaders and participants maintained shared objectives, goals and financial resources as well as access to large amounts of human and social capital. This context allowed for social capital availability, and the network’s relational culture enabled leaders to be comfortable with influencing and building social capital among participants. Despite limited human and capital resources (e.g. stroke specialists and funding), the collectivity of network participants maintained high levels of social capital as a resource. Network leaders capitalised on the availability of their and others’ social capital as a means to meet network-wide objectives and goals. The core leadership group felt comfortable contacting informal leaders and participants and did so with ease, given accessibility to social capital as a resource. For example:

I get on with people, and it’s easy for me to reach out. David, Graham, and I know who to discuss with ... I’m comfortable picking up the phone and having a discussion offline ... That’s how things get done in this network. (Joanna)

The network’s availability and accessibility of social capital as a resource enabled leaders to influence through networking and relational development. The data suggest that social structure and action are important and that formal network leaders maintaining power can facilitate network processes to help shape and develop local contexts. Thus the study aligns with social network theories that focus on local interactions and power issues, and importantly also acknowledges the wider networks of power as an aspect of context.

Second, past experience based on observational and experiential learning drove the core leadership group to exercise influence. Graham shared examples of how his mentor, a senior hybrid clinician-
manager, used and developed relationships in the past within the clinical setting to achieve goals.

He described how this influenced his approach, particularly regarding delicate network issues:

Especially with sensitive issues, I’ve seen things work most effectively when as a leader you reach out to someone [informally], have a discussion with them ... I’ve seen it work for my mentor who is great at navigating these things ... There’s an art to it, but first you have to actually engage [intentional relational development] to make it work. (Graham)

Graham and the other formal network leaders drew upon past observations of influencing and networking that worked for leaders and mentors as well as for themselves.

Graham and I were swapping stories about a senior leader whom we both learned from over the years…when we drilled down to how he got things done, it was through working well with his peers and bringing them together. It’s harder than it seems in medicine because there are so many specialisms and silos. Graham and I realised how effective [John] had been and started to develop a collective approach on how to tackle some of the network’s people problems. I asked him who he thought he carried the most weight with and where he thought there may be tensions if he approached that person…I agreed to take on those few. (David)

Social capital management and capacity building became embedded in their frame repertoires over time through observation and learning. Thus these frames were available for them to draw upon to facilitate leadership processes in the interorganisational network.

Third, the core group was driven by an evidence base. As hybrid professionals, David and Graham were particularly influenced by peer-reviewed, academic, medical journal articles, predominantly those with either an exclusive medical or medical management focus. David often referred to articles surrounding stroke, stroke telemedicine, telemedicine implementation, and telemedicine in clinical networks that influenced his thoughts (i.e. frames) and decisions about the project. For example, he mentioned to Graham:

There was a great article in the BMJ on telemed IT implementation and the crucial need for clinical champions. Also, the Lancet had one on stroke you should take a look at. It’s worth a read ... We should identify key influencers at [Hospitals A, B, and C] who will steadily help us drive this forward. Those advocates shouldn’t be underestimated. (David)

Graham responded receptively, and they both often engaged in these types of discussions surrounding medical journals or current studies. Given the culture of the network, availability of social capital and trusted recommendations by peer-reviewed, evidence-based journal articles, the
core group decided to reach out to potential clinical champions at the network hospitals, and they drew upon these factors as part of their leadership processes.

The Stroke Network could be described as tightly linked organisations because of the high interdependence among the core leadership group, the SHA, stroke units, and commissioners. As a visible consequence, network participants were connected via the formal, quasi-hierarchical nature of the network as well as informally. Despite these interconnections, participants heavily relied upon the network core leadership group – Joanna, David and Graham – to receive pertinent information and negotiate resources both in the inner and outer context. As discussed in Chapter 6, network leaders acted as boundary-spanners, scanning and interpreting the network’s environment and then passing information to other participants (cf. Katz & Tushman, 1979; Hansen, 2002), which proved crucial for KT. As a result, leaders had a greater command of access to social capital resources, which enabled them to engage more readily in influencing processes. Through boundary-spanning actions, leaders employed social capital to facilitate KT among participants that ultimately drove NPL.

In summary, the evidence indicated three dominant reasons behind the network core leadership’s influencing processes: network culture – based on localised context – as a function of the network’s social capital, past professional experience and an evidence base.

7.2.1.2 Influencing processes

Networking

Informal network interactions influenced network processes and change as leaders who spanned boundaries were more likely to share information and ideas that mobilised interactions and facilitated interorganisational KT. In addition, the process of networking was crucial to network interactions and change processes. As one consultant noted:

I think the network inside is extremely powerful ... There are many strong relationships that keep things moving, especially with David and Graham. They draw on expertise from
Participants had the ability to influence the network structure while simultaneously being constrained and directed by the sub-network structures to which they belonged. Networking and its basis in relational leadership illuminate the importance of dependence on others, as opposed to traditional leadership views on individualism. Leaders valued a relational, collective approach involving distributed rather than individualistic leadership. Network leadership processes involved a significant amount of relationship development and alliance creation in the service of others and that of interorganisational network goals. Joanna offered her opinion to less experienced managers:

> My network is incredibly valuable to me ... there are colleagues I can rely on to help me get things done. In some cases I’ve asked them to drive things forward in their departments … Their support helped me meet several of my career goals and even the network’s objectives. (Joanna)

Several managers engaged in intentional formation of high-exchange relationships with select participants, who then transmitted and reinforced their influence with other professional and organisational participants, demonstrating a process of network building across the interorganisational network. Moreover, network leadership occurred in and through relationships and networks of influence.

Core network leaders, Joanna, Graham and David, exerted influence across disciplines, organisations and participants, yet differences in the types of participants targeted by each leader were observed. Doctors tended to target and influence medical professionals, whereas managers attempted to influence managers, clinicians and IT participants. In an important example, Joanna, David and Graham jointly agreed on outreach planning to connect with and link other participants. They strategised about who would be most effective at strengthening and establishing connections based on one another’s existing connections and standing (i.e. social capital capacity) among various cohorts.

> David tends to get through to most of the clinicians because he’s trusted and highly respected. Graham is respected but better at addressing the academic clinicians given where he’s based [AMC]. I focus more on the managers and IT guys to get things done. This distribution [of networking] works for us. (Joanna)
The formal network leaders influenced network participants by employing the concepts of active networking, trust and social capital. It is also important to note the underlying social-epistemic dynamics involved in their targeted networking. Leaders proactively engaged in influential outreach to strengthen their and others’ links as well as mobilising others to form new links. Joanna reinforced this, stating ‘It’s ensuring the right people are talking … it gets things done’. In addition, the collaborative working relationship among the three was well received and perceived as having greater influence over network participants, as opposed to each leader working individually. Their cross-disciplinary, hybrid team was highly respected among the interorganisational set due to their competence and levels of trust established with participants, which rendered them effective at broader interorganisational networking. Therefore, the strength of the core leadership group resided in their relational, collective approach to leadership, which enabled greater influence over network leadership processes. For example, Graham and David discussed and acknowledged that many doctors would respond positively to evidence-based medicine arguments about telestroke utilisation, based on their prior experiences of observing change happen in the clinical setting. During the early phase of network telestroke adoption, Graham and David identified peer-reviewed, academic, medical journal articles that demonstrated the benefits of telestroke. They agreed they would share this knowledge with the Stroke Network, targeting clinicians, to disseminate the information and gain the dominant clinical community’s buy-in. Graham and David used their influence and social capital within their sub-regions, shared the positive outcomes based on journal evidence, and facilitated framing around selecting a telestroke supplier. The result of their influencing and use of social capital were framing processes that ultimately led to a telestroke decision, and most importantly, shaped network actions and practices. Their influencing facilitated processes that shaped the interorganisational network.

Influencing processes over time

SHA leaders had a longer-term view than most network participants, a view that may have emerged from their experience with the network’s evolution. One SHA leader said:
I have found that network experience has a dramatic impact on productivity when you need to get things done. Those that are particularly effective are those that have broad connections … We have to find a way to keep enriching networks. (SHA Network Lead 1)

Here, productivity was to some degree attributable to wide-reaching connections developed over time, which enabled work processes. This also suggested that the temporal dimension of influencing via networking could have an effect on enhancing productivity and driving processes. Similarly, participants placed value on developing their network connections. Another SHA lead expressed an analogous opinion accounting for influential factors:

The people that are more successful are the people that understand how those relationships work, and then can find themselves effective within those connections. Not just understanding how important they are, but it is also being able to utilise the network. When you look at people that are most successful, they have progressed to access [to others] and influence [with others]. Their ability to have control over their position is important, but the leaders are ones who have access and influence. (SHA Network Lead 2)

The data on networking revealed that making use of interactions with existing contacts as well as building capacity by establishing new contacts were micro-processes significant to influencing.

For example, Stroke Network leaders indicated:

I wouldn’t have been [there] if I did not think it was important to build relationships of access and influence. (Graham)

Skill development is about networking. It’s not a soft skill area, rather a hard skill area. It needs work, development and training. The benefits are huge. It’s an interactive process – give and take. (Joanna)

Graham emphasised the importance of relational development that enabled him to increase his influence within the network. Joanna noted the interactive process of reciprocity (i.e. ‘give and take’) that is required for beneficial network development. Through the interactive, reciprocal processes between two individuals developing a networked relationship, trust strengthened over time. The important point here is that access to social capital and the influence it allowed network leaders to exert was perceived as beneficial to their role. Network leaders’ ability to forge new linkages demonstrated value to other participants as well:

David is always looking for – he arranges for – opportunities for us to meet with different departments … He invited other units for us to get to know. (Stroke Consultant 1)

Our manager makes phone calls. He sends emails and copies us on those emails. He does consistent follow-up to make sure that it [collaboration between teams] is happening. (IT Manager 4)
By making use of social capital, network leaders such as David and Joanna were able to influence and establish flexible, dynamic communication and knowledge exchange linkages to connect multiple participants across professional and organisational boundaries. For example, during the pro-forma review period, Joanna and David identified key contacts at two hospitals that would need to liaise to provide telestroke services. Hospital A did not have the capacity to provide hyper-acute services, and its stroke unit would be closed. Hospital B had a robust stroke service and could provide extended services to Hospital A’s referral patients.

Consultants, unit managers, and IT personnel from [Hospital A] and [Hospital B] never really interact, since they haven’t needed to until now. Rather than leave it to them to pick up and start working together, Joanna and I engaged with some key people. We mapped out which organisations needed to speak to one another. After agreeing on the prioritised list, I reached out to fellow consultants at the sites, and Joanna connected the other disciplinary units. (David)

They influenced by providing introductions via email, and then reinforced those connections after a presentation meeting via face-to-face interactions. Joanna indicated:

It probably would have taken months for them to figure out a collaborative arrangement. We just sped up the process by introducing the right people and giving them a push to move things along. I merely connected them and recommended they work together if they planned to offer stroke services. With telestroke, the doctors don’t feel comfortable working with others they don’t know because they have to trust the team on the other end of the teleconferencing equipment. (Joanna)

Through social capital capacity building, new collaborative partnerships developed to help the network achieve its objectives. One of the consultants involved commented:

David came to me and said we really need to work with [Hospital B] in order to maintain a good service … I trust him, so took what he had to say on board … He introduced me to my counterpart at [Hospital B], and we started having conversations to determine the best way to move forward. (Stroke Consultant 9)

The consultant acknowledged his trust in David based on existing social capital, which enabled him to be receptive to David’s suggestions. David made use of his social capital and facilitated a new relationship whereby the two newly linked consultants engaged in social capital capacity building with one another and ultimately became cross-organisational collaborators. The result of leaders’ influencing processes and use of social capital was the reconfiguration of the interorganisational network due to new organisational linkages. Reinforcing the importance of reciprocal social capital exchange, a nurse stated:
We’ve started two-way discussions with [Hospital C] about how best to provide the service… what they could offer us out-of-hours and what we could provide in terms of other capacity. I suppose there has to be that back and forth to get things done. (Stroke Nurse 2)

It is worth noting that network leaders did not formally institutionalise the role of relational development within the network, but rather subtly built commitment to network-level goals among participants by influencing, social capital dynamics, and employing strategic and operational networking. A critical finding of the study was the suggestion that leaders could influence networks by employing processes linked to relational development (e.g. social capital and capacity building), including the formation of new linkages among participants and organisations within the interorganisational network. This finding is discussed in detail in Chapter 8.

**Initiating new linkages and working across formal and informal interactions**

One benefit of the longitudinal study was that the data revealed continuity in influencing processes, whereby changes in influence were analysed over time rather than statically. The temporal aspect of influencing dynamics was evidenced by several interviewees. For example:

> It’s not having a clear direction and clear vision and leadership from the commissioners, and saying actually ‘this is the model we want to deliver’. It hasn’t been very much driven by them, and I don’t necessarily think that’s the right way it should have happened. (Stroke Manager 7)

Here the manager criticised network leaders for their lack of ownership and concrete model identification to drive network processes. The comment was collected early on in the study during the nascent phase of the telestroke adoption key decision period. It illuminates the interactive leadership dynamics between core network leaders and commissioners that were anti-facilitative. This data is contrasted to a comment made by the same manager following the network’s decision to pursue telestroke:

> Joanna really brought everyone together and pushed this [telestroke] decision forward. She made sure managers were at the table with clinicians and IT. The process was already dragging on so long, and thanks to her pushing it along, it’s finally getting somewhere. (Stroke Manager 3)

A similar example of influencing over time emerged during the stroke specification key decision period. When Joanna announced the SHA’s requirement of pro-forma submissions, many
clinicians were disgruntled with the approach. They argued, ‘Forcing us to submit paperwork is just reinforcing the bureaucratic, mandated approach of old’ (Stroke Consultant 11). Gradually, as Joanna, Graham and David worked closely with the clinical sub-networks and transitioned framing away from mandates towards Stroke Network survival, the perspectives of participants shifted. Rather than resentment towards the hierarchical policy, multidisciplinary participants engaged with the pro-forma process. For example:

We run the risk of closure, and nobody wants that. We’ve teamed up with [local hospital] to develop a strategy and way to move forward. During the network meetings, Joanna helped by identifying potential collaborative sites with capacity. She said what each of our organisations was doing and suggested how we could work together ... The info and intros during those meetings were useful. (Stroke Consultant 12)

Another example illustrated the concurrent nature of dynamic network leadership processes:

A new person came in and tried to change the direction of the SHA. He wouldn’t budge on his decision. Joanna had to go to the others and the Board. She had to provide an alternative to the hyper-acute model, otherwise they’d challenge the decision. They wanted evidence to make a decision about telemedicine. This was all going on in the background as she was driving the procurement process … getting sites to work together. (Cardiovascular Network Manager, SHA)

Related to this example, Joanna noted the use of social capital via informal discussions she had with Board members prior to their reaching a decision, stating:

I approached [Board members] offline to explain where we aimed to go with telemedicine, and they said I would need to provide evidence to officially satisfy the Board. [Board members] made suggestions on how best to approach the situation … It was helpful to get their input before officially presenting to the SHA Board and also influence their perspectives on the issue before their next big meeting. (Joanna)

In this example, Joanna utilised social capital because she maintained existing relationships with certain Board members. Knowledge was transferred through the informal exchange of ideas and social capital influence between a formal network leader using informal leadership processes and the Board. By learning the Board members’ insights, Joanna was able to more effectively present them with a solution to the telestroke adoption decision they faced and subtly influence their thoughts on the issue. This demonstrated reciprocity between formal and informal means of leadership. Trust was inherent in this informal process among Joanna and the Board members with whom she engaged in these highly sensitive discussions.
The evidence showed that Joanna and the Board’s social capital and power dynamics mattered with respect to network change and practice (c.f. Haynes & Hillman, 2010). This aligns with West and Barron (2005), who argue that dissemination and influence strategies that account for features of the social structure are more likely to be successful. Through investment in building their network of relations, network leaders such as Joanna augmented their social capital and gained benefits in the form of superior access to information and power, and by investing in the development of internal network relations formal leaders working collaboratively strengthened their collective identity and augmented their capacity for collective action. Influence, control and power constitute a benefit of social capital (Adler & Kwon, 2002). Burt (1997) argues that managers spanning structural holes are more powerful because they can control projects that connect other groups. Power benefits could also have positive side effects for the wider network, since power helps accomplish things. Because some network participants accrued relatively more power and played a formal leadership role, the Stroke Network was arguably a more effective network than it might be otherwise.

Similarly, Graham frequently engaged in informal discussions with colleagues to drive processes.

> I had talks with [Andrew] at [Hospital D] to learn what they were doing about the potential telemedicine kit … I gave him high-level details about what’s going on in the network more broadly, and I discovered they had already put processes in place to understand clinical pathways with the carts… I connected him with a district hospital unit lead that was struggling to provide services … I think they’re working on something now. (Graham)

By learning from one organisation, Graham initiated links with another organisation to facilitate interactions that would enable the network to achieve its goals (i.e. telestroke adoption). Social capital capacity building to form a new linkage between Graham and the unit leader and their KT exchanges demonstrated the reciprocity of network leadership processes between the formal and informal network leader. Related to this point, very often important processes that required input from core leaders occurred concurrently, suggesting that the management of multiple leadership processes at a single point in time as well as over time were significant characteristics of network leadership. Time constraints may have prevented the formation and maintenance of strong links
across distributed and unconnected participants, which instead generated linkages that involved infrequent interaction and lower trust levels (i.e. weak ties).

My time is limited and spread across the entire large network, so sometimes I can’t spend a lot of time getting to know everyone really well, but gradually try to as I have time … I’ve found connecting others has been very beneficial for the network overall. (Joanna)

It proved advantageous for Joanna, David and Graham to form new weak relationships and to connect those who were unconnected via email, conference calls, face-to-face introductions and meetings, as examples have shown. Over time, trust, value, reciprocity and social capital developed among participants. As these factors strengthened and more frequent interactions occurred, weak ties transitioned into strong ties. Thus leadership influence in the network provided a basis for stronger, reciprocal relational development that helped facilitate network processes.

In summary, the overall findings point to several significant influencing processes employed by leaders, including the facilitation of relational development by using their social capital to strengthen existing relationships and form new linkages. Network leaders influenced network participants by employing the concepts of social capital, intentional networking and trust reciprocity. They proactively engaged in influential outreach to strengthen existing links and facilitate new linkages. Influencing occurred across multiple boundaries but, importantly, spheres of influence tended to be professionally or disciplinarily related. Network leaders relied heavily on informal network interactions to influence network processes and change as they spanned boundaries, shared knowledge, developed linkages and facilitated interorganisational processes. The power of the core leadership group resided in their relational, collective approach to leadership, which enabled greater influence over leadership processes. Lastly, the longitudinal study demonstrated the temporal dimension of influence, such that influencing could shift and transition, in that network leaders exhibited high degrees of flexibility of influencing over time (e.g. policy mandate to network survivability). Building upon the relational development and social capital factors involved with influencing discussed here, the next section emphasises the maximisation of social over spatial proximity within the network.
7.2.2 Maximising social over spatial proximity

Overall this section demonstrates that maximising social proximity over spatial proximity among network participants facilitated interorganisational network processes.

7.2.2.1 Social and spatial proximity

This sub-section focuses on the significance of maximising social proximity over spatial proximity as well as the related importance of social capital dynamics to proximity within the interorganisational context. Given the formal roles and processes underway within the network, leaders had the capacity to influence the network context, whereby social context was an active and interacting component in interorganisational network development processes. In this study, ‘social proximity’ pertains to social closeness between at least two network individuals due to the presence of shared social capital. It involved mutually beneficial reciprocity of social capital resources as well as the development of trust over time between the two individuals. Therefore, as more social capital exchanges occurred and trust increased over time, two individuals gained higher social proximity. ‘Spatial proximity’ refers to geographic closeness between network participants and related to the work processes of network participants at a distance (e.g. clinical pathways). Working within the same organisation meant high spatial proximity, whereas working at a physical distance from one’s colleagues (outside one’s immediate organisation) implied low spatial proximity. For example, an entirely virtual-based working relationship involved low spatial proximity. ‘Maximising’ refers to increasing to the greatest extent possible. Study evidence often showed that spatial proximity was important to achieving social proximity because face-to-face interactions enabled network participants to build social capital capacity that increased their social proximity.

First, the core leadership group led in a diffuse style of leadership, and it is important to recognise that the channels of communication, knowledge and influence flowed down through informal social networks rather than spatial networks. This is due to the relational nature of the network as well as the accessibility of social capital as a readily available resource within the network. Social
proximity was significant because, given the structure of the interorganisational network, leadership and work processes involved multi-professional teams. Second, due to the virtual remote nature of working engaged in by a clinical team utilising telestroke, the remote consultant relied upon the treating clinical team at a distance; hence the critical players in telestroke were geographically distributed and maintained low spatial proximity. In the context of an interorganisational network using telestroke technology, spatial proximity mattered far less than social proximity. This is because distance was inherent in the remote work processes of telestroke utilisation, and social proximity (e.g. between consultant and clinical team) significantly impacted life-critical diagnostic and treatment processes. With these factors in mind, network leaders exerted influence to increase social proximity within the interorganisational network. Spatial proximity also played a role, for example, since leaders regularly hosted in-person Stroke Network meetings. However, the purpose of the face-to-face meetings with high spatial proximity was primarily to maximise social proximity by facilitating participant interactions and relational development.

We technically have these meetings to go over the quarterly agenda. I update the specialists, and we discuss the agenda items … But a lot of the time they spend time discussing details after the meetings, staying after to catch up, which is more relaxed. (Graham)

Building on this point, a specialist emphasised how the meetings facilitated stronger informal relationships:

Discussions happen after the meetings with fellow colleagues … I think plans come out of those conversations that for me ends up in more offline discussions … It’s the on-going, offline discussions that affect decisions we make and solutions we apply in our units. Sometimes we discuss an issue and then align around it before the next meeting. (Stroke Consultant 5)

Although formal network meetings offered the opportunity for social capital capacity building, the on-going social interactions significantly affected network processes. Overall within the interorganisational network, the majority of processes related to high social proximity rather than high spatial proximity; hence, social rather than spatial proximity mattered more in the interorganisational network context.
Given the proposed NHS policy reforms and resulting overhaul to cut administrative costs and shift commissioning control to GPs, the telestroke tender process halted in November 2009 due to concerns over funding availability. It took four months to confirm funding, and a brand new tender process started, inviting another round of supplier bids and presentations. As I followed delayed progression of telestroke adoption, issues of social proximity emerged as dominant themes from the interviews and observational analysis. With their own reputations and credibility on the line during life-critical diagnostic processes, confidence among the clinical stroke unit teams was crucial. Maximising social proximity was especially important because it enabled increased levels of trust among participants and minimised the inherent risks involved with telestroke utilisation over time.

