

**STRATEGIC ALLIANCES IN CONSTRUCTION:
A STUDY OF CONTRACTING RELATIONSHIPS
AND COMPETITIVE ADVANTAGE
IN PUBLIC SECTOR BUILDING WORKS**

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**This thesis is submitted in partial fulfilment of
the degree of Doctor of Philosophy,
Queensland University of Technology**

1998

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STATEMENT OF ORIGINAL AUTHORSHIP

The work contained in this thesis has not been previously submitted for a degree or diploma at any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signed:

Date:

ACKNOWLEDGMENTS

The author wishes to express his appreciation for the assistance, guidance, advice and encouragement provided by his Principal Supervisor, Dr Keith Hampson, and two Associate Supervisors, Professor Martin Skitmore and Dr George Earl. Also Ms Michele Haynes is sincerely thanked for providing helpful advice and references in the statistical analysis. Gratitude is expressed to School of Construction Management and Property at Queensland University of Technology for providing an opportunity, scholarship and facilities in this research. Appreciation and thanks are due to the Academic and General staff of not only the School of Construction Management and Property but also other Schools at the University for their encouragement and assistance.

The author is indebted to the many industry professionals with whom he has worked with over the last two decades. From their experience and contributions, the ideas and concepts have been originated in development of this research. Thanks are extended to the fifty-one contracting firms who have participated and completed the survey questionnaire. Also the Staff in Queensland Government Department of Public Works and Housing are sincerely thanked for providing information, helpful advice and feedback during the study. Without their contributions and support, the work could not have been directly linked to the public sector building construction industry.

Thanks are extended to fellow colleagues at the University, who have offered intellectual stimulants and strong shoulders. All other good friends and relatives have given encouragement. Thank you all!

Last, but not least, I would like to thank my wife Puis-Shim and my children, Joon-Yee, Hing-Wah, Wai-Ming, Gee-Wai and Ho-Doug. Without their constant support and encouragement, this research project would not have reached completion.

Tommy Looshang Kwok

1998

1 INTRODUCTION

1.1 Background to the Research

For a long time, there has been much talk about workplace reform, improving performance and gaining efficiency in the building construction industry. It is said that *“changing workplace relationships is the toughest change process to implement, but it is vital in order to improve industry performance”* (Australian Federation of Construction Contractors, 1992, p3). The concept of working together (Hinks et al, 1996; Day, 1996) with shared objectives, pooled resources, mutual respect and trust has worked successfully in other industries, such as the automotive industry (Burgers et al, 1993; Sasaki, 1993; Haigh, 1992; Cusumano and Takeishi, 1991; Devlin and Bleackley, 1988). It could be argued then, that such a concept could play a vital role in improving efficiency in the building construction industry.

It is recognised by industry professionals and academics that as much as 80 to 90% of the dollar value of work on a construction project is performed by subcontractors (Matthews et al, 1996; Hinze and Tracy, 1994). It is clear that the greatest potential for improvement of efficiency and cost saving lies with subcontractors. If contractors are to improve their performance and productivity, therefore they should concentrate their efforts on where the majority of the work takes place, i.e. subcontracting (Matthews et al, 1996). *“Contractors are now starting to recognise the importance of subcontractors’ performance has on their own performance and they are making attempts to move away from their traditional adversarial approach in dealing with subcontractors towards developing closer working relationships”* (Matthews et al, 1996, p1).

To be successful in business, firms need a competitive advantage that stands out from their competitors. *“Competitive advantage is the foundation for any sustained and successful business strategy”* (Plemmons and Sanders, 1995, p141). Hence, the purpose of competitive advantage is not to retreat from competition, but to compete selectively from an advantageous strategic position. Porter (1980) developed a

competitive structure based on the proposition that business success rests on satisfying customer needs. Dent (1991, p63) supports this view that “*strategic focus ultimately comes down to understanding one simple concept: value added—how and where to add value for the ultimate customer.*”

To out-perform the competitors and add value for customers, Porter (1980) outlines three potentially successful generic strategic approaches—overall cost leadership, differentiation and focus. According to Langford and Male (1991) since the ‘focus’ strategy can also employ cost leadership or differentiation, there are, in practice, only two major generic strategies in construction—cost or differentiation. The report prepared by the US Construction Industry Institute, Construction 2000 Task Force (1992) indicates that, for competition and future strategic advantage, a shift toward co-operation as a means of strengthening competitiveness is required. This implies that firms need to increase their concentration on working with other firms, establishing project teams that would work on more than a single project together, and combining independent firms to form strategic alliances.

Alliances are co-alignments between two or more firms in which the partners hope to learn and acquire from each other the technologies, products, skills, and knowledge that are not otherwise available to their competitors (Lei and Slocum, 1992). Takac and Singh (1992) define ‘alliance’ as the joining of forces and resources between firms, for a specific or indefinite period, to achieve a common objective.

In the construction industry, the concept of alliance can be applied to partnering which was formally introduced to contract agreements by Charles Cowan of the US Army Corps of Engineers in the late 1980s (McGeorge and Palmer, 1997). “*The partnering concept is a way of overcoming the traditional and litigious nature of the construction industry. It is a process for improving relationships among those involved on a construction project to the benefit of all*” (New South Wales, 1994, p4). According to Bennett and Jayes (1995), partnering can be based on a single project (project partnering), but greater benefits are available when it is based on a long-term commitment (strategic partnering).

Takac and Singh (1992) further explain that the term 'strategic' provides an additional dimension to the definition. They also identify a number of components that lead to strategic decisions. These include:

- *“have a futuristic vision;*
- *have an impact on multi-functional or multi-business environments; and*
- *necessitate consideration of factors in the firm's external environment”* (Takac and Singh, 1992, p33).

Hamilton (1985, p207) defines *“strategic alliance as a formal linkage between firms that offers actual or potential strategic advantages to either or both firms. Such co-operation arrangement may take many forms, but all are based on two principal features: complementary strengths and mutual benefits”*. Spekman and Sawhney (1990, p5) agree with this view *“strategic alliances embody a future-oriented relationship forged between two or more independent companies in which each attempts to leverage the strengths of the other to achieve mutually beneficial goals”*. The definition of strategic alliance which fit into the context of this study is that *“a strategic alliance is a co-operative arrangement between two or more organisations that forms part of, is consistent with their overall strategy, and contributes to the achievement of their major goals and objectives”* (Howarth et al, 1995, p2).

Building construction contracting is regarded as a very competitive and high risk business (Uher, 1994). This competitiveness is largely due to cost traditionally being the prime factor in the tender selection process. Park (1979) argues that while the awarding of construction contracts based on competitive bids offers advantages to both owners and contractors, many of the construction industry's problems can be attributed directly to the practice of making price the sole criterion for selection. This competitiveness is compounded where conflicting objectives amongst contracting and subcontracting firms set the stage for an adversarial and destructive approach. The more competitive the market, the keener the tender price must be with a consequently lower profit margin (unless efficiency is improved).

The Final Report of the Royal Commission into Productivity in Building Industry in New South Wales (Gyles, 1992) also revealed that this adversarial approach had evolved over many years and had its roots in the earliest stages of project inception with each stakeholder independently formulating its own goals for the project, without regard to the other stakeholders' interests or expectations. When this adversarial management style took over, the sole purpose of each of stakeholders was to guard their own position during the execution of the project. Such business relationships often severely degraded into a destructive and costly adversarial approach characterised by mistrust, lack of respect and the ever-present threat of litigation and conflict.

The building construction industry is believed to have a poor public image, despite its key role in the state and the national economy. Some of the perceptions of the industry include:

- *“having an adversarial nature destructive to relationships;*
- *poor quality outcomes with little commitment to continuous improvement; and*
- *an insufficient level of investment for business improvement, long-term business planning, training, research and development”* (NSW Government, 1997, p8).

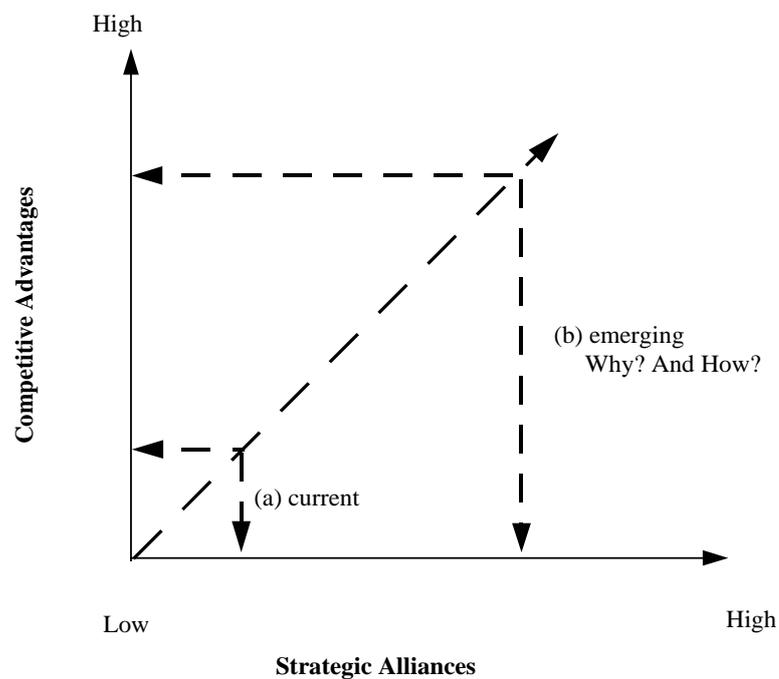
This adversarial climate has severely reduced the productivity of the construction industry and consequently its ability to achieve the primary goal of producing quality projects on time and within budget. As a result, it is claimed that there is a need for a change to a more co-operative approach—in essence a return to the old way of doing business based more on trust, respect and good faith rather than suspicion, contempt and scepticism (Gyles, 1992). A balance between co-operation and competition, therefore, is seen as a necessary condition for a successful future construction industry in changing the existing building construction culture to create a *win-win* situation. It follows, then, that the formation strategic alliances which is one form of co-operative organisation, should help in achieving this position.

However, the formation of strategic alliances between contractors and subcontractors in the construction industry could face the same dilemma of process re-engineering. According to Ireland (1994), the goal of the T40 process re-engineering was an attempt to aim for a time reduction of 40% in construction. While the principles of process re-engineering were seemingly accepted, it was difficult to find an organisation willing to pay for the cost of reorganising and retraining subcontractors, and to experiment the process in construction (Ireland, 1997).

1.2 Research Framework

This study focuses on vertical relationships between contractors and subcontractors and on contractors' perceptions of their relationships with key subcontractor. Hence, the unit of analysis in this study is the contracting firms.

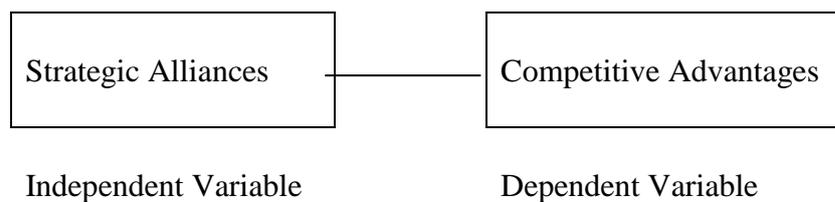
Figure 1.1 Strategic Alliance Relationships versus Competitive Advantage



The proposition suggests that the formation of strategic alliances between contracting and subcontracting firms is positively related to competitive advantage in public sector construction works. Figure 1.1 indicates the proposition that is to be tested by this investigation. The literature review in Chapter 2 further discusses this proposed relationship.

To test the proposition, a conceptual framework, as shown in Figure 1.2, is developed to postulate and test the correlation so as to improve the understanding of the dynamics of the situation. In order to tap into the subjective feelings and perceptions of individuals, it is necessary to reduce the concept into observable characteristic behaviours. *“Reducing concepts so that they can be measured is called operationalising the concepts”* (Sekaran, 1992, p190). Chapter 4 details the research design including the operationalisation of the concepts of strategic alliance as an independent variable and of competitive advantage as a dependent variable.

Figure 1.2 Relationship between the Independent and the Dependent Variables



1.2.1 Problem

This study sets out to investigate the balance between co-operation and competition; hence the problem addressed in this research is *“Do strategic alliance relationships between contractors and subcontractors promote competitive advantage in public sector works?”* Essentially the argument to be tested proposes that the formation of strategic alliance relationships is a business strategy which contracting firms can adopt to gain competitive advantage over competitors.

1.2.2 Questions

To explore this research problem, two principal research questions and four supplementary questions were developed to operationalise the research. “*How can strategic alliances be measured?*” and “*Do strategic alliances matter in gaining competitive advantage?*” form the two principal questions. The supplementary questions are:

- What benefits can contracting firms expect from the formation of strategic alliances with subcontractors?
- What factors hinder the formation of strategic alliances relationships?
- How do industry professionals perceive the degree of importance in forming strategic alliances with subcontractors?
- Which subcontractors are involved in strategic alliance relationships?

1.2.3 Objectives

This research is intended to lead to an increase in the understanding of the role of strategic alliances in gaining competitive advantage or otherwise in the building construction industry. It also develops a series of measures to evaluate strategic alliance as a competitive tool for contractors in building construction. It begins with the introduction of a framework comprising six elements sourced from published literature describing attributes of strategic alliances. A specific and important industry sector—public building construction in Queensland—was selected. Contracting firms’ responses towards attributes of strategic alliances are tested against competitive advantages over their competitors. To compare the performance of different contracting firms, six measures of competitive performance were selected. This analysis framework allowed the possible existence of relationships to be examined between strategic alliances and competitive performance.

In this context, the following operational objectives were established:

- to investigate and define the concept of strategic alliances in use in industries;
- to identify the strategic alliance attributes;
- to devise measures of strategic alliances in the building construction industry (to answer the first principal research question: *How can strategic alliances be measured?*)
- to develop a set of competitive advantage indicators;
- to increase the understanding of how the formation of strategic alliances between contractors and subcontractors relates to competitive advantage in gaining Queensland public sector building construction works (to answer the second principal research question: *Do strategic alliances matter in gaining competitive advantage?*); and
- to assess the validity and reliability of the measure of strategic alliance relationships.

1.2.4 Research Methodology

The main objective of any research investigation is to select a research method and design a most appropriate approach to the study. Before finalising the selection of the research approach for this investigation, preliminary information gathering was carried out by unstructured interviews with industry professionals in the private sector and with public sector managers in a number of Government Institutions. A focus group discussion with officials from the Queensland Government, Department of Public Works and Housing was also conducted.

After completing the preliminary investigation, the main study was carried out in breadth (quantitatively) rather than in depth (qualitatively) and “*focuses directly on the relationships among variables*” (Ragin, 1994, p145). This research was carried out by questionnaire survey.

This investigation is motivated primarily by curiosity in a professional discipline. It is a deductive mode of research in a quantitative study for a correlational-predictive type of research. The research plan, which guides this work, consists of the seven-step process in the hypothetical-deduction method: observation, preliminary information gathering, theory formulation, hypothesising, data collection, data analysis and deduction. The detail of the research method is fully described in Chapter 4.

1.2.5 Delimitation of Scope

Sections 1.2.1 and 1.2.2 outline the core of the research problem and questions, which establish the boundaries of this investigation. The data collection adopted for this investigation consists of detailed survey questionnaires. A list of building contractors was obtained from the Queensland Government Department of Public Works and Housing. The list comprised of 71 registered contractors who had offices located in South-East Queensland, and were capable of performing building projects valued upward of AUD\$5m. Each contractor was contacted by telephone prior to mailing a questionnaire in order to identify the principal type of business and the names of the key personnel—General Manager, Construction Manager, Estimator and Project Manager—and to seek co-operation for the study.

1.3 Justification for the Research

This research problem is proven to be important on several theoretical and practical grounds. This study of the limitations of contracting firms forming strategic alliance relationships with subcontractors can be justified by:

- the importance of the strategic alliance relationships relating to the construction industry in terms of the national economy;
- the application of existing theories of strategic alliances developed from other industries, e.g. manufacturing industries, to the construction industry;
- the relative neglect of this research problem by previous researchers; and
- the future usefulness of potential applications of the research findings.

1.3.1 Effect on the National Economy

The construction industry occupies a significant position in the Australian economy. The 1995-96 Australian National Accounts (Australian Bureau of Statistics, 1997) indicates that the construction of non-residential building and engineering construction as a whole represented AUD\$27 billion of work—6.4% of Gross Domestic Product (GDP). Of the AUD\$27 billion, \$6.3 billion represents the public sector's expenditure on non-residential building construction in 1995-96. Table 1.1 provides a comparative summary of the Gross Domestic Product by Industry for the 1995-96 fiscal year.

Table 1.1 Gross Domestic Product by Industry (AUD\$ million)

Industries	1995-96
Manufacturing	59,184
Wholesale trade	43,890
Ownership of dwellings	41,905
Property and business services	34,306
Retail trade	30,657
Construction	27,147
Transport and storage	25,462
Health and community services	23,303
Education	19,509
Mining	18,668
Finance and insurance	17,572
Agriculture, forestry and fishing	15,873
Government administration	15,393
Communication	15,180
Electricity, gas and water	13,707
Culture and recreational services	8,683
Accommodation, cafes and restaurants	8,240
Personal and other services	7,533
Import duties	5,439
All industries (GDP)	415,133

Source: Australia Bureau of Statistics (1997), Table 4, p10

The industry employs 7.4% of the nation's workforce and exerts a considerable influence over the rest of the economy. In addition, a range of related industries also depend on a vigorous construction industry, for example: building materials suppliers and components manufacturers. *"Construction, therefore, is an important barometer of a nation's economy—both in terms of current investment in fixed capital assets and as a guide to a country's stage of economic development"* (Male, 1991, p5).

The construction industry as a whole is very sensitive to any slow-down in the national economy. It is usually the first to feel the effects of any form of recession and the last to recover from an economic downturn. As a result, the number employed in the construction industry is highly susceptible to booms and busts in the economy and to the 'stop-go' policies of Governments (Harvey and Ashworth, 1993). In Australia, the public sector is a large client of the construction industry. The Australian Government can affect the amount of public construction work by influencing the demand on the industry and by acting to control economic growth through fiscal and monetary policies.

This construction sector of the economy not only faces the fluctuations of the financial capitals in and out of the industry but also problems with efficiency and productivity. Up until now, construction has received little attention and comparatively little policy reform has been undertaken. Results from a study by Stoeckel and Quirke (1992, p36) indicate that *"a 10 per cent gain in efficiency in construction would lead to a 2.5 per cent annual gain in the GDP after all long term adjustments have occurred in the economy. The construction industry (other than residential building) is the sixth largest services industry yet it can apparently make over twice the impact on GDP as efficiency gains (in percentage terms) in other industries of similar size"*.

Given the impact of the construction industry on GDP, it appears to justify to carry out this research in order to explore whether or not the concept of strategic alliances will enhance co-operation and reduce adversarial relationships, and in turn, improve efficiency in the construction industry.

1.3.2 Application of Existing Theory

The theoretical framework developed in this research is drawn from the existing theories published in the literature relating to areas such as: business marriages (Lendrum, 1995), marketing relationships (Gummesson, 1994) in business, marketing channels (Spekman and Sawhney, 1990) in computer industry, partnering (Cowan, 1992) in the building construction industry, and with particular emphasis on the buyer-supplier relationships (Morris and Imrie, 1993) in the manufacturing industry.

Newcombe (in Langford and Male, 1991) claims that functions carried out in construction are comparable to those of manufacturing, as illustrated in Table 1.2.

Table 1.2 Principal Functions Performed in the Manufacturing and Construction Industry

Manufacturing	Construction	Principle of Function
Marketing	Estimating	Identification/creation of markets, and selling of end 'product'.
Production	Construction	Organisation, movement and assembling of various materials, components etc.
Purchasing	Buying	Acquisition, bulk or otherwise of production materials and components for a project or in lieu of a project.

Source: Newcombe (in Langford and Male, 1991)

Traditionally, the automotive industry relies on competitive bidding for awarding supplier contracts (Frey and Schlosser, 1993, p69). It is a tendency in the Australian Construction industry for contractors to award work to sub-contractors, also by a competitive bidding method.

However, the Japanese manufacturing industries have changed the concept of competitive bidding. The Ministry of International Trade and Industry (in Dyer and Ouchi, 1993) points out that the Japanese manufacturing industries owe their competitive advantage and strength to their sub-contracting structure. Dyer and Ouchi (1993) explain that a Japanese-style partnership is an exclusive (or semi-exclusive) buyer-supplier relationship that focuses on maximising the efficiency

of the entire business system (value chain). This research sets out to explore whether or not such a relationship is important between the contractor and subcontractor in the construction industry.

1.3.3 Limitation of Previous Research

A number of studies have addressed the relationship between strategic alliance and competitive advantage in industries such as: automobiles (Burgers, Hill and Kim, 1993; Sasaki, 1993; Haigh, 1992; Cusumano and Takeishi, 1991; Devlin and Bleackley, 1988); computers (Mohr and Spekman, 1994; Magee, 1992; Crouse, 1991); electronics (Hagedoorn and Schakenraad, 1994; Henricks, 1991; Doz, 1988); pharmaceutical (Spiegel, 1993; Doorley, 1993); telecommunications (Whenmouth, 1993; Hagedoorn and Schakenraad, 1993). In the construction industry, the concept of project partnering between client and contractors has been studied (Lenard et al, 1996, Bennett and Jayes, 1995; Cowan, 1992), but little research has addressed the relevance and limitation of the concept of strategic alliance between contractors and subcontractors, although the majority of on-site building construction work is subcontracted.

1.3.4 Potential Applications

Public sector policy analysts and managers are constantly seeking ways to improve the contractor selection process to reduce project risk and create conditions for a greater certainty and quality of contractor performance. It is also the objective of the Queensland Government's industry reform program to eliminate perceptions that price is the single relevant criteria in tendering for its works. Hence, tender selection seeks to evaluate the tender not only on the basis of lowest price confirming tender but also other criteria, which include the formation of strategic alliances between contracting and subcontracting as one of the evaluation criteria.

It is recognised by industry professionals and academics that as much as 80 to 90% of the value of work on a construction project is performed by subcontractors. Contractors have started to realise that a possible potential for improving efficiency and cost saving lies with subcontractors. If contractors are to improve their performance and productivity they should concentrate their efforts on where the majority of the work takes place, i.e. subcontracting. *Contractors are making attempts to move away from their traditional adversarial approach in dealing with subcontractors towards developing closer working relationships* (Matthews, Tyler and Thorpe, 1996, p1).

1.4 Key Findings and Results

The measures for the concepts of strategic alliance and competitive advantage developed in this research represents a thorough literature search of existing knowledge in the areas as mentioned in Section 1.4.2. Six strategic alliance attributes—trust, commitment, interdependence, communication, co-operation and joint problem solving—form the independent variable; and two dimensions relating to competitive advantage—business performance and on-site construction process—form the dependent variable. This theoretical framework is the foundation on which this research project is based. It elaborates the relationships among the variables and describes the significance and direction of the relationships.

This research provides evidence of the limitations of strategic alliances in suggesting that managers of contracting firms with strategic alliances believe they are not competitive with low cost but provide better customer satisfaction due to improved on-site construction process. The findings suggest that the dichotomy between a differentiation and low cost generic strategy evidences itself in comparing contracting firms' competitive strategies, i.e. either low cost or differentiation, in the tendering process. Public sector clients should be aware of the on-site benefits achievable through contractors and subcontractors working more closely together. This relationship may result in a higher initial tender price than typically achieved using the open competitive tendering amongst all contracting firms, regardless of their relationship with subcontractors. However, in the long-term, a higher standard

of on-site construction processes may provide better value for money in respect of the facility life-cycle.

Despite a number of studies having addressed the concept of strategic alliance in other industries, the significant contributions from this research are based on two facts: 1) there is lack of theoretical and empirical evidence to address the operationalising the concept of strategic alliances in the building construction industry, and 2) this research into the relationships between strategic alliance and competitive advantage of building contracting firms is new.

1.5 Outline of the Thesis

Chapter 1 is the introductory section which develops the reasons for and the direction of this investigation. Chapter 2 summarises the current state of knowledge by addressing relevant background literature. Areas included are business strategy, co-operative business relationships, independent and dependent variables for measurements, and competitive advantage of the construction industry.

Chapter 3 reviews building construction in Queensland, in particular, the functions and tendering process for awarding building contracts by the Queensland Government Department of Public Works and Housing. Chapter 4 describes the research methodology in general; the research design used, including data collection method, sample selection, scale measures, validity and reliability; theoretical framework and development of hypotheses. Chapter 5 describes the data collection process and how the data are being analysed.

Chapter 6 describes a factor analysis seeking patterns among the variables. A reliability analysis by computing the Cronbach's Coefficient Alpha for both the independent and dependent variables is also detailed. Chapter 7 describes and examines the issues leading to the abandonment of strategic alliances in building construction industry. Chapter 8 offers conclusions regarding the research objectives, contributions to both theoretical and applied knowledge.

1.6 Summary

This chapter laid the foundation for the thesis. It introduced the research problem and research questions and proposition. Then the research was justified, definitions were presented, the methodology was briefly described and justified, the thesis was outlined, and the limitations were given. On these foundations, the thesis can proceed with a detailed description of the research.

2 REVIEW OF THE LITERATURE

2.1 Introduction

This chapter presents a synthesis of a literature review from several broad areas: competitive strategy, marketing relationships, buyer-supplier relationships in the manufacturing industries, manufacturer-distributor business relationships in the computer industry and partnering in the building construction industry. Section 2.2 introduces the concept of strategic alliances. Section 2.3 summarises the research needs established in the literature. The following two sections, Sections 2.4 and 2.5 describe the motives of firms entering into strategic alliances and the types of strategic alliance relationships.

Section 2.6 provides an overview of the existing typologies and attributes of strategic alliance and Section 2.7 indicates the benefits and hindering factors in forming strategic alliance relationships. The relevance of strategic alliances between contractors and subcontractors is discussed in Section 2.8 and Section 2.9 reviews the difficulties in forming strategic alliances in construction industry.

The attributes established in Section 2.6 form the measurement of a contractor's strategic alliance relationships with subcontractors as an input measure are detailed in Section 2.10. The development of the measuring instrument for strategic alliance attributes is also described in Section 2.10.

While Section 2.11 highlights competitive strategy in industry, Section 2.12 focuses on competitive advantage in the building construction industry. Section 2.13 formulates the performance indicators for competitive advantage as an output measure. The linking between strategic alliances and competitive advantage is described in Section 2.14. Section 2.15 summarises the background literature review and establishes the point of departure for this investigation.

2.2 The Concept of Strategic Alliances

Industry has rarely been so simple that a single entity could assemble all the materials necessary to produce particular goods or services efficiently, hence “*businesses have been networking in some form or another for centuries*” (Holmes, 1994). According to Limerick and Cunnington (1993), networking was the primary characteristic of nineteenth-century business organisations. The networking came in different forms with different labels such as strategic networking, subcontracting and strategic alliances.

Ring and Van de Ven (1992) state that recently an unprecedented number of firms in many industries have been entering into a variety of interorganisational business relationships to conduct their business deals. Such relationships can be found in many forms such as mergers and acquisitions (Nevaer and Deck, 1990), joint ventures (Kogut, 1988), license agreements and suppliers arrangements (Borys and Jemison, 1989), networking (Buttery and Buttery, 1994), mentor/protégé (Thompson, 1993), partnering (Cowan, 1992) and alliances (Lei and Slocum, 1992).

Focusing on alliances, these alliances are coalignments between two or more firms in which the partners hope to learn and acquire from each other the technologies, products, skills, and knowledge that are not otherwise available to their competitors (Lei and Slocum, 1992). Dev and Klein (1993) indicate that the alliances are relationships between independent parties that agree to cooperate but still retain their separate identities.

Takac and Singh (1992, p33) explain that the term *strategic* provides an additional dimension to the definition and such dimensional components require that strategic issues: “(1) *have a futuristic vision; (2) have an impact on multi-functional or multi-business environments; (3) necessitate consideration of factors in the firm’s external environment.*” The term *strategic alliance* (Howarth et al, 1995, p2) is described as “*a cooperative arrangement between two or more organisations that*

forms part of, is consistent with their overall strategy, and contributes to the achievement of their major goals and objectives.”

Pekar and Allio (1994) found the existing of *strategic alliance* formations in a wide spectrum of industries including electronics, communications, financial services, pharmaceuticals and manufacturing. In the United States, over 20,000 US alliances were forged between 1988 and 1992 comparing only 5,100 were created between 1980 to 1987. Such formation has been growing at an annual rate of over 25 per cent since 1985. Feulner (1992) indicates that from 1979 to 1985, the number of alliances among American, European, and Japanese firms grew 30 fold.

In the construction industry, alliances represent a significant departure from the traditional project by project contracting arrangements between contractor and subcontractors, and are characterised by the involvement of long-term relationship between contractors and subcontractors to achieve both individual and joint business goals. The Final Report of the New South Wales Royal Commission Building Industry (Gyles, 1992) indicates the necessity for changing the existing building construction culture to more of a *win-win* relationship. An alliance is a viable response to business opportunity to achieve the *win-win* solutions (Plemmons and Sanders, 1995).

2.3 Identify Need for Research in Literature

Subcontracting is a very common practice in the building construction industry (Chau and Walker, 1994). On building construction projects, it is common for 80-90% of the total work value to be performed by subcontractors (Matthews et al, 1996; Hinze and Tracy, 1994). The UK Ministry of Public Building and Works Report (1964) emphasised in its findings the importance for building subcontractors to be closely integrated into the construction team. Thirty years later, Latham (1994) also recommended the earlier involvement of subcontractors and the development of greater team involvement through better and more co-operative relationships with contractors. Much of the Royal Commission into the Building Industry (Gyles, 1992,

Appendix PR11, p161) also pointed “*to the abiding significance to the building process of the relationship between the head contractor and subcontractors.*”

Contractors are now not only starting to recognise the importance subcontractors’ performance has on their success. In addition, they have only just started to make attempts to move away from their traditional adversarial approach in dealing with subcontractors towards developing closer working relationships (Matthews et al, 1996). With a shift toward co-operation as a means of strengthening competitiveness, contractors are now concentrating on more effective marketing strategies, establishing project teams that would work on more than a single project together and forming strategic alliances (Construction Industry Institute, 1992).

Although subcontractors play a vital role in the building construction process, little is documented in literature, theoretically or empirically, about the working relationship that exists between contractors and subcontractors (Hinze and Tracey, 1994). This study seeks to mitigate this knowledge gap.

2.4 Motives for Firms to Enter into Strategic Alliances

Research on strategic alliances generally postulates theories addressing the reasons firms enter into closer business relationships. Kanter (1989) points out that due to heightened competitive pressures, many firms have established new cooperative agreements with other organisations. It is claimed that the use of alliances will grow in the future (Dev and Klein, 1993, Borys and Jamison, 1989), because combinations of strengths found in a well arranged alliance will serve as an antidote to many industries' problems and difficulties (Dev and Klein, 1993).

Lorange et al (1992) identify four generic motives for forming alliances: as a defence, to catch up, to remain or to restructure. A *defensive* position when a firm's business is of primary importance and is a leader in this particular business, and when it wants additional access to new competencies, to markets, to technology or to specific resources in order to sustain its competitive advantage over time. A firm's

catching-up motive is more of a follower in the business segment; strategic alliance could strengthen a firm's competitive position and help it moving toward becoming a leader. The other two generic motives for forming an alliance are to *remain* in the business and to *restructure* the business.

The underlying principles for these motives are summarised as follows:

Efficiency

- Efficiency creation through economies of scale specialisation and/or rationalisation (Lorange and Roos, 1993; Gugler, 1992; Spekman and Sawhney, 1990; Contractor and Lorange, 1988)
- Extend the scope of existing operations (Collazo, 1993; Powell, 1987)
- Maximise use of facilities (Lindsay, 1989; Powell, 1987)

Capabilities

- Complementary capabilities (Henricks, 1991; Contractor and Lorange, 1988; Powell, 1987) of alliances in a 'value chain' - vertical quasi- integration (Porter, 1980) such as:
 - money (finance)
 - technical talent (technology, manufacturing)
 - distribution channel (marketing)
- Access to different and /or new technologies (Murray and Mahon, 1993; Gugler, 1992)
- Pool resources, raise equity capital and diversify the Company (Spekman and Sawhney, 1990; Lindsay, 1989; Powell, 1987)

Competition

- Growth and improve competitiveness (Doorley, 1993; Dev and Klein, 1993; Roberts, 1992; Spekman and Sawhney, 1990; Contractor and Lorange, 1988; Powell, 1987)
- Strong barriers to competitors (Lewis, 1992; Dent, 1991)
- Beat competitor (Murray and Mahon, 1993; Roberts, 1992; Lindsay, 1989)

Marketing

- Accelerate product introduction (Collazo, 1993; Cellini, 1993; Henricks, 1991)
- Access to markets (Stiles, 1994; Dubbs, 1993; Gugler, 1992; Powell, 1987)
- Access to global markets (Murray and Mahon, 1993; Lindsay, 1989; Contractor and Lorange, 1988)

Risk and Costs

- Spreading financial risk and sharing costs (Collazo, 1993; Murray and Mahon, 1993; Gugler, 1992; Spekman and Sawhney, 1990; Lindsay, 1989; Contractor and Lorange, 1988; Powell, 1987)

Technology

- Access to complementary technological resources (Lorange and Roos, 1993; Murray and Mahon, 1993; Hampson, 1993; Gugler, 1992; Contractor and Lorange, 1988)
- Attract new technologies (Lindsay, 1989; Powell, 1987)

Research and Development

- To participate in a defined research program and benefit from results (Cellini, 1993)
- Reduction, minimisation and sharing of uncertainty in research and development (Harrigan, 1988; Porter, 1986)
- Reduction and sharing of costs of research and development (Harrigan, 1988)

Industry professionals and researchers indicate that the formation of strategic alliances between firms is becoming an important business strategy for firms to gain or maintain competitive advantage (Mohr and Spekman, 1994). Devlin and Bleackley (1988) discuss that the formation of strategic alliances is to secure and maintain firms' competitive advantage. The growth of alliances is viewed as a key to sustained competitive advantage for industry success (Gulati et al, 1994).

2.5 Types of Strategic Alliance Relationships

The term 'strategic alliance' is used to refer to a range of inter-organisational relationships. These relationships can be grouped into four broad classifications of service: ad hoc, cross-company consortium, opportunistic and stakeholder alliances (Kanter, 1988; Lorange et al, 1992; Howarth et al, 1995).

Lorange et al (1992) indicate that an over-riding consideration driving the formation of a strategic alliance is the type of relationship that the parent firms intend to have with others. There are numerous possible alliances which include:

- an *ad hoc* strategic alliance. This is when two firms put in a minimum set of complementary resources, on a temporary basis, and all of the output is given to the parent firms;
- a *consortium* alliance. This occurs when the parent firms are willing to put in more resources than in the ad hoc case, but the output is dispersed back to the parent firms;
- a *joint operations* strategic alliance. This type of alliance operates where the parent firms are contributing a minimum input resources into common organisation, but the main output resources are now retained in the alliance;
- *full-blown alliances*. This involves resources being supplied in abundance and most of the outputs being ploughed back to the alliance itself. This is a long-term cooperation between partners to develop an entirely new business operation.

Kanter (1989) argues the benefits and issues that partnerships create depend on the purpose of the alliance. She distinguishes three categories of such partnerships: service alliances, opportunistic alliances, and stakeholder alliances.

- **Service alliances:** a group of organisations band together to create a new entity to fill their common need e.g. an industry research consortium;

- ***Opportunistic alliances:*** organisations see an opportunity to gain an immediate competitive advantage through a temporary alliance that gets them into a new business;
- ***Stakeholder alliances:*** complementary coalitions between a number of stakeholders in a business process who are involved in different stages of the value-creation chain. Stakeholders include suppliers, customers, and employees.

Ad hoc strategic alliance

An example of the ad hoc pool strategic alliance can be found in the pharmaceutical industry, where a particular leader cooperates on an ad hoc basis in tight strategic alliance designs on new business development or on research development. It can also be found in chemical firms dealing with small innovative potential competitors. These ad hoc strategic alliances tend to have a defensive nature from the point of view of the leader partner. From the point of view of the other party, the leader's nature tends to be opportunistic in exploiting the leadership it sees from being an innovator in the niche area (Lorange and Roos, 1993).

Service alliances: the cross-company consortium

This type of strategic alliance is where a group of companies engages in an industry research consortium, each partner having too small a resource base to carry out all of the research on its own. According to Howarth et al (1995), such alliances provide economies of scale and the ability for partners to undertake large-scale projects but, generally, have a limited purpose. They also indicate that the consortium alliance structure is used to minimise the risk of any one partner. However, they further indicate that difficulties might arise due to the diversity of the interests and goals of the partners, resulting in a loss of commitment from members.

Opportunistic alliances: the joint venture

Kanter (1988) identifies opportunistic alliance is one motivated by an opportunity to gain an immediate competitive advantage through an alliance. The joint venture is a typical opportunistic alliance (Howarth, 1995). In building construction, a joint venture involves two or more participants and is typically short-term, such as an agreement for one project (Plemmons and Sanders, 1995). The participants retain their original identity in a joint venture relationship (Badger and Mulligan, 1995). For example, the construction of Australia's \$1.1 billion new Parliament House project in Canberra was a massive undertaking that challenged the construction industry to perform to the highest standard. The Concrete-Holland Joint Venture was formed specifically to bid for construction management of the project. Concrete Constructions Pty Ltd, the senior partner, supplied expertise in building construction and John Holland (Constructions) Pty Ltd brought additional experience in design, engineering and resource know-how (Parliament House Construction Authority, 1990).

Stakeholder alliances: suppliers, customers, employees

Stakeholder alliances had been described as having the closest tie among business organisations' members of all of the three forms, and is identified as having the largest amount of sharing and overlap in its activities (Kanter, 1989). Eccles (in Kanter, 1989) describes one good example of a stakeholder alliance that is the 'quasifirms' of building contractors and their subcontractors in the construction industry. Kanter (1989) and Howarth et al (1995) identify the merits of moving from being merely an opportunistic alliance to a stakeholder alliance as:

- increasing reliance on suppliers in order to continually cut costs and improve quality and reliability;
- focusing on creating more significant networks with customers to form the single best source of new business; and

- establishing linkages between labour organisations and management to formulate policies to guide organisations through periods of rapid change, to permit innovation and improve competitiveness.

Pekar and Allio (1994) indicate that firms are increasingly cooperating through non-equity ventures. They also identify different types of non-equity alliances in Table 2.1.

Table 2.1 Different Types of Strategic Alliances

Alliance Types	Examples
Collaborative advertising	American Express and Toys R Us (co-operative effort for television advertising and promotion)
R & D partnerships	Cytel and Sumitomo Chemicals (alliance to develop next generation of bio-technology drugs)
Lease service agreements	Cigna and United Motor Works (arrangement to provide financing services for non-US firms and Governments)
Shared-distribution	Nissan and Volkswagen (Nissan sells Volkswagen in Japan and Volkswagen distributes Nissan's cars in Europe)
Technology transfer	IBM and Apple Computers (arrangement to develop next generation of operating system software)
Co-operative bidding	Boeing, General Dynamics and Lockheed (co-operated together in winning advanced tactical fighter contract)
Cross-manufacturing	Ford and Mazda (design and build similar cars on same manufacturing/assembly line)
Resource venturing	Swift Chemical Co., Texas gulf, RTZ and US Boral (Canadian-based mining natural resource venture)
Government and industry partnering	Du Pont and National Cancer Institute (Du Pont worked with NCI in first phase of clinical cancer trial of IL)
Internal spin-offs	Cummins Engine and Toshiba Corporation (created new company to develop/market silicon nitride products)
Cross-licensing	Hoffman-LaRoche and Glaxo(HL and Glaxo agreed for HL to sell Zantac, anti-ulcer drug, in the United States)

Source: Pekar and Allio (1994, p56)

Alliances can also be classified as either *horizontal* or *vertical*. Alliances between competitors are referred to as *horizontal alliances* (Burgers et al, 1993). They can be distinguished from *vertical alliances* between firms operating in adjacent stages of a value chain (Harrigan, 1988). This research focuses on a full-blown (Lorange et al, 1992), co-operative bidding (Pekar and Allio, 1994) and vertical alliance relationships between contractors and subcontractors operating in adjacent stages of a value chain (Harrigan, 1988) relating to the building construction industry.

In the building construction industry, vertical alliances operate like a value-adding partnership. Johnston and Lawrence (1988) describe that general contractors subcontract almost all the work on a construction job, soliciting bids from a selected set of sub-contractors they trust and making contracts with 'partners' who offer reasonable prices, not always the lowest bid. Porter (1980) states that quasi-integration is the establishment of a relationship between vertically related business such as in the building construction industry business. In this vertical alliance process, each operating company (sub-contractor) focuses on doing one-step of the value-added chain, generally one specific construction trade or process.

2.6 Typologies of Strategic Alliances

In reviewing previous work it is necessary to examine some frameworks for analysis. Such frameworks—relationship between couples, marketing relationships, buyer and seller relationships in the manufacturing industries and partnering in the construction industry—can help not only to focus attention on the co-operative relationships and highlight similarities and differences but also to formulate the research model of strategic alliances between contractors and subcontractors.

2.6.1 Business Marriages

Some analysts have compared *strategic alliances* to long term relationship between couples such as marriages (Lendrum, 1995; Dev and Klein, 1993). Dev and Klein (1993) view alliances as relationships between independent parties that agree to co-operate but still retain their separate identities. They categorise relationships as short-term, medium-term and long-term relationships such as marriages:

- short-term relationships are opportunistic relationships which have a limited focus. While each party receives some satisfaction through a clearly defined set of expectations, there is no commitment to the relationship.
- medium-term tactical relationships are characterised by some degree of sharing, there remains a strong sense of self-protection among the partners, and the alliances' duration are limited.

- long-term relationships have strategic relation in view. The parties in these arrangements clearly expected continuity and mutual commitment. The level of sharing is high, and these relationships offer considerable opportunity for synergy.

According to Lendrum (1995), a good long term relationship, such as marriage, involves developing the right attitude, having a vision, setting common goals and having the courage, skills and commitment to make it happen. He argues that the *“fundamental to a strong marriage is trust, a common set of values, good communication, co-operation and the ability to resolve conflicts amicably”* (p31).

Lederer and Jackson (1968, p188) explain *“marriage is a complex unity made up of at least three different but **interdependent** systems:”* a different system in each of the two partners and the marital system, deriving from the interaction of two different systems joined together (the compages, or relationship). In order to have a workable and satisfactory long term relationship, they indicate that the partners need to respect and **trust** each other i.e. having confidence in or reliance on some *“quality of being trustworthy; fidelity; loyalty; trustiness”* (p106); to **communicate** constantly i.e. *“a constant exchange of information—of messages”* (p98); to make a **commitment** which is being described as *“the degree to which that person is willing to compromise self-interest, personal ideals of perfection, indulgence in tastes, and so forth, so that a particular relationship can continue”* (p196) and *“keep working on their relationship until the day they die”* (p199); to **co-operate** so that *“they can be both supportive and competitive without fear, knowing that neither will win all issues at the expense of the other”* (p161) and to *“combine two sets of individual goals in forming a joint system which develop its own share goals”* (p174); to tolerate each other and to negotiate *“quid pro quo implying shared, or exchanged, behaviour”* (p178) instead of tit for tat or point and counterpoint behaviour.

2.6.2 Marketing Relationships

The main findings of the UK Chartered Institute of Building (1993) indicate that the traditionally accepted 4P’s of marketing—product, price, promotion and place—are inappropriate for contractors to be leaders in the business. A new approach has been

developed to foster a wide network of long term relationships between clients and contractors with other project team members—consultants, subcontractors, suppliers and financiers. The aim is to secure perpetual long-term benefits for all, encouraged by relationships founded on trust.

According to Gronroos (1994), the marketing mix management paradigm with its 4P's model turns into a straitjacket for marketing researchers, educators and practitioners. *“A paradigm shift from the manipulate of customers through the 4P's to co-operative relationships, networks and interactions is called for”* (Gummesson, 1994, p32). i.e. moving *“from a short-term transaction-oriented goal to a long-term relationship-building goal”* (Gronroos, 1994, p16). Gummesson (1994) also indicates that relationships marketing is a win-win strategy which is beneficial to all parties in the long term. He argues that without the relationships it is a win-lose situation, it is easy to go for the quick gains rather than long term benefits. At the end, one party wins and the other loses.

Wilson and Jantrania (1994, p56) define a strategic alliance in marketing relationships as *“a relationship where a synergistic combination of individual and mutual goals encourages the partners to invest time, effort and resources to create a long term collaborative effort that achieves individual and partnership strategic advantage.”* Relations should be driven by strategic goals and firms should use such relationships to gain competitive advantage, to strengthen core competencies and to create market position (Wilson and Jantrania, 1994).

Borys and Jemison (1989) describe relationships using the term hybrid. They discuss the theoretical concept of hybrid arrangements as strategic alliances and define hybrids as *“organizational arrangements that use resources and/or governance structures from more than one existing organisation”* (p235). They identify four key elements that form the core of a theory of a hybrid arrangements—*“breadth of purpose, boundary determination, value creation, and stability mechanisms”* (p234). Wilson and Jantrania (1994) summarise the stages and issues at each stage in creating a hybrid relationship as discussed by Borys and Jemison:

- purpose—goal definition, assess corporate culture compatibility, mutual purpose of relationship and openness of communication;
- boundary definition—trust in corporate reputation and individuals, resource and people commitment, and limited resources;
- value creation—value management, changes in value and sharing value; and
- hybrid stability—relationship expansion, hybrid culture maintenance and reward systems to support the relationship.

2.6.3 Buyer–Supplier Relationships

Both the UK and US automobile manufacturers have traditionally operated buyer–supplier relationships through a system of *adversarial contracting* (Morris and Imrie, 1993, p53), which relies on “*competitive bidding for awarding contracts*” (Frey and Schlosser, 1993, p69). Under such a system, “*material specifications are explicitly defined in advance and a supplier is selected through competitive bidding, often on the basis of the lowest bid price*” (Stuart, 1993, p23). A survey by Lyons, Krachenberg and Henke in 1990 (in Frey and Schlosser, 1993) of US automotive suppliers reveal that, with this aggressive competition, suppliers were losing their margins while manufacturers were reaping the gains due to the more powerful manufacturers extracting concessions and achieving improvements at the expense of less powerful suppliers. Morris and Imrie (1993) indicate similar situations in the UK where relationships are often one sided with little collaboration, cooperation and lack of trust between parties.

Ministry of International Trade and Industry (in Dyer and Ouchi, 1993, p51) points out that “*Japanese manufacturing industry owes its competitive advantage and strength to its subcontracting structure.*” According to Cusmano and Takeishi (1991), automobile manufacturers in Japan have changed from the traditional behaviour of the competitive bidding process in selecting suppliers to a long-term and mutual co-operative relationship with their suppliers. Morris and Imrie (1993) indicate the Japanese model now emulating by Western firms is an obligational relationship involving a series of close ties between buyer-supplier in a long term trust partnership with heightened interdependency.

Stuart (1993) summarises the paradigm shift from a traditional approach to a buyer-supplier relationship in Table 2.2.

Table 2.2 Traditional Vs Supplier Partnering Elements

Traditional Approach (an extreme illustration)	Supplier Partnership
Primary emphasis on price	Multiple criteria including management philosophy
Short-term contracts	Longer term contracts
Evaluation by bid	Intensive and extensive evaluation
Many suppliers	Fewer selected suppliers
Improvement benefits are shared based on relative power	Improvement benefits are shared equitably
Improvement at discrete time intervals	Continuous improvement is sought
Problems are supplier's responsibility to correct	Problems are jointly solved
Information is proprietary	Information is shared
Clear delineation of business responsibility	Quasi-vertical integration

Source: Stuart (1993, p23)

The key characteristics of the buyer-supplier relationship in the automobile industries in Japan is described by Dyer and Ouchi (1993, p53):

- *“Long term relationships and commitments with frequent planned communication, which reduces transaction costs and eliminates intercompany inefficiencies.*
- *Mutual assistance and a focus on total cost and quality, working together to minimise total value chain costs (not just unit costs).*
- *Willingness to make significant customised investments in plant, equipment, and personnel as well as share valuable technical information.*
- *Intensive and regular sharing of technical and cost information to improve performance and set prices, which share equally the rewards of the relationships.*
- *Trust building and using flexible legal contracts that create a high degree of goal congruence and mutual trust.”*

2.6.4 Marketing Channels

Section 2.4 examines the motives for firms forming strategic alliance relationships with one another. Spekman and Sawhney (1990) recognise each of these different relationships shares a common and fundamental set of core dimensions that must be present for any strategic alliance relationship to exist.

