

**ALLIANCE CONTRACTING;
WHEN IS IT THE BEST
PROJECT DELIVERY METHOD?**

by

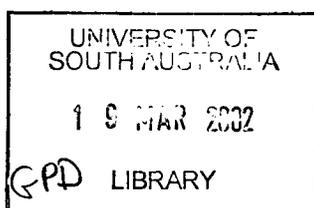
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ABSTRACT

The Australian construction industry has been described as a battlefield on which relationships, productivity and efficiency have all been victims. Through necessity, a new form of contracting has evolved from this adversarial environment based upon trust, integrity and a more cooperative relationship. This new form of contracting, termed alliance contracting, is formed under a joint board comprising equal representation from each alliance participant, ensuring cooperation and consultation. An integrated team is brought together comprising of the best people for the project, drawn from the organisation of each of the alliance participants, whereby all partners to the alliance decide the directions of the project. It is an open book arrangement, and there are certain performance indicators that each partner has to achieve, and they are rewarded or not rewarded on how these performance indicators are achieved.

The aim of this research was to compare alliance contracting with the traditional style of contracting, to determine if alliance contracting can be used as a legitimate and superior project delivery method for specific projects. If so, then the objective of the research was to provide appropriate guidelines for its' use in these specific projects. This was performed by firstly conducting a review of the relevant literature, followed by an industry survey by questionnaire. A detailed analysis of the survey results and findings from the literature review was performed, with subsequent conclusions drawn and recommendations made in order to improve the numbers of successful alliance contracting relationships within Australian industry as a whole.

Alliance contracting has proven to be a legitimate and superior alternative to traditional forms of contracting, for delivery of specific projects. The benefits offered to clients and contractors by alliance contracting include:

- Reduced project delivery time, particularly in the scope development and early design phases;
- Optimum project cost is realised through operating efficiencies, and value added engineering;
- Better management of risks is achieved, as each risk is managed by the party best suited to manage them, and the risk/reward model aligns all parties to the objective of minimising costs, as the client and contractor gain from savings. Success or failure is a joint responsibility;
- Project personnel are selected from each of the alliance participants on a best for project basis, and work in an environment designed to foster a best for project problem solving and decision making process;
- Enhanced business relationships through a win/win approach, pave the way for future business;

- Increased flexibility to manage change, with significantly lower costs to change;
- Greater incentive to be innovative, and apply the latest technology; and
- Optimum standards of quality, safety, industrial relations, and environmental performance.

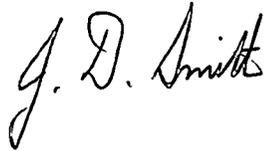
The following recommendations were made in order to improve the overall efficiency, together with the numbers of successful alliance contracting relationships within Australian industry as a whole.

- Critically review all projects for selection of the superior project delivery method, by firstly considering alliance contracting.
- Seek expert opinion and guidance in the formation of an alliance, as the most important aspect contributing to success is the correct selection of an alliance partner.
- Seek companies suitable for partnership in an alliance, by ensuring they have the right culture, resources and commitment to form an alliance.
- Critically review existing alliances continually, to ensure the alliance remains in the continuous improvement cycle, and continues to deliver projects to world's best practice.

DECLARATION

I hereby declare that the content of this document is entirely my own work, and has not been copied in whole or in part other than where cited and as understood by the School of Geoinformatics Planning and Building's policy on plagiarism.

Additionally I confirm that this work or any part thereof has not been previously submitted to this or any other body in respect of any other award or for any other purposes.

A handwritten signature in black ink that reads "J. D. Smith". The signature is written in a cursive style with a large initial 'J' and 'S'.

John D, Smith
February, 2001

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To Debbie, Cameron and Allannah, I am truly grateful for your support throughout the long hours required to complete this project dissertation.

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CHAPTER 1 - INTRODUCTION

1.1 INTRODUCTION

The building and construction industry in Australia is very small, very fragmented, and in recent years there have been extreme examples of adversarial conduct between contractors, and the clients they serve. This trend towards increased disputation, litigation, and consequential financial losses, resulted in changes in attitudes, which promoted increasingly aggressive and confrontational relationships. Industry experts have attributed this adversarial activity to the fact, that in more recent years projects have to be delivered in an environment of uncertainty - driven by diverse stakeholder interests, shifting business or political imperatives, and rapid technological change, whereby the traditional risk-transfer contracting models have increasingly been shown to be inadequate to deal with these circumstances.