Stroke units are very integrated and non-hierarchical using an interdisciplinary team-based approach. The quality of service providers consultants work with – either at their [hospital] or other sites – they are relying [upon others] in the clinical pathway. Confidence in your medical professional colleagues, especially at other sites, during this process is crucial. (Stroke Consultant 13)

Given the geographic dispersion of the regional network, clinicians were physically separated from their collaborating clinical colleagues. Confidence in one’s colleagues was closely related to social proximity, since social closeness enabled that confidence to develop over time; therefore, social proximity was more important for facilitating network processes given the context of spatial dispersion. As demonstrated by these and other supporting data, the network exhibited high interdependency inherent in interactions within and across professional and organisational boundaries. As the next section shows, social proximity enabled increased trust levels among network participants, which was particularly important given the dispersed network and virtual nature of participants’ work. Overall, spatial proximity could help enable social proximity (e.g. speaking after a network meeting increased two participants’ social capital and proximity); however, it was not an exclusive prerequisite to social proximity. Social proximity could also be supported through ongoing virtual interactions (e.g. via phone conversations and emails) that increased social capital over time.
7.2.2.2 Trust

Within the socially embedded network construct, trust among clinicians was particularly important, since the relationships among clinical team members were highly collaborative and interdisciplinary. This case demonstrated the types of trust both within and between professional network levels that clinicians possessed in order to adopt and utilise the new technology. Several participants articulated the need for validation and reassurance, suggesting that the reciprocity of trust was a significant network process.

I think there has to be that element of trust. It’s that trust between clinicians, so they know each other, they know the [other’s] capabilities and they’re happy to go on that clinician’s judgement. (Stroke Manager 9)

Although social connections were important, they could not substitute for professional connections embedded with power dynamics that reinforced other clinicians’ capabilities and competence. The power wielded by medical professionals within the healthcare context was strengthened by intramedical professional connections. Intraprofessional trust was critical to network clinical pathway processes, particularly with telesstroke requiring virtual collaboration at a distance and dependence on one’s clinical colleagues.

Human trust is the critical thing. [Telemedicine] is a useful thing. It’s very good in terms of the technology. It’s a supplement. The personal interactions cannot be substituted by technology … I think that some of my colleagues will find it far more comfortable to make decisions if they see the patients themselves via the telemedicine equipment and know the clinicians on the other end of the video screen. (Neurologist 2)

Given the importance of trust, improving participants’ relations was one way to reinforce trust and enhance sensemaking and KT. One example of how network leaders accomplished this related to the delivery of the pilot site’s telesstroke equipment. Joanna arranged for the first instalment of telesstroke equipment to be delivered to the initial site, but rather than implement the technology as it would be used in practice, she arranged with the local clinical lead to temporarily store it in a separate room. They then invited local doctors (A&E, stroke specialists, radiologists and neurologists), nurses and IT personnel to visit the room during open hours to test the equipment, familiarise themselves with it and engage in cross-disciplinary interactions. The clinical lead in particular emphasised the importance of relationship building among the various clinical sub-
specialties, since they would be relying on one another during time- and life-critical stroke cases using telestroke:

It’s important that the stroke consultants familiarise themselves with the cart and also with other colleagues who will be participating along the stroke pathway. There’s a lot riding on what happens over the telemedicine system during a serious stroke case. (Stroke Consultant Lead, telestroke pilot hospital)

By initiating these early links in the pilot site, relationships were built to not only familiarise participants with the telestroke equipment but importantly with one another. As one nurse commented:

When a stroke patient comes in and we use telestroke, I’m going to be responsible for all the initial med history, work-up and communicating with the remote consultant at home. But he’s going to have to review all the info and make the diagnosis based on what me and my team do in the hospital, then we’ll treat based on his final input. (Stroke Nurse 3)

Joanna and the local clinical lead facilitated the linkages by creating the opportunity for social capital capacity building, which promoted local participants’ establishment of trusting relationships both within and across specialisms. Professionals who trusted one another (e.g. competence-based trust) were more likely to admit uncertainty about solving a problem, increasing the likelihood that learning would occur (cf. Lanham et al., 2009). Hence the data supported the dominant role of competence-based trust in network processes, particularly among clinical participants.

Trust is the absolutely critical factor. When we were thinking about models of involving other hospitals ... we decided it would be difficult to make decisions on the end of the phone or even using the telemedicine equipment when you don’t know if the people on the other end are sensible or not. A relatively small group of people who know each other is in my view a very important part [of telestroke]. (Stroke Consultant 14)

The importance of a localised core unit working together based on mutual respect and trust could not be overemphasised, particularly among medical professionals.

Interpersonal competence-based trust, reliance, and interdependency among medical professional colleagues (i.e. social proximity) was extremely important when dealing with a geographically dispersed, interorganisational virtual telemedicine network. In a context where medical professionals shared interorganisational network goals working toward shared objectives, and in many cases engaged in interdependent functional work tasks (e.g. relying on other medical
professionals within your team to effectively treat patients), increased social proximity supported competence-based trust over time. This was a salient point especially with regard to actual telestroke processes:

Telemedicine is simple if one is used to working with people to get them to trust each other. If the service wants to work across different hospitals, it will be difficult. They need to build up that trust. It’s all about the human factor. (Director of IT)

Rather than the technological artefact, the human, social elements were most significant in the virtual collaborative processes of the interorganisational network. This is a particularly salient finding because it reinforces the importance of maximising the underlying social capital dynamics within a complex network relying on virtual-based work. Trust and reciprocity among professionals, particularly clinicians, were crucial to the utilisation of telestroke technology, since it required virtual, interactive, highly interdependent working at a distance. As one doctor asserted:

While working remotely, I will be highly dependent on the clinical team at the patient’s bedside. I have to trust they’ll take a comprehensive medical history, properly run tests, and communicate with me in real time so I can make a diagnosis. I have a lot at risk in this situation, and relying on my clinical colleagues is absolutely essential to the stroke care process ... We know the equipment works to a clinical standard, so I’m not concerned about the tech ... it’s about the people I’ll be working with on the other end. (Stroke Consultant 15)

When utilising telestroke, diagnosing stroke specialists would rely exclusively on clinicians remotely, trusting them to collect necessary information and treat the patient for whom the consultant made life-critical, time-sensitive decisions. Power dynamics and interdependent reciprocal relations, as well as both individual participant and collective network identities, greatly affected interorganisational network functioning, suggesting that leaders need to manage interactive social dimensions to drive network processes. In addition, the evidence suggested that there are different types of trust, including both intraprofessional and interprofessional trust. As evidenced by the study data, the need for trust within the complex network was important for network process change. Given that professionals were often ‘tribal’, reputation within the intraprofessional network was a critical resource and characteristic of network leaders.
7.2.2.3 The importance of trust and social capital for influence

Importantly, this study demonstrated differentiation of trust both within and among network levels to identify social capital capacity building mechanisms and highlight the dominance of social over spatial proximity in driving interorganisational processes. Trust was a crucial component of influencing, and participants revealed that both competence-based trust (ability) and benevolence-based trust (vulnerability, relating to whether someone has your best interest in mind) were aspects of their network relationships, with data dominantly exhibiting the former. Linking to Chapter 5, trust in David as he formulated the primary frame was critical to sustaining peer consultants’ buy-in to the framing process. Without participants’ competence-based trust, it is unlikely David would have been as effective in driving the primary frame forward to shape network actions and practices during Key decision period 1. Relating to Chapter 6, competence- and benevolence-based trust both play a significant role in KT across networks (Abrams et al., 2003; Levin & Cross, 2004). Within my study, benevolence-based trust was discussed limitedly, primarily as a component of personal relationships as well as participants’ perceptions of others. Since the study did not specifically analyse personal, social dyadic relationships, this trust theme was less dominant. However, competence-based trust – surrounding participants’ abilities – was mentioned often regarding short-term, task-centric relationships. It was expressed in both short- and long-term orientations. Those participants with less experience viewed it primarily as a short-term, transaction-based process, whereas more senior participants tended to express it with a long-term orientation. Competence was one of the most discussed trust-related topics and was cited frequently as part of facilitating influence and developing and using trusted networks. Competence of others, confidence in others, and consistent value provided by others was mentioned often across multiple disciplines:

He delivers results. I think that plays a large part in why I go to him. If you go to someone and he knows that answer, you think, ‘Well then, I’ll go to him again, maybe he will know this as well’. (Joanna)

Somebody that you have confidence in, that you can go talk to. Proven success in the past. (Stroke Manager 4)

Expertise and results are what cause me to seek out colleagues – ones that you know you can count on, ones that deliver, and ones that help. (Stroke Consultant 16)
Yes, track record has shown that they provide some sort of value. The people that consistently do not provide value, you find other people to leverage. (Director of IT)

Across disciplines and organisations, one reason trust was so crucial in the healthcare network related to context specificity. Collaboration issues among healthcare workers stem from the individualistic, hierarchical culture of medicine (IOM, 2001, 2004), which is grounded in the socialisation process for health professionals (Leape & Berwick, 2005). This study suggested that competence-based trust, influence and interdependency among medical professionals were characteristics that facilitated network processes such as telestroke engagement. While working with this virtual health IT system, stroke consultants were spatially distant from their patients and the treating stroke team. Their comfort and ease about working remotely with the distant stroke unit was highly dependent upon their intraprofessional, competence-based trust and social proximity, with interprofessional trust also demonstrating value given the interdisciplinary nature (e.g. clinical sub-specialties) of stroke unit teams. This issue resonated among several stroke consultants, for example:

I know [Consultant] at [Hospital A], and I trust him. We went through training together … It’s hard to rely on someone or some team I don’t know, especially when I’m remote and not with the patient… I need to know the local team can do the job. (Stroke Consultant 17)

In telestroke cases, because both the patient and treating team are distant from the diagnosing doctor, social capital and competence-based trust between the remote doctor and treating team are crucial to help the patient throughout diagnostic and treatment processes. Thus social proximity was far more important than spatial proximity to cross boundaries in this context, since the former was highly related to competence-based trust needed to drive processes, and contextual conditions imposed geographic separation. Social proximity was increased through social capital capacity building and gradually the result of increased reciprocity of trust among network participants.

Significantly, the evidence showed that network leaders commonly facilitated these interactive processes in order to drive wider network goals (e.g. telestroke implementation), which links particularly well to Chapters 5 and 6. Although Joanna, Graham and David did not openly discuss how boundaries could be used in a constructive way, their facilitative actions suggested an
understanding of how boundaries as barriers could be overcome. Numerous meeting observations and follow-up feedback conversations filled in details where gaps remained from interview comments. These data revealed examples where the network leaders proactively used social capital to connect participants within and across professions and organisations, suggesting that NPL involves a matrix-style approach. One salient example pertains to the pro-forma specification period during which time Joanna and Graham facilitated several cross-boundary relational exchanges (Table 7.1). Given Graham’s role as a hybrid clinician-manager and stroke lead, he tended to maintain more frequent communication with clinical professionals. The power he maintained as clinical lead assuming a formal, authoritative role enabled him to make effective use of social capital to influence participants. In addition to the power originating from his formal role, Graham also possessed power as a hybrid medical-managerial leader, given the dominance of medical professionals within this healthcare context. The underlying power dynamics enabled him to facilitate and shape network processes, which he accomplished in conjunction with a managerial lead. Joanna typically engaged more frequently with stroke managers and IT professionals, given her day-to-day duties leading the telemedicine project and managing the interorganisational network. Importantly, these two network leaders interacted with one another often, exchanging knowledge related to the other’s dominant domain and areas of expertise whereby social-epistemic boundaries were enablers.

During the pro-forma specification period, Joanna and Graham learned through discussions with one another and other participants that several hospitals did not possess certain professional and organisational linkages. In one instance, Hospital B, which could not offer a robust hyper-acute stroke service and would need to be reliant on Hospital A, did not actually communicate or maintain professional and organisational ties with Hospital A. Noting the problem this presented and concern about wasted time until the organisations established their own collaboration, Graham and Joanna discussed establishing new relational linkages between the two. They decided that Graham would reach out to the two lead stroke consultants at each hospital, since he knew them well. He suggested to each consultant what would be needed to establish a robust stroke service in
their sub-region and recommended they collaborate to provide telestroke. Graham then made introductions after the subsequent clinical Stroke Network meeting. By making use of his own social capital with the two consultants, Graham created an opportunity for them to build social capital and create a new, dyadic, relational professional linkage between two organisations. Over time, ongoing social capital capacity building between the two consultants led to a collaborative partnership between Hospital A and Hospital B, which reconfigured the interorganisational network. This particular linkage established through social capital dynamics was both intramedical professional and interorganisational in nature. Similar examples of the matrixed, cross-boundaried linkages Graham and Joanna facilitated (e.g. helped to establish or strengthen) during this period are included in Table 7.1.

**Table 7.1: Newly established dyadic relational linkages facilitated by network leaders**

<table>
<thead>
<tr>
<th>Facilitator</th>
<th>Network participant 1</th>
<th>Network participant 2</th>
<th>Boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graham</td>
<td>Stroke Consultant, Hospital A</td>
<td>Stroke Consultant, Hospital B</td>
<td>Intramedical professional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interorganisational</td>
</tr>
<tr>
<td>Graham</td>
<td>Stroke Consultant, Hospital C</td>
<td>Stroke Nurse, Hospital C</td>
<td>Intraclinical professional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intraorganisational</td>
</tr>
<tr>
<td>Graham</td>
<td>Stroke Consultant, Hospital B</td>
<td>Stroke Unit Manager, Hospital C</td>
<td>Interprofessional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interorganisational</td>
</tr>
<tr>
<td>Joanna</td>
<td>Stroke Unit Manager, Hospital A</td>
<td>Stroke Unit Manager, Hospital D</td>
<td>Intramanagerial professional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interorganisational</td>
</tr>
<tr>
<td>Joanna</td>
<td>Stroke Unit Manager, Hospital C</td>
<td>IT Manager, Hospital C</td>
<td>Interprofessional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intraorganisational</td>
</tr>
<tr>
<td>Joanna</td>
<td>Stroke Telemedicine Project Manager</td>
<td>IT Manager, Hospital A</td>
<td>Interprofessional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interorganisational</td>
</tr>
</tbody>
</table>

Table 7.2 provides a simplified overview of the dominant types of cross-boundary linkages established during the study. Also, given the levels of trust across professional and organisational boundaries and related social capital dynamics in this case, the boundaries acted as a secure place for participants to work.
With regard to telestroke operations, by virtue of remote, virtual working, the overall clinical team’s social proximity was more crucial to diagnostic and treatment process success than spatial proximity. Increased social proximity improved trust and social capital reciprocity among clinicians as well as other participants. The empirical evidence therefore supports the salience of increasing social proximity through social capital dynamics and trust reciprocity, the stratification of trust across intraprofessional, interprofessional and organisational sub-network boundaries, and most significantly, the maximisation of social over spatial proximity to facilitate network processes. This point is especially important given the context of a virtual telestroke IT system implemented in an interorganisational network.

As an important contribution to the thesis, this section demonstrated that the maximisation of social proximity among participants facilitated interorganisational network processes. The next section moves to a discussion of network leaders’ emergent and submergent processes to adopt both focal and non-focal roles.

### 7.2.3 Assuming a focal v. non-focal role: Emergence and submergence of leaders

As mentioned in Section 4.3.2, there was a dichotomy between emergent and submergent leadership. In the study, emergence refers to the rise of a network leader’s visibility as a focal, formal leader, and submergence refers to the decrease of a leader’s visibility as a focal, formal...
leader (i.e. non-focal). Below are several definitional terms to establish the conceptual basis for this section:

- **Formal**: The term ‘formal’ throughout the study refers to the conception of intentional authority and position. For example, Joanna was a formal network leader because she was placed in her position of authority to oversee the network. Similarly, the Stroke Network was considered a formal network because it was intentionally established as a quasi-hierarchical structure put in place by the SHA.

- **Informal**: By contrast, the term ‘informal’ refers to more emergent roles and networks that were not intentionally authoritative. For example, informal social network linkages emergently developed among network participants through social capital and capacity building.

- **Focal role**: Focal roles refer to network leadership whereby the leader took a primary, highly visible role in leading network participants. This role was commonly adopted by Joanna, David and Graham as formal network leaders.

- **Non-focal role**: Non-focal roles refer to network leadership whereby leaders took a non-primary, low visibility role in leading participants, which directly related to instances in which formal network leaders removed themselves from primary leadership visibility and assumed an informal leadership role.

Emergence pertains to the visible presence of a focal role whereas submergence pertains to the presence of a non-focal role. Within the network these related to network leaders’ power, control, influence and identity. There was a dichotomy between the focal and non-focal role – presence or absence from view and presence or absence of dominant, formal influence – of the formal network leaders. The way these leaders helped shape the context, and induced processes to develop informal networks and leaders, allowed for complementary influence between the formal and informal leaders. In the former case, the formal leader’s identity and control related to orchestrating and overseeing leadership processes (i.e. emergence), whereas in the latter scenario the formal leader catalysed leadership processes and was thereafter formally removed from the process (i.e. submergence). For example, Chapter 5 demonstrated how network leaders facilitated and influenced framing processes by using social capital to drive consensus building among network participants to reach a decision. These leaders emerged, taking on focal roles to formulate, propagate, and influence framing to ultimately shape network actions and practices. The evidence showed how framing could be employed by focal leaders to implement NPL.
In late 2010, once the Cardiovascular Network determined the organisational collaborations and closures required to provide quality hyper-acute stroke service across the regional network, formal leaders Joanna and Graham transitioned into less dominant (i.e. non-focal) roles. As the core formal leaders initiated new informal relationships within the network, they submerged from positions of visible authority, adopted non-focal roles and facilitated independence of the informal network. As the informal network grew more autonomous and increased cohesiveness and compliance with interorganisational network goals, the formal network was gradually deconstructed. In the example below, a network leader indicated that following deconstruction of the formal network, the remaining informal network could operate independently while he subsequently assumed the role of a boundary-spanner to facilitate KT.

One of the reasons we’ve [network leads] chosen to do this [oversee telestroke implementation at the network level] is to put the process in motion and signpost how people should participate. I have no real input in it [formal network] anymore and don’t have to chase-up people. I now just take information back to them and let them run with it from there. (David)

By operationalising and mobilising interdisciplinary informal networks, David facilitated leadership processes throughout the wider network by transitioning from a focal to a non-focal role. In this example, David initially emerged as a formal, focal leader to drive process change towards shared network goals, yet he later mobilised informal networks via collective leadership, withdrew, and submerged from his focal role over the longer term. He described his submerged, non-focal role as one in which he did not formally lead (i.e. authoritatively lead from a position of power) but shared knowledge and facilitated others’ active processes. This finding is important, since even in a non-focal role David was able to drive momentum among participants via informal network processes. The data suggested that both focal and non-focal network leadership roles could facilitate network processes. Moreover, the evidence showed a previously unexplored process of formal network deconstruction as an ultimate result of formal, focal leaders’ submergence. Similarly, Graham exhibited emergence and submergence in his clinical lead role:

Joanna and I spent a long time working together to minimise the chances for a fight at the last clinical Stroke Network meeting. We managed to get away with that because contrary to past events, she led the meeting rather than me, and I left immediately after. ... As far as updates from the big network meeting, I pulled myself out to eliminate conflict of interest. (Graham)
This point highlighted how Graham and Joanna jointly devised a plan involving Graham’s submergence – adopting a non-focal role – in an effort to combat epistemic, institutional culture clashes and support Joanna to orchestrate the meeting. As this example demonstrates, they were able to achieve this objective by swapping focal and non-focal roles. Graham was uncertain how two smaller hospitals were planning to provide stroke services, and grew increasingly frustrated with their responses to him during the initial pro-forma submission period. They lacked clarity in their pro-forma submissions, and he was unsure what actions they were taking to clarify the problems. The main stroke consultants from each site were aware of Graham’s uneasiness and discontent with their approaches. The AMC v. clinical dialectic was also at play here, since the other hospitals perceived Graham as driving an AMC agenda. Rather than inefficiently spend the Stroke Network meeting engaged in arguments and unproductive discourse focused on only these two hospitals, Graham collaborated with Joanna to devise a plan for how best to proceed.

Following several phone calls and informal email exchanges, they decided it would minimise tension if Joanna led the meeting and Graham sat among his clinical colleagues just listening. During the meeting, Joanna emerged as a focal leader and spokeswoman for the whole network, while Graham submerged as a non-focal leader.

Graham and I discussed – and even asked David’s input – on what problems we were facing immediately in terms of getting things done, getting results. …I summarised an outline of our objectives, then we identified the problems as we saw them…tensions between the community and research [AMC] hospital views. We discussed [collectively] how best to approach the sticky issue of some consultants thinking Graham was driving his own [research] organisation’s agenda. Some of the smaller hospitals don’t like to be forced into the large research centre approach. Since I’m more neutral coming at this from the SHA and network perspective, we agreed I would be the best person to lead the meeting and drive the wider network agenda among members. (Joanna)

She facilitated collective discourse on how to progress, and encouraged participants’ questions and discussion following the meeting. By collaboratively employing this mechanism, Joanna and Graham mobilised and operationalised informal networks of medical and managerial professionals to interact and take action regarding provision of stroke services within and among professional and organisational sub-networks. Because Graham removed himself from this formal meeting and other formal engagements – dismantling his focal, authoritative dominance – his newly adopted non-focal leadership role during this time resulted in informal, interdisciplinary interactions and
collaborative processes to address network-wide goals. As Graham submerged, he and Joanna enabled relational engagement among participants, which increased local capacity of the informal networks to build social capital among themselves, thereby helping to facilitate network processes towards finalising hyper-acute centre establishment. Importantly, Graham’s partnership with Joanna and submergence into a non-focal leadership role enabled the network to overcome challenges, which importantly, contradicts traditional views of the typical focal leader. Contrary to historical views of leadership that are individualistic, dominant, formal and focal, the study’s original findings illuminated the facilitative, influencing leadership processes of a collaborative, non-focal leader with informal characteristics. Adaptiveness between formal and informal leadership roles over time was an important analytical finding, and reciprocity between these leadership types is discussed in the next section. Significantly, these data demonstrated that the emergence, and more importantly the submergence, of formal network leaders facilitated the dynamic mobilisation of multidisciplinary, interactive, collective leadership within informal networks towards the network’s strategic goals.