Spekman and Sawhney (1990) identify and discuss the core dimensions of a strategic alliance:

- goal compatibility
- strategic advantage
- interdependence
- commitment
- communication and conflict resolution
- co-ordination of work.
- Planning

Building on Spekman and Sawhney's previous works, Mohr and Spekman (1994) developed a model of partnership success and posed the question of what partnership success means. The authors empirically tested the context of vertical partnerships in marketing channels (i.e. manufacturer and distributor relationships) in the computer industry. They indicate that the vertical partnerships are formed in order to gain competitive advantage by selling the product more effectively and efficiently. Mohr and Spekman (1994, p137) outline the behavioural characteristics in measuring a successful partnership:

- *“attributes of the partnership: commitment, co-ordination, interdependence and trust;*
- *communication behavior: quality, information sharing and participation; and*
- *conflict resolution techniques: joint problem solving, persuasion, smoothing, domination, harsh words and arbitration.”*

2.6.5 Partnering in Building Construction Industry

Building construction contracting is regarded as a very competitive business. This competitiveness is due to the cost traditionally being the prime factor in the tender

selection process (Construction Industry Development Agency, 1995). As a result, relationships among project team members have tended to be adversarial. Both the NSW Royal Commission Building Industry Report (Gyles, 1992) and the UK Latham (1994) Report identified this adversarial relationship. Both Reports recommended that, in order to achieve improvement in the building construction industry, project team members necessitate to cultivate better relationships i.e. a change from a confrontational and adversarial attitude to a harmonious relationship and a more cooperative approach. The industry needs a concept that creates a win-win attitude among all participants and partnering is one such concept (Cowan, 1992).

Cowan (1992) indicates that in the US, public sector contracting relationships have deteriorated badly in the last several years and one of the solutions to the problem is partnering. Partnering not only *“offers a new paradigm for owner-contractor relationships but also provides participants with a win-win orientation towards problem resolution and fosters synergistic team-work”* (Cowan, 1992, p39). Li and Green (1996) report in their findings on 19 public infrastructure partnering projects in Australia between 1992-1994, and showed *“positive and enthusiastic attitudes to project partnering”* (p16). The research undertaken by Bennett and Jayes (1995) indicate that the concept of partnering benefits all project team members involved. The foreword by Sir Michael Latham in the report states that the work by Bennett and Jayes offers hard evidence to support his recommendation *“that industry should make greater use of partnering; and partnering can change attitudes and improve the performance of the UK construction industry”* (Bennett and Jayes, 1995, pii).

Dubbs (1993) indicates that partnering agreements typically involve the building owner, architect, and construction manager, it is well worth the time and money to involve consultants and subcontractors. Partnering agreements are usually non-contractual alliances, formed in the spirit of cooperation and fair dealing. Bennett and Jayes (1995, p2) indicate that *“partnering can be based on a single project (project partnering) but greater benefits are available when it is based on a long term commitment (strategic partnering).”*

Royal Commission Building Industry Report (Gyles, 1992) indicates that the analysis of subcontractors and contractors in partnering is incomplete. The Report also implies that contractor and subcontractor relationships should develop under the Partnering concept. In time, *“a partnering bid may be sold to the client on the basis of the strength of teamwork and planning that lies behind it and the potential for quality execution of the work, without the usual delays and rancour and all of the established benefits of partnering”* (Gyles, 1992, Appendix PR11, p169). The partnering projects mentioned in the Construction Industry Institute Australia report (1996) and the report by Li and Green (1996) are mainly public sector works from various States. Both research findings focus on partnering relationships between clients and contractors.

To be successful, Cowan (1992) identifies the key elements of Partnering as *“commitment, equity, trust, development of mutual goals/objectives, implementation, continuous evaluation and timely responsiveness.”* These key elements have the support of: Construction Industry Institute Australia (1996), New South Wales Public Works Department (1994), Construction Industry Development Agency and Master Builders Australia (1993), Master Builders’–Construction & Housing Association Australia (1992) and Associated General Contractors of America (1991).

2.7 Benefits and Hindrance in Forming Strategic Alliance Relationships

According to Mohr and Spekman (1994), while the formation of business partnering relationships is often viewed as a panacea for an individual firm’s competitive woes, the fact is that not every strategic partnership succeeds. Section 2.7.1 describes the benefits in forming strategic alliance relationships; and Section 2.7.2 examines hindering factors which have inhibited firms from becoming involved in such business relationships.

2.7.1 Benefits

According to Bennett and Jayes (1995, p2), in the construction industry, “*partnering can be based on a single project (project partnering) but greater benefits are available when it is based on a long term commitment (strategic partnering),*” and full benefits take time to develop.

The Strategic Partnering Handbook, Lendrum (1995) identified two levels of benefits—base level and high-level—for long-term business relationships between customer and supplier. In the base-level, he illustrated the common benefits are:

- elimination of litigation and adversarial confrontation;
- elimination of waste associated with tendering system and multiple suppliers;
- reduced total cost in real terms;
- improved productivity and efficiencies;
- improved skills through joint training and skills development;
- increased profit margins;
- improved communication and people relationships;
- increased market share;
- early customer/supplier involvement in product/service development, hence reducing product/service development time; and
- improved/extended range of products and services.

Lendrum (1995) further indicated high-level benefits are forged when the base-level benefits between the customer/supplier sustained over time. High-level benefits include:

- sustained competitive advantage based on differentiated value-adding strategies;
- adding value based on an open learning environment; allowing for high skills and fast adaptation to change;
- customer satisfaction through continuous improvement based on trust, co-operation and commitment;
- higher return on investment based on profitability, greater employment opportunities and positive impact on the economy;
- positive cultural change for both organisations at all levels based on trust, co-operation and commitment; and
- world class as benchmark against world best practice.

Other principal benefits of partnering for all project stakeholders identified by the Construction Industry Institute, Australia (1996, p12) are:

- reduced exposure to litigation;
- improved project outcomes in terms of cost, time and quality;
- lower administrative and legal costs;
- increased opportunity for innovation and value engineering; and
- increased chances of financial success.

A more detailed set of benefits was identified in the Institute's study (1996) are:

- positive effect on cost of claims;
- repeating business between client and contractor;
- positive effect on schedule duration;
- improved safety performance;
- reduced rework;
- fewer errors in documentation;
- more profitable project;
- mechanism in place for recording and reporting innovation;
- evidence of innovation and improvement;
- exchanging specialist knowledge;
- innovation as a result of information exchange;
- fostered innovation;
- prompted technology transfer;
- reduced exposure to litigation;
- lower risk of cost overruns due to better cost control;
- lower risk of delay due to better time control;
- better quality product;
- lower administration costs; and
- financial success because of win-win attitudes.

2.7.2 Hindrance

In 1994, AGB McNair completed its *Business Attitude Survey on Networking*. The survey outlined the five main reasons inhibiting firms from becoming involved in business co-operation. These are: 1) concerns about disclosing information to competitors, 2) distrust of other companies, 3) desire to be independent, 4) lack of suitable partners, and 5) uncertainty about how to initiate and operate a network. The survey also revealed a range of factors (ranked from greatest to least significant) which may either have inhibited or may inhibit a business from becoming involved:

- concern regarding disclosure of information;
- want to remain independent;
- uncertain of assistance to business;
- distrust of other firms;
- lack of suitable partners;
- increased risk to firm;
- lack of information/guidance;
- type of manufacturing process;
- financial resources;
- lack of personal contacts;
- size of business; and
- geographic distance.

No doubt, some partnerships will fail. A study by Lendrum (1995) suggested poor quality and financial performance, poor communication, diminished competitive advantage due to increased costs or reduced differentiation, change in management with a new direction at odds with partnership philosophy, lack of commitment, complacency or loss of trust could cause such failures.

In 1995, the Bureau of Industry Economics published a Research Report, *Beyond the Firm—An Assessment of Business Linkages and Networks in Australia*. The aim of the study was to fill the knowledge gaps and to provide a measure for Australia manufacturing firms with respect to business linkages and networks (collectively known as business co-operation) and to assess their effectiveness as business strategies. One section of the Report discussed the impediments to business

co-operation and highlighted the factors inhibiting the forming of co-operative business arrangement. These are:

- loss of control;
- disclosing commercial secrets;
- financial costs;
- administrative/legal burden;
- additional time commitments;
- personality difficulties; and
- lack of trust.

A research project undertaken by Li and Green (1996) highlighted other obstacles to the successful implementation of partnering in the construction industry:

- individual personalities;
- lack of full participation by all stakeholders;
- inadequate top management commitment;
- frequent change of key staff in project team;
- insufficient education/training;
- bureaucracy in client organisation;
- lack of immediate monetary incentive;
- good in principle but not substantial; and
- lack of legally binding force.

2.8 Relevance in Building Construction Industry

The literature review revealed that the concept of working together with common goals and objectives seemingly worked successfully in other industries such as automobiles, computers, electronics and telecommunications as mentioned in Section 1.3.3. The review also highlighted that in other industries large benefits were gained from forming strategic alliance relationships.

Why is this relevant to the construction industry? After all, if strategic alliances are beneficial to contracting and subcontracting firms, then firms will surely adopt them as business strategies to gain competitive advantages.

There are two major gaps in this argument, which may create a reform blueprint for industry action:

- Construction industry professionals for a long time have shown negative attitudes towards reform.
- There is a need for change/reform in the building construction industry not only to make it more attuned to the progress in the other industries but also to make it more effective in meeting the needs of the various participating parties within the industry.

Changing workplace relationships is difficult to implement, but it is vital in order to improve industry performance (Australian Federation of Construction Contractors, 1992).

2.8.1 Building Construction Industry Reform

A report by the National Public Works Conference and National Building and Construction Council Joint Working Party (NPWC/NBCC)(1990) showed that during the late 1980's the Australian building and construction industry had substantial increases in the incidence of contractual claims and disputes compared to the previous ten years. The Royal Commission Building Industry Report (Gyles, 1992) also uncovered extensive corruption and malpractice in the New South Wales

construction industry. Bribery and collusive tendering practices were found to be widespread, especially in the commercial sector. Both reports identified the trend on the increase relating to disputation and litigation. The win-lose attitudes promoted adversarial and confrontational relationships among project team members.

The combination of competitive tendering and the contractual and legal framework by which project team members are bound together are the main causes of the adversarial and confrontational relationships. The main objective of competitive tendering is to drive the costs down. This action leads to disputes and conflict, which revolve around financial self-interest, among the various project team members through the construction process. A consequence of this competitive tendering and

contractual and legal framework is that costs of the project usually exceed the initial agreed price, and the conduct of the process is characterised by confrontation (Hinks, Allen and Cooper, 1996).

The NPWC/NBCC (1990) report also emphasised that no party benefits from circumstances that cause claims and disputes; and that co-operation should be encouraged for the future. It emphasised the need for industrial change. The Final Report of the Royal Commission into Productivity in Building Industry (Gyles, 1992) also clearly indicated the need for a change not only to a more co-operative approach to build mutual trust, respect and good faith but also from a confrontational and adversarial attitude to a harmonious relationship. Simply, it is necessary to change the existing building construction culture to create a *win-win* situation. Doing everything the “*same old way*” is sure to produce the “*same old results*” (Kaydos, 1991).

The construction industry has an extremely poor public image despite its key role in the state and the national economy. It needs to work on improving its image. “*One of the possible strategies for image improvement is to improve labour management relationships*” i.e. change from confrontation to co-operation in working together (Construction Industry Institute, 1992, p15). The concept of working together (Hinks et al, 1996; Day, 1996) with:

- shared objectives and goals which meet the needs of all partners;
- pooled resources to the task of meeting these goals; and
- mutual respect and trust underpinning team effort;

has seemingly worked successfully in other industries, such as the automotive industry. The concept of partnering with similar philosophy was discussed in Section 2.6.5. Latham (1994) in his report ‘Constructing the Team’ recognised the role that Partnering could play in reducing conflict and improving efficiency in the construction industry within the UK and the Royal Commission into Building Industry in NSW (Gyles, 1992) also recommended its use.

A literature search, field study questionnaire and detailed case studies were undertaken in late 1994 in Australia by Li and Green (1996). A list of 19 partnering

projects with a total value of \$340 million was established. Their findings indicated that *“the surveys of industry showed entirely positive and enthusiastic attitudes to project partnering, reflecting the benefits which were perceived to have been gained”* (p16). Bennett and Jayes (1995) suggested improvements in cost savings of 2-10% for project partnering (single project basis) and savings of 30%, over time, with strategic partnering (a series of projects), in their report on partnering arrangements both in the UK and abroad. It is also clear that greater savings are, theoretically, likely to spring from a long-term alliance than may be possible where the partnering arrangement only lasts for one project. Thus, in theory, there are bound to be improvements in working methods and communication systems resulting from the evolutionary development of long term strategic alliance relationship.

Strategic alliance relationship requires a completely new culture to that which has existed in the past. To do this, one needs to select those firms (contracting firms) which are most sympathetic to the new culture of those (subcontracting firms) with whom they are working within the alliance and then rationalise their structures and objectives to the benefit of the industry. In order to succeed in the reform, it is suggested that the building construction industry needs to invest the time and resource in developing this new culture and to ensure it works.

2.8.2 Public Sector Policy Analysts and Managers

Korman et al (1992) indicated that six US States (i.e. Arkansas, Massachusetts, Delaware, New York, New Mexico and California) required general contractors bidding on State contracts exceeding a designated amount to list the subcontractors that they intended to use in the project. Particularly in New York state, legislation also passed in order to protect those subcontractors performing a substantial portion of the project, such as plumbing, heating ventilating, mechanical and electrical subcontractors.

Construction Industry Development Agency (1994) stated in one of its recommendations that for traditional contracts only, each head contract must state the main subcontractors at the time of tender and be bound to engage those

subcontractors, unless there are compelling reasons for not being bound. Similarly each of those subcontractors should be bound to its tendered price. The Air Conditioning and Mechanical Contractors' Association of Australia (1994) also recommended that whenever engineering services contractors are selected by head contractors, that head contractor should be required to nominate both engineering service contractors and their prices in the tender.

Public sector policy analysts and managers are constantly seeking to improve the contractor selection process to reduce project risk and create conditions for a greater certainty and quality of contractor performance. It is Queensland Government's attempt to award the contract not only on the basis of lowest confirming tender but also other criteria such as technical capacity, management approach, people involvement and business relations (Queensland Government, 1997).

In a recent press release, Sunday Mail, September 21, 1997, the Queensland Government reveals a 10-year building plan for State's public hospital and health services with a total budget of AUS\$2.4 billion for over 50 major hospital projects across Queensland. It is the largest capital works program of its type in Australia.

In reference to constructing hospital projects and according to Rawlinsons-Australian Construction Handbook (1997), the services such as plumbing, mechanical, fire, electrical and transportation constitute over an average of 51% of the total building construction cost. Table 2.3 shows the elemental services costs of hospital buildings.

Table 2.3 Elemental Services Costs of Building

	Hospital District Single Storey	Hospital General Multi Storey	Hospital Maternity Multi Storey
Plumbing	6.4	4.1	4.2
Mechanical	34.0	32.8	28.1
Fire	0.5	2.3	2.8
Electrical	10.0	10.2	10.6
Transportation	-	4.2	3.6
TOTAL	50.9%	53.6%	49.3%

Source: Rawlinsons (1997, p75)

With the above discussions regarding the value of hospital building projects for the State in the next 10 years and the costs of the services comparing to the total cost of any hospital building projects, it should be appropriate for the Government to implement the formation of strategic alliance relationships in particular with the services subcontractors as one of the evaluation criteria in awarding hospital building construction project.

2.8.3 Private Sector Managers

Traditionally, contractual and business relationships between contracting and subcontracting firms are formed in three ways: as a product of open competitive tendering, or selective tendering, or by negotiation with preferred subcontractors. Among contracting firms, the subcontract procurement policy has traditionally been only to ensure the lowest price in each subcontract. This leads to a price oriented way of doing business and to frequent changes of subcontractors from one project to the next. When the project is completed, the contractual and business relationship ends. The next project is seen as a separate entity with its new set of team members, rules and problems. Based on the study of twenty major projects, the Royal Commission Building Industry Report (Gyles, 1992) revealed that the industry's adversarial relationships were not primarily caused by the form of project delivery nor by the nature of the contracts, but more fundamentally by the relationships and understandings among project team members. The Latham (1994) Report revealed the needed focus and motivation to explore improvements in main contractor - subcontractor relationships for the benefit of the industry as a whole. He further revealed that some contractors have developed long term relationships with subcontractors. Such arrangements have the principal objective of improving performance and reducing costs for clients.

It is recognised by industry professionals and academics that the majority, if not all, of the on-site construction work on projects is performed by subcontractors with main contractors only undertaking the management and co-ordination roles and activities. Contractors have to realise that the greatest potential for improving efficiency and cost saving lies with subcontractors. If contractors are to improve their

performance and productivity they should concentrate their efforts where the majority of the work takes place, i.e. subcontracting (Matthews, Tyler and Thorpe, 1996). Hence, the reliance on subcontractors has put much stress on the contractor and subcontractor relationships. Matthews et al, (1996, p1) reveal that *“contractors are now starting to recognise the importance subcontractors performance has on their own performance and they are making attempts to move away from their traditional adversarial approach in dealing with subcontractors towards developing closer working relationships.”*

The report prepared by the Construction Industry Institute Construction 2000 Task Force (1992) indicates that the success of the better working relationships require each of the project team member to be able to interact with one another to establish long-term relationships that lead to continuous improvement in productivity and quality of products and services. Each project team member needs to maintain the necessary abilities and competence to sustain a healthy, trusting relationship. The report further indicates for competition and future strategies, a shift toward co-operation as a means of strengthening competitiveness, firms need to increase their concentration on:

- *“their awareness of additional marketing strategies and the potential for new ideas created by working with other firms;*
- *establishing project teams that would work on more than a single project together, and selling the team concept to new customers as this satisfies clients who want single-point responsibility for the co-ordination of their projects;*
- *assisting clients more in the development and execution of projects; and*
- *combining independent firms to form consortia partnering relationships and strategic alliances”* (Construction Industry Institute, 1992, p12).

According to the New South Government, one of the significant drivers of change in relationships over the next five years is forging long rather than short-term project focused relationships. In the year 2005, these drivers will demand that relationships between industry participants are:

- “co-operative i.e. founded on shared objectives and shared benefits;
- built upon the essential qualities of openness, trust, equity and honesty;
- established for the long rather than short-term; and
- complement and enhance the business outcomes of all parties involved” (New South Wales Government, 1997, p14).

Dr David Watson, former Queensland Government Minister for Public Works and Housing, highlighted in his opening address to the International Conference on Construction Process Re-Engineering in July 1997:

*“Strategic alliances will also play a vital role in the future. Relationships in general in this industry will be different in the future. In a response to the clients’ need for diversity and flexibility from its seamless service providers there will be a development of what can be termed a “virtual enterprise”. This new co-operative business relationship, with its shared values and objectives, will need to have in place elements of trust, co-operation, equity and honesty. This element will need to be at a level which will allow effective management with open sharing of information. In the area of **procurement**, clients of the future will also be looking for fully packaged proposals and long term solutions from their service providers. Innovative value adding ways of procuring goods, services and infrastructure will be the competitive advantage which distinguishes one organisation from another. As well as developing the technical qualifications of its workforce, the construction industry will need to look at its **business management skills**” (Watson, 1997, p4).*

2.9 Difficulties in Forming Strategic Alliances in Construction Industry

A report by the National Public Works Conference and National Building and Construction Council Joint Working Party (1990) showed that during the late 1980’s the Australian building and construction industry had substantial increases in the incidence of contractual claims and disputes compared to the previous ten years. However, the construction industry is predominantly privately owned, with contracting firms competing against one another to undertake construction projects. With private enterprise and competition, it is suggested that, despite the increasing

disputation and litigation, there is nothing fundamentally wrong in building construction industry.

A recent survey of the Australian building construction industry (Construction Industry Development Agency, 1995) overwhelmingly indicated that contractors and subcontractors perceive their success to be determined by their company's ability to submit the lowest cost tenderer—75% of 179 companies responded ranked submission of the lowest price as the 'number one' reason for tender award success. Due to the competitive nature of the construction industry, the 'prime cost' is more important than 'value'. The practice of making price the sole criterion in awarding contracts still dominates the marketing place. Under the competitive tendering system and in order to win work, contractors must have access at tender stage to lowest possible quotations from subcontractors.

The low cost competitive strategy has a controlling influence in the economical environment of the construction industry, e.g. the market supply ranges from entrepreneurial investors looking for short term returns to Government agencies acting as long term investors. These investors have different criteria for their projects and different level of risk taking. Due to the complex nature of the construction industry, the competitive tendering system for low cost is particularly suited to some of the investors, hence, their objections to any changes.

If changes are to be made, and if the formation of strategic alliances between contractors and subcontractors is to become a selection criterion for awarding public sector works, then Government needs to look a lot more literally at it's role. The needs are to impose a discipline conducive to 'strategic alliances' within it's own sector. In the existing Government's pre-qualified tendering system, formation of strategic alliance relationships between contractors and subcontractors is neither one of the pre-qualification nor selection criterion in awarding public sector works. Therefore, it is unnecessary for any contractors in forming strategic alliances with subcontractors in order to satisfy Government's requirements.

Due to the fragmentation of the industry, management personnel of both contracting and subcontracting firms changes regularly, it is suggested that long-term commitment from the top management in the formation and implementation of such relationships would be too difficult to maintain due to regular changes in the management personnel.

The fear of losing competitive advantage in low cost, the lower of quality of product, non-performance, creating a perception of 'closed shop' and taking advantages by subcontractors are some of the contractors' concerns in forming strategic alliance relationships with them. To enter into a strategic alliance with a particular subcontractor would restrict trading with other subcontractors of the same trade, and result in a non-competitive situation.

The concept of forming strategic alliances would have the same predicament as process re-engineering—T40 project—in building construction. According to Ireland (1997, p39), *“while the principles of process re-engineering, of revising processes to make them more efficient, are beyond question, the implementation is inherently more difficult in construction than in manufacturing or service industries”* and no one in the construction industry was willing to make the additional financial commitment for a project being completed under the T40, of what may turn out to be an experiment.

2.10 Core Dimensions of Strategic Alliance Relationship

Dev and Klein (1993) compare strategic alliances to long term personal relationships such as marriages. In order to have a workable and satisfactory marriage as previously mentioned, Lederer and Jackson (1968) indicate that the partners need:

- to respect and trust each other;
- to communicate constantly;
- to make a long term commitment (until death) in working toward the success of the relationship;

- to co-operate both supportive and competitive without fear of losing;
- to combine two sets of individual goals in forming a joint system which develop its common goals; and
- to be interdependent.

Chartered Institute of Building (1993) indicates, in marketing, contractors need a paradigm shift from the traditional 4p's of marketing to relationship marketing. The new paradigm is to foster long-term profit for all, encouraged by long term relationships founded on trust. This approach requires industry:

- to create co-operative relationships for win-win strategy (Gummesson, 1994);
- to commit in investing time, effort and resources to create a long-term relationships (Wilson and Jantrania, 1994; Gronroos, 1994; Borys and Jemison 1989);
- to combine individual and mutual goals (Borys and Jemison, 1989; Wilson and Jantrania, 1994);
- to collaborate to achieve individual and partnership strategic advantage (Wilson and Jantrania, 1994); and
- to communicate with openness, to build trust, to create and share value (Borys and Jemison, 1989).

In the automobile manufacturing industry, manufacturers have changed from the competitive bidding process in selecting suppliers to a long-term and mutual co-operative relationship with their suppliers (Morris and Imrie, 1993; Cusmano and Takeishi, 1991). Stuart (1993) and Dyer and Ouchi (1993) identify the key characteristics of the buyer-supplier relationship in the automobile industries:

- long-term relationships;
- commitments;
- planned communication;
- continuous improvement;
- trust building;
- joint problem sharing;
- sharing information; and
- mutual assistance.

This compares with the key behavioural characteristics (Spekman and Sawhney, 1990; Mohr and Spekman, 1994) in measuring a successful partnership between manufacturers and distributors in computer industry:

- commitment;
- co-ordination;
- interdependence;
- trust;
- goal compatibility;
- communication participation and quality;
- information sharing; and
- conflict resolution;

According to McGeorge and Palmer (1997), the emergence of partnering as a force in the construction industry in the late 1980s is mainly through the efforts of Charles Cowan. He identifies the key elements of Partnering as:

- commitment;
- equity;
- trust;
- development of mutual goals/objectives;
- implementation;
- continuous evaluation; and
- timely responsiveness.

Having reviewed the range of determinants for these dimensions from the five typologies of strategic alliances: 1) marriages, 2) marketing relationships, 3) buyer-supplier relationships, 4) marketing channels, and 5) partnering, the main objective is to establish a set of parameters without any duplications. The six dimensions—trust, commitment, interdependence, communication, co-operation and joint problem solving—form the independent variable of strategic alliance as introduced in Section 1.2.1 for this research.

Trust

Larson (1991) states that trust refers to confidence that the other side would not exploit the relationship. According to Lewis (1990), trust is to help each other to get out of difficult situations. Mohr and Spekman (1994) indicates that trust is accepting that each other's word is reliable and that each party will fulfil their respective obligations. In business organisational behaviour, sharing commercial and technical information with each other without the need of protection is one aspect of trusting each other (Mink et al, 1987).

Commitment

Porter et al (1974) (quoted by Mohr and Spekman, 1994) refers to commitment as the willingness of trading partners to exert effort on behalf of the relationship. Win-win attitude at the senior management level is an absolute necessity if an alliance is to endure and there must be a complete commitment to jointly risking, sharing, and winning as a unit (Bruce and Shermer, 1993). Actively building trust (Howarth et al, 1995), sharing resources (Bureau of Industry Economics, 1995), minimising conflicts between individual and joint goals (Mohr and Spekman, 1994) and long term relationship between business partners (Howarth et al, 1995) are important elements of commitment.

Interdependence

Lewis (1990) indicates interdependence simply as giving each other work. On the other hand, Mohr and Spekman (1994) suggest when firms join forces to achieve mutually beneficial goals and objectives, they acknowledge that each is dependent on the other. Howarth et al (1995) states interdependence implying not only relying on each other but also treating each other equally as business partners.

Communication

Cummings (1984) (quoted by Mohr and Spekman, 1994) states that in order to achieve the benefits of collaboration, effective communications between partners are

essential. Information communicated has to be timely and accurate (Mohr and Spekman, 1994). Communication has to be open in order to prevent hesitation, reservation or other defensive behaviour (Varney, 1989) and with trust in mutually pursuing opportunities and solving problems and conflicts (Mink et al, 1987). Regular communication between business partners are required to compare current performance against expectations (Mink et al, 1987) and to consult each other before making key decisions (Lewis, 1990).

Co-operation

Tjosvold (1991, p46) defines that “*cooperation is not based on altruism, but on the recognition that, with positively related goals, self-interests require collaboration; and cooperative work integrates self-interests to achieve mutual goals.*” Co-operation between business partners not only reduces the likelihood of opportunistic behaviour but also provides a foundation for business growth (Bureau of Industry Economics, 1995).

Joint Problem Solving

Conflict often exists in interorganisational relationships due to the inherent interdependencies between parties (Mohr and Spekman, 1994, p139). Given that a certain amount of conflict is expected, an understanding of how such conflict is resolved is important (Borys and Jemison, 1989). Mink, Mink and Owen (1987) indicate that problems and conflicts are accepted as part of teamwork. Mink, Shultz and Mink (1991) built on work by Mink, Mink and Owen (1987), they indicate that partners should feel free to admit and discuss difficulties even when they relate to uncomfortable issues.

2.11 Competitive Strategy in Industry

One of the most frequently quoted business strategists working in the area of competitive strategies is Michael Porter. In his books, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (1980) and *Competitive*

Advantage: Creating and Sustaining Superior Performance (1985), he identified five competitive forces that influence the ultimate profit potential in industry. These five forces are: (1) threat of new entrants, (2) bargaining power of buyers, (3) threat of substitute products or services, (4) bargaining power of suppliers and (5) rivalry among existing firms. To win in business, firms need a competitive advantage that stands out from competitors. “*Competitive advantage is the foundation for any sustained and successful business strategy*” (Plemmons and Sanders, 1995, p141). Hence, the purpose of competitive advantage is not to retreat from competition, but to compete selectively from an advantageous strategic position.

Porter (1980) developed a competitive structure which is based on the proposition that business success rests on satisfying customer needs. Dent (1991, p63) also supported this view that “*strategic focus ultimately comes down to understanding one simple concept: value added—how and where to add value for the ultimate customer.*” Porter (1980, p35) outlines three potentially successful generic strategic approaches—overall cost leadership, differentiation and focus which have the potential to out perform other firms in an industry and add value for customer.

Porter further explains that cost leadership requires economy of scale, vigorous pursuit of cost reductions and cost minimisation of administrative functions; in differentiation, the firm differentiates itself from industry-wide by creating a unique position to gain a wider market share; and focus can be directed on a particular client group or segment of the product line. According to Langford and Male (1991) since the last strategy can also employ cost leadership or differentiation, there are, in practice, only two major generic strategies in construction—cost or differentiation.

Firms need to identify that advantage and exploit it. Apart from lower prices, firms could adopt any one of a number of factors (Peters, 1990, p102) in gaining that advantage:

- “*Speed and time (reduction of delivery and product develop cycle);*
- *Flexibility (the opportunistic ability to attack any new market, fast);*
- *Quality (not just a lip service);*

- *Information technology (to completely transform the firm and all its relationships-and all its products and services);*
- *Alliances and networks (with anyone, of any size, from anywhere);*
- *Fast innovation and perpetual improvement of products and processes;*
- *Skill upgrading (in a world where relative skill advantages will be the principal advantage);*
- *Service-added (service and distribution and customization, in all of their manifestations, will be even more important to manufacturing industries than to services);*
- *Small within big (the construction of small, often temporary business units to attack a particular market);*
- *Subcontracting (seeking the best, from anywhere and of any size, to take on any task).”*

2.12 Competitive Advantage in Building Construction Industry

Leadership in any competitive industries requires sound strategic decisions. According to Park (1991), the competitive pressures in construction contracting are more intense than in any other industry. There is an increasing need for contractors to formulate fundamental policies for achieving competitive advantage and hence, subsequent growth (Hasegawa, 1989). *“Even a single action can create a significant competitive advantage for contractors”* (Construction Industry Institute, 1992, pv).

A recent survey of the Australian building construction industry (CIDA, 1995, p82) indicated *“overwhelmingly that contractors and subcontractors perceived their successes to be determined by their ability to be the lowest cost tenderer.”* This competitive bidding process has been characterised by one party trying to obtain the best possible deal at the cost of its partner. Hence, adversarial relationships among contractors and subcontractors have been very common within the building construction industry.

When competitive tendering is the traditional method of securing contract work, the contracting firm has already reduced the overhead cost and the profit margin to the

minimum they believe will allow them to compete in their chosen projects and also obtain the lowest subcontract quotations in the market place. What else can the contracting firm do to gain or sustain that competitive advantage? It has been suggested that for a contracting firm to be differentiated from its competitors, it can seek one or more forms of strategic advantage—strategic management (Male, 1991), bidding strategy (Skitmore, 1991), technological and organisational innovation (Lansley, 1991), strategic planning (Betts and Ofori, 1992), and technology strategy (Hampson, 1993).

Both the NSW Royal Commission Building Industry Report (Gyles, 1992) and the UK Latham Report (Latham, 1994) identified the adversarial relationships in the building construction industry. The Royal Commission Building Industry (Gyles, 1992) Report also revealed in detail within its study of twenty major projects that such adversarial relationships were not primarily caused by the form of project delivery nor the nature of the contracts, but more fundamentally upon the relationships and understandings between parties. Both RCBI and Latham reports recommended that improvement in the building construction industry could be achieved through the development of better relationships among all project team members including contractors and subcontractors.

The Royal Commission Building Industry (Gyles, 1992) highlighted in its report that a balance between co-operation and competition is sorely needed in the building construction industry in Australia, after experiencing decades of mistrust and hostility. The development of attitudinal shifts to one mutual trust and harmony can only be achieved through full co-operation among all the project team members.

In 1995, the New South Wales Government instigated a contractor accreditation scheme to encourage reform and best practice in the construction industry. The scheme highlighted the possible benefits to contractors, subcontractors and suppliers:

- Contractors should only be tendering against similarly experienced and capable contractors.
- Contractors should have significantly increased tendering opportunities compared with contractors not pre-qualified under the scheme.

- Subcontractors should have the opportunity to contribute formally to project planning under partnered contracts.
- Contractors and subcontractors should be encouraged to form strategic business relationships.
- Participation in the scheme should encourage contractors, together with subcontractors and suppliers, to enhance their competitiveness through implementation of the programs required achieving the best practice level of performance.

US Construction Industry Institute (1992, p23) recommended that *“each member of the project team needs to be able to interact with any of the other project team members to establish long-term relationships that lead to continuous improvement in productivity and quality of product and services.”* In addition, contracting firms need to increase their awareness of competition and future strategies. Co-operation is a means of strengthening competitiveness and establishing strategies on (Construction Industry Institute, 1992):

- the potential for new ideas created by working with other firms;
- establishing project teams and selling the team concept to new clients who want single-point responsibility;
- combining independent firms to form consortia partnering relationships and strategic alliances;
- assisting clients in the development and execution of projects.

Plemmons and Sanders (1995) argue that traditional systems of construction are based on adversarial relationships between most, if not all members, of the project team. The goal is adversarial negotiation or coercion to minimise purchase price. To obtain the lowest initial price, the party with superior position (owner or contractor) attempts to gain a price advantage by playing the parties against each other. The result is a win-lose situation that is inefficient, ineffective, and self-defeating (Cowan, 1992). If industry professionals want construction projects at lower cost, in less time, and with fewer problems associated with adversarial relationships, they must examine the possible competitive advantages offered by alliances (Badger and Mulligan, 1995). An alliance is a viable response to business opportunities where the

parties seek win-win solutions. The challenge of any alliance is to demonstrate the value for money in terms of project cost and performance.

Each member of the project team needs to be able to interact with any of the other project team members to establish long-term relationships that lead to continuous improvement in productivity and quality of products and services (Construction Industry Institute, 1992). The ability to provide a competitive advantage to prospective partners will encourage these long-term relationships. Effective performance on many types of future projects will depend on long-term partnerships between each of the major project participants. According to Badger and Mulligan (1995), such long term relationship is usually established between a contractor and one of the following: an owner, another contractor, a subcontractor, a supplier, a financial institution, a government organisation, an architect/engineer and a combination of any of the above.

Client-Contractor alliance relationship

The participants in a partnering relationship comprise those stakeholders, such as the end-user, contractors, consultants, subcontractors, suppliers of plant and building materials and government agencies, directly involved in the delivery of the project. The partnering projects mentioned in the Construction Industry Institute Australia Report (1996) and the report by Li and Green (1996) focus mainly on the partnering relationships between clients and contractors on single project basis (project partnering). No doubt, project partnering offers the construction industry new possibilities. It reduces exposure to litigation, improves project outcomes in terms of cost, time and quality, lower administrative costs, increases opportunity for innovation, increases chances of financial success (Construction Industry Institute Australia, 1996) and improves the quality and reliability of the partners (Sarkilahti, 1996). Greater benefits and competitive advantages will be gained by contractors when partnering is based on a long term commitment with the client (strategic partnering) (Bennet and Jayes, 1995) without having to compete with rival bids.

Contractor-Contractor alliance relationship

This contractor-contractor alliance relationship can be described as a joint business venture. Organisations see an opportunity to gain immediate competitive advantage through an alliance that gets them into a new business. The goal is venture development. *The alliance opens up possibilities that would not have existed for either of the partners acting alone. Once that opportunity is exploited, it is not always clear whether there is any basis for the relationship to continue* (Kanter, 1989, p125). For example, the Concrete-Holland Joint Venture was formed to bid for the construction management of the new Australia Parliament House and the joint business venture was dissolved after the completion of the project. The opportunities that contractor-contractor alliance relationships can make many contractors have a short-term gain not a long term benefits in term of competitive business strategy.

Contractor-Supplier alliance relationship

Traditionally in the industry, the negotiating process has been characterised by one party trying to obtain the best possible deal at the cost of its counterpart. *Now the emphasis is changing from competition to long term cooperation with the best partners and costs are lowered through cutting unnecessary costs, not through hard bargaining* (Sarkilahti, 1996, p406). The change towards cost consciousness means that instead of trying to achieve the lowest price, the emphasis is on minimising the costs of the production chain as a whole. Sarkilahti (1996) indicates that through cooperation with suppliers, delivery times have been reduced, reliability and quality have been increased and costs have been cut by significant amounts. Hence, a contractor who forms strategic alliances with suppliers will gain competitive advantages over its competitors by receiving the favourable or discounted rate from its suppliers.

Contractor-Subcontractor alliance relationship

In order to receive the most comprehensive and competitive bids, a contractor must make conscientious efforts to establish strategic alliance relationships with subcontractors related to each scope of the work. Making a practice of using different

firms for various projects will prove advantageous over the long term (Millman, 1990). This type of alliance is usually designed as a long-term arrangement primarily geared to reduce transaction costs and to add value to adjacent stages of a value chain.

Cheung (in Chau and Walker, 1994, p7) explains that transaction costs are all those costs not directly incurred in the physical process of production. These transaction costs may be viewed *as a spectrum of institutional costs including those of information, of negotiation, of drawing up and enforcing contracts, of delineating and policing property rights, of monitoring performance and of changing institutional arrangement.* These costs include bidding costs, negotiation costs, administering costs and in some arbitration or litigation costs. The term added value is used here to mean the aggregate effect each participant brings to the alliance. *Elements of added value include expert problem solving skills, innovative ideas, and decision-making acumen* (Thompson in Plemmons and Sanders, 1995, p143).

The September 1994 monthly newsletter for the Construction Industry Development Agency mentioned that Multiplex Construction (Vic) Pty Ltd became the first construction company to be selected as part of the Australian Best Practice Demonstration Program. Mr Henderson, Managing Director of the Multiplex, said that *“the Multiplex Subcontractor Development Program will create performance standards for the pre-selection of subcontractors and assist our key subcontractors to implement best practice management into their companies. The strategic alliances that we will either create or enhance under the program will further improve our competitiveness and create greater certainty for our clients in the achievement of time, cost and quality targets.”*

The June 15, 1995 Financial Review featured an article regarding the concept of strategic alliance being introduced in the construction industry. It was detailing the statements made by senior managers of two major building construction companies in Australia:

- Leighton Holdings chief executive, Mr Wal King said that *“strategic alliances, which bring together clients, contractors and other project team members in a*

collaborative arrangement, are being used to generate more effective ways of developing projects. Alliances are designed to create a win-win situation with shared benefits from capital cost savings or increased productivity.”

- Baulderstone Hornibrook chief executive, Mr Dean Pritchard said *“his group has strategic alliances with major building material supply companies such as ACI, CSR and BHP.”*

Contractors are starting to recognise the importance subcontractors' performance has on their success (Matthews et al, 1996). With a shift toward cooperation as a means of strengthening competitiveness, contractors concentrate on more effective competitive business strategies by forming strategic alliances with other stakeholders that would work on more than a single project together (Construction Industry Institute, 1992).

Mr Martin Albrecht, Managing Director of Thiess Contractors Pty Ltd, highlighted in his opening address to the Thiess Training Summit in May 1998:

“A key measure of the future competitive performance is likely to be the percentage of our work delivered by subcontractors. The critical issue for the success of our business is the development of long-term strategic alliances with subcontractors. This will require a quantum leap in our approach to building sustained, win/win relationships with our subcontractors. We must select, accredit, and retain the services of the best performing subcontractors and transfer our core company values to those we employ.”

Although subcontractors play a vital role in the building construction process, unlike the concept of partnering and the practice of joint venture, little is documented in literature theoretically or empirically about the working relationship that exists between contractors and subcontractors (Hinze and Tracey, 1994). This study seeks to mitigate this knowledge gap and focuses on the contractor-subcontractor alliance relationship as a competitive strategy in the building construction.

2.13 Performance Indicators for Competitive Advantage

Construction Industry Development Agency (1993) identified seven management imperatives considered essential for effective strategic management in the building construction industry:

(1) Customer Focus, (2) Planning, (3) Process Improvement, (4) Supplier Relationships, (5) People Involvement, (6) Information Use, and (7) Leadership.

The improvement measures of the seven strategic management imperatives should have the potential to produce an indication of overall firm performance. The benefits of strategic management are improved quality of products and services, increased productivity, reduced costs, reduced errors and waste, and better project scheduling and control.

This research focuses on the actual improvement (if any) on supplier relationships (i.e. relationships between contractors and subcontractors) as the management imperative i.e. using the benefits of better supplier relationships as dependent variables (introduced in Section 1.2.1) in achieving the competitive advantage as competitive strategy of firm.

Typical possible benefits of better supplier relationships (Construction Industry Development Agency, 1993) are as follows:

- better estimates and tender submissions, leading to a reduction in marketing costs and an increase market share
- better project planning results in better work allocation and co-ordination, reducing lead time, improving productivity, reducing errors and also resulting in better employee relationships
- increasing joint problem solving and process involvement
- reduction of purchasing costs

Vertical strategic alliances between contractors and subcontractors are formed in order to gain competitive advantage by *improving business performance through better estimates and tender submissions* (Construction Industry Development Agency, 1993). This indicates that better and closer business relationships between the contractor and its subcontractors would produce superior client satisfaction

through improvement of on-site construction processes due to fewer complaints of subcontractors' works by client and also fewer disputes to subcontractors by client. Two subjective measures have been used: one related to business performance and the other to on-site construction processes.

Tender success rate and business turnover were used to describe business performance. Planning work, co-ordination of subcontractors, standard of workmanship and quality of subcontractors were used to measure on-site construction processes. Tender success and business turnover are common industry measures for business performance, while planning work, co-ordination of subcontractors, standard of workmanship and quality of subcontractors are some of the assessment measures used by the Queensland Government Department of Public Works and Housing as post-contract evaluation on contractor's on-site performance. In this research, two subjective indicators of competitive advantage were business performance and on-site construction process.

2.14 Link between Strategic Alliances and Competitive Performance

Mason (1993) indicates in today's business environment, many firms are seeking strategic alliances to gain competitive advantage in the marketplace; and the winners in alliances are firms that do think ahead and manage their relationship. Strategic alliances are becoming an important form of business activity in many industries in order to compete on a global field (Dev and Klein, 1993). According to Dent (1991), firms need to grow by building a strategic family of long-term vendors and strategic alliance partners that deliver the best in all functional areas and poses strong barriers to competitors and new entrants to industry. He further indicates that specialisation and co-operation are key principles for competitiveness in the dynamic market of the 1990s.

Bruce and Shermer (1993) state the key to success is to use a firm's core strength as leverage and to ally other firms who need the benefits of those strengths. Firms can build strengths with a wide set of partners—customers, suppliers, distributors, universities, firms in other industries, even competitors. By using alliances, firms can

grow existing business and invent new ones to sustainable competitive advantage. The following studies examine the diversity of strategic alliances used to achieve advantages in various industries:

- Aerospace (Gugler, 1992; Roberts, 1992)
- Automobiles (Burgers, Hill and Kim, 1993; Sasaki, 1993; Haigh, 1992; Cusumano and Takeishi, 1991; Devlin and Bleackley, 1988)
- Biotechnology (Doorley, 1993)
- Chemical (Hagedoorn, 1993)
- Communications (Lewis, 1992)
- Computers (Mohr and Spekman, 1994; Magee, 1992; Crouse, 1991)
- Electronics (Hagedoorn and Schakenraad, 1993; Henricks, 1991; Doz, 1988)
- Pharmaceutical (Spiegel, 1993; Doorley, 1993)
- Semi-Conductor (Gugler, 1992; Anderson and Narus, 1991; Case, 1990)
- Telecommunications (Whenmouth, 1993; Hagedoorn and Schakenraad, 1993)

Strategic alliances—joint ventures, co-operative agreements and business networks—are partnerships among firms that work together to attain strategic objective (Killing, 1988; Berg, Duncan and Friedman, 1982). These co-operative strategies are now being used as a business strategy option. Harrigan (1988) examines these co-operative strategies from a different perspective. She detects a shift in competitive behaviour and firms have been using co-operative strategies to build strengths to change industry structure to the disadvantage of competitors. Hence, instead of trying to gain competitive advantage, firms can form co-operative agreements to disadvantage competitors by either “(1) *exacerbating competition*, (2) *stabilising profit levels*, or (3) *precipitating structural changes in vertical integration, technological scale, or other industry traits*” (Harrigan, 1988, p141).

In their book, *Business Networks*, Buttery and Buttery (1994) discuss the concept of business networking (also referred to as strategic alliances) building on their strength by co-operating with other business firms in a relationship based on trust, respect and solidarity. They identify such “*networks as having the potential for generating economics of scale, scope and learning in production, marketing, operations and*

finance, and how these can contribute to the network a distinct competence that facilitates competitiveness at home and abroad” (pix).

In the construction industry, the concept of partnering, i.e. mainly project partnering with clients, consultants and contractors, has been studied:

- Construction Industry Institute (1992) in the US—*Projects and Competition of the Future*
- Bennett and Jayes (1995) in the UK—*Trusting the Team: the Best Practice Guide to Partnering in Construction*
- Construction Industry Institute, Australia (1996)—*Partnering: Models for Success.*

There has been no study that addresses the strategic alliance and competitive performance relationship between contractors and subcontractors in the building industry.

A report on a pilot study on the concept of ‘Partnering’ by the Royal Commission Building Industry Report (Gyles, 1992, Appendix PR11, p169) concluded that “*the analysis of Subcontractor/Supplier/Consultant participation with the Contractor in Partnering (either project or strategic partnering) is obviously incomplete in relation to its application across the full range of options for project delivery and in all sorts of competitive situations.*”

2.15 Summary

The evidence from the above broad review of concept of strategic alliances covers literature and publications mainly relating to the manufacturing and services industries. The concept of partnering in the construction industry focus mainly on relationships between clients and contractors. There is a lack of theoretical and empirical work focused on the working relationship between contractors and subcontractors. Furthermore, little research has addressed the strategic alliances and competitive advantage issue in the building construction industry. Hence, it is necessary for the theoretical and empirical work of this research to be drawn from the

other industries such as manufacturing and services and other disciplines such as marketing relationships, buyer-supplier relationships and marketing channels to establish a starting point for this research project.

A number of researchers have provided theoretical dimensional concepts for discussion of strategic alliance relationships (Mohr and Spekman, 1994; Gummesson, 1994; Wilson and Jantrania, 1994; Dev and Klein, 1993; Morris and Imrie, 1993; Borys and Jemison, 1989). The competitive pressures are more intense than ever before. There is an increasing need for firms to formulate fundamental policies in order to gain competitive advantage over competitors (Plemmons and Sanders, 1995; Dent, 1991; Peters, 1990; Porter, 1980). Several researchers have discussed the link between strategic alliances and competitive performance (Mason, 1993; Burgers et al 1993; Mohr and Spekman, 1994; Hagedoorn and Schakenraad, 1993). From the literature review, six dimensions of concept of strategic alliances and two dimensions of competitive advantage have been developed. These are for strategic alliance: trust, commitment, interdependence, communication, co-operation and joint problem solving; and for competitive advantage: business performance and on-site construction processes.

The literature that formulated the framework to describe the concept of strategic alliances and competitive advantage established the three broad areas of research focus: 1) the strategic alliance relationships between contractors and subcontractors as independent variable, 2) the competitive advantage as dependent variable, and 3) linking the relationships between the two. These three broad areas of focus provide a starting point for this research.

The current background provides no empirical knowledge in developing and testing the framework for the correlation between strategic alliances and firm's competitive performance within the construction industry. The indications are, however, that strategic alliances are not likely to be competitively advantageous in building construction due to: 1) competing in lowest price still dominating the market place; 2) perceptions of fundamentally nothing wrong in the building construction industry; 3) proportion of investors still looking for short term gains; 4) not a

Government requirement in tendering public sector works; 5) regular changes of management personnel rendering difficulties in sustaining such relationships; and 6) unwillingness of contractors to commit resources in implementing such concept.

However, surveys on the manufacturing and services industries provide a starting point to determine whether the role of strategic alliances between contractors and subcontractors enable contractors to gain competitive advantage over competitors for public sector building construction works.

3 PUBLIC SECTOR BUILDING CONSTRUCTION IN QUEENSLAND

3.1 Introduction

This chapter reviews the construction industry in Queensland, in particular, the functions and the tender review process for awarding building contracts by the Queensland Government Department of Public Works and Housing. The aspect of justification in establishing strategic alliance relationships between contractors and subcontractors as an evaluation criterion in awarding tenders is also examined. The purpose is to provide the reader with background information to the Data Analysis in Chapter 5.

Section 3.2 describes the Queensland construction industry with emphasis on public sector non-residential building construction works. Section 3.3 outlines the history, functions and the organisational structure of the Department of Public Works and Housing. Project delivery systems and tendering methods are discussed in Section 3.5 and Section 3.6 respectively.

Section 3.6 introduces the concept of pre-qualification implemented by the Department, while Section 3.7 describes the tender evaluation process. More recent development of pre-qualification system is discussed in Section 3.8. Section 3.9 details the proposal of forming strategic alliance relationships between contractors and subcontractors as a tender evaluation criterion for public sector works. Section 3.10 summarises the Chapter.

The information presented in this chapter is a synthesis of data and information gathered from the Queensland Government, Department of Public Works and Housing (formerly, Administrative Services Department) in the areas such as: 1) publications and references relating to the history and the development of the Department; 2) Departmental procedure manuals and policies; 3) relevant past completed projects records; and 4) for the past two years, periodic interviews and personal discussions with the Department's professional staff and policy makers.

