Increasingly demanding and knowledgeable clients in construction require an approach to project management that recognises both the important role played by the client in the definition of a project and the lack of certainty that large and/or complex projects present.

Having identified the importance of managing relationships, both analysts and practitioners today need a sophisticated framework and methodology for observing systems and managing the complex relationships in major construction project coalitions. Social Network Analysis in Construction shows how social network analysis (SNA) can be used to observe, monitor and analyse systems and relationships. Although this has been an established analytical technique in the US for some time, it is only now being developed in the UK.

Stephen Pryke spent nearly two decades investigating major project relationships using SNA and brings together here mathematical and sociological methods, and major project relationships in a manner that will inspire both academic interest and a desire to apply these concepts and techniques to live construction projects. Case studies include projects from two of the UK’s largest property developers – the UK Ministry of Defence, and a County Council.

SNA is innovative – but potentially inaccessible to project management analysts and practitioners. The author provides clear and relevant explanation and illustration of the possibilities of using SNA in a major project environment. In addition to offering the potential for sophisticated retrospective analysis of a wide range of systems associated with construction and engineering project coalitions, he also looks at how we might apply the network analysis findings to the design and management of project and supply chain networks.

Postgraduate students and academic researchers in Project Management and Construction Management, as well as practitioners from professional consultancies and project management companies will find here an excellent exposition of an often inaccessible subject.

The author
Dr Stephen Pryke is a Senior Lecturer in Project Management at The Bartlett School, University College London and Director of Studies for the MSc Project and Enterprise Management programme there. He has published a number of books and papers in leading research journals dealing with supply chain management, social network analysis and the legal aspects of procurement reforms in the UK. His work has been presented to a number of international research conferences and his work on procurement and project management systems in France and China has been published by the RICS. He has provided project management training and consultancy to a number of major European companies and is a consultant to Durland Consulting in Chicago, USA. Prior to entering academia in the mid 1990s, he ran his own consultancy and held a number of senior project management positions in both the public and private sectors within the UK.

Other books of interest:
The Management of Complex Projects: A Relationship Approach
Edited by Pryke & Smyth 978 1 4051 2431 7

Collaborative Relationships in Construction: Developing Frameworks and Networks
Edited by Smyth & Pryke 978 1 4051 8041 2

Managing Construction Projects second edition
Winch 978 1 4051 8457 1

Advanced Research Methods in the Built Environment
Knight & Ruddock 978 1 4051 6110 7

Stephen Pryke

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Social Network Analysis in Construction
This book is dedicated to

Stanley Pryke whose enquiring mind and determined spirit influenced the course of my life in so many ways.
Social Network Analysis in Construction

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Dr Stephen Pryke is a Senior Lecturer in Project Management at The Bartlett School, University College London. He is the Director of Studies for the MSc Project and Enterprise Management programme. He has recently published three texts for Wiley-Blackwell: *The Management of Complex Projects: A Relationship Approach* (with Smyth), *Collaborative Relationships in Construction* (with Smyth) and *Construction Supply Chain Management*. He is a series editor of the RICS/Wiley-Blackwell series on innovation in construction, and he contributed to *Advanced Research Methods in the Built Environment* (Knight and Ruddock, 2008) and *Managing the Professional Practice: In the Built Environment* (edited Smyth, 2011), both also published by Wiley-Blackwell. He has published a number of papers in leading research journals dealing with supply chain management, social network analysis and the legal aspects of procurement reforms in the UK. His work has been presented to a number of international research conferences, and his work on procurement and project management systems in France and China has been published by the RICS. Stephen is a reviewer for *Construction Management and Economics* and the RICS research paper series; he is an APC panel member for the RICS Project Management Faculty. He has provided project management training and consultancy to a number of major European companies. He is a consultant to Durland Consulting in Chicago, USA. Prior to entering academia in the mid 1990s he held a number of senior project management positions in both the public and private sectors within the UK.
Preface

This book responds to, and builds upon, two previous books: *The Management of Complex Projects: A Relationship Approach* and *Collaborative Relationships in Construction*. Focusing on these books convinced me of the need for the approaches to the analysis of the systems involved in the management of projects, and the language used to describe the findings of such analysis, to be radically changed. The subsequent book dealing with supply chains, *Construction Supply Chain Management*, emphasised the inadequacy of current analytical methods in my mind, and increasingly I found myself turning to the idea of networks as a means of representing and understanding the project systems and their effectiveness. Alongside my work on collaborative relationships and supply chain management, I was invited to contribute a book chapter to Andrew Knight and Les Ruddock’s (2008) book *Advanced Research Methods in the Built Environment*. Chapter 5 on social network analysis as a research method contains material included within Chapter 15 of Knight and Ruddock (2008).

Much of our thinking in management and project management terms has been constrained by boundaries imposed by classifications that are artificial and unhelpful. Work packages, project phases, contracts and subcontracts, projects and programmes are all artificial constructs that help us to understand and manage some aspects of our projects but prevent us from analysing and improving systems in other respects. Even the idea of supply chains is problematic; although the chain helps with the economics of value and cost, it really does not present the format of the interfirm and intrafirm relationships that deliver satisfaction. The idea of networks of relationships and the associated social network analysis provides an opportunity to look at a wide range of relationships between individuals and firms in a manner that is free from artificial boundaries. In this way the opportunity to really understand the structure of the systems and their effectiveness is possible.

This book therefore challenges some of the traditional thinking on the distinction between corporate strategic management, project management and programme management. This is because the value delivered to individuals, whether they are end-users or stakeholders of some other type, is the product of value generated by networks of relationships; and these relationships often span organisational and project-related boundaries.

This book is a product of the academic environment in which I have found myself over the last decade or so following two or more decades managing projects for clients in industry. The last decade has been spent in the company of the dedicated and articulate academics comprising the School of Construction and Project Management at University College London. The school, led by Professor Peter Morris, has provided a stimulating and challenging
environment in which to develop new ideas in management related to construction and engineering. The book was written in the aftermath of the world recession commencing in 2008, and perhaps this has also influenced the way in which we are trying to understand the activities of the construction industry and the new terms that we increasingly needed to accurately describe success and failure.

This book is almost certainly incomplete and imperfect; some of the content will be challenged, I am sure, by those with superior knowledge, or differing views, in the areas of social network analysis, governance, procurement and project management and systems. I have brought together aspects of these individually complex subject areas in an attempt to make sense of our projects and their supply chains; and to provide some navigation between, and assimilation of, this eclectic group of material.

I sincerely hope that those of us who have grown up with social networks as part of the way that we manage our social lives will find something new and interesting here; and a means of understanding the use of social networks and their analysis in their research, writing and successful management careers, in construction and hopefully other sectors.

I really hope you enjoy reading this book and that you find something to interest and perhaps inspire you. I have hugely enjoyed the ‘journey’ as well as the final production of this book.

Stephen Pryke
London
September 2011
Acknowledgements

My thanks to each of the organisations that allowed me to gather social network data and to interview their staff in connection with the four case studies presented here. The case studies are presented anonymously but the individuals involved will know who they are. Sincere thanks to Georgia Zagkli for reproducing the figures used in Chapters 2, 7 and 8, using AutoCAD 2010 by Autodesk. Professor Martin Everett at the University of Manchester provided much support in the use of UCINET, the software package that he created with Steve Borgatti, and the most popular SNA software in the world. The idea of using SNA to analyse inter coalition relationships evolved during my PhD studies under the supervision of Professor Graham Winch. I thank Prof. Winch for his inspiration and guidance. I also want to thank The Bartlett School of Construction and Project Management at University College London for effectively sponsoring this book.

Finally, this book would not have happened without the long-term support and encouragement I have been most fortunate to receive from Karen Rubin. Karen convinced me of the pressing need to get the book published, produced Figure 1.1, and helped edit the manuscript prior to submission as well as the proof.

To all these people, thank you.
1 Introduction

Whether you are wanting to make contact with friends through Facebook or business associates through LinkedIn, to share or find entertainment through YouTube or MySpace, or to locate old school friends through Friends Reunited, the exponential, global expansion of the application of social networks has increasingly influenced our lives, largely because of the opportunities provided by the Internet. The idea of networks and some basic social network analysis (SNA) terminology have entered our everyday lives and increasingly inform our understanding of the society in which we live (for example, Easley and Kleinberg, 2010). Yet much of our thinking relating to organisations and projects, particularly those in construction, is not conceptualised in network terms.

This book is essentially about how people form networks for work; it is about how networks are created and modified and what these network configurations mean for the actors and for the projects. In particular I was keen to contribute to the discussion about how we might use networks prescriptively and proactively. Much of the current work of social network analysts is essentially retrospective – accurately analysing past activities, mostly using a cross-sectional or ‘snapshot’ approach.

Social network analysis is a fascinating mixture of mathematics, IT and sociology. My observation is that there is a gap in our knowledge, as far as projects and their analysis have been concerned, which can be dealt with through the exploitation of SNA. The analysis of relationship networks enables us to understand the interdependent and transitory systems that we have been discussing for so long, particularly in complex project environments.

Understanding the construction sector

Value for our construction clients is created through projects and programmes carried out by people working in relationships that are collaborative to some degree or another. Those people are employed by a number of firms located within various tiers in the supply chains established by contractors and increasingly client organisations. Some individuals are project actors in their own right; other individuals need to collaborate with others to command ownership and delivery of a project actor role and to achieve delivery of service in relation to that role. Figure 1.1 shows the relationship
between supply chains and networks and provides the starting point for this book.

Understanding complex interdependent systems in construction requires an understanding of the classification and variety of possible network configurations into which our project actors are connected. We also need an appreciation of the nature of the linkages, along with network environmental effects acting upon the behaviour of individual actors. These influences affect the formation, development and decay of network relationships. Network
structure, and the characteristics of the actors and their position within the structure, are related to the effectiveness of that network to fulfil its function. Let us now turn to a brief review of the construction sector environment within which the proposed network-based analysis of project systems is located.

Context

For most of the nineteenth and twentieth centuries a traditional procurement system prevailed, using consultants to carry out design and financial monitoring and a main contractor which took overall responsibility for production of the building to a design and specification defined by the professional team. Winch (2000) refers to this system as the professional system, the structure and organisation of the industry being dominated and heavily influenced by the professional bodies established by architects (RIBA), engineers (ICE, ISE, CIBSE), quantity surveyors (RICS) and, most recently, contractors (CIOB).

The 1960s brought management contracting to the UK (Winch, 2000) from the USA, and the late 1960s and early 1970s saw the re-emergence of design and build as a significant procurement route in the UK (Masterman, 2002; Franks, 1999). Most importantly, this period of dominance of the professional system, albeit tempered by new initiatives like ‘management contracting’ and ‘design and build’, established the reward and penalty structure for the actors in the British construction industry, in a context of generally adversarial relations (Winch, 2000).

The Latham Report (1994) registered the fact that the construction industry had been very slow to respond to pressure for change in the past and referred to the need for ‘better performance, but with fairness to all . . . [and] teamwork’. The report also recommended that the New Engineering Contract (NEC) form of contract be adopted and that ‘endlessly refining existing conditions of contract [would] not solve adversarial problems’. With hindsight this was a somewhat strange solution to couple with the other, non-contractual, proposals. The recommendations were typical of this type of review and the issues of governance structure and reform implementation are important. In the event the industry did not, apparently, make a policy shift towards the NEC form; the industry did, however, make significant efforts to introduce a less adversarial approach to construction, notably through the extensive introduction of partnering. The terms win–win and later partnering entered the vocabulary of every individual associated with the UK construction industry.

One of the first major client organisations to change its procurement strategies following the publication of the Latham Report was the British Airports Authority (BAA), initially through its subsidiary, London Heathrow Ltd (LHR). BAA launched its Frameworks initiative (BAA, 1997) which constituted a highly structured and well-documented, some might say bureaucratic, approach to partnering.

The incoming Labour government of May 1997 launched the Construction Task Force (CTF) in the face of a slowing pace of implementation within the Construction Industry Board (CIB). The job of the CTF was to implement the
findings of the Latham Report. The report of the CTF, *Rethinking Construction*, was published in July 1998 (Egan Report, 1998). The Egan Report embraced partnering and explored some of the ways in which the industry could reform in a context free from the limitations of competitive bid tendering on a project-by-project basis. Longer-term relationships and the associated financial security provided an environment in which to implement, critically, an important new initiative for the construction industry. This was supply chain management based on the principles of lean thinking, first described in *The Machine that Changed the World* (Womack et al., 1990) and subsequently developed into *Lean Thinking* (Womack and Jones, 1996). *The Machine that Changed the World* influenced the thinking of the BAA project team dealing with the Genesis Terminal Five pilot project. Professor Dan Jones was a member of the Construction Task Force.

The other important new initiative to have flowed from the non-adversarial environment was the reordering of project relationships around *technology clusters* (Gray, 1996). The concept involved the grouping of actors in relation to specific critical interfaces within the production phase of the project. For example, an upper floor cluster leader would be responsible for the design coordination and construction of the concrete suspended slab, the screed above it, and the ductwork and suspended ceiling below it. This concept was first tried on the BAA Genesis project at Heathrow and was an important feature of the Slough case study and the Aldershot project (Chapter 6).

These innovations in project systems, primarily partnering, supply chain management and technology clusters, have since been adopted more generally by other large client organisations. The Defence Estates’ use of these initiatives in a design and build environment is referred to as ‘prime contracting’.

I have referred to these three new initiatives in procurement and management as *governance modifiers* simply because, as things stand at the time of writing, they have been appended to traditional contract conditions. Any agreement relating to any or all three of these modifiers lies outside the contractual governance of projects. Where organisations have sought to formalise these modifiers, the resulting partnering charters and framework agreements lie alongside the main contractual conditions and in some senses are, arguably, in conflict with them. At present the industry is at a crossroads, with relational contracts in one direction and a move away from contractual governance in another direction. Relational contracts are those that seek to define the *nature* of the relationship, rather than the detail of the possible future eventualities which the contract is intended to incorporate (see, for example, Macauley, 2000). The Egan Report (1998) on the other hand proposed that construction might be governed without the use of formal contractual agreements. Egan was, in effect, proposing that maintenance of network position be used as an incentive to perform.

The publication of PPC 2000 (Trowers and Hamlins, 2000; subsequently amended in 2003), the Association of Consultant Architects (ACA) Standard Form of Contract for Project Partnering, was a bold step towards drafting a standard form of building contract that envisaged the use of partnering,
supply chain management and work clusters. The important work of David Mosey at Trowers and Hamlin, solicitors, although publicly supported by Sir David Egan, has not been given the attention that it deserves by a UK construction industry perhaps more focused upon ‘doing things right’ than ‘doing the right things’. PPC 2000’s move away from solely dyadic relationships provides context for the analysis of contractual relationships that is discussed in Chapters 7 and 8.

**Problems with existing forms of analysis and visualisation**

The analysis and visualisation of project management systems have not been possible in the past, the construction process being represented by a range of task dependency, structural and process mapping approaches which fail to reflect the network of relationships and their function. This book presents a solution to the problem: how do we set about trying to understand and improve the systems that we use in construction?

**Structure of the book**

Chapter 2: rationale for a network approach to the analysis of project management systems

The chapter asks why we need to find a new approach to the analysis of procurement and project management systems. It looks at some traditional analytical methods – task dependency, structural analysis and process mapping – and critiques these. The chapter deals with some of the important and frequently repetitive findings of reviews of the construction industry. Identifying and classifying the problems is relatively easy, but reaching agreement and consensus on which are the parts worth using in any given report, and implementing change, is almost always much more difficult. The chapter also looks at problems arising out of the situation where we quite intuitively understand construction processes as ‘systems’ and yet we lack an effective means of representing and critiquing those systems. A start is made on the classification of the systems, based upon project functions. The chapter deals with the benefits that social network analysis (SNA) might bring to the understanding, representation and analysis of the multiple concurrent and interdependent systems that comprise the construction project. There is a review of the limitations of other analytical methods which have been applied to construction.

Chapter 3: twenty-first century reform and emergent systems in construction

This chapter explores the industrial contextual drivers for a network approach to analysing construction project systems. Supply chain management (SCM)
and collaborative relationships (and the lack of collaborative relationships) are put forward as important contextual issues for the construction industry and to help provide definition and focus for the case studies that follow later in the book. The chapter confronts the tension between the development of collaborative relationships and the fight for survival for many construction firms in the face of recessionary forces. No discussion about SCM would be complete without consideration of Gray’s (1996) work on technology clusters. There is also a link to Pryke and Smyth’s (2006) work on the relationship approach to managing projects.

Chapter 4: the construction project as a system of interdependent governance networks

Chapters 2 and 3 provide context and motivation for the case studies and analysis in later chapters; Chapter 4 starts to elevate the level of abstraction. Network theory and the governance of transactions are dealt with along with reference to the contract theory of the firm. The transaction is suggested as a possible unit of investigation in the study of construction coalitions, and the difficulties in the operationalisation of the work of the prominent transaction cost economist are wrestled with and some proposals are made.

The case is made for applying Reve’s (1990) work on the nexus of contracts to Winch’s (1989) temporary project coalitions. Five basic theoretical premises for using SNA in the analysis of construction coalitions are posited, and these are followed by some definition of terms. Network density and actor centrality are justified as important SNA measures for the development of a SNA theory of construction project coalitions. Finally a move is made to provide some application for the theoretical discussion presented. It is proposed that the construction coalition might be conceptualised as three groups of transaction sets: contract, performance incentives and information exchange. The importance of density measures in relation to, in particular, information exchange networks is referred to. It is also proposed that changes in centrality values for project actors provide an important measure of the change in coalition actor roles. Finally, comparison of different functional classes of networks provides a measure of the maturity of any given role – and also, perhaps, some measure of the likelihood of the success of that role.

Chapter 5: social network analysis as a research method

We take a brief look at the origins and history of SNA. We move on to an appraisal of the limitations associated with the application of SNA to construction research. The chapter covers key concepts and terminology and then provides some examples of the types of issues and problems that might be investigated using SNA. These include financial transactions and performance incentives, contractual relationships, a range of communication types and modes, information and knowledge transfer, risk transfer, abuse of power and conflict resolution. Chapter 5 provides details of a selection of software
available for network analysis. Finally, we provide some information about getting started with the analysis of network data using one of the packages of software identified.

Chapter 6: network case studies

This chapter gives details of four case studies from which are drawn the network data analysed in subsequent chapters. Having dealt with the criteria for selection, the chapter then covers the background for each project, information about the procurement strategy, the specification of the works (in broad terms), and some details on the profile and role for each of the project actors. Methodological issues associated with the selection of each case study and/or the data gathering process are also covered. The case studies cover two projects which used ‘traditional’ design (non-collaborative, without contractors) in both public and private sectors – a public record office for a county council and a commercial office building; these were the two ‘control’ projects. The other two case study projects involved collaborative procurement, which included some activities involving the proactive management of the supply chain either by the client or on behalf of the client, in the latter case using what might be described as a supply chain management ‘agent’. These projects comprised a sports centre for the joint use of one of the armed forces and the public, and a private sector commercial development. It should be noted that neither of the commercial building projects were constructed on a speculative basis. In each case the tenant for the building and its advisers contributed to the development of the building design.

Chapter 7: interpreting the network diagrams for the case studies

This chapter provides sociograms for each of the project transaction sets identified: contract, cost management, instructions, progress management, performance incentives and design development. The sociograms were provided for each transaction set for each of the four case study projects, referred to as ‘Essex’, ‘Uxbridge’, ‘Aldershot’ and ‘Slough’. These are the public and private sector traditional procurement and the public and private sector collaborative procurement case studies respectively. A commentary is provided for each sociogram with a view to helping the reader to understand the interpretation of network data analysis based upon the inspection of sociograms produced using the UCINET software package. Other suitable software packages are also available (refer to Chapter 5).

Chapter 8: data analysis for the case studies

Whereas Chapter 7 focused on the analysis of network data based upon the inspection of graphical material, Chapter 8 now turns to some basic mathematical analysis of the data sets from the four case studies. Although all of the formulae are embedded within the software package used for the research project, the mathematical analysis is dealt with from first principles in order to
provide the reader with an insight into the nature of the analysis. Mathematical analysis involves calculations of network densities and centrality values for each of the main project actor groups and each of the main transaction sets. Some simple nodal statistics are presented along with analysis relating to isolates, transmitters, receivers and carriers.

The maths in this chapter is designed to be reasonably accessible to those without degrees in mathematics. Mathematicians will want to explore the much wider range of formulae indentified in Wasserman and Faust (1994) among others.

Chapter 9: managing networks

This chapter is much more speculative than those that precede it. A lot has been written on the subject of SNA and its applications to organisations (although relatively little has related to construction) but almost all of this has been concerned with retrospective analysis and, therefore, predominantly cross-sectional rather than longitudinal studies. There is a real dearth of material relating to the use of network and actor characteristics predictively and prescriptively.

The material in Chapter 9 is not derived from the previous chapters or the case study analysis provided therein. Rather, it has been inspired by the research used as the basis of the book. It is tentative and speculative and it does not relate specifically to construction.

This chapter starts with a review of how we understood the management of organisations before we adopted a network approach. We compare and classify hierarchies and networks before establishing some good practice in relation to managing networks as against hierarchical organisations. It moves on to look at the important role that trust has to play in the ‘low-governance’ network environment. We look at some generic network actor classifications: prominent disseminators, gatekeeper hoarders, isolated dyads and triads, boundary spanners and bridges. Network roles are more likely to be adopted by an individual actor based upon personality type, preferences and environmental factors than to be imposed by a superior or pre-existing authority-based hierarchy embodied within organisation governance policy documents.

To round off, we deal with leadership in networks and the role of managers. It is argued that both terms need redefinition in a network context. Finally the effects of network cohesiveness are discussed.

Summary

This chapter started with a historical reference that in some small way helps to justify the author’s interest in networks and shows the enduring relevance of human relationships along with the importance of their analysis and representation. Some context relating to the UK construction industry in the late
The twentieth and early twenty-first century was provided before we dealt with a brief overview of the contents of each chapter. The intention of the book is to bring together a range of material that the author has been working on over the last decade and to provide access to this material for the student of project management studies, typically at masters level. It is also hoped that some practitioners might take an interest in the contents of this book.

Chapter 2 deals with a critique of existing methods for analysing construction project team activity and provides a justification for the need for a network approach.
2 Rationale for a network approach to the analysis of project management systems

Introduction

This chapter provides some context for the detailed discussions that follow in later chapters. It examines the ways in which the activities comprising the typical construction project might be conceptualised and analysed. The chapter contains a review of the options available and concludes that each of the existing types of analysis has merits in specific applications. None of the previous approaches provides the potential for quantitative analysis and a level of detail appropriate for the purposes of understanding the myriad of systems, typically freestanding rather than integrated, involved in the planning, design and delivery of our increasingly complex projects. Social network analysis is introduced following a critique of the limitations of other analytical tools available.

This chapter also demonstrates the pressing need of the industry and its analysts for a more rigorous and analytical approach to the evaluation of reforms in the procurement of construction and the organisation of construction project coalitions. It is argued that the use of social network analysis will enable a far more rigorous examination of construction design and production processes, and provide better analysis and more accessible graphical representation.

Review of approaches to the analysis of procurement and management systems

Existing methods of analysis and modelling appear to fall into three main groups:

- Task dependency analysis (critical path analysis, for example)
- Structural analysis (use of management structures, for example)
- Process mapping (cognitive mapping, for example)
Arguably, the earliest of the significantly important reviews of the construction industry was the Simon Report of 1944. The Simon Report was followed by the Emmerson Report (1962), the Banwell Report (1964), the Wood Report (1975), the British Property Federation Report (1983), the Latham Report (1994) and the Egan Report (1998), among others. The characteristics and findings of these reports are remarkably similar.

The Latham Report (1994) effectively summarised many of the issues that these reports dealt with. For example, procurement methods, roles and responsibilities, and management systems were covered in some detail by the Simon (1944), Emmerson (1962) and Banwell (1964) Reports. The Latham Report refers to the fact that issues discussed and specific proposals made in previous reports were still outstanding at the time of presenting the report in 1994.

With the exception of the British Property Federation (1983) publication, each of the reports mentioned above was instigated by the government of the day.

The Simon Report (1944) dealt with a number of issues that are fundamental to the management of construction projects including types of contract, documentation and management issues. Each of these subjects was described and analysed, and recommendations were made through the use of descriptive text. Many of the plans made during the years of conflict in Europe were not enacted on the grounds that the proposals involved highly centralised control of the construction industry by the state (Smyth, 1985). Notwithstanding this, a post of Minister for Reconstruction was created (The Builder, 1944a) and the new cities needed were catered for by the Town and Country Planning Act 1944. Despite a specific recommendation within the Simon Report (1944) itself, the Ministry of Works was not involved in the implementation of the recommendations of the report. The trade press reported at the time that ‘impressive as the report was in its detail and breadth, [the contributors] do not propound any remedy’ (The Builder, 1944b). The need for some kind of structural, quantitative approach to the analysis and presentation of changes in management and procurement systems begins to emerge.

The Emmerson Report (1962) was presented to an industry which, thanks to a massive programme of post-war reconstruction, was suffering from a shortage of capacity. The report was presented within 12 months of its commencement and was clearly regarded as a preamble to the more detailed Banwell Report that was to follow. The Emmerson Report dealt with relations between the players in the construction process and arrangements for placing and management of contracts. Emmerson, in his introduction, lamented the difficulty experienced in presenting relevant statistics dealing with the construction industry.
The Banwell Report (1964) was commissioned as the Emmerson Report was published, reflecting the government’s intention to present a brainstorming, agenda-setting report followed by a more detailed, analytical report. The Banwell Report dealt with (inter alia) construction team relationships, contracts and documentation. Implementation was to be made the responsibility of the Ministry of Works, which seems not unreasonable given that, at that time, 56% of the workload of the construction industry was generated by the public sector. In the event the Ministry of Works declined to take responsibility, and three years later the Potts Report (1967) was launched in order, it would appear, to make a start on implementation of the findings of the Banwell Report.

The Wood Report (1975) was presented to a construction industry and government in crisis. The building cost index had risen by 20% each year for two consecutive years in 1974 and 1975 (Building, 1975), whilst some of the country was working a three-day week. The 1996 report has a more academic approach than the other reports considered here; it dealt with roles (particularly client) and procurement of consultants and contractors, along with a number of other issues. The report comprised predominantly narrative text – perhaps missing an opportunity to represent and classify the key findings.

Exceptionally, the British Property Federation (1983) report was instigated and delivered by a group of predominantly private sector clients. The group comprised approximately 30 private sector companies, Milton Keynes Development Corporation and what was referred to at the time as the British Rail Property Board. If the government sponsored reports lacked effective communication of principles to the industry and a clear implementation strategy, the report of the British Property Federation approached these two problems in a fundamentally different way. It appeared to deal with some common themes arising from other reports considered here. In particular, roles and contractual relations were important issues considered.

In this case, recommendations and implementation employed a dramatically different approach. Recommendations were very specific and applied to the industry, resulting in the creation of a new role of client’s representative. These proposals were supported by the publication of a BPF standard form of contract (British Property Federation, 1984), the provisions of which reflected the modified roles outlined in the report. This highly prescriptive approach appeared to work well for private sector developers and was widely adopted by this group of clients; elsewhere the report and its new form of contract were evidently largely ignored.

The Latham Report (1994) dealt with procurement of consultants and contractors and contractual conditions. This thorough review of the systems operating within the industry provided analysis and proposals, many of which were subsequently adopted by the industry. The report, for example, introduces the principle of partnering. Unfortunately, three years after the publication of the report the Construction Industry Board (CIB), which was the vehicle chosen to implement the Latham measures, was regarded as having lost its momentum (Winch, 2000).
Rethinking Construction (Egan Report, 1998) was the product of the Construction Task Force set up by an incoming UK Labour government. The CTF comprised exclusively private sector construction clients and was biased towards house building rather than the broader interest of the remainder of the industry. An interesting and important feature of this report was that implementation should involve the use of the ‘demonstration project’. This was an important and influential step towards effective communication of new ideas to the construction industry. A number of demonstration projects were set up and publicised, some more innovative than others. The idea behind demonstration projects was to provide knowledge transfer and promotion of best practice to other firms operating in the sector. Typically, presentations, site talks and websites were used.

A major UK retailer worked closely with academics to explore the possibility of establishing standard project protocols (construction project process modelling, similar to the RIBA Plan of Work). Kaglioglu et al. (1998) reported on the subject of project protocols, although Winch and Carr (2001) advised that differences between individual projects, even in the retail sector, meant that an industry-wide generic process protocol was unlikely to be viable. We return to the subject of process protocols later in this chapter. For a comprehensive discussion of the reports mentioned above and other reports published during the second half of the twentieth century, refer to Murray and Langford (2003).

Problems of implementing report recommendations

Data gathering and data analysis are only part of the process of the management of change; implementation and monitoring have to follow if we are to achieve tangible change within the industry. Each of the reports reviewed above generally constituted a critique of systems within the construction industry. Few of these reports suggested how change should be brought about, and implementation has been a problem with each of the reviews. The British Property Federation (1983) alone diagnosed contractual failure and then presented the industry with a new form of contract, creating a greater focus on project organisational systems and their management. Other reviews have tended to be analytical but less prescriptive.

A more detailed, rigorous and quantitatively analytical approach to the analysis of project organisation systems will provide a clearer understanding of the problems and shortfalls of systems in construction projects and appropriate terminologies for analysis. The source of this new analytical language is social network analysis (SNA).

Relating the approach to analysis with success in implementation

We have looked at the most important sources of analysis of construction procurement over the last 60 years. With two exceptions, the analysis and presentation have been in the form of prescriptive text. In some cases, the analysis is not followed by conclusions; in many cases, implementation has