To conclude this section, two salient processes these findings add to the literature are alternative mechanisms by which leaders manage their networks: (1) formal leaders’ submergence into non-focal roles devolves leadership to informal networks, which drives collective leadership processes; by extension – formal leaders’ submergence into long-term non-focal roles could ultimately result in the formalised network’s deconstruction, and (2) the defusing of tensions through submergence. The study’s empirical evidence indicated that these mechanisms were employed by formal leaders to facilitate informal network processes in order to shape interorganisational practices. Linking to the theme of leader interactions, the next section discusses reciprocity between the two types.

7.2.4 Reciprocity between formal and informal leadership

As an extension of the formal network configuration and contextual change evidence and arguments presented, it became clear that the network maintained complex, functional formal and informal networks. This section focuses on the dynamic interactions between formal and informal
leaders by illuminating linkages and interdependencies. Reciprocity here refers to the communication channels that enabled KT between formal and informal leaders. Through interactive feedback loops, formal and informal leaders reciprocally exchanged information and knowledge that helped drive processes within the wider network.

Once the Cardiovascular Network concluded pro-forma reviews and reconfigured the Stroke Network by forming new organisational linkages able to provide hyper-acute stroke services, Joanna was assigned in early 2011 to follow-up to ensure the integrity and progressive coproduction of interactions towards these objectives. She did this by collaborating with fellow formal leaders, Graham and David, and informal leaders, such as key managerial and clinical champions within the network. David shared his view on their collaborations:

> It’s our job as the core group to work together on this and help the sites figure out the best way to proceed. Graham, Joanna and I talk frequently … there are emails going around, sometimes phone calls, and discussions after meetings … We each have our own strengths and weaknesses, and having worked together this long, we know who is good at what and can identify which of us should be doing certain tasks. For instance, Joanna is well versed at connecting people … By collaborating in this way we get things done more effectively. (David)

The three network leaders interacted frequently to evaluate the issues they faced during certain phases of adoption, determine the next steps, and distribute responsibility for facilitating progress within the wider network. This also reinforced the notion that social-epistemic boundaries, particularly their professional specialisations and hybrid background – served as enabling factors. During the early phase of telestroke adoption, it was unclear which organisations had the capacity to provide a robust telestroke service. As Joanna had discussions with David and Graham, listened during clinical network meetings, and had informal conversations with local champions, she learned which hospitals were primed for telestroke adoption. Joanna began working more closely with the local informal managerial and clinical champions at the two identified sites.

> Now that we know which units are ripe for telestroke adoption, I’m spending a lot of time talking with their managers and clinical leads that can help drive this through … They tell me what has worked and is working for them, how they got over challenges, and I provide guidance as I can on navigating some of the issues … sharing information, strategising, and in many cases connecting them to a relevant resource. (Joanna)
In this example, the unit managers and clinical leads shared lessons learned from their organisations with Joanna, who could pass on these lessons to other organisations’ units. In return, Joanna could ‘provide guidance … sharing information … connecting them’. As an important result of these reciprocal interactions, Joanna, David and Graham prompted local champions into action to better understand their clinical pathways. By strengthening the relationships between the manager and lead stroke specialist at the two sites, this local informal leadership pair began collaborating on pathway evaluation and determined the steps that would require change post-adoption. Thus the formal network leaders facilitated informal leadership processes through engagement and reciprocal interactions. Informal network leaders benefited, since they gained new collaborative resources, information flows and feedback loops. Formal network leaders benefited from both information flows and results of the new linkages that facilitated processes within organisations that would help achieve interorganisational network objectives. This latter point was a goal of formal network leaders; hence reciprocal interactions helped them achieve their goals.

By telling me what their challenges are and how they’re getting over them, I take the lessons learned to Graham and David, and we discuss them to tease out what could work elsewhere, identifying which organisations should be talking. We agreed I’d approach other hospitals … The people I introduce then go off and work together to come up with solutions … It all helps the network make progress in the right direction, and I know I’m doing something right. (Joanna)

The evidence reinforces the importance of reciprocity between formal and informal leadership to facilitate interorganisational network processes, which is an original contribution of this thesis. These data also link to framing processes whereby network leaders relied on social capital among informal exchanges to facilitate consensus building that ultimately shaped interorganisational network actions and practices. The data presented here were unique to interorganisational networks in that they identified ways in which leaders managed these needs and the delicate reciprocity between traditionally hierarchical, formal networks and those that are diffuse and informal. For a more macro example, the NHS Service Development and Improvement Manager noted, ‘We aim to make the service sustainable without high-level centralised, formalised network involvement’. Her assertion is that the network will need to gradually become independently sustainable without formal, authoritative leadership. Rather than ‘high-level centralised, formalised
network involvement’, collective, informal leadership processes should gradually develop to facilitate sustainable interorganisational network processes. Reinforcing the informal network benefits, a manager commented:

It’s quite a useful network. Clinicians connect to develop links, then link with management teams ... and suggest how we can fill gaps. We’ve had discussions with [other] hospitals on stroke and how we can support each other ... We’re partnering with another hospital to understand what worked for them. (Stroke Manager 10)

This point and others revealed the reciprocal nature of the relationship that was needed to drive network leadership processes. The formal leaders created opportunities for clinicians and managers to network informally, which resulted in participants’ development of linkages across professions and organisations that reinforced support for stroke services throughout the region.

In addition to information that was commonly fed back to formal leaders, informal network leaders and participants facilitated processes that helped formal leaders achieve interorganisational network goals, exhibiting the reciprocity between formal and informal network leadership. For example, near the end of the study, Joanna worked very closely with stroke managers at three hospitals in particular during the pro-forma submission period to achieve the telestroke implementation goal. Given their shared managerial specialty, terminology and communication were mutually understood and conducted with ease, since epistemic barriers were immaterial. The three managers at each site were those most proactively involved with the Stroke Network over a year-long period surrounding telestroke adoption.

These managers actively participate in Stroke Network meetings with clinicians and have the best grasp of network activities and processes compared to other unengaged managers ... They regularly feed-back info on their local initiatives ... I let them know what’s going on at other sites that might be useful and give them the big network picture. (Joanna)

By communicating and reciprocally exchanging information regularly with these three managers, Joanna was able to share knowledge about telestroke implementation. She learned over time that these managers had a solid understanding of how the technology and its related processes could be implemented within their respective stroke units. They informally shared the local managerial issues and implications of adoption and implementation processes with Joanna, who was able to learn from their localised experience. Joanna then translated these findings into lessons for
overcoming similar managerial issues in other hospitals throughout the network, and was able to offer guidance to other hospital managers surrounding these issues. She commented: ‘It’s helpful to understand the challenges faced locally by each stroke unit because I can share the lessons learned with others managing in the network’. By collaborating with Joanna, the three key managers were also the first to facilitate implementation processes within their respective organisations. For example, one stroke unit manager stated:

I’ve been working with Joanna to develop a plan for telestroke at my hospital. My clinical colleagues know what they’re doing, and I’ve been working with them to develop a clear understanding of how telestroke will affect our clinical pathways. This is critical to implementing the technology. (Stroke Manager 8)

The KT between Joanna and local managers represented an aspect of the reciprocity between formal and informal network leaders that enabled network processes. As Section 7.2.4 showed, social capital dynamics also enabled reciprocity between formal and informal leaders. Furthermore, these processes helped the overall network achieve its goal of moving toward telestroke implementation. Informal communication feedback loops between formal and informal leaders provided the formal leader with localised ‘insider information’. This reciprocal relationship suggested that the coproduction of relational leadership was significant within the network, and that complementary formal and informal leadership processes were crucial to process facilitation and interorganisational functioning.

NPL was demonstrated by the ability to patch and reposition network objectives according to different changes in the external environment, while driving informal leadership processes throughout the interorganisational network. Formal leaders, such as the Programme Lead for ICT, made use of informal network processes to transition ownership and facilitate network sustainability, reinforcing the importance of formal–informal reciprocity to interorganisational network processes:

Now that the NHS is taking SHAs away, my role will transition into something else. ... If it’s not possible for me and the Service Development and Improvement Manager to be around, then users and organisations own the process and implementation of the technology. We are putting processes in place making our users accountable and creating project sustainability in the formalised network’s absence … Over time teams learn their own way and are gradually sustainably effective. (Programme Lead ICT)
Here the emphasis was on a core team of formal leaders developing stakeholders over time, building consensus within informal networks – through an organic process of informal meetings and discussions – to affect the entire network. The Programme Lead underscored how ownership of the technology implementation process transitioned to participants and organisations by increasing social capital among these stakeholders. The lead assured transparency by sharing ownership of the process and gradually increased accountability of his users. By ‘putting processes in place’, such as engaging users in a needs assessment and subsequent feasibility study, he transferred process ownership to network participants, thereby devolving leadership such that the remaining informal network construct was operationally self-sustaining. He collaborated closely and informally with participants, understanding that they would be crucial to driving sustainable network success. There was reciprocity between the network leader and participants in that the leader shared knowledge and devolved ownership of network processes to participants. In return, they drove processes to achieve the network-wide goal of achieving sustainability, which he was responsible for facilitating. Social capital capacity building and KT were stratified across multiple levels within the network. Therefore, network leadership involved formal initiation of collaborative problem solving within informal networks to promote interorganisational processes whereby reciprocal formal and informal interactions facilitated processes such as relational development. The formal leader gained help in facilitating the network’s sustainability (i.e. his goal), and the informal leaders acquired new relationships that enabled them to be operationally sustainable in the formal leader’s absence. The benefits to both informal and formal leaders related to information flows and access to new collaborative resources.

The next example importantly demonstrates the macro-level network orchestration of informal processes:

You need to bring clinical teams together to implement technology and meet on a regular basis to discuss. We engage doctors and drive a network process. It stimulates momentum to discuss within a network process. (Link Manager, NTAC and NIC)

Here the link manager emphasised the ongoing relational development, particularly of informal networks, needed to facilitate interorganisational processes. Joanna reinforced this, saying, ‘The
network acts as a hub for other smaller networks. I facilitate things from my role managing the network by mobilising several informal networks at play’. Network leaders could draw on readily available social capital resources within the informal network design to help drive network-wide change. As Joanna reflected upon her managerial position and prior experience leading networks, she contemplated the crucial objective of complex, inter organisational networks:

Part of the role of the [formal] network should be to set up sustainable systems – put systems in place so it doesn’t need to exist anymore. So you’re not running it from the top down any longer, you only have the informal network left. (Joanna)

Importantly, this suggests that leadership agency was transferred from the formal to informal network level such that leadership was devolved from the centre to the periphery of the formal, inter organisational network. Again, this emphasises formal– informal reciprocal leadership interactions over time whereby informal networks gain access to increased network leader knowledge, social capital resources and process ownership, and network leaders gain collaborative, knowledgeable resources to help them achieve network-wide goals. As a manager noted, ‘We are getting things done, finally… Joanna helps me out … and I tell her what I know that could prove useful for the wider network … There’s a lot of back and forth but gradually we’re seeing results’ (Stroke Manager 4). Delving deeper into informal sub-networks within professional and organisational networks, physician respondents interviewed throughout the study suggested that the large, formalised network meetings were useful because they also allowed informal, face-to-face connections. As one unit lead commented:

I think there are plenty of informal discussions going on, especially among the specialists. I personally speak often with David after these clinical meetings to hear what he really thinks is going to happen and similarly tell him my views and how the network is affecting my hospital and my unit … Given some of his thoughts on telemedicine, I’ve been able to get my local colleagues on board … He’s been helpful sharing lessons learned elsewhere … I’m getting things off the ground within my unit … I’m starting to see progress. (Stroke Consultant 18)

The value of the formal network was attributed to the fact that it mobilised informal network interactions that developed, grew, and most importantly generated actionable change and further planning. Much of these benefits were attributable to the strong collaborations among the core network leadership group and their interactions with informal leaders. Collaborating over time – increasing social capital and trust – Joanna, Graham and David began to understand their different
leadership styles as well as collective strengths and weaknesses as a leadership group. As hybrid clinician-managers, Graham and David maintained close contact with the network’s clinical professionals, further targeting contacts based on clinical v. academic affiliations. Joanna was more effective at communicating and interacting with network managers and IT professionals. By making use of their own experiences, backgrounds and social-epistemic boundaries, the core formal leaders engaged with informal leaders to facilitate interorganisational processes. The temporal dimension was important, since it allowed for relational development factors and processes such as social capital, trust, and reciprocal interactions to strengthen over time.

In line with Dickinson and Ham (2008), engagement in formal organisational roles was a useful and symbolic mechanism, and the complex sub-cultures in healthcare networks as well as the role of informal leaders were also important. Reciprocity between formal and informal leaders was based on relational leadership processes that allowed the leaders to work in a collaborative, complementary manner. As the evidence showed, Joanna, Graham and David frequently interacted with each other and relevant informal leaders within the wider network by proactively contacting and connecting participants across disciplines and sub-specialties. Although they acted as a formal network leadership core group, they were more effective in their leadership roles because they regularly interacted and coordinated with informal leaders (e.g. clinical champions, IT managers). Their relational, reciprocal leadership approach facilitated processes that helped them progress toward interorganisational network goal achievement. Overall, the main conclusion of this section is that reciprocity between formal and informal leaders facilitated network processes, and this adaptive reciprocity has implications for leading network processes both formally and informally. The next section discusses the interrelationship among this chapter’s key NPL themes.

7.3 Chapter conclusions: interrelatedness of the four dominant network process leadership themes

I begin by summarising the four critical findings of this chapter related to NPL then discuss their interrelatedness. The purpose of this section is to explain how the four interorganisational NPL
themes presented here are interconnected. They are: (1) leadership influence in the network; (2) maximising social proximity; (3) focal v. non-focal roles; and (4) formal and informal leadership reciprocity. As discussed in Section 7.2.1, the evidence indicated that leaders influenced through networking, particularly drawing on informal relational development. While leaders influenced, they also needed to understand the other three themes, and how if used strategically, they could achieve interorganisational goals. Understanding these themes allowed them to employ the others. Network leaders could do so because they were multifaceted and capable of working across complex, multidisciplinary boundaries using a distributed, relational approach.

Importantly, the concepts of social capital and relational development underlie these four NPL themes, in that network leaders adaptively drew upon their social capital in a relational manner to facilitate network processes. For example, extensive data revealed that Joanna, Graham and David utilised their social capital to influence, connect and link participants, increase social proximity and collaborate with informal leaders. In addition, several examples demonstrated links to prior results Chapters 5 and 6 indicating how network leaders’ social capital related to framing and KT processes. By building social capital capacity among unconnected participants and organisations, they were able to facilitate further influencing, enhance social proximity within the wider network, adapt to focal and non-focal roles, and reciprocally coproduce leadership with informal leaders. The accessibility of social capital and ability to facilitate relational development enabled network leaders to flexibly employ the four thematic network leadership processes based on specific contextual conditions. Numerous observations of, and direct accounts from, these network building leaders found that they shared information and decision-making, connected with multidisciplinary participants, encouraged collaboration in problem solving (e.g. framing), and integrated peripheral participants into the network. They also shared their networks with others (e.g. using social capital to influence and/or enhance social proximity), helped participants and organisations build their networks and directed participants to those with relevant expertise and capacity. The core group employed leadership as networking based on a foundation of social capital. In the interorganisational configuration, complex network requirements and new roles were needed to
maintain relational development given the context, functions and nature of the network. Due to the nature of the network and social capital influencing, leaders agreed to work flexibly, employing a relational and networking approach to conduct distributed leadership. By doing so, network leaders could adapt social capital dynamics to flexibly employ the four dominant network leadership processes based on the contextual conditions during certain time periods.

Network leaders’ motivation, network culture and value alignment also influenced network building behaviour within the interorganisational context, while maintaining the underlying social capital and relational dimensions. As previously addressed, the leaders’ motivations were predominantly based on the relational culture and function of social capital in the network, past experience and an evidence base. These factors supported their influencing throughout the network to achieve goals. Furthermore, the culture of the network supported KT and learning, which helped build and shape the network. Rather than valuing individual achievement, the core leaders and Stroke Network’s culture valued collaboration and working in a collaborative manner, which had a direct effect on the network, distinctly different from values centred on individualism.

In summary, social capital and relational development are critical concepts underlying the four NPL themes. Network leaders drew upon their social capital in a relational manner to facilitate network processes in order to achieve interorganisational goals. In the next chapter, I expand upon these four interrelated themes by reviewing NPL themes and patterns from the overall study. Chapter 8 synthesises holistic findings on NPL patterns and identifies four higher order NPL themes.

The major contributions of this chapter include (1) provision of original empirical evidence on leadership processes in an interorganisational network, and (2) identification of critical, foundational concepts for a NPL framework linking network theory and complexity leadership that will be developed in Chapters 8 and 9.
Chapter 8: Network process leadership results synthesis

8.0 Introduction

Chapter 8 moves from the specifics of the Stroke Network case findings to the important, generalised dimensions of NPL. Leaders of interorganisational networks in healthcare face complex, often ill-defined, problems the solution to which requires the full cooperation of heterogeneous network members with highly specialised knowledge and high degrees of responsibility and autonomy, i.e. they are independent and used to being authoritative. Formal network structures bring together their members but do not automatically lead to collaboration and knowledge integration. Indeed, it is inherent in formal structures that the boundaries inhibit collaboration and KT.

Few formal leaders of networks have the credibility to direct such a network or to mandate collaboration. This means that they have to remove formal leadership as a barrier, and engage the members in informal leadership or ownership of their problems and potential solutions. The study showed how the formal network leaders approached this set of challenges. In effect they took three types of action: (1) they framed the network’s problem; (2) they facilitated integration of knowledge and collaborative working; and (3) they devolved leadership to the network membership where possible.

Framing the network’s problem set the task for the network. It is unclear from this one case whether this is commonly a task for formal leadership or whether a well-established and well-functioning network can collectively frame its problem. The case demonstrated two instances of framing in which the formal leadership group might be thought to have forcibly urged the network and pointed it directly at a framing of its task. This might be thought to be a traditional form of directive leadership except that the leadership group sought to make it seem more consensual.
Facilitating integration of knowledge and collaborative working was achieved through using the formal network as a foundation (nexus) from which to seed more informal networks. Specifically, the leadership group mobilised and developed social capital through a process of relational development (e.g. introducing individuals to each other, creating social proximity, and thereby legitimising cross-boundary interaction). Key to this was the leadership group’s ability to span organisational and occupational boundaries. They were thereby creating the potential by which the network might hopefully solve its problems.

Devolving leadership from the central, formal group to the periphery was achieved through the adoption of non-focal roles, submergence of individuals at key decision points, and the reciprocal sharing of information. It was a process of saying to the network, ‘we are not leading, you are’. In so doing they removed formal leadership as a barrier to engagement in the network. What is revealed, then, is a relatively skilled process of mixing formal and informal leadership to set an agenda while encouraging and enabling the network to address that agenda. Not only did formal leadership frame the problems to set an agenda, it also appropriated pressure from the environment to create a system stressor as a threat to network objectives and survival. Essentially this was formal leadership combined with informal.

The remainder of the chapter is structured as follows. The following section applies a complexity leadership lens to the predominant findings, discussing its advantages for linking the network and complexity leadership literatures, which is a contribution of this thesis. It extends the examination of complexity leadership and CLT to interorganisational networks. Following an engagement in theoretical discussion to provide an informed, critical understanding of synthesised results, the final section summarises the contributory findings that will be elaborated upon in Chapters 9 & 10 to establish an NPL framework.
8.1 Application of Complexity Leadership Theory to interorganisational networks

Addressing the need for leadership thinking to harness holistic organisational adaptive capacity (Penprase & Norris, 2005; Uhl-Bien et al., 2007; Schreiber & Carley, 2008), I argue that the future of network leadership requires a processual non-centric leadership approach. In order to do this, I begin by considering complexity leadership and CLT. I then apply a CLT lens to key study findings in order to initiate filling the gap between network and leadership theories.

Complexity science expands conceptualisations of leadership from perspectives that are heavily invested in psychology (e.g. human relations models) to include processes for managing dynamic systems and interconnectivity. Complexity science allows scholars to develop leadership thinking that moves past bureaucratic assumptions to generate a perspective of leadership as a complex, interactive dynamic, resulting in adaptive outcomes. Complexity thinking suggests that current organisational leaders in both policy and operations should look across sub-network and at the interorganisational network as a whole. The interactions within and across organisations are more important than the discrete actions of individual parts. A productive or generative relationship occurs when interactions among parts produce valuable, new and unpredictable capabilities that are not inherent in any of the individual parts acting alone. Complexity leadership involves a system of unpredictable, dynamic agents interacting with each other in a complex feedback network, producing adaptive outcomes such as knowledge sharing, learning, innovation and further adaptation to change (Uhl-Bien et al., 2007; Uhl-Bien & Marion, 2008). According to complex systems leadership theory, ‘leadership can be enacted through any interaction in an organisation … leadership is an emergent phenomenon within complex systems’ (Hazy et al., 2007: 2). Aligned with leadership fitting the needs of the situation or challenges in which it operates (i.e. contextual and temporal specificity), complexity leadership posits that to achieve optimal performance, organisations cannot be designed with simple, rationalised structures that underestimate the contextual complexity in which the organisation functions and adapts (Uhl-Bien et al., 2007). Viewing the leader and follower in a simple exchange process is insufficient in terms of explaining the full dynamics of leadership. The next section describes the tenets of CLT.
8.1.1 Complexity Leadership Theory

Acknowledging that ‘much of leadership thinking has failed to recognise that leadership is not merely the influential act of an individual or individuals but rather is embedded in a complex interplay of numerous interacting forces’ (Uhl-Bien et al., 2007: 302), CLT addresses these dynamics (see also Section 2.4.2). Uhl-Bien et al. (2007) propose a model of CLT that examines leadership as a process involving networks of highly interactive, interdependent members leading to collaboration, creativity, innovation and other outcomes needed for organisational adaptation. The unit of analysis is a CAS, which exists throughout an organisation and is interrelated with bureaucracy. As indicated by Uhl-Bien et al. (2007), CLT provides an overarching explanation of how a CAS operates within a bureaucratic organisation and identifies three types of leadership roles: (1) administrative leadership – leadership grounded in traditional, bureaucratic notions of hierarchy, alignment and control; (2) enabling leadership – leadership that structures and enables conditions such that CAS are able to optimally address creative problem solving and adaptability; and (3) adaptive leadership – leadership as a generative dynamic that underlies emergent change activities. ‘By focusing on emergent leadership dynamics, CLT implies that leadership only exists in, and is a function of, interaction; despite this, there are roles for individual leaders in interacting with (i.e., enabling) this dynamic’ (Uhl-Bien et al., 2007: 314). Importantly, CLT contributes to leadership research an understanding of the contexts and mechanisms through which change occurs and systems develop, rather than a predominant preoccupation with variables. The consideration of mechanisms enables analyses of interactions of numerous participants over a period of time, as was conducted in the stroke study. Moving beyond CAS within an organisation as the primary unit of analysis in CLT, the next section extends the discussion of CLT to networks as relevant to the Stroke Network case study.

8.1.2 Complexity Leadership Theory’s relevance to interorganisational networks

The complex, interorganisational network configuration will be an important flexible, structural model now and in the future. Such networks take advantage of a broader set of resources and increased capacity necessary to help solve some of the ‘wicked problems’ facing businesses and
societies. Increasingly networks are being seen as enabling structures creating greater opportunities for advanced, innovative improved service delivery, distributed risks and shared accountability. In addition, an inherent aspect of these shifts is a broadening of the context towards a whole network perspective where all critical stakeholders are engaged in understanding a holistic perspective and in cocreating sustainable solutions.

Although Uhl-Bien et al. (2007) do not formally address the conception of networked organisations in CLT, an indirect link can be drawn between the two. This is because CLT addresses organisational leadership in the Knowledge Era and networked organisations are seen as an organisational form that matches the challenges of this era. However, I will argue a more direct link to show that this theory is clearly relevant to interorganisational networks. This link is drawn by stating how CLT relates to the characteristics and advantages of networked organisations. First, CLT is focused on leading for adaptation and learning. Change, adaptation and learning are desired responses for interorganisational networks. Second, collective action results in learning and adaptation. As Powell (1990) notes, network organisations are facilitators of collective action. Collective action allows organisations to develop faster adaptive and learning responses. Third, collective action arises in response to change. Networks are responsive to highly volatile environments (Podolny & Page, 1998). This responsive capability makes them suitable for the dynamic challenges of current contextual, environmental conditions. Fourth, collective intelligence is formed by the coevolution of human and social capital. Networked organisations maintain a flexible social structure that responds to changes and connects human capital in numerous ways (Baker, 1994). This capability increases the rate of interaction and KT such that social and human capital coevolve with structural social changes, which is important for sustaining competitive advantage. Also, diverse knowledge is a crucial factor for increasing collective intelligence. Networked organisations are characterised by differentiation (Baker, 1992) and diversity (Ibarra, 1992), both of which represent diverse knowledge. Fifth, collective action requires stimulation (e.g. via facilitative processes) rather than control. Network organisations are typically decentralised (Arquilla & Ronfeldt, 2001), which loosens the controls of vertical leadership and
stimulates interactions. Sixth, there is a structural duality to account for such that networked organisations could contain elements of hierarchy (Arquilla & Ronfeldt, 2001). This is consistent with the interorganisational network definition that I employ and has also been demonstrated in the prior analysis of the Stroke Network.

CLT analyses the CAS as the basic unit of analysis and, according to Uhl-Bien and colleagues (2007), the organisational form is the system. In contrast to this approach focused on internal organisational processes, my study targeted the interorganisational network as the primary unit of analysis by analysing the multiplicity of interdependencies and interactions among participants, professions and organisations. Other recent studies are aligned with CLT and prior complexity research set within a networked perspective (Hanson & Marion, 2008; Schreiber & Carley, 2008), most recently asserting that ‘an informal “leader” fulfills an enabling role’ (Hanson & Ford, 2010: 6594). Leader competencies relate to managing organisational dynamics and enabling informal initiative as well as transferring control willingly and harnessing the generative, collective mind to address emerging issues (Hanson & Ford, 2010). My study aligns with these approaches to CLT in order to advance the literature by linking network theory and complexity leadership. Thus the next section applies a CLT lens to better understand the dominant, higher order NPL thematic patterns. It demonstrates that CLT should be extended to accommodate NPL, which is an original contribution of this thesis.

8.1.3 Applying a Complexity Leadership Theory lens to Stroke Network findings

My study analysed the network leadership processes within an interorganisational stroke network over time, and four salient findings emerged: (1) system stressors enabled participants’ cross-boundary collaboration; (2) network leaders adopted both focal and non-focal roles to facilitate interorganisational processes; (3) maximising social proximity helped facilitate network processes; and (4) the coproduction of leadership between formal and informal network leaders significantly facilitated processes and shaped network practices.
Although the current literature has evolved from the dominant paradigm of agentic leadership, its emphasis on leadership styles, dialectical roles (e.g. formal v. informal), and the individual or organisational unit of analysis must be extended to the interorganisational context. Applying a CLT lens aims to address this challenge by recognising that network leadership is complex, which demands an analysis of the dynamic capabilities embedded in networks. Although interactions among certain leadership characteristics and processes exist in any leadership context, their dynamics are intensified in an interorganisational network due to the interplay among various networked levels and susceptibility to turbulence; thus applying CLT to my study underscores the reciprocal dynamics that are constantly interacting in an interdependent manner. As a contribution to the network and leadership literatures, my findings focus on exploring and identifying the strategies, leadership processes and patterns that foster network process change and shape actions and practices, based on the multiplicity of interactions and processes previously unexplored in this complex context.

By examining the CLT leadership roles more closely, it is clear that my findings on network leadership processes relate and overlap with administrative, enabling and adaptive leadership types. Employing the terminology ‘formal leaders’, I account for the administrative, bureaucratic positional leader who maintains authority due to a designated post. These formal leaders, Joanna, David and Graham, positionally led the Stroke Network due to their roles as network lead and clinical leads, respectively, adopting informal, non-focal roles at times. CLT’s enabling leadership pertains to processes by which leadership structures and facilitates conditions to address problem solving. In my study, both formal and informal leaders engaged in such processes in interactive, complementary ways, mobilising influence across boundaries to achieve network objectives. Study evidence demonstrated the use of framing and its nuanced processes of discourse and propagation that helped achieve decisions and shape practices. For example, stroke consultants emphasised the role that network leaders played in framing issues within the Stroke Network, identifying key areas of attention for participants (e.g. ‘Graham and Joanna help us to delineate the things that we should...')
be measuring’). Joanna and Graham propagated and communicated primary frames across the network particularly via informal exchanges to influence clinicians’ frames.

I spoke with [Consultant 3] offline, explained what we are collectively working toward to get him on board. We all want to do what’s right for our patients, and talking to him one-on-one usually helps convince him. (Graham)

Thus network leaders assisted multidisciplinary participants in reaching a dominant frame around critical issues such as telestroke supplier selection whereby telestroke adoption resultantly shaped network practices.

Lastly, CLT’s adaptive leadership generated dynamics that underlie emergent change activities. In an example from the stroke study, although an initial mandate was set by formal leaders to require pro-forma submissions, it was the reciprocity between formal and informal leaders that led to emergent, collaborative interorganisational linkages. Shared complexity leadership promoted network participants’ collaboration to achieve network survival. Results also revealed that permeation across sub-network level boundaries was imperative for both formal and informal network leaders, which implied that the role of a boundary-spanner traversing sub-network jurisdictions was crucial. This construct is particularly important across multi-levels, since permeating boundaries was shown to sustain momentum and effectively facilitate processes in both formal and informal networks. Applying CLT as a lens illuminates the types of dynamic leadership roles that exist across levels within a complex, interorganisational network. Developing this thought further, the next section extends the discussion of CLT within the whole network.

8.1.4 Extension of Complexity Leadership Theory in the interorganisational network context
Leadership of context enables interorganisational processes that allow for productive, collective action to emerge in response to a changing environment. Despite the alignment between CLT and my findings, there are also constructs that the theory does not address. Extending CLT, which asserts that administrative leadership hinders innovative processes, my study exhibited the employment of system stressors by formal leaders to drive network processes to achieve network goals (e.g. improve stroke service delivery) and create new configurations (e.g. interorganisational
One of the most significant outcomes of my study related to NPL emphasising the reciprocity between formal and informal networks, which CLT does not emphasise. This complementary reciprocity was built upon trust, social capital and interdependence, which revealed that leadership agency was transferred from the formal, hierarchical to informal social, professional and organisational networks such that leadership was devolved from the centre to the periphery of the overall interorganisational network. Thus leadership in interorganisational networks is horizontal rather than vertical in nature. Extending CLT, my study found that the construct of a formal network acted as a nexus from which informal networks were developed and operationalised to drive KT, resource capacity development (e.g. new linkages) and facilitate processes to shape practices. The research showed that although the social capital capacity building of networks was traditionally viewed as occurring at the formal network level (e.g. power elites), actual KT and learning occurred in the background informally. Importantly, formal network leadership facilitated these processes.

In addition, my study investigated the challenges for network leaders to ensure survival in an environment that was, or expected to become, dynamic, unpredictable and increasingly complex; hence an understanding of how to manage and make use of turbulence was relevant, particularly as it related to social capital capacity building. The research presented contributes to an understanding of how networks and social capital could be adapted or created by formal and informal leaders within interorganisational networks to reflect changing strategic circumstances. Overall, despite periods of turbulence, the network made progress along its developmental trajectory. Leaders engaged in several critical processes that shaped the progressive development of the interorganisational network, including: boundary-spanning across multiple network levels, maximisation of social proximity (e.g. through social capital and capacity building), adoption of focal and non-focal roles, and the reciprocal coproduction of formal and informal leadership. The implication is that network leaders demonstrated ‘good practice’, since these critical processes facilitated wider network processes that enabled the complex, interorganisational network to achieve its goals. In the end, the network not only adopted and began implementation of telestroke
at several hospitals, it also formed new interorganisational collaborative linkages and partnerships that led to improved service delivery for stroke patients within the region.

A prevailing theme exhibited by my study suggests that network leaders should be proactive in facilitating the enhancement of interdisciplinary interaction and trust through socialisation as well as social capital use and capacity building. Leaders’ proactive networking enables these processes. It is crucial to employ integrating mechanisms that allow a leader to promote coordination, interaction and the building of trust by re-evaluating identities and changing the self-conception and configuration of professional and organisational networks. Interorganisational network leaders could facilitate this process using methods exposed and concepts derived in the chapter conclusions. The next section explores how the abundant network leadership processes were achievable due to the specific leadership approach of the network leaders.

8.2 Alternative leadership approaches

The purpose of this section is to briefly address the strength of the relational, distributed approach to leadership as compared to alternative leadership approaches in relation to management of networks. Given the assertions discussed above surrounding leaders’ facilitation of interactions through the use of social capital and capacity building, it becomes clear that relational, enabling leadership and the distributive nature of the network supported the leaders to lead in the manner they did. The fact that the formal network leaders avoided the traditional leader–follower construct was both a function of the distributive nature of the network as well as the innovative, collective approach to leadership they employed. Their facilitation of network processes in a relational, cohesive manner – centred on reciprocity of trust and availability and accessibility of social capital resources – enabled them to drive wider network processes and achieve goals, as opposed to the rigid linearity of the leader–follower paradigm that would have hindered network processes. The interorganisational network was stronger as a result of their enabling, distributed, relational approach. In this context, with the technology adoption focus and the processes required for this technology to be utilised, the relational, distributive yet collective, informal leadership approach
generated success (e.g. achieving goals, shaping practices). Also, findings showed the functions of social capital within the network, the network culture and leaders’ value alignment were also mitigating factors. The final section summarises the chapter’s conclusions.

8.3 Chapter conclusions
The main conclusions drawn are four-fold. First, leadership in interorganisational networks is highly differentiated from the hierarchical, bureaucratic form. It requires differentiated relational approaches based on relevant processes, and complexity leadership helps explain these processes. Second, leadership by the central, formal leaders cannot be assumed to control network processes. Dynamic mobilisation of influence occurs across stratified levels within the network and affects participants’ interactions. Informal network relations and processes affect interorganisational processes. Third, leadership in complex, interorganisational networks requires a hybrid (e.g. formal and informal complementarity) or matrixed (e.g. multiple leadership styles such as collective, complexity leadership) approach. The co-production of leadership processes between formal and informal leaders is most facilitative. Fourth, social capital dynamics are absolutely crucial to network leadership processes in complex, interorganisational networks.

Network leaders at all levels need to develop a more sophisticated view of the role of variation in complex networks. This can be accomplished by exploring with others the degree of certainty and agreement around both the ‘what’ and the ‘how’ of a given issue, along with an understanding that network improvement such as innovation requires occasional variation. Prior leadership research has not developed a model that addresses the nature of leadership for enabling network dynamics, one whose epistemology is consistent with relational, connective, collective, dynamic and contextual views of leadership (Uhl-Bien et al., 2007); nor does network theory account for the nuanced dynamics of network leadership processes as analysed in this chapter. Leadership inspired by complexity theory recognises that change occurs naturally within the interorganisational network and that individuals engage in this effort for a variety of reasons. The network leader’s role is to create dynamic, collaborative micro-networks that disseminate rich information and KT
about better practices, allowing others to adapt those practices in ways that are most meaningful to them, suggesting that both strategic macro and customised micro processes are important. From the analysis of the influencing conditions of network leadership, it becomes apparent that leadership processes and the degree of interdependence among formal and informal leaders and network participants are critical contingencies in cross-professional, interorganisational networks.

As a salient contribution to the thesis, this chapter concludes that CLT should be extended to accommodate NPL, such that a foundational NPL framework is a sub-set of CLT. A deep analytical review reveals that social capital is the primary cross-linking theme that connects the dominant findings and exemplifies the most significant processes determined in this study of NPL. Extending beyond CLT’s exclusive evaluation of internal organisational networks, my study establishes the basis for a complexity interorganisational NPL framework. Chapter 9 addresses the critical linking theme of social capital as the theoretical connection between network theory and complexity leadership. I elaborate upon the limited extant literature related to interorganisational network leadership, showing how my work supports the importance of a basic NPL framework that I introduce in Chapter 10. The next chapter links the critical higher order NPL thematic patterns discussed here with the network theory and leadership literatures, which is an important contribution of this thesis.
Chapter 9: Discussion

9.0 Introduction

Chapter 8 synthesised the original empirical findings of my study on network process leadership, and this chapter focuses on highlighting the key study findings as they relate to the extant literature. I identify the original elements of my research in the context of the wider literature and illuminate findings that are limited or previously unaddressed. The predominant focus in much of the extant literature has been on individual dyadic relationships between organisations. To fully understand the nature of interorganisational relationships, greater attention must be directed to the larger integrated network in which complex relationships exist. This chapter seeks to contribute to the general understanding of leadership in complex interorganisational networks and the key leadership processes that drive network development. I lay the groundwork for a simple, integrated framework for understanding how leaders facilitate multi-organisational collaboration and under which conditions (i.e. characteristics, processes) they establish functioning interorganisational networks that promote collective leadership. This lays the groundwork for my proposed network process leadership framework introduced in Chapter 10 as the key contribution of this thesis.

Prompted by public sector network research enquiries from Fitzgerald et al. (2007), Dopson et al. (2008), Currie et al. (2007, 2009, 2011), Provan et al. (2007), Sheaff et al. (2010), Turrini et al. (2010), Ferlie et al. (2011), and Martin et al. (2011), the study findings draw attention to the lack of understanding about network processes and development over time as well as how different leadership and managerial roles interrelate in large complex networks. Despite the ten primary clusters of theoretical network traditions (Table 2.1), contemporary changes involving reconfigurations of the network context, the erosion of traditional organisational units of analysis and emergence of more novel complex interrelated webs of interactions, scholars are calling for systematic studies on interorganisational networks (e.g. Provan et al., 2007; Turrini et al., 2010; O’Leary, 2011). Recent work has targeted the complex network context, including research on wicked problems in managed healthcare networks (Ferlie et al., 2013), understanding public sector
networks (Martin et al., 2012; Provan & Huang, 2012; Provan & Lemaire, 2012; Sheaff et al., 2012), and networked society in the information age (Castells, 2011). This thesis falls in direct line with recent calls for more study in, and efforts to understand, current complexities of leading in interorganisational networks (Graen & Graen, 2006; Lichtenstein et al., 2006; Uhl-Bien, 2006; Uhl-Bien et al., 2007; Currie et al., 2009, 2011; Martin et al., 2009; Fitzgerald et al., 2013). This aim was addressed through a longitudinal case study of a UK regional stroke network adopting telestroke in the context of the wider NHS.

The thesis adds to the network literature by providing insight into the broad spectrum of dynamic interorganisational processes over a longer time period (i.e. rather than a static snapshot) to demonstrate network development. The analytical evidence depicts a distinctive approach to NPL, highlighting exchanges and processes among leaders and participants across multiple network levels previously unexplored. My study offers original empirical evidence integrated with theorising on an interorganisational network to lay the foundation for an NPL framework. Although research on networks has been increasing, a study on NPL has not been conducted previously. For example, Turrini et al. (2010) analyse network performance but only address ‘network leadership’ once. My theoretical foundation resonates with Turrini et al.’s (2010) work, and my study aims to extend their work further by exploring leadership processes in complex interorganisational networks. While their conceptualisation of network process facilitation provides part of the theoretical scaffolding to explain my empirical findings, it falls short of explaining the evidence on the four key themes, especially the underlying social capital dynamics. The conceptualisation is merely that – a conceptualisation – and the literature does little to provide evidence on actual network processes as well as how those processes are facilitated. Extending our view of leading in networks, my thesis provides specific evidence and integrative theoretical commentary on the four higher order NPL thematic processes and their underlying, significant social capital dynamics. Importantly, the research findings presented here expand our understanding of the applicability of mainstream network and leadership theories.
The remainder of this chapter is organised as follows. First, I begin with a description of how each research question was answered by the study findings. Second, I identify the crucial components of NPL, social capital dynamics, as the key linking theme between network theory and complexity leadership. Following an elaboration upon the theoretical contributions of social capital related to NPL, I thirdly address the limited extant literature that supports the importance of the network process leadership framework. Lastly, I close with chapter conclusions.

9.1 Answering the study research questions: moving toward network theory contributions

The primary research question pursued in this study was: ‘What characteristics, behaviours, and processes are involved in the dynamics, development, and orchestration of complex, interorganisational public sector networks?’ My study focused on the critical characteristics (e.g. trust, power) and processes such as framing, boundary-spanning, knowledge transfer, and using social capital that underpin this broad research question. The evidence demonstrates that four dominant higher order themes are involved in the dynamics, development and orchestration of complex interorganisational public sector networks: employing system stressors and managing turbulence, adopting focal and non-focal leadership roles, maximising social over spatial proximity and reciprocally coproducing formal and informal leadership. The most critical component of the framework that addresses the research question is social capital, since its dimensions (e.g. capacity building) are essential to relational network dynamics and collective interorganisational network development.

Secondarily, the study investigated: ‘What drives network processes?’. Importantly, study outcomes revealed that formal and informal leadership processes drive interorganisational network processes. The complementary, reciprocal coproduction of formal and informal leadership processes is critical to NPL. The study findings and theoretical discussion also showed that social-epistemic boundaries internal to the interorganisational network could signal concrete expertise and KT across network participants. Professionals from one specialism recognised the expertise of professionals from another specialism, which signalled defined areas of expertise within the
network. For example, physicians were recognised by managers and IT as medical professionals with distinct clinical expertise. Similarly, the underlying social-epistemic boundaries between doctors and managers signalled to doctors that managers held specific skill sets and specialisation in their functional field. These boundaries in cross-professional networks may, during certain time periods, facilitate the recognition, understanding and integration of different forms of specialist expertise. Although social-epistemic boundaries in instances act as KT barriers, which is dominantly exhibited in the extant literature, there are also some conditions under which these boundaries act as KT enablers. The study highlighted the importance of the triangulation across the medical, managerial, and technical/IT social-epistemic boundaries within the interorganisational Stroke Network. Rather than the duality of the medical–managerial divide, the case on telestroke adoption demonstrated the importance of this triangulation among social-epistemic jurisdictions beyond the traditional chasm in the context of network technology adoption. More importantly, it revealed that informal networks helped facilitate KT across social-epistemic boundaries. The social-epistemic boundaries (e.g. between neurology and stroke specialists and neurology specialists and managers) within the network presented opportunities for communication, knowledge sharing, social capital capacity building, and collaboration among different network participants. Importantly, social capital dimensions (e.g. social capital utilisation and capacity building) underlie the driving of these and many broader network processes.

Thirdly, the study evaluated: ‘How do interorganisational networks change and develop over time?’. Results demonstrated that network micro-processes, particularly those involving social capital and relational development (e.g. networking), are significant drivers of network-wide processes. The study showed that contextual factors and conditions, particularly the participants – and their relationships – involved during certain time periods in the network’s trajectory (e.g. David’s connections with key medical professional informal leaders) are important to the interorganisational network’s goal achievement and development over time.
Lastly, the final sub-question asked: ‘How does leading in complex, interorganisational networks affect the network?’ The study showed that reciprocity and the coproduction of leadership between formal and informal leaders is critical to interorganisational network development. Reciprocity refers to the communication feedback loops between formal and informal leaders. As an example, Joanna regularly communicated with informal leaders at the various network hospitals to exchange information that helped her facilitate network-wide processes and helped the organisational participants improve processes within their organisations. The sharing of knowledge between formal and informal leaders provided benefits to each (i.e. helped them accomplish their functional tasks), and ultimately the reciprocity benefitted the overall network. Network leaders facilitate and mobilise network processes to achieve network objectives (e.g. through the use of framing) and drive interorganisational development (e.g. network reconfiguration). The implication is that network leaders could facilitate the following to instigate interorganisational change: employing system stressors and managing turbulence, adopting focal and non-focal leadership roles, maximising social over spatial proximity and reciprocally coproducing formal and informal leadership.

9.2 Social capital: linking network theory and complexity leadership

The purpose of this section is to make a theoretical contribution by focusing on the application of social capital as a means for better understanding network progress. The dynamics and processes observed in the Stroke Network case hinged on social capital dynamics, including social capital utilisation and capacity building over time. CLT’s focus on relational, non-hierarchical leadership is predicated on the importance of encouraging collaboration through its power to develop and mobilise social capital. Therefore, social capital and its processes appear to be a crucial foundation of the leadership required to facilitate, orchestrate and develop complex interorganisational networks. As I draw upon what more is known about social capital to develop a framework for NPL, it enables us to extend our ability to analyse interorganisational network dynamics and development and to improve CLT’s applicability to such complex networks.
Specifically, I do the following in this section: (1) identify social capital dynamics based on empirical findings, (2) describe the interconnectedness of the four higher order themes and its importance, and (3) discuss social capital dynamics in complex interorganisational NPL as a theoretical contribution.

9.2.1 Social capital dynamics

Throughout the results chapters, I identified several relational network processes, including social capital utilisation and capacity building. Based on their dominant presence in network processes of relational development and NPL, I categorise these micro-processes as social capital dynamics. Inherent in social capital dynamics are relational interactions, which emphasise the importance of ‘being connected’.

First, social capital utilisation refers to the process whereby one individual makes use of an existing contact(s) to gain information or to connect two previously unlinked individuals. For example, Joanna used her existing relationships with two stroke unit managers, neither of whom knew the other, in order to connect the two managers and establish a new linkage. Social capital utilisation is differentiated from capacity building due to the involvement of at least three individuals who could either strengthen an existing relationship or form a new one. The individual who utilises his or her social capital does not directly benefit from the connection.

Second, social capital capacity building refers to the process of networking or relational development. It is defined as the process of building capacity for social capital between as few as two individuals, even if they did not previously know one other (e.g. networking between two strangers). Social capital capacity building can be done by an individual (network leader or participant) out of self-interest, or can be done by an individual to connect other individuals. As opposed to social capital utilisation, capacity building results in the formation of new linkages that directly benefit all involved in the connection. The processes of social capital utilisation and
capacity building could provide benefits beyond the individual level at the organisational and even interorganisational network levels.

Based on the study’s empirical analyses, the significant social capital dynamics related to each NPL theme are included in Table 9.1.

Table 9.1: Key NPL themes and related social capital dynamics

<table>
<thead>
<tr>
<th>NPL theme</th>
<th>Social capital dynamics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilising strategic system stressors and turbulence</td>
<td>• Network leaders managed turbulent scenarios through social capital utilisation and capacity building</td>
</tr>
<tr>
<td>Adopting focal v. non-focal leadership roles</td>
<td>• Network leaders emerged and submerged by utilising social capital</td>
</tr>
<tr>
<td></td>
<td>• Network leaders constructed and deconstructed the hierarchical network through social capital utilisation</td>
</tr>
<tr>
<td>Maximising social proximity</td>
<td>• Social capital dynamics: Network leaders networked and facilitated network participants’ networking through social capital utilisation and capacity building</td>
</tr>
<tr>
<td>Complementary coproduction of network leadership (formal and informal)</td>
<td>• Social capital dynamics: Network leaders managed formal and informal reciprocal fields through social capital utilisation and capacity building</td>
</tr>
<tr>
<td></td>
<td>• Social capital dynamics: Network leaders permeated boundaries through social capital utilisation and capacity building</td>
</tr>
</tbody>
</table>

As shown in the list above, there is at least one social capital element underlying each of the higher order NPL themes. A synthesis of the empirical analyses revealed the specific social capital dynamics that facilitate each theme. For example, the data showed on several occasions how David, Graham and Joanna purposefully facilitated network participants’ networking by utilising and building capacity of social capital at the interorganisational level over time. As a result, network participants’ social proximity – rather than spatial proximity – was maximised. The next section discusses the themes’ interconnectedness as well as why it is important that social capital dynamics underlie all four themes.

9.2.2 Interconnectedness of the network process leadership themes

Social capital is the crucial linking theme that connects NPL in the underexplored complex network context. Importantly, the findings suggest that employing social capital in targeted ways is
a core process in NPL that affects interorganisational network dynamics and development. In order to synthesise work across the underexplored gap between network theory and complexity leadership, an analysis of the concept of social capital is required. Each of the four NPL themes ties in some way to the use or capacity building of social capital. For example, the formal network leaders’ introduction of system stressors, such as the mandated pro-forma submissions, facilitated participants’ collaboration across organisational boundaries, resulting in an improved interorganisational network configuration (i.e. new organisational partnerships able to provide better stroke services). Second, network leaders’ adoption of non-focal roles and use of social capital enabled them to mobilise informal exchanges among participants to drive network momentum. For example, when Graham adopted a non-focal role and prompted Joanna to take the lead during a clinical Stroke Network meeting, he utilised social capital in the background to facilitate participants’ informal interactions. Meanwhile Joanna adopted a focal role, such that she was perceived by clinical participants as leading the meeting and subsequent processes. Third, maximising social proximity was accomplished through social capital capacity building (e.g. networking). For example, David introduced two consultants from a district hospital and Trust who previously had not interacted. By building social capital capacity among the three of them, each individual benefitted from the connections as the relationship developed over time. In addition, David facilitated a new organisational collaboration between the two hospitals forged by the newly established relationship between the consultants, which helped him achieve the interorganisational network goal of reconfiguration to improve stroke services. Fourth, the coproduction of formal and informal leadership involved the reciprocal use of social capital. These findings show that employing social capital in targeted ways is a core process in interorganisational NPL.

9.2.3 Theoretical contributions: social capital dynamics in complex interorganisational NPL
Social capital is the critical concept linking network and complexity leadership theories, which provides a better understanding of NPL (Figure 9.1). These findings are not insignificant, as social capital dynamics were empirically and analytically found underlying the four dominant constructs
of NPL within the study. Based on the most salient research findings, Section 9.3 presents the foundation of a 'complex interorganisational NPL framework’.

Figure 9.1: Linking the network and leadership literatures

I assert that NPL should be viewed in terms of relational, reciprocal, recursive, facilitative processes involving social capital dynamics among multiple participants (e.g. individuals, organisations) in an interorganisational context, which is highly differentiated from studying unidirectional effects of a hierarchical, central leader on subordinates within one organisation. Theoretically, I argue the importance of social capital in the complex nature of leadership processes within interorganisational networks. The research presented contributes to an understanding of how networks and social capital can be adapted or created by formal and informal leaders within networks to reflect changing processes and circumstances over time. For example, during the telestroke supplier selection period, David and Graham permeated professional and organisational boundaries through relational development to propagate dominant framing. By strengthening and establishing new linkages through social capital utilisation and capacity building, the two formal leaders were able to complementarily coproduce network leadership with informal leaders (e.g. key consultant stakeholders). Ultimately, this resulted in the interorganisational network achieving its goal of telestroke adoption. Social capital is the main currency in multi-professional, interorganisational network interactions, since within this interdisciplinary and multi-organisational context, social capital is crucial to processes and network goal achievement. Creating linkages and configurations embedded in a dense relational network using social capital facilitates the formation of shared knowledge and meanings (e.g. frames, knowledge transfer), reduces ambiguity and turbulence due to trust and interdependence, enables boundary-spanning and promotes the collaboration necessary to integrate a multiplicity of
factors (e.g. participants, sub-networks) and processes. Complexity leader competencies pertain to managing organisational dynamics and enabling informal initiative as well as readily transferring control and allowing the collective to consider the emergence of issues (Hanson & Ford, 2010). Network leaders face challenges to ensure survival in an environment that is, or is expected to become, dynamic, unpredictable and increasingly complex; hence an understanding of how to manage and/or utilise system stressors is relevant, particularly as it relates to social capital.

The social capital capacity building of networks is traditionally viewed as occurring at the formal network level; however, this study discovered that many interorganisational network leadership processes involving social capital occurred in the background informally. The processes of network leadership require new approaches to influence, communication, message propagation, knowledge transfer and boundary-spanning, employing dynamic network skills and social capital instead of traditional power and control or hierarchical structure. Network building requires a personal investment by leaders to purposefully, proactively network and facilitate participants’ relational growth. Intentional development, maintenance, and use of contacts and alliances are fundamental behaviours for formal and informal network leaders. Management experts assert that elite professionals benefit from the possession and use of high social capital within networks. Some suggest that the related concept of corporate social capital explains the means by which social structure is mobilised to achieve organisational outcomes (Ferlie et al., 2009).

This chapter augments the emphasis on mobilisation of influential processes by extending our understanding of network leadership. The study identifies important network leadership types (i.e. formal and informal) that are dependent on social capital, and are needed in the interorganisational context. The study also analyses multiple levels – from micro to macro – through which collective network goals must be transferred in order to drive process change, achieve network objectives and change interorganisational practice. Significantly, when network leaders facilitate and mobilise these processes, they are able to achieve network-wide goals. For example, David, Graham and Joanna’s social capital capacity building among network participants enabled them to
facilitate interactions that previously had not existed. By mobilising the relational processes among multi-disciplinary participants, the formal leaders established new, collaborative organisational linkages between network hospitals. Following the pro-forma mandate and hospitals’ presentations to the network, the network leaders made use of the new organisational linkages in order to reconfigure the network’s clinical stroke pathways. As a result, stroke patients from one district hospital were thereafter referred to the stroke unit at another hospital that had appropriate service capacity. Ultimately this new collaborative arrangement and reconfiguration of the network led to improved quality of stroke services at the interorganisational level (i.e. network-wide goal).

Sustainable interorganisational network growth comes from relational, distributed yet collective leadership processes, and network leaders can influence and facilitate NPL by employing social capital dynamics. The study’s findings suggest that network leaders should assume a boundary-spanning role that utilises informal networks and facilitates collaboration across boundaries. Engagement by boundary-spanners is facilitative to permeating jurisdictional boundaries in order to promote NPL across a highly specialist, interdisciplinary networked structure. Specifically, hybrid-role professionals working across professional jurisdictions are needed to act in brokerage and boundary-spanning role capacities in order to facilitate formal and informal NPL and sustain momentum. To summarise, my study suggests that NPL involves reciprocity between formal and informal leaders and may involve the transference of responsibility to informal leaders or even a collectivity of participants. This emphasises the underlying social capital collective processes among formal and informal leaders. Effective network leaders are likely to understand how to mobilise their levels of influence within a network by utilising and capacity building social capital – individually and among participants – to achieve positive change.

In addition to the benefits of network social capital dynamics, there are also drawbacks and criticisms of related leadership processes. First, although the study’s findings highlight the complementary coproduction of leadership between formal and informal leaders (Sections 6.6, 7.2, 8.1), this process cannot be relied upon exclusively given different contexts and time periods
within an interorganisational network’s trajectory. In the context of this study, the Stroke Network was working towards shared objectives and goals (Section 6.6), employing shared financial resources (Section 4.3), and maintaining strong access to social capital (Section 7.2) during several turbulent periods. Formal network leaders coproduced inclusive, collective leadership with informal leaders to advance change and development towards shared network goals (Section 7.2).

In an alternative network context over a different period, network leaders must consider the immediate contextual conditions (e.g. competing v. shared goals, allocation of financial resources) to determine the optimal NPL approach. The coproduction of formal and informal leadership alone cannot be relied upon, but rather other NPL mechanisms must be considered (e.g. networking). For example, competitive rather than complementary leadership involves alternative social capital processes detrimental to internal network progress change.

Regardless, a constant requirement of NPL in this context is social capital. Due to the specialised, professionalised nature of public healthcare networks, there is high propensity for competition among organisations, interdisciplinary departments, clinical units and professionals. It is important to recognise alternative social capital interactions and processes that affect complex interorganisational networks in order to account for contextual and temporal specificity. As the study showed, collective leadership processes that promoted collaboration rather than competition enabled the achievement of network goals. The findings suggest that although alternative social capital interactions such as competition are possible and perhaps likely in the networked context, positive interorganisational network performance is closely aligned with collaborative social capital dynamics. The second criticism is that the absence of social capital utilisation and capacity building could lead to hindering effects on network leadership processes. In contrast to facilitative, collective leadership processes involving dynamic, relational networking, secluded leadership is likely to hinder network processes because isolated leaders do not utilise or build social capital capacity. Individualistic, leader-centric leadership represents an extreme that is likely to result in negative interorganisational network performance.
Kilduff and Tsai (2005) identify ideas familiar to all organisational network researchers, stating that four interrelated principles generate network theories and hypotheses: the importance of relations between organisational actors, actors’ embeddedness in social fields, the social utility of network connections and the structural patterning of social life. My study extends their organisationally based view to argue that social capital dynamics are crucial to leaders operating in complex interorganisational networks. Closely aligned with these relational dimensions are trust and interdependence among network participants, particularly leaders. The dimensions are important as network leaders design, develop and navigate within a web of sub-networks, crossing multiple boundaries to achieve network goals. The study demonstrated that social proximity to network participants and other leaders is vital compared to spatial proximity, in order to achieve network momentum and drive processes throughout the whole network. This is especially significant due to the virtual-based nature of work utilising IT systems whereby professionals are reliant on colleagues at a distance, which will become increasingly important as societal trends shift toward virtual work using new technologies in interorganisational contexts. In addition to the strategic use of system stressors to induce collaboration, adoption of focal and non-focal roles and maximisation of social proximity, the most significant construct with underlying social capital dynamics derived from this study is the coproduction of formal–informal leadership among network leaders and participants. This thesis presents an important contribution both to linking the network and complexity leadership literatures and to understanding the underexplored processual dynamics needed to facilitate NPL.

9.3 Limited extant literature: supporting the importance of the network process leadership framework

The purpose of this section is to provide a theoretical basis for NPL, grounded in CLT, while demonstrating the extant literature’s limitations in explaining NPL. I provide support for the importance of the foundational NPL framework to further our understanding of leading in complex interorganisational networks. The thesis aims to extend our understanding and application of
traditional leadership variables and practices by arguing that network leadership processes and underlying social capital dynamics are essential to interorganisational network leadership.

Network theorists have provided conceptual explanations of how managing and leading in networks focus on leader-centric characteristics and behaviours. Those researchers who have addressed network leadership focus on distributed leadership primarily at static points in time rather than dynamically over time to reveal critical processes of network leadership. The purpose of this section is to demonstrate that although historical studies focus on certain factors, there is still limited evidence on interorganisational leadership processes and NPL to which my study contributes. I argue that the complex interorganisational NPL framework I propose in Chapter 10, which is grounded in the extant network and CLT literatures and integratively developed with empirical findings, furthers our understanding of leadership processes and dynamics in large, complex interorganisational networks.

The findings of extant studies identified in Table 9.2 relate in many ways to the optimal mix of a formal leader’s characteristics and behaviours or aspects of distributed leadership at a certain point in time. These studies are important because they establish the historical basis for conceptualising leadership variables that lay the groundwork for understanding leadership processes. My research built upon these studies – in conjunction with network theory – with a particular focus on the processes of leading and social capital dynamics in interorganisational networks.

Expanding beyond the characteristic and behaviour-focused line of leadership thought, through my theoretical sampling, I analysed not only these more traditional features but also leadership processes within networks where the degree of complexity and turbulence precludes stabilising and normalising processes. This thesis extends our understanding and application of traditional leadership variables and practices by arguing that network leadership processes and underlying social capital dynamics are essential to interorganisational network leadership. This presents a significant void in Table 9.2 and emphasises the embeddedness of social capital dynamics in NPL.
It does this by identifying a foundation for an NPL framework that lays the preliminary groundwork for a logical structure of a theory of leading in networks. In the interorganisational context with conditions such as distributive yet collective leadership, shared resources and high availability of social capital, the social capital dynamics of network leadership are crucially needed. A focus on activities that draw upon, build, and use social capital is conducive to more effective leadership behaviour that could positively affect interorganisational network performance. Hence, my work targets the significance of social capital to network leadership.

Table 9.2: Historical studies on leader characteristics, behaviours and distributed leadership: void of processes and social capital dynamics

<table>
<thead>
<tr>
<th>Characteristics and Behaviours</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role classification:</td>
<td></td>
</tr>
<tr>
<td>- formal and informal</td>
<td>Nohria, 1992b; Uhl-Bien et al., 2007; Ferlie et al., 2009; Sheaff et al., 2010</td>
</tr>
<tr>
<td>- broker</td>
<td>Burt, 2000, 2005; Kilduff &amp; Tsai, 2003; Ibarra et al, 2005; Sauer et al., 2007; Lingo &amp; O'Mahoney, 2010</td>
</tr>
<tr>
<td>- boundary-spanner</td>
<td>Goodwin et al., 2004; Fitzgerald et al., 2006</td>
</tr>
<tr>
<td>Leadership style</td>
<td>Maak &amp; Pless, 2006; Turner et al., 2008; Goodwin et al., 2009; Nembhard et al., 2009; Sheaff et al., 2010 on leadership differences; Walter &amp; Bruch, 2010</td>
</tr>
<tr>
<td>Openness</td>
<td>Hutt et al., 2000</td>
</tr>
<tr>
<td>Communication ability</td>
<td>Hutt et al., 2000</td>
</tr>
<tr>
<td>Compatibility</td>
<td>Hutt et al., 2000</td>
</tr>
<tr>
<td>Commitment</td>
<td>Hutt et al., 2000</td>
</tr>
<tr>
<td>Alignment</td>
<td>Hutt et al., 2000</td>
</tr>
<tr>
<td>Network governance and power</td>
<td>Addicott &amp; Ferlie, 2007; Kenis &amp; Provan, 2009; Milward et al., 2010; Provan et al., 2011</td>
</tr>
<tr>
<td>Ability to influence</td>
<td>O'Reilly et al., 2010</td>
</tr>
<tr>
<td>Accountability</td>
<td>Turrini et al., 2010</td>
</tr>
<tr>
<td>Legitimacy</td>
<td>Provan &amp; Lemaire, 2012</td>
</tr>
<tr>
<td>Traditional managerial work</td>
<td>Jennings &amp; Ewalt, 1998; Provan &amp; Milward, 2001; Page, 2003; Turrini et al., 2010</td>
</tr>
<tr>
<td>Relations with others (outside dyads)</td>
<td>Barnard, 1938; Newcomer, 1955; Mintzberg, 1973; Burns, 1978; Luthans et al., 1985; Alvesson, 1992; Geletkanycz &amp; Hambrick, 1997; Greenleaf, 1997; McGee-Cooper &amp; Looper, 2001; Avolio &amp; Kahai, 2003; Kanter et al., 2003; Pearce &amp; Conger, 2003; Cross &amp; Parker, 2004; Eisenberg &amp; Goodall, 2004; Grayson &amp; Baldwin, 2007; Ibarra &amp; Hunter, 2007</td>
</tr>
<tr>
<td>Generic networking</td>
<td>Kanter, 1982; Kotter, 1982; Meier &amp; O'Toole, 2001; O'Toole &amp; Meier, 2003, 2004; Goerdel, 2006; Turrini et al., 2010</td>
</tr>
<tr>
<td>Leadership networking</td>
<td>Grayson &amp; Baldwin, 2007; Martin et al., 2012 on network interactions among setting, leadership, and stakeholder contributions</td>
</tr>
<tr>
<td>Leadership trajectory</td>
<td>Day, 2001; Day &amp; Sin, 2011</td>
</tr>
<tr>
<td>Distributed leadership</td>
<td>Pettigrew et al., 1992; Brooks, 1997; Denis et al., 1996, 2000, 2001; Ferlie et al., 2003; Buchanan et al., 2007; Currie et al., 2009; Martin et al., 2009; Fitzgerald et al., 2013</td>
</tr>
</tbody>
</table>
The literature in Table 9.2 provided a basis to describe, understand and analyse a case study while I concurrently revisited the theories and concepts to further develop the complexity leadership and network theory literatures. I initially surveyed several theories (networks, contextualism and structuration) that might assist in explaining data gathered from the network. Following data collection and analyses, I focused on network theory, leadership and social capital as these literatures better highlighted the case. After briefly reviewing the research on leading in networks, I focused on the importance of conceptualising leading in networks as NPL to endeavour to better understand how leadership is operationalised within interorganisational networks. For many researchers contributing to this literature, an important factor for strengthening public networks and leading them towards goals is a central, committed leadership (Hageman & Bogue, 1998; Lasker et al., 2001; Shortell et al., 2002; Weiss et al., 2002; Conrad et al., 2003; Fitzgerald et al., 2013). A key group of organisations within ‘the network’ and their leaders are said to play a central role as the main carriers of those rules and practices, often reflecting the environment in which they are situated (Hendry, 1999). The practices and commitments of those key nodes may result in the development of dominant logics at the network and community levels (Bazzoli et al., 1998; Owen-Smith & Powell, 2004), suggesting that a dominant set of individuals within the network may drive how the network develops and/or evolves (Provan et al., 2007; Milward et al., 2010; Sheaff et al., 2012). Underlying these approaches are concepts reinforcing leader-centric views. My study’s findings suggest that it is necessary to extend this classical understanding of leadership within complex interorganisational networks to a non-centric leadership, processual, relational perspective.

According to Agranoff and McGuire’s (2001) work on public network management, leadership and guidance ability within self-managing systems is a prominent contributor to network cohesion. They suggest that it is common for network leadership and management to require the ‘principles of “soft” guidance’ as a replacement for command and control (Windhoff-Hentier, 1992). Steering ability and facilitation are critical in holding the network together such that it could self-manage,
involving minimal coercion and resources, ‘balancing social forces and interests and enabling social actors and systems to organise themselves’ (Kooiman, 1993: 256).

Although extensive research has been conducted on large, complex public sector networks (Benson, 1982; Bardach, 1994; Provan & Milward, 1995; Wagner, 2000; Addicott et al., 2006, 2007; Addicott & Ferlie, 2007; Currie et al., 2009, 2011; Ferlie et al., 2012; Fitzgerald et al., 2007, 2013; Kenis & Provan, 2009; Lemaire & Provan, 2009; Martin et al., 2009, 2012, 2013; Milward et al., 2010; Provan & Lemaire, 2012; Sheaff et al., 2010, 2012), little attention has been paid to leadership processes and their effects over time within the interorganisational setting. Following a systematic review of the literature, Turrini et al. (2010) present a unified, integrated framework of network effectiveness by building upon Provan and Milward’s (1995) preliminary ‘theory’ on network effectiveness and Provan and Sebastian’s (1998) model, considering them as benchmarks in assessing determinants of public network effectiveness. Despite the comprehensiveness of their framework, they mention ‘network leadership’ only once. Their framework and the literature more broadly forego examining the interactive relationships among leadership characteristics and network processes.

Martin et al. (2009) note that despite the known challenges to networked governance and distributed leadership in the public services, a careful alignment of objectives with managerial agenda fosters success to service improvement. They find that a combination of clear benefits to network stakeholders and distributed and dispersed leadership, can enable effective collaboration and establishment of reforms, through structural integration and the harnessing of agency. My study aligns with their finding that networks compound the need for distributed leadership in public-service contexts, since they create new loci of power that could be influenced by a more dispersed form of leadership. However, their study adds to a growing literature on leadership practice and the role of public-service networks and brings these literatures together; whereas my research expands our understanding of complexity leadership in interorganisational networks by introducing the critical linking theme of social capital. In addition, Currie et al. (2011) find that
leadership and networks should complement one other, with the less hierarchical logic of the network allowing leadership of change to develop, distributed among network members rather than led from dominant organisational role. They argue that as a consequence of bureaucracy, power differentials among network participants, and a strong centralised performance management policy regime, a relatively scant form of distributed leadership is enacted in practice. My findings extend their work to offer evidence on the processes of distributed leadership within an interorganisational network that facilitate change and network wide development. I focus theoretically on linking networks and complexity leadership, drawing upon Complexity Leadership Theory to help explain the nuances of network process leadership. Currie et al. (2011) acknowledge that their analysis of the dynamic interaction between networks and leadership is a contingent one and suggest there is a temporal dimension to the development of distributed leadership as a network matures. Through the longitudinal Stroke Network case study, my findings highlight processes over time, which support the theoretical underpinnings of the NPL framework.

The results of my work point to interactive, relational and collective leadership processes involving social capital as the dominant factor holding the network together and driving it forward. Having built upon the extant literature and integrated theoretical concepts with my empirical analyses, I propose that the foundation of a complex inter organisational NPL framework helps extend our understanding of leading in networks and provides a means by which to operationalise NPL beyond what is known. The final section summarises the conclusions of the chapter surrounding the NPL framework as a critical contribution.

9.4 Conclusions

The purpose of this section is to discuss the primary contribution of this chapter and its implications, whereas Chapter 10 addresses the broader contributions of the overall thesis. In the above discussion, I theoretically integrate the findings on the different higher order NPL themes and underlying social capital dynamics within the complex inter organisational network context. By doing so, my research attempts to contribute to current discussions on present-day forms of leading.
in interorganisational networks by identifying a set of NPL processes and crucial social capital dynamics that facilitate NPL in these complex contexts. As discussed and demonstrated throughout the thesis, the concepts of both network theory and CLT embody social capital. Social capital therefore can be used as a foundational theory for my proposed complex interorganisational leadership framework.

The main contribution of this chapter is to present the foundation for a complex interorganisational NPL framework. Consequently, this chapter proposes a reconceptualisation of network leadership as complex, interorganisational NPL. It demonstrates the crucial role social capital dynamics (i.e. social capital utilisation and capacity building) play in facilitating leadership as well as in wider network processes. This chapter unites the empirical observations and evidence of network processes and leadership functioning with social capital as the linking theme, thereby linking network theory and complexity leadership, which is an original contribution of this thesis. It describes ways in which leaders in complex, interorganisational networks use, adapt and build social capital to put mechanisms in place to drive network processes and functioning and ultimately shape practice. Finally, the chapter establishes the basis for a complex interorganisational NPL framework.

Based on the study’s dominant findings related to leading in networks and application of a CLT lens, I focus on social capital as the key conceptual foundation to NPL. Social capital dynamics resonate throughout the results chapters and underlie the conceptualisations of mobilising influence, building trust, facilitating processes, maximising social proximity, managing system stressors and turbulence, adopting focal and non-focal leadership roles and the coproduction of formal and informal leadership processes. Whether considering social capital utilisation or capacity building, the concept of social capital is the primary theme linking the study’s dominant findings. Social capital is highly expandable within complex interorganisational networks, particularly under conditions of high reciprocity and trust within a networked environment. By developing their social capital within a network, leaders and participants are capable of building
and expanding it, thereby strengthening linkages and relationships. Social capital resource exchange and reciprocity could be both mutually reinforcing and/or mutually beneficial in this context. A critical conclusion of this thesis is the assertion that social capital dynamics are necessary for interorganisational NPL, which importantly extends our understanding of how to lead in complex networks as well as the micro- to macro-benefits gleaned from these processes.

The discourse presented here draws theoretical and empirical links between network theory and complexity leadership, thereby initiating research and inviting network and leadership scholars to elaborate the literature in this interstitial domain. This research is fundamentally an interpretivist account and presents one perspective on the evidence. There may be another lens that could be applied, such as a purely social capital lens derived exclusively from the social capital literature, but it would diminish the salient network process effects and complexity leadership elements. A quantitative social network analysis (SNA) perspective is another alternative lens; however, its dependence on quantitative network affiliation analysis ignores the rich, processual, longitudinal, qualitative findings presented here. I applied a combined network theory and complexity leadership lens based on the empirical evidence, and my interpretation is useful given its theoretical underpinnings, methodology, consideration of alternative theoretical lenses (e.g. exclusively social capital, SNA, contextualism), and reliance on dominant, empirically grounded patterns and findings.

The study of NPL is immature without sufficient practice, experience, observation or multi-level longitudinal studies. For the understanding of this concept to advance, leadership practitioners should be aware of, purposeful, and proactive about their approach to NPL so contextual experience and practical understanding can be achieved through research. Interorganisational networks do not operate autonomously nor does leadership exist in vacuity.

The next chapter provides an overview of the thesis and its main contributions before presenting the foundational NPL framework. Building upon the groundwork provided, working towards
expansion of the foundational NPL framework will significantly impact the legacy of scholarly network and leadership research. Chapter 10 discusses my study’s contributions to knowledge, addresses limitations and generalisability, and identifies potential research opportunities that build upon my work. The chapter importantly discusses the policy and management implications of the findings. It identifies practical mechanisms offering operational insights into the nature of leadership that will prove useful to practitioners in interorganisational contexts. This thesis asserts that a processual, relational, collective approach is needed to advance management research.
Chapter 10: Conclusion

10.0 Introduction

This chapter seeks to contribute to the general understanding of leadership in complex interorganisational networks and the key leadership processes that drive network development. As a primary contribution of this thesis, a simple, integrated framework for understanding how leaders facilitate multi-organisational collaboration and under which conditions (i.e. characteristics, processes) they establish functioning interorganisational networks that promote collective leadership and action is provided. Network theory is extended by distinguishing between dyadic-level and sub-network-level leadership processes, and identifying critical leadership processes that promote overall network development. This allows for better comprehension of how networks are led, how they develop and evolve, and ultimately, how collective interorganisational outcomes might be generated.

As an important finding, my study identifies reciprocal interactions among network leadership processes and social capital to establish the groundwork for a complex interorganisational network process leadership framework. The framework assists in exploring and identifying those processes and social capital dimensions that foster interorganisational network change and development. The significance of NPL processes and related social capital dynamics correspond specifically to leadership in a complex interorganisational network context as a critical contribution linking network and complexity leadership literatures. The purpose is to distinguish between generic leadership processes and indicators and those critically relevant to interorganisational process facilitation and change, presenting principles of NPL development. As a contribution to both literatures, NPL assists in exploring and identifying specific processes and social capital dynamics that foster interorganisational change over time based on the multiplicity of interactions previously unexplored in this context. This is particularly important for network managers and public sector policymakers who are interested in interorganisational network performance and sustainability. The foundational NPL framework importantly conceptualises leading in networks as crucially...
related to social capital dynamics to achieve a better understanding of how leadership is operationalised within interorganisational networks. Grounded in the network and CLT literatures, the NPL framework integratively developed with empirical findings furthers our understanding of leadership processes and dynamics in complex networks. Given limited evidence on interorganisational leadership processes and network process leadership, the original foundation of the NPL framework and my research more broadly encourages future work in this important area.

The single most important theme linking these theoretical findings within the complex interorganisational context is social capital. Of practical importance, this is especially relevant to policymakers, management practitioners, and those having a perspective that extends beyond the leadership and performance of individual organisations. Figure 10.1 provides a holistic overview of my thesis and identifies its main contributions. The diagram describes the chronological layout of the thesis, emphasising the linking theme of social capital in Chapter 9 and critical contributions in Chapter 10.
Figure 10.1: Thesis overview and key contributions

Overview and Research questions (Chapter 1)

Literature review: Theoretical foundations (Chapter 2)

Research design (Chapter 3)

Empirical study: Network case study narrative (Chapter 4)

Key empirical results themes:
1) Framing (Chapter 5)
2) Impact of informal networks and boundaries on knowledge transfer (Chapter 6)
3) Network process leadership (Chapter 7)

Applying a complexity leadership lens to network process leadership results (Chapter 8)

Network theory

Linking theme:
social capital
(Chapter 9)

Complexity leadership

Contribution (Chapter 10)
Contributions to network theory: the foundational NPL framework
- Collective, coproduction of leadership
- Influencing processes
- Informal networks
- Social capital
Filling gaps in the literature
10.1 Foundation of a complex interorganisational network process leadership framework

As a primary contribution of my research, this section identifies the core arguments and constructs derived as a basis for the NPL framework. Current work on leading in networks does not address the temporal, interactive dynamics of network leadership processes that facilitate momentum and change in interorganisational contexts. Prior frameworks on network effectiveness (Turrini et al., 2010) imply that network functioning occurs autonomously; however, empirical evidence from my study indicates that there are several NPL thematic constructs that facilitate interorganisational network change and development. The proposed foundation of an NPL framework provides a schema for network and leadership scholars to consider both formal and informal leadership processes (Barnes & Kriger, 1986; Fernandez, 1991; Bryman, 2004; Uhl-Bien et al., 2007; Sheaff et al., 2010) and coproduction across sub-networks of participants. This perspective is grounded in a core proposition asserting that leadership is not merely the influential act of an individual or individuals, but rather is embedded in a matrixed interplay of numerous interacting and constantly evolving processes and social capital dynamics: an environment ripe with power interdependencies and social capital complexities. Based on concepts from network theory and complexity leadership, a major contribution of the proposed framework is that it examines leadership as a dynamic process involving multi-layered networks of highly interactive, interdependent participants driving network processes to achieve interorganisational goals.

My study demonstrated that social rather than spatial proximity to participants and leaders is more crucial in order to facilitate network processes. Also, hierarchical network construction referred to the development of a formal, mandated network over time across a developmental stage continuum. The study showed that formal network leaders are able to deconstruct the formal network and employ informal leadership processes, thereby facilitating informal, collective leadership processes to drive the overall network. This conclusion is closely aligned with findings on managing formal and informal reciprocal fields. The study provided data surrounding the reciprocity between formal and informal networks, termed here ‘reciprocal fields’, which suggests that informal leadership can both complement and detract from the work of formal, authoritative
leaders. Moreover, network leaders can drive and manage such processes by coproducing leadership with informal leaders, allowing for the coexistence of formal and informal functions. Network leaders must recognise the transition from individualism and independence to a dependence on others (Ibarra & Hunter, 2007) and collectivism.

Emergence and submergence pertains to the presence of a focal or non-focal role related to network leaders’ power, control and identity. There is a dichotomy between the focal and non-focal role – presence or absence from view and presence or absence of control – of the formal, authoritative network leader. Formal network leaders can reshape the structure and context and induce processes to develop informal sub-networks whereby their informal leaders may ultimately substitute for the formal leader’s influence. The study recommends that network leaders permeate network boundaries across multiple jurisdictions. This can be accomplished, as David, Graham and Joanna demonstrated, through social capital and capacity building across professional and organisational boundaries. Relational development, particularly through the informal social networks within the network, enables network leaders to act as cross-disciplinary boundary-spanners. Network leaders must operate across interstitial domains of a multiplicity of professions, sub-networks, specialties and organisations, all which affect the interorganisational set.

Although trust is considered a requisite variable in any leadership context (Bass, 1985; Hutt et al., 2000; Goodwin et al., 2004a, 2004b; Casimir et al., 2006; Davis & Eisenhardt, 2011), the core NPL themes emphasise the importance of social capital based on trust between and within the internetwork and intranetwork levels. Moreover, there are power interdependencies that affect performance (Addicott & Ferlie, 2007; McGivern & Dopson, 2010) between formal and informal leaders. This is particularly crucial for the coexistence and coproduction of formal and informal leadership. The nuanced balancing of these power interdependencies is exacerbated in the NPL context, which demands that network leaders carefully map out and manage these power interrelationships in order for complementary leadership to function successfully. The NPL
framework suggests that a network leader’s power and influence both internal and external to her/his multiple networks are critical.

The basic structure of the framework (Table 10.1) combines NPL’s significant higher order thematic processes (left column) with the dominant social capital dynamic means for achieving those NPL processes (right column), where derived from the empirical findings and theoretical developments of the research study. The skeletal NPL framework outlined below is not exhaustively comprehensive, but rather establishes the foundation for a previously unexplored NPL framework.

**Table 10.1: Complex interorganisational network process leadership framework**

<table>
<thead>
<tr>
<th>NPL: significant processes</th>
<th>Social capital dynamics critical to NPL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coproducing leadership between formal and informal leaders</td>
<td>• Managing formal and informal reciprocal fields</td>
</tr>
<tr>
<td>Maximising social proximity</td>
<td>• Permeating boundaries</td>
</tr>
<tr>
<td>Assuming focal and non-focal roles</td>
<td>• Social capital utilisation and capacity building</td>
</tr>
<tr>
<td>Employing strategic system stressors to facilitate collaboration</td>
<td>• Purposefully facilitating network participants’ networking by social capital building</td>
</tr>
<tr>
<td></td>
<td>• Leader emergence and submergence by utilising social capital</td>
</tr>
<tr>
<td></td>
<td>• Hierarchical network construction and deconstruction through social capital utilisation</td>
</tr>
<tr>
<td></td>
<td>• Managing turbulent scenarios to harness the collective generation of collaboration</td>
</tr>
<tr>
<td></td>
<td>• Social capital utilisation within a turbulent environment</td>
</tr>
</tbody>
</table>

These processes – based on the significant thematic constructs identified from dominant study findings – and their associated social capital dynamics lay the structural foundation for the NPL framework. Although interactions among certain leadership variables (e.g., power) are found in any leadership context, their dynamics are intensified in an interorganisational network due to the interplay among various networked levels; thus NPL underscores the reciprocal relationships that are constantly interacting in an interdependent manner. Certain leadership-related processes and indicators, such as identity, transparency, leadership style and accountability, will also be found in any leadership context; however, the significance of the NPL processes and related social capital dynamics correspond specifically to leadership in a complex interorganisational context as a critical contribution linking the network and complexity leadership literatures. The purpose here is
to distinguish between generic leadership processes and indicators and those critically relevant to interorganisational process facilitation and change, presenting principles of NPL development. As a contribution to both literatures, NPL assists in exploring and identifying those processes and social capital elements that foster interorganisational network change and development, based on the multiplicity of interactions previously unexplored in this context. I have provided the foundation of a framework whereby NPL processes can be appropriately understood in terms of social capital. Moreover, this foundational NPL framework importantly conceptualises leading in networks as crucially related to social capital dynamics to achieve a better understanding of how leadership is operationalised within interorganisational networks. The next section discusses the existing leadership literature’s limitations and reinforces the significance of the foundation of a NPL framework.

10.2 Contributions to network theory
Where I am seeking to make my main contribution is to network theory by introducing a preliminary Network Process Leadership framework (Table 10.1). This part of my thesis aims to make a contribution by establishing a basis for future research into network leadership, and it does so in four ways as discussed in Table 10.2 and the sections that follow.
Table 10.2 Thesis contributions to network theory

<table>
<thead>
<tr>
<th>Contributions to network theory</th>
<th>Key points</th>
</tr>
</thead>
</table>
| Collective, coproduction of leadership | • Relations among formal and informal leaders significantly shape a network’s adaptability to change and its developmental trajectory  
• ‘Leadership in process’ is a shared dynamic that is distributed among network leaders and participants. Collective leadership between formal and informal leaders will better facilitate change  
• Using social capital is essential to network leadership processes |
| Influencing processes | • NPL uses social capital to influence the interorganisational network  
• Influencing processes drive change (e.g. framing involves consensus-building among numerous network participants)  
• Formal and informal leaders mobilise influence throughout the network toward shared goals and network objectives |
| Informal networks | • Informal networks support and facilitate knowledge transfer and traverse professional and organisational boundaries to operate across multiple levels  
• Collective leadership employing informal network and leaders are more effective at instigating change at the interorganisational network level |
| Social capital | • Social capital and relational development are essential to network process leadership  
• Network leaders draw on their social capital to facilitate processes  
• Social capital is crucial to leadership processes in complex, interorganisational networks |

10.3 Filling the gaps in the literature

The study presents a theoretical and empirical foundation for rethinking network processes, particularly interorganisational network leadership processes. Theories in the extant literature on networks and leadership are limited and there is also a gap between them. Based on a theoretical foundation covering networks, complexity leadership and social capital, I contribute to existing findings by exploring concepts related to NPL and propose several constructs that provide an initial foundation for a NPL framework. Filling the gap between the network theory and leadership literature, this thesis provides evidence on complexity management and leadership development in the interorganisational context, which are underexplored areas, particularly in healthcare.

Extending current theory in conjunction with data provision, I identify several practical, operational mechanisms that leaders could employ within complex interorganisational networks to facilitate positive changes and development. More broadly, I used multi-level analysis as a means of answering my research questions. The research presented here extends traditional network and leadership approaches that ignore professional, organisational and interorganisational networks by addressing the dynamics of leadership processes within and among different network level
boundaries. It builds upon and further develops both network and complexity leadership theories by providing empirical evidence and refining theoretical concepts. The thesis concurrently draws upon theoretical and empirical links at the intersection of these literatures, thereby expanding our understanding of interorganisational processes such as framing, KT, boundary permeation and network leadership. The research reveals how processes, particularly leadership processes, affected the network along its developmental trajectory. It emphasises the importance of understanding interorganisational network dynamics and development, a process that is significant for identifying and evaluating leadership processes within a complex interorganisational network. Extending the outcomes of this research to other contexts, I discuss the study’s generalisability after identifying the study limitations in the next section.

10.4 Limitations

Here I address the limitations of the overall study, including the single rather than multiple case studies and changes in the UK NHS regulatory environment that affected research. This research is based on a single case study; however, it provides a longitudinal processual view based on deep analytical immersion in an interorganisational network over a two-and-a-half-year period. Although it does not exhaustively cover all the processes that may potentially be relevant for the understanding of network change, it employed a trustworthy reliable methodology to expose previously unexplored interorganisational network processes. Its extended perspective over time, rather than at a single point in time, revealed a deeper understanding of network processes, change and development. Due to the severe delay in the Stroke Network’s adoption of telestroke, robust observation of the clinical pathways during technology implementation could not be conducted during fieldwork. The direct shadowing of clinical network leads over an extended period of time would elicit structured observational data from an observation schedule that could systematically record each clinical lead’s interactions within interdisciplinary teams during the periods of technology implementation and utilisation.
In addition, the current political climate and its direct effects on healthcare services in the NHS affected the willingness of some R&D departments and individuals to participate in this study. Impending closures and redundancies due to the NHS reforms underway during the study caused several potential interview candidates to feel demoralised and, as a result, apathetic about involvement in the case study. As the reforms were instituted, a few network participants were made redundant. This was addressed in the research design by proactively pursuing key network stakeholders for interviews, regularly following up with critical collaborators and past interviewees, frequently reviewing network documents and materials, consistently attending network-wide meetings and triangulation of empirical evidence. The research moved beyond the typical analysis of structural network changes to focus on processes and practices, accounting in detail for the manner in which change processes were generated, facilitated and actioned within the network over time. This study provides an opportunity to explore these themes further within a context of heightened turbulence at times. In today’s connected global society, turbulence is increasingly a significant issue that both public (e.g. governments) and private (e.g. multinationals) complex networks must adapt to in order to achieve sustainability. The predominant finding that social capital underpins NPL provides insights into the relational dynamics and ability of interorganisational networks to adapt over time to changing circumstances. Given the study’s credible research design, involving integration between data and theorising, the next section discusses its broader generalisability.

10.5 Generalisability

Middle-range theory falls ‘between the minor working hypothesis of everyday life and the all inclusive grand theories’ (Glaser & Strauss, 1967: 33). Generalisability is related to middle-range theory (Merton, 1957; Eisenhardt, 1989a), and the generated theory is specific to the phenomena under investigation but is still ‘testable, novel and empirically valid’ (Eisenhardt, 1989a: 547). It is enhanced if the theory developed from the case ties into broader theoretical frameworks as it does here. At its core, my research design relied on analytic induction as a way to move from the case to a set of theoretical explanations that could be applied to the broader phenomena under study.
Although the study covers only one interorganisational network’s adoption of a technological innovation, the findings may provide useful guidelines for other healthcare innovation initiatives. Adoption of complex, networked and learning-intensive technologies have not been examined from a NPL perspective. Importantly, my study is relevant to the analysis of network processes and innovation adoption in complex interorganisational contexts. Several reasons lead me to believe that the findings and contributions of this thesis are not parochial and are therefore applicable to other interorganisational network contexts beyond UK healthcare. First, the study’s theoretical sampling strategy allowed the gathering of a multitude of processual data from different organisations, professions and departmental units over time, providing a broader and more significant empirical base supporting the key findings. The process-oriented aspects of leading within interorganisational networks are likely to be applicable to other non-healthcare and non-public sector contexts. For example, the findings could potentially be applied to complex, governmental decision-making networks such as interactions and configurations of a country’s interorganisational policymakers. Within the private sector, the complex interorganisational network structure could parallel a multinational corporation composed of multiple boundaries that implements new technologies and innovations. Secondly, the findings from the network provide support to previous studies that show, for example, the importance of formal and informal leaders’ interactions in the context of complex networks (e.g. Uhl-Bien et al., 2007). Third, it has been described how the diffusion of network public management reforms exposed traditional healthcare institutions and participants from different countries to similar businesslike and market-driven trends (e.g. Pollitt & Bouckaert, 2000).

It is important to identify and understand the differences in NPL required by different network archetypes. The theoretical foundations established in my study are based on research into public networks, including theoretical constructs based on evidence and analysis from a stroke network case study that evaluated an interorganisational network in the UK public sector. Some of the case study findings concur with studies conducted outside the healthcare setting. This relates to parallels that emerged between interorganisational networks and complex systems. For example,
Surana et al. (2005) and Pathak et al. (2007) adopt a complexity perspective as I have done here to explain supply-chain networks in global healthcare systems and supply network theory, demonstrating applicability to other contexts. In addition, some of the findings pertain to pre-adoption processes linking an innovative, new technology with users. The longitudinal processual findings presented here extend our understanding of complex network development involving technology adoption, generalisable beyond the healthcare context. Finally, the longitudinal study’s findings demonstrate the complexity of interorganisational working. Despite a common desire to overcome turbulence, the findings suggest how to strategically use system stressors – given certain contextual conditions and time periods – to generate strategic turbulence that facilitates network processes (e.g. interorganisational collaboration). Leadership increasingly relies upon the leader’s ability to operate within a networked context, hence social capital is critical. Working toward development of NPL theory based on the foundation provided here will significantly impact the legacy of scholarly network and leadership research.

10.6 Future research

The discourse presented thus far draws on previously unexplored theoretical and empirical links between network theory and complexity leadership, thereby initiating research and inviting network and leadership scholars to elaborate the literature in this interstitial domain. The higher order themes identified in this thesis should be explored further to validate and expand upon them, and I identify two prioritised streams of future research.

Single v. multiple case method

First, with regard to the single v. multiple cases, future research could perform a similar analysis – accounting for the four higher order themes presented – over multiple cases to broaden the generalisability of the results and extend validation of the proposed theoretical contributions. Multiple case studies could seek to understand longitudinal processes, operationalise variables related to NPL and build instruments to measure those variables. Such an instrument could be used to look for correlations between known leadership constructs, new network leadership constructs,
and the extent of networking as well as individual, professional, organisational and interorganisational network performance.

*Mixed method: qualitative case study and quantitative SNA*

Second, researchers could employ a mixed method design to develop and test the NPL theoretical foundation in conjunction with network structural dynamics and the evolution of social relationships, particularly in the healthcare context. Specifically, a quantitative SNA approach (e.g. bipartite network affiliation analysis) coupled with a qualitative case study design could be used to examine both structural and processual relationships within complex interorganisational networks. Such an integrated approach could analyse: complexity leadership processes across multiple levels within a network comparing several interorganisational networks, social capital and networking effects on sub-network and whole network structural configurations; how leadership processes in networks affect network performance; and performance outcomes as the dependent variable.

‘Social network analysis can provide an appropriate and innovative paradigm for the health systems researcher, allow new analyses of the structure of health systems, and facilitate understanding of the role of stakeholders within such a system’ (Blanchet & James, 2012: 441; see also O’Leary et al., 2011).

In the future, the crucial consideration will be network-level outcomes rather than outcomes for individual organisations that compose the network (Provan et al., 2007). To date, network effectiveness has been the primary outcome variable of interest. For example, effective networks have been shown to foster network-wide learning (Kraatz, 1998) and catalyse innovation (Powell et al., 2005); however, there is still limited empirical evidence in the literature. My study suggests the need for analysis on emergent, shared relational leadership in the interorganisational context. Future network studies should measure patterns of dispersion among and between professions, organisations, and their salient processes. Such findings would illuminate significant network processes and structures that affect long-term interorganisational performance and sustainability.
This thesis proposes a foundational integrated NPL framework that is easy to translate into an operational model, such that leadership and network scholars could operationalise it to conduct further research, test theoretical constructs, and collect and analyse additional empirical evidence to test its claims. Further empirical, theoretical, and innovative methodological work should be conducted to analyse this research domain. This thesis underscores the recursive processes among multiple sub-networks in an interorganisational context by extending our understanding of the important linkages between network theory and complexity leadership with social capital as the linking theme.

10.7 Practical implications

I conclude the thesis by identifying pragmatic implications for the understanding and operationalisation of NPL. The next sub-section addresses implications for policymakers, as it is useful for those who consider healthcare delivery services overall, for example, and work across multiple boundaries. The subsequent sub-section identifies practical implications for interorganisational network management and leadership immersed in these complex contexts.

10.7.1 Policy implications

From a policy perspective, the identified nuances of NPL suggest that a broad and generic framework to foster leading and innovation adoption in interorganisational NHS networks might be of limited applicability. This is evident to the extent that the processual nature of framing, KT, permeating boundaries and leadership varies across complex interdisciplinary, multi-layered contexts. Given the high reliance on virtual KT and established IT infrastructures, the findings suggest that emphasis should be placed on increasing social proximity within complex interorganisational networks to enhance collaboration and shape practices. Social capital is a crucial component to NPL that facilitates interorganisational change and development. There is a high degree of connectivity among individuals, professions and multiple organisations, which has implications for the level of interdependence and embeddedness among networks. The pluralistic nature of complex health networks means that the diversity of participants involved is broad and
that the boundaries of the complex network can remain blurred (Bloom et al., 2007). This emphasises the importance of the planning of change to be embedded in a deep understanding of the figurations of which people are a part. Evidence generated by the interorganisational network analyses could help policymakers understand how large, complex interorganisational health networks react over time and how relationships among individual, professional and organisational participants can influence the network’s trajectory (e.g. diffusion of innovations). Furthermore, the study showed that networks improve performance, as demonstrated by the network processes that shaped network-wide actions, practices and development positively. Simply put, networks improve performance and development; hence this supports the likelihood that policymakers’ acknowledgement of this finding and proactive targeting of initiatives could strengthen networked environments and their performance. This finding is important to policymakers as they consider financial resource allocations (e.g. cost-effectiveness) and future strategic goals. Specifically, policymakers should focus on investing in leadership and social capital development by up-skilling network participants (e.g. network coaching) and increasing skills training around leadership development. Through concerted efforts, allocating human and capital resources to these areas would benefit complex interorganisational network performance and development. Furthermore, this could have broader implications for complex network sustainability.

10.7.2 Management and leadership implications

There are several managerial and leadership implications that emerge from the study.

- Leaders within complex networks are network strategists, architects and developers, and should proactively network. Leaders could deliberately build the strength of networks within their groups, professions, organisations and interorganisational networks centred on social capital utilisation and capacity building, influencing and designing their surrounding networks. Formal leaders should facilitate interactions with informal leaders and create social capital capacity building opportunities among participants’ informal networks, collaborating with their complementary informal leaders. Managers’ networking is correlated with the network’s sustainability and flexibility to change (Turrini et al., 2010). Chance encounters or lucky opportunities often occur because of intentional network building behaviours. What was presumed to be random or chaotic is not (Burt, 2005), as serendipitous interactions can be orchestrated.
- Leaders need to understand their personal effectiveness as network builders so they can be coached on desired behaviour (Collins & Clark, 2003). Facilitating and managing interorganisational networking creates opportunities for relational, formal and informal exchanges.
• Leaders should ensure that there is a high level of transparency across the network, allowing all network participants to monitor and discuss the functioning of the whole. They should facilitate processes to engage participants, accounting for transparency and accountability in the network.

• Framing could be used as a central mechanism to influence strategic choices (Kaplan, 2008) and drive collective decision-making. Framing involves a negotiation process across multiple sub-network levels within interorganisational networks such that a dominant strategy decision is reached through coalition building.

• A needs assessment could be conducted in conjunction with stakeholder analysis to identify key strategic players with whom relationships should be developed. Continuous network mapping and monitoring is important. This exercise will also be helpful when designing teams, considering participants’ social capital and access to other resources.

• Leaders should create conditions for collaboration to occur and trust in the capacity of the interorganisational network’s immediate social and professional networks to self-organise, respond to the internal and external environments, and dynamically adapt and regenerate if conditions require. Conditions can be re-evaluated and adaptively facilitated further as needed.

• Social proximity matters more than spatial proximity. Leaders should mobilise and operationalise informal social, professional and organisational networks to develop relational interactions that increase trust, communication and KT. Constellations of formal and informal collective leadership can be coordinated to drive interorganisational network outcomes (e.g. learning, economic, innovation).

• At the senior interorganisational network management level, leaders could create and strategically introduce system stressors – as needed – as a specific change management strategy, weighing the risks of the intended turbulent period generated by the stressor(s).

Grounded in empirical analyses, these operational NPL insights are practical and offer network leaders pragmatic characteristics, devices and tools to employ in complex, often turbulent, interorganisational networks.
References


Lichtenstein, B.B. et al. (2006) Complexity leadership theory: An interactive perspective on leading in complex adaptive systems. University of Nebraska – Lincoln Digital Commons@University of Nebraska – Lincoln. Management Department Faculty Publications.


Robertson, M. et al. (forthcoming) Knowledge, networking and innovation: Developing the process perspective. Manuscript.


Thompson, J.D. (1967) *Strategies, structures, and processes of organizational decision*. Prentice Hall.


Annexe 1: Proportionate Review Sub-Committee of the South East London REC 3 Research Ethics Committee approval letter

Annexe 1

National Research Ethics Service
South East London REC 3
(formerly King's College Hospital Research Ethics Committee)
1st Floor Camberwell Building
King's College Hospital
94 Denmark Hill
London
SE5 9RS

Telephone: 020 7188 2250
Facsimile: 020 7188 2258

11 June 2010

Miss Lena Mass
DPhil Candidate in Management Research
University of Oxford
Green Templeton College
43 Woodstock Road
Oxford OX2 6HG

Dear Miss Mass

Full title of study: Analysis of telestroke implementation and adoption at the network level
REC reference number: 10/H0808/88
Protocol number: 2

The Proportionate Review Sub-committee of the South East London REC 3 Research Ethics Committee reviewed the above application at the meeting held on 09 June 2010.

Ethical opinion

Protocol
- the researcher is to include the details of the analysis of the data she will generate (as provided to the review committee via email on 10 June 2010) in section 7 Statistics and Analysis.

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.
For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk. Where the only involvement of the NHS organisation is as a Participant Identification Centre, management permission for research is not required but the R&D office should be notified of the study. Guidance should be sought from the R&D office where necessary.

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The documents reviewed and approved at the meeting were:

<table>
<thead>
<tr>
<th>Document</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covering Letter</td>
<td>1.0</td>
<td>26 April 2010</td>
</tr>
<tr>
<td>REC application</td>
<td>1.0</td>
<td>25 May 2010</td>
</tr>
<tr>
<td>Protocol</td>
<td>2</td>
<td>06 May 2010</td>
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<tr>
<td>Investigator CV</td>
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<td>14 May 2010</td>
</tr>
<tr>
<td>Participant Information Sheet: Staff Interview</td>
<td>3</td>
<td>10 May 2010</td>
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<tr>
<td>Participant Information Sheet: Staff Observation</td>
<td>1</td>
<td>24 May 2010</td>
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<tr>
<td>Participant Consent Form: Staff Interview</td>
<td>2</td>
<td>20 May 2010</td>
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<tr>
<td>Participant Consent Form: Staff Observation</td>
<td>1</td>
<td>24 May 2010</td>
</tr>
<tr>
<td>Letter of invitation to participant</td>
<td>1</td>
<td>26 April 2010</td>
</tr>
<tr>
<td>Letter from Sponsor</td>
<td>1.0</td>
<td>26 May 2010</td>
</tr>
<tr>
<td>Academic Supervisor: Susan Elizabeth Dopson</td>
<td>1.0</td>
<td>26 May 2010</td>
</tr>
<tr>
<td>Interview Schedules/Topic Guides</td>
<td>1</td>
<td>24 May 2010</td>
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Membership of the Proportionate Review Sub-Committee

The members of the Sub-Committee who were present at the meeting are listed on the attached sheet.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

This Research Ethics Committee is an advisory committee to London Strategic Health Authority
• Notifying substantial amendments
• Adding new sites and investigators
• Progress and safety reports
• Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

10/H0808/88 Please quote this number on all correspondence

With the Committee’s best wishes for the success of this project

Yours sincerely

[Signature]
Dr Mike Philpot
Chair

Email: samantha.roper@gstt.nhs.uk

Enclosures:

List of names and professions of members who were present at the meeting and those who submitted written comments

"After ethical review – guidance for researchers"

Copy to:

Academic Supervisor
Professor Sue DOPSON
University of Oxford
Said Business School
1 Park End Street
Oxford OX1 1HP

Sponsor / R&D
Ms Heather House
Clinical Trials & Research Governance
John Radcliffe Hospital
Manor House
Headington
Oxford OX3 9DU
South East London REC 3

Attendance at PRS Sub-Committee of the REC meeting on 09 June 2010

Committee Members:

<table>
<thead>
<tr>
<th>Name</th>
<th>Profession</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor Rebecca Cassidy</td>
<td>Senior Lecturer</td>
<td>Yes</td>
</tr>
<tr>
<td>Dr Nora Donaldson</td>
<td>Head of Clinical Research Statistics</td>
<td>Yes</td>
</tr>
<tr>
<td>Mr John Fowler</td>
<td>Lay Member</td>
<td>Yes</td>
</tr>
<tr>
<td>Dr Mike Philpot</td>
<td>Consultant Old Age Psychiatrist</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Also in attendance:

<table>
<thead>
<tr>
<th>Name</th>
<th>Position (or reason for attending)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms Samantha Roper</td>
<td>Proportionate Review Service Coordinator</td>
</tr>
</tbody>
</table>
CONSENT FORM – Participant Interview
Analysis of telestroke implementation and adoption at the network level
Chief Investigator: Lena Mass (University of Oxford)

Please initial box

1. I confirm that I have read and understood the participant information sheet dated 10 May 2010 (version 3) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights or employment status being affected.

3. If applicable, I agree to the interview being audio recorded.

4. I understand that findings from this study will be presented at conferences and published as research reports and journal articles and may include non-attributable verbatim quotes.

5. I understand that non-attributable audio clips (if applicable) may be used for presentation at academic conferences and seminars.

6. I understand that data collected during the study may be looked at by authorized individuals from the University of Oxford where it is relevant to my taking part in this research. I permit these individuals access to my research records.

7. I agree to take part in the above study.

Name of participant (BLOCK CAPITALS)

Signed

Date

Name of researcher/person taking consent (BLOCK CAPITALS)

Signed

Date
Annexe 3: Project information sheet

PROJECT INFORMATION SHEET
– Participant Interviews –
Analysis of telestroke implementation and adoption at the network level
Chief Investigator: Lena Mass (University of Oxford)

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?
In the modern NHS it has become increasingly common for individuals and organisations to collaborate in the form of networks; including social, professional and organisational networks. Numerous healthcare and medical innovations, such as health information technology, cause changes in the way healthcare services are delivered. These change processes involve many stakeholders, organisations and networks in shaping the innovation, while unfolding in a complex health system. The nature of emergent healthcare and medical innovations requires a research approach that supports understanding how processes work and allows several levels of analysis (e.g. individual, organisation, and network levels). The purpose of this study is to understand the way in which multiple organisations that form a large network (inter-organisational network) interact together using telemedicine equipment and further develop as an overall larger whole network; a process that is significant for identifying and evaluating inter-organisational network outcomes (e.g. innovation, learning, health outcomes). The goal of the research is to bear to light improved ways to manage innovation within large inter-organisational networks. This study is being undertaken for educational purposes, as part of my DPhil in Management Research focusing on emergent medical technologies.

Who is organising and sponsoring the study?
Your hospital/trust has agreed to take part in an independent research programme being carried out by a DPhil Candidate from the University of Oxford. The work is being sponsored by the University of Oxford.

Why have I been chosen?
The research is being carried out in one clinical field within two hospital trusts across England. The local collaborator has been asked by the researcher to select a representative cross section of staff from departments in these areas.

Do I have to take part?
No. It is up to you to decide whether or not to take part. If you do, you will be given this information sheet to keep and be asked to sign a consent form. You are still free to
withdraw at any time and without giving a reason. Whether you decide to take part or not, you are assured that your current employment conditions will not be affected in any way.

What will happen if I take part?
You will be asked to take part in an interview conducted by the Chief Investigator. The interview will last no longer than 30-45 minutes and will be carried out in a quiet room on a strictly confidential basis. There will be no need for any preparation on your behalf: it is a chance for an informal discussion about your experience of the telemedicine/telestroke implementation project. There are no right or wrong answers. The interview will be audio-recorded (if you consent) and notes taken by the researcher to help later analysis. You are able to request a copy of the transcript from the researcher free of charge until August 2011 when the project finishes. Please use the contact details at the end of this sheet.

What are the possible benefits of taking part?
You will have the opportunity to express your views in confidence about aspects of the telestroke implementation and adoption process, as well as your perspective on social and professional networks in healthcare. Your opinions are very important to the future development of emergent medical technology dissemination at the whole network level. The research results will be made available to your trust management and published in academic journals, which will include implications for managers and policymakers.

What are the possible disadvantages of taking part?
We do not anticipate that there are any disadvantages or risks to taking part. Please be assured that any views expressed during the interview will not affect your employment status or career progression. However, if you have any concerns about any aspect of the way you have been approached or treated during the course of this study, you should contact Professor Sue Dopson at the University of Oxford (see below for contact details).

Will my part in this study be kept confidential?
Yes. All information which is collected about you during the course of this research will be kept strictly confidential. The Chief Investigator named on this information sheet will have primary access to your consent form, which will be the only place where your real name will be stored. Audio recordings and computer records will be labelled with a code number. Direct text quotations may be used in any subsequent reports and presentations. Short audio clips may also be used at academic conferences and seminars. No direct quotations used, either text or audio, will ever be made attributable to a particular individual. Confidentiality will be ensured at all times in accordance with the Data Protection Act 1998. Some parts of the data collected for the study may be looked at by authorized persons from the University of Oxford to check that consent was taken appropriately and the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and nothing that could reveal your identity will be disclosed outside the context of this study.

What will happen if I don’t want to carry on with the study?
Participation is voluntary and you are free to withdraw from the study at any point even after you have signed the consent form. If you decide to withdraw then any audio recording, transcript and notes will be destroyed.
What if something goes wrong?
Given the nature of this study, it is highly unlikely that you will suffer harm by taking part. However, the University of Oxford has arrangements in place to provide for harm arising from participation in the study for which the University is the Research Sponsor.

What will happen to the results of this study?
All data collected during this study will remain confidential. The Chief Investigator will conduct analyses on the data and incorporate them in anonymized form in publishable journal articles. No data provided will be disseminated to the trust or hospital by which you are employed.

Who has reviewed the study?
This study has been granted ethical approval for conduct in the NHS by the University of Oxford Clinical Trials and Research Governance Department. This study has been reviewed by the South East London Research Ethics Committee 3 Proportionate Review Sub-Committee. Your Trust’s Research and Development Department has also given its approval.

Contact details for further information

Lena Mass
University of Oxford
Said Business School
Park End Street
Oxford
OX1 1HP
Phone: +44 (0) 7957 171220
Email: lena.mass@sbs.ox.ac.uk

Professor Sue Dopson
University of Oxford
Said Business School
Park End Street
Oxford
OX1 1HP
Phone: +44 (0) 1865 288800

Thank you for taking time to read this participant information sheet
Annexe 4: Interview schedule guideline questions

INTERVIEW SCHEDULE
Guideline Questions
Analysis of telestroke implementation and adoption at the network level
Chief Investigator: Lena Mass (University of Oxford)

The modules in this interview schedule are ordered more or less in the order of a typical interview; however, modules are suggestive rather than obligatory. Wherever possible the questions have been worded with ethic, gender and other sensitivities in mind and the wording is somewhat generic so as to be modifiable for the relevant staff member’s expertise and specialisation.

Read out the following:
The purpose of this study is to understand the way in which multiple organisations that form a large network (inter-organisational network) interact together using telemedicine equipment and further develop as an overall larger whole network; a process that is significant for identifying and evaluating inter-organisational network outcomes (e.g. innovation, learning, health outcomes). The goal of the research is to bear to light improved ways to manage innovation within large inter-organisational networks. I am conducting this study for educational purposes as part of my DPhil in Management Research focusing on emergent medical technologies. The primary goal of this study is to gain a greater understanding of the implementation and adoption process of emergent telemedicine technologies at the whole network level; including network outcomes. Would you mind answering a few questions on your experience in the network and associated use with the telestroke implementation project? (If they decline, discontinue the interview and thank them.)

Your answers will be treated with confidentiality for the purpose of evaluating the telestroke project. All information which is collected about you during the course of this research will be kept strictly confidential. The Chief Investigator named on this information sheet will have primary access to your consent form, which will be the only place where your real name will be stored. Audio recordings and computer records will be labelled with a code number. Would you be agreeable to that?

How would it be best to contact you later on?

Record Interview Reference Number on Participant’s Consent Form.

INTERVIEW REFERENCE NUMBER:
Demographics

1. What is your exact job title?
2. How long have you been employed in this role?
3. How long have you worked in the NHS overall?
4. What would you say is your primary specialisation in the context of your work role?
5. Do you view your role as occurring within a larger network?
6. Do you think a defined ‘telestroke network’ exists in your sub-region, or is it just an undefined, boundless group of people working on telemedicine?
   a. If so, what is your role in this telestroke network?
   b. Would you describe the telestroke sub-regional network as integrated or fragmented?
   c. Do you feel your sub-region’s telestroke network has a sense of legitimacy within the wider regional network?
7. Would you say your organisation’s place in the overall telestroke network is centrally or peripherally located in the overall inter-organisational whole telestroke network?

Technology Implementation and Adoption

8. Do you consider yourself (please select one of the following):
   a. An IT beginner
   b. An intermediate IT user
   c. A fairly experienced IT user
   d. A very experienced IT user
9. Do you consider yourself (please select one of the following):
   a. An early adopter of new technology. I always have to have the latest equipment.
   b. An intermediate adopter of new technology
   c. A late adopter of new technology
   d. Avoid new technologies for as long as possible
10. What types of things usually prompt you to adopt new technology? For example, word-of-mouth from colleagues and friends, advertisements, special deals/coupons, testing the technology for yourself? Please list them in order of most influential to least influential.
11. What shapes your use of technology once it is in place?
   a. Do you find that you try to tweak the equipment or programme to make it more user-friendly?
12. What role does your organisation’s culture and attitude toward technology influence your use of a new technology?

Telestroke User Experience

13. Do you think there is value in introducing telemedicine equipment for stroke into the hospital?
   a. If so, could you please describe the added value of this technology/equipment.
14. Could you give me an illustration of the difference it has meant to you personally to have telestroke equipment available here in the hospital? (If subjects need further prompting, try
15. How did you come to adopt telemedicine equipment? Was it expected by your supervisor, were you incentivised to use it, etc.?

16. In what capacity do you use the telestroke equipment? (e.g. to pull up images, to make a diagnosis, to help the doctor who is working remotely)

17. Did you have issues with the new telestroke equipment while it was first being implemented?
   a. What types of problems have you encountered?
   b. What did you do as a result of these issues? Did you contact IT, try to find a solution yourself, or stop using the equipment?

18. Do you think the telestroke equipment has made things in your organisation more efficient? More productive?

19. How do you think patients view the telestroke equipment and process of being treated and diagnosed remotely?

20. To medical staff only: How do you view your own use of the telestroke equipment in treating and/or diagnosing patients?
   a. If you have diagnosed remotely, could you please describe that process and what it meant to you to have that ability?

21. Do you think the telestroke equipment will lead to improved health outcomes?
   a. If so, how? Please elaborate.

22. Are there any ways you feel the telestroke implementation project could be improved going forward?

Performance Measures

23. What types of inter-organisational network outcomes result from the network development process as telestroke equipment is implemented and adopted in your area?

24. Are network outcomes predictable or emergent?
   a. If emergent, what types of network outcomes come to mind?

25. On a scale of 1 to 5, 1 being not important at all and 5 being very important, please tell me the importance of the following as performance measures within your sub-regional telestroke network and describe your views on each:
   a. Innovation
   b. Knowledge management
   c. Learning
   d. Economic activity
   e. Productivity
   f. Rate of technology diffusion (e.g. proliferative)
   g. Quality of product and/or service provision (e.g. improved health outcomes)
   h. Network well-being

26. Would you say there is momentum within your sub-regional telestroke network?

27. How is whole inter-organisational network performance measured in relation to health technology implementation?
Social & Professional Networks

28. Who do you turn to in your social network for information? Please indicate the role these people play in your life (e.g. spouse, sibling).
29. Does your social network affect your work-related decision-making? How?
30. Would you say you play a central role in your social network?
31. How does your social network influence your use of new technology?
32. How would you describe knowledge transfer in your social network? How does it occur? (e.g. word of mouth, email, meeting discussions, etc.)
33. Who do you turn to in your professional network for information? Please indicate the role/title of these individuals.
34. How regularly do you communicate with these individuals?
35. What methods of communication do you use most frequently to interact?
36. Does your professional network affect your daily work-related decision-making? How?
37. Would you say you play a central role in your professional network?
38. How does your professional network influence your use of new technology?
39. How would you describe knowledge transfer in your professional network? How does it occur? (e.g. word of mouth, email, meeting discussions, etc.)
40. Could you please share your views on the following as each topic relates to your sub-regional telestroke network and your work role:
   a. Network integration or fragmentation
   b. Resources available
   c. Culture
   d. Trust
   e. Adaptive capacity (ability to adapt to a changing environment or conditions)
   f. Incentivisation
   g. Governance
   h. External control
   i. Stability (turbulence ie. adverse change: conflict or competition)

Leadership

41. What role do medical professional leaders play in coordinating knowledge and learning throughout the development process in your sub-regional telestroke network?
42. Is leadership in your organisation more centrally run and hierarchical, or do multiple interdisciplinary individuals play a leadership role that affects organisational performance?
   a. What do you think about collective or shared leadership?
      i. Does it exist in your organisation or network?
      ii. Could interdisciplinary teams of professionals collaborate as leaders to promote improved performance?
      iii. Is there a place for collective leadership in the NHS?
43. Is leadership in your sub-regional telestroke network more centrally run and hierarchical or do multiple interdisciplinary individuals play a leadership role that affects network performance?
44. Who ultimately has the most influential leadership role in your organisation? In your social network? In your professional network? In the larger sub-regional telestroke network? (Please state the individual’s role or title)
45. How important do you think the hybrid ‘doctor-manager’ role is in leadership in your organisation and telestroke network?
46. To medical staff only: As a doctor, how does your professional network impact your role as a leader? OR As a nurse, how does your professional network impact your role as a leader?

47. Does your organisation’s performance contribute to and potentially result in network effectiveness?
   a. What does network effectiveness mean to you (e.g. definition)?

48. Do you think a network can be optimised?
   a. If so, how? What does that mean to you?

49. What type of external control is exerted on your organisation? On your larger sub-regional telestroke network? What individual/body/organisation exerts this control?
   a. How does this affect the culture within your organisation?
   b. How does this affect the trust among organisational within your wider telestroke network?

Emergent questions:
  50. 
  51. 
  52. 
  53. 
  54. 

Thank you very much for taking the time to answer my questions.

(Double check their Interview Reference Number on the first page and ensure it corresponds to that recorded on their Participant Consent Form)
Annexe 5: Coding list

1. Networks
   1.1. Levels
      1.1.1. Whole network level
      1.1.2. Organisational level
      1.1.3. Professional level
      1.1.4. Social level
      1.1.5. Individual level
      1.1.6. Construction
      1.1.7. Deconstruction
   1.2. Type
      1.2.1. Hierarchical
      1.2.2. Quasi-hierarchical
      1.2.3. Mandated
      1.2.4. Emergent
   1.3. Proximity
      1.3.1. Spatial
      1.3.2. Social

2. Decision-making
   2.1. Influence
   2.2. Frames
      2.2.1. Cognitive
      2.2.2. Mental models
      2.2.3. Repertoires
   2.3. Framing processes
      2.3.1. Formulation
      2.3.2. Propagation
      2.3.3. Discourse
         2.3.3.1. Discussion
         2.3.3.2. Debate
         2.3.3.3. Negotiation
         2.3.3.4. Coalitional struggle
         2.3.3.5. Social capital dynamics
         2.3.3.6. Consensus building
         2.3.3.7. Dominant frame development
   2.4. Framing results
      2.4.1. Key decision reached
      2.4.2. Shaped actions
      2.4.3. Shaped practices

3. Knowledge
   3.1. Type
      3.1.1. Specialist
         3.1.1.1. Medical
         3.1.1.2. Managerial
         3.1.1.3. Technical
         3.1.1.4. Hybrid
      3.1.2. Organisational
      3.1.3. Interorganisational
   3.2. Distributed
      3.2.1. Expertise distribution
      3.2.2. Unawareness distribution
   3.3. Collective
   3.4. Knowledge transfer
3.4.1. Exchange
3.4.2. Actual knowledge
3.4.3. Previous knowledge

4. Boundaries
4.1. Interorganisational (structural)
4.2. Organisational (structural)
4.3. Professional (structural)
4.4. Knowledge boundaries
   4.4.1. Professional
      4.4.1.1. Institutionalised standards
      4.4.1.2. Integrated
   4.4.2. Epistemic/Social-epistemic boundaries
   4.4.3. Language boundaries

4.5. Jurisdictional power
4.6. Boundary-spanning

5. Contexts
5.1. External
   5.1.1. Uncertainties
   5.1.2. Changes
   5.1.3. Turbulence
   5.1.4. Complexity
5.2. Internal
   5.2.1. Uncertainties
   5.2.2. Stressors
   5.2.3. Changes
   5.2.4. Turbulence
   5.2.5. Complexity
   5.2.6. Information systems
   5.2.7. Economic conditions
   5.2.8. Policy conditions
   5.2.9. Power dynamics

6. Temporality
7. Technology
7.1. Adoption
   7.1.1. Strategy
   7.1.2. Facilitation
7.2. Implementation
   7.2.1. Facilitation
   7.2.2. Operational
7.3. Execution
   7.3.1. Usability
   7.3.2. User factors
   7.3.3. Facilitation

8. Leadership
8.1. Bureaucratic
   8.1.1. Mandated
   8.1.2. Formal
8.2. Distributive
8.3. Collective
8.4. Informal
8.5. Facilitative
8.6. Influencing
8.7. Collaborative
8.8. Competitive
8.9. Specialisms
8.9.1. Medical  
8.9.2. Managerial  
8.9.3. Technical  
8.9.4. Hybrid  

8.10. Roles  
8.10.1. Emergence  
8.10.2. Submergence  
8.10.3. Focal  
8.10.4. Non-focal  

8.11. Coproduction  
8.11.1. Reciprocal fields  

8.12. Complexity  

9. Social capital dynamics  
9.1. Usage  
9.2. Capacity building
Annexe 6: Stroke clinical pathway utilising telestroke equipment

Patient suffers stroke at home

Ambulance transportation to hospital A&E

Arrives at A&E Ambulance bay: received by A&E physicians and nurses

Patient history taken by physician and nurses on site after-hours

Consultant on-call is contacted/paged at home and logs-in to laptop for connection to telestroke cart and PACS imaging

Patient taken to Radiology Department for CT scan

CT results uploaded to PACS in hospital. Remote Consultant accesses scans from home laptop via PACS

Remote Consultant assesses patient using camera & audio on the telestroke cart by controlling it remotely; focusing on patient functionality

Remote Consultant diagnoses patient and directs on-site staff whether or not to administer thrombolysis in A&E Department

Following administration of thrombolytic treatment, patient is transferred to the Stroke Unit, where on-site staff oversee patient
Annexe 7: Chapter 4 data tables

Annexe 7 – Table 1. Clinicians’ concerns regarding telestroke expressed during supplier presentations/demonstrations

<table>
<thead>
<tr>
<th>Respondent, Organisation</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>David, Clinical Lead for Stroke</td>
<td>We know Supplier A can do this [implement telestroke] and has done it all over Germany in the clinical setting. I’m comfortable proceeding with them.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 1, network hospital</td>
<td>I want the mobility and ability to get around, not be locked to a workstation.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 2, network hospital</td>
<td>We are looking for maximum flexibility.</td>
</tr>
<tr>
<td>Neurologist, network hospital</td>
<td>We’re remotely going to diagnose a serious patient problem and have to absolutely ensure quality of service.</td>
</tr>
</tbody>
</table>

Annexe 7 – Table 2. IT professionals’ views of telestroke

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director of Hospital Information Systems, network academic medical centre</td>
<td>Telemedicine is about enabling a clinician to work remotely; providing specialist advice remotely. They need a team that is embedded and dedicated. …Right now the multi-organisational components of this are not agreed across the organisations. It will be a success when it’s integrated across the wider network. Right now it’s not there. …Most of the issues come down to the human factor, since technology issues are easily surmountable. Getting people to use it and trust each other to get telemedicine to work will be the challenge.</td>
</tr>
<tr>
<td>Director of IT, network hospital</td>
<td>It [telestroke implementation] all depends on the quality of people and their willingness to work together. Very few people are working across boundaries to understand pathways.</td>
</tr>
<tr>
<td>IT Manager, network hospital</td>
<td>The tech doesn’t change in essence, it just gets updated. What has gotten better is communication (e.g. talking into a TV screen). It’s a cultural thing to get over. The [technological] artefact as an institution doesn’t change over time, but rather it’s the process that has changed.</td>
</tr>
<tr>
<td>IT representative, network hospital</td>
<td>Everything works in silos. It needs to be integrated. Technically it’s a no brainer to get things connected.</td>
</tr>
<tr>
<td>Director of IT, SHA, stroke network</td>
<td>So none of this is rocket science, it’s just conferencing stuff with a few bells and whistles added on. With the prime supplier that we [IT] had indicated a preference to, there was some resistance [from clinicians] because they couldn't prove that they had the technology working in the NHS.</td>
</tr>
<tr>
<td>NHS National Improvement Lead for Stroke</td>
<td>It’s rarely about the technology. It’s usually about other factors and issues that come up as far as adoption and implementation.</td>
</tr>
</tbody>
</table>
### Annexe 7 – Table 3. Medical professionals’ comments on informal networking

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist Stroke Consultant 1, network district hospital</td>
<td>I use both [social and professional networks] equally. ...The corridor discussions are about here is my situation, this is what worked best for us, ‘what do you make of this?’ Sometimes it’s e-mails between small groups, telephone calls, people you trained with who you are on friendly terms with. ...Big network meetings can be useful. They let you connect...Some people are reticent to speak up at meetings, so it’s easier to have informal discussions later. That goes on a lot and big plans come from those informal meetings.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 2, network hospital</td>
<td>I come to these meetings having talked to my local colleagues who couldn’t attend to make sure I know their views before speaking up here. This ensures we’re all on the same page.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 3, network hospital</td>
<td>I tend to stick around after the clinical network meetings to talk to the other docs and hear what they thought, especially those that have a similar set-up to my stroke unit.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 4, network hospital</td>
<td>Discussions in the hall with more senior Consultants who have been doing this for awhile are helpful.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 5, network district hospital</td>
<td>I talk to my colleagues working on stroke in other regions to learn what approaches they are taking locally. It helps put things into perspective and acts like a benchmark.</td>
</tr>
</tbody>
</table>

### Annexe 7 – Table 4. Clinicians’ preferences for telestroke suppliers in the clinical context

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>David, Clinical Stroke Lead</td>
<td>Supplier A didn’t demonstrate they could use the solution clinically. They’re using it elsewhere, but not within clinical processes. They are unproven [clinically] and using kit that has been adapted and didn’t give me comfort that I could get from Supplier B, and yet Supplier B doesn’t give me the comfort that they’ll give us the personal touch, since they’re so large.</td>
</tr>
<tr>
<td>Stroke Consultant 1, network hospital</td>
<td>I want to see it [telestroke] operating in a clinical environment.</td>
</tr>
<tr>
<td>Stroke Consultant 2, network hospital</td>
<td>Both suppliers have the technology, they’ve demonstrated it works, but I’m leaning toward Supplier B because their equipment is working in numerous hospitals already. My colleague has used it at one of their sites.</td>
</tr>
<tr>
<td>Stroke Consultant 3, network hospital</td>
<td>I know all these suppliers have quality technology, but it’s more important that our preferred supplier has shown successful use in clinical pathways.</td>
</tr>
<tr>
<td>Neurologist, network hospital</td>
<td>I spent some time in Germany during my fellowship, and saw Supplier B’s products in use. They’re highly regarded.</td>
</tr>
</tbody>
</table>

### Annexe 7 – Table 5. Network member reactions to the effects of national healthcare reforms

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Manager, Cardiovascular Network, SHA</td>
<td>I don’t have enough information at this stage to know what will come next for me, but it’s clear that government is determined to abolish SHAs. I will need to deal with my own career prospects when confronted with the issue, but more pressingly I now have to manage the concerns, frustrations, and motivations of those I work with regularly within the SHA and the [cardiovascular] network.</td>
</tr>
<tr>
<td>David, Clinical Stroke Lead</td>
<td>We’re unsure how this is going to affect the longevity of the [stroke] network right now. This couldn’t have happened at a worse time given what we are in the middle of doing within the network.</td>
</tr>
<tr>
<td>Programme Lead ICT, NHS Directorate of Informatics</td>
<td>My role is around overseeing several different, major projects involving IT; trying to get trusts to collaborate on the services they intend to procure. It’s about networks, services, covering boundaries. Now that the NHS is taking that level [SHA] away, my role will transition into something else. In two years’ time the responsibility will trickle down to GPs.</td>
</tr>
<tr>
<td>National Improvement Lead for Stroke</td>
<td>It’s unlikely we’ll disband the [cardiovascular] network, since it’s more or less devolved from the SHA. Funding will be another issue that we will discuss with the DoH.</td>
</tr>
</tbody>
</table>
### Annexe 7 – Table 6. Clinicians’ views on telestroke utilisation

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist Stroke Consultant 1, network hospital</td>
<td>We see telemedicine as means to an end, and we’re going to have to learn during that process. It’s quite daunting to do remote consult because you are away from the patient; not confident from seeing the CT scan alone to thrombolyse patients.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 2, network hospital</td>
<td>It’s about the quality of service providers Consultants are working with either at their main site or at other sites they are relying upon during the clinical pathway process. Confidence in your medical professional colleagues during this process is crucial!</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 3, network hospital</td>
<td>There are concerns about working with staff I don’t know at another site.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 4, network hospital</td>
<td>The telemedicine gives us the back-up tool to be able to see the patients and to record findings; making a quicker diagnosis.</td>
</tr>
<tr>
<td>Neurologist, network hospital</td>
<td>Human trust is the critical thing. It’s [telemedicine] a useful thing. It’s very good in terms of the technology. …It may be difficult because personal interactions cannot be substituted by technology. But if … I think that some of my colleagues will find it far more comfortable to make decisions if they see the patients themselves via the telemedicine equipment.</td>
</tr>
<tr>
<td>Specialist Stroke Consultant 5, network district hospital</td>
<td>It’s much more difficult if one deals with different hospitals, different trusts.</td>
</tr>
</tbody>
</table>

### Annexe 7 – Table 7. Dominant emergent themes from stroke specification pro-forma evaluations: clinical leadership and processes

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissioner and clinician 1</td>
<td>For me it’s about how serious they are about the issues. They should be saying ‘I want to use this process.’ If they want to be an acute or hyper-acute unit, there are certain measures and processes they must put in place.</td>
</tr>
<tr>
<td>Commissioner and former clinician</td>
<td>They need to provide pathway details.</td>
</tr>
<tr>
<td>Cardiovascular Network Manager</td>
<td>It seems obvious there is no clinical buy-in, which is absolutely detrimental for provision of such an important clinical service.</td>
</tr>
<tr>
<td>Commissioner and clinician 2</td>
<td>Need more about pathways, evidence, track-record of straight care, collaboration, passion and commitment for those patients.</td>
</tr>
<tr>
<td>Commissioner 1</td>
<td>Currently there’s no system in place to deal with patients who need thrombolysis.</td>
</tr>
<tr>
<td>Commissioner 2</td>
<td>There’s no real leadership from the [stroke] Consultants for this.</td>
</tr>
</tbody>
</table>
Annexe 8: Network participants’ views on uncertainty and turbulence in the network

And it’s [NHS stroke strategy] evolving very fast…maybe there are people somewhere who see a clear path of where it’s going to go. I really don’t have a clear view of where it’s going to go. I think there’s going to be a lot of start-up projects…a lot of initiatives and a lot of ideas, and I think a lot of it will start-up and fall, and start-up and fall. I’m optimistic that eventually we will find a system that works…or I actually suspect we will go back to something we’ve done before, but the goalposts are moving all the time.
(Specialist Stroke Consultant, Hospital)

The stroke specialist raised the issue of reversion to prior decisions, which suggested the network was susceptible to inertia. In addition to network inertia and evolving targets, the Project Lead at a network hospital indicated time constraints presented challenges and further ambiguity within the interorganisational network.

The network has been put in quite a difficult place. There’s been a turnover of management, and the network has been trying to drive through some of the stuff at a very short timescale and not everybody has always been able to respond to that.
(Project Lead for Medicine, stroke network hospital)
Annexe 9: Chapter 5 data tables

### Annexe 9 – Table 1: Discussion with Clinical Lead for Stroke (David) regarding the decision to pursue telestroke: telestroke frame of reference

<table>
<thead>
<tr>
<th>Interview Participant</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Investigator</td>
<td>What role does stroke telemedicine have within the network? What is the status?</td>
</tr>
<tr>
<td>David</td>
<td>The role of the telemedicine process of developing a technological specification that will go out to tender is underway by the SHA. Actually getting equipment will take some time. All IT people from across all trusts involved have met. We’ve hosted a London site-visit with mainly IT people. Need to understand how it will change service we deliver. (1) Introspective use of telemedicine within a site (2) smaller network view of key stroke services facilitated by telemedicine. Graham will be using telemedicine out of hours to provide the service. We all need to work out how telemedicine will work.</td>
</tr>
<tr>
<td>Study Investigator</td>
<td>What was the motivation for adopting stroke telemedicine?</td>
</tr>
<tr>
<td>David</td>
<td>The main driver is that many hospitals have a small number of stroke clinicians; according to the DH stroke must be managed by stroke specialists; limited resources available across regions within hospitals, particularly within my hospital. There are numerous resource constraints. There are two different models of stroke care are possible: hub and spoke, and distance assessment. …In January 2008, I met with my stroke network/regional group to discuss the role of telemedicine take-up and determined it was the way to go. Over time thrombolysis has spread, other MDs can do it (administer it). Smaller hospitals can develop systems internally. Here[at my hospital] we are training acute MDs and geriatricians so we’re not reliant on stroke specialists [alone].</td>
</tr>
<tr>
<td>Study Investigator</td>
<td>What is the goal of telemedicine?</td>
</tr>
<tr>
<td>David</td>
<td>When the doctor is outside the hospital – at home – in a time-critical case, the patient gets medication faster by using telemedicine. There are efficiency gains. There is the provision of medical expertise at a distance to ensure diagnosis in time sensitive cases.</td>
</tr>
<tr>
<td>Study Investigator</td>
<td>How will it be approached within the network?</td>
</tr>
<tr>
<td>David</td>
<td>We need a similar system agreed across the network. Local solutions within the individual trusts. Telemedicine utilisation across the network would assist other specialists – neurologists, radiologists, or even surgical solutions. Rapid assessment within our own hospital and inter-hospital assessments to be done as well in the future. Thrombolysis given without stroke experts – we currently have in place a telephone local network. Support across the network – stroke expert via phone is the current model, pre-telemedicine model.</td>
</tr>
<tr>
<td>Study Investigator</td>
<td>How do you promote knowledge sharing within the network?</td>
</tr>
<tr>
<td>David</td>
<td>We want to create an inter-hospital MDT setting to hold post-case discussions and scans to share in learning; so busier hospitals can share with less busy hospitals. Higher stroke and thrombolysis case load hospitals share with lower case load hospitals. Also, I always suggest reading research on a systematic review of stroke care.</td>
</tr>
<tr>
<td>Network level</td>
<td>Source</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Professional network level</td>
<td>Stroke Specialist 1</td>
</tr>
<tr>
<td>Professional network level</td>
<td>Stroke Specialist 4</td>
</tr>
<tr>
<td>Professional network level</td>
<td>Stroke Specialist 5</td>
</tr>
<tr>
<td>Organisational level</td>
<td>Stroke Specialist 2</td>
</tr>
</tbody>
</table>
| Interorganisational network level | Stroke Specialist 3     | Now within the network the ability to get information to people fairly quickly and to get opinion from other people, but also to discuss the strategy and to discuss national and local agendas quickly means that some of the burden is shared. Now in terms of the network I think some of the national strategies have been difficult for us to get our head round and so by having the people like Joanna and David at some of these meetings, they help us to delineate the things that we should be measuring and they help us to identify the areas that others are moving ahead of us and the areas where we need help with etc. So in terms of the usefulness of the network, that is fantastic, that has been really, really fantastic. Where our commissioners have been
slow to react to our demands for certain services, they’ve said well actually if you take this to the commissioners and say this is the national target then they have to commission these services. So by them giving us direction in terms of being available to help us formulate plans to influence commissioners and making sure we get some things done more easily than we would have done by ourselves.

<table>
<thead>
<tr>
<th>Interorganisational network level</th>
<th>Stroke Specialist 6</th>
<th>It’s comparing what targets I’m setting myself and what they’re setting themselves. It’s seeing what we’re doing as an organisation and taking it and comparing it with organisations that I see as similar size and sharing the difficulties and sharing your little successes and getting ideas about what to do differently and where to make improvements and getting ideas about which of the targets are easy to meet, which of the targets are achievable locally. I find the big [stroke network] meetings useful. I find that a getting a clear idea of where we’re going as a region and the wider stroke network is helpful. I find that by doing your bit within your patch, and comparing that with other people and organisations, and trying to find where the collaborations can take place, it helps you to deliver what you set out to deliver.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interorganisational network level</td>
<td>Stroke Specialist 7</td>
<td>It’s comparing what targets I’m setting myself and what they’re setting themselves. It’s seeing what we’re doing as an organisation and taking it and comparing it with organisations that I see as similar size and sharing the difficulties and sharing your little successes and getting ideas about what to do differently and where to make improvements and getting ideas about which of the targets are easy to meet, which of the targets are achievable locally. I find the big [stroke network] meetings useful. I find that a getting a clear idea of where we’re going as a region and the wider stroke network is helpful. I find that by doing your bit within your patch, and comparing that with other people and organisations, and trying to find where the collaborations can take place, it helps you to deliver what you set out to deliver.</td>
</tr>
<tr>
<td>Interorganisational network level</td>
<td>Stroke Specialist 8</td>
<td>I find the big [stroke network] meetings useful. I find that a getting a clear idea of where we’re going as a region and the wider stroke network is helpful. I find that by doing your bit within your patch, and comparing that with other people and organisations, and trying to find where the collaborations can take place, it helps you to deliver what you set out to deliver.</td>
</tr>
</tbody>
</table>