Many initiatives focused on non-adversarial project delivery methods of contracting have been developed throughout the last decade, to correct the adverse effect this was having on both the efficiency and well being of the industry.

The topic of this research, being one of these initiatives is alliance contracting. The problem under investigation is: When is alliance contracting the best project delivery method?

1.2 THE EVOLUTION OF ALLIANCE CONTRACTING

Problems in project delivery have been reviewed in many countries, and these studies revealed a sharp increase in adversarial activity between contracting parties in the construction industry, with consequential financial losses. This has resulted in clients seeking the establishment of a cooperative and synergistic relationship between its own consultants and agents, and those of the contractor. In the late 1980's partnering emerged as a new contracting philosophy. The partnering type of contract entered the Australian construction industry in the early 1990's, and has evolved with mixed reaction, whereby some firms have found partnering to be a powerful contracting approach, while it has been resisted by some as ill-founded and wrong, generally due to a lack of commitment to the process from all stakeholders. During 1998 an advanced form of partnership contracting was introduced in Australia. This new style of contracting, termed relationship contracting, resulted from research conducted by the Australian Constructors Association.

This research will focus on project alliance contracting, a further advancement on these initiatives, and one that can be considered as the highest level of relationship contracting. This form of contract

is a long-term partnership directed by a joint board, ensuring cooperation and consultation throughout the project. A virtual company is created to deliver the project, whereby project reporting is directed to the Project Alliance Board, consisting of equal representation from all alliance participants.

1.3 AIMS & OBJECTIVES OF RESEARCH

To compare alliance contracting with the traditional style of contracting to determine if alliance contracting can be used as a legitimate and superior project delivery method for specific projects. If so, the objective of the research will be to provide appropriate guidelines for its' use in these specific projects. ✓

1.4 ASSUMPTIONS ?

There are many risks involved in the delivery of all major capital works projects, such as changes in climate, soil conditions, politics and the economy, together with errors in judgment, industrial disputation, development restrictions, and environmental considerations. For the client to achieve optimum outcomes for the project, the most appropriate strategy for managing these risks must be selected. For many years the traditional risk transfer approach has proved successful for many projects, particularly where the scope has been clearly defined, and the risks have been easily identifiable.

The assumption has been made that during more recent years, complex projects have found the traditional risk transfer contracting models to be inadequate. Whilst having to consider varying stakeholder interests, these projects have risks that are almost impossible to predict. As a result of this, many clients and construction firms are looking for new approaches. One of these movements is towards the process of alliance, partnering or relationship contracting, which will be defined later.] *concerns firms?*

1.5 RESEARCH METHODOLOGY

Throughout this research the following methodologies will be adopted:

- Literature review
- Survey by questionnaire

The method of analysis will be as follows:

- Search, collect, analyse and critically review the theories, principles and literature relating to project delivery using alliance contracting and traditional contracting.
- Conduct a structured survey of construction firms, sub-contractors, and the customers they perform work for, to test findings and bridge gaps from literature review.

- Analyse survey results and literature review, draw conclusions and make recommendations for future work.

1.6 POTENTIAL APPLICATION OF THE RESEARCH

Expose alliance contracting as a legitimate alternative choice to traditional forms of contracting, for the delivery of projects.

Provide information for clients and contracting firms wishing to use alliance contracting as an alternative to other styles of hard dollar contracting, and formulate guidelines for selection of projects which could best be delivered using alliance contracting.

CHAPTER 2 - REVIEW OF THE RELATED LITERATURE

2.1 INTRODUCTION

Disclaimer:

All articles, books and papers reviewed for this literature review stand on their own merits and face value, and were not assessed as to their accuracy and the author's credibility, professional or academic status.

To get to the heart of the problem the following questions must first be answered:

- What are the traditional forms of contracting?
- Why has there been a desire for a new form of contracting?
- What is alliance contracting?

These questions may be answered by reviewing the evolution of alliance contracting.