3.2 Queensland Construction Industry

The construction industry is typically considered as having two components, namely building and the engineering construction (Australian Bureau of Statistics, Queensland Year Book 1988 to 1997). The building component is subdivided into residential and non-residential buildings. Non-residential buildings include hotels, shops, factories, offices, business premises, educational, health, religious, entertainment, recreational and miscellaneous buildings. These buildings are also further classified into either the private or public sector. Engineering construction includes bridges, roads, airports, water storage and reticulation and other non-building works.

Building activity is a significant indicator of the state of a regional economy. The level of activity and the types of building being constructed affect the physical and social environments. The number of building approvals issued gives an indication of the extent of investment by private individuals, companies and government agencies.

Queensland's State Government invests heavily in buildings, services, materials and equipment to support its social and economic programs. For the past 133 years the Department of Public Works and Housing or its predecessors have played a key role in providing services and buildings for the Queensland Government on behalf of the Queensland community. This research focused specifically on building construction in Queensland.

3.2.1 Value of Building Work in Queensland

Building work consists of residential and non-residential sectors. Construction work involving non-residential building relates not only to new buildings but also to refurbishment, fitouts, alterations and additions to existing buildings. The value of building work completed between 1987 to 1997 is shown in Table 3.1.

Table 3.1 Value of Work Completed on Building, Queensland

Year	88/89	89/90	90/91	91/92	92/93	93/94	94/95
Total Residential	3062.6	3093.4	2928.6	3135.6	3959.2	4425.4	4592.8
Non-Residential							
Hotels	400.2	395.9	195.8	136.7	72.0	113.0	261.4
Shops	403.2	476.1	353.1	275.2	241.6	314.6	567.4
Factories	185.4	212.5	159.7	102.9	128.5	122.8	125.4
Offices	410.2	377.9	328.4	253.4	229.3	239.3	231.6
Business	254.8	265.0	206.6	156.0	224.6	228.3	377.9
Education	194.0	182.8	164.7	255.2	191.4	200.0	217.6
Health	103.3	143.1	97.8	158.9	124.4	69.8	99.5
Others	213.0	234.4	176.0	263.1	295.9	279.9	346.3
Total Non-Residential	2164.1	2287.7	1682.1	1601.4	1507.7	1567.7	2227.1
Grand Total	5226.7	5381.1	4610.7	4737.0	5466.9	7560.8	6819.9

Source: Queensland Year Book, 1988 to 1997

The value of work for the public sector on non-residential buildings in Queensland is shown in Table 3.2.

Table 3.2 Value of Work Done on Public Sector Non-Residential Building, Queensland

Year	88/89	89/90	90/91	91/92	92/93	93/94	94/95
Offices	58.3	48.1	67.5	95.1	84.7	96.0	73.6
Business	65.8	83.1	63.0	43.9	56.0	67.0	153.6
Education	94.6	131.6	108.7	201.7	134.6	109.4	141.7
Health	29.8	47.3	28.0	54.3	41.9	14.2	37.3
Others	145.5	159.2	134.1	129.1	125.6	113.6	174.3
Total	394.0	469.2	401.3	524.0	442.7	400.2	580.5

Source: Queensland Year Book, 1988 to 1997

3.3 The Queensland Department of Public Works and Housing

The following section summarises the history of the Queensland Department of Public Works and Housing and provides a brief description of its development, growth and achievement since 1862. It highlights the progress of the Department since inception and the development of a framework for the future.

3.3.1 History

In 1987 the Queensland Department of Works (formerly the Department of Public Works and Housing) celebrated its 125th Anniversary. The first portfolio of Public Lands and Works was created in April 1862, three years after Queensland became a colony. From 1862 to 1865, the construction of Government buildings was supervised by military officers and by Andrew Petrie, the Superintendent of Works. Some of the historic buildings built by the Department's workforce during the last century include Newstead House, Old Government House, Parliament House and the Treasury Building.

Most work was still being performed by Departmental labour up until the mid 1960's when changes in Government policy and construction methods dictated that most significant construction work go to tender on an open competitive basis i.e. traditional lump sum contract. The Department enjoyed many years of stability. Architects and Engineers designed and documented building contracts, Quantity Surveyors measured Bills of Quantities and prepared estimates and Builders constructed after winning contracts through the traditional lump sum tendering systems. On minor instances, disputes arose concerning the cost of variations and the occasional claim for Bill of Quantities under measures and Preliminaries adjustment. Claims for prolongation, disruption, frustration, acceleration, compression, loss of profit and the like were yet to be born.

The Department first became involved in non-traditional forms of contract, such as Turnkey, Design and Construct and Construction Management, in the mid 1970's when the Queensland Government Department of Health became disenchanted with the overall performance of their consultants with respect to over design, wastage of available funds, lack of budgetary control and failure to communicate. The Queen Elizabeth II Hospital in Brisbane was subsequently let Design and Construct Turnkey. The Mater Hospital was procured through professional design and construction management. The experience gained on these projects stood the

Department in good stead during the ensuing years as the need to develop and use non-traditional processes developed further.

As a result of the following limitations of the traditional system, Queensland Government Departmental clients had adopted non-traditional and fast track systems:

- extended delivery time involved due to the sequential nature of the process;
- general lack of control over time and consequent effect on cost: the increased legalistic approach adopted by some contractors in an effort to make a profit;
- resultant high potential for contractual claims and disputation;
- inadequacies of the nominated subcontractor system and its general overuse; and
- general problems faced by subcontractors and suppliers under the traditional system, especially with regard to ensuring payment.

In July 1977 the Auditor-General, Sir Allan Sewell, was requested by Queensland Government Cabinet to prepare a report on the ramifications of constructing public buildings by non-traditional methods. The findings of the Sewell Report included a recommendation that Department of Works was to provide alternatives to the traditional methods of design and construction for projects.

The Department first ventured into non-traditional contractual methods in November 1984. The Government allocated an additional \$200 million for a Special Major Capital Works Building Program on top of the \$300 million normal building program. In November 1986 a Special Major Capital Works Program of \$164 million was contracted out for three new Prisons, a new Police Headquarters and a Government Chemical Laboratory.

The time frame stipulated for completion of these projects was insufficient to use traditional methods of project procurement and open tendering. In order to meet the requirement for an immediate start to construction activities, an innovative non-traditional project delivery systems had to be developed. Public accountability, completion within time and budget, minimal projected life cycle costs, and no significant decrease in architectural and engineering design quality were some of the new initiatives introduced.

3.3.2 Functions of Department of Public Works and Housing

The procurement of buildings is as much an economic investment decision in the Queensland public sector and is seen as an element in the delivery of managed programs by Government Departments and Agencies for the community they serve. A significant role for Department of Public Works and Housing, which was the Administrative Services Department (ASD) up to late 1996, is that of principal adviser to Government on building industry matters. In this activity, the Building and Legal & Contractual Divisions are responsible for establishing systems and procedures for the management of public building programs. The Building Division is a major component of the Department which also has a close working relationship with the Legal & Contractual Division and the State Projects Unit section. The following sub-sections briefly describe their respective functions and the linkages with other Government Departments.

Building Division

The Building Division is largely responsible for:

- protecting and promoting the interests of Government in the strategic management of existing building assets, the procurement of new assets, and the rationalisation of surplus assets;
- providing independent advice to Government on 'best practice' in relation to property and building matters. This includes policy and advice on building standards, building procurement, management and performance, major property developments, environmental health and safety, heritage issues and energy management; and
- providing effective management of the interface between the Government and industry. Through the Division, the building industry is provided with single point contact with the Government on industry matters and the opportunity to participate in various forums designed to address industry issues (ASD, 1994).

The major activities (ASD, 1994) of the Building Division are to :

- protect and promote the interests of the Government and Government agencies in the strategic management of Government property assets;

- develop policies, guidelines and 'best practice' operating procedures to assist Government agencies in the procurement and ongoing management of their built assets;
- provide independent professional advice on building and property related matters including the application of Strategic Asset Management to the Government's built assets;
- advise on environmental health, energy management, and heritage building issues;
- co-ordinate the provision of Government office accommodation including the effective management of the Government owned office;
- identify and sponsor whole-of-Government building and property development opportunities;
- manage property disposal and acquisition activities to ensure the interests of Government and Government agencies are protected; and
- provide leadership and direction in the areas of industry reform and development.

Legal and Contractual Division

Closely allied to the Building Division is the Legal and Contractual Division, whose major activities (ASD, 1994) are to:

- develop and provide legal and contractual policies to all areas of the Department;
- take a lead role in construction industry reform for contractual issues;
- ensure an effective interface exists between Government and the building industry on these issues;
- develop and implement policies and strategies for an effective contractual and tendering service; and
- administer significant subcontractor issues.

State Projects Unit

The State Projects Unit undertakes the role of an 'informed client' for major whole-of-Government building projects which do not fall within the core business of any particular Government Agency. The Unit also acts on behalf of Agencies for large-scale projects which are well in excess of their typical capital works program.

The Unit provides advice from a project initiation to completion and hand over. Activities (ASD, 1994) of the Unit include:

- establishing the project scope, parameters, and constraints;
- project definition and delivery brief, co-ordination of technical input into feasibility and option studies, and indicative cost estimates;
- development of detailed planning and design briefs and project budgets, assisting value management studies;
- recommendations for procurement systems, overseeing of consultant selection, design proposals, contract documentation, and cost planning;
- co-ordination of tender call, tender evaluation, and contract award;
- role of principal for contract administration; and
- co-ordination of project commissioning and hand over.

3.4 Project Delivery Systems

A range of alternative project delivery systems has been developed by the Department to suit the particular requirements of various Queensland Government Departmental clients and Hospitals Board projects. Project Delivery System is a method of organising the production stages of a building project, i.e. the design, documentation, construction, furnishing, equipping and commissioning, and embodies the risks, obligations and responsibilities assigned to the contracting parties. The three broadly used delivery systems are:

- Traditional Lump Sum;
- Design and Construct; and
- Construction Management.

3.4.1 Traditional Lump Sum

Masterman (1992, p24) defines traditional lump sum contract as *“when the client appoints independent consultants to design the project and prepare tender documents upon which competitive bids, on a lump sum basis, are obtained from main contractors.”* The successful tenderer enters into a direct contract with the

client and carries out the work under the supervision of the original design consultants.

The strength of traditional lump sum delivery system, apart from the independence of design and construction, includes:

- project delivery is a sequential process (Masterman, 1992);
- the design phase of the project is largely completed prior to the bid submittal to the client (Calomeni, 1989);
- a Bill of Quantities, fully detailed and prepared in accordance with the latest edition of the Standard Method of Measurement, being supplied to each one of a number of contractors who have been selected by the client to price the work in competition with each other (Smith, 1986);
- competitive bidding is used to secure the lowest possible price for the work (Uher, 1988);
- providing the client with a good degree of control over financial aspects of the contract (Uher, 1988).

The consensus among clients is that the traditional lump sum delivery system provides a high degree of certainty that quality and functional standards will be met. The method has the advantage of having stood the test of time over many decades and being understood by most clients and participants within the building construction industry. The client's risk exposure is minimised by the consultants' management skill. In addition, the role and responsibilities of the client, design consultants and contractor are spelled out clearly. The project has the opportunity to be awarded to the most competitive tenderer.

The Queensland Government has strong faith in the traditional systems. They continue to be the most appropriate choice for most majority of Departmental projects. These systems have proven themselves suitable for use on any type of building project of any scale and have distinct advantages in terms of quality control, tendering competition, familiarity and industry acceptance.

3.4.2 Design and Construct

This definition contains three elements that are fundamental characteristics of this method: 1) the responsibility of design and construction lies with one organisation, 2) reimbursement is generally by means of a fixed price lump sum, and 3) the project is designed and constructed specifically to meet the needs of the client (Masterman, 1992).

In 1984 and again in 1986 the Queensland Government introduced special major capital works programs involving several significant projects outside the guideline of the Department forward planning programs. These special programs rendered the traditional methods of project procurement and open tendering unsuitable and innovative contractual/commercial non-traditional systems were developed to meet the challenge. These included Design and Construction Management and Design and Construction Lump Sum.

In essence, these non-traditional systems empowered the successful contractor to carry out design as well as construct the building project.

3.4.3 Construction Management

According to Masterman (1992), the Construction Management system is one in which the Construction Manager adopts a consultant role with direct responsibility to the client for the overall management of the construction of the project, including liaison with design consultants, to meet agreed objectives. Masterman (1992) indicates the main characteristics of the system are:

- the construction manager is appointed as a consultant and has equal status to the members of the design team;
- reimbursement for management services is made by means of a lump sum or percentage fee; and
- trade contractors who are employed by the client and co-ordinated, supervised and administered by the Construction Manager carry out the construction of the project.

Under the Construction Management system, the Department enters into a contractual arrangement with an external organisation for the latter to manage the construction and commissioning of a project. The client retains total responsibility for the design and documentation and employs professional consultants for this purpose. The Construction Manager is responsible for programming design and document activities and for co-ordinating the work of the consultants in this respect, and must ensure that the consultants comply with the program for preparation of preliminary drawings and subcontract tender documents. The Construction Manager must also co-ordinate the production and distribution of subcontract tender documents.

The tendering process involves the submission of competitive Fixed Lump Sum offers for a Construction Management Fee, normally by up to three selected tenderers. The Construction Management Fee embraces on-site overheads including site management and programming, site establishment costs and other 'Preliminaries' and the tenderer's allowances for off-site overheads and profit.

3.5 Tendering Methods

Government agencies throughout Australia operate many different procurement systems (Mills, 1996). Although the ranges of procurement paths are many, the routes invariably lead to two tendering process. These are:

- open tendering - no pre-qualification assessment undertaken; and

- pre-qualified tendering:
 - selective
 - pre-registered
 - selected.

Open tenders are invited by public advertisement in national newspapers. No restriction is placed on who is eligible to tender. The selective tendering system is used where a limited number of contractors are invited to tender for a particular

project. Pre-registered tendering involves the pre-qualification of contractors prior to the calling of tenders, in a similar manner to the selective tendering process. However, where pre-qualified tenders are required for a particular project, expressions of interest are first called by public advertisement. The selected tender process involves the choice of contractor without public advertisement. This takes place by invitation to tender, or by direct negotiation (Mills, 1996).

3.5.1 Open Tendering

In the construction industry, competitive bidding is traditional and is still widely used. The process encourages efficiency and innovation of the participating contractors, thereby providing the client with a constructed project of specified quality at the lowest possible price (Clough, 1986). The rationale for open competitive tendering is that it has the advantage of maximising competition and securing the most competitive price or contractual terms for the client. These advantages are not gained without cost.

The number of tenderers in open tender for construction works, at the Brisbane metropolitan area, above \$5m in estimated value called by the Department in the traditional lump sum delivery method, during six year period of 1 January 1988 to 31 December 1993 is summarised in Table 3.3.

Table 3.3 Open Tender Construction Works

Project Description	Year	Number of Tenderers	Tender Price Ranges
Centre for Advanced Technologies	1991	22	\$8,680,000 to \$12,800,000
State Archives Building	1991	12	\$15,881,000 to \$18,456,000
Information Technology Building	1991	12	\$9,724,000 to \$12,206,000
Food Technology Building	1991	13	\$11,624,000 to \$13,568,000
School of Printing	1992	14	\$9,190,000 to \$10,085,000

Any tendering process is expensive to both the competing firms and the client. Each firm devotes a portion of its resources to the tendering competition and has a relatively small chance of winning the contract. According to an initial survey conducted by Holt et al (1996), their findings indicated that contractors achieved contract awards 25% of the time, hence the resources in compiling 75% of tenders are wasted. Tendering costs, if not recovered, cause financial loss to the company and the industry overall. Thus, the costs of all tendering to be recovered from the projects are built in as an overhead cost of the building industry. The waste of resource in compiling tenders is clearly illustrated in Table 3.3, when there can be only one successful tenderer.

When establishing contracts for the construction of capital works, government authorities aim for propriety, accountability and opportunity for the whole spectrum of industry to compete in the works. Government procurement authorities are required to obtain the best offer consistent with best value for money including lowest price, satisfactory quality and timely delivery (Queensland Government, 1992). This implies that there should be free and open competition for government projects to the greatest extent possible and that the lowest suitable tender should be selected.

3.5.2 Pre-qualified Tendering

During the mid-1980's, the Department (known as Administrative Services Department—ASD) commenced using the pre-qualified tendering process in conjunction with the introduction of non-traditional delivery methods. Pre-qualified tendering used one of the three processes, namely Selection, Pre-registration, or Selected Tendering.

The selective tendering system is used where a limited number of contractors are invited to tender for a particular project. The tenderers are taken from a list of contractors who have been firstly pre-qualified with the Government agency. Pre-qualification is based on the information provided by the contractor in advance

and on a proven record of satisfactory performance in the category for which tenders are sought.

Pre-registered tendering involves the pre-qualification of contractors prior to the calling of tenders, in a similar manner to the Selective Tendering process. However, where pre-qualified tenders are required for a particular project, expressions of interest are first called by public advertisement. In the advertisement the relevant pre-qualification requirements are stated, and only contractors who meet the requirements will be eligible for the tender. Upon receipt of expressions of interest, a limited number of eligible firms are chosen and invited to prepare formal tenders.

The Selected Tender process involves the choice of contractor without public advertisement. This takes place by invitation to tender, or by direct negotiation. With selected tendering, an agreed number (normally a maximum of six) of previously registered firms for the category of work involved are invited to submit tenders for a project, with pre-registration being sought by public advertisement initially (Queensland Government, 1991). The Department advertises for pre-registration of interest in tendering on a specific project, and tenderers are selected from those firms who register an interest and possess the expertise, quality assurance accreditation, competence and financial capacity necessary to carry out the work. These are considered the primary criteria.

The National Public Works Conference and National Building and Construction Council (NPWC/NBCC) joint working party report (1990, p46) also recommends the following procedures for the pre-registration of tenderers:

- *“Tenderers may be selected from a regularly reviewed pre-registered list, or on a project basis;*
- *No more than six tenderers should be invited to tender in order to avoid excessive costs to the construction industry;*
- *The objective of pre-registration is to qualify tenderers in respect of their capacity and ability to undertake particular classes of works and so minimise the need for further investigation after tenders have closed.”*

The Queensland Government expressed two main concerns in the tendering process. Fohrman (1996), in investigating them, pointed out that:

- evaluation of tenders and assessment of value for money in this complex environment are becoming increasingly difficult.
- costs of tendering are increasing and such costs may vary from as low as 0.25% for small lump sum projects up to 3.0% for build/own/operate projects.

He further pointed out when these figures are compared with the industry indicator of 4.9% operating profit before tax and 2.5% after tax in an industry environment averaging 5 tenders/project, it is apparent that:

- significant risks are being carried by industry;
- high costs of tendering are being borne by the State; and
- for unsuccessful tenderers, tender costs for State projects are borne by the industry.

In theory, selective instead of open tendering limits the competition and reduces the costs of tendering. The question is whether the benefits of increased competition via an open tendering process justify the cost. Flanagan and Norman (1989) report in their research findings that there is little to be gained by having more than five tenderers on any list.

Table 3.4 shows the advantages and disadvantages of open competitive and selected and pre-registered tendering according to the Queensland Government Discussion Paper: Security of Payment for Subcontractors in the Building and Construction Industry (1991).

Table 3.4 Advantages and Disadvantages of Open Competitive and Selected and Pre-registered Tendering Method

Advantages:

Open Competitive Tendering	Selected and Pre-registered Tendering
<ul style="list-style-type: none"> • Open and effective competition 	<ul style="list-style-type: none"> • Tenders are limited to those with a proven track record and capability to undertake a project and financial stability
<ul style="list-style-type: none"> • Marginally lower tender prices 	<ul style="list-style-type: none"> • Risk of insolvency of head contractor and non-payment of sub-contractors and suppliers is lessened

<ul style="list-style-type: none"> • Less open to abuse by principals, collusion by head contractors and unethical practices by industry representative organisations 	<ul style="list-style-type: none"> • Risk of head contractor over-reaching technical and financial capacities is lessened
<ul style="list-style-type: none"> • Perceived as being fair and equitable to all parties. 	<ul style="list-style-type: none"> • Less need for tenderers to cut prices "to the bone"
	<ul style="list-style-type: none"> • Greater chance of project finishing on time and within budget
	<ul style="list-style-type: none"> • Decreased level of contractual disputation
	<ul style="list-style-type: none"> • Lower unsuccessful tendering costs and thereby less cost to the industry
	<ul style="list-style-type: none"> • Supported by the majority of the industry

Disadvantages:

Open Competitive Tendering	Selected and Pre-registered Tendering
<ul style="list-style-type: none"> • Greatest risk of insolvency of head contractor and non-payment of subcontractors 	<ul style="list-style-type: none"> • Marginally higher tender prices
<ul style="list-style-type: none"> • Greater risk of head contractor over-reaching his technical and financial capacities 	<ul style="list-style-type: none"> • Can be open to abuse by principals, collusion by head contractors and unethical practices by industry representative organisations
<ul style="list-style-type: none"> • Increased risk to tenderers through increased competition and resultant to cut tender prices 	<ul style="list-style-type: none"> • No open tendering - may be perceived as not being equitable to all parties
<ul style="list-style-type: none"> • Less chance finishing on time and budget 	
<ul style="list-style-type: none"> • Increased level of contractual disputation due to lower margins 	
<ul style="list-style-type: none"> • Increased cost to the industry through higher tendering costs 	
<ul style="list-style-type: none"> • Not supported by the majority of the industry 	

Source: Queensland Government (1991, pp68-69)

In addressing the tendering issues, Fohrman (1996) suggests, in order to avoid a large number of contractors tendering with only one winner, that building project clients should consider allowing only contractors who are acceptable and qualified to submit conforming bids. Increasing probability of success can reduce risks of losing bids. Industry professionals spending more time on bid preparation, in turn, should reduce conflict that arises due to poor tendering techniques and have the overall result of a higher return to the contractor and more equitable costs for the Queensland State.

The number of tenderers in selected and pre-registered tenders for construction works, in the Brisbane metropolitan area, above \$5m in estimated value called by the Department in the traditional lump sum delivery method, during 1½ year period of from 1 January 1994 to 30 June 1995 is summarised in Table 3.5:

Table 3.5 Selected and Pre-registered Tender for Construction Works

Project Description	Year	Number of Tenderer	Tender Prices Range
Conservatorium of Music	1994	6	\$26,860,000 to \$32,985,000
Computing and Amenities Building	1994	6	\$6,462,000 to \$7,330,000
New Cell Block	1995	4	\$7,980,000 to \$10,424,000

Indication between this Table 3.5 with the previous Table 3.3 Open Tender clearly shows that in this selected and pre-registered tendering system: 1) number of tenderers had been reduced, 2) individual tenderer had a better chance to be successful, 3) the waste of resource on compiling tenders had also been reduced.

3.6 Pre-qualification Criteria

The success or failure of a building construction project is not a chance outcome. It is influenced by numerous factors. One major factor which influences project success is the prevention of contractor failure at any stage of the project. Russell (1996) proposes an evaluation method through which building project clients can minimise the chance of contractor failure. Such a method is contractor pre-qualification which is to assist building project client avoid contractor failure by ensuring that contractors participating in tendering process have the experience to complete the building project. A building project client screens the candidate contractors according to a given set of criteria before any competitive tendering. The goal of this screening process is to determine a contractor's competence and capabilities to perform the work.

Mills (1996) reported that, since the early 1990s, public sector agencies have used some form of pre-qualification assessment process in order to rate contractors for capital works projects. In general, agencies are trying to determine which contractors are likely to produce an adequate standard of work, within the budgeted cost and time limits. The pre-qualification process has been used to screen contractors, who are likely to be capable of undertaking the project and those who are not. Only companies qualified for a project at hand will participate in the tendering process.

Some contractors may view pre-qualification as a drain on their resources that open up to biased and erroneous disqualification by the building project client. Russell (1996) indicates that by implementing thorough and accurate pre-qualification methodology, contractors will benefit by the resultant reduction in number of competitors in any tendering process.

The 'No Dispute' report by the National Public Works Conference and National Building and Construction Council joint working party (1990, p51) suggests that evaluations of:

- *“technical, management, physical and financial resources;*
- *current commitments;*
- *reputation within the industry;*
- *record of performance;*
- *ability to perform the subject project; and*
- *industrial relations and safety record.”*

should be undertaken at the pre-registration stage and should consider but not be limited to the prospective tenderers. After the close of the tender, the price should be compared with the estimated cost.

The Queensland Government's State Purchasing Policy (1992) indicates that in assessing construction contract tenders, in addition to price, financial and technical capability, it is necessary to take into consideration tenderers' past performance on contracts, including:

- technical and construction competence;
- quality of work;
- ability to meet construction time;
- claims and disputations history;
- management skills;
- history of payment of workers, subcontractors and suppliers;
- safety and industrial relations record;
- performance during defects liability period and finalisation;
- apprenticeship policy;
- litigation and arbitration history;

- complexity of work; and
- record of tendering taking into account instances where the contractor has withdrawn a tender bid or failed to tender after being invited to do so.

In the more recent times, the Federal Government Reform Agency—Construction Industry Development Agency (1995), suggested ten criteria which should be used to assess contractors performance. These include:

1. technical capacity
2. financial capacity
3. quality assurance
4. time performance
5. occupational health and safety
6. human resources management
7. skill formation
8. claims performance
9. compliance with legislative requirements
10. management for continuous improvement.

To properly design the pre-qualification process, Russell (1996, p5) suggests the following major issues should be taken into consideration:

- contractor and major subcontractors, and material suppliers are competent, responsible, and experienced, with adequate resources to complete the project;
- contractors with limited financial resources, over-extended commitments, inadequate and inexperienced organizations should be eliminated from the tender list for the project;
- maximising competition among qualified contractors and major subcontractors.

3.7 Tender Evaluation Process

The Queensland Government's State Purchasing Policy (1992, pix) applies to the procurement of all goods, equipment and related services, construction contracts and service contracts by departments and statutory bodies as defined in the Financial Administration and Audit Act. The Policy is based on five fundamental principles:

- *“Open and effective competition;*
- *Value for money;*
- *Enhancing the capabilities of local business and industry;*
- *Environmental protection; and*
- *Ethical behaviour and fair dealing.”*

The Administrative Services Department has established a selection panel to examine and evaluate applications against the pre-registration criteria in the selection of tenderers, and tenders invited from only those have been considered suitable and capable. It is possible in this pre-registration selection process to reject any unsuitable applications, to justify their exclusion from the tendering process and to limit the tenderers to an acceptable number.

The proper evaluation is one which enables the evaluating panel to select the most appropriate offer given the nature, value and importance of the work. In its procurement endeavours Administrative Services Department seeks to achieve value for money, that is, the best quality for the lowest possible price that is consistent with the specifications of the project being procured.

3.7.1 Example: Royal Brisbane Hospital Central Energy Station Project

Late in 1995, the Administrative Services Department invited expressions of interest for Construction Management Services for the New Royal Brisbane and Royal Women's Hospital Re-development Construction of Central Energy Building, Plant and Reticulated Services.

The tendering process was:

(1) Pre-registration Stage

- Public call for Expressions of Interest in newspapers;

Thirteen Companies expressed their interest by a specified due date. These Companies were: BM Construction Limited, BH Pty Ltd, CAC Pty Limited, CCG

Pty Limited, AWE Pty Limited, GE Pty Limited, FCA Limited, JHCAE Pty Ltd, LC Pty Limited, MC Pty Ltd, FAPAS Pty Ltd, WA Pty Ltd and BMCAA Pty Ltd.

(2) Tenderer Screening and Selection Stage

- Registration of those Companies who expressed interest and were selectively invited as potential tenderers.

Applicants were evaluated against published criteria. The selection criteria adopted by the Department for the pre-registration of tenderers for the project is summarised in Table 3.6. Those Companies meeting the required criteria were to tender.

Five Companies were short-listed and invited to submit tender by the closing due date. These Companies were: BM Construction Limited, BH Pty Ltd, CAC Pty Limited, FCA Limited and LC Pty Ltd.

(3) Assessing and Awarding Tender Stage

After having pre-registration to qualify tenderers in respect of their capacity and ability to undertake the project, the Government applied the ‘lowest confirming tender’ criteria giving it a weighting of 60% and the other 40% of criteria consists of management structure and project personnel (as illustrated in Table 3.7) in awarding the tender.

This is in consistency with the NPWC/NBCC (1990, p46) recommendation that *“it should be possible to confidently recommend for acceptance any registered firm which subsequently submits the lowest acceptable tender, unless the circumstances under which the firm was registered have changed substantially subsequent to pre-registration.”* The contract price should be used as a winner in tendering only when tenderers are pre-qualified (Chartered Institute of Building - UK, 1993).

The example illustrates the steps, by means of the process of pre-registration, which the Queensland Government has adopted for choosing a reliable and solvent contractor. This simply means short-listing contractors who will be considered for a proposed construction project. Pre-registration is a helpful precaution to take before

inviting contractors (tenderers) to tender. Subsequent to the pre-registration stage, the tender representing best value for money and best conforming to the published criteria is awarded the contract.

Table 3.6 RBH CES Selection Criteria Explanation

SELECTION CRITERIA for RBH Central Energy Station Expressions of Interest			
		WEIGHT	DESCRIPTION FOR MARKING
Criteria Level No 1 {stop/go}		If “no” then no further consideration	
1.1	Relevant Registrations	Y/N	QBSA, CAN, etc.
1.2	Quality Assurance to AS3901/ISO 9001	Y/N	Full implementation to ISO 9001/2 or AS3901/2 required
1.3	Consultants compatible	Y/N	Any objections to nominated consultants?
Criteria Level No 2		%	Score 1-5 (5 high) on absolute performance
2.1	Previous M&E experience	20	Demonstrated experience in managing M&E contractors; not necessarily on Hospitals but claimed experience to be relevant; last 5 years particularly relevant
2.2	Previous experience in Construction Management	20	Demonstrated experience in both public and private sector construction management projects; last 5 years particularly relevant
2.3	Overall financial capability	20	Risk rating determined by Financial Adviser Contracts plus consideration given for this project compared to annual turnover
2.4	Overall organisational capability	20	Demonstrated proper head office management structure in place; demonstrated efficiencies in this sphere; good reporting systems in place; clear delegations; stable company
2.5	Ability to meet tight programme	10	Tightly programmed complex projects quoted; demonstrated performance on previous projects especially high turnovers achieved
2.6	Safety policy	7	Should have a company safety policy supported by a plan; full time safety officer in managerial position
2.7	Ethics	3	Promising co-operation and espousing partnering philosophy; known ethics
	Total	100	Minimum score to proceed is 75%; if more than 10, take top ten scorers; min score any one line is 2
Criteria Level No 3		Enquiries may be needed, scoring 1-5 on absolute basis	
3.1	Current availability of personnel	Y/N	Names, qualifications, and current deployment of current and immediately expected contracts personnel; not necessarily in Qld but should be with company not consultants
3.2	Current financial capacity	Y/N	Need to know both current and expected immediate contracts; working capital
Consideration to:			

4.1	Current workload with ASD	40	Records held by Contracts Branch in main database
4.2	Opportunities previously given on ASD select lists	60	Records held by Contracts Branch in Excel spreadsheet

Table 3.7 Evaluation Criteria for tenders

EXPLANATION OF CRITERIA

1 PRICE (60% of overall score)		\$	
1.1	Management Fee		
1.2	Construction Management fee (calculated by taking tendered % times estimated Actual Construction Sum)		
	TOTAL		
	Scoring is based on Part C Section 7 of the State Purchasing Policy point scoring system:		
	Excellent	5	
	Very Good	4	
	Good	3	
	Acceptable	2	
	Marginally Adequate	1	
	Unacceptable	0	
	Scores may be made to one decimal point		
2 MANAGEMENT (40% of overall score)			
	Management is divided into two 2.1 "Structure" is weighted at 60% and 2.2 "Personnel" is weighted at 40%.		
		WEIGHT	SCORING BASIS
2.1	Structure	60%	
2.1.1	Head office organisation chart as it relates to the project	5	Chart to show clear and effective structure with enough power being vested in Project Team but balanced by overall control.
2.1.2	Identification of tasks and duties for CM to undertake.	15	Will reflect contract; checklist to be prepared by Assessment team but modify in light of knowledge gained from tenders.
2.1.3	Project organisation chart, with names of personnel shown	20	Chart to show how tasks at 2.1.2 discharged and Assessors to work in how other tasks not identified by that tenderer would be handled.
2.1.4	Number of management and supervisory personnel involved in project.	60	Both on and off site but need to identify where located and extent of involvement.
	Sub-total	100	
2.2	Personnel	40%	
2.2.1	Duty lists and positions description for each position shown on project organisation chart.	5	
2.2.2	Qualifications and experience of Project Manager.	18	Tertiary education and actual experience of project management are advantages.
2.2.3	Qualifications and experience of M & E Managers.	18	Qualifications (M&E engineering, design, and managerial) desirable for higher level positions backed by trade qualified supervisors.
2.2.4	Qualifications and experience of Construction Site Managers.	18	Qualifications (building and managerial) desirable for higher level positions backed by trade qualified supervisors
2.2.5	Qualifications and experience of Contracts Manager.	18	Previous experience letting M&E trade packages and finalising accounts thereon desirable; ability to budget essential.
2.2.6	Qualifications and experience of Programmer.	18	Previous experience of programming M&E work is almost essential.
2.2.7	Qualifications and experience of other Project staff.	5	
	Sub-total	100	
THE BREAKER			
1	If the tied Tenderers have the same overall score for the two criteria and the same score for each of the two major criteria then the one with the lower actual price shall be favoured.		

2	If the tied Tenderers have the same overall score but different scores for the two major criteria then the one with the lower actual price shall be favoured.		
3	If the above two criteria fail to break a tie then the names shall be drawn by Senior Administration Officer Tenders to determine the favoured one.		

3.8 Recent Development of Pre-qualification System and Criteria in the Queensland Public Sector Works

The April 1997 Building Services Authority Newsletter featured an article regarding the competition for Queensland Government Public Work in the future. It described the Government as having a major interest in the performance of individual contractors, value for money, and consistency and fairness in the way in which work is distributed to business across the whole of Government. The Government also has a major stake in the performance of the industry as a whole, and benefits from using its purchasing power to achieve its objectives in making the Queensland construction industry stronger and more productive. In order to achieve the objectives, the Government is to introduce a system of pre-qualification criteria for contractors.

Mills (1996) points out although the process of pre-qualification of contractors is important to the procurement process, it has not attracted much attention by academics or industry professionals until recently. The public sector aware of the potential of improving the efficiency of the process for themselves and the industry as a whole. Public Sector agencies throughout Australia operate many different procurement systems, some of which incorporate the use of a pre-qualification assessment.

As detailed in the copy, *'Competing for Government Building Work - Contractor's Guide to Pre-qualification'* (Queensland Government, 1997, p1), *"the Queensland Government has developed a pre-qualification system (to be known as PQC), which ensures each contractor in the state has a fair opportunity to share the work; and the system also seeks to ensure that the most suitable contractors are identified for submission of proposals, encourages the general development of the industry and rewards contractors who perform well."*

The objectives of the pre-qualification criteria are to make the tendering process more streamlined by providing the supporting data by which tender lists may be developed; to make it more consistent and fair; to reduce the costs of tendering; to reduce contract awarding requirements or higher pre-qualified tenders; and to eliminate perceptions that price is the single relevant criteria in tendering for government.

Pre-qualification is a preliminary step in the tendering and selection process, but it does not replace the 'Request for Tenders' and the assessment of tenders. The criteria are designed to clearly state the levels of technical and management capabilities that a contractor should have before considering tendering for Government works. PQC has four levels of qualification (Queensland Government, 1997, p3):

- *“Level 1 - Demonstrated compliance with effective work practices, that is, observing standardised work procedures and codes of practice;*
- *Level 2 - Commitment to continuous improvement, that is, an enthusiasm for continuous improvement in the way in which they do business;*
- *Level 3 - Industry best practice, that is, a learning organisation operating at high standards of excellence;*
- *Level 4 - World's best practice, that is, achieving as good as, or better than, the best in any industry.”*

If contractors cannot meet these pre-qualification standards in their respective levels, then it is unlikely that they will meet the project criteria, and therefore they should not submit a tender. In addition to eliminating unnecessary costs of tendering, the outcome will be to eliminate perceptions that business is won on price alone.

Apart from meeting the financial criteria, contractors are assessed on the following criteria (Queensland Government, 1997):

(1) technical capacity—related to past performance and approach to innovation:

- performance
- experience
- qualifications
- applications
- innovation.

(2) management approach—related to the business competencies in planning and financial management:

- corporate planning
- project planning
- processes
- quality
- environment.

(3) people involvement—related to quality and development of staff:

- competency
- performance appraisal
- training and development
- workplace health and safety
- culture.

(4) business relationships—related to dealings with clients and suppliers:

- clients focus
- supplier alliances
- stakeholder involvement
- communication
- handling conflict.

In addition, a supplier (subcontractor) alliance is one of the pre-qualification criteria in business relations to be assessed. The Queensland Government (1997, pp31,32) rate contractors in their respective levels:

“Level 1 - Demonstrating compliance with codes of practice—Subcontractors are selected on broad performance criteria not just price.

Level 2 - Recognising the need to work together..... value for the client’s money—Supplier/Subcontractor performance is regularly reviewed and formally reported.

Level 3 - Maintaining long term partnership with clients and suppliers/ subcontractors—Repeat business is promoted with subcontractors/suppliers by addressing mutual problems, moving towards single negotiation.

Level 4 - Mutual benefits to all parties via trust, confidence and support—Subcontractors and suppliers actively participate prior to, during and following contract delivery.”

The Queensland Government (1997, p3) indicates that there are benefits to both the building industry and government in adopting PQC:

For the contractor:

- *“lower tendering cost*
- *competing against similarly qualified contractors*
- *raising the professionalism of the industry.”*

For Government:

- *“lower project costs*
- *objective, quantifiable information for contractor selection*
- *greater certainty of project outcomes.”*

3.9 Strategic Alliances between Contractors and Subcontractors—A Tender Evaluation Criterion for the Public Works Sector

According to Matthews et al (1996), subcontractors perform approximately 80 to 90% of the value of work on most construction projects. Thus, it is imperative for the contractor to use keen judgment when selecting subcontractors for each project. Based on his results, Millman (1990) reported that many contractors have a list of preferred subcontracting firms to which they award the majority of their work. These contractors are more confident of better performance and less risk when working with familiar and proven subcontractors. Assuming that these subcontractors' prices are competitive, it is only logical for the contractor to follow this pattern. Subsequent to this, it is also logical for the principal or the client to request a list of the subcontractors which the contractor intends to engage in the project for assessment of the contractor at the tender evaluating stage. Giles (1995) suggested that the principal

is encouraged to require tenderers to name or at least provide a selection of names of proposed subcontractors for major trades.

The Royal Commission Building Industry (Gyles, 1992) highlighted in its report that many subcontractors develop a preference to work for a particular head contractor. This occurs because the contractor exhibits qualities that subcontractors find agreeable. Some of these qualities are (Vol 9, p168):

- *“the willingness to make payments before or on the due date;*
- *a high level of competence in administering their business, from site to office level;*
- *a willingness to support the subcontractor should difficulties be experienced;*
- *an ability to communicate at all levels;*
- *fairness in assessing contract sums and variations;*
- *competent industry knowledge, and technical expertise;*
- *good industrial relations;*
- *consistent supply of work;*
- *respectable reputation; and*
- *ability to remain solvent and maintain good credit ratings.”*

The report also indicates the benefits of the head contractor and the subcontractors due to the willingness of both parties in forming a lasting business relationship. These benefits are: reduction in payment disputes, improved project control and higher productivity.

Based on results of a survey of the level of satisfaction of specialist contractors (subcontractors) rated by the company (contractor), Latham (1994) concluded that success of a project is improved by:

- developing better relations through partnership arrangements;
- involving subcontractors earlier to achieve project objectives, and developing greater team involvement through the project life cycle and beyond;
- utilising the skill and knowledge of subcontractors more fully and better, and recognising that subcontractors can and want to make a greater contribution; and

- developing a more structured, standardised and ethical approach to the procurement and management of subcontractors.

So far, this research has identified many recommendations regarding the inclusion of subcontractors' names and their prices in the contractor's tender submission for client's evaluation. It is imperative for the client to formulate criteria—including the evaluation of subcontractors—as a tender evaluation tool.

The discussion paper—*A perspective of the Construction Industry in NSW in 2005*—produced by New South Wales (1997) summarised the attributes required for the industry to be responsible to the future environment. To sustain improvement in productivity and quality, the construction industry must be:

- seamless
- efficient and profitable
- innovative
- environmentally responsible.

New South Wales Government (1997, p18) introduced propositions for the seamless:

- *“integration—The industry must move from being inwardly focused, adversarial and fragmented to being outwardly oriented, cooperative and integrated in terms of both the industry’s structure and its production processes.*
- *long-term relationships—Clients will look to minimise risk through long-term relationships.*
- *single source solutions—Clients, rather than dealing with numerous individual suppliers, will look for single source solutions.”*

Table 3.8 shows the performance indicators for seamless industry as proposed by the NSW government.

Table 3.8 Performance Indicators for Seamless Industry

Strategic Relationships	Number	Nature/Diversity
Duration of Relationships	Number	Duration
Long-term Contracts	Number	Duration/Nature/Diversity
Projects Delivered Using Partnering	Number	Scope/Outcomes

Source: New South Wales Government (1997, p23)

Having satisfied the process of pre-qualification, selected tenderers are requested to submit names and details of subcontractors with whom they have strategic alliance relationships, so that assessment and evaluation of tenderers can be made.

As detailed in the copy—Competing for Government Building Work - A Contractor's Guide to Pre-qualification (Queensland Government, 1997)—the Queensland Government has developed a pre-qualification system to grade contractors in four levels (Level 1 the lowest to Level 4 highest) according to their technical and management capabilities. Under the business relations' criteria relating to 'Supplier Alliances' of the pre-qualification system, the Government identifies the best relationships to be long term ones. It is expected that business relationships between contractors and subcontractors follow the following requirements:

- *“Subcontractors are selected on broad performance criteria not just price;*
- *Supplier/Subcontractor performance is regularly reviewed and formally reported;*
- *Repeat business is promoted with subcontractors/suppliers by addressing mutual problems, moving towards single negotiation; and*
- *Subcontractors and suppliers actively participate prior to, during and following contract delivery” (p32).*

Contractors with strategic alliance relationships with subcontractors would satisfy the above business relations criteria as set by the Queensland Government. Therefore, contractors with such relationships would gain competitive advantage over competitors.

3.10 Summary

This chapter provides a brief history of the Department of Public Works and Housing of Queensland and a selection of its departmental functions. The Queensland Government context for procuring public buildings in terms of project delivery systems and tendering methods is also discussed.

The pre-qualification criteria and evaluation process have developed from the pre-qualified tendering. The evolution benefit is demonstrated by the example in the

tendering procedure for the Royal Brisbane Central Energy Station Project. The tendering process for the project demonstrates the Queensland Government's intention to make the tendering process more streamlined; to make tendering more consistent and fair; to reduce the costs of tendering; to reduce contract awarding requirements for higher pre-qualified tenders; and to eliminate perceptions that price is the single relevant criteria in tendering for Government project.

The natural progression of pre-qualification criteria leads to the justification of establishing strategic alliance relationships between contractors and subcontractors as tender evaluation criteria and the development of decision factors for rating in a seamless industry.

4 METHODOLOGY AND RESEARCH DESIGN

4.1 Introduction

This chapter presents a broad discussion of issues related to research methodology and then justifies the selection of a research methodology appropriate to this investigation. Hence, the aims are to identify a research design and method most appropriate to this investigation, and to apply and evaluate its success in testing the alternate hypotheses that:

- HA 1 Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation and Joint Problem Solving, are perceived as positively correlated with business performance.¹
- HA 2 Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation and Joint Problem Solving, are perceived as positively correlated with the performance of on-site construction process.²

A range of methodological issues to be considered is summarised in Figure 4.1. These issues include the nature of research, formulation of research problem, academic and professional research, applied and basic research, and characteristics of scientific research. In addition, inductive and deductive modes, qualitative and quantitative perspective and hypothetical-deductive method of conducting research are discussed.

The selection criteria for the specific research design and method for this work is outlined. The major component of this investigation itself was carried out after implementing of two semi-structured interview pilot studies. The principal options to be considered in a hypothetical-deductive method of investigation as used in this research include the development of theoretical framework, establishment of

¹ As introduced in Section 2.13, business performance relates contractor's tender success rate and business turnover as common industry measures for business performance in the building construction industry.

² As defined in Section 2.13, on-site construction processes refers to planning work, co-ordination of subcontractors, standard of workmanship and quality of subcontractors are some of the assessment

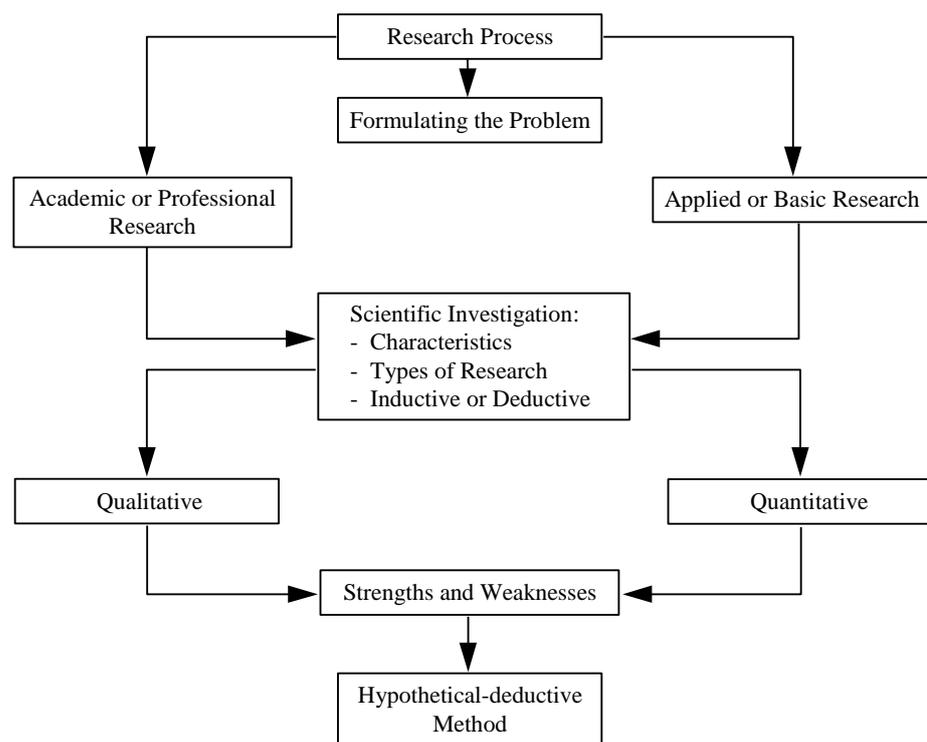
hypotheses, type of investigation, unit of analysis, time horizon, measurement of variables, scales and measurement, reliability and validity, data-collection method, instrumentation, sample selection, analysing the data and reporting the results.

The process of formulating the survey questionnaire, and the relevant factors adopted in securing an acceptable response rate are also outlined.

4.2 Hypothetical-deductive Research Method

Figure 4.1 illustrates the various research methodological issues and methods.

Figure 4.1 Research Methodological Issues



In general terms, the nature of research as shown in Figure 4.1 and various research methods are described in Appendix A. It is clear that the selection of an appropriate research method for the investigation is of prime importance. The success of a research project relies substantially on a well-defined problem statement and a clear

understanding of each of its components. A research design is a coherent framework that ties the component parts as an integrated structure.

Following Mauch and Birch (1989), a research design was developed to carry out the investigation in order to produce reliable knowledge. This was a blueprint to deal with four questions (Yin 1984): what questions to study, what data are relevant, what data to collect, and how to analyse the results. In other word, the research plan is “*an action plan for getting from here to there*” (Yin, 1984, p28).

Sekaran (1992) listed seven steps involving the hypothetical-deductive method of research which are described in Table 4.1:

Table 4.1 Seven-Step Process in the Hypothetical-Deduction Method

Steps	Descriptions
Observation	In which one senses that certain changes are occurring, or that some new behaviours, attitudes, and feelings are vaguely surface in one’s environment.
Preliminary Information Gathering	It involves the seeking of information to know more about what one observed. Through unstructured interviews, one gets an idea or a “feel” for what is happening in the situation.
Theory Formulation	It is an attempt to integrate the information logically so that the reason for the problem can be conceptualised.
Hypothesising	From the network of associations drawn among the variables, certain testable hypotheses or educated conjectures can be generated. Hypothesis testing is called deductive research.
Further Scientific Data Collection	After the development of the hypotheses, data with respect to each variable in the hypotheses need to be obtained. Scientific data collection is needed to test the hypotheses that are generated in the study.
Data Analysis	The data gathered are statistically analysed to see if the hypotheses that were generated have been supported. A correlational analysis might be conducted in order to determine the relationship between the two factors.
Deduction	It is the process of arriving at conclusions by interpreting the meaning of the results of the data analysis.

Source: Sekaran (1992, pp17-19)

The following sections describe the approach (Table 4.1) in this research. It is basic research motivated primarily by curiosity in a professional discipline. It is a deductive mode of research in a quantitative study. It is also a correlational-predictive type of research (Mauch and Birch, 1989). The research plan, which guides this work, consists of the seven-step process in the hypothetical-deduction method: observation, preliminary information gathering, theory formulation, hypothesising, data collection, data analysis and deduction.

4.2.1 Observation

Observation is the first step in the hypothetical-deductive method, in which one senses that certain changes in behaviour or attitude are occurring in one's environment; or one senses that there has been no changes at all.

Anecdotal evidence indicated although subcontractors play a vital role in the building construction process, there had been minimal changes in relationships between contractors and subcontractors for the past thirty years. The Ministry of Public Building and Works in the United Kingdom (UK) (1964) emphasised in its findings the importance for the subcontractors to be closely integrated into the construction team. Thirty years later, Latham (1994) recommended involving subcontractors earlier and developing greater team involvement through better and more cooperative relationships with contractors.

In Australia, much of the New South Wales Royal Commission into the Building Industry (RCBI) (Gyles, 1992, Appendix PR11, p161) pointed "*to the abiding significance to the building process of the relationship between the head contractor and subcontractors.*" The RCBI report (Gyles, 1992) also suggested in its detailed study of twenty major projects that such adversarial relationships were not primarily caused by the form of project delivery nor the nature of the contracts, but more fundamentally upon the relationships and understandings between parties including contractors and subcontractors.

Both the RCBI (Gyles, 1992) and Latham (1994) reports recommended that, in order to achieve improvement in the building construction industry, contractors and subcontractors should develop good working and business relationships.

The aim of this study is to examine to the extent do and limitations of strategic alliance relationships between contractors and subcontractors on the future success in gaining competitive advantages in the Queensland public sector works.

4.2.2 Preliminary Information Gathering

In this study, preliminary information gathering was carried out using two methods:

- unstructured interviews—face to face or by telephone—with private sector building industry professionals and consultants; and with public sector government officials from South East Queensland Electricity Board, Queensland Railways, Brisbane City Council, and the Capital Works Section of Queensland University of Technology;
- a focus group discussion with professional staff from the Queensland Government, Department of Public Works and Housing.

Unstructured Interviews

These preliminary interviews provide an indication of the current situation and the phenomena and a better comprehension of the research problem. The nature of this exploratory interviewing process is to attempt to determine the degree and limitations of strategic alliance relationships between contractors and subcontractors.

These preliminary interviews were carried out during September 1995. The fourteen interviewees consisted of:

five representatives from the public sector:

- a project manager and an estimator from the Building Construction section of Brisbane City Council;
- a project development officer from the Queensland Railway;
- a senior engineer in capital works from South East Queensland Electricity Board;
- a principal architect from the Capital Works Section of Queensland University of Technology;

five industry professionals from the private sector:

- a construction manager from a large commercial building company;
- a project manager from a large commercial building company;

- three quantity surveyors from three separate quantity surveying consultancy firms;

four academics:

- two university academics:
- two lecturers from the School of Construction Management, Queensland University of Technology.

None of the above fourteen interviewees indicated any awareness of strategic alliance relationships existing between contractors and subcontractors. They further indicated, in reference to pre-qualification of the contractors prior awarding tender, that the formation of strategic alliance relationships between contractors and subcontractors was never considered as one of the pre-qualification or selection criterion. However, the interviewees from the public sector did mention in rare occasions that they required tenderers to name the subcontractors in the specialised trades in their tender submission for the work.

Focus Group Discussion

With origins in sociology, focus groups became a popular form of research in the 1980s and developed a more diverse research application in the 1990s (Emory and Cooper, 1991). Principles of group dynamics were used to guide the group in an exchange of ideas, feelings, and experiences on a clearly understood topic. Furthermore, focus groups also “*produce qualitative data that provide insights into the attitudes, perceptions, and opinions of participants*” (Krueger, 1988, p30).

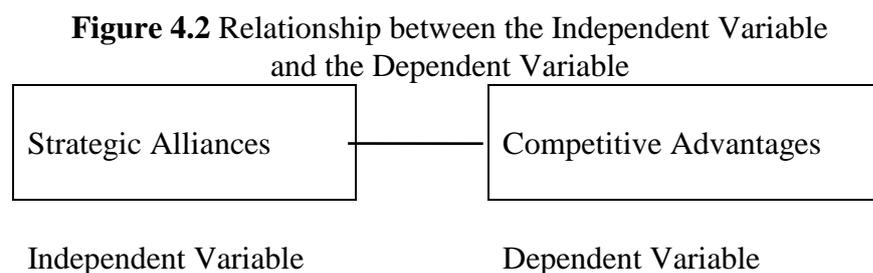
The group in this preliminary investigation, which was carried out in October 1995, consisted of a Director, a Principal Project Manager, a Legal and Contractual Manager, a Principal Policy Officer and a Financial Adviser of the Administrative Services Department (ASD)(now Department of Public Works and Housing). The objectives of the session were to explore the group’s understanding of the concept of strategic alliance relationships between contractors and subcontractors and to evaluate their views on the formation and limitations of such relationships as one of the evaluation or selection criteria for future government works.

This focus group discussion indicated that none of the group participants were aware of the existence of any strategic alliance relationships between contractors and subcontractors. At the time of discussion, the group expressed its interest in considering the formation of strategic alliances between contractors and subcontractors as one of the selection criteria in awarding future public sector works. Hence, the research setting for this study was focused on the Queensland public works sector.

4.2.3 Theoretical Framework

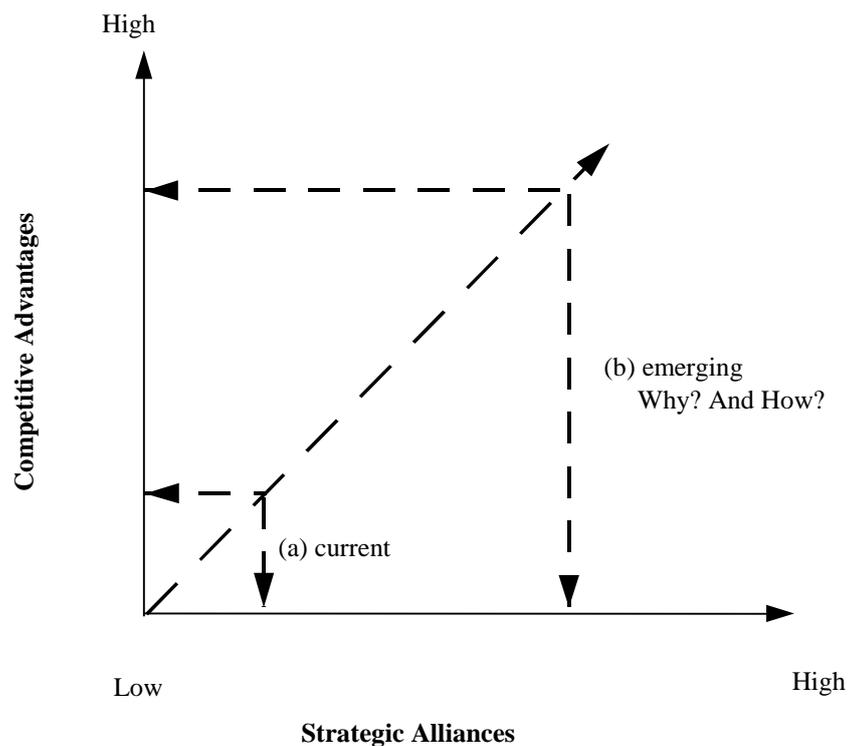
Having completed the preliminary exploratory unstructured interviews, a focus group discussion, literature reviews relating to the concept of strategic alliances and defined the problem, the next step was to develop a theoretical framework in order to test the relationships among the factors that have been identified as important to the problem.

Following Sekaran (1992), formulating theoretical framework is the foundation on which this research project is based. The developed conceptual framework helped to postulate and test certain relationships so as to improve the understanding of the dynamics of the situation. From the theoretical framework as shown in Figure 4.2, testable hypotheses were developed to ascertain whether the theory formulated was valid or not. The relationships were tested through appropriate statistical analysis. The theoretical framework elaborated the relationships among the variables, explained the theory underlying these relations, and described the nature and direction of the relationships.



In this research, the proposition to be tested is that strategic alliance relationship between contractors and subcontractors are perceived as positively correlated with the competitive advantage over competitors. Figure 4.3 illustrates the theorised direct influence of independent variable (strategic alliances) on the dependent variable (competitive advantages).

Figure 4.3 Strategic Alliance Relationships versus Competitive Advantage



CNBR/RESCON Debate

In order to establish an appropriate instrument for measuring strategic alliance relationships, in 1996 a request was sought through the Internet for an instrument measuring the attributes of strategic alliance. An electronic mail message seeking assistance was sent out to colleagues of Co-operative Network for Building Researchers (CNBR), of the Royal Melbourne Institute of Technology, Department of Building and Construction Economics, and Research Concentration in Design and

Construction Studies (RESCON), of Queensland University of Technology. The discussion via the electronic mail network was over a period of three weeks. The request was as follows:

“I am a PhD research student, from Queensland University of Technology, School of Construction Management and Property, undertaking a research project entitled ‘Competitive Advantage in Building Construction through Strategic Alliances.’ In brief, I am looking at relationship between contractors and subcontractors in a long-term basis. I am seeking an instrument(s) to measure the following attributes for the success of strategic alliances: TRUST, COMMITMENT, INTERDEPENDENCE, COMMUNICATION, CO-OPERATION and JOINT PROBLEM SOLVING” (Kwok, 1996).

Crook (1996) replied that *“this is an interesting problem and one upon which I would like to obtain a few opinions.”* Howell (1996) stated that *“I doubt there are meaningful measures of trust, commitment etc. as these are ‘process outcomes’ that is the result of the parties having together.”* Raftery (1996) pointed out that *“Tom Kwok never for an instant implied that these attributes could easily be measured. In fact he chose to consult with CNBR colleagues for the very reason that they are extremely difficult to deal with”.* According to Smyth (1996), *“trust, commitment etc. are certainly issues and are factors for research. They are key factors in a process (as opposed to effects). Therefore, they are correctly attributes in and of strategic alliances.”*

Electronic mail response from Smith (1996) suggested the above attributes are part of the domain studied by organisational consultants in the area of organisational behaviour relating to team climate or organisational climate. Smyth (1996) indicated *“the area of relationship marketing offers useful ideas that move marketing away from the traditional rational approach of the marketing mix and towards a more qualitative one based around the dynamics of relationships both at corporate and individuals levels.”* Uher (1996) suggested review publications from the Construction Industry Institute (University of Texas). All the above suggestions have been reflected upon in the previous sections of the literature review.

Crook (1996) pointed out that in *“Tom Kwok’s case, he is trying to isolate the various attributes for the success of strategic alliances: trust, commitment, interdependence, co-operation, communication and joint problem solving in order to build a theory/model which purports to enable a manager to be more successful.”* He further described *“that the classic variables analysis is to identify ‘independent’ and ‘dependent’ variables (for instance trust, commitment etc. as independent and successful as dependent), to (somehow) draw up a questionnaire that will (somehow) produce data (somehow) pertaining to the relationship between variables, and then to perform analysis and prose relationships.”*

Thomas (1996) believed the *“only effective way to obtain any supportable basis of measurement is through the statistical analysis of focused questionnaire based data directed at both contractors and subcontractors. Such a questionnaire would require a whole body of research in itself just to set up the right questions to get the responses required.”* Raftery (1996) emphasised that in advancing construction management research field *“it is important that the research work is replicable, objective (as far as possible) and generalisable. Even though qualitative research provides rich meaning there are often serious difficulties in generalising and replicating the work. This is one reason why using quantitative research and statistics should not be criticised.”*

Having examined the request, Then (1996) has indicated that the research seems to be heading very much into the area of social science. *“The attributes mentioned are ‘soft variables’ and therefore subjective in nature. It will be difficult to find a single measure for each of them. It is necessary to use ‘indirect or surrogate’ measures, e.g. communication and joint problem solving may be measured by considering the frequency of contact between various parties and whether the final solution could be arrived at through a consensus of the parties involved. Furthermore, social science methods are often very quantitative oriented. As for structured questionnaire design,*

should start with a key topic and decide what to ask and how the answers are going to be analysed, e.g. quantitatively (statistics).”

It is concluded in this debate. Since there are no meaningful measures of strategic alliance attributes as they are process outcomes (Howell, 1996), the measures for these attributes are developed using indirect measures as suggested by Then (1996). The statistical analysis of focused questionnaire (i.e. quantitative research), as suggested by Crook, Thomas and Raftery, was adopted for this investigation.

A series of 22 specific elements for measuring strategic alliance based on these six dimensions has been developed through a rigorous review of literature in the areas of social science, organisational behaviour, marketing, buyer and seller relations, manufacturing industry and partnering in the construction industry.

Independent Variable—Strategic Alliance Attributes

The relevant attributes describing the success of business relationships between firms and the six core dimensions—trust, commitment, interdependence, communication, co-operation and joint problem solving—were detailed as the independent variable of strategic alliances of this research. The six dimensional areas of strategic alliance each consists of between three to five elements or measures.

In reference to measuring strategic alliance attributes, a clear understanding of the current situation is an important first step in relating the concept of strategic alliances between the contracting firms and its subcontractors. The contractors were requested to indicate these attitudes (i.e. ranging from strongly disagree to strongly agree) towards subcontracting firms to the following statements/elements:

Trust

- We help each other get out of difficult situations (Lewis, 1990).
- Our word is reliable and we fulfil our respective obligations (Mohr and Spekman, 1994).

- We share commercial and technical information relating to projects without the need to protect ourselves (Mink, Mink and Owen, 1987).

Commitment

- The co-operative business relationship has developed from the top management of both parties (Bennet and Jayes, 1995).
- We see this co-operative business relationship as long term commitment (Howarth, Gillin and Baily, 1995).
- We share resources (Bureau of Industry Economics, 1995).
- We are committed actively in building trust (Howarth, Gillin and Baily, 1995).
- There is no conflict between our individual and joint goals (Mohr and Spekman, 1994).

Interdependence

- We give each other work (Lewis, 1990).
- We have a mutual reliance on each other (Mohr and Spekman, 1994)
- We treat each other equally as business partners (Howarth, Gillin and Bailey, 1995).

Communication

- We maintain openness in order to prevent hesitation, reservation or other defensive behaviour (Varney, 1989).
- We communicate openly and with trust in mutually pursuing opportunities and solving problems and conflicts (Mink, Mink and Owen, 1987).
- We communicate regularly to compare current performance against expectations (Mink, Mink and Owen, 1987).
- We consult each other before making key decisions (Lewis, 1990)

Co-operation

- We co-operate out of mutual need and desire (Lewis, 1990).
- We co-operate to share risks (Lewis, 1990).
- Co-operation between us provides a foundation for business growth (Bureau of Industry Economics, 1995).

- We believe that co-operation with each other will reduce the likelihood of opportunistic behaviour (Bureau of Industry Economics, 1995).

Joint Problem Solving

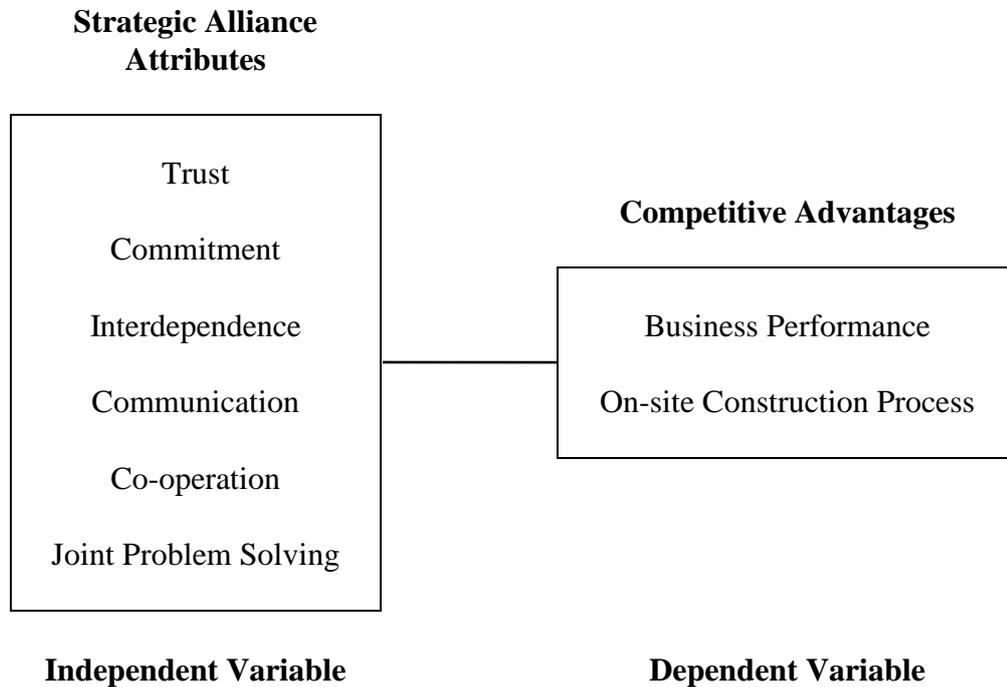
- Problems and conflicts are accepted as a part of teamwork (Mink, Mink and Owen, 1987).
- We feel free to admit and discuss difficulties even when they relate to uncomfortable issues (Mink, Shultz and Mink, 1991).
- When problems occur, we concentrate on solving them rather than trying to blame the other party (Howarth, Gillin and Baily, 1995)

Dependent Variable—Competitive Advantage

It is claimed that vertical strategic alliances between a contractor and its subcontractors in the building construction industry have been formed in order to gain competitive advantage by “*improving business performance through better estimates and tender submissions*” (CIDA, 1993). If this is true, one might also expect that the better and closer business relationship between the contractor and its subcontractors would produce superior client satisfaction through improvement of on-site construction processes due to fewer complaints of subcontractors’ works by Client and also fewer disputes to subcontractors by Client. Two subjective measures—one related to business performance and the other to on-site construction process—detailed in Section 2.14.

Tender success rate and business turnover are used to describe business performance. Planning work, co-ordination of subcontractors, standard of workmanship and quality of subcontractors are measurements of the on-site construction process. The rate of tender success and business turnover are key measures of business performance. Planning work, co-ordination of subcontractors, standard of workmanship and quality of subcontractors are some of the assessment measures used by the Queensland Government Department of Public Works and Housing as post-contract evaluation of contractor’s on-site performance. Figure 4.4 shows the schematic diagram of the theoretical framework.

Figure 4.4 Schematic Diagram of the Theoretical Framework



4.2.4 Hypotheses Development—Null and Alternate

A proposition is a statement about concepts which may be judged as true or false if it refers to something which is observable in the real world. Hypotheses are the propositions from a theory, which are capable of empirical testing (Emory and Cooper, 1991). As Sekaran (1992) has put it simply, a hypothesis is an educated guess about a problem's solution.

Having proposed both independent and dependent variables important to this study and established the relationships between the independent and dependent variables as detailed in Section 4.2.3 of formulating the theoretical framework, the next step was to test whether the relationships that had been theorised do in fact hold true. By testing these relationships through appropriate statistical analysis, reliable information on the extent to which relationships existed among the variables

operating in the problem situation should be obtained. Sekaran (1992) described the process of formulating testable statements as hypothesis development.

From the theoretical framework discussed above, two null hypotheses were developed for this research:

H_N 1 Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation and Joint Problem Solving, are perceived not to be correlated with business performance.

H_N 2 Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation and Joint Problem Solving, are perceived not to be correlated with the performance of on-site construction process.

These are to be contrasted with the alternate hypotheses that:

H_A 1 Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation and Joint Problem Solving, are perceived as positively correlated with business performance.

H_A 2 Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation and Joint Problem Solving, are perceived as positively correlated with the performance of on-site construction process.

4.2.5 Statistical Analysis Issues

In this study, descriptive statistics, frequency counts and measures of central tendency—mean and median, is used. Clover and Balsley (1984) indicate that correlation deals with association of variables. Nonparametric tests are used to test hypotheses with nominal and ordinal data (Emory and Cooper, 1991). Nonparametric tests are more appropriate for analysing ordinal data and Spearman's coefficient of rank correlation is appropriate in applying such ranked data. Hence, Spearman's rank correlation coefficient was used to determine the "*relationship and quantification of the strength of the relationship*" (Wright, 1976, p240) between strategic alliance elements and competitive advantage indicators. The limiting value of Spearman coefficients is -1 to +1, the sign (+ or -) denotes the direction of relationship. The +1

expresses perfect positive correlation, -1 expresses perfect negative correlation while the midpoint, 0, denotes a lack of any relationship.

4.2.6 Level of Significance

Levin and Rubin (1994, p382) indicate that “*there is no single standard or universal level of significance for testing hypotheses*. However, they also state that *the higher the significance level is used for testing a hypothesis, the higher the probability of rejecting a null hypothesis when it is true.*” The most common level is 0.05 although 0.01 is also widely used and other levels such as 0.10, 0.025, or 0.001 are sometimes chosen (Emory and Cooper, 1991).

Sekaran (1992) points out:

- Confidence refers to the probability that the estimations are correct. In social science research, a test result with 95 percent confidence level is deemed to be acceptable and is usually referred to as a significance level of 0.05 ($p \leq .05$). In other words, a 5 percent probability that the findings may not be correct.
- In a directional hypothesis, all tests that meet the .05 level of confidence are accepted. The null hypothesis is rejected if the results do not meet the $p \leq .05$ level of significance. However, in a non-directional hypothesis, the relationship can be either positive or negative. Due to the uncertainty to which side of the normal curve our sample belongs, thus, the results are subject to two-tailed tests of significance, which means that it can no longer be satisfied with a .05 level of significance, but the results have to be significant at the .025 level (.025 on each side of the normal curve ultimately amounts to .05). Thus, to be accepted, the results of non-directionally stated alternate hypotheses should meet a more stringent significance level.

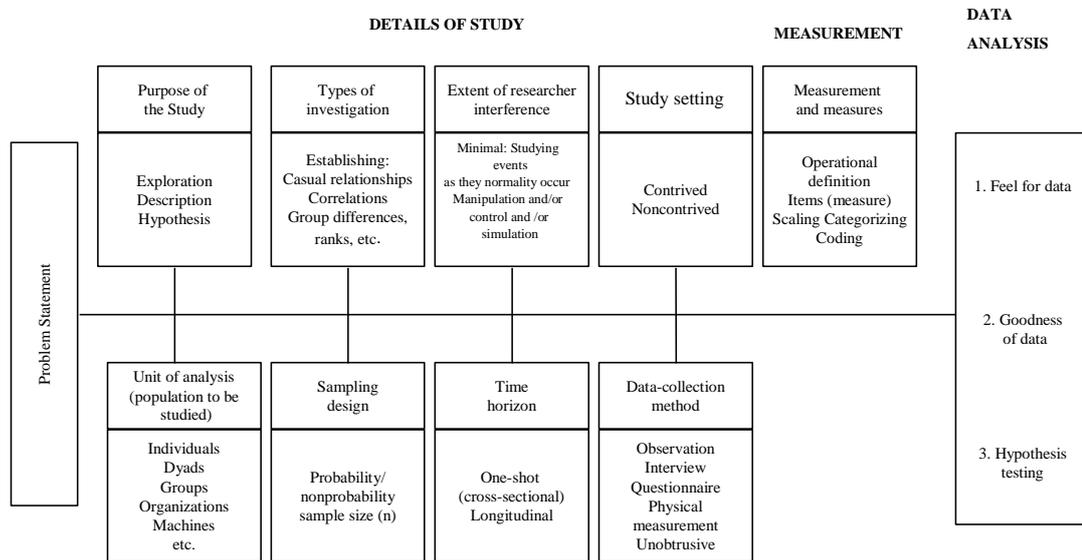
Boyatzis (1982, p58) argues that when a test of statistical significance is used, a finding labelled ‘significant’ is one that satisfies the commonly accepted level of .05. Findings satisfy the degree of ‘near significance’ which is .05 to .10. ‘Near significant’ findings should be considered suggestive and not as substantial as ‘significant’ findings.

4.3 Research Design for the Current Study

Basic design issues involve the type of investigation, purpose of the study, extent of researcher interference, study setting, the unit of analysis, and the time horizon. Therefore, it is necessary to determine the appropriate decisions to be made in the study design based on the problem definition, the research objectives, and the extent of rigour desired.

Sekaran (1992) illustrates the issues pertinent to research design relate to where the study will be conducted (i.e. the study setting), what type of a study it will be (type of investigation), the extent to which the researcher manipulates and controls the study (extent of researcher interference), the duration of the study (time horizon), and at what level the data will be analysed (unit of analysis). Other important issues include deciding what the sample will be (sampling design), how the data will be collected (data collection methods), how variables will be measured (measurement), and how they will be analysed to test the hypotheses (data analysis). All the above issues are summarised in Figure 4.5 and these are discussed in detail below.

Figure 4.5 Research Design for Current Study



Source: Sekaran (1992, p93)

4.3.1 Problem Statement

The aim of this study is to examine to what extent strategic alliance relationships between contractors and subcontractors relate to perceptions of future success in gaining a competitive advantage in the Queensland public sector works.

The examination of the background information identifies characteristics and factors contributing to significant attributes of strategic alliance (independent variable) and the factors measuring competitive advantages (dependent variable). A statistical correlation between independent and dependent variables is to be carried out to investigate the significance of the relationships in gaining competitive advantages.

4.3.2 Purpose of the Study—Exploration and Hypothesis Testing

A brief exploratory study has been carried out in order to find out much about the current situation regarding the concept of strategic alliance relationship between contractor and subcontractors. Preliminary work, such as unstructured interviews, needed to be done to gain familiarity with the phenomena in the situation, and to

understand what was happening before a model could be developed and set up a rigorous design for complete investigation.

It is suggested (Emory and Cooper, 1991) that qualitative research should be used for preliminary exploratory work before mounting a more complex work. As previously described in Section 4.2.2, preliminary exploratory studies—unstructured interviews and a focus group discussion—were conducted to gain an insight into the nature of the problem and to get a better perspective of the situation and the phenomena. Data, when gathered through unstructured interviewing and the focus group discussion, can be analysed in an exploratory way. When the data reveal some pattern regarding the phenomena of interest, theories are developed and hypotheses formulated for subsequent testing.

Studies that engage in hypotheses testing explain the nature of certain relationships. In this preliminary exploratory study, one of the fundamental objectives was to explore the situational factors and to identify the characteristics of the phenomena of interest. Hypotheses testing offer an enhanced understanding of the relationships that exist among variables. In this study, hypotheses testing utilise the quantitative data.

4.3.3 Type of Investigation—Correlations

Whether a study is causal or correlational depends on how the research question is answered. The former type of study is done when it is necessary to establish a definitive ‘cause → effect’ relationship e.g. whether smoking causes lung cancer. However, it needs to call for a correlational study if it is required to identify the important factors ‘associated with’ the problem. This study constituted as a correlational study.

Simon (1978, p53) indicates that “*an investigation into whether there is a relationship between two variables is an attempt to find out whether two phenomena are part of the same scheme.*” How well are strategic alliance relationships between contractors and subcontractors related to past/present/future success in gaining

competitive advantages in the public sector works? That is, how well do strategic alliance relationships predict/explain competitive advantages?

4.3.4 Extent of Researcher Interference

Data were collected from the sample contracting firms through postal questionnaire. The normal flow of events in running of the contractors' business was not interfered beyond administering a questionnaire to the sample contractors. Hence, researcher interference was minimal.

4.3.5 Study Setting—Contrived and Noncontrived

Sekaran (1992, p104) explains the differences concerning a field study, field experiment and laboratory experiment:

- *“a field study—a noncontrived setting with minimal researcher interference;*
- *a field experiment—a noncontrived setting but with researcher interference to a moderate extent;*
- *a laboratory experiment—a contrived setting with researcher interference to the maximum extent.”*

This research was carried in the natural environment where the events normally occurred, that is, a field study in noncontrived settings (see Section 4.3.4) and this should contain minimal researcher interference.

4.3.6 Unit of Analysis

Determining the unit of analysis based on the research question was an important aspect of the research design. *“A unit of analysis is the unit from which the researcher obtains information; a group or organisation could be a unit of analysis”* (de Vaus, 1991, p32).

The research question of this study sought answers from contracting firms regarding the formation of strategic alliance relationships with subcontractors in gaining competitive advantages. Hence, the unit of analysis is the building contracting firm.

The individual responses from contracting firms were totalled and the 'mean' used in the descriptive statistics. When individual responses from each of the contracting firms were aggregated and treated as one unit, the 'median' was used in inference statistics.

4.3.7 Time Horizon

Emory and Cooper (1991) explained that cross-sectional studies are carried out once only and represent a 'snapshot' of one point in time. Others are repeated over an extended period of time and such studies have come to be known as longitudinal studies.

A questionnaire survey was carried out to collect data from contracting firms. A total of 277 survey questionnaires were posted out within three consecutive days to the targeted respondent firms. Co-operation and assistance were sought from the respondents in replying to the questionnaire within a pre-set date. Total 112 replies were received. 85 replies were received from respondent firms within the stipulated due date. The remaining 27 replies were received within four weeks after the due date. (Section 4.4.5 describes the details in securing a good response rate).

This research is a cross-sectional study. This cross-sectional method has treated each sample contracting firms on an equal basis, that is, at a snapshot of one point in time with respect to the building industry culture and environment.

4.3.8 Measurement of Variables

According to Sekaran (1992, p149), *measurement of the variables in the theoretical framework is an integral part of research and an important aspect of research*

design. Unless the variables are measured in some way, one will not be able to test the hypotheses and find answers to complex research issues.

Sekaran (1992) further explains that there are two types of variables: one lends itself to some objective and precise measurement; the other is more nebulous and does not lend itself to precise measurement because of its subjective nature. Despite the lack of objective physical measuring devices to measure the latter type, there are ways of tapping the subjective feelings and perceptions of individuals. One technique is to reduce the abstract notions into observable characteristic behaviours. Sekaran (1992, p190) defines that *“reducing abstract concepts so that they can be measured is called operationalising the concepts.”*

Operational Definition

Operational definition involves reducing the concept from its level of abstraction by breaking it into its dimensions and elements as discussed above. The variable can be measured from the behaviour associated with a concept. The independent variable (as described in Section 4.2.3) in the concept of strategic alliance can be defined operationally.

Figure 4.6 schematically diagrams the dimensions:

- trust
- commitment
- interdependence
- communication
- co-operation
- joint problem solving

and the elements, for example, the elements of TRUST are:

- We **help each other** get out of difficult situations.
- **Our word is reliable** and we fulfil our respective obligations.
- We **share commercial and technical information** relating to project without the need to protect ourselves.

for the concept of strategic alliance.

Figure 4.6 Dimensions and Elements of the Concept of Strategic alliance

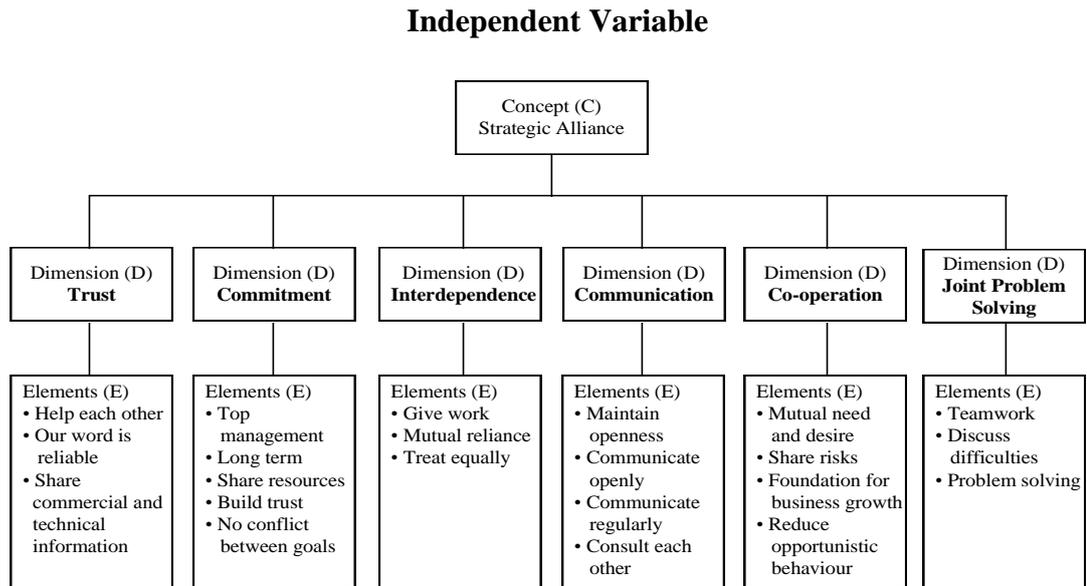
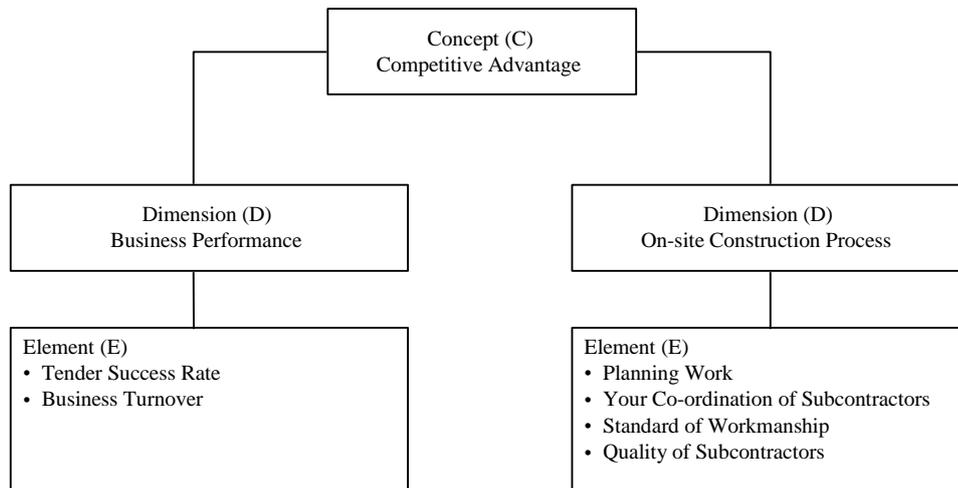


Figure 4.7 illustrates the operational definition of the concept of competitive advantage which is the dependent variable as described in Section 4.3.2. Tender success rate and business turnover are the elements of business performance dimension. Planning work, your co-ordinations of subcontractors, standard of workmanship and quality of subcontractors are elements of on-site construction process.

Figure 4.7 Dimensions and Elements of the Concept of Competitive Advantage

Dependent Variable



Respondents' rating to the statements/elements is one way of measuring the strength of the relationships between strategic alliance and competitive advantage. The questions were asked for responses on a scale. Section 4.3.9 details the scales and measurement used in this study.

4.3.9 Scales and Measurement

After defining the concepts and determining the type of questions to be asked to explain the concepts, the next step was to develop a method of measurement. In other words, how to find the extent to which these subjective feelings, attitudes or perceptions might exist in different individuals?

Is it possible to devise an instrument that would measure these variables? Certain scales have been devised to measure the variables of interest. *"Summated Scale consists of statements which express either a favorable or unfavorable attitude towards the object of interest"* (Emory and Cooper, 1991, p219). They further indicate that the most frequently used form is the Likert scale which allows the respondent to respond to each statement in terms of five degrees of agreement (i.e. from 1- strongly disagree to 5 - strongly agree). The respondents indicate the extent to which they agree or disagree to a variety of statements which are then aggregated.

4.3.10 Sampling Design

With the research framework in place, the next step along the research path was to select the research sample. This research focuses exclusively on commercial contracting firms in the Queensland building construction industry. According to Sekaran (1992), there are two major types of sampling designs: 1) probability and 2) nonprobability as shown in Table 4.2.

Sekaran further explains that:

- in probability sampling, the elements in the population have some known chance or probability of being selected as sample subjects. Probability sampling designs are used when the representatives of the sample are of importance for purposes of wider generalisability.
- in non-probability sampling, the elements do not have a known or predetermined chance of being selected as subjects. When time rather than generalisability becomes critical, nonprobability sampling is generally used.

Table 4.2 Probability and Non-probability Sampling Designs

Sample Design	Description	Advantage/Disadvantage
Probability Sampling		
Simple random sampling	All elements in the population are considered and each elements has an equal chance of being chosen as the subject	High generalisability of findings. Not as efficient as stratified sampling.
Systematic sampling	Every <i>n</i> th element in the population is chosen starting from a random point in the population frame.	Easy to use if population frame is available. Systematic biases are possible.
Stratified random sampling	Population is first divided into meaningful segments; there after subjects are drawn:	Most efficient among the probability designs.
Proportionate	in proportion to their original numbers in the population.	Population frame for each stratum is essential.
Disproportionate	based on criteria other than their original population numbers.	Would adequately represent strata with low numbers.
Cluster sampling	Groups that have heterogeneous members are first identified; then some are chosen at random; all the members in each of the randomly chosen groups are studied.	In geographical clusters, costs of data collection are low. The least reliable among all probability sampling designs.
Area sampling	Cluster sampling within a particular area or locality.	Cost-effective. Use for decisions regarding location.
Double sampling	The same sample or a subset of the sample is studied twice.	Offers more detailed information on the topic of study.

		Original biases, if any, will be carried over.
Nonprobability Sampling		
Convenience sampling	The most easily accessible members are chosen as subjects.	Quick, convenient, less expensive.
Judgment sampling	Subjects selected on the basis of their expertise in the subject investigated.	Sometimes, the only meaningful way to investigate. Generalisability is questionable.
Quota sampling	Subjects are conveniently chosen from targeted groups according to some predetermined number or quota.	Very useful where minority groups' participation in a study is critical. Not easily generalisable.

Source: Sekaran (1992, p237)

The population in the building industry was divided into two sectors—public and private and then into two segments—domestic and commercial. The commercial contractors involved in public sector works were selected for the study.

These commercial contractors were chosen to satisfy two criteria: (1) contracting firms who had registered with the Queensland Government and capable of carrying out \$5m upward Government buildings; (2) the respondents were General Manager, Construction Manager, On-site Project Manager, Chief Estimator and Contract Administration Manager. Hence, in this research, disproportionate stratified random sampling was used to satisfy the sample design criteria.

4.3.11 Data Collection Method

Data collection methods include face-to-face interviews, telephone interviews, computer-assisted interviews; questionnaires that are either personally administered, sent through the mail, or electronically administered and observation of individuals with or without videotaping or audio recording. As for the setting, data can be collected in any one of the aforementioned ways in the natural environment in which phenomena occur.

Interviewing, administering questionnaires, and observing people and phenomena are the three main data-collection methods in survey research. Although interviewing has the advantage of flexibility in terms of adapting, adopting, and changing the questions as the researcher proceeds with the interviews, questionnaires have the

advantage of obtaining data more efficiently in terms of researcher time, energy, and costs.

In this study, quantitative approach—questionnaire survey—was adopted. This method is appropriate for the study of the breadth of relationships among variables because this approach can be used to assess the correlation between two or more features across many cases (Ragan, 1994).

Mail Questionnaires

The main advantage of a mail questionnaire is that a wide geographical area can be covered in the survey. Questionnaire survey is a popular method of collecting data because researchers can obtain data fairly easily and the questionnaire responses are easily coded. *“When well-validated instruments are used, the findings of the study benefit the scientific community through replicated results and additions to the theory base”* (Sekaran, 1992, p214).

Sommer and Sommer (1991) indicate that in a randomly selected sample, a mail survey falls within in a 10-33% return rate. In order to compensate for this return rate, the researcher needs to send out from three to five times more questionnaires for better results.

Preliminary telephone investigations of the 71 contracting companies revealed that two companies were no longer in business, one company had merged with another, one company was operating under two company names, one company was mainly dealing with prefabricated buildings, one company was in the heavy earthmoving and mining operations business, and five companies were in civil engineering constructions. These twelve companies were eliminated from the study since two companies were no longer in business and the other ten were in businesses other than building contracting. The remaining 59 companies were all involved in building construction and formed the sample for this study.

During the first preliminary telephone investigation, 277 names of the key personnel—General Manager, Construction Manager, Estimator and On-site Project Manager were obtained. Subsequently, 277 survey questionnaires were mailed out to the 59 companies, with follow-up telephone discussions within a week after the target questionnaire return date for those not returned. A total of 112 responded to the survey (40% response rate). These 112 responses also represented 51 out of the 59 companies (representing 86%). Six survey questionnaires were eliminated from the analysis due to incomplete responses, leaving a total of 106 responses representing 51 companies for analysis. Of the 51 companies responded, 26 companies (51%) had no experience of strategic alliance relationships with subcontractors, 12 companies (24%) had strategic alliance relationships but had subsequently abandoned such relationships, and 13 companies (25%) indicated, at the time of the survey, that they were having strategic alliance relationships with subcontractors. This study focused on the 13 ‘HAVE’ contracting companies.

4.3.12 Testing Goodness of Measures—Validity and Reliability

The two main criteria for testing the goodness of measures are validity and reliability (Sekaran, 1992). The relationship between reliability and validity can be simply illustrated by the use of a simple measuring scale. If the scale weights correctly then it is both reliable and valid. If it has been calibrated incorrectly so that it is never correct but is consistently off by the same amount; then the scale is reliable but not valid. If the scale measures erratically, then it is neither reliable nor valid.

Validity tests how well an instrument that is developed measures the particular concept it is supposed to measure. Reliability tests how consistently an instrument measures whatever concept it is measuring. Thorndike and Hagen (in Emory and Cooper, 1991, p179) refer to “*validity as the extent to which a test measures what we actually wish to measure and reliability has to do with the accuracy and precision of a measurement procedure.*”

Internal and External Validity

The concept of validity is usually expressed in two major forms - internal and external validity (Emory and Cooper, 1991; Drew and Hardman, 1985). Patton (1990, p14) indicated that “*validity in quantitative research depends on careful instrument construction to be sure that the instrument measures what it is supposed to measure.*” Testing of validity can be grouped under “*three broad headings: content validity, criterion-related validity and construct validity*” (Sekaran, 1992, p171).

In testing content validity, “*the more the scale items represent the domain of the concept being measured, the greater the content validity*” (Sekaran, 1992, p171). The measuring instrument for the concept of strategic alliance was broken into six dimensions which ranged from three to five elements, as discussed in Section 4.2.3 and illustrated in Section 4.3.9.

Criterion-related validity can be done by establishing predictive validity which is the ability of the measure to differentiate among individuals as to a future criterion (Sekaran, 1992).

Construct validity testifies to how well the results obtained from the use of the measure fits the theories around which the test is designed. This can be assessed through “*discriminant validity which is established when, based on theory, two variables are predicted to be uncorrelated, and the scores obtained by measuring them are indeed empirically found to be so*” (Sekaran, 1992, p173).

External validity refers to the generalisability of the findings. Sommer and Sommer (1991, p5) argued that “*research in natural settings often provides higher external validity than does research from the laboratory.*” In contrast, laboratory research may be higher on internal validity. External validity or generalisability of results from a given study involves how well the results of a particular study apply to the world outside the research situation. “*If a study is externally valid or has considerable external validity, one can expect that the results are generalisable to a considerable degree*” (Drew and Hardman, 1985, p293). The sample of contracting firms selected representing the population of public building construction companies

with the capacity to handle multi-million dollars projects. The results of this research should be generalisable to other contracting firms of comparable size with similar capacity.

Factorial Validity

Sekaran (1992, p284), in discussing the testing goodness of data, states that *“factorial validity can be established by submitting the data for factor analysis; and the results of factor analysis (a multivariate technique) will confirm whether or not the theorised dimensions emerge. Factor analysis would reveal whether the theorised dimensions are indeed explained by the items in the measure”*

According to Dubin (1978, p82), *“factor analysis is an especially powerful tool for inventing new units by subdivision.”* In a much-simplified form, the procedure of factor analysis is to subdivide a unit into other units. The essential feature of this process of discovery of new units through factor analysis is to subdivide a large unit and then establish the relationship of the new units to each other. The complement of new units taken together constitutes the factoring of a starting unit through factor analysis.

According to Emory and Cooper (1991, p630), *“factor analysis looks for patterns among the variables to discover if an underlying combination of the original variables (a factor) can summarise the original set.”* They further state factor analysis is a general description for a number of specific computational techniques.

All of these techniques, however, have the objective of reducing a large number of variables to some smaller number by indicating which belong together and which seem to measure the same thing. The predictor-criterion relationship that was found in the dependence situation is replaced by a matrix of intercorrelations between a number of variables, none of which is viewed as being dependent upon the others.

Kim (1975, p469) indicate *“the single most distinctive characteristic of factor analysis is its data-reduction capability.”* Given an array of correlation coefficients

for a set of variables, factor-analytic techniques enable us to see whether some underlying pattern of relationships exists, such that the data may be rearranged or reduced to a smaller set of factors or components that may be taken as source variables accounting for the observed interrelations in the data.

The interpretation of factor loadings is largely subjective. It is at this point that factor analysis becomes interpretational. There is no way to calculate the meanings of factors; they are what one sees in them. For this reason, factor analysis is largely used for exploration. One can detect patterning of latent variables with the aim of discovering new concepts and/or reduce data (Emory and Cooper, 1992, p651).

Chapter 6 details the factor analysis of the strategic alliance dimensions and the competitive advantages indicators.

Reliability

Sommer and Sommer (1991, p6) states "*reliability refers to repeatability or replicability of findings.*" Instruments and procedures should produce the same results when applied to similar people in similar situations or to the same people on a second occasion. Sekaran (1992) agrees with Sommer and Sommer and also states that the reliability of a measure indicates the stability and consistency with which the instrument is measuring the concept and helps to assess the goodness of a measure. The ability of a measure to maintain stability over time, despite uncontrollable testing conditions and the state of the respondents themselves, is indicative of its stability and low vulnerability to changes in the situation.

According to Sekaran (1992, p174), "*the internal consistency of measures is indicative of the homogeneity of the items in the measure that tap the construct, that is, the items should hang together as a set.*" Sekaran further explains consistency could be tested through interitem consistency reliability. A test of interitem consistency reliability is the Cronbach's coefficient alpha which is a test of the consistency of respondents' responses to all the items in a measure. To the degree

that items are independent measures of the same concept, they will be correlated with one another.

Cronbach's Alpha is a reliability coefficient that reflects how well the items in a set are positively correlated to one another and Cronbach's Alpha is computed in terms of the average intercorrelations among the items measuring the concept. "*The closer Cronbach's Alpha is to 1, the higher the internal consistency reliability*" (Sekaran 1992, p284). In sum, the goodness of measures is established through different kinds of validity and reliability tests. The results of any research can only be as good as which penetrate the concepts in the theoretical framework. In order for research to be scientific, well-validated and reliable measures are required.

Chapter 6 indicates the results in testing interitem consistency reliability—Cronbach's Alpha—of the strategic alliance elements and competitive indicators.

4.4 Formulating Questionnaire

A questionnaire is a pre-formulated written set of questions to which respondents record their answers. Since a questionnaire is an efficient data-collection mechanism, it is imperative to decide exactly what is required and how to measure the variables of interest. The questionnaire survey instrument was pretested in two separate pilot studies—14 respondents in the first pilot study and six in the second. None of the above 20 respondents were in the final target group for the survey.

The following sections describe the steps adopted in the development of the questionnaire applicable for this research:

- semi-structured in-depth interview with two large commercial contracting firms;
- first pilot study on the questionnaire based on literature and interview findings;
- amending first pilot study questionnaire;
- subsequent validations of the amended questionnaire from academics and research industry professionals;

- second pilot study after inputs from academics and research industry professionals; and
- finalisation of the survey process to ensure a good response rate.

4.4.1 Semi-structured In-depth Interview

Patton (1990, p278) describes *“the purpose of interviewing as finding out what is in someone else’s mind, which allow us to enter into the other person’s perspective.”* Holmes et al (1991, p163) suggest *“interviewing is a useful technique when conducting opinion research, by seeking the views, judgments and/or appraisals of certain subjects with respect to a research problem.”*

Two separate semi-structured in-depth interviews were carried out between late 1995 and early 1996. These two pilot personal interviews (Appendix B) with two industry professionals from two separate contracting firms provided the prevailing industry’s viewpoints regarding the concepts of strategic alliance relationships between contractors and subcontractors. The interviews informed decisions regarding the altering of data collection plans from qualitative to quantitative and also re-defined the more appropriate procedures for data collection and statistical analysis. The semi-structured interview schedule detailed in Appendix B. This schedule later proved to be very useful in formulating the survey questionnaire.

4.4.2 First Industry Pilot Study

Mauch and Birch (1989, p84) state that the *“pilot study takes place before the actual study in order to determine feasibility and to work out bugs.”* The main objective of my pilot studies in this research is to refine the data collection and analysis plans regarding the content and the most appropriate procedures for data collection. Sommer and Sommer (1991, p138) indicates the *“best way to reduce ambiguity is to pretest the questions.”*

In June 1996, the first survey questionnaire was tried out on a group of 14 people who were asked the items and, in addition, asked to comment on their wording and clarity. The fourteen people consisted of:

Building industry professionals:

- two project managers
- two builders
- two contracts administrators
- an estimator.

Academics from School of Construction Management, Queensland University of Technology

- three lecturers.

Government Research Institution—CSIRO

- two researchers involving in building construction industry

Project management consultancy

- two project managers.

None of the above 14 people were in the final sample of the survey.

4.4.3 Inputs from Academics and Industry Professionals

Having made the minor amendments as suggested by the respondents from the first pilot study, the amended survey questionnaire was sent to eight researchers for review and validation. These eight researchers consisted of:

- two academic researchers from two other Universities
- three academic researchers, one from School of Social Science, one from School of Management, one from School of Business and Marketing in this University
- a Government researcher in the area of building industry
- a researcher from the commercial research industry
- a Queensland Government professional staff.

Their comments mainly consisted of issues such as wording, length, structure, time required, measuring scale, layout, proposed statistical analysis procedure and coding of the questionnaire. They assisted to validate the use of this measuring instrument for this research.

The collective comments received from the above researchers were supportive of the principles established by Sekaran (1992) in producing a good questionnaire design:

The wording of the questions:

- must be appropriate for tapping the variable;
- should be at a level that is meaningful to the respondents;
- should be geared to minimising respondent biases.

The issues of the variables:

- how the variables would be categorised, scaled, and coded after receipt of the questionnaire responses;
- the measuring instrument, including scaling techniques used and the data collected, would be appropriate to test the hypotheses;
- the 'goodness of data' should be assessed through tests of validity and reliability.

The general appearance of the questionnaire:

- should be attractive and neat with appropriate introduction, instructions, and a well-arranged set of questions to make it easy for the respondents to answer;
- the sequencing of the questions should facilitate the smooth progression of the respondent through the questionnaire.

4.4.4 Second Industry Pilot Study

Having refined the questionnaire with the principles in producing good questionnaire design as described by Sekaran (1992), the preliminary final questionnaire was sent out to another six building industry professionals for testing. They were different

from the original fourteen and they were not involved in the final sample of the survey.

Feedback received from them indicated that there were no ambiguities in the questionnaire, and that the questionnaire took about 15 minutes to complete.

4.4.5 Procedures Adopted in Securing a Good Response Rate

The return rates of mail questionnaires are typically not very high (Malhotra et al, 1996). The most widely voiced criticism of mail surveys is that they often achieve poor response rates. In some cases, low response rates could be the results of a poorly conceived and poorly implemented mail survey.

A review in quantitative research textbooks (Malhotra et al, 1996; Creswell, 1994; Ragin, 1994; Robson, 1993; Sekaran, 1992; Emory and Cooper, 1991) reveal some effective techniques existed for improving the rates of response to mail questionnaires, such as sending follow-up letters, providing the respondent with self-addressed, stamped return envelopes, and keeping the questionnaire as short as possible.

In this research, the following procedures were taken to ensure a good response rate:

The general appearance of the questionnaire (Appendix C):

- was designed to look easy to fill in;
- clarity of wording (two pilot studies were carried out);
- clear and simple instructions—answering by putting ticks in boxes.

Initial mailing:

- Names of 277 key personnel—General Manager, Construction Manager, Estimator and On-site Project Manager—from 59 contracting firms were obtained at the first preliminary telephone investigation. Hence, the covering letter was addressed to a specifically named person;
- Reply paid addressed envelopes were provided for the respondents;

- Questionnaires were mailed out on 16 October, 1996 and requested to be returned by 1 November 1996. This would allow the month of November to do the necessary follow-up before the festive season starting in December.

Covering letter (included in Appendix C):

- The covering letter indicated the aim of the survey and conveyed its importance;
- It assured the confidentiality;
- It explained the reasons for the coding—coded only for data collating and monitoring responses;
- It encouraged reply—to take about 15 minutes to complete;
- It solicited an early return—a set date for its return;
- It expressed gratitude for their participation and co-operation;
- It offered a summary of the final research finding report.

Follow-up telephone call:

- Within a week after the due date for return, contracting firms who had not replied were contacted;
- It emphasised the importance of the study and the value of the respondents' participation;
- A further copy of the questionnaire and another reply paid addressed envelope were sent on request.

Further follow-ups:

- Further telephone call to those who had promised to reply.

4.5 Summary

This chapter addressed relevant methodological issues in a general sense and described the particular methodology—hypothetical-deductive—appropriate for use in this research. One of the key elements of the research methodology is the development of the framework to postulate and test for a possible relationship between strategic alliances (independent variable) and competitive advantage (dependent variable). From the theoretical framework, testable hypotheses were

developed with the intention of determining that the theory formulated was not valid. The emphasis of this research was on statistical analysis—Spearman's rank correlation coefficient, level of significance—with quantitative data collected.

The results show that the research design was appropriate for this investigation. The final survey questionnaire design developed through personal interviews, focus group discussion and two separate pilot studies, with validations from a number of research academics, and a series of procedures used to ensure good response rate proved to be vital to the success of this investigation. The results and research findings are described and detailed in Chapter 5.

Factor analysis of strategic alliance elements and competitive advantage indicators, and results in testing interitem consistency reliability—Cronbach's Alpha—are discussed in Chapter 6.

5 DATA ANALYSIS AND RESULTS

5.1 Introduction

This chapter describes the analysis of the data acquired by the questionnaire survey. Three objectives in the data analysis were “(1) *getting a feel for the data*, (2) *testing the goodness of data*, and (3) *testing the hypotheses*” (Sekaran, 1992, p275). In regards to the first objective—getting a feel for the data—descriptive statistics were applied to indicate how good the scales were, and how well the data coded and entered. By utilising inferential statistics, the second objective—testing on the goodness of data—was accomplished by using analysis of variance (ANOVA). The third objective—hypotheses testing—was achieved by testing each of the hypotheses with Spearman’s rank correlation coefficient, the results of which determine whether the hypotheses acceptance or rejection.

Section 5.2 reiterates the number of respondents from the sample. Section 5.3 examines and reports the individual responses relating to benefit and hindering factors of forming strategic alliance relationships. It also discusses the changing importance and frequency of these relationships.

Section 5.4 reports the Companies’ responses relating to business generated from the Queensland Government, tendering processes, experience in constructing Government buildings, pre-qualification criteria required for contractors and subcontractors and an overview of business relationships between contractors and subcontractors. This section also details the testing results and findings of each hypotheses for the two groups of Companies (i.e. one group of 13 Companies who were having strategic alliance relationships with subcontractors at time of survey, the other group of 12 Companies who had indicated their abandonment of such relationships).

Section 5.5 concludes and summarises this chapter and leads on to Chapter 6 describing the process of factor analysis of the strategic alliance elements (independent variable) and competitive advantage indicators (dependent variable).

5.2 Data Collection

The research methodology used in this investigation consisted of posted survey questionnaires. Section 4.3.10 described the sample design and Section 4.3.11 described the data collection method.

A total 112 returns were received out of the 277 questionnaires despatched (40% response rate). Six of these returns were eliminated from the analysis due to incomplete responses, leaving a total of 106 individual responses representing 51 (86%) out of the 59 targeted companies for analysis.

The responses were analysed both individually and by companies. Where more than one reply was obtained for a company, these were totalled and the “median” was used to represent company’s collective view. The “median” was selected in order to minimise distortions of data due to outliers from multiple replies from one company.

5.3 Individual Responses

This section summarises the 106 individual respondents’ perceptions relating to the degree of importance of benefits and the hindering factors in the formation of strategic alliance relationships with subcontractors. The 106 individual respondents consisted of 32 General Managers, 15 Construction Managers, 20 Estimators and 39 On-site Project Managers.

5.3.1 Benefit Factors

Those surveyed were given a list of 13 possible benefits in forming strategic alliance relationships (Appendix E). The list was designed to try and capture benefits in a

number of broad areas—increases in profit, improved construction project in terms of time and quality, access to resources and technologies, enhanced co-operation and co-ordination and conflict resolution skills. The 13 benefits were established from the literature as described in Section 2.7.1. Respondents were asked to indicate the degree of importance of the benefit (on a five point Likert scale ranging from 1 - no benefit to 5 - major benefit). Table 5.1 shows the mean of the 106 individual responses, in various categories of positions (such as, on-site project managers, general managers, construction managers and estimators), relating to the degree of perceived benefits. It also shows the rankings for the benefits. (Appendix E presents the rank orders, mean, standard deviation and variance). Visual inspection suggests the rankings by all respondents to be broadly comparable among the various categories of positions.

Table 5.1 Benefits of Strategic Alliance Relationships

	All Respondents		On-site Project Managers		All Gen. Managers		All Construction Managers		All Estimators	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
1 Co-operation	(1)	3.94	(1)	3.90	(1)	3.97	(1)	3.47	(1)	4.35
2 Resolution of Problems	(2)	3.71	(2)	3.76	(3)	3.63	(6)	3.07	(2)	4.25
3 Co-ordination	(3)	3.66	(6)	3.49	(2)	3.75	(4)	3.27	(3)	4.15
4 Quality of Product	(4)	3.57	(3)	3.64	(4)	3.34	(2)	3.40	(7)	3.90
5 Contractual Conflict & Litigation	(5)	3.55	(5)	3.54	(5)	3.34	(5)	3.27	(4)	4.10
6 Completion Time	(6)	3.48	(4)	3.56	(7)	3.13	(3)	3.33	(6)	4.00
7 Site Productivity	(7)	3.47	(7)	3.41	(6)	3.34	(7)	3.07	(5)	4.10
8 Innovation	(8)	3.14	(9)	3.28	(9)	2.91	(9)	2.60	(9)	3.65
9 Long Term Profitability	(9)	3.04	(8)	3.33	(11)	2.81	(10)	2.60	(13)	3.15
10 Access to Resources & Facilities	(10)	3.01	(10)	2.95	(10)	2.91	(12)	2.47	(8)	3.70
11 Decisions Making Process	(11)	2.98	(11)	2.90	(8)	3.06	(8)	2.67	(11)	3.25
12 Interorganisational Managerial Skills	(12)	2.84	(13)	2.77	(12)	2.78	(11)	2.60	(12)	3.25
13 Access to Technologies	(13)	2.79	(12)	2.90	(13)	2.50	(13)	2.20	(10)	3.50
'Mean' Average		3.32		3.34		3.19		2.92		3.80

Using the Least Significant Difference (LSD) with the pooled all respondents data and a significance level of 0.05, the top group was found to comprise 'Co-operation', 'Resolution of Problems' and 'Co-ordination' with sample mean of 3.94, 3.71 and 3.66 respectively. These three most important benefits are generally the same for each of the category position groups—General Managers, Construction Managers, Estimators and On-site Project Managers.

A high level of co-operation provides the context in which both parties can achieve individual and joint goals. Highly co-operative partners exert effort and balance short-term problems with long-term goal achievement. Co-ordination reflects the set of tasks each partner expects the other to perform. Without high levels of co-ordination, any planned individual and joint goals cannot be achieved. Problems often exist in relationships. Given that a certain amount of problem is expected, an understanding the resolution of problems is important. The manner in which partners resolve problem has implications for partnership success.

Other benefits such as quality of product, completion time, site productivity, innovation, long term profitability, access to resources and technology can be achieved through high level of co-operation and co-ordination between partners. When partners engage in joint problem solving process, both interorganisational managerial and decisions making skills will improve, thereby reducing contractual conflicts and litigation.

5.3.2 Hindering Factors

Those surveyed were also given a list of seven possible hindering factors, as described in Section 2.7.2, in preventing contractors forming strategic alliance relationships with subcontractors. Respondents were asked to indicate on a five point Likert scale (ranging from 1 - no problem to 5 - major problem). Table 5.2 shows the mean of the 106 individual responses, in various categories of positions, indicating the hindering factor in preventing the formation of strategic alliance relationships. (Appendix F details the rank orders, mean, standard deviation and variance).

Table 5.2 Hindering Factors

	All Respondents		On-site Project Managers	All Gen. Managers	All Const'ion Managers	All Estimators	
	Rank	Mean	Rank Mean	Rank Mean	Rank Mean	Rank	Mean
1 Loss of Competitive Cost Advantage	(1)	3.75	(1) 3.67	(1) 3.97	(1) 3.33	(1)	3.85
2 Conflicting Objectives	(2)	3.06	(4)	(2)	(2)	(3)	3.30

			3.13	3.03	2.60	
3 Hidden Agendas of Other Party	(3)	3.05	(2) 3.23	(3) 2.91	(4) 2.40	(2) 3.40
4 Disclosing Commercial Secrets	(4)	2.91	(3) 3.15	(5) 2.63	(3) 2.57	(4) 3.15
5 Loss of Control	(5)	2.81	(6) 2.90	(4) 2.84	(6) 2.13	(5) 3.10
6 Lack of Trust	(6)	2.65	(5) 3.03	(6) 2.44	(7) 2.00	(6) 2.70
7 Incompatible Personal Chemistry	(7)	2.37	(7) 2.56	(7) 2.25	(5) 2.21	(7) 2.30
'Mean' Average		2.94	3.10	2.87	2.46	3.11

Using the Least Significant Difference (LSD) with the pooled all respondents data and a significance level of 0.05, 'Loss of Competitive Cost Advantage' is with sample mean of 3.75. The major hindering factor in preventing firms to form strategic alliance relationships 'Loss of Competitive cost Advantage' is indicated the same for each of the staff position groups—General Mangers, Construction Managers, Estimators and On-site Project Mangers.

In the contractors' perspective, 'loss of competitive cost advantage' means not being competitive in low cost when tendering for works. The market perception of the strategic alliance relationships between contractors and subcontractors was that it was essentially a 'closed' shop. This implied that competitive edge was lost and contractors would have no real understanding of market price. It was also contractors' fear that subcontractors' prices would increase over time.

Other hindering factors—conflicting objectives, hidden agendas of other party, disclosing commercial secrets, loss of control and lack of trust—are interorganisational relationships. There is always fear that one party would behave opportunistically and take advantage of the relationship.

The 'incompatible personal chemistry' is an interpersonal factor. There is possibility that partners might not be able to get on with each other after the formation of strategic alliance relationship.

5.3.3 Benefit/Hindering Factors and Positions

A 2-way ANOVA was used to examine the combined effect of the 13 'benefits' variables, the 4 'position' variables together with their interactions. This showed a significant difference (at the 5% level) of both the set of 'benefit' variables ($F=11.98$, $df=12$, $p=0.00$) and the set of 'positions' variables ($F=26.70$, $df=3$, $p=0.00$) and with a non-significant interaction effect ($F=0.06$, $df=36$, $p=0.97$).

This analysis was repeated for the 7 'hindering factors' variables and the 4 'position' variables. This also showed a significant difference of both the set of 'hindering factor' variables ($F=13.51$, $df=6$, $p=0.00$) and the set of 'position' variables ($F=8.11$, $df=3$, $p=0.00$) with non-significant interaction effects ($F=0.65$, $df=18$, $p=0.86$).

This indicates the 'benefit', 'hindering factor' and 'position' variables are both significant and independent in their effects. This suggests that there are consistent differences in responses from the different 'positions' irrespective of the questions answered and visas versa.

5.3.4 Changing Importance and Frequency of Strategic Alliance Relationships

The 106 individual respondents to the questionnaire survey were asked their views on the importance and frequency of the strategic alliance relationships (Question 8 of the questionnaire in Appendix G).

The sample data shows 43 (41%) of all the respondents indicated strategic alliance relationships had become strategically important and 60 (56%) indicated that there were no changes. In terms of population, there is no significant (at 5% level) difference between the 'more important' and 'no change' groups frequencies ($\text{chi-square}=2.806$; $df=1$; $p=0.09$).

In reference to the changing role of strategic alliance relationships, thirty-four (32%) of respondents believe that strategic alliance relationships with subcontractors are now used more frequently. Sixty-nine (65%) indicates that there is no change in frequency and only three (3%) views it as less frequently. The difference between the first two groups is significant ($\text{chi-square}=11.89$; $df=1$; $p=0.00$).

5.4 Company Responses

As previously mentioned in Section 4.3.11, the 106 respondents represent 51 of the 59 companies for analysis. Of these 51 companies, 26 companies indicated that they had no strategic alliance relationships with subcontractors, 12 had such relationships but subsequently abandoned the relationships, and 13 companies were having relationships at the time of the survey.

5.4.1 Value of Work from Queensland Government

SURVEY QUESTION: Approximately, what percentage by value of your Company's non-residential business has come from the Queensland Government over the last three years?

Table 5.3 Percentage Value of Business Generated from Queensland Government

	%	%	%	%	%	%	%	%	%	%	%	
	0	10	20	30	40	50	60	70	80	90	100	D K
No. of Companies	6	16	7	3	6	1	3	2	0	3	1	3

This gives a weighted average of 28.5% and compares closely with the calculated turnover of 30% (Queensland Construction Executive Planning Group, 1996) in total non-residential construction work generated by the Queensland Government.

5.4.2 Public Sector Tendering Process

In his report, Mills (1996) indicates that Government agencies through out Australia operate many different procurement systems. Although the range of procurement paths is many, they use the following methods to call all tenders:

- open tendering - no pre-qualification assessment undertaken, and
- pre-qualified tendering
 - selective
 - pre-registered
 - selected.

Open tenders are invited by public advertisement with no restriction placed on who is eligible to tender. The selective tendering system is used where a limited number of contractors are invited to tender for a particular project. Pre-registered tendering involves the pre-qualification of contractors prior to the calling of tenders, in a similar manner to the selective tendering process. However, where pre-qualified tenders are required for a particular project, expressions of interest are first called by public advertisement. The selected tender process involves the choice of contractor without public advertisement. This takes place by invitation to tender or by direct negotiation (Mills, 1996).

SURVEY QUESTION: What percentage of your Company's work was won by each of the following tendering processes over the last three years?

Table 5.4a provides an indication of percentage of work won by companies in open competitive and Table 5.4 b; c&d indicate the pre-qualified tendering processes.

Open Competitive Tender

Table 5.4a Percentage of Work Won by Open Competitive Tendering Process

	%	%	%	%	%	%	%	%	%	%	%	
	0	10	20	30	40	50	60	70	80	90	100	D K
No. of Companies	7	13	6	5	3	0	3	1	5	3	3	2

Select Tender

Table 5.4b Percentage of Work Won by Select Tendering Process

	%	%	%	%	%	%	%	%	%	%	%	
	0	10	20	30	40	50	60	70	80	90	100	D K
No. of Companies	7	13	11	6	2	7	3	0	0	0	0	2

Pre-registered and Select Tender

Table 5.4c Percentage of Work Won by Pre-registered and Select Tendering Process

	%	%	%	%	%	%	%	%	%	%	%	
	0	10	20	30	40	50	60	70	80	90	100	D K
No. of Companies	10	7	9	7	6	3	3	1	3	0	0	2

Direct Negotiation

Table 5.4d Percentage of Work Won by Direct Negotiation

	%	%	%	%	%	%	%	%	%	%	%	
	0	10	20	30	40	50	60	70	80	90	100	D K
No. of Companies	12	17	8	6	1	0	1	0	3	0	1	2

These provide weighted average (Table 5.4a to 5.4d) of 34%, 22%, 26% and 18% respectively.

The main approaches adopted by the Government in tender selection are: 1) by open tendering; 2) by pre-qualified tendering with sub options: a) selective, b) pre-registered; and c) selected whereby this takes place by direct negotiation.

The weighted averages as indicated by the Companies' responses are 34% of work won by open competitive tender, 22% by select tendering, 26% by pre-registered and select tendering process, and 18% by direct negotiation. The percentages shown indicate a good spread in term of tendering strategy adopted by contractors.

5.4.3 Types of Public Sector Buildings

The construction industry in Australia is regarded as having two components, namely the building sector and the engineering construction sector. Building sector covers residential and non-residential buildings and divides into private and public sectors.

The public sector non-residential includes building categories of offices, educational, health, entertainment and recreation, factories and other business premises.

SURVEY QUESTION: Over the last ten years, does your Company have experience in constructing the following types of Public Sector building?

Table 5.5 Experience in Constructing Various Types of Government Buildings

Types of Public Sector Buildings	No. of Companies with experience
School Buildings	38
Technical and Further Education College Buildings	33
University Buildings	28
Community Buildings	41
Convention Centres	5
Archives Buildings	3
Hospitals	34
Prisons	15
Court Houses	8
Office Facilities - Low Rise	41
Office Facilities - High Rise	16

The research findings suggest that 80% of the 51 Companies indicated having experience in constructing school buildings, community buildings and low-rise office buildings. 60% had experience in constructing TAFE college buildings, university buildings and hospitals and 30% had high rise building experience.

The findings also indicate that less than 15% had experience in constructing convention centres, archives buildings and courthouses. Perhaps, it could be due to the fact that there were not too many these types of buildings procured by the Government.

5.4.4 Pre-qualification Criteria for Contractors

In November 1993, Construction Industry Development Agency (1993, pii) launched pre-qualification criteria *“to provide clients, contractors, consultants and subcontractors with a consistent and objective framework to determine which companies will pre-qualify to tender for work”*.

Table 5.6 Pre-qualification Criteria for Contractors

SURVEY QUESTION:	No. of Companies responded	Yes	No
In tendering over the last three years, has your Company been required by clients to comply in any form to Pre-qualification Criteria?	51	50	1

Table 5.6 provides a summary of the number of companies which have or have not been required by clients to comply in any form of pre-qualification criteria. Only one company has no experience in complying with any form of pre-qualification criteria.

5.4.5 Pre-qualification Criteria for Subcontractors

Table 5.7 shows 29 of the 51 Companies have been required by clients to nominate subcontractor(s) as one of the pre-qualification criteria and 22 have not been required by clients to do so.

Table 5.7 Pre-qualification Criteria for Subcontractors

SURVEY QUESTION:	No. of Companies responded	Yes	No
Over the last three years, has your Company been required by clients to nominate Subcontractor(s) as one of the Pre-qualification Criteria?	51	29	22

The system of subcontractors pre-qualification criteria requires subcontracting firms to provide contractors with information pertaining to their past performance and key factors. The objective, as pointed out by the Construction Industry Development Agency (1995), is to provide contractor with sufficient information about the subcontractor to enable the contractor to reach an informed opinion as to the capability of the subcontractor to carry out the work and adequately assess the risk inherent in engaging that subcontractor

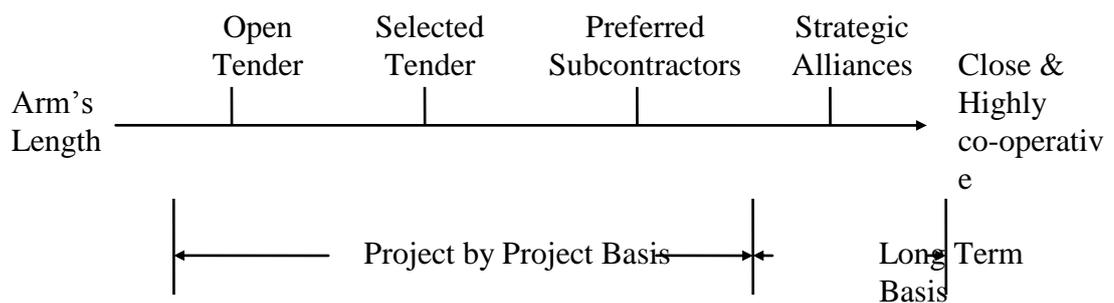
Although the Construction Industry Development Agency (1995) recommended the implementation of pre-qualification criteria for subcontractors for all subcontracts in excess of \$100,000, the recommendation has not yet been widely implemented by both private and public sector clients because it is not a requirement in the tender evaluation process. Perhaps, only under specific circumstances such as a specialist trade being required on the project or a subcontractor's ability to perform being doubtful, the client would require the contractor to pre-qualify such subcontractors.

5.4.6 Business Relationships between Contractors and Subcontractors

Although strategic alliance relationships can take many forms, including both horizontal and vertical relationships (Borys and Jemison, 1989), this study focuses on vertical relationships between contractors and subcontractors. Strategic alliances in this study is about the head contractor forming a long-term business relationship with its subcontractors with the aim of being more efficient and effective, hence gaining competitive advantages over its competitors.

In the building construction industry, business relationships between contractors and subcontractors range along a relationship from arm's length on a project by project basis to a close and highly co-operative relationship on a long-term basis as shown in Figure 5.1. That is, *"a pure market transaction, where only exchange is money for service provided, is an arm's length transaction and on the contrary, firms not only working closely together but also sharing gains and losses on projects is highly co-operative"* (Bureau of Industry Economics, 1995, p9).

Figure 5.1 Business Relationships between Contractors and Subcontractors



The formation of strategic alliances shown on the extreme right hand side of the business relationship is of long term, close and highly co-operative business arrangement comparing with the other extreme of open tender with no restriction placed on who is eligible to tender.

SURVEY QUESTION: Please indicate the method your Company adopts in engaging the following Subcontractors.

The findings, as shown in Table 5.8, indicate the majority of contractors opt for selecting and inviting a number of subcontractors in their respective trade to tender and are not involved in engaging subcontractors with long term strategic alliance relationships.

Of the 13 contracting companies who had strategic alliance relationships with subcontractors, two companies indicated that they had over ten relationships with various trade subcontractors, one with nine, one with six, two with five, two with four, four with two and one with one. The ‘STRATEGIC ALLIANCE’ column shows the most used type of subcontractor is used with electrical services leading (9) followed by hydraulic services and air-conditioning & ventilation (6). The least strategic alliances are with the reinforcement fixer and plasterboard partitioner (1).

Table 5.8 Tendering Methods in Engaging Subcontractors

	Open Competitive Tendering	Select to Tender	Preferred and Negotiate	Strategic Alliance	Total
SUBSTRUCTURE					
Bulk Excavation	6	36	5	4	51
Detailed Excavation	7	33	6	5	51
Piling & Foundation	10	37	2	2	51
STRUCTURE					
Formwork	5	34	9	3	51
Reinforcement Fixing	9	30	11	1	51
Concreting	5	32	10	4	51
Precast Concrete Panels	8	40	1	2	51
Tanking & Waterproofing	9	38	2	2	51
Bricklaying	2	36	9	4	51
Glazing (External & Internal)	6	41	2	2	51
Structural Steelworks	8	38	2	3	51
Carpentry	6	36	6	3	51
Roofing	10	37	1	3	51
FINISHES					
Plasterboard Partitioning	8	40	2	1	51
Suspended Ceilings	8	40	1	2	51

Solid Rendering	10	31	7	3	51
Wall & Floor Tiling	3	35	10	3	51
Carpeting	10	36	2	3	51
Painting & Decorating	7	35	4	5	51
FITOUTS					
Joinery	8	37	2	4	51
SERVICES					
Hydraulic	6	37	2	6	51
Air-condition & Ventilation	4	37	4	6	51
Fire Services	7	36	4	4	51
Electrical Services	6	31	5	9	51
Lifts Installation	9	38	2	2	51
Security Services	8	37	2	4	51

5.4.7 Analysing Data

This section examines relationships between strategic alliance and competitive advantage to answer the principal research question *“Do strategic alliances matter in gaining competitive advantage?”* In reference to the method of analysis, Section 4.2.5 discussed statistical analysis issues and Section 4.2.6 explained level of significance.

Section 5.4.7.1 focuses on the results of the 13 Companies who were having strategic alliance relationships with subcontractors. Section 5.4.7.2 describes the testing of the hypotheses of the 13 ‘HAVE’ Companies and Section 5.4.7.3 discusses the findings. Section 5.4.7.4 describes the testing of the hypotheses and discusses the findings of the 12 Companies who had abandoned the relationships (indicated as the 12 ‘HAD’ Companies).

5.4.7.1 Results of 13 ‘HAVE’ Companies

Table 5.9 Spearman Coefficients for Strategic Alliance Elements and Competitive Advantage Indicators—13 Companies Who HAVE Strategic Alliance Relationships

Strategic Alliance Elements	Competitive Advantage Indicators					
	Tender success	Business T'over	Planning Work	Coord of Subcont	Standard W'ship	Qual of Subcont
TRUST						
(SA1) We help each other out of difficult situations.	-0.49 *	-0.58 **	0.24	0.10	0.20	0.58 **
(SA2) Our word is reliable and we fulfil our respective obligations.	-0.49 *	-0.30	0.08	-0.02	-0.18	0.09
(SA3) We share commercial and technical information relating to projects without the need to protect ourselves.	-0.42	-0.45	0.26	0.54 *	0.49 *	0.61 **
COMMITMENT						
(SA4) The co-operative business relationship has developed from the top management of both	-0.03	-0.12	0.13	0.26	0.25	0.34

parties.						
(SA5) We see this co-operative business relationship as a long-term commitment.	-0.36	-0.41	0.32	0.26	-0.11	0.24
(SA6) We share resources.	-0.66 **	-0.63 **	-0.26	-0.06	0.16	0.44
(SA7) We are committed to actively build trust.	-0.54 *	-0.65 **	0.16	0.05	0.10	0.57 **
(SA8) There is no conflict between our goals and joint goals.	0.04	-0.20	0.27	0.19	0.09	0.23

INTERDEPENDENCE

(SA9) We give each other work.	0.14	-0.05	-0.13	-0.34	-0.12	-0.19
(SA10) We have a mutual reliance on each other.	-0.31	-0.33	-0.39	-0.56	-0.33	-0.08
(SA11) We treat each other equally as business partners.	0.08	0.10	-0.06	0.27	0.26	0.39

COMMUNICATION

(SA12) We maintain openness in order to prevent hesitation, reservation or other defensive behaviour.	-0.08	-0.15	0.28	0.69 **	0.60 **	0.65 **
(SA13) We communicate openly and with trust in mutually pursuing opportunities and solving problems and conflicts	-0.02	-0.14	0.39	0.67 **	0.63 **	0.71 **
(SA14) We communicate regularly to compare current performance against expectations.	0.34	0.04	0.66 **	0.55 **	0.19	0.06
(SA15) We consult each other before making key decisions.	-0.27	-0.39	0.26	-0.22	-0.21	0.08

CO-OPERATION

(SA16) We co-operate out of mutual need and desire.	-0.06	-0.20	0.61 **	0.46	0.32	0.55 **
(SA17) We co-operate to share risks.	0.32	0.18	0.28	0.44	0.33	0.39
(SA18) Co-operation between us provides a foundation for business growth.	0.23	0.10	0.21	0.10	-0.27	-0.15
(SA19) We believe that co-operation with each other will reduce the likelihood of opportunity behaviour	-0.18	0.04	-0.25	-0.16	0.25	0.43

JOINT PROBLEM SOLVING

(SA20) Problems and conflicts are accepted as regular part of teamwork.	-0.17	-0.14	0.14	0.11	0.24	0.41
(SA21) We feel free to admit and discuss difficulties even when they relate to uncomfortable issues.	-0.52 *	-0.70 **	0.23	0.06	0.13	0.24
(SA22) When problems occur, we concentrate on solving them rather than trying to blame the other.	-0.11	-0.23	0.25	0.33	0.15	0.23

* Spearman Correlation Coefficient with a 'NEAR' Significance Level between 0.05 and 0.10

** Spearman Correlation Coefficient with a Significance Level less than 0.05

Table 5.9 summarises the results of Spearman Correlation Analysis for the 13 companies (indicated as 'HAVE' Companies) who were having strategic alliance with subcontractors at the time of the survey.

The 22 strategic alliance elements were coded for ease of interpretation; e.g. we help each other out of difficult situations was coded as SA1.

The six competitive advantage indicators, as shown in Table 5.9, are: 1) tender success rate and 2) business turnover under the dimension of business performance;

3) planning work, 4) co-ordination of subcontractors, 5) standard of workmanship and 6) quality of subcontractors under the dimension of on-site construction process.

One element of commitment—share resources (SA6)—was found to be significant in the negative sense. Help each other (SA1) and reliable (SA2) elements of trust, build trust (SA7) element of commitment, and discuss difficulties (SA21) element of joint problem solving were found to be near significant. However, these five elements were negatively related to the indicator of tender success rate.

One element of trust—help each other (SA1)—and two elements of commitment—share resources (SA6) and build trust (SA7)—and one element of joint problem solving—discuss difficulties (SA21)—these four elements were found to be significant but negatively related to indicator of business turnover.

Communicate regularly (SA14) element of communication and mutual need (SA16) element of co-operation were found to be significant and positively related to indicator of planning work.

Three elements of communication—maintain openness (SA12), communicate openly (SA13) and communicate regularly (SA14) were found to be significant. Share information (SA3) element of trust was found to be near significant. However, the four elements were positively related to indicator of co-ordination of subcontractors.

The two elements of communication—maintain openness (SA12) and communicate openly (SA13)—were found to be significant. One element of trust—share information (SA3)—was found to be near significant. All these three elements were positively related to indicator of standard of workmanship.

Help each other (SA1) and share information (SA3) elements of trust, build trust (SA7) element of commitment, maintain openness (SA12) and communicate openly (SA13), and mutual need (SA16) element of co-operation, these five elements were found to be significant and positively related to indicator of quality of subcontractors

5.4.7.2 Hypotheses Testing for the ‘HAVE’ Companies

From the theoretical framework discussed Section 4.2.4, two principal hypotheses were developed for this research.

H_N 1. Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation, and Joint Problem Solving, are perceived not to be correlated with business performance.

H_N 2. Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation, and Joint Problem Solving, are perceived not to be correlated with the performance of on-site construction process.

The hypotheses were tested at 5% level, i.e. $p \leq 0.05$, H_A accepted to cover 'significant' results. By way of comparison, hypotheses were also tested at 10% level, i.e. $p \geq 0.10$, H_A rejected; $p \leq 0.10^*$, H_A accepted to cover 'near significant' results (after Boyatzis, 1982).

In order to test the alternate hypotheses, factor analysis was carried to confirm whether the six competitive advantage indicators were grouped correctly under the dimensions of business performance and on-site construction process. A principal component extraction followed by quartimax rotation was used and stopped when eigenvalue was less than one. Table 5.10 shows the factor loading derived from analysis of the competitive advantage items.

Table 5.10 Factor Loading Derived from Analysis of the Competitive Advantage Indicators

Competitive Advantage Items	Factor 1	Factor 2
Standard of Workmanship	0.90	
Co-ordination of Subcontractors	0.85	
Quality of Subcontractors	0.83	
Planning Work	0.53	
Business Turnover		0.96
Tender Success Rate		0.93

The two new factors validate the two—business performance and on-site construction process—previously described in Section 2.14. Factor 1 is same as on-site construction process and Factor 2 is business performance. This analysis supports the pre-conceived factor grouping of the concept of competitive advantage.

Table 5.11 summarises the results of this Spearman Correlation Analysis between strategic alliance variables and Factors 1 (on-site construction process) and 2 (business performance) for the 13 ‘HAVE’ Companies.

Table 5.11 Spearman Coefficients for Strategic Alliance Elements and the Two Validated Factors of Competitive Advantage Indicators for the 13 ‘HAVE’ Companies

Strategic Alliance Elements	Competitive Advantage Indicators	
	FAC1 - On-site Construction process	FAC2 - Business Performance
TRUST		
(SA1) We help each other out of difficult situations.	0.29	-0.62 **
(SA2) Our word is reliable and we fulfil our respective obligations.	-0.19	-0.34
(SA3) We share commercial and technical information relating to projects without the need to protect ourselves.	0.53 *	-0.49 *
COMMITMENT		
(SA4) The co-operative business relationship has developed from the top management of both parties.	0.28	-0.12
(SA5) We see this co-operative business relationship as a long-term commitment.	0.09	-0.40
(SA6) We share resources.	0.06	-0.77 **
(SA7) We are committed to actively build trust.	0.16	-0.68 **
(SA8) There is no conflict between our goals and joint goals.	0.25	-0.13
INTERDEPENDENCE		
(SA9) We give each other work.	-0.09	-0.02
(SA10) We have a mutual reliance on each other.	-0.40	-0.34
(SA11) We treat each other equally as business partners.	0.25	-0.06
COMMUNICATION		
(SA12) We maintain openness in order to prevent hesitation, reservation or other defensive behaviour.	0.67 **	-0.21
(SA13) We communicate openly and with trust in mutually pursuing opportunities and solving problems and conflicts	0.72 **	-0.20

(SA14) We communicate regularly to compare current performance against expectations.	0.47	0.17
(SA15) We consult each other before making key decisions.	-0.06	-0.38

CO-OPERATION

(SA16) We co-operate out of mutual need and desire.	0.50 *	-0.21
(SA17) We co-operate to share risks.	0.43	0.14
(SA18) Co-operation between us provides a foundation for business growth.	-0.06	0.17
(SA19) We believe that co-operation with each other will reduce the likelihood of opportunity behaviour	0.06	-0.19

JOINT PROBLEM SOLVING

(SA20) Problems and conflicts are accepted as regular part of teamwork.	0.19	-0.25
(SA21) We feel free to admit and discuss difficulties even when they relate to uncomfortable issues.	0.13	-0.58 **
(SA22) When problems occur, we concentrate on solving them rather than trying to blame the other.	0.24	-0.19

* Spearman Correlation Coefficient with a 'NEAR' Significance Level between 0.05 and 0.10

** Spearman Correlation Coefficient with a Significance Level less than 0.05

In general, the data support the null hypotheses. The exceptions are discussed below.

Recall H_{A1}: Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation, and Joint Problem Solving, are perceived as positively correlated with the performance of on-site construction process.

The results for H_{A1} are shown in Table 5.11. It shows that two elements of communication—maintain openness (SA12) and communicate openly (SA13)—were found to be significant and positively related with on-site construction process. One element of trust—share information (SA3)—and one element of co-operation—mutual need (SA16)—were found to be near significantly and positively related with on-site construction process. Other elements from commitment, interdependence and joint problem solving were found to be not significantly related to the on-site construction process.

Recall H_{A2}: Strategic alliance attributes of Trust, Commitment, Interdependence, Communication, Co-operation, and Joint Problem Solving, are perceived as positively correlated with business performance.

The results for H_{A2} are shown in Table 5.11. It shows that help each other (SA1) element of trust, share resources (SA6) and build trust (SA7) elements of commitment, and discuss difficulties (SA21) element of joint problem solving were found to be significant. Share information (SA3) element of trust was found to be near significant. However, these five elements were found to be negatively related to business performance. Other elements of interdependence, communication and co-operation were not significantly related to business performance.

5.4.7.3 Discussion of Findings

Two elements of communication—maintain openness (SA12) and communicate openly (SA13) were significantly and positively related to the on-site construction processes. Communicating openly and maintaining openness can not only prevent hesitation, reservation or other defensive behaviour (i.e. *us and them* mentality) but also allows parties to trust one another in pursuing opportunities and solving problems and conflicts. Hence, this supports the view that “*the importance of communication becomes critical in signalling future intentions and might be interpreted as an overt manifestation of more subtle phenomena such as trust and commitment*” (Mohr and Spekman, 1994, p146).

The findings of near significant for one element of trust—share information (SA3)—and one element of co-operation—mutual need (SA16) are also consistent with emerging research on strategic alliance relationships. For example: Howarth et al (1995, p35) suggest that “*trust in a strategic alliance context must also include the concept of reciprocity which implies a long-term focus, the acceptance that obligations are mutual.*” Trust and co-operation between contractors and subcontractors are established at the initial planning stage of the construction phase of project. From this stage, the relationships between the two parties developed

during construction, the quality of the relationships stemming from the outcome of the completion of the project.

Help each other (SA1) element of trust, share resources (SA6) and build trust (SA7) elements of commitment, and discuss difficulties (SA21) were found to be significant. Share information (SA3) element of trust was found to be near significant. The negative association between these five elements and business performance was contrary to the alternate hypotheses. It is possible, however, these 'HAVE' companies recognise that building trust, sharing resources and information, helping each other, discussing and resolving problems with strategic alliance subcontractors are for long term benefits not for short term gains.

5.4.7.4 Hypotheses Testing for the 'HAD' Companies

As mentioned previously, of the 51 Companies responded to the survey, 13 Companies indicated that they were having strategic alliance relationships with subcontractors at time of survey; and 12 Companies had abandoned such relationships.

In order to carry out a comparison between the 13 'HAVE' Companies and the 12 'HAD' Companies, same analysing procedure (i.e. factor analysis to confirm grouping of competitive advantage dimensions and Spearman's rank correlation coefficient to test hypotheses) was repeated for the 12 'HAD' Companies

The factor analysis was repeated for the 12 'HAD' Companies who had strategic alliance relationships with subcontractors but had abandoned such A principal components extraction followed by quartimax rotation was used. Table 5.12 shows the factor loading derived from analysis of the competitive advantage items.

Table 5.12 Factor Loading Derived from Analysis of the Competitive Advantage Indicators

Competitive Advantage Items	Factor 1	Factor 2
Standard of Workmanship	0.97	
Co-ordination of Subcontractors	0.96	

Planning Work	0.84	
Quality of Subcontractors	0.74	
Tender Success Rate		0.87
Business Turnover		0.82

Again, the two new factors validate the two—business performance and on-site construction process—previously described in Section 2.14. Factor 1 is same as on-site construction process and Factor 2 is business performance. This analysis also supports the pre-conceived factor grouping of the concept of competitive advantage. Table 5.13 summarises the results of this Spearman Correlation Analysis between strategic alliance variables and Factors 1 (on-site construction process) and 2 (business performance) for the 12 ‘HAD’ companies who had abandoned strategic alliance relationships with subcontractors.

Table 5.13 Spearman Coefficients for Strategic Alliance Elements and Two Validated Factors of Competitive Advantage Indicators for the 12 ‘HAD’ Companies

Strategic Alliance Elements	Competitive Advantage Indicators	
	FAC1 - On-site Construction process	FAC2 - Business Performance
TRUST		
We help each other out of difficult situations.	-0.02	0.03
Our word is reliable and we fulfil our respective obligations.	-0.39	0.11
We share commercial and technical information relating to projects without the need to protect ourselves.	-0.19	0.17
COMMITMENT		
The co-operative business relationship has developed from the top management of both parties.	0.06	0.37
We see this co-operative business relationship as a long-term commitment.	0.25	0.75 **
We share resources.	0.23	0.26
We are committed to actively build trust.	0.00	0.58 **
There is no conflict between our goals and joint goals.	-0.26	0.52 *
INTERDEPENDENCE		
We give each other work.	0.01	0.01
We have a mutual reliance on each other.	-0.15	0.93 **
We treat each other equally as business partners.	-0.44	0.31
COMMUNICATION		
We maintain openness in order to prevent hesitation, reservation or other defensive behaviour.	-0.32	0.03

We communicate openly and with trust in mutually pursuing opportunities and solving problems and conflicts	-0.05	0.55 *
We communicate regularly to compare current performance against expectations.	-0.04	0.03
We consult each other before making key decisions.	0.16	-0.01

CO-OPERATION

We co-operate out of mutual need and desire.	-0.20	0.00
We co-operate to share risks.	-0.28	0.65 **
Co-operation between us provides a foundation for business growth.	0.29	0.51 *
We believe that co-operation with each other will reduce the likelihood of opportunity behaviour	0.46	0.17

JOINT PROBLEM SOLVING

Problems and conflicts are accepted as regular part of teamwork.	-0.23	0.11
We feel free to admit and discuss difficulties even when they relate to uncomfortable issues.	-0.13	0.09
When problems occur, we concentrate on solving them rather than trying to blame the other.	-0.09	0.35

* Spearman Correlation Coefficient with a 'NEAR' Significance Level between 0.05 and 0.10

** Spearman Correlation Coefficient with a Significance Level less than 0.05

There was neither significant nor near significant element found related to the on-site construction process. Two elements of commitment—long term commitment (SA5) and build trust (SA7)—and one element of interdependence—mutual reliance (SA10)—and one element of co-operation—share risks (SA17)—were found to be significant to business performance. One element of commitment—no conflicting goals (SA8)—and one element of communication—communicating openly (SA13)—and one element of co-operation—business growth (SA18)—were found to be near significant also to business performance. All these seven elements were found to be positively related to business performance.

The above limited positive relationships with business performance of the 12 'HAD' Companies contrasts to the limited negative relationships with business performance as indicated by the 13 'HAVE' Companies. The 12 'HAD' Companies indicated no significant relationships between strategic alliance attributes and on-site construction process. However, the 13 'HAVE' Companies indicated a limited positive relationships between strategic alliance attributes and on-site construction process.

It is possible that these 12 companies had the perception that they could increase their tender success rate and business turnover by forming strategic alliances with subcontractors.

However, 8 of 12 'HAD' Companies gave the reason why they had abandoned such relationships:

- Inflated prices; quotes not competitive; poor quality of product and poor workmanship (General Manager and Construction Manager of Company 4);
- Work standard dropping off (Project Manager of Company 18)
- Reduction in competitive edge (General Manager of Company 23);
- Subcontractor lost the plot (Construction Manager of Company 24);
- The final price from the subcontractor was not competitive (Construction Manager of Company 33);
- Failure to maintain a competitive price and performance (General Manager of Company 54);
- Subcontractors growing too quickly and losing focus on the core clients, resultant quality standards fall (Project Manager of Company 55); and
- Drop off or lowering of performance; subcontractor taking on too much work; Disclosure of confidential information (Construction Manager of Company 61)

The responses from the 12 'HAD' Companies concluded the main reasons, from the contractors' perspective, for abandoning the relationships were due to: 1) subcontractors' quotes were not competitive, 2) subcontractors' performance and standard of workmanship dropped, and 3) subcontractors lost their credibility.

5.5 Summary

The findings reveal that 'co-operation' is perceived to be most beneficial in the formation of strategic alliance relationships. However, the fear of diminishing competitive cost advantage seems to be the main reason why contractors have so far avoided more substantial or abandoned linkages with subcontractors. In the present building construction business environment, contracting firms must learn the arts of

competing and co-operating as equally valid aspects of corporate strategy (Gyles, 1992).

Forty-three (41%) of the 106 respondents indicated the formation of strategic alliances with subcontractors becomes more important. On the other hand, 34 (32%) of the 106 respondents indicated such relationships becomes more frequent. Sixty (56%) respondents suggested that there was no change in importance, while 69 (65%) respondents indicated that there was no change in frequency for forming such relationships. This finding suggests that forming strategic alliances between contractors and subcontractors are not important. It appears that it is up to each individual contractor to decide whether it is beneficial or not in forming such relationships.

In reference to the 51 Companies' responses, nearly all except one of the 51 Companies had experience in satisfying the clients' pre-qualification criteria in tendering. Only 29 of the 51 Companies indicated the necessities in pre-qualify subcontractors in order to satisfy clients' tendering processes.

The findings indicate the most likely subcontractors that the contractors would form strategic alliances with are electrical services, hydraulic services and air-condition & ventilation services.

These research findings broadly demonstrate that the 13 'HAVE' contracting firms believed the strategic alliance relationships had limited positive associations with the on-site construction processes but had some negative impacts on the business performance. The findings also indicate that the main reason for 12 'HAD' contracting firms for abandoning the formation of strategic alliance relationships with subcontractors was their tender prices becoming non-competitive in the competitive market.

The two generic strategies to be competitive in construction are cost and differentiation (Langford and Male, 1991), this research's results support the view that while the 13 'HAVE' contracting firms were perceived to adopt a differentiated

strategy (i.e. forming strategic alliances with subcontractors) to be competitive, the 12 'HAD' contracting firms were still adopting the low cost strategies.

The measures for strategic alliance relationships used in this survey were developed from the literature for this study. These measures had never been tested previously. Chapter 6 describes the process of analysing by factor and item analysis whether or not the developed strategic alliance elements and competitive advantage indicators had been grouped together correctly.

6 FACTOR ANALYSIS AND TESTING INTERITEM CONSISTENCY RELIABILITY

6.1 Introduction

The theoretical background of testing goodness of measures, in terms of, validity and reliability has already been discussed in Section 4.3.12. This chapter describes the process of analysing and confirming whether or not both the strategic alliance and competitive advantage measures had been grouped together correctly by carrying out factor and item analyses. Cronbach's Coefficient Alpha was used to test interitem consistency reliability. Then, a Spearman's correlation analysis was carried out in a re-analysis of the new groupings of strategic alliance elements and competitive advantage indicators.

6.2 Factor Validity

Following Sekaran (1992), factorial validity was established by submitting the data for factor analysis. The results of factor analysis confirmed whether or not the theorised dimensions emerge. The six dimensions of strategic alliances were trust, Commitment, Interdependence, Communication, Co-operation and Joint Problem Solving. The measure developed for measuring these six dimensional strategic alliance relationships was a set of 22 elements which are recalled below. These 22 elements were coded (see Table 5.9) and abridged (as shown in bold letters) for ease of interpretation at a later stage.

TRUST

- (SA1) We **help each other** out of difficult situations.
- (SA2) Our word is **reliable** and we fulfil our respective obligations.
- (SA3) We **share** commercial and technical **information** relating to projects without the need to protect ourselves.

COMMITMENT

- (SA4) The co-operative business relationship has developed from the **top management** of both parties.
- (SA5) We see this co-operative business relationship as a **long-term** commitment.
- (SA6) We **share resources**.
- (SA7) We are committed to actively **build trust**.
- (SA8) There is **no conflict** between our goals and joint **goals**.

INTERDEPENDENCE

- (SA9) We **give each other work**.
- (SA10) We have a **mutual reliance** on each other.
- (SA11) We **treat each other equally** as business partners.

COMMUNICATION

- (SA12) We **maintain openness** in order to prevent hesitation, reservation or other defensive behaviour.
- (SA13) We **communicate openly** and with trust in mutually pursuing opportunities and solving problems and conflicts.
- (SA14) We **communicate regularly** to compare current performance against expectations.
- (SA15) We **consult each other** before making key decisions.

CO-OPERATION

- (SA16) We co-operate out of **mutual need** and desire.
- (SA17) We co-operate to **share risks**.
- (SA18) Co-operation between us provides a foundation for **business growth**.
- (SA19) We believe that co-operation with each other will reduce the likelihood of opportunistic **behaviour**.

JOINT PROBLEM SOLVING

- (SA20) Problems and conflicts are accepted as regular part of **teamwork**.

- (SA21) We feel free to admit and **discuss difficulties** even when they relate to uncomfortable issues.
- (SA22) When **problems** occur, we concentrate on **solving** them rather than trying to blame the other.

The measure for competitive advantage was a set of six indicators which are also recalled here. They are: 1) tender success rate and 2) business turnover under the dimension of business performance; 3) planning work, 4) co-ordination of subcontractors, 5) standard of workmanship and 6) quality of subcontractors under the dimension of on-site construction process.

In reference to Questions 10 of the questionnaire, respondents were required to record their responses to the 22 elements of strategic alliance relationships on a five point Likert scale (ranging from 1 - strongly disagree to 5 - strongly agree). Likewise, in Question 11, respondents also were required to record their responses to the 6 competitive advantage indicators also on a five point scale, for the two business performance indicators (ranging from 1 - decreased to 5 - increased) and for the four on-site construction process (ranging from 1 - poor to 5- excellent).

The measures developed specifically for this study and used in measuring strategic alliance relationships and competitive advantage had never been tested. Therefore, it was necessary to subject the structure of groupings of the elements to a test in factorial validity. In this factor analysis, a principal component extraction followed by a quartimax rotation with eigen values greater than one was used. The factor loadings less than 0.30 are suppressed in the summary tables. Likewise, the same factor analysis procedure was also carried out for the six indicators of competitive advantage.

The data used for the analyses were data of the 13 'HAVE' Companies who were having strategic alliance relationships with subcontractors at the time of survey. (Appendix K presents the details of the factor analyses for strategic alliance elements and competitive advantage indicators).

Table 6.2 (same as Table 5.10) shows the summary of the factor analysis of competitive advantage indicators on the 13 ‘HAVE’ Companies.

Table 6.2 Factor Analysis - Competitive Advantage Indicators

Competitive Advantage Indicators	Factor 1	Factor 2
Standard of Workmanship	0.90	
Your Co-ordination of Subcontractors	0.85	
Quality of Subcontractors	0.83	
Planning Work	0.53	
Business Turnover		0.96
Tender Success Rate		0.93

The original dimensions of the concept of competitive advantage are business performance and on-site construction process. The results of the factor analysis grouped into two new factors of competitive advantage. However, Factor 1 matches one of the original dimensions—on-site construction process—of competitive advantage, while Factor 2 matches the other original dimension—business performance. The results indicate that this factor analysis confirmed the *a priori* grouping of competitive advantage indicators.

6.3 Comparing New Factors with Original Factors of Strategic Alliances

The results of the factor analysis grouped the 22 elements of strategic alliance attributes into seven new empirically derived factors. These new factors were interpreted as Factor 1: Joint Information Sharing; Factor 2: No Conflicting Goals; Factor 3: Teamwork; Factor 4: Business Growth; Factor 5: Mutual Reliance; Factor 6: Reliable; Factor 7: Resources Sharing. These factor names were derived from the highest factor loading of each of the seven factors as indicated on Table 6.3.

As discussed in Chapter 2, the evidence from the literature review of concept of strategic alliances covered literature and publications mainly relating to the manufacturing and services industries. The literature review clearly indicated that there was a lack of theoretical and empirical work focused on the working relationship between contractors and subcontractors. Furthermore, little research addressed the strategic alliances and competitive advantage issue in the building construction industry. It was necessary for the theoretical and empirical work of this research to be drawn from the other industries such as manufacturing and services. The six dimensions—trust, commitment, interdependence, communication, co-operation and joint problem solving—of concept of strategic alliances were developed mainly from the manufacturing and the services industries.

It is suggested that the formation of strategic alliance relationships is motivated to gain competitive advantage in the marketplace. The concept has worked well in industries such as automobiles (Burgers et al, 1993; Sasaki, 1993; Haigh, 1992) and computer (Mohr and Spekman, 1994; Magee, 1992; Crouse, 1991). There is a lack of theoretical and empirical work indicating that the concept of forming strategic alliances between contractors and subcontractors in gaining competitive advantage could prove to be unsuccessful in the building construction industry. The above six strategic alliance dimensions developed from the manufacturing and services industries might not apply to the construction industry. Therefore, it was not expected that seven new empirically derived factors would fully match with the original six strategic alliance dimensions.

The comparison between the original six strategic alliance dimensions and the seven new empirically derived factors are summarised in Table 6.3.

Table 6.3 Comparing the New Empirical Factors with the Original Strategic Alliance Factors

New Factor	Element	Original Factor	Element
Joint Information Sharing	(SA3) Share Information	Trust	(SA1) Help Each Other
	(SA12) Maintain Openness		(SA2) Reliable
	(SA13) Communicate Openly		(SA3) Share Information
	(SA22) Problem Solving	Communication	(SA12) Maintain Openness
	(SA16) Mutual Need		(SA13) Communicate Openly
	(SA21) Discuss Difficulties		(SA14) Communicate Regularly
	(SA7) Build Trust.		(SA15) Consult Each Other
	(SA1) Help Each Other	Joint Problem Solving	(SA20) Teamwork
	(SA15) Consult Each Other		(SA21) Discuss Difficulties
	(SA22) Problem Solving		
No Conflicting Goals	(SA8) No Conflict Goals	Commitment	(SA4) Top Management
	(SA4) Top Management		(SA5) Long Term
	(SA14) Communicate Regularly		(SA6) Share Resources
			(SA7) Building Trust
	(SA8) No Conflict Goals		
Teamwork	(SA20) Teamwork		
	(SA11) Treat Each Other Equally		
	(SA19) Opportunistic Behaviour		
Business Growth	(SA18) Business Growth.	Co-operation	(SA16) Mutual Need
	(SA17) Share Risks.		(SA17) Share Risks
			(SA18) Business Growth
	(SA19) Opportunistic Behaviour		

Mutual Reliance	(SA10) Mutual Reliance	Interdependence	(SA9) Give Each Other Work
	(SA9) Give Each Other Work		(SA10) Mutual Reliance
			(SA11) Treat Each Other Equally
Reliable	(SA2) Reliable		
	(SA5) Long Term Commitment		
Resource Sharing	(SA6) Share Resources		

The new factor ‘Joint Information Sharing’ indicates the combination of elements from 3 of the original strategic alliance dimensions—namely trust, communication and joint problem solving. This new factor includes:

- two elements of trust: (SA1) help each other and (SA3) share information;
- two elements of communication: (SA12) maintain openness and (SA13) communicate openly; and
- two elements of joint problem solving: (SA21) discuss difficulties and (SA22) problem solving.

The new factor ‘No Conflicting Goals’ includes 2 of the 5 elements from the one of the original dimensions, namely: commitment. This new factor includes:

- two elements of commitment: (SA4) top management and (SA8) no conflict goals.

The new factor ‘Teamwork’ contains none of the original elements.

The new factor ‘Business Growth’ covers 2 of the 4 elements from one of the original dimension, namely: co-operation. This new factor covers:

- two elements of co-operation: (SA17) share risks and (SA18) business growth.

The new factor 'Mutual Reliance', includes 2 of the 3 elements from one of the original dimension, namely: interdependence. This new factor includes:

- two elements of interdependence: (SA9) give each other work and (SA10) mutual reliance.

The last two new factors 'Reliable' and 'Resource Sharing' also contain none of the original elements.

As mentioned previously, the instrument for measuring strategic alliance attributes—trust, commitment, interdependence, communication, co-operation and joint problem solving—was developed specifically for this study and had never been tested. Visual inspection indicates from the factor pattern, as shown in Table 6.3, that there is evidence in partial support of the original developed structure of the measure for the concept of strategic alliances.

6.4 Testing Interitem Consistency Reliability

Having completed the validity tests, for both strategic alliance elements and competitive advantage indicators, using factor analyses as described in previous section, the next step was to test interitem consistency reliability of the new factors of strategic alliances and new indicators of competitive advantages. These tests were carried out to determine what extent to which elements share a common variation.

Cronbach's Alpha is a reliability coefficient that reflects how well the items in a set are positively correlated to one another. The coefficient of reliability runs from 0 to +1, with 0 meaning totally unreliable and +1 meaning perfectly reliable, and the closer Cronbach's Alpha is to 1, the higher the internal consistency reliability (Sekaran, 1992).

However, Nunnally (1978, p245) indicated *"in the early stages of research on predictor tests or hypothesised measures of a construct, one saves time and energy by working with instruments that have only modest reliability, for which purpose reliability of 0.70 or higher will suffice."*

Table 6.4 shows how the original 22 elements of the 13 'HAVE' Companies in the concept of strategic alliance are regrouped together and the name of the scale they form. The values shown in Table 6.4 for this coefficient for the 'Mutual Reliance' scale are well below the Alpha 0.70, and therefore considered unacceptable. The

coefficient of 'Reliable' scale is just below the alpha value of 0.70 and might also be considered unacceptable. The results for these two factors, therefore, need to be treated with cautions. The reliability of 'No Conflicting Goals', 'Teamwork' and 'Business Growth' scales is somewhat higher, while the reliability of 'Joint Information Sharing' scale quite high. Cronbach's Alpha is a measure of internal reliability of a set of elements and hence cannot be applied to a single element such as 'Resource Sharing' element.

Table 6.4 Cronbach's Alpha - New Factors

New Factors	Elements	Mean	Std Dev
Joint Information Sharing	• Share Information	3.92	0.89
	• Maintain Openness	3.81	0.75
	• Communicate Openly	3.96	0.78
	• Problem Solving	4.31	0.85
	• Mutual Need	3.73	0.53
	• Discuss Difficulties	4.08	0.79
	• Build Trust.	4.15	0.72
	• Help Each Other	4.00	0.61
	• Consult Each Other	3.27	0.78
Cronbach's Alpha = 0.92			
No Conflicting Goals	• No Conflict Goals	3.31	1.01
	• Top Management	3.50	0.96
	• Communicate Regularly	3.38	0.87
	Cronbach's Alpha = 0.76		
Teamwork	• Teamwork	4.19	0.63
	• Treat each other equally	3.58	0.86
	• Opportunistic Behaviour.	3.81	0.69
	Cronbach's Alpha = 0.75		
Business Growth	• Business Growth	3.65	0.75
	• Share Risks.	2.92	0.84
	Cronbach's Alpha = 0.74		
Mutual Reliance	• Mutual Reliance	3.69	0.85
	• Give Each Other Work.	3.08	1.21
	Cronbach's Alpha = 0.40		
Reliable	• Reliable	4.58	0.49
	• Long Term Commitment.	3.92	0.89
	Cronbach's Alpha = 0.63		
Resource Sharing	• Share Resources.	3.38	0.85
	Cronbach's Alpha = n/a		

Note: Measurement Scale 1 to 5, 1 - Strongly Disagree and 5 - Strongly Agree

Table 6.5 shows how the original 6 elements in the concept of competitive advantage are regrouped together. These new groupings match with the original postulated groupings. The values shown in Table 6.5 for this reliability for the ‘On-site Construction Process’ scale is considered high, while the reliability of the ‘Business Performance’ scale is higher.

Table 6.5 Cronbach’s Alpha - New Indicators

New Indicators	Elements	Mean	Std Dev
Business Performance	• Tender Success Rate	3.04	0.99
	• Business Turnover	3.27	0.81
	Cronbach’s Alpha = 0.92		
On-site Construction Process	• Planning Work	3.50	0.46
	• Co-ordination of Subcontractors	3.54	0.48
	• Standard of Workmanship	3.65	0.66
	• Quality of Subcontractors	3.70	0.52
Cronbach’s Alpha = 0.79			

Note: Measurement Scale for Business Performance 1 to 5, 1 - Decreased and 5 - Increased

Measurement Scale for On-site Construction Process 1 to 5, 1 - Poor and 5 - Excellent

(Appendix L presents the details of the reliability analyses).

6.5 Spearman Coefficients between New Factors and New Indicators

Table 6.6 shows the combining elements from each of the new factors into individual scales. The table also indicates the results of the Spearman Coefficients between the newly established strategic alliance factors and competitive advantage indicators of the 13 ‘HAVE’ Companies.

Table 6.6 Spearman Coefficients for New Factors and New Indicators

Strategic Alliance Factors	Competitive Advantage Indicators	
	FAC1 - On-site Construction process	FAC2 - Business Performance
Joint Information Sharing	0.53 *	-0.47
No Conflicting Goals	0.17	-0.23
Teamwork	0.13	-0.20
Business Growth	-0.18	0.36
Mutual Reliance	-0.35	-0.56 **
Reliable	-0.35	-0.14
Resource Sharing	-0.15	-0.59 **

* Spearman Correlation Coefficient with a 'NEAR' Significance Level between 0.05 and 0.10

** Spearman Correlation Coefficient with a Significance Level less than 0.05

'Joint Information Sharing' was found to be near significant and positively related to on-site construction process. 'Mutual Reliance' and 'Resource Sharing' were found to be significant but negatively related to business performance. 'No Conflicting Goals', 'Teamwork', 'Business Growth' and 'Reliable' were not related to any of the measures of on-site construction process and business performance.

The above results were expected because the above findings were in line with the findings of the 13 'HAVE' Companies, as discussed in Section 5.4.7.2, that forming strategic alliance relationships with subcontractors had limited positive associations with on-site construction processes but had some negative impacts on business performance.

6.6 Summary

The measure developed in measuring strategic alliance attributes for this study had never been tested. In order to test its validity, a factor analysis was carried out for the 22 elements of the original six strategic alliance dimensions. Seven new empirical factors namely: Joint Information Sharing, No Conflicting Goals, Teamwork, Business Growth, Mutual Reliance, Reliable and Resource Sharing, were generated. After comparing the elements of the new seven factors with the original strategic

alliance elements, Visual evidence indicates that original groupings are partially matching with the new groupings. A factor analysis was likewise carried out for the original indicators of competitive advantage. The two new factors developed matched with the original two indicators, i.e. business performance and on-site construction process.

To measure the internal reliability of the new factors of strategic alliances and new indicators of competitive advantages, Cronbach's Alpha was used. The results indicated that four of the seven new factors namely: 1) joint information sharing, 2) no conflicting goals, 3) teamwork and 4) business growth were above 0.70. Two factors: 1) mutual reliance and 2) reliable were below the acceptable value range of 0.70. Cronbach's Alpha could not be applied to a single item factor namely resource sharing. The two new indicators which were matching the original postulated groupings had Cronbach's Alpha above 0.07.

The new strategic alliance factors generated through factor analysis clearly demonstrated that the 22 elements could not be exhaustive. The elements included in the questionnaire for the measure and the wording of elements could vary with context and intent. Continuous modifications to the questionnaire may be required and tested in order to perfect such a measure. Nevertheless, the measures developed and tested in this research serves as a foundation for future research in this area.

7 ANALYSING STRATEGIC ALLIANCE FAILURE FACTORS

7.1 Introduction

As discussed in Section 2.6.1 of the literature review, a number of researchers compared strategic alliance relationships to long term relationships between couples—such as marriage (Lendrum, 1995; Dev and Klein, 1993). Trust, a common set of values, good communication, co-operation, and the ability to resolve conflicts amicably are the fundamentals of a strong marriage (Lendrum, 1995). Some marriages fail. Similarly, not every strategic alliance relationship will be successful—some will fail. The objective of this chapter is to describe and examine the issues leading to the abandonment of strategic alliances in building construction, specifically:

- to identify the factors leading to abandonment of the relationship; and
- to increase the knowledge of how to prevent failure in strategic alliance relationships by closely interpreting statements made by respondents to the research survey.

This chapter is structured by initially examining the background literature. Then, a review of the new empirical factors developed in this research using factor analysis and testing interitem consistency reliability as detailed in Chapter 6, is also discussed. These factors are: joint information sharing, no conflicting goals, teamwork, business growth and resource sharing. The importance of these factors highlights the approach that both partners must support to work for the success and survival of the relationship. Should one or both partners act opportunistically, the relationship will suffer and eventually may fail.

The chapter concludes with the findings from the 21 individual respondents, from the 12 'HAD' companies, who indicated the reasons leading to the abandonment of their alliance relationships with subcontractors. Their reasons are interpreted with

reference to the newly established factors influencing the success and failure of alliance relationships.

7.2 Background

As discussed in Section 2.12, the building construction industry has traditionally operated through competition. This competitiveness is largely due to cost being the prime factor in the tender selection process. The combination of competitive tendering and the contractual and legal framework by which project team members are bound together are the main causes of the adversarial and confrontational relationships. Both New South Wales Royal Commission Building Industry (RCBI) Report (Gyles, 1992) and UK Latham Report (Latham, 1994), identified this sort of adversarial relationship. Both RCBI and Latham Reports recommended that improvement in the building construction industry could be achieved through development of better relationships amongst all projects team members.

Since as much as 80 to 90% of the value of work on a construction project is performed by subcontractors, it is clear that the greatest potential for improvement of efficiency and cost saving lies with subcontractors (Matthews et al, 1996). If contractors are to improve their performance and productivity, they should concentrate their efforts on where the majority of the work takes place, i.e. subcontracting. *“Contractors are making attempts to move away from their traditional adversarial approach in dealing with subcontractors towards developing closer working relationships”* (Matthews et al, 1996, p1). Hence, this study mainly focused on the vertical relationships between contractors and subcontractors in adjacent stages of a value chain (Harrigan, 1988).

Chapter 5 described the analysis of the data acquired by the research questionnaire survey. Section 5.4.7.1 focused on the results and Section 5.4.7.2 described the detailed testing of the hypotheses of the 13 ‘HAVE’ companies who were involved in strategic alliance relationships with subcontractors. The research findings broadly demonstrate that the 13 ‘HAVE’ contracting firms believed the strategic alliance relationships had limited positive association with the successful performance of

on-site construction processes and in fact had some negative impacts on business performance.

Section 5.4.7.4 went on to describe the testing of the research hypotheses and discussed the findings of the 12 companies who had abandoned the relationships. The findings indicated that the main reason for the 12 'HAD' contracting firms for abandoning the strategic alliance relationships with subcontractors was the subcontractors' tender prices becoming non-competitive in the market. The question can be asked if the non-competitive pricing by subcontractors is the sole reason for contractors abandoning such relationships. Hence, the research question asked in Question 12 of the Survey Questionnaire *"Has your Company ever abandoned strategic alliance relationship? If yes, Why?"*

7.3 Framework for the Analysis

Having reviewed a range of determinants for core dimensions of strategic alliance relationships in the literature, six dimensions were established initially and formed the independent variables. They were: trust, commitment, interdependence, communication, co-operation and joint problem solving. The instrument developed for measuring these six dimensional strategic alliance relationships consisted of a set of 22 elements, which were detailed in Section 4.2.3. The results of the factor analysis grouped the 22 elements of strategic alliance attributes into seven empirically derived factors. These factors, as listed following, are indicators of a successful relationship:

- Joint Information Sharing;
- No Conflicting Goals;
- Teamwork;
- Business Growth;
- Mutual Reliance;
- Reliable; and
- Resource Sharing.

These factor names were derived from the highest factor loading of each of the seven factors as indicated previously in Table 6.3.

After completing the validity tests using factor analysis on the 22 strategic alliance elements, the next step was to test interitem consistency reliability of these new factors. The values shown in Table 6.4 for the coefficient for both the 'Mutual Reliance' and 'Reliable' scales are below alpha 0.70, and therefore these two new factors were considered unacceptable. Hence, the five fundamental dimensions found to be important to a successful strategic alliance relationship between building contractors and subcontractors consisted of:

- Joint Information Sharing;
- No Conflicting Goals;
- Teamwork;
- Business Growth; and
- Resource Sharing.

Joint Information Sharing

Information sharing refers to the extent information is communicated to one's alliance partner. Mink et al (1987) suggest that commercial and technical information relating to projects must be shared freely and transferred effectively as a cohesive team. They also imply that sharing of information and communication must be open and honest at all levels, based on mutual respect in order to pursue business opportunities and solving problems and conflicts. Hence, an atmosphere of openness must be created and encouraged in order to prevent hesitation, reservation or other defensive behaviour (Varney, 1989). Partners must be committed to actively build trust (Howarth et al, 1995) and must have confidence and faith in each another so there are no hidden agendas within the relationship.

Lewis (1990) suggests by sharing information and by understanding each another's mutual needs and desire, partners are able:

1. to help and support each other out of difficulties,
2. to consult each other for exchanging ideas without recrimination, and
3. to assist each another to achieve not only joint goals but also individual goals.

The systematic availability of information allows alliances to discuss difficulties without animosity (Howarth et al, 1995) and to solve problems and resolve conflicts without fear of retribution. In order to achieve success in the strategic alliance relationships, effective communications between partners are essential. Communication captures the utility of the information exchanged and is deemed to be a key factor of the relationship's vitality (Mohr and Spekman, 1994).

No Conflicting Goals

The goals and objectives of the alliance should be clear to both partners. Partners must understand each other's expectations and commitment in relation with their common or compatible goals and objectives. To achieve the established goals, Mink et al (1987) suggest that partners need to communicate regularly in order to produce timeliness of actions and decisions and to compare current performance against expectations. Howarth et al (1995) acknowledge that the time spent in clarifying the common vision and shared mission will be well worth the effort. They suggest that if common goals are not achievable, it will be unwise to proceed with the alliance. The co-operative business relationship of both parties must be developed and committed from top management (Bennet and Jayes, 1995) and must be implemented at all levels with the highest standards of performance and conduct.

Commitment refers to the willingness of partners to exert the level of effort for the success of the relationship (Porter in Mohr and Spekman, 1994). According to Howarth et al (1995), a strategic partner will measure the level of importance related to the alliance by the level of involvement and commitment demonstrated by senior management in their partner's business organisation. When both partners share a similar high level of commitment to the alliance, they can achieve individual and joint goals without raising the spectre of opportunistic behaviour (Mohr and Spekman, 1994). The higher level of commitment from both partners, the greater effort they will exert to balance short-term problems with long-term goal achievement (Angle and Perry in Mohr and Spekman, 1994).

Teamwork

As business organisations join forces to achieve mutually beneficial goals, they must acknowledge that each is dependent on the other and must work as a cohesive team. In order to achieve success in the relationship, Mohr and Spekman (1994) argue both partners need to recognise the advantages of interdependence that will provide benefits greater than either could attain individually. They must treat each other equally as business partners to share concerns, problems, needs and ideas (Howarth, 1995). Lendrum (1995) indicates that the success of the alliance depends on the team built on trust, respect and long-term commitment.

Business Growth

One of the reasons for firms to form strategic alliance is for business growth. For example, if the business strategy of an organisation being considered requires a partner who provides a technical expertise, then the appropriate partner will be one who has the ability and capability to provide the required expertise. Nevertheless, a strategic alliance may still experience a failure due to lack of attention and effort in the search for a compatible partner. Howarth et al (1995, p121) identify a list of qualities desired in an appropriate partner:

- *“commitment to the proposed alliance’s vision and strategy;*
- *required level of expertise, experience, reputation or influence;*
- *financial stability and evidence of long-term viability;*
- *decision makers and managers with values compatible with the originating organisation;*
- *an organisational culture that can accommodate an alliance partner;*
- *employees who are prepared to collaborate rather than compete with employees of the originating organisation; and*
- *experience with successful alliances.”*

According to a report by the Bureau of Industry Economics (1995), partners need to invest their special talents into the relationship and draw strength from the team’s diversity in order to provide foundation for business growth. Partners must be willing to share risks, setbacks and rewards (Lewis 1990).

Resource Sharing

A successful alliance requires a willingness to share the resources of both partners. One of the significant costs in relation to the use of resources is time. The formation of strategic alliances takes a long time to develop and can be a time-consuming and expensive endeavour. Badger and Mulligan (1995) indicate that during the formation period, the alliance may not construct one single major project. However, Howarth et al (1995) suggest that working together on small projects gives each partner the time and opportunity to test one another out. It is imperative to share resources, knowledge and ideas of the partners in order to create successful relationship for the betterment of projects (Bureau of Industry Economics, 1995).

7.4 Key Factors Influencing Alliance Failure

Having reviewed the empirically derived factors from this research, the five key factors—joint information sharing, no conflicting goals, teamwork, business growth, and resource sharing—containing elements are influencing the successes of strategic alliance relationships. If present they are no guarantee of successes, but if absent suggest that the strategic alliance relationship is likely to fail. Hence, the opposites of key success factors are those which are likely to lead to failure and abandonment of the strategic alliance relationship. These failure factors are:

- reluctance in sharing information including elements such as poor communication, lack of trust, adversarial relationships (win/lose) and lack of commitment;
- conflicting goals;
- no teamwork;
- hindrance to business growth including elements such as reluctant to share risks and hidden agenda; and
- reluctance to resource sharing including elements such as capital and time.

7.5 Analysing the Abandonment of Strategic Alliances in Building Construction

Of the total of 106 responses representing 51 companies in this study, this examination was conducted by a further analysis of the 21 responses representing all 12 'HAD' companies who had abandoned strategic alliance relationships. These 21 respondents consisted of 7 General Managers, 4 Construction Managers, 6 Estimators and 4 On-site Project Managers.

Reluctance in Sharing Information

No business relationship can expect to last very long if parties involved do not trust each other. Mutual respect and trust are essential for the success of strategic alliance. The Estimator of Company 4 said, "*we attribute the failure of the relationship primarily due to the lack of trust between the two parties*". If there is not trust between people who work together, the alliance will not be successful. "*Our alliance subcontractor lost our trust because he was disclosing confidential information to one of our competitors*" (Project Manager of Company 61). A solid foundation for a successful strategic alliance relationship is knowing what each partner in the alliance wants, and the ability of the alliance to provide it. According to the General Manager of Company 61, "*the subcontracting firm could not get their personnel down the line to deliver what they had promised*".

The construction industry has a reputation for keeping all information secret. The Estimator of Company 24 indicated that their subcontractors were very reluctant to share the information because "*these trade secrets are thought to give subcontracting firms the edge they need to remain competitive*". Establishing clear criteria and guidelines for the operation can only be achieved when the lines of communication are kept open and honest. Thus mechanisms need to be developed to facilitate open communication and regular sharing of information in order to strategically plan their activities as a team. Such mechanisms need the support of senior management of both partners and the implementation from all levels. The Estimator of Company 45 stated that "*lack of firm commitment from senior management and support, of both Companies, in following through to lower management level was the main cause of failure*".

Conflicting Goals

The most competent partner in the world will not make a good alliance if contradictory strategies collide within the alliance (Economist Intelligence Unit, 1994). The goals and objectives of the alliance should be clear to both partners. The General Manager of Company 24 agreed with that statement, *“our objectives relating to the strategic alliance relationship were not clearly defined from the outset. Compounding the problem, due to unclear goals and uneven commitment, the relationship lost its good intention”*. Long-term alliance partnering requires an entirely different approach of management. Senior management and project level management from both parties needs to work toward common goals and objectives. However, due to constant changes in management both senior and on-site project management levels, *“the senior management policies did not remain consistent with the established goals and objectives which the original management had initially endorsed”* (Estimator of Company 33). The time spent in achieving clarity and agreement on direction will be well worth the effort. If common or compatible goals were not achievable, it would be unwise to proceed with the alliance. Hidden agendas will become obvious over time and do much to damage the relationship. *The subcontractor with whom we formed alliance was seeking a relationship opportunity rather than a long-term alliance* (Project Manager of Company 23). According to the Estimator of Company 18, another factor caused the failure of the relationship is *“due to change of subcontractor’s management with conflicting goals and objectives emerging on the future direction of the relationship”*.

No Teamwork

It is imperative that when choosing potential alliance partners the feasibility of the alliance must also be looked at from the perspective of the alliance partners. Ideally, from a long-term business relationship perspective, the potential alliance partner is the one who possesses complementary skills, resources, needs and commitment to the success of strategic alliance from both parties (Devlin and Bleackley, 1988). Every company has its own unique corporate culture. Management needs to weigh

what kind of impact both companies will have in forming the strategic alliance relationship. Senior management of both companies must realise that the corporate cultures must be joined to make one efficient organisation (Badger and Mulligan, 1995). Unfortunately, *“due to the fragmentation of the industry, long term commitment from top management in the formation and implementation of such relationships would be difficult to maintain given regular changes in the management personnel”* (Construction Manager of Company 57).

Some contractors and subcontractors will avoid forming any type of relationship. This attitude is due to the long-standing perception that an adversarial relationship always exists between contractors and subcontractors. Firms considering an alliance must overcome this bias (Badger and Mulligan, 1995). Realistically, this adversarial attitude adjustment is not easy for some people to make because they believe these adversarial relationships naturally exist in the business. *“Differences in corporate culture, operating procedures and management practices became apparent during the course of the relationship, which was leading back to the adversarial relationships”* (Construction Manager of Company 55). However, many employees will eventually adjust to the new environment over a period of time, aided perhaps through additional training. Teams building sessions and training courses are vehicles that can be used to educate those employees who will be participating in the alliance (Badger and Mulligan, 1995).

Devlin and Bleackley (1988) argue that the people who make the alliance succeed are the alliance managers, the project managers and the project team. These are the architects of success, not the top management. They also acknowledge although top management may be able to force the team to co-operate, unless the team believes in the underlying philosophy and understands how it is implemented, maximum benefit cannot be generated. Badger and Mulligan (1995) agree with Devlin and Bleackley's view that the 'champion' of an alliance is typically a position equivalent to a project manager. This individual's responsibilities include day-to-day interaction with each of the alliance participants' primary points of contact. This person should have a very good understanding of the philosophy and procedures of his/her company as well as those of the alliance partner. This manager must also have the trust and confidence of

all alliance members so that he/she can be depended upon to make the right decisions with the same degree of concern for all. Supporting this, the Construction Manager of Company 33 said, *“we could not get along, which eventually destroyed the co-operative spirit of both companies”*. The Project Manager of Company 18 had a similar problem, indicating that the *“project managers of our Company could not work with our alliance subcontractor’s managers”*.

Hindrance to Business Growth

In an alliance relationship, the traditional adversarial attitude is out of place (Badger and Mulligan, 1995). The Project Manager of Company 23 indicated that *“under the traditional competitive tendering procurement process, in order to win work we have to have access at tender stage the very best (lowest) possible quotation at the time our bid is submitted”*. The General Manger of Company 23 also pointed out one of the difficulties in forming strategic alliance with subcontractors. He stated that *“our commitment in forming strategic alliance with some subcontractors creating a perception of closed shop and restricted ourselves from dealing with other subcontractors of the same trade.”* Howarth et al (1995) stress that the relationship must be structured to achieve equitable sharing of benefits and risks. *“After the formation of the relationship, our alliance subcontractor indicated that its willingness to share the profit, but very reluctant to share the risks with us”* (General Manager of Company 65). All stakeholders should ideally have equal equity in the relationship, jointly creating mutual goals, satisfying each other's requirement, and focusing on win/win outcomes (Lendrum, 1995). *“One of our alliance subcontractors was growing too quickly and losing focus on our Company. The subcontractor was too busy serving other companies”* (Estimator of Company 55).

Reluctance in Resource Sharing

The success of strategic alliance relationships requires a visionary approach to invest the necessary time and money into a program that may or may not become profitable. *“It takes up too much management time”*, according to the General Manager of Company 4. The Construction manager of Company 48 added, *“we have the best*

intention to develop relationships, but finally, lack of time and resources caused the collapse of the relationship.” The most important act that senior management performs is lending total support for the formation of the alliance. *“Implementation is inherently more difficult than originally anticipated, our subcontractor was unwilling to make the additional financial and time commitment for the trial period—for what may turn out to be an experiment”* (General Manager of Company 54). As a part of this commitment, senior management pledges the resources and corporate cooperation required for the formation and continuing preservation of the alliance (Badger and Mulligan, 1995). However, *“senior management changes regularly at all companies and each company has only enough resources to carry out the optimum workload”* (General Manager of Company 33).

7.6 Preventing Failure in Strategic Alliances

A close analysis of the statements made by respondents to research survey revealed the issues leading to the abandonment of strategic alliances in building construction industry. These issues are:

Sharing Information

- lack of trust;
- loss of trust leading to reduction in information exchange;
- over-promise and under-deliver;
- resistance in sharing information; and
- lack of senior management commitment and support.

Goals and Objectives

- soliciting alliance for short-term gains rather than long-term benefits;
- unclear goals and objectives;
- inconsistent with established goals and objectives; and
- conflicting goals and objectives emerging on the future direction of the relationship.

Teamwork

- doubtful about establishing alliance relationship due to regular changes in management;
- entrenched adversarial relationships;
- management fail to lead and inspire the process; and
- lack of implementation of project level management.

Business Growth

- fear of losing competitive advantage in low cost;
- creating a perception of closed shop; and
- willing to share profits but reluctant to share risks.

Resource Sharing

- taking up too much management time;
- inadequate time, finance and resource to nurture the relationship; and
- unwilling to commit additional financial and time.

Strategic alliance relationship requires a completely new culture to that which has existed in the past. Hence, in order to prevent failure of strategic alliances, many of the above traditions, and related paradigms, would have to be abandoned. Obviously, it would be extremely difficult for firms to completely change the culture pertaining to the contractor and subcontractor relationship over a short period of time. However, for successful strategic alliance relationships, the traditions described above would have to be at least modified, if an alliance is to survive even the initial stages of formation.

7.7 Summary

This chapter sets out to achieve the following objectives:

1. to identify the factors leading to the abandonment of the strategic alliance relationship; and
2. to increase the knowledge of how to prevent failure in strategic alliance relationships.

In order to achieve the first objective, it was necessary to elaborate on the five success factors which were developed in this research as detailed in Chapter 6. These factors are: joint information sharing, no conflicting goals, teamwork, business growth and resource sharing and they contain the elements influencing the successes of strategic alliance relationships. It is suggested if present they are no guarantee of successes, but if absent suggest that the relationship is likely to fail. Hence, the opposites of key success factors are failure factors. They are:

1. Reluctance in sharing information;
2. Conflicting goals;
3. No teamwork;
4. Hindrance to business growth; and
5. Reluctance in resource sharing.

An analysis and interpretation of the 21 responses representing the 12 'HAD' Companies reveals the five failure factors pertaining the elements, other than 'non-competitive pricing' as discussed Section 5.4.7.4, leading to the failure and abandonment of strategic alliance relationships between building contractors and subcontractors.

To prevent failure in strategic alliance relationships, this analysis indicates that the selection of an alliance partner and the willingness of both parties' top management to make a long-term commitment to the development of the relationships are vital. Critical also to the success of a strategic alliance relationship is mutual respect, trust, clearly defined goals and objectives of alliance established by the alliance partners. Open communication strategies used by the partners enable quality information transmitting clear criteria and guidelines by partners in goal setting and trust building to prevent any hidden agenda from either or both partners. Alliance partners must also have equity in the relationship in order to satisfy each other's requirement and focusing on win/win outcomes instead of adversarial (win/lose) relationships traditionally operating between contractors and subcontractors. Investing adequate time and resources—both human and financial—enable partners to better understanding the strategic choice facing them. At times, sharing resources and information is not natural for alliance partners; however, they must develop the skills

and learn the concept of sharing in order to strategically plan their activities as a fully co-operated team.

The major issue was found not to be competitive pricing, but the non-cost contributing factors were important for the success of the alliance relationships. This analysis has demonstrated the efficacy of the developed framework as a powerful tool for analysis of both success and failure of strategic alliance relationships.

8 CONCLUSIONS, CONTRIBUTIONS AND IMPLICATIONS

8.1 Introduction

Chapter 5 discussed the analysis of the data and results from the survey questionnaire. It highlighted the correlations between strategic alliances and competitive advantages of the 13 'HAVE' and of the 12 'HAD' Companies. Chapter 6 detailed the process of analysing in terms of factor and item analyses; and confirmed the *a priori* grouping of competitive advantage indicators but a different set of factor grouping for strategic alliance relationships of the 13 'HAVE' Companies. Chapter 7 described and examined the issues leading to the abandonment strategic alliance relationships of the 12 'HAD' Companies.

This chapter builds upon the analysis and the findings of the correlations between strategic alliances and competitive advantages and takes a step further by describing the conclusions, contributions, and implications that emerge from this research. Hence, this chapter serves several purposes:

- to evaluate the investigation's success at meeting the original research objectives as outlined in Chapter 1;
- to delineate contributions to knowledge;
- to discuss implications to building construction industry, public sector policy analysts and managers, and private sector industry professionals; and
- to conclude for future research.

8.2 Conclusions Regarding Objectives

This section summarises the results of the investigation in light of the objectives outlined in Chapter 1. It also addresses the ability the two principal research questions to support these objectives. The objectives originally proposed are:

- to investigate and define the concept of strategic alliances in use in industries;
- to identify the strategic alliance attributes;
- to devise measures of strategic alliances in the building construction industry (to answer the first principal research question: *How can strategic alliances be measured?*)
- to develop a set of competitive advantage indicators;
- to increase the understanding of how the formation of strategic alliances between contractors and subcontractors relates to competitive advantage in gaining Queensland public sector building construction works (to answer the second principal research question: *Do strategic alliances matter in gaining competitive advantage?*); and
- to assess the validity and reliability of the measure of strategic alliance relationships.

8.2.1 Concept of Strategic Alliances in Use

The term *strategic alliance* (Howarth et al, 1995, p2) is described as “a co-operative arrangement between two or more organisations that forms part of, is consistent with their overall strategy, and contributes to the achievement of their major goals and objectives.” Strategic alliance is a business strategy which aims at improving

efficiency, gaining complementary capabilities, growth and improve competitiveness, gaining access to markets, spreading financial risks and sharing costs, gaining access to complementary technological resources; and participating in a defined research program and benefit from results.

The literature review reveals that strategic alliances have been successfully adopted and implemented in the manufacturing and services sectors, particularly in industries such as automobile manufacturing, electronics and semi-conductors, telecommunications, computers and retailing industries.

In the automobile manufacturing industry, the manufacturers have changed from the traditional behaviour of the competitive bidding process in selecting suppliers to a long-term and mutual co-operative relationship with their suppliers. Electronic, semi-conductors and telecommunications organisations have formed strategic alliances with one another for long-term collaboration in the research and development. In the computer industry, strategic alliances between manufacturers and distributors are formed in order to gain competitive advantage by selling the product more effectively and efficiently. In the retailing sector, a paradigm shift from the manipulate of customers through the traditional 4p's of marketing—product, price, promotion and place—to a co-operative relationships, i.e. moving from a short transaction-oriented goal to a long-term strategic alliance relationship-building goal.

There is neither theoretical nor empirical evidence indicating the formation of strategic alliances between contractors and subcontractors in the building construction industry and hence the research into this subject is the first of this kind.

8.2.2 Strategic Alliance Attributes

A number of researchers have provided theoretical dimensional concepts for the discussion of strategic alliances. Dev and Klein (1993) viewed strategic alliances to long term personal relationships such as marriage; and Lederer and Jackson (1968) indicated the characteristics of a satisfactory marriage. Researchers (Gummesson, 1994; Wilson and Jantrania, 1994; Gronroos, 1994; Borys and Jemison, 1989) discussed the

key elements of relationship marketing. Stuart (1993) and Dyer and Ouchi (1993) identified the key characteristics of the buyer-supplier relationship in the automobile manufacturing industry. These compared with the key behavioural characteristics (Spekman and Sawhney, 1990; Mohr and Spekman, 1994) in measuring a successful partnership manufacturers and distributors in computer industry. Charles Cowan (1992) identified the key elements of partnering in the construction industry.

These researchers provided a diverse range of dimensions for measurement of strategic alliance characteristics. The six most discussed dimensions—trust, commitment, interdependence, communication, co-operation and joint problem solving—were selected and formed the framework to structure data collection regarding strategic alliances in the building construction industry.

8.2.3 Measure for Strategic Alliance Attributes

The measure of the variables in the theoretical framework is an integral part of research. Unless the variables are measured in some scientific way, one will not be able to achieve an answer to research issues (Sekaran, 1992). In order to tap the subjective perceptions of individual managers, it is necessary to reduce the concept of strategic alliance to six dimensions and to categorise these dimensions into measurable elements.

A set of 22 specific elements for measuring strategic alliance based on the six dimensions developed in this research represents a synthesis and extension of current knowledge of strategic alliance relationships. The six dimensional measures of strategic alliance each consisted between three to five elements. The dimension of trust, interdependence and joint problem solving has three elements each, communication and co-operation each has four elements, and commitment has five elements. A simple quantitative scale was used, whereby respondents were requested to indicate their attitudes towards these 22 elements on a Likert scale (i.e. ranging from 1- strongly disagree to 5 - strongly agree). Breaking the concept of strategic alliances into six dimensions and then into 22 elements enables other researchers to achieve similar results using the same type of field data.

A factor analysis of the 22 elements generated seven new empirical factors namely: joint information sharing, no conflicting goals, teamwork, business growth, mutual reliance, reliable and resource sharing. A test of interitem consistency reliability revealed that four of seven factors were above acceptable Cronbach's Alpha of 0.7, except factors 'mutual reliance' and 'reliable' were below 0.70. Cronbach's Alpha could not be applied to a single item factor 'resource sharing'.

The new strategic alliance factors generated through factor and item analysis demonstrated that the 22 original elements in the questionnaire could vary with context and intent. Continuous modifications to the questionnaire might eventually perfect such a measure. This research successfully provides a theoretically based and empirically tested framework for the concept of strategic alliance and a series of elements to measure strategic alliance relationships between contractors and subcontractors in the building construction industry. Therefore, this research has provided a positive answer to the first principal research question, "*How can strategic alliances be measured?*"

8.2.4 Measure for Competitive Advantage Indicators

Porter (1980) develops a competitive structure which is based on the position that business rests on satisfying customer needs. He also outlines three potentially successful generic strategic approaches: 1) overall cost leadership, 2) differentiation and 3) focus. Langford and Male (1991) argue that since the 'focus' strategy can also employ cost leadership or differentiation, there are, in practice, only two major generic strategies—cost or differentiation—in construction.

Building construction contracting is regarded as a very competitive and high-risk business. This competitiveness is largely due to cost traditionally being the prime factor in the tender selection process (although, it is the Queensland Government's intention to eliminate perceptions that price is the single relevant criteria in tendering for public sector projects). Hence, apart from concentrating on lowering the cost, there is an increasing need for contractors to formulate other fundamental policies for achieving competitive advantage (Hasegawa, 1989). "*Even a single action can create a*

significant competitive advantage for contractors” (Construction Industry Institute US, 1992, pv).

The background literature indicated that the formation of strategic alliances became a business strategy in gaining competitive advantage. In construction industry, it is suggested that better and closer business relationships between contractors and subcontractors would produce better client satisfaction through improvement of on-site construction processes due to fewer complaints of subcontractors’ works by clients and also fewer disputes to subcontractors by the client (Queensland Government, 1992).

Two broad measures—one related to business performance and the other to on-site construction process—were selected. The rate of tender success and business turnover are key measures of business performance. Planning work, co-ordination of subcontractors, standard of workmanship and quality of subcontractors are assessment measures used by the Queensland Government Department of Public Works and Housing in the post-contract evaluation of contractor’s on-site performance.

Factor and item analysis were carried out for the six original competitive advantage elements. The two new factors generated matched the two original indicators, i.e. business performance and on-site construction process. These two new indicators also matched the original postulated groupings with Cronbach’s Alpha above 0.7.

8.2.5 Correlations between Strategic Alliances and Competitive Advantage

The two generic strategies to be competitive in construction are cost and differentiation. In order to achieve differentiation in the building construction industry, a number of researchers identify different competitive strategies, such as strategic management, bidding strategy, technological and organisational innovation, strategic planning and technology strategy.

There is little theoretical or empirical evidence linking strategic alliance relationships (i.e. between contractors and subcontractors) and competitive advantage in the building

construction industry. This research is a new effort to link and measure the relationships between strategic alliances and competitive advantage.

8.2.6 Validity and Reliability of Measures

Validity

The measures developed specifically for this study and used in measuring strategic alliance relationships and competitive advantage had never been tested. Therefore, it was necessary to subject the structure of groupings of the elements to a test in factorial validity. To test validity, factor analyses were carried out for both the 22 elements of the original six strategic alliance dimensions and the 6 indicators of the original two competitive advantage dimensions. In this factor analysis, a principal component extraction followed by a quartimax rotation with eigen values greater than unity was used.

The result of factor analyses suggests the *a priori* grouping of competitive advantage indicators but a different set of factor grouping was generated for strategic alliance elements. Seven new empirical factors were generated. Visual inspection also indicates from the pattern of the seven new factors that there is evidence in partial support of the original developed structure of the measure for the concept of strategic alliances.

Reliability

The result indicates that the Cronbach's Alpha for the seven new factors of strategic alliances (independent variable) were found to range from 0.40 to 0.92. Cronbach's Alpha for 'Mutual Reliance' was found to be 0.4, 'Reliable' had a 0.63, 'Business Growth', 'Teamwork' and 'No Conflicting Goals' were found to range from 0.74 to 0.76. 'Joint Information Sharing' had a 0.92. Cronbach's Alpha could not be applied to a single item factor namely 'Resource Sharing'. According to Sekaran (1992), reliability less than 0.60 are generally considered to be poor, those in the 0.7 range, to be acceptable, those over 0.80 to be good, and the closer the reliability coefficient gets

to 1.0 the better. Therefore, elements of factors—‘Mutual Reliance’ and ‘Reliable’—need to be modified to an acceptable range of 0.7.

The result also indicates the Cronbach’s Alpha for the two new factors of competitive advantages (dependent variable). While ‘Business Performance’ had a reliability coefficient of 0.92, ‘On-site Construction Process’ had a 0.79. These two new factors were found to be matching the original two dimensions of competitive advantages.

8.3 Contributions to Knowledge

Despite a number of studies having addressed the concept of strategic alliance in other industries, the significant contributions from this research are based on two facts: 1) there is lack of theoretical and empirical evidence to address the operationalising the concept of strategic alliances in the building construction industry, and 2) this research into the relationships between strategic alliance and competitive advantage of building contracting firms is new.

This investigation, therefore, offers significant contributions within the academic community:

- a theoretically based and empirically tested framework and method for measuring strategic alliances;
- an increased understanding of how strategic alliances related to the limitation of competitive advantages in gaining the public sector building works.

The measures for strategic alliance developed in this research represent a distillation of current knowledge of strategic alliances and a synthesis of this knowledge into a higher level of conceptual structure. It is the first effort to operationalise the concept of strategic alliance and to examine the relationships between strategic alliances and competitive advantage. Furthermore, the measures developed and tested in this research provide not only a structured framework to assist researchers in modifying such measures for future investigation in this area but also a response to the first principal research question *“How can strategic alliances be measured?”*

This research also provides some valuable early evidence to answer the second principal research question “*Do strategic alliances matter in gaining competitive advantage?*” The implication from this investigation is that strategic alliance relationships may contribute in providing competitive advantage in terms of the differentiation strategy, but not low cost approach of the generic competitive strategies.

8.4 Contributions and Implications to Industry Practice

The background literature revealed that the formation of strategic alliances to work together with common goals and objectives seemingly been worked successfully in industries such as automobile, computers, electronics and telecommunications. The literature also highlighted that in those industries large benefits and competitive advantages were gained from forming strategic alliance relationships. This section discusses the implications of strategic alliances concept to building construction industry, public sector analysts and managers, and private sector industry professionals.

8.4.1 Building Construction Industry Reform

Building construction contracting is challenged not only by the adversarial relationships between parties but also by fierce competition within the construction environment. The building construction industry has created itself as extremely poor public image. Apart from the adversarial relationships, other perceptions include poor quality outcomes with little commitment to continuous improvement and an insufficient level of investment for business improvement and long-term business planning.

The concept of strategic alliance emphasises a change in the construction industry not only to a more co-operative approach to build mutual trust, respect and good faith but also from a confrontationist and adversarial attitude to a harmonious relationship. Strategic alliance relationship requires a completely new culture to that which has existed in the past. To do this, one needs to select those firms (contracting firms) which are most sympathetic to the new culture of those (subcontracting firms) with whom they are working within the alliance and then rationalise their structures and objectives to the benefit of the industry. In order to succeed in the reform, the building

construction industry need to invest the time and resource in developing this new culture and to ensure it works.

8.4.2 Public Sector Policy Analysts and Managers

The Queensland Government has already introduced a system of pre-qualification criteria for contractors. One of the objectives of the pre-qualification criteria is to eliminate perceptions that price is the single relevant criteria in tendering for government works. In the survey, 50 of the 51 responded companies had indicated that they had complied with pre-qualification criteria when tendering public works over the last three years. Only 29 companies indicated that they had complied in nominating subcontractors in their tender as one of the pre-qualification criteria. The implication of this is that public sector managers need to be aware of the potential role of strategic alliance relationships between contractors and subcontractors in enhancing the success of industry reform. The public sector managers also need to indicate to potential contractors in the tendering process, which lowest price is not the only criterion in winning public sector works but other criteria including the formation of strategic alliances should also form part of the selection process.

“The challenge is for local construction industry service providers to jointly show they are genuinely competitive, that they can produce client-driven, high quality, value-for-money outcomes and show appropriate return on funds as well as the ability to sustain long-term relationships” (New South Government, 1997, p15). If this is the future challenge of the building construction industry, strategic alliances appear to matter in promoting competitive advantage for public sector works. However, the low cost competitive strategy has a controlling influence in the economical environment of the building construction industry. There are always investors looking for short-term gain rather than long-term benefit. Hence, the concept of forming strategic alliance relationships between contractors and subcontractors like the process re-engineering which would require the governments using their purchasing power to effect change in order to provide long-term benefit if implemented (Ireland, 1994 and 1997).

8.4.3 Private Sector Industry Professionals

Contractual and business relationships between contracting and subcontracting firms are formed in three ways: as a product of open competitive tendering, or selective tendering, or by negotiation with preferred subcontractors. Contractors' procurement policy for subcontractors has been in most instances to ensure the lowest price in each subcontract. This leads to a price-oriented way of doing business.

The results of this research of the 13 'HAVE' Companies draw the attention to strategic alliances between contractors and subcontractors by highlighting the limited positive relationships with competitive advantage in gaining public sector works. However, with the Queensland Government's intention to eliminate perceptions that price is the single relevant criteria in tendering for government works, this should increase industry professionals' motivation to pursue a more positive approach to formation of strategic alliances for competitive advantage. Industry professionals accustomed to intense price competition can start to consider in changing the low cost competitive strategy to the differentiation strategy, i.e. formation of strategic alliances.

8.5 Recommendations for Further Research

This research has opened up exciting areas for further work. This section indicates some of the areas for future research:

Measure for Strategic Alliance Attributes

Although this research provides a theoretically based and empirically tested measure for the concept of strategic alliance, the measures developed specifically for this study has never been tested. The result indicated in the factor and item analysis suggests that modifications and refinements are required to the original 22 elements of strategic alliances in order to provide a set of improved measures.

Broader Population Sample

The small sample of 13 'HAVE' Companies restricts the strength of arguments that formations of strategic alliances promote competitive advantage in the public sector works. This study leaves an opportunity for further research on a broader population.

Managing and Implementing Strategic Alliance Relationships between Contracting and Subcontracting Firms

The managerial implications to be drawn from this research relate to the manner in which contracting and subcontracting firms attempt to manage the future scope and tone of their relationship. Trust, commitment, communication quality, joint planning, and joint problem resolution all serve to better align partners' expectations, goals, and objectives. These factors all contribute to success of the strategic alliance relationships. The challenge, however, lies in developing a management philosophy or corporate culture. A firm's future success is dependent on not only how well it improves its internal efficiency but also how effective it manages its external relationships (Tendrum, 1995). Effort must be dedicated to the formation and implementation of management strategies that promote and encourage the continued growth and maintenance of the relationship. Such management strategies require further investigation.

Subcontractors' Perceptions Regarding the Concept of Strategic Alliances as Competitive Advantage

This study focuses strategic alliance relationships between contracting and subcontracting firms and investigates the contractors' perceptions of the relationship with subcontractors. Data were collected on contractors' perspectives. An extension to this research is an investigation on the subcontractors' perspectives.

Formation of Strategic Alliance Relationships in Gaining Private Sector Works

This research concentrates on the formation of strategic alliance relationships in gaining competitive advantage in public sector works. It is an opportunity to investigate and

compare the outcome of future research in private sector of the building construction industry.

8.6 Closure

This research set out to answer two guiding questions: 1) *How can strategic alliances be measured?* and 2) *Do strategic alliances matter in gaining competitive advantage?*

In answering these questions, this research developed a validated measurement framework for both the elements of strategic alliance and of performance measures relating to business performance and on-site construction processes.

This research made contributions to both the academic community and building construction industry. In the academic community, it has contributed by developing a theoretical framework to operationalise the concept of strategic alliances and by examining the association between strategic alliances and competitive advantage. In the building industry, its major contribution is by increasing understanding the potential in gaining competitive advantage, in terms of the differentiation strategy but not a low cost approach in public sector works.

The findings of this research also indicate the key factors, other than ‘non-competitive pricing’, leading to the failure and abandonment of strategic alliance relationships between contractors and subcontractors.

This research concludes with a discussion on contributions and implications to building construction industry reform, formation of strategic alliance relationships between contracting and subcontracting firms as one of the tender evaluating criteria for public sector works. Finally, this study also provides opportunities for future research.

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APPENDIX A: RESEARCH AND RESEARCH METHODS

Research Process

Research is a systematic inquiry aimed at providing information to solve problems (Emory and Cooper, 1991, p14). This research follows the scientific method as described by Sekaran (1992, p4);, the entire process in solving problems consisting of three fundamental steps

- *to identify clearly and specifically the problems that need to be studied and rectified;*
- *to gather information, analyse data, and delineate factors associated with the problem;* and
- *to take corrective action in solving the problem.*

A good research method was identified and used to satisfy the six criteria as described by Emory and Cooper (1991, p15):

- *the purpose of the research, or the problem involved, should be clearly defined;*
- *the research procedures used should be defensible and replicable;*
- *the research procedural design should be carefully planned to yield results that are as objective as possible;*
- *the researcher should report, with complete frankness, flaws in procedural design and estimate their effect upon the findings;*
- *analysis of the data should reveal its significance, and the methods of analysis used should be appropriate;*
- *conclusions drawn should be limited to those clearly justified by the findings.*

Formulating the Problem

At the very heart of every research project is the problem which requires explanation. Problems are the catalysts of research. The situation is quite simple: no problem, no

research. According to Sekaran (1992, p43), *a problem is any situation where a gap exists between the actual and the desired ideal state.*

Buckley et al (1975) listed five attributes were considered in characterising a research:

1. defined properly, labelled and described accurately;
2. posed in solvable terms;
3. connected logically to the environment from which it is drawn and the solution can be applied within that environment;
4. screened against an existing body of knowledge to assure its uniqueness, i.e. it has not been solved previously; and
5. made potential contribution to the body of knowledge, i.e. the problem must be significant.

Academic Research versus Professional Research

Mauch and Birch (1989) point out that research may be categorised into two distinct disciplines—academic and professional. The person trained in an academic discipline is master of a large and involved, but unified body of knowledge and is primarily interested in adding to that body of content. On the other hand, the person trained in a professional discipline is master of diversified information and concepts which focus on the efficient and effective conduct of some operation. The authors illustrate the two disciplines by the following examples: in the *Academic Disciplines*: Art, Chemistry, Economics, English, Geology, History, Linguistics, Mathematics, Music, Philosophy, Physics and Psychology; in the *Professional Disciplines*: Accounting, Architecture, Clergy, Education, Engineering, Journalism, Law, Library Science, Medicine, Pharmacy, Social Work and Theatre Arts.

Mauch and Birch (1989) further describe some of the distinctions between research in Academic and Professional Disciplines. These are illustrated in Table 1.

Table 1 Distinctions between Academic and Professional Research

Academic Discipline	Professional Discipline
The chief purpose is to increase knowledge in a particular disciplinary field.	The chief purpose is twofold: to increase knowledge about a matter relevant to the practice of the profession and to reinforce the attitude of using objective systematic approaches to problem solving.
The topics studied are clearly linked to other problems previously studied within the prescribed and academically recognised bounds of the discipline.	The problems studied may range anywhere in the realm of human concerns so long as they also have demonstrated implications for society's professional enterprises.
The worth of a thesis or dissertation is assessed chiefly on the basis of the amount it advances knowledge, clarifies or adds to a theory, or stimulates further investigation.	The worth of the thesis or dissertation is judged mainly by the potential applications of the results and conclusions in professional practice and knowledge.
Knowledge is accrued for its own sake.	Knowledge is accrued to validate or to bring into question aspects of professional practice, to create better practices, and generally, to foster and guide the improvement of the profession and its services.
Matters of value are deliberately eschewed, except as primary data. The objectivity of the academic scholar is most closely tied to dealing with concepts, ideas, animate or inanimate objects, materials, documents, and events.	Both matters of substance and of value can be legitimate and necessary topics of inquiry; sometimes values are the essential data subjected to study.
Each academic discipline has certain especially respected methods, legitimised by the power they have shown in helping uncover or prove matters of importance to the discipline.	Methods of investigation used are invented or adapted to suit the problems which need to be probed. Investigators freely borrow procedures from the academic disciplines or from other professional disciplines if they seem to have promise.

Source: Mauch and Birch (1989, pp8&9)

This research leans more towards the Professional Research end of the spectrum, whilst incorporating substantial elements of the Academic character.

Applied Research and Basic Research

Sekaran (1992) points out research can be undertaken for two different purposes: solving a currently existing problem and adding or contributing to the general body of knowledge. Applied research is conducted with the intention of applying the results of its findings to solving specific problems. Basic or fundamental research is carried out chiefly to improve our understanding of certain problems and how to solve them. It is also known as pure research. Phillips and Pugh (1994) imply pure research supplies the theories and applied research uses and tests them in the real world.

The main distinction between applied and basic business research is that the former concentrates on solving a current problem, whereas the latter has a more general objective of generating knowledge and understanding old phenomena and problems that occur in various organisational settings. Sekaran (1992) explains that despite this distinction, both types of research follow the same steps of systematic inquiry to arrive at solutions to problems. Hence, the main purpose of conducting basic research is to generate more knowledge and understanding of the phenomena that occur and to build theories based on the research results. Such theories subsequently become the foundation for further study of the phenomena. This process of building on existing knowledge is the genesis for theory building in the management area.

Scientific Investigation

Scientific investigation is not based on hunches, experience, and intuition alone, but is purposive and rigorous. *Scientific research focuses on the goal of problem solving and pursues a step-by-step logical, organised, and rigorous method to identify problems, gather data, analyse the data, and draw valid conclusions therefrom* (Sekaran, 1992, p9). Scientific research procedure applies to both basic and applied research.

Sekaran (1992) summarises the main distinguishing characteristics of scientific research: purposiveness, rigor, testability, replicability, precision and confidence, objectivity, generalisability and parsimony succinctly. These characteristics are described in Table 2 below.

Table 2 Main Distinguishing Characteristics of Scientific Research

Purposiveness	The research consists of a definite aim or purpose for the research, thus has a purposive focus.
Rigor	A good theoretical base and a sound methodological design would add rigor to a purposive study. These factors enable the researcher to collect the right kinds of information from an appropriate sample with the minimum amount of bias, and they facilitate appropriate data analysis once the data have been gathered.
Testability	Scientific research lends itself to testing logically developed hypotheses to see whether or not the data support the educated conjectures or hypotheses that are developed after a careful study of the problem situation. The test would indicate whether the hypothesis is substantiated or not.
Replicability	The results of the tests of hypotheses should be supported again and again when the research is repeated in other similar circumstances. The results are replicated or repeated.
Precision and Confidence	Precision refers to how close the findings, based on a sample, are to “reality.” Confidence refers to the probability that the estimations are correct. In social science research, a 95 percent confidence level, which implies that there is only a 5 percent probability that the findings may not be correct, is conventionally accepted and is usually referred to as a significance level of 0.05 ($p \leq .05$).
Objectivity	The conclusions drawn through the interpretation of the results should be based on the facts resulting from the actual data and not on subjective or emotional values.
Generalisability	Generalisability refers to the scope of applicability of the research findings in one organisational setting to other settings. The more generalisable the research, the greater its usefulness and value.
Parsimony	Simplicity in explaining the phenomena or problems that occur, and in the application of solutions to problems, is always preferred to complex research frameworks that consider an unmanageable number of factors.

Source: Sekaran (1992, pp11-14)

Types of Research

In reviewing literature relating to research methods, there is a wide variety of forms of scientific investigation. Phillips and Pugh (1994) describe three basic types of research—first, exploratory research, which is involved in tackling a new problem,

issue or topic; second, testing-out research, which pursues the limits of previously proposed generalisations; and third, problem-solving, in which a problem from practice is identified and all intellectual resources are brought to bear upon the solution.

According to Mauch and Birch (1989), there are fourteen common types of research; and each is a valuable method when linked to appropriate problems, as shown in Table 3.

Table 3 Fourteen Types of Research

Types	Descriptions
Analytical	Classes of data are collected and studies are conducted to discern and explicate principles which might guide action.
Comparative	Two or more existing situations are studied in order to determine and explicate their likenesses and differences.
Correlational-predictive	Statistically significant correlation coefficients between and among relevant phenomena are sought and interpreted; this type includes the determination of the extent to which variations in one or more factors correspond with variations in one or more other factors and the use of such findings in making predictions.
Design and demonstration	New operationally related business systems, personnel training curricula, professional education programs, instructional materials, disease control plans, and the like are constructed and described; this type is often called action research and includes, at least, formative evaluation.
Developmental	The changes over time in one or more observable factors, patterns, or sequences of growth or decline may be traced or charted and reported.
Experimental	One or more variables may be deliberately manipulated and the results analysed and rationalised—"true" experiments requiring tight controls and subject randomisation.
Historical	Individuals or activities are studied to reconstruct the past accurately and without bias in order to ascertain, document, and interpret their influences or to check the tenability of a hypothesis.
Opinion polling	The behaviours, beliefs, or intentions of specified groups are determined, reported, and interpreted.
Status	A representative or selected sample of one or more phenomena may be isolated and examined in order to ascertain the characteristics of the object(s) of study.
Theoretical	Inclusive and parsimonious explanatory principles for phenomena or data are developed, proposed, and described.
Trend analysis	Phenomena that are or have been in the process of change are examined in order to identify and report the directions of trends and to make interpretations and forecasts.

Case Study	The background, development, current conditions, and environment interactions of one or more individuals, groups, communities, businesses, or institutions are observed, recorded, and analysed for stages or patterns in relation to internal and external influences.
Quasi-experimental	Experimental rigor so far as manipulation, control, or randomisation is not feasible but the comparison of treatment versus nontreatment conditions is approximated and the compromises and limitations are stated, understood, and taken into account in all conclusions and interpretations.
Evaluation	A program or a project is expected to be carried out in a certain way and is expected to produce a certain result; research is intended to determine whether the anticipated procedure and the outcome are realised. Evaluation research that focuses on the procedure is called formative and that which attends particularly to the outcome is called summative.

Source: Mauch and Birch (1989, pp79-82)

In reference to research by objective, Dane (1990, p18) identifies five different ways to ask the same question: exploration, description, prediction, explanation, and action:

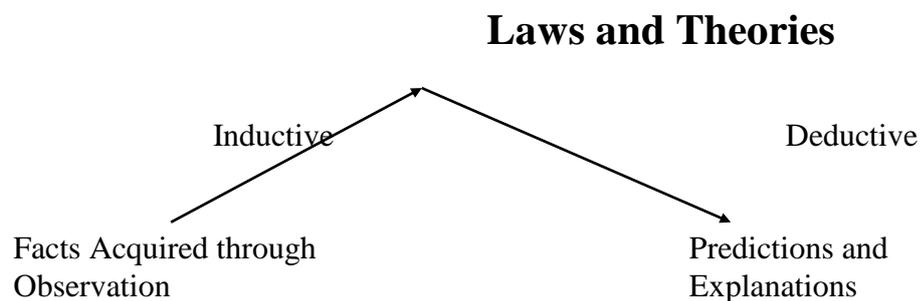
1. *exploration involves attempting to determine whether or not a particular phenomenon exists;*
2. *description involves attempting to more carefully define a phenomenon;*
3. *prediction involves examining the relationship between two things so that educated guesses can be made about one by knowing something about the other;*
4. *explanation also involves examining the relationship between two things, but it specifically attempts to determine whether or not one causes the other; and*
5. *action involves using research to attempt to solve a social problem.*

Easterby-Smith et al (1991, p31) point out that *increasingly authors and researchers argue that one should attempt to mix methods to some extent, because it provides more perspectives on the phenomena being studied.* Due to time and other resource constraints, for this thesis, a basic and predictive research—correlational-predictive—has been adopted and used as the major methodology which suits the research problem and associated research gaps uncovered in Chapter 1. Other methodology—exploratory—has also been used in a secondary role to help formulate research issues.

Inductive and Deductive Modes

According to Sekaran (1992, p15), *the research method of starting with a theoretical framework, formulating hypotheses, and logically deduction from the results of the study is known as the hypothetical-deductive method* (which is discussed more fully in section 3.3), *while the inductive method proceeds in the opposite direction as the researcher begins with data in hand and generates hypotheses and a theory from the ground up*. Chalmers (1982) illustrates in a simple diagram the inductive and deductive approaches in the Figure 1:

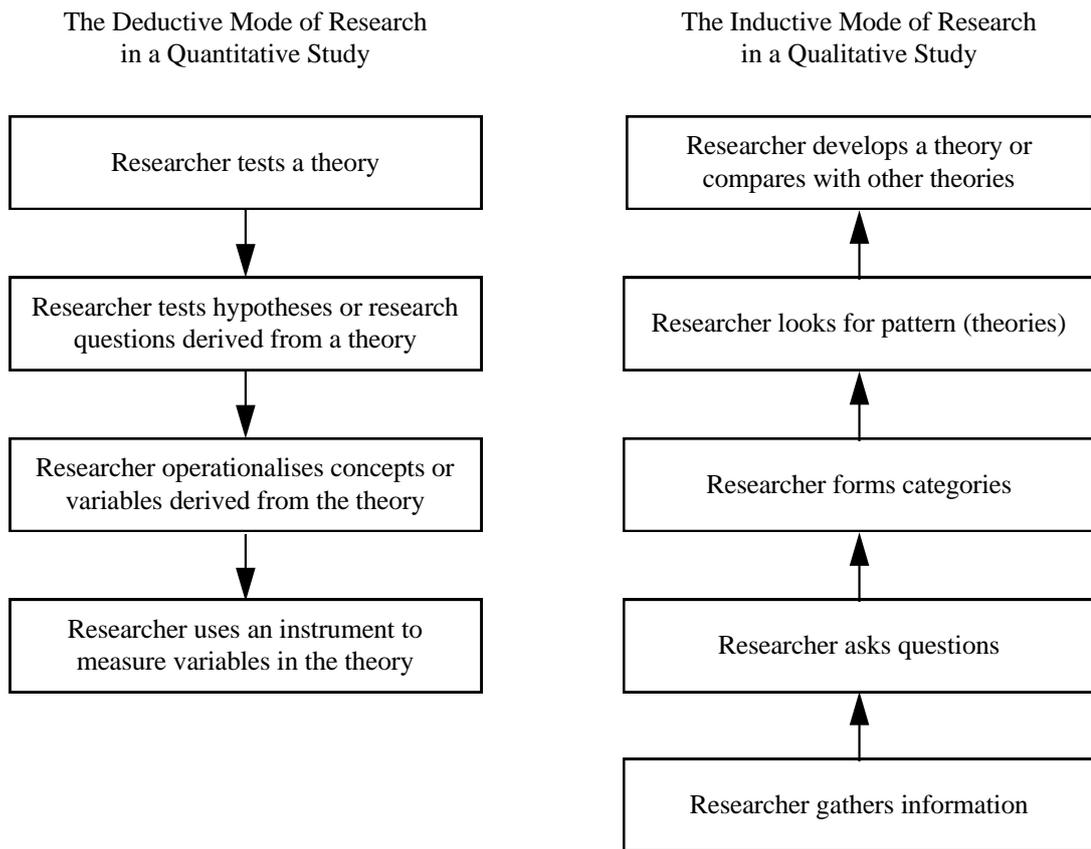
Figure 1 Inductive and Deductive Approaches



Source: Chalmers (1982, p6)

The deductive and inductive modes as described by Creswell (1994) are summarised in Figure 2.

Figure 2 Deductive Mode—Quantitative and Inductive Mode—Qualitative Approaches



Source: Creswell, J W (1994, pp88&96)

Creswell (1994) further explains that in quantitative studies one uses theory deductively and places it toward the beginning of the plan for a study and the objective of a quantitative research is to test or verify a theory, rather than to develop it. On the other hand, in a qualitative study, one does not begin with a theory to test or verify. Instead, consistent with the inductive model of thinking, a theory may emerge during the data collection and analysis phase of the research or be used relatively late in the research process as a basis for comparison with other theories.

Qualitative and Quantitative Research

Research may be categorised into two distinct types: qualitative and quantitative. Krueger (1988) points out that qualitative research concentrates on words and observations to express reality. On the other hand, the quantitative approach grows

out of a strong academic tradition that places considerable trust in numbers that represent opinions or concepts. Creswell (1994, p4) indicates that *quantitative is the traditional, the positivist, the experimental, or the empiricist paradigm and the qualitative paradigm is termed the constructivist approach or naturalistic.*

Qualitative methods are appropriate for in-depth examination of fewer cases because they aid the identification of key features of cases whereas quantitative methods are appropriate for the study of the breadth of relationships among variables because these methods can be used to assess the correlation between two or more features across many cases (Ragin, 1994). *One strength of qualitative research is that the qualitative data are typically welcomed by decision makers because the results are presented in a concrete and understandable manner* (Krueger 1988, p39). On the other hand, a strength of quantitative research, as argued by Ragin (1994, p145), is that *quantitative methods focus directly on the relationships among variables, especially the effects of causal or independent variables on outcome or dependent variables. The strength of the correlation between the independent and the dependent variable provides evidence in favour of or against the idea that two variables are causally connected or linked in some other way.*

The strengths and weaknesses of the positivist (quantitative) paradigm and phenomenological (qualitative) paradigms are summarised in Table 4.

Table 4 Comparison of Strengths and Weaknesses—Positivist (Quantitative) and Phenomenological (Qualitative) Paradigm

	Strengths	Weaknesses
Positivist (Quantitative) paradigm	They can provide wide coverage of the range of situations.	The methods used tend to be rather inflexible and artificial.
	They can be fast and economical.	They are not very effective in understanding processes or the significance that people attach to actions.
	Where statistics are aggregated from large samples, they may be of considerable relevance to policy decisions.	They are not very helpful in generating theories.

		Because they focus on what is, or what has been recently, they make it hard for policy-makers to infer what changes and actions should take place in the future.
Phenomenological (Qualitative) paradigm	Data gathering methods seen as more natural rather than artificial.	Data collection can be tedious and require more resources.
	Ability to look at change processes over time.	Analysis and interpretation of data may be more difficult.
	Ability to understand people's meaning.	Harder to control the pace, progress and end-points of research process.
	Ability to adjust to new issues and ideas as they emerge.	Policy-makers may give low credibility to results from qualitative approach.
	Contribute to theory generation	

Source: Easterby et al (1991)

Research scientists and scholars have been engaged in a long-standing debate on how best to conduct research. There has been much discussion about which of these two ways of doing research is the best, measuring and testing—quantitative, or observing/listening and interpreting—qualitative. This debate has centred on the relative value of two fundamentally different and competing schools of thought: (1) Logical-positivism, which uses quantitative and experimental methods to test hypothetical-deductive generalisations, versus (2) phenomenological inquiry, using qualitative and naturalistic approaches to inductively and holistically understand human experience in context-specific settings (Patton, 1990). Ragin (1994) suggests qualitative methods are appropriate to study commonalties whereas quantitative methods are suitable to study relationships among variables.

This study is in breadth (quantitatively) rather than in depth (qualitatively) and *focuses directly on the relationships among variables* (Ragin, 1994, p145). The investigation is to be carried out by means of questionnaire survey.

APPENDIX B: SEMI-STRUCTURED INTERVIEW SCHEDULE

Company:

Interviewee:

Position:

Qualification(s):

Work Experience in your Company: Years

Work Experience in the same Industry: years

Date: Time:

1. Company Profile

Q1.1 Date the Company was founded/established in Queensland?

Q1.2 What (approximately) was your company turnover last year?

Q1.3 Organisation chart -- Head Office & Site?

Q1.4 What proportion of building work does your company engage in:

- CBD Commercial
- Government Public Buildings
- Industrial
- High Density Residential
- Community Services Buildings e.g. Hospitals
- Retail Shopping Centres
- Recreational
- Others

Q1.5 What proportion (approximately) of your Company's works is procured by each of the following methods?

- Competitive Tendering i.e. Traditional Lump Sum Contract
- Project Management
- Construction Management for a Fee
- Design and Construct
- Cost Plus Contract
- Turnkey

Q1.6 How would you rank your preference for type of procurement?

2. Competitive Positioning

There are two basic form of competitive advantages:

- **Overall Cost Leadership - Low Cost Position**
- **Differentiation - Uniqueness Perceived by the Customer.**

Q2.1 In your opinion, which form does your Company fall into?

Q2.2 Why? Explain!

Q2.3 What overall business strategy is your Company following?

Q2.4 Which companies are your Company's main competitors? Why?

Q2.5 What distinguishes your Company from the competitors?

The formation of strategic alliances between firms is becoming an increasingly common way for firms to find and maintain competitive advantage and many see the growth of alliances as a key to sustained competitive advantage industry.

Q2.6 Do you understand the concept of strategic alliances? Y/N Don't know!

Q2.7 Can you see the formation of strategic alliances between your Company and subcontractors will give your Company competitive advantage over its competitors? Y/N Don't know!

In theory there are two basic types of strategic alliances: ad hoc & formal arrangement.

Indicate whether or not your Company is currently involved in either type of strategic alliances with subcontractors:

Q2.8 Ad hoc arrangements on a project by project basis? Y/N Don't know!

Q2.9 Formal arrangements on a long-term basis with a clear and common objectives? Y/N Don't know!

With the formal arrangement indicate if your Company:

Q2.10 Has ever been involved? Y/N Don't know!

Q2.11 Is planning to be involved in the near future? Y/N Don't know!

Q2.12 Is interested but no immediate plans to be involved? Y/N Don't know!

Q2.13 Has considered being involved but rejected the concept? Y/N Don't know!

SUMMARY REVIEW CONNOLLY AND CONNOLLY CASE STUDY

It was agreed between myself and the interviewee in order to maintain the confidentiality of the interview, both the company and the interviewee names would be withheld.

The interviewee is a Senior Project Manager with Connolly and Connolly Pty Ltd. He has 15 years of experience in the building construction industry and he has been with the Company for 13 years.

Connolly and Connolly Pty Ltd is a subsidiary company and the construction arm of LL Corporation which is one of top 100 public companies in Australia. Connolly and Connolly's Queensland branch had a turnover of \$300m last year. The company have been carried mainly commercial, retail shopping centres, Government buildings and community services buildings. Recently, they have also carried out infrastructure projects such as airports, sewerage and water reticulation. 85% of their works are Project Management and Design & Construct type of contracts.

Total 85% to 95% of the on-site construction works are sublet to independent subcontractors. The company have not formed any alliance with their subcontractors, however, they have preferred subcontractors or sometime known as favour subcontractors to carry out the work.

The interviewee agreed with the concept in forming strategic alliances with subcontractors in providing better teamwork and improving on-site working relationships because the company would be dealing with same groups of subcontractors for a long term not on a project by project basis.

Since Connolly and Connolly seldom carried out work in the traditional lump sum contract, the interviewee could not comment whether the formation of strategic alliances with subcontractors would give the company the competitive advantage under client's point of view.

SUMMARY REVIEW FOSTER CONSTRUCTION CASE STUDY

It was agreed between myself and the interviewee in order to maintain the confidentiality of the interview, both the company and the interviewee names would be withheld.

The interviewee is a Senior Project Administrator with Foster Construction Ltd. He is a Quantity Surveyor by profession. He has 26 years of building industry experience and has been with the Company just over a year.

Foster Construction Ltd is an International Company. The Company established itself in Australia in the mid-1970 by taking over a national local company, Jackson Industry Ltd. Subsequent to the take-over, Foster Construction had branch offices in every capital cities in Australia. The Queensland branch had a turnover of \$200m in 1995.

The Company had been carried mainly on CBD commercial buildings, Government buildings, hospitals, regional shopping centres, hotels and industrial buildings. Approximately 40% of the Company's works is procured by competitive tendering; 30% on design and construct; with 15% project management and 15% on construction management. The Company prefers the 'design and construct' type of procurement and the least preference is 'competitive tendering'.

Foster Construction Ltd prides itself with a good reputation and excellent track records in the building construction industry. The Company's main objective is to become leader in the industry, based on its diversification and expertise on international joint venture projects. It distinguishes itself from industry competitors

in terms the size of the Company and the reputation to perform and produce quality product.

The interviewee understood the concept of forming strategic alliance relationships with subcontractors. He also indicated the merits in such relationships. However, he further indicated that Foster Construction had involved in neither ad hoc nor long-term strategic alliance relationships with subcontractors. The Company had no immediate future plan to instigate such relationships.

The interviewee was unsure whether formation of strategic alliances with subcontractors would give company the competitive advantage. In his opinion, such concept had not been implemented by any of the construction companies and it would be difficult to either pre-judge or pre-determine the success rate, by implementing the concept, in gaining competitive advantage in the marketing place.

APPENDIX C: COVERING LETTER AND QUESTIONNAIRE

16 October 1996

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«Address2»
«City» «State» «PostalCode»

Dear «Title» «LastName»

CONTRACTOR - SUBCONTRACTOR RELATIONSHIPS

In furthering its relationship with the local construction industry, a team from the School of Construction Management at Queensland University of Technology is investigating the use of strategic alliances in building construction (i.e. co-operative business relationship between Contractors and Subcontractors). The aim is to better understand the working relationships in the Queensland building construction industry and help improve its competitiveness. This study is supported by the Queensland Department of Public Works and Housing.

Please complete this attached questionnaire and return it by 1 November 1996 in the reply paid addressed envelope provided.

The questionnaire will take about 15 minutes to complete. Your co-operation is very much appreciated. Your completed questionnaire will remain confidential. No information identifying individuals and firms will be released. The questionnaire is coded only for data collating and monitoring responses.

For further information regarding this study, please contact Mr Tom Kwok on (07) 3864 1412. Should the results of this study be of interest to you, please complete the information sheet on the last page and study findings will be forwarded separately.

Thank you for your co-operation.

Yours sincerely

Tom Kwok
Researcher
School of Construction Management

Dr Keith Hampson
Director of Research
School of Construction Management

General Information

1. In tendering over the last three years, has your Company been required by clients to comply in any form to Pre-Qualification Criteria (including: Track record, Financial security, Technical capability, Occupational Health & Safety standards, Industrial Relations Record and Quality) for Contractors? (Please tick one box)
- | | | | |
|----|------------------------------------|--------------------------|--------------------------|
| No | | Yes | |
| | Don't know | | |
| | Contractors? (Please tick one box) | <input type="checkbox"/> | <input type="checkbox"/> |
-
2. Over the last three years, has your Company been required by clients to nominate Subcontractor(s) as one of the Pre-Qualification Criteria? (Please tick one box)
- | | | | |
|----|---|--------------------------|--------------------------|
| No | | Yes | |
| | Don't know | | |
| | Pre-Qualification Criteria? (Please tick one box) | <input type="checkbox"/> | <input type="checkbox"/> |
-
3. Approximately, what percentage by value of your Company's business has come from the Queensland Government over the last three years?
- | | | | |
|---|-------------------|---|--------------------------|
| % | | | |
| | Don't know | | |
| | last three years? | <input style="width: 50px;" type="text"/> | <input type="checkbox"/> |
-
4. What percentage of your Company's work was won by each of the following tendering processes over the last three years? (Please indicate either the % or Don't Know)
- | | | | |
|------|----------------------------------|--------------------------|---|
| | Open Competitive Tender | | <input style="width: 50px;" type="text"/> |
| | % | | |
| | Select Tender | | <input style="width: 50px;" type="text"/> |
| | % | | <input style="width: 50px;" type="text"/> |
| | Pre-registered and Select Tender | | |
| | % | | |
| | Direct Negotiation | | <input style="width: 50px;" type="text"/> |
| | % | | |
| | TOTAL | | 100 |
| % | | | |
| Know | | <input type="checkbox"/> | Don't |

5. Over the last ten years, does your Company have experience in constructing the following types of Public Sector Building?
(Please tick the appropriate box or boxes)

School Buildings	<input type="checkbox"/>
Technical and Further Education College Buildings	<input type="checkbox"/>
University Buildings	<input type="checkbox"/>
Community Buildings	<input type="checkbox"/>
Convention Centres	<input type="checkbox"/>
Archives Buildings	<input type="checkbox"/>
Hospitals	<input type="checkbox"/>
Prisons	<input type="checkbox"/>
Court Houses	<input type="checkbox"/>
Office Facilities - Low Rise	<input type="checkbox"/>
Office Facilities - High Rise	<input type="checkbox"/>

Contractor and Subcontractor Relationships

In the questions that follow, the term **strategic alliance** is described as a co-operative arrangement between two or more organisations that forms part of, is consistent with their overall strategy, and contributes to the achievement of their major goals and objectives. In the construction industry, alliances represent a significant departure from the traditional project by project contracting arrangements between contractor and its subcontractors, and are characterised by the involvement of long term relationship between the participants to achieve both individual and joint business goals.

6. How much do you believe your Company would benefit from the formation of strategic alliances with Subcontractors in terms of the following factors. (Please tick one box per row)

	No Benefit				Major Benefit
	1	2	3	4	
5					
Completion Time	<input type="checkbox"/>				
Quality of Product	<input type="checkbox"/>				
Long Term Profitability	<input type="checkbox"/>				
Site Productivity	<input type="checkbox"/>				
Co-operation	<input type="checkbox"/>				

Co-ordination	<input type="checkbox"/>				
Interorganisational Managerial Skills	<input type="checkbox"/>				
Decision Making Process	<input type="checkbox"/>				
Contractual Conflict & Litigation	<input type="checkbox"/>				
Resolution of Problems	<input type="checkbox"/>				
Innovation	<input type="checkbox"/>				
Access to Resources & Facilities	<input type="checkbox"/>				
Access to Technologies	<input type="checkbox"/>				
Other _____	<input type="checkbox"/>				

7. How serious are the following factors in hindering your Company from forming strategic alliances with Subcontractors? (Please tick one box per row)

Problem	No Problem				Major
	1	2	3	4	5
Disclosing Commercial Secrets	<input type="checkbox"/>				
Lack of Trust	<input type="checkbox"/>				
Incompatible Personal Chemistry	<input type="checkbox"/>				
Hidden Agendas of Other Party	<input type="checkbox"/>				
Conflicting Objectives	<input type="checkbox"/>				
Loss of Competitive Cost Advantage	<input type="checkbox"/>				
Loss of Control	<input type="checkbox"/>				
Other _____	<input type="checkbox"/>				

8. From your Company's perspective, is the formation of strategic alliances with Subcontractors becoming:

- (a) Tick one box
- More Strategically Important
 - No Change in Strategic Importance
 - Less Strategically Important
- (b) Tick one Box
- More Frequent
 - No Change in Frequency
 - Less Frequency

9. Please indicate the method your Company adopts in engaging the following Subcontractors: (Please tick one box per row)

only Engage a Adopt the open Select and invite Approach

- | | 1 | 2 | 3 | 4 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| • We help each other get out of difficult situations. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Our word is reliable and we fulfil our respective obligations. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We share commercial and technical information relating to projects without the need to protect ourselves. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • The co-operative business relationship has developed from the top management of both parties. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We see this co-operative business relationship as a long term commitment. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We share resources. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We are committed to actively building trust. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • There is no conflict between our individual goals and joint goals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We give each other work. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We have a mutual reliance on each other. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We treat each other equally as business partners. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We maintain openness in order to prevent hesitation, reservation or other defensive behaviour. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We communicate openly and with trust in mutually pursuing opportunities and solving problems and conflicts. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We communicate regularly to compare current performance against expectations. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We consult each other before making key decisions. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We cooperate out of mutual need and desire. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We cooperate to share risks. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Co-operation between us provides a foundation for business growth. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We believe that co-operation with each other will reduce the likelihood of opportunistic behaviour. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Problems and conflicts are accepted as a regular part of teamwork. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We feel free to admit and discuss difficulties even when they relate to uncomfortable issues. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • When problems occur, we concentrate on solving them rather than trying to blame the other. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

11. If your Company was to enter into strategic alliances with Subcontractors, to

what extent do you believe these relationships would affect your Company's future performance: (Tick one box per row)

		Increased		Decreased		
		2	3	4	5	1
Business Performance						
	Tender Success Rate			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Business Turnover			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Excellent		Poor		
		2	3	4	5	1
Site Construction Process						
	Planning Work			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Your Co-ordination of Subcontractors			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Standard of Workmanship			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Quality of Subcontractors			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Has your Company ever abandoned a strategic alliance relationship with Subcontractors? Yes

No Don't Know

(Please tick one box)

If yes, why? _____

13. If your Company has never formed any strategic alliance relationship with subcontractors, does your Company have any intention of forming such relationship? Yes

No Don't Know

(Please tick one box)

Please specify the reason(s) _____

If you would like us to send you a **summary of our findings**, please complete your name and address details. *This is completely optional.*

We reiterate that any information provided by you will be held in the strictest confidence.

Please forward the findings of this study to:

Name:

.....
.....

Company:

.....

Address:

.....

.....Postcode
.....

THANK YOU FOR YOUR COOPERATION

APPENDIX D: QUESTIONNAIRE CIRCULATION LIST

No	Name of Company	G M	CM	Est	PM 1	PM 2	PM 3	PM 4	PM 5
1	T.F. Woollam & Son Pty Ltd	*	*	*	*	*	*		
2	A.W.Edwards Pty Ltd	*	*	*	*	*	*	*	*
3	Adco Constructions Pty Ltd	*	*	*	*	*	*	*	
4	Alpha Constructions Pty Ltd	*		*	*				
5	Barclay Mowlem Construction	*		*	*	*	*	*	*
6	Boulderstone Hornibrook Pty Ltd	*	*	*	*	*	*	*	
7	Belich Constructions Pty Ltd	*							
8	Belmadar Constructions Pty Ltd				*	*			
9	Bli Bli Nominees	*	*	*	*	*	*	*	
10	Campac Building Systems	*							
11	Campak Construction Pty Ltd	*	*						
12	Col Palmer Constructions	*							
13	Concrete Constructions Group	*	*	*	*	*	*	*	*
14	Contrapac Pty Ltd	*		*	*	*			
15	Covecorp Constructions Pty Ltd	*	*	*	*	*			
16	D.G. Wilson Constructions	*	*	*	*	*			

17	Vos Constructions	*							
18	Evans Harch Pty Ltd	*	*	*	*	*	*	*	
19	Fletcher Construction Aust. Ltd	*		*	*	*	*	*	*
20	Forrester Parker Construction	*	*	*	*	*			
21	Graham Evans Pty Ltd	*	*	*					
22	Hanna & Edmed (Qld) Pty Ltd	*	*	*	*	*	*		
23	Hooker-Cockram Limited	*	*	*	*				
24	Hornick Constructions Pty Ltd	*	*	*	*	*	*		
25	J. Hutchinson Pty Ltd	*	*	*	*	*	*	*	
26	Cordukes Limited	*	*	*	*	*	*		
27	John Holland Construction	*	*	*	*	*	*		
28	John Denington Builder	*							
29	John Wolbers Constructions	*			*	*			
30	Petrie Builders	*							
31	Kinakon Pty Ltd	*	*	*	*	*	*		
32	Lanskey Constructions Pty Ltd	*	*		*	*	*	*	
33	Leighton Contractors Pty Ltd	*	*	*	*	*	*	*	
34	Mage Constructions Pty Ltd	*			*				
35	McMaster Queensland Pty Ltd	*	*	*	*	*	*	*	
36	Milson Projects Pty Ltd	*	*	*	*				
37	Multi Construction Services	*	*	*					
38	Multiplex Constructions Pty Ltd	*	*	*	*	*	*	*	
39	Stewart Constructions Pty	*	*	*	*	*			

	Ltd								
40	N.H. Dickinson Constructions	*	*	*					
41	Northbuild Construction Pty Ltd	*	*	*	*				
42	Northern Project Management	*	*						
43	Peter Fardoulis Constructions	*	*		*	*			
44	Sommer & Staff Constructions	*		*	*	*	*		
45	Statham (Qld) Pty Ltd	*	*	*	*	*			
46	Steve-Watt Constructions	*	*	*	*	*			
47	Shailer Constructions	*		*	*				
48	T.P. Turner Pty Ltd	*	*	*	*				
49	Thiess Contractors Pty Ltd	*	*	*	*	*			
50	Watpac Australia Pty Ltd	*	*	*	*	*	*	*	*
51	Watts & Hughes (Qld) Pty Ltd	*			*				
52	G & J Box Pty Ltd	*	*	*	*	*	*	*	
53	Construction Engineering (Aust)	*	*	*	*				
54	Iezzi Constructions Pty Ltd	*		*	*	*	*	*	
55	Waller Constructions Pty Ltd	*	*	*					
56	Civil & Civic Pty Ltd	*	*	*	*	*	*	*	*
57	Graystone Pty Ltd	*	*	*	*	*			
58	Paynter Dixon (Q) Pty Ltd	*	*	*	*	*	*	*	
59	Wiley & Co Pty Ltd	*	*	*					

Notes: * denoted questionnaire despatched to GM = General Manager, CM = Construction Manager, Est = Estimator and PM = On-site Project Manager.
Total 277 questionnaires were despatched.

APPENDIX E: 'BENEFIT' FACTORS

APPENDIX F: 'HINDERING' FACTORS

APPENDIX G: IMPORTANCE AND FREQUENCY

**APPENDIX H: SPEARMAN'S COEFFICIENTS – 13
'HAVE' COMPANIES**

**APPENDIX I: SPEARMAN'S COEFFICIENTS – WITH NEW
COMPETITIVE ADVANTAGE - FACTORS – 13 'HAVE' COMPANIES**

**APPENDIX J: SPEARMAN'S COEFFICIENTS –
WITH NEW COMPETITIVE ADVANTAGE -
FACTORS – 12 'HAD' COMPANIES**

APPENDIX K: FACTOR ANALYSIS – 13 ‘HAVE’ COMPANIES

**APPENDIX L: RELIABILITY ANALYSIS – 13 ‘HAVE’
COMPANIES**

**APPENDIX M: SPEARMAN'S COEFFICIENTS –
NEW STRATEGIC ALLIANCE FACTORS AND
NEW COMPETITIVE ADVANTAGE FACTORS –
13 'HAVE' COMPANIES**

BIBLIOGRAPHY

Administrative Services Department, (1994) *Building Relationships*, Queensland Government, Australia.

Administrative Services Department, (1994) *Building Division*, Queensland Government, Australia.

Adrian, J. J., (1987) *Construction Productivity Improvement*, Elsevier, New York.

AGB McNair, (1994) *Business Attitude Survey on Networking - A Research Report*, AGB McNair Pty Ltd, Brisbane, Australia..

Air Conditioning and Mechanical Contractors' Association of Australia Ltd., (1994) *Achieving Reform*, AMCA - Australia.

Albrecht, M, (1998) Opening Address, *Thiess Training Summit*, Gold Coast, Australia, 22-23 May.

Allen, J. and Atkin, B., (1995) "Concentrating on Value for Money" in *Chartered Surveyor Monthly*, Vol.5, Iss.1, September, pp. 26-27.

Alter, C. and Hage, J., (1993) *Organizations Working Together*, Sage Publications, Newbury Park, California.

Anderson, J. C. and Narus, J. A., (1991) "Partnering as a Focused Market Strategy" in *California Management Review*, Spring, pp. 95-113.

Andrews, K. R., (1993) "The Concept of Corporate Strategy" in *Australian Strategic Management: Concepts, Context and Cases*, eds., G. Lewis, A. Morkel and G. Hubbard, Prentice Hall of Australia Pty. Ltd., pp. 33-48.

Associated General Contractors of America, (1991) *Partnering: A Concept for Success*, The Associated General Contractors of America.

Australian Bureau of Statistics, (1997) *Australian National Accounts: National Income, Expenditure and Product*, Australian Government Publishing Service, Catalogue No. 5204.0.

Australian Bureau of Statistics, (1995) *Building Activity, Queensland, June Quarter 1995*, Commonwealth of Australia, Catalogue No. 8752.3.

Australian Bureau of Statistics, (1988 to 1997) *Queensland Year Book 1988 to 1997*, ABS Queensland Office.

Australian Federation of Construction Contractors, (1992) *The New Manager - from Control to Commitment*, Australian Federation of Construction Contractors, St Leonards, New South Wales.

Axelrod, R., (1984) *The Evolution of Cooperation*, Basic Books, New York.

Badaracco, J. L., (1991) *The Knowledge Link - How Firms Compete through Strategic Alliances*, Harvard Business School Press, Boston, Massachusetts.

Baden-Hellard, R., (1995) *Project Partnering - Principle and Practice*, Thomas Telford, London.

Badger, W. W. and Mulligan, D. E., (1995) "An Implement Model of An Alliance" in *Journal of Construction Procurement*, Vol. 1, No. 1, May, pp. 21-37.

Baker, S. T., (1990) "Partnering: Contracting for the Future" in *Cost Engineering*, Vol. 32, No. 4, April, pp. 7-12.

Baldry, D., (1996) "Client Benchmarking of Contractor Performance" in *The Organization and Management of Construction: Shaping Theory and Practice (Vol 2)*, eds., D. A. Langford and A. Retik, E&FN Spon, pp. 72-81.

Banks, P. F. and Baranson, J., (1993) "New Concepts Drive Transnational Strategic Alliances" in *Planning Review*, Vol.21, Iss.6, Nov./ Dec., pp. 28-31 & 54.

Barda, P., (1995) *In Principle*, Australian Government Publishing Service.

Beart, F., (1987) "Relationships with Suppliers" in *The Management of Manufacturing - the Competitive Edge*, eds., R. Toone and D. Jackson, IKS Ltd., UK, pp. 81-88.

Belohlav, J. A., (1990) *Championship Management - An Action Model for High Performance*, Productivity Press, Cambridge.

Bennett, J., (1993) "Japan's Building Industry: The New Model" in *Construction Management and Economics*, Vol.11, Iss.1, January, pp. 3-17.

Bennett, J. and Jayes, S., (1995) *Trusting the Team - The Best Practice Guide to Partnering in Construction*, Centre for Strategic Studies in Construction, University of Reading, UK.

Berdie, D. R., Anderson, J. F. and Niebuhr, M. A., (1986) *Questionnaires: Design and Use*, 2nd edn, Scarecrow Press, New York.

Berg, S.V., Duncan, J. and Friedman, P., (1982) *Joint Venture Strategies and Corporate Innovation*, Oelgeschlager, Cambridge, MA.

Bergman, T., (1993/94) "Job Performance Learning: A Comprehensive Approach to High-Performance Training Design" in *Employment Relations Today* pp. 399-409.

Betts, M. and Ofori, G., (1994) "Strategic Planning for Competitive Advantage in Construction: The Institutions", in *Construction Management and Economics*, Vol.12, Iss.3, May, pp. 203-217.

Betts, M. and Ofori, G., (1992) "Strategic Planning for Competitive Advantage in Construction" in *Construction Management and Economics*, Vol.10, Iss.6, November pp. 511-532.

Bleeke, J. and Ernst, D., (1991) "The Way to Win in Cross-border Alliances" in *Harvard Business Review*, November/December, pp. 127-135.

Blenkhorn, D. L. and MacKenzie, H. F., (1994) "The Importance of Buyer-Seller Relative Dependence in Relationship Marketing" in *1994 Research Conference Proceedings - Relationship Marketing: Theory, Methods and Applications*, eds., J.N. Sheth and A. Parvatiyar, June, pp. 1-10.

Borys, B. and Jemison, D. B., (1989) "Hybrid Arrangements as Strategic Alliances: Theoretical Issues in Organisational Combinations" in *Academy of Management Review*, Vol.14, No.2, pp. 234-249.

Boyatzis, R. E., (1982) *The Competent Manager - A Model for Effective Performance*, John Wiley & Sons, NY.

Bradford, H., (1993) "Partnership Approach Urged" in *ENR*, August, p. 14.

Brokaw, L., (1993) "Twenty-Eight Steps to a Strategic Alliance" in *INC.*, April, pp. 96-104.

Bruce, G. and Shermer, R., (1993) "Strategic Partnerships, Alliances used to Find Ways to Cut Costs" in *Oil & Gas Journal*, November, OGJSpecial, pp. 71,74&76.

Buckley, J. W., Buckley, M. H. and Ching, H. F., (1975) *Research Methodology and Business Decisions*, National Association of Accountants and The Society of Industrial Accountants of Canada, p. 28.

Buckley, P. J. and Casson, M., (1988) "A Theory of Cooperation in International Business" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P. Lorange, Lexington Books, New York, pp. 55-67.

Buckley, P. J. and Enderwick, P., (1989) "Manpower Management" in *The Management of Construction Firms*, eds., P.M. Hillebrandt and J. Cannon, Macmillan, London, pp. 108-127.

Bureau of Industry Economics, (1993) *R & D, Innovation and Competitiveness: An Evaluation of the Research and Development Tax Concession*, Research Report 50, Australian Government Publishing Service.

Bureau of Industry Economics, (1995) *Beyond the Firm - An Assessment of Business Linkages and Networks in Australia*, Research Report 67, Australian Government Publishing Service.

Burgelman, R. A., (1986) *Inside Corporate Innovation*, Free Press, New York.

Burgers, Willem P., Hill, Charles W. L. and Chan Kim, W. (1993) "A Theory of Global Strategic Alliances: The Case of The Global Auto Industry" in *Strategic Management Journal*, Vol.14, pp. 419-432.

Buttery, E. and Buttery, A., (1994) *Business Networks*, Longman Business & Professional, Melbourne, Australia.

Calomeni, D. A., (1989) "A Model Cost Comparison between Construction Management and General Contracting" in *Excellence in the Constructed Project - Proceedings of Construction Congress I, 1989*, ASCE, p. 39.

Campbell, N., (1990) "An Interaction Approach to Organizational Buying Behavior" in *Understanding Business Markets - Interaction Relationships Networks*, ed., D. Ford, Academic Press, New York, pp. 265-278.

Cannon, J. and Hillebrandt, P. M., (1989) "Theories of the Firm" in *The Management of Construction Firms*, eds., P.M. Hillebrandt and J. Cannon, Macmillan, London, pp. 1-7.

Cannon, J. and Hillebrandt, P. M., (1989) "Diversification" in *The Management of Construction Firms*, eds., P.M. Hillebrandt and J. Cannon, Macmillan, London, pp. 31-42.

Case, J., (1990) "Intimate Relations" in *INC*, August, pp. 64-66, 70 & 72.

Cellini, G. L., (1993) "Strategic Alliances in the '90s" in *Management Accounting*, June, pp. 56-59.

Chalmers, A.F., (1982) *What Is This Thing Called Science?* 2nd edn, University of Queensland Press.

Charlett, A. J., (1996) "A Review of Partnering Arrangements within the Construction Industry and Their Influence on Performance" in *CIB W89 Beijing International Conference*, October, pp. 1-7.

Chartered Institute of Building, (1993) *Marketing and the Construction Client*, The Chartered Institute of Building, UK.

Chau, K W and Walker, A., (1994) "Subcontracting in the Construction Industry - A Transaction Cost Minimisation Perspective" in *International Building Economics: Proceedings of the 21st Annual Meeting of CIB Working Commission W-55 Building Economics*, September, pp. 1-12.

Chen, M. and Miller, D., (1994) "Competitive Attack, Retaliation and Performance: An Expectancy-Valence Framework" in *Strategic Management Journal*, Vol.15, pp. 85-102.

Clough, R.H., (1986) *Construction Contracting*, 5th edn, John Wiley & Sons, New York.

Clover, V.T. and Balsley, H. L., (1984) *Business Research Methods*, 3rd edn, Grid Publishing, Columbus, Ohio.

Coakes, S. J. and Steed, L. G., (1996) *SPSS for Window - Analysis without Anguish*, John Wiley & Sons, Brisbane, Queensland.

Cole, T. R. H., (1994) "The Concept of Reasonableness in Construction Contracts" in *Building and Construction Law*, February, pp. 7-17.

Cole, T. R. H., (1994) "Law - All in Good Faith" in *Building and Construction Law*, February, pp. 18-33.

Collazo, J. A., (1993) "Strategic Alliances Keep Customers Plugged In" in *Management Review*, March, pp. 24-26.

Construction Industry Development Agency, (1993) *Model Projects & Enterprises*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1993) *Creating Productive Partnerships*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1993) *Construction Industry: Project Initiation Guide for Project Sponsors, Clients & Owners*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1993) *Project Performance Update*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1993) *Best Practice Project Management Guide*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1993) *Building Best Practice in the Construction Industry: A Practitioner's Guide*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1993) *The Australian Construction Industry - Pre-Qualification Criteria for Contractors and Sub-Contractors*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1994) *Two Steps Forward, One Step Back: Management Practices in the Australian Construction Industry*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1994) *Security of Payment - Final Report*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1994) *Building Best Practice in the Construction Industry - Overview for Clients, Consultants & Contractors*, 2nd edn., Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1995) *Measuring Up or Muddling Through*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency, (1995) *Pre-Qualification Criteria for Sub-Contractors - The Australian Construction Industry*, Construction Industry Development Agency, Sydney.

Construction Industry Development Agency and Master Builders Australia, (1993) *Partnering: A Strategy for Excellence*, Construction Industry Development Agency and Master Builders Australia.

Construction Industry Institute, (1992) *Projects and Competition of the Future*, Bureau of Engineering Research - University of Texas, Austin.

Construction Industry Institute, Australia, (1996) *Partnering: Models for Success - Research Report 8*, Construction Industry Institute, Australia.

Contractor, F. J. and Lorange, P., (1988) "Why Should Firms Cooperate? The Strategy and Economics Basis for Cooperative Ventures" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P. Lorange, Lexington Books, New York pp. 3-28.

Cowan, C., (1992) "Partnering: A Concept for Success" in *Partnering: A Strategy for Excellence - Proceedings of the Master Builders' - Construction & Housing Association of Australia Partnering Conference*, Sydney, September, pp. 2-22.

Creswell, J. W., (1994) *Research Design - Qualitative & Quantitative Approaches*, Sage Publications, CA.

Crook, D., (1996) *Research Instruments*, via E-mail: CNBR-L@kanga.edc.rmit.edu.au (6 May 1996).

Crouse, H. J., (1991) "The Power of Partnerships" in *The Journal of Business Strategy*, Vol. 12, No. 6, November/December, pp. 4-8.

Cryer, P., (1996) *The Research Student's Guide to Success*, Open University Press, Buckingham.

Cusumano, M. A. and Takeishi, A., (1991) "Supplier Relations and Management: A Survey of Japanese, Japanese-Transplant, and US Auto Plants" in *Strategic Management Journal*, Vol.12, pp. 563-588.

Dane, F. C., (1990) *Research Methods*, Brook/Cole Publishing Co., Pacific Grove, CA.

Day, T., (1996) "The Way to succeed in Construction Projects" in *Chartered Surveyor Monthly (CSM)*, VOL.6, No.2, October, p. 48.

de Vaus, D.A., (1991) *Surveys in Social Research*, 3rd edn., Allen & Unwin, Sydney.

Dent, Jr., H., (1991) "Strategic Focus" in *Small Business Reports*, January, pp. 62-73.

Department of Defence, (1993) *Tender Evaluation and Recommendation Report*, Commonwealth of Australia - Department of Defence, Australia.

Department of Finance, (1994) *Doing Evaluation - A Practical Guide*, Commonwealth of Australia.

Department of Industry, Science and Technology, (1995) *Non Residential Construction Forecasts Short - Term Prospects*, Commonwealth of Australia.

Department of Industry, Technology and Commerce, (1993) *Innovation in Australia's Service Industries*, Australian Government Publishing Service.

Dev, C. S. and Klein, S., (1993) "Strategic Alliances in the Hotel Industry" in *The Cornell H.R.A. Quarterly*, February, pp. 42-45.

Devlin, G. and Bleackley, M., (1988) "Strategic Alliances - Guidelines for Success" in *Long Range Planning*, Vol.21, No.5, October, pp. 18-23.

Dlugos, III, J.J. and Maugans, R.P., (1990) "Effective Project Controls in an Owner/Contractor Association" in *AACE Transactions*, pp. M.2.1-M.2.4.

Dombkins, D., (1992) *Partnering: A Definition, Review of American and Australian Experience, Theoretical Framework and Recommendations for Implementation in Australia*, Unpublished, Construction Management and Economics Unit, School of Building, University of New South Wales.

Doorley, III, Thomas L., (1993) "Teaming up for Success" in *Business Quarterly*, Summer, pp. 99-103.

Doyle, J., (1995) "Successful Partnering – Legally" in *Vision to Reality - Proceedings of the 1995 Australian Institute of Project Management National Conference*, Adelaide, September, pp. 468-473.

Doz, Y. L., (1988) "Technology Partnerships between Larger and Smaller Firms: Some Critical Issues" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 317-338.

Drew, C. J. and Hardman, M. L., (1985) *Designing and Conducting Behavioral Research*, Pergamon Press, New York.

Dubbs, D., (1993) “Partnering Means Making Friends, Not Foes” in *Facilities Design & Management*, June, pp. 48-51.

Dubin, R., (1978) *Theory Building*, revised edn, The Free Press, New York.

Dunphy, D. and Stace, D., (1990) *Under New Management*, McGraw Hill, Sydney.

Dyer, J. H. and Ouchi, W. G., (1993) “Japanese-Style Partnerships: Giving Companies a Competitive Edge” in *Sloan Management Review*, Fall, pp. 51-63.

Easterby-Smith M., Thrope, R. and Lowe A., (1991) *Management Research - An Introduction*, Sage Publishing.

Economist Intelligence Unit, (1994) *Best Practices: Strategic Alliances - Research Report*, The Economist Intelligence Unit, New York.

Eilenberg, I. M., (1996) “Partnering - Is it the Answer After-all?” in *CIB W89 Beijing International Conference*, October, pp. 1-5.

Eisenhardt, K. M., (1989) “Building Theories from Case Study Research” in *Academy of Management Review*, Vol.14, No.4, pp. 532-550.

Emory, W. C. and Cooper, D. R., (1991) *Business Research Methods*, 4th edn, Irwin, Boston, MA.

Feulner, E. J., (1992) “Choosing the Right Friends” in *Above the Beltway*, March, pp. 14-15.

Flanagan, R. and Norman, G., (1989) “Pricing Policy” in *The Management of Construction Firms*, eds., P.M. Hillebrandt and J. Cannon, Macmillan, pp. 129-153.

Foddy, W., (1993) *Constructing Questions for Interviews and Questionnaires - Theory and Practice in Social Research*, Cambridge University Press.

Fohrman, N., (1996) *PQC - A System for Pre-Qualification of Contractors in Queensland*, Queensland Government, Strategic Asset Management Unit, Building Division, Brisbane.

Ford, D., (1990) “The Development of Buyer-Seller Relationships in Industrial Markets” in *Understanding Business Markets - Interaction Relationships Networks*, ed., D. Ford, Academic Press, NY, pp. 42-57.

Ford, D., Hakansson, H. and Johanson, J. (1990) “How Do Companies Interact?” in *Understanding Business Markets - Interaction Relationships Networks*, ed., D. Ford, Academic Press, NY, pp. 381-392.

- Franks, J., (1984) *Building Sub-Contract Management*, Construction Press, NY.
- Franks, J., (1984) *Building Procurement Systems - A Guide to Building Project Management*, The Chartered Institute of Building, UK.
- Frey Jr., S. C. and Schlosser, M. M., (1993) "ABB and Ford: Creating Value through Cooperation" in *Sloan Management Review*, Fall, pp. 65-72.
- Ghemawat, P., (1991) *Commitment - The Dynamic of Strategy*, Free Press, NY.
- Giles, B., (1995) "Secure Payment: A Right, Not a Lottery" in *Constructing the Future -Proceedings of 1995 Construction Industry Development Agency National Conference*, Construction Industry Development Agency, May, pp. 398-423.
- Golden, P. A. and Dollinger, M., (1993) "Cooperative Alliances and Competitive Strategies in Small Manufacturing Firms" in *Entrepreneurship Theory and Practice*, Summer, pp. 43-56.
- Grant, R. M., (1993) "Analysing Resources and Capabilities", in *Australian Strategic Management: Concepts, Context and Cases*, eds., G.Lewis, A.Morkel and G.Hubbard, Prentice Hall of Australia Pty. Ltd., pp. 153-179.
- Green, A., (1987) "Manufacturing Management in Action" in *The Management of Manufacturing - the Competitive Edge*, eds., R.Toone and D. Jackson, IFS Ltd., UK, pp. 27-34.
- Grigg, P. J., (1978) *Alternative Approaches to the Procurement of Building Works*, Royal Australian Institute of Architects.
- Gronroos, C., (1994) "From Marketing Mix to Relationship Marketing: Towards a Paradigm Shift in Marketing" in *Asia - Australia Marketing Journal*, Vol.2, No.1, August, pp. 9-29.
- Gugler, P., (1992) "Building Transnational Alliances to Create Competitive Advantage" in *Long Range Planning*, Vol.25, No.1, February, pp. 90-99.
- Gulati, R., Khanna, T. and Nohria, N., (1994) "Unilateral Commitments and the Important of Process in Alliances" in *Sloan Management Review*, Spring, pp. 61-69.
- Gummesson, E., (1994) "Broadening and Specifying Relationship Marketing" in *Asia - Australia Marketing Journal*, Vol.2, No.1, August, pp. 31-43.
- Gyles, R. V., (1992) *Royal Commission into Productivity in the Building Industry in NSW Volume 1 - 10*, South Wood Press Pty Ltd, Sydney.
- Hagedoorn, J., (1993) "Understanding the Rationale of Strategic Technology Partnering: Interorganizational Modes of Cooperation and Sectoral Differences" in *Strategic Management Journal*, Vol.14, pp. 371-385.

Hagedoorn, J. and Schakenraad, J., (1994) "The Effect of Strategic Technology Alliances on Company Performance" in *Strategic Management Journal*, Vol.15, pp. 291-309.

Haigh, R. W., (1992) "Building a Strategic Alliance: The Hermosillo Experience as a Ford-Mazda Proving Ground" in *The Columbia Journal of World Business*, Spring pp. 60-73.

Hakansson, H. and Johanson, J., (1988) "Formal and Informal Cooperation Strategies in International Industries Networks" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 369-379.

Hakansson, H and Snehota, I., (1990) "No Business is an Island: The Network Concept of Business Strategy" in *Understanding Business Markets - Interaction Relationships Networks*, ed., D. Ford, Academic Press, NY, pp. 526-540.

Hamel, G., Doz, Y. L. and Prahalad, C.K., (1989) "Collaborate with Your Competitors-and Win" in *Harvard Business Review*, January-February, pp. 133-139.

Hamel, G. and Prahalad, C.K., (1993) "Strategic Intent" in *Australian Strategic Management: Concepts, Context and Cases*, eds., G.Lewis, A.Morkel and G.Hubbard, Prentice Hall of Australia Pty. Ltd., pp. 115-133.

Hamilton, W. F., (1985) "Corporate Strategies for Managing Emerging Technologies" in *Technology in Society*, Vol.7, pp. 197-212.

Hampson, K., (1993) *Technology Strategy and Competitive Performance: A Study of Bridge Construction*, Unpublished Doctor of Philosophy Dissertation, Stanford University, CA.

Hanly, G., (1993) "Partnering: An Australian Perspective Part 2 - Implementing Strategies" in *Australian Construction Law Newsletter*, pp. 132-139.

Hanly, G. and de Valence, G., (1993) "Partnering: An Australian Perspective Part 1- Partnering Explored" in *Australian Construction Law Newsletter*, pp. 50-59.

Harrigan, K. R., (1988) "Joint Ventures: A Mechanism for Creating Strategic Change" in *The Management of Strategic Change*, ed. Andrew M. Pettigrew, Basil Blackwell, UK, pp. 195-230.

Harrigan, K. R., (1988) "Joint Ventures and Competitive Strategy" in *Strategic Management Journal*, Vol.9, pp. 141-158.

Harrigan, K. R., (1988) "Strategic Alliances and Partner Asymmetries" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 205-226.

Hart, S. and Banbury, C., (1994) "How Strategy-Making Processes Can Make a Difference" in *Strategic Management Journal*, Vol.15, pp. 251-269.

Harvey, R. C., and Ashworth, A., (1993) *The Construction Industry of Great Britain*, Butterworth Heinemann, London.

Hasegawa, F. and Shimizu Group, (1988) *Built by Japan - Competitive Strategies of the Japanese Construction Industry*, John Wiley & Sons, New York.

Hatten, K. J. and Hatten, M. L., (1993) "Corporate Strategy in Diversified and Integrated Multibusiness Firms" in *Australian Strategic Management: Concepts, Context and Cases*, eds., G.Lewis, A.Morkel and G.Hubbard, Prentice Hall of Australia Pty. Ltd., pp. 193-215.

Haynes, M., (1997) Statistical Consultant - School of Mathematical Sciences, Queensland University of Technology, Brisbane, Queensland, Personal discussions, February.

Hayton, G., Garrick, J. and Guthrie, H., (1993) *Learning Construction: Skill Formation in the Construction Industry and Case Studies - Vol.1 & 2* Construction Industry Development Agency, Sydney.

Hedderson, J., (1987) *SPSSx Made Simple*, Wadsworth Publishing Co., CA.

Henderson, (1994) "Multiplex Wins Recognition" in *Incida - Monthly Newsletter* Construction Industry Development Agency, Sydney, September, p.3.

Hendrick, D. R., (1993) "The General Contractor Factor" in *Business Credit*, June, pp. 12-13.

Henricks, M., (1991) "The Power of Partnering" in *Small Business Reports*, June, pp. 46-57.

Hibbert, S. and Moloney, E., (1993) "Good Faith in Commercial and Construction Contracts" in *Building and Construction Law*, September, pp. 183-189.

Hillebrandt, P. M., (1988) *Analysis of the British Construction Industry*, Macmillan London.

Hillebrandt, P.M. and Cannon, J., (1994) *The Modern Construction Firm*, Macmillan London.

Hinks, A.J., Allen, S. and Cooper, R.D., (1996) "Adversaries or Partners? Developing Best Practice for Construction Industry Relationships" in *The Organization and Management of Construction: Shaping Theory and Practice (Vol 1)*, eds., D.A. Langford and A. Retik, E&FN Spon, pp. 220-228.

Hinterhuber, H. H. and Levin, B. M., (1994) "Strategic Networks - The Organization of the Future" in *Long Range Planning*, Vol.27, No.3, June, pp. 43-53.

Hinze, J. and Tracey, A., (1994) "The Contractor-Subcontractor Relationships: The Subcontractor's View" in *Journal of Construction Engineering and Management*, ASCE, Vol.120, No.2, June, pp. 274-287.

Holmes, S., (1994) *Network Brokers Manual*, AusIndustry, Department of Industry, Technology and Commerce, Canberra.

Holmes, S., Hodgson, A. and Nevell, P., (1991) *Accounting Students Handbook*, Harcourt Brace Jovanovich, Sydney.

Holt, D. (1996) *Research Instruments*, via E-mail: CNBR-L@kanga.edc.rmit.edu.au (9 May 1996).

Holt, G. D., Olomolaiye, P. O. and Harris, F. C., (1994) "Evaluating Prequalification Criteria in Contractor Selection" in *Building and Environment*, Vol.29, No.4, pp. 437-448.

Holt, G. D., Olomolaiye, P. O. and Harris, F. C., (1996) "Tendering Procedures, Contractual Arrangements and Latham: The Contractors' View" in *Engineering, Construction and Architectural Management (Vol 3)*, ed. Ronald McCaffer, Blackwell Science, March/June, pp. 97 - 115.

Howarth, C., Gillin, M. and Baily, J., (1995) *Strategic Alliances: Resource-Sharing Strategies for Smart Companies*, Pitman Publishing, Melbourne.

Howell, G., (1996) *Research Instruments*, via E-mail: CNBR-L@edc.rmit.edu.au (1 May 1996).

Huck, S. W., Cormier, W. H. and Bounds, Jr. W. G., (1974) *Reading Statistics and Research*, Harper & Row, New York.

Hurry, D., (1993) "Restructuring in the Global Economy: The Consequences of Strategic Linkages Between Japanese and U.S. Firms" in *Strategic Management Journal*, Vol.14, pp. 69-82.

IMP Group (Industrial Marketing and Purchasing), (1990) "An Interaction Approach" in *Understanding Business Markets - Interaction Relationships Networks*, ed., D. Ford, Academic Press, New York, pp. 7-26.

Ireland, V., (1985) "The Role of Managerial Actions in the Cost, Time and Quality Performance of High-rise Commercial Building Projects" in *Construction Management and Economics*, Vol.3, pp. 59-87.

Ireland, V., (1994) *T40 Process Re-Engineering in Construction*, Fletcher Construction Australia.

Ireland, V. (1997) "Difficulties and Solutions in Process Re-Engineering of Construction" in *Conference Proceedings of the International Conference on Construction Process Re-Engineering*, ed., Sherif Mohamed, Gold Coast, pp. 39-49.

James, D., (1993) *Managing for the 21st Century*, Text Publishing Company, Melbourne.

James, Jr. H. S. and Weidenbaum, M., (1993) *When Business Cross International Borders - Strategic Alliances and Their Alternatives*, Praeger, Westport, Connecticut.

Johnson, D. P., (1991) "Partnering, Who Cares?" in *Construction Business Review*, September/October, pp. 46-48.

Johnston, G. A., (1993) "The Yin and the Yang: Cooperation & Competition in International Business" in *Executive Speeches*, Vol.7, Iss.6, June/July pp. 15-17.

Johnston, R. and Lawrence, P. R., (1988) "Beyond Vertical Integration - the Rise of the Value - Adding Partnership" in *Harvard Business Review*, Vol.66, No.4, July-August pp. 94-101.

Kanter, R. M., (1984) *The Change Masters*, George Allen & Unwin, GB.

Kanter, R. M., (1989) *When Giants Learn to Dance*, Simon & Schuster, GB.

Kaydos, W., (1991) *Measuring, Managing, and Maximising Performance*, Productivity Press, Cambridge.

Kelly, K., Port, O., Treece, J., DeGeorge, G. and Schiller, Z., (1992) "Learning from Japan" in *Business Week*, January, pp. 52-55 and pp. 59-60.

Kharbanda, Om P. and Stallworthy, E. A., (1990) *Project Teams: The Human Factor*, NCC Blackwell Limited, Oxford.

Killing, J. P., (1988) "Understanding Alliances: The Role of Task and Organisational Complexity" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P. Lorange, Lexington Books, New York, pp. 55-67.

Kim, J., (1975) "Factor Analysis" in *Statistical Package for the Social Sciences* by Nie, Norman H., Hull, C. Hadlai, Jenkins, Jean G., Steinbrenner, Karin and Bent, Dale H., 2nd edn, McGraw-Hill, New York.

King, W., (1995) "Co-operation Is Key to Rush of Strategic Pacts" in *Financial Review*, 15 June, p. 43.

Knill, B., (1992) "Partnering with Your Vendor" in *Material Handling Engineering*, January, pp. 41-44.

Kogut, B., (1988) "A Study of the Life Cycle of Joint Ventures" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 169-185.

Korman, R., Rosenbaum, D. B., Setzer, S. W. and Bicknell, S., (1992) "Shop Till They Drop" in *ENR*, March, pp. 26-28.

Krueger R. A., (1988) *Focus Groups: A Practical Guide for Applied Research*, Sage, CA.

Kwok, T. and Hampson, K., (1996) "Building Strategic Alliances in Construction" in *Project Management Directions*, eds., David Carmichael, Bruce Hovey, Hans Rijdsdijk and David Baccharini, Australian Institute of Project Management, pp. 119-131.

Kwok, T. and Hampson, K., (1997) "Strategic Alliances between Contractors and Subcontractors - A Tender Evaluation Criterion for the Public Works Sector" in *Conference Proceedings of the International Conference on Construction Process Re-Engineering*, ed., Sherif Mohamed, Gold Coast, July, pp. 671-684.

Langford, D. and Male, S., (1991) *Strategic Management in Construction*, Gower, England.

Lansley, P. R., (1991) "Organizational Innovation and Development" in *Competitive Advantage in Construction*, eds., Steven Male and Robert Stocks, Butterworth Heinemann, London, pp. 128-138.

Larson, A., (1992) "Network Dyads in Entrepreneurial Settings: A Study of the Governance of Exchange Relationships" in *Administrative Science Quarterly*, March pp. 76-104.

Larson, A., (1991) "Partner Networks: Leveraging External Ties to Improve Entrepreneurial Performance" in *Journal of Business Venturing*, Vol.6, No.3, May pp. 173-188.

Latham, M., (1994) *Constructing the Team - Final Report of the Government/Industry Review of Procurement and Contractual Arrangements in the UK Construction Industry*, HMSO Publications Centre, London.

Lecraw, D. J., (1988) "Countertrade: A Form of Cooperative International Business Arrangement" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 425-442.

Lederer, W. J. and Jackson D. D., (1968) *The Mirages of Marriage*, W.W. Norton & Company, Inc., New York.

Lei, D., Slocum Jr., J. W., (1992) "Global Strategy, Competence: Building and Strategic Alliance" in *California Management Review*, Fall, pp. 81-97.

Lenard, D, Bowen-James, A, Thompson, M and Anderson, L., (1996) *Partnering: Models for Success - A Research Report*, Construction Industry Institute, Australia.

Lendrum, T., (1995) *The Strategic Partnering Handbook - A Practical Guide for Managers*, McGraw-Hill, Sydney.

Levin, R. I. and Rubin, D. S., (1994) *Statistics for Management*, 6th edn, Prentice-Hall, Englewood Cliffs, New Jersey.

Lewis, G., (1993) "Concepts in Strategic Management" in *Australian Strategic Management: Concepts, Context and Cases*, eds., G.Lewis, A.Morkel and G.Hubbard, Prentice Hall of Australia Pty. Ltd., pp. 5-38.

Lewis, G., (1993) "The Fundamentals of Strategic Analysis" in *Australian Strategic Management: Concepts, Context and Cases*, eds., G.Lewis, A.Morkel and G.Hubbard, Prentice Hall of Australia Pty. Ltd., pp. 51-90.

Lewis, G., (1993) "Introduction to Corporate Strategy" in *Australian Strategic Management: Concepts, Context and Cases*, eds., G.Lewis, A.Morkel and G.Hubbard, Prentice Hall of Australia Pty. Ltd., pp. 183-192.

Lewis, J. D., (1990) *Partnerships for Profit - Structuring and Managing Strategic Alliances*, The Free Press, New York.

Lewis, J. D., (1992) "The New Power of Strategic Alliances" in *Planning Review*, Vol. 20, Iss. 5, September/October, pp. 45-46 & 62.

Li, D. C. and Green, D. C., (1996) "Project Partnering in Australia" in *Australian Project Manager*, Vol.16, No.3, September, pp. 10, 12, 14&16.

Limerick, D. and Cunnington, B., (1993) *Managing the New Organisation: A Blueprint for Networks and Strategic Alliances*, Business & Professional Publishing, Chatwood, NSW.

Lindsay, J., (1989) *Joint Ventures and Corporate Partnerships*, Probus Publishing Company, Chicago, Illinois.

Liston, J. (1994) *Pre-qualification of Contractors*, Physical Infrastructure Centre, Queensland University of Technology, School of Civil Engineering.

Lorange, P. and Roos, J., (1991) "Why Some Strategic Alliances Succeed and Others Fail" in *The Journal of Business Strategy*, January/February, pp. 25-30.

Lorange, P. and Roos, J., (1993) *Strategic Alliances - Formation, Implementation, and Evolution*, Blackwell, Cambridge, Massachusetts.

Lorange, P., Roos, J. and Bronn, P. S., (1992) "Building Successful Strategic Alliances" in *Long Range Planning*, Vol.25, No.6, December, pp. 10-17.

Lyles, M. A., (1988) "Learning Among Joint Venture-Sophisticated Firms" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 301-316.

Magee, J. F., (1992) "Strategic Alliances: Overcoming Barriers to Success" in *Chief Executive*, Iss.81, November/December, pp. 56-61.

Male, S., (1991) "Strategic Management in Construction: Conceptual Foundations" in *Competitive Advantage in Construction*, eds., Steven Male and Robert Stocks, Butterworth Heinemann, London, pp. 5-44.

Male, S., (1991) "Strategic Management and Competitive Advantage in Construction" in *Competitive Advantage in Construction*, eds., Steven Male and Robert Stocks, Butterworth Heinemann, London, pp. 45-104.

Malhotra, N. K, Hall, J., Shaw, M. and Crisp, M., (1996) *Marketing Research - An Applied Orientation*, Prentice Hall, Sydney.

Martin, P. and Nicholls, J., (1987) *Creating a Committed Workforce*, McGraw-Hill.

Mason, J. C., (1993) "Strategic Alliances: Partnering for Success" in *Management Review* Vol.82, Iss.5, May, pp, 10-15.

Master Builders' - Construction & Housing Association Australia, Inc., (1992) *Partnering: A Strategy for Excellence*, Master Builders' - Construction & Housing Association Australia.

Masterman, J., (1992) *An Introduction to Building Procurement Systems*, First Edition, E and FN Spon, London.

Matthews, J.D., Tyler, A. and Thorpe, T., (1996) "Subcontracting - The Subcontractor's View" in *The Organization and Management of Construction: Shaping Theory and Practice (Vol. 2)*, eds., D.A. Langford and A. Retik, E&FN Spon, pp. 471-480.

Matthews, J., Tyler, A. and Thorpe, A., (1996) "Pre-construction Project Partnering: Developing the Process" in *Engineering, Construction and Architectural Management (Vol. 3)*, ed. Ronald McCaffer, Blackwell Science, March/June, pp. 117-131.

Matthews, J., Thorpe, A. and Tyler, A., (1996) "Improving Relationships with Subcontractors: A UK Main Contractors Approach" in *CIB W89 Beijing International Conference*, 21-24 October, Beijing, pp. 1-7.

Mauch, J. E. and Birch, J. W., (1989) *Guide to the Successful Thesis and Dissertation*, Marcel Dekker, New York.

McCracken, G., (1988) *The Long Interview*, Sage, CA.

McDonnell, J., (1993) *The Best Service in the World: A Critique of International Best Practice as Applied to the Australian Service Industries*, Australian Government Publishing Service.

McGeorge, D. and Palmer, A., (1997) *Construction Management - New Directions*, Blackwell Science, Oxford.

McKee, D., (1994) "Guidelines for Strategic Development Alliance Success" in *Economic Development Review*, Vol.12, Iss.1, Winter, pp. 90-92.

Millman, M., (1990) *General Contracting*, McGraw-Hill, New York.

Mills, A., (1996) *Existing Public Sector Prequalification Procedures*, Faculty of Architecture, Building & Planning, University of Melbourne.

Ministry of Public Building and Works, (1964) *The Placing and Management of Contracts for Building and Civil Engineering Work - Report of the Committee*, Her Majesty's Stationery Office.

Mink, O. G., Mink, B. P., Downes, E. A. and Owen, K. Q., (1994) *Open Organisations: A Model for Effectiveness, Renewal, and Intelligent Change*, Jossey-Bass, San Francisco.

Mink, O. G., Esterhuysen, P. W., Mink, B. P. and Owen, K. Q., (1993) *Change at Work - A Comprehensive Management Process for Transforming Organizations*, Jossey-Bass, San Francisco.

Mink, O. G., Shultz, J. M. and Mink, B. P., (1991) *Developing & Managing Open Organizations - A Model and Methods for Maximizing Organizational Potential*, Somerset, Austin.

Mink, O. G., Mink, B. P. and Owen, K. Q., (1987) *Groups at Work*, Educational Technology Publications, Englewood Cliffs, New Jersey.

Mitchell, M. and Jolley, J., (1988) *Research Design Explained*, Holt, Rinehart and Winston, Inc., New York.

Mohr, L. B., (1985) "The Reliability of the Case Study as a Source of Information" in *Advances in Information Processing in Organizations*, Vol.2, pp. 65-93.

Mohr, J. and Spekman, R., (1994) "Characteristics of Partnership Success: Partnership Attributes, Communication Behaviour, and Conflict Resolution Techniques" in *Strategic Management Journal*, Vol.15, pp. 135-152.

Morris, J. and Imrie, R., (1993) "Japanese Style Subcontracting - Its Impact on European Industries" in *Long Range Planning*, Vol.26, No.4, August, pp. 53-58.

Moser, C. and Kalton, G., (1971) *Survey Methods in Social Investigation*, 2nd edn, Gower, England.

Mosley, D., Moore, C., Slagle, M. and Burns, D., (1991) "Partnering in the Construction Industry: Win-Win Strategic Management in Action" in *National Productivity Review*, Vol. 10, Iss. 3, Summer, pp. 319-325.

Murray, Jr E. A. and Mahon, J. F., (1993) "Strategic Alliances: Gateway to the New Europe?" in *Long Range Planning*, Vol.26, No.4, August, pp. 102-111.

Nahapiet, H. and Nahapiet, J., (1985) "A Comparison of Contractual Arrangements for Building Projects" in *Construction Management and Economics*, Vol.3, pp. 217-231.

National Public Works Conference and National Building and Construction Council, (1990) *No Dispute: Strategies for Improvement in the Australian Building and Construction Industry*, National Public Works Conference, Canberra.

National Research Council, (1991) *The Competitive Edge: Research Priorities for US. Manufacturing*, National Academy Press, Washington, DC.

Nayyar, P. R., (1993) "On the Measurement of Competitive Strategy: Evidence from a Large Multiproduct US Firm" in *Academy of Management Journal*, Vol.36, No.6, pp. 1652-1669.

Nevaer, L. E.V. and Deck, S. A., (1990) *Strategic Corporate Alliances - A Study of the Present, a Model for the Future*, Quorum Books, Westport, Connecticut.

New South Wales Public Works Department, (1994) *Partnering Guidelines*, NSW Government Printing Service, Australia.

New South Wales Department of Public Works and Services, (1996) *The Construction Industry in New South Wales - Green Paper*, NSW Government, Australia.

New South Wales Department of Public Works and Services, (1997) *A Perspective of the Construction Industry in NSW in 2005 - Discussion Paper*, NSW Government, Australia.

Nielson, C. C. and Wilson, E. J., (1994) "Interorganisational Cooperation in Buyer-Seller Relationships" in *1994 Research Conference Proceedings - Relationship Marketing: Theory, Methods and Applications*, eds., J.N. Sheth and A Parvatiyar, June pp. 1-10.

Nunnally, J. C., (1978) *Psychometric Theory*, McGraw- Hill, New York.

Osbaldeston, M. and Barham, K., (1992) "Using Management Development for Competitive Advantage" in *Long Range Planning*, Vol.25, No.6, December, pp. 18-24.

Osgood, C. E., Suci, G. J. and Tannenbaum, P. H., (1967) *The Measurement of Meaning*, University of Illinois Press.

Park, W. R., (1979) *Construction Bidding for Profit*, John Wiley & Sons, New York.

Park, W., (1991) "Business Strategy" in *Contractor's Management Handbook*, eds., James J. O'Brien and Robert G. Zilly, 2nd edn., McGraw-Hill, New York, pp. 8.1-8.42.

Parkhe, A., (1993) "Strategic Alliance Structuring: A Game Theoretic and Transaction Cost Examination of Interfirm Cooperation" in *Academy of Management Journal*, Vol.36, No.4, pp. 794-829.

Parkhe, A., (1993) "Messy Research, Methodological Predispositions, and Theory Development in International Joint Ventures" in *Academy of Management Review*, Vol.18, No.2, pp. 227-268.

Patton, M. Q., (1990) *Qualitative Evaluation and Research Methods*, 2nd edn, Sage Publications, London.

Payne, A., Christopher, M., Clark, M. and Peck, H., (1994) "Relationship Marketing and the Relationship Management Chain" in *Asia - Australia Marketing Journal*, Vol.2, No.1, August, pp. 81-91.

Pekar, Jr P. and Allio, R., (1994) "Making Alliances Work - Guidelines for Success" in *Long Range Planning*, Vol.27, No.4, August, pp. 54-65.

Peters, T., (1987) *Thriving on Chaos*, Alfred A. Knopf, New York, NY.

Peters, T., (1990) "The New Building Blocks" in *Industry Week*, January, pp. 101-102.

Peters, T. J. and Waterman, R. H., (1982) *In Search of Excellence: Lessons from America's Best Run Companies*, Harper & Row, New York.

Pfeffer, J., (1994) "Competitive Advantage through People" in *California Management Review*, Winter, pp. 10-28.

Phillips, E. M. and Pugh D.S., (1994) *How to Get a PhD - A Handbook for Students and Their Supervisors*, 2nd. edn. Open University Press, Buckingham.

Pitts, R. A. and Snow, C. C., (1986) *Strategies for Competitive Success*, John Wiley & Sons, New York.

Plemmons, J. K. and Sanders, S. R., (1995) "Developing the Strategic Alliance" in *Innovation and Dynamism for Future Prosperity - Proceedings for First International Conference on Construction Project Management (Singapore)*, January, pp. 141-147.

Poirier, C. C. and Houser, W. F., (1993) *Business Partnering for Continuous Improvement*, Berrett-Koehler Publishers, San Francisco.

Porter, M. E., (1980) *Competitive Strategy: Techniques for Analysing Industries and Competitors*, Free Press, New York.

Porter, M. E., (1985) *Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, New York.

Porter, M. E., (1990) *The Competitive Advantage of Nations*, Free Press, New York.

Porter, M. E., (1991) "Towards a Dynamic Theory of Strategy" in *Strategic Management Journal*, Vol.12, pp. 95-117.

Powell, W. W., (1987) "Hybrid Organisational Arrangement: New Form or Transitional Development?" in *California Management Review*, Fall, pp. 67-87.

Powell, W. W., (1990) "Neither Market Nor Hierarchy: Network Forms of Organization" in *Research in Organisational Behaviour*, Vol.12, pp. 295-336.

Pritchard, D., (1995) "Co-operation Is Key to Rush of Strategic Pacts" in *Financial Review*, 15 June, p. 43.

Public Works Department of New South Wales, (1993) *Capital Project Procurement Manual*, New South Wales Government, Australia.

Public Works and Services Department of New South Wales, (1996) *Code of Tendering for the Construction Industry*, New South Wales Government, Australia.

Public Works and Services Department of New South Wales, (1996) *Code of Practice for the Construction Industry*, New South Wales Government, Australia.

Public Works and Services Department of New South Wales, (1996) *Implementation Guidelines for the Code of Practice & Code of Tendering*, New South Wales Government, Australia.

Pucik, V., (1988) "Strategic Alliances with the Japanese: Implications for Human Resource Management" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 487-498.

Queensland Construction Executive Planning Group, (1996) *Queensland Construction Industry Strategy - Final Report*, Department of Tourism, Small Business & Industry, Queensland, Australia.

Queensland Government, (1991) *Security of Payment for Subcontractors in the Building & Construction Industry: Discussion Paper*, Government Printer, Queensland, Australia.

Queensland Government, (1992) *State Purchasing Policy*, Government Printer, Queensland, Australia.

Queensland Government, (1997) *Competing for Government Building Work - A Contractor's Guide to Pre-Qualification (DRAFT)*, Department of Public Works and Housing, Queensland, Australia.

Queensland Government, (1997) "Queensland Health Report" in *Sunday Mail*, 21 September, Brisbane, pp.79-82.

Quick, R.W., (1995) "The Partnering Contract: Some First Thoughts" in *Leadership in a World of Change - Proceedings for Second Bi-Annual Queensland Chapter AIPM Project Management Conference*, April, pp. 136-185.

Raftery, J., (1996) *Research Instruments*, via E-mail: CNBR-L@kanga.edc.rmit.edu.au (8 May 1996).

Ragin, C. C., (1994) *Constructing Social Research - The Unity and Diversity of Method*, Pine Forge Press, California.

Ramsay, W., (1989) "Business Objectives and Strategy" in *The Management of Construction Firms*, eds., P.M. Hillebrandt and J. Cannon, Macmillan, pp. 9-29.

Rawlinsons, (1997) *Australian Construction Handbook*, Rawlhouse Publishing Pty Ltd, Perth, Australia.

Ring, P. S. and Van De Ven, A. H., (1992) "Structuring Cooperative Relationships Between Organizations" in *Strategic Management Journal*, Vol.13, pp. 483-498.

Ring, P. S., (1994) "Development Processes of Cooperative Interorganizational Relationships" in *Academy of Management Review*, Vol.19, No.1, pp. 90-118.

Robbins, D., (1993) "The Dark Side of Team Building" in *Training & Development*, December, pp. 17-21.

Roberts, R. F., (1992) "Competition and Cooperation: The Role of Strategic Alliances" in *Executive Speeches*, Vol.7, Iss. 2, October/November, pp. 13-15.

Robson, C., (1993) *Real World Research - A Resource for Social Scientists and Practitioner-Researchers*, Blackwell, UK.

Root, F. R., (1988) "Some Taxonomies of International Cooperative Arrangements" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 69-80.

Russell, J. R., (1996) *Constructor Prequalification - Choosing the Best Constructor and Avoiding Constructor Failure*, ASCE Press, New York.

Salmond, D., (1994) "Refining the Concept of Trust in Business-to-Business Relationship Theory, Research & Management" in *1994 Research Conference Proceedings - Relationship Marketing: Theory, Methods and Applications*, eds., J.N. Sheth and A. Parvatiyar, June, pp. 1-10.

Samli, C. A., Kaynak, E. and Sharif, H., (1995) "International Corporate Alliances: How Strategic Are They?" in *Proceedings of the Seventh Bi-annual World Marketing Congress*, Academy of Marketing Science, Vol VII-III, pp. 15-37 to 15-41.

Samson, D., (1991) *Manufacturing & Operations Strategy*, Prentice Hall.

Sarkilahti, T., (1996) "Long Term Co-operation between Main Contractors and Its Suppliers in Construction" in *The Organization and Management of Construction: Shaping Theory and Practice (Vol 2)*, eds., D.A.Langford and A. Retik. E&FN Spon, pp. 404-413.

Sasaki, T., (1993) "What the Japanese Have Learned from Strategic Alliances" in *Long Range Planning*, Vol.26, No.6, December, pp. 41-53.

Schleifer, T. C., (1990) *Construction Contractors' Survival Guide*, John Wiley & Sons, New York.

Schriener, J., (1991) "Partnering Saying Off on Projects" in *ENR*, October, pp. 25-27.

Sekaran, U., (1992) *Research Methods for Business - A Skill Building Approach*, 2nd edn, John Wiley & Sons, New York.

Shash, A. A., (1993) "Factors Considered in the Tendering Decisions by Top UK Contractors" in *Construction Management and Economics*, Vol.11, Iss.2, March, pp. 111-118.

Shergold, N., (1996) *Research Instruments*, via E-mail: CNBR-L@kanga.edc.rmit.edu.au (8 May 1996).

Sidwell, T., (1995) "Managing Process Improvement for Construction" in *Vision to Reality - Proceedings of the 1995 Australian Institute of Project Management National Conference*, Adelaide, September, pp. 173-178.

Simon, J. L., (1978) *Basic Research Methods in Social Science - The Art of Empirical Investigation*, 2nd edn, Random House, New York.

Simonin, B. L. and Ruth, J. A., (1994) "Towards a Better Understanding of Strategic Alliances in Marketing through Observation of Symbiotic Relationships in Nature"

in *1994 Research Conference Proceedings - Relationship Marketing: Theory, Methods and Applications*, eds., J.N. Sheth and A Parvatiyar, June, pp. 1-10.

Skitmore, M., (1991) "An Introduction to Bidding Strategy" in *Competitive Advantage in Construction*, eds., Steven Male and Robert Stocks, Butterworth Heinemann, London, pp. 139-162.

Skjerstad, T. A., (1994) "Strategic Partnerships and Trojan Horses: Winners and Losers from Successful Product Development" in *1994 Research Conference Proceedings - Relationship Marketing: Theory, Methods and Applications*, eds., J.N. Sheth and A. Parvatiyar, June, pp. 1-10.

Smith, S., (1996) *Research Instruments*, via E-mail: rescon@qut.edu.au (2 May 1996).

Smyth, H., (1996) *Research Instruments*, via E-mail: CNBR-L@kanga.edc.rmit.edu.au (17 June 1996).

Soellner, A.O.E., (1994) "Commitment in Exchange Relationships: The Role of Switching Costs in Building and Sustaining Competitive Advantages" in *1994 Research Conference Proceedings - Relationship Marketing: Theory, Methods and Applications*, eds., J.N. Sheth and A. Parvatiyar, June, pp. 1-10.

Sommer, B. and Sommer, R., (1991) *A Practical Guide to Behavioural Research*, 3rd edn, Oxford University Press, Oxford.

Spekman, R. E., Isabella, L. A., MacAvoy, T. and Forbes, T., (1994) "Strategic Alliances: A view from the Past and a Look to the Future" in *1994 Research Conference Proceedings - Relationship Marketing: Theory, Methods and Applications*, eds., J.N. Sheth and A. Parvatiyar, June, pp. 1-10.

Spekman, R. E. and Sawhney, K., (1990) *Toward a Conceptual Understanding of the Antecedents of Strategic Alliances*, Marketing Science Institute, Cambridge, Massachusetts.

Spiegel, Jr., F. H., (1993) "Strategic Alliances, with Care and Creativity" in *Financial Executive*, March/April, pp. 28-31.

Stiles, J., (1994) "Strategic Alliances: Making Them Work" in *Long Range Planning*, Vol.27, No.4, August, pp. 133-137.

Stocks, R., (1991) "Strategic Marketing Management" in *Competitive Advantage in Construction*, eds., Steven Male and Robert Stocks, Butterworth Heinemann, pp105-127.

Stoeckel, A. and Quirke, D., (1992) *Services: Setting the Agenda for Reform*, Department of Industry, Technology & Commerce, Canberra.

Stuart, I. F., (1993) "Supplier Partnerships: Influencing Factors and Strategic Benefits" in *International Journal of Purchasing & Materials Management*, Vol.29, Iss.4, October pp. 22-28.

Sujansky, J. G., (1991) *The Power of Partnering - Vision, Commitment and Action*, Pfeiffer, California.

Takac, P. F. and Singh, C. P., (1992) "Strategic Alliances in Banking" in *Management Decision*, Vol.30, No.1, pp. 32-43.

Tesch, R., (1990) *Qualitative Research: Analysis Types and Software Tools*, The Falmer Press, Hampshire, UK.

Then, D., (1996) *Research Instruments*, via E-mail: CNBR-L@kanga.edc.rmit.edu.au (18 May 1996).

Thomas, G., (1996) *Research Instruments*, via E-mail: rescon@qut.edu.au (2 May 1996).

Thompson, K. D., (1993) "Forging a Perfect Partnership" in *Black Enterprises*, September, pp. 66-68&70.

Thorpe, T. and McCaffer, R., (1991) "Competitive Bidding and Tendering Policies" in *Competitive Advantage in Construction*, eds., Steven Male and Robert Stocks, Butterworth Heinemann, London, pp. 163-194.

Tjosvold, D., (1991) *Team Organization: An Enduring Competitive Advantage*, John Wiley & Sons Ltd, London.

Tull, D. S. and Hawkins, D. I., (1987) *Marketing Research - Measurement and Method*, 4th edn., Macmillan, New York.

Turpin, D., (1993) "Strategic Alliances with Japanese Firms: Myths and Realities" in *Long Range Planning*, Vol.26, No.4, August, pp. 11-15.

Uher, T.E., (1989) "Australian Subcontracting Practice" in *Australian Institute of Building Papers*, Volume 3, pp. 61-69.

Uher, T. E., (1988) "Bidding Practice in Australian Building" in *Journal of the Project Managers Forum*, The Australian Project Manager, pp. 27-30.

Uher, T. E., (1994) "What is Partnering?" in *Australian Construction Law Newsletter*, Iss. 34, February, pp. 49- 60.

Uher, T. E., (1996) *Research Instruments*, via E-mail: CNBR-L@kanga.edc.rmit.edu.au (30 April 1996).

Varney, G. H., (1989) *Building Productive Teams: An Action Guide and Resource Book*, Jossey-Bass Inc., CA.

Viljoen, J., (1991) *Strategic Management - How to Analyse, Choose and Implement Corporate Strategies*, Longman Professional, Australia.

Walker, G., (1988) "Network Analysis for Cooperative Interfirm Relationships" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 227-240.

Warwick, D. P. and Lininger, C. A., (1975) *The Sample Survey: Theory and Practice*, McGraw-Hill, New York.

Watson, D., (1997) Opening Address, *International Conference on Construction Process Re-Engineering*, Gold Coast, Australia, 14-15 July.

Westney, D. E., (1988) "Domestic and Foreign Learning Curves in Managing International Cooperative Strategies" in *Cooperative Strategies in International Business*, eds., F.J. Contractor and P.Lorange, Lexington Books, New York, pp. 339-346.

Whenmouth, E., (1993) "Rivals Become Partners" in *Industry Week.*, February, pp. 11,12&14.

Williams, A., Owen, B. and Emerson, A., (1991) *The Nissan Way - From Conflict to Commitment*, Collins, New Zealand.

Williamson, O. E., (1985) *The Economic Institutions of Capitalism - Firms, Markets, Relational Contracting*, The Free Press, New York.

Wilson, D. T. and Jantrania, S., (1994) "Understanding the Value of a Relationship" in *Asia - Australia Marketing Journal*, Vol.2, No.1, August, pp. 55-66.

Wilson, D. and Mummalaneni, V., (1990) "Bonding and Commitment in Buyer-Seller Relationships: a Preliminary Conceptualisation" in *Understanding Business Markets - Interaction Relationships Networks*, ed., D. Ford, Academic Press, NY, pp. 408-420.

Wolff, M. F., (1994) "Building Trust in Alliances" in *Research: Technology Management*, May/June, pp. 12-15.

Wright, R.L.D., (1976) *Understanding Statistics*, Harcourt Brace Jovanovich, NY.

Wright, M. and Flanagan, R., (1982) *A Report on Methods of Research in Construction Management*, Science and Engineering Research Council, England.

Yin, R. K., (1984) *Case Study Research : Design and Methods*, Sage Publications, Beverly Hills, CA.

Young, J. A., Pelton, L. E. and Gilbert, F. W., (1995) "Speculation on Strategic Alliance Failures: Gender and Family Orientation in Strategic Bridging" in *Proceedings of the Seventh Bi-annual World Marketing Congress*, Academy of Marketing Science, Vol VII-III, pp. 15-28 to 15-36.

Zey, M. G., (1991) *The Mentor Connection - Strategic Alliances in Corporate Life*, Transaction Publishers, New Brunswick.