

# THE NATURE AND CHARACTERISTICS OF MULTI-SITE CONSTRUCTION PROJECTS AND PROGRAMMES

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Multi-site construction projects and programmes (MSCP) are characterized by large numbers of similar sub-projects undertaken regionally, nationally or globally as part of a single medium to long-term project or programme. The aim of this research is to identify the general characteristics of MSCP, establish *how* they are delivered and determine whether, and where these differ to traditional single-site and other construction projects. Current literature concentrates heavily on single-projects, with multi-project research generally focussed in domains other than construction. To effectively study MSCP, a clear definition is required to differentiate these from other types of construction projects. The literature, particularly from other industries, is reviewed and adapted to develop a framework describing and classifying construction projects into various categories. These categories enable the research to focus on particular types of projects by differentiating and defining construction projects. In particular, multi-site construction projects are proposed and defined as a variant within this framework.

The multiple case-study approach adopted for the study and the associated methodological issues are discussed. Preliminary findings of one of the seven cases comprising the study are presented. The case demonstrates that there are differences in the general characteristics, definition and problems encountered on these projects when compared to the traditional single site construction project.

Keywords: case study, multi-project, multi-site, project, programme.

## INTRODUCTION

The general concept of Multi-Site Construction Projects and Programmes (MSCP) was introduced by Blismas *et al.* (1998) at ARCOM '98. MSCP typically consist of a network of geographically disparate projects undertaken by a single client body as part of a co-ordinated programme. The aim of the research is to identify and investigate the differences with other project types and the impact of these differences on project and programme delivery. This paper presents a general overview of the broader study, introducing concepts and a definition of MSCP. The methodology is briefly discussed and the preliminary findings of the first of seven cases is presented.

### Context of the study

Clients usually construct to facilitate their primary activities (Walker 1996). Organizations whose primary activities are enabled by a geographically dispersed network of facilities encounter a unique situation when programmes are instituted to

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expand, refurbish or engage in any construction work across the network. The resultant projects are for a single client, and are to some degree repetitive although each site incorporates individual peculiarities. In addition, the geographical disparity of sites exacerbates the complexity of such programmes.

Although not as common as traditional single-site construction projects, MSCP can involve vast networks, and in some case are even global in extent. The unique features involved in successfully delivering a programme of this nature forms the basis of this study.

### **Literature review and definitions**

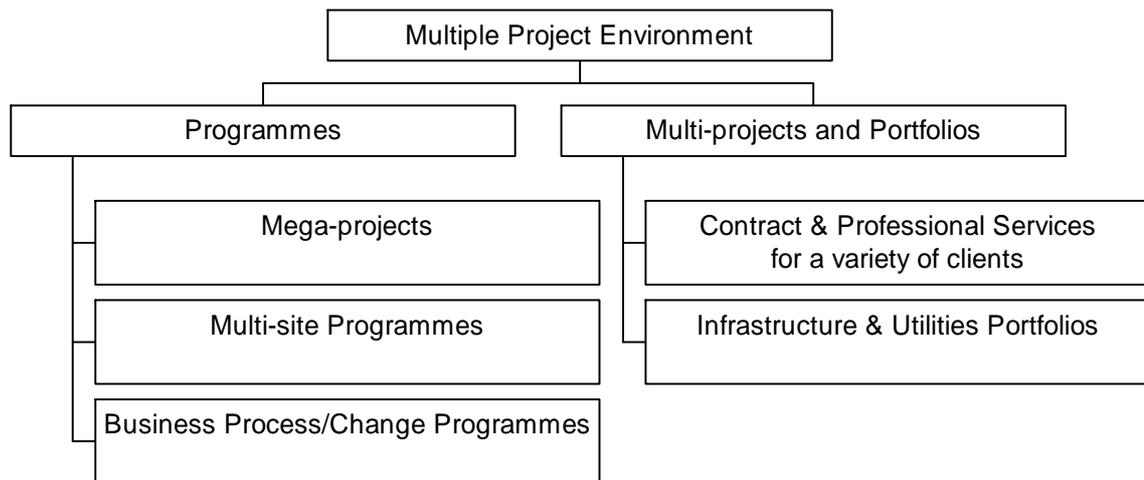
Most of the existing literature is about co-ordinating, scheduling and managing single projects with very little written on managing multi-projects (Levy and Globerson 1997; Eskerod 1996; Reiss 1996; Payne 1995). Although the emphasis is overwhelmingly on single projects, a body of multiple project related literature does exist. This literature approaches the subject from various perspectives, and arises primarily from industries other than construction. Those that do focus on construction related problems tend to concentrate on scheduling of repetitive components within single structures (references available from primary author).

The views within the literature can be broadly divided into two main categories, namely multi-projects and programmes, although the distinction is not clearly defined. The vagueness and resultant confusion is due to the variety of definitions offered within the literature. Several authors (PMI 1996; Pellegrinelli 1997; Ferns 1991) have commented on the array of definitions and the resultant contrariety. Projects and project management have more universally accepted definitions, whereas programmes and programme management tend to be defined within the context of their use. Furthermore the use of terms such as multi-project, portfolio, mega-project, super-project, meta-project (Gray 1997) contributes to the notion that these are all interchangeable terms having very similar meanings.

Our view concurs with that taken by Pellegrinelli (1997) who points out that these terms have distinct and different meanings. Definitions and differences between these terms are required to ensure that research is congruent. 'Generic' definitions abound, although they vary from loose and general to very distinct. A content analysis was performed on a number of definitions of projects, programmes, project management, programme management, multi-projects and portfolios to extract the essential elements of these definitions.

The interchangeability between programme and multi-project is particularly marked. However, it is contended that the emphasis of programmes is on achieving specific corporate objectives or benefits through co-ordinated management (CCTA 1994; Pellegrinelli 1997), whereas multi-project emphasis is on the simultaneous management of a number of projects, (Koppelman 1992; Payne 1995) the emphasis usually being on resource management.

Using this division a basic framework can be constructed to illustrate the relationship between these types of projects and the management of them. MSCP do not fit comfortably into either of the two streams of general thought prevailing within the multiple project literature, although are generally better defined within programmes (Figure 1).



**Figure 1:** The management of the multi-project environment

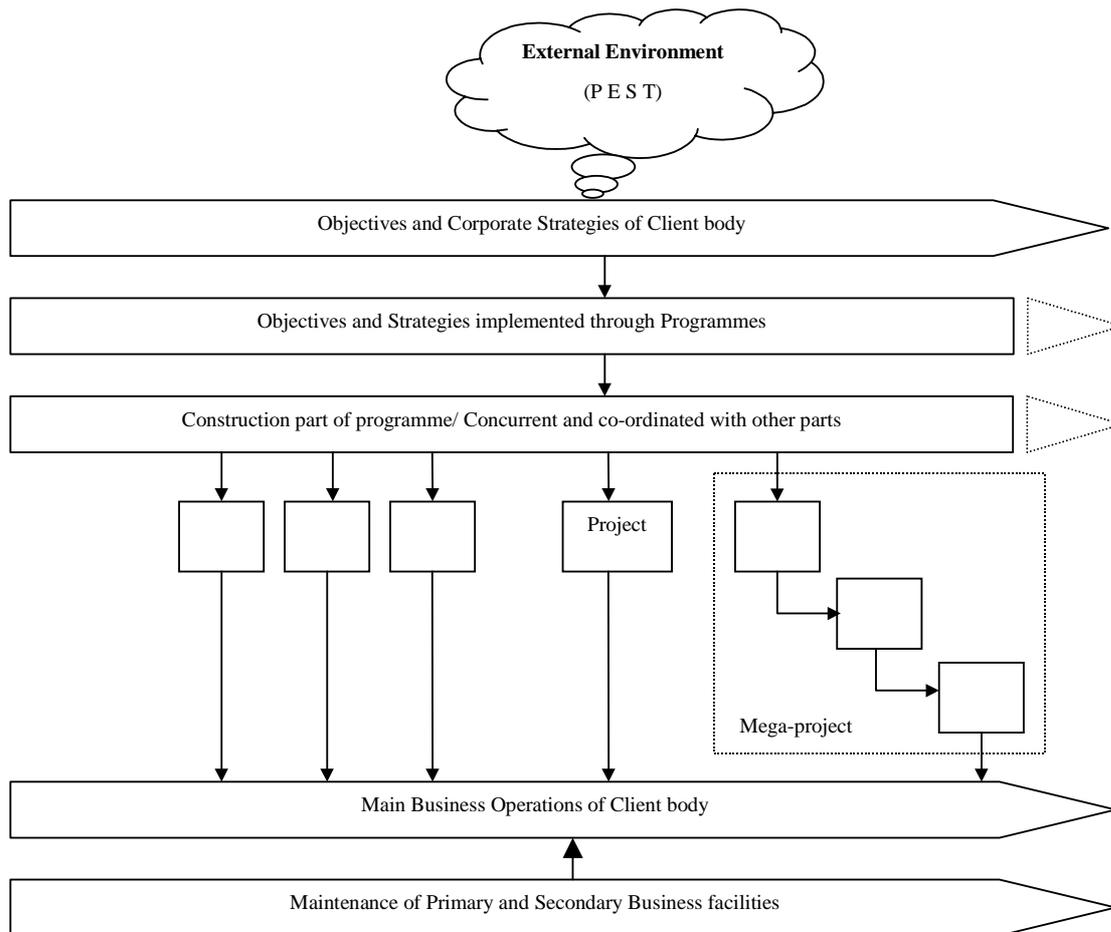
A provisional definition of a MSCP is that it is an undertaking to achieve a specified purpose or objective involving numerous separate, relatively independent construction related undertakings which are geographically disparate and undertaken by a single sponsor body as part of a co-ordinated effort.

Massive construction projects which involve many allied projects to achieve a single integrated structure are usually termed 'mega-projects' and fall between programmes, multi-projects and single-projects, demonstrating features of all. However they are clearly not MSCP as they do not display the vital characteristic of multiple geographically disparate sites.

## CONCEPTUAL FRAMEWORK

As defined above, programmes are borne out of corporate strategies and objectives and focus on the delivery of business benefits from the outputs of multiple projects. The focus is broader and more holistic than that found in the project management or multi-project environment. The management of resources is clearly an element of programme management but is wider than that and incorporates generative and organizing aspects (Pellegrinelli 1997).

Multi-project management focuses more on resource management, prioritization and scheduling associated with managing multiple competing projects. This is a common scenario within construction and professional firms, which are usually involved on a number of projects for different clients simultaneously. This clearly becomes an exercise of balancing the available resources to satisfy all projects within the portfolio. MSCP however, consist of many projects for a single sponsor which all contribute to the achievement of the programme objective. Figure 2 illustrates the MSCP environment (adapted from CCTA 1994). This demonstrates how corporate strategies are shaped by the external business environment, which results in the conception of programmes to implement the strategies. Some of these will involve massive construction programmes, usually in the form of MSCP. These ultimately feed into the main business operations of the client body.



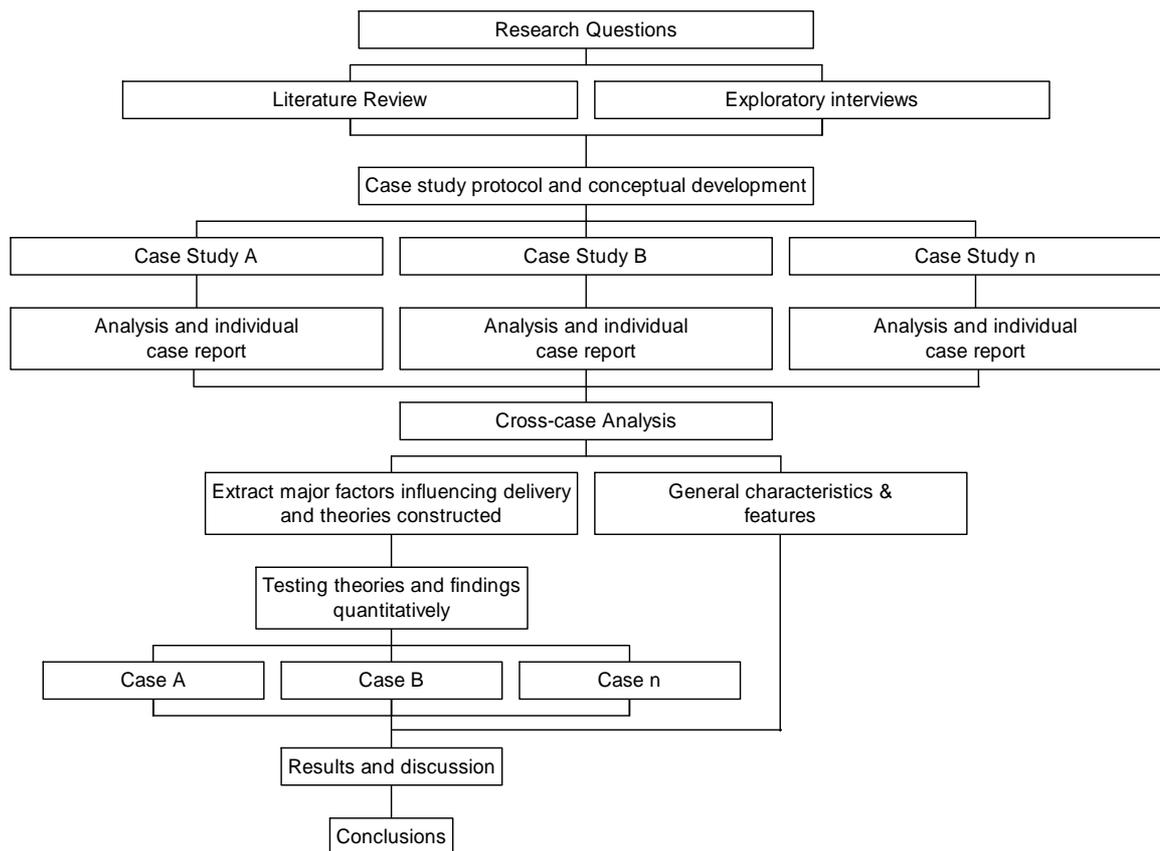
**Figure 2:** The programme environment (adapted from CCTA, 1994)

## METHODOLOGY

### Overview

The exploratory nature of our research motivated the choice for a multiple case study approach. This approach was adopted to capture the unique characteristics of these projects, which are lost in the more quantitative approaches. The case study as a research strategy is well suited to the research question addressed, being best suited to answering ‘how’ and ‘why’ questions underpinning decisions (Yin 1994). The lack of a clear understanding of the concept and definition of multi-projects and more specifically MSCP precludes the meaningful use of questionnaires or structured interviews. Preliminary investigative interviews indicated differences in terms and expressions, which implied that surveys would have rendered meaningless data. In addition, quantitative approaches are limited in exploratory research as their scope of data gathering is limited by the questions and they assume a theoretical framework prior to data capture. The research methodology is summarized in Figure 3.

The case study approach can be used within different epistemological perspectives, ranging from an inductive theory-building approach as described by Eisenhardt (1989) to a more structured ‘positivist’ approach advocated by Yin (1994). This research draws on the merits of both approaches, with an essentially exploratory inductive phase followed by a more structured deductive stage as illustrated in figure 3.



**Figure 3:** Overview of the research methodology

### Choice of cases

The choice of cases is a subject of varying opinion. Simister (1994) used a self-appointment principle where random ‘unbiased’ choice was pursued, and argued as methodologically valid. This paper argues contrary to this view and in concurrence with Eisenhardt (1989) who advocates a deliberate choice of cases. This choice may be to replicate previous cases or extend emergent theory, or chosen to fill theoretical categories and provide examples of polar types. The concept of theoretical sampling (Glaser and Strauss 1967; Yin 1994) was developed specifically for theory-building research. The diverse ‘sampling’ also enhances the generalizability of the results. Yin (1994) likewise argues for case selection based on whether literal or theoretical replication is predicted. Random choice (statistical approach), with small numbers of cases, can even cause bias (Miles and Huberman 1994).

This research is based on seven cases selected for their multi-site project activities, diverse nature and the willingness of all parties to participate (table 1). Extremes, as perceived within the framework of MSCP, were selected with both ongoing and fixed number projects; retail as well as service and infrastructural utility; and purely financial as well non-financial motivated organizations. The three cases within the Oil Retail industry have an added advantage of allowing comparisons to take place on cases from similar industries. Case D, the utility organization, was specifically selected as it is a form of project that falls between programmes and multi-projects and therefore serves as a ‘theoretical replication’ case. The client bodies, in all cases, could be classed as secondary experienced (as described by Masterman and Gameson,

**Table 1:** Outline of cases

Case	Type of Organization	Project/Programme Description
A	Retail High St Shops	Expansion programme across the UK
B	Oil Company Retail Network	Europe expansion programme
C	Oil Company Retail Network	Retail Visual Reimage world-wide, but case on Southern Africa
D	Utility Company	Network expansion and reinforcement
E	Tourist	Expansion programme across the UK
F	Oil Company Retail Network	Reimage project world-wide, but case on South Africa
G	Food, Leisure and Sport	Network introduction into the UK

1994) within construction, although not all necessarily experienced with the multi-site programme. The table below outlines the cases:

### **Units of analysis**

The multi-site construction programme forms the main unit of analysis within each case study. Within the unit of analysis several modes of data collection are used to increase the scope and confidence in the data. Difficulty defining the unit of analysis is common (Yin 1994), and an explicit description is necessary to confirm the perspective of the research. An example is that of Simister (1994) who furnished explicit descriptions of the units of analysis at the outset of his research.

### **Number of cases**

The number of cases in a multiple case study is another consideration, which must be addressed. There is a general consensus that ‘theoretical saturation’, as described by Glaser and Strauss (1967), determines the number of cases to be studied. Simister (1994) used this method and reached saturation after four cases. Although there is no ideal number of cases Eisenhardt (1989) suggests a number between four and ten usually suffices. Anything below this number renders theory generation difficult and above ten data volume and complexity become inhibitive. This research is based on an initial case load of seven. Miles and Huberman (1994) also discourage numbers over about 15, which result in large unwieldy volumes of data and consequent loss of detail which, in turn, may suggest a survey.

### **Data collection**

The first stage of the case study involved semi-structured interviews with a number of participants within these cases to gain multiple perspectives on the motivation, processes and problems associated with the project or programme. Documented data was also collected which could corroborate any of the interview data, such as internal process manuals, annual reports and organizational charts.

The interviews were analysed and coded to extract the following main data:

- Contextual setting of the case,
- Motivations and objectives of the project or programme,
- Delivery process and influences upon it,
- Unique features or characteristics of the projects and programme,
- Causal links of main problems and unique phenomena.

The entire programme delivery process of each case is established through the interviews to gain an overall picture of MSCP. The resulting schematics, and particularly the associated details, form the basis for analysis of any generic features that emerge, including elements of the process, constraints on the process and general planning, managerial and unique problems.

## **PRELIMINARY FINDINGS OF CASE A**

### **Case description**

The client is a retailer that has recently been listed as a public limited company. From a single retail shop in 1976 the business grew to 30 shops by 1990/1 and onto 105 at present. The ongoing programme is to expand the network to 350 shops within the next four years. The overriding objective of the programme is to have a shop in every major town and city in the UK.

The shops are mainly situated on the High street with several being opened within existing and newly developing shopping centres. The construction related work consists of fitting-out existing 'shells' with the required furnishings and livery to trade as a store.

A sole property manager, who outsources all work, manages the programme within the organization. The team employed by him includes architects, estate agents ('site finders'), solicitors, surveyors, and the main and specialist contractors. As highlighted by the client, their business is primarily retail, and the management of properties is merely a facilitator of the main operations;

*...we are essentially retailers as opposed to property people.*

*...we are fundamentally retailers, all these ancillary bits have effects on the level of retail that we do.*

The client could be classified as secondary experienced (Masterman and Gameson 1994) because these projects are secondary to their specific business activity, and they have experience due to repetition.

### **The process and influences on the programme**

The process is driven primarily by the current economic climate. This affects the rate of shop openings severely, although the site-finding and investigation processes continue. The surveyors have a mandate to search for appropriate property, upon which the property manager and director conduct feasibilities. If accepted the site joins the programme and follows a standard procedure.

The process is repetitive although each individual site has unique features that require specific attention. The construction sub-programme is intricately linked to the wider programme of opening retail outlets. Personnel acquisition and training, and stocking of shops are some of the activities reliant upon the completion of construction work.

### **Some preliminary thoughts**

The themes emerging from an initial scan of the data indicates a form of construction undertaking which is different to those normally presented within the literature. The approach is one that balances an individual site-by-site, project-by-project perspective to one where the overall picture is viewed as a long-term programme.

*I never look at projects only on their own, I take the whole acquisition programme and the whole concept and split it into those little bits for ease of control...*

The programme contains elements of 'project based' as well as 'production based' management. A 'multiplier effect' is noted on these projects as decisions made on the programme have a great multiplied effect once implemented throughout the entire network. Decisions are therefore based not only on the immediate site but with a perspective on the whole programme.

The process also demonstrates features of instability. Although the objective is fairly stable the projects required to realize this are unstable and subject to considerable change prior to construction work. To remain competitive the organization requires flexibility to react to changes in the market, however efficiency in planning is facilitated by stability. There is therefore a constant trade-off between flexibility and planning efficiency.

The emphasis, contrary to most findings within the multi-project research, is not on resource management and scheduling, but rather on economic and programme objectives. The resources, it was argued, can be obtained should the programme warrant it. Success is seen on two levels, within the management of the project and in the commercial success of the store. The direct involvement of the sponsor in the programme emphasizes this point and therefore departs from the common perception that project management success is equivalent to the sponsors ultimate success.

The influence of external factors appears to have a great influence upon the programme. Single projects tend to focus on the outcome of the project objectives, whereas these are focused on the larger picture. The external factor most influencing the programme is the economic environment, which understandably affects the rate, position and specifications of stores, and causes the number of stores opened to vary significantly between years.

These observations are tentative and subject to change as the data is analysed more rigorously. It is important however to emphasize that each case will be analysed and reported individually, and the results of each compared such that replication logic (Yin 1994) is satisfied.

## **CONCLUSION**

The paper has introduced the concepts of multi-site projects and placed these within the context of multi-projects and programmes. The confusion within the literature is addressed through the creation of a conceptual framework incorporating both the definitions and relationships of different projects types within the multiple project environment. The methodology adapted for the study has been discussed with special reference to case selection. Finally the preliminary findings of the first of seven cases were presented with brief discussion of some emergent themes.

## **REFERENCES**

- Blismas, N.G., Sher, W.D., Thorpe, A. (1998) National and global multi-site projects. *In:* Hughes, W. (ed.) *Procs. 14th annual ARCOM conference*. University of Reading, 9-11 September. Reading: ARCOM. 2: 458-464.
- CCTA The Government Centre for Information Systems (1994) *A Guide to Programme Management*. London: HMSO.

- Eisenhardt, K.M. (1989) Building theories from case study research, *Academy of Management Review*, **14**(4), 532–550.
- Eskerod, P. (1996) Meaning and action in a multi-project environment, *International Journal of Project Management*, **14**(2), 61–65.
- Ferns, D.C. (1991) Developments in programme management, *International Journal of Project Management*. **9**(3), 148–156.
- Glaser, B. and Strauss, A. (1967) *The discovery of grounded theory*. Chicago: Adline.
- Gray, R.J. (1997) Alternative approaches to programme management, *International Journal of Project Management*, **15**(1), 5–9.
- Koppelman, J.M. (1992) Conflicts, politics and illogics in multi-project management, *Project Management Seminars, Project Manager Today*, 10-11 March 1992.
- Levy, N. and Globerson, S. (1997) Improving multi-project management by using a queuing theory approach. *Project Management Journal*. **28**(4), 40–46.
- Masterman, J.W.E. and Gameson, R.N. (1994) Client characteristics and needs in relation to their selection of building procurement systems, *In: Rowlinson, S. (ed) Procs CIB Procurement Systems Symposium, Hong Kong, East meets West*. Honk Kong: Hong Kong University, 70–88.
- Miles, M.B. and Huberman, A.M. (1994) *Qualitative data analysis*. 2ed. London: Sage.
- Payne, J.H. (1995) Management of multiple simultaneous projects: a state-of-the-art review, *International Journal of Project Management*, **13**(3), 163–168.
- Pellegrinelli, S. (1997) Programme management: organizing project-based change, *International Journal of Project Management*, **15**(3), 141–149.
- Project Management Institute (PMI) (1996) *A Guide to the Project Management Body of Knowledge (PMBOK)*. Sylva USA: PMI Communications.
- Reiss, G. (1996) *Programme management demystified*. London: Spon.
- Simister, S. (1994) *An investigation into the influences on construction professionals' working practices*. Unpublished PhD thesis, University of Reading.
- Walker, A. (1996) *Project Management in Construction 3ed*. Oxford: Blackwell Science.
- Yin, R.K. (1994) *Case study research: design and methods*. 2ed. London: Sage.