When these problems have been defined clearly, and the topic of the research is better understood, it will be opportune to research the problem under investigation: When is alliance contracting the best project delivery method, for specific projects?

2.2 DEFINING TRADITIONAL FORMS OF CONTRACT

2.2.1 Overview

The traditional approach has been for owners to transfer as much of the risk as possible to others. Antill and Farmer (1991), James (1995) and Davison (1996), concur that while there exists a wide variety of contract types, most of the traditional type contracts employed in the construction field fall into the category of fixed price contracts or cost based contracts. These authors further divide these two basic groups as follows:

- Fixed price contracts are of two general types:
 1. Lump-sum contracts; and
 2. Schedule of rates or unit based contracts.
- Cost based contracts are many and varied, however the most common types are:
 1. Cost plus a predetermined percentage;
 2. Cost plus a fixed fee; and
 3. Target price contracts, which have a built-in incentive for the contractor to minimize costs.

The authors further define each of these methods of contracting, together with the relevant advantages and disadvantages, and this provides insight into why the industry pursued a more advanced style of contracting:

2.2.2 Fixed price contracts

The consideration is either a stipulated total sum of money for the whole of the work, or a series of stipulated rates for the various quantities of work to be done. In both cases, the contractor must stand or fall by its bid price, or rate for the specified work, whatever it may actually cost to perform the work.

There is consequently a distinct element of competition between contractors who bid for a particular project, and the owner has the advantage of knowing, within reasonable limits, the probable cost of the work before it begins. These contracts pass a large proportion of risk to the contractor, and hence in the past, they have been favoured by government, public authority and private enterprise alike, for all types of building and engineering construction works.

2.2.3 Lump-sum contracts

Lump-sum contracts are contracts for which a set sum is quoted to carry out a clearly defined scope of work. These contracts are commonly used for mechanical, electrical and process installations.

This type of contract offers the following advantages to the client:

- The final price, less any variations, is known at commencement;
- The contractor has a clear picture of all the work required of it, and can accurately estimate the total price accordingly. Competition from other bidders will ensure that the price is reasonable;
- There is a strong incentive and opportunity for the contractor to organize the work efficiently, and usually the work would be completed expeditiously;
- Quality of work can be high, provided that documentation and inspection are satisfactory; and
- There will be minimum monitoring required by the principal.

However the client also faces the following disadvantages:

- They require a precise definition of the scope of work;
- As a result, lead-time is the longest for any of the contract types; and
- The potential for disputes is high, due to the hard dollar style of the contract.

As the name implies there is a fixed limit to expenditure, and typically a fixed end date, with penalties applied for late completion. This type of contract shifts the majority of the risk to the contractor, and of course leaves little flexibility for addressing problems encountered throughout the project. Relationships rapidly break down whenever there is a dispute over money, and typically result in expensive litigation proceedings. Disputes became prevalent throughout the late 1980's, which were adversely affecting the efficiency and well being of the Australian construction industry. This resulted in the formation of a Research Project Group to prepare a report on strategies for the reduction of claims and disputes, as published by the National Public Works Conference and National Building and Construction Council (NPWC/NBCC, 1990).

2.2.4 Schedule of rates or unit based contracts

Schedule of rates contracts are tendered as rates for individual items of work. These contracts are used when the nature and quantity of work can be specified in detail, but when the required quantity of work cannot be properly calculated.

This type of contract offers the following advantages to the client:

- They allow great flexibility as the work can be changed without contract variations;
- They can be initiated more quickly than lump-sum contracts;
- Widely used where quantities cannot be initially defined;
- There is a strong incentive and opportunity for the contractor to organize the work efficiently, and usually the work would be completed expeditiously.

However the client also faces the following disadvantages:

- They are prone to cost over-runs;
- The schedules must be as precisely defined as practicable, as the quality of work is dependent upon the quality of the specification, and of the monitoring applied;
- The superintendent would usually be involved in measurement of the quantities of work executed. This adds to supervision costs and the amount of paperwork generated; and
- Disputes over measurements are common.

It is fair to say, when considering the advantages offered by fixed price contracts, they will continue to serve particular clients very well. This is particularly the case when the

scope of works, or the nature and quantity of work can be specified in detail. However when this is not the case, it has been detrimental to the project to try and shift all of the risk to the contractor. Hence the reason to look for alternative risk sharing types of contract.

2.2.5 Cost based contracts

Cost based contracts are many and varied, however they all exhibit a common feature in that the owner pays the contractor for all costs arising from the execution of the contract, plus some form of additional reimbursement for the contractor's administration and profit.

While seeming to place the price risk on the principal, and to place little discipline on the contractor to contain costs, they do offer flexibility, and can have the following advantages:

- Easier adaptation to fast tracking;
- Lower administration costs by the owner in defining work scope and responsibilities;
- A substantial reduction in the adversarial relationship between owners and contractors;
- Less owner effort to enforce contractual quality provisions; and
- Greater flexibility to change the design or scope of works, particularly for the skilled project manager who can maintain close control.

However cost based contracts are recognized as having the following disadvantages for the client:

- They require careful monitoring by the principal;
- They generate more paperwork than any other contract;
- They require careful definition of what represents a cost, and of overheads applicable;
- There is no apparent incentive for the contractor to manage the work efficiently, and every encouragement to maximize costs;
- The principal pays for the contractor's errors and rework;
- There is usually no time limit for completion; and
- The final cost is not known until the work has been completed.

The advantages described by the above authors give many good reasons as to why the traditional forms of contracting, or variations thereof will continue to be used, however because of the many

disadvantages highlighted, for various types of projects they are no longer suitable. This statement, further complimented by Ross (1999) in his Sydney address to the industry summit on Relationship Contracting in Australia, provides a good lead into the drivers for developing new forms of contracting.

2.3 DRIVERS FOR DEVELOPING NEW FORMS OF CONTRACTING

Ross (1999), suggests the traditional risk management strategy adopted by owners is to transfer as much of the risk as possible to others, typically evidenced by lump sum contracts, while in schedule of rates contracts the owner retains the risk on quantity variations outside specified limits of accuracy, and the contractor assumes all other performance risks. These traditional risk transfer models have served the industry well for many years, because they have been appropriate for the circumstances, and no doubt they will continue to be the dominant contracting model well into the future. However, in more recent years projects have to be delivered in an environment of uncertainty - driven by diverse stakeholder interests, shifting business or political imperatives, and rapid technological change. The traditional risk-transfer contracting models have increasingly been shown to be inadequate to deal with these circumstances.

In a report from Industry Science Resources (1999), the Australian economy was reported to have again grown strongly for 1998-99, with construction accounting for 9.1% of gross domestic product and growing annually by 4.9%. This, together with employment in this industry accounting for 9% and growing annually by 6.2%, speaks for itself as to the flow on effect to the economy from improved efficiencies in the construction industry.

Patching (1994), gives a good lead into solving the question of why there has been a desire for a new form of contracting, by stating;
“Project delivery problems have been reviewed in a number of countries, highlighting a sharp increase in adversarial activity between contracting parties in the construction industry with consequential financial losses, together with changes in attitudes which promoted increasingly aggressive and confrontational relationships.”

Patching further adds that; by the mid 1980s, cost overrun had become normal practice on large construction projects, with the same problems continuing into the 1990s. Attempts to control these cost problems resulted in complex contractual documents, which were difficult to understand and administer. In addition to this, the increased complexity of projects produced similarly complex claims, and often-severe penalties for delays and other extensions of time.

Design professionals are spending more of their time and money - and their insurance carrier's money - defending themselves against claims, whilst construction claims present a sad but real dilemma for the construction industry as described by Dinsmore (1993).

“Claims establish an us-versus-them attitude when what is required is a team approach to accomplish a project.”

Disputes often arise during the course of contract performance and, some of these become major disputes with expensive and disruptive consequences. Alternate dispute resolution (ADR) procedures were formed within Australia during the late 1980's, to assist government and private organizations to resolve their commercial disputes without litigation. James (1995), quotes the Sydney-based Australian Commercial Disputes Centre (ACDC) as the leader in the implementation of ADR procedures. While the ACDC has been successful in resolving disputes at considerably less cost, and within 5% of the time needed for litigation, together with the preservation of goodwill between the parties, it could be argued that a properly formed contract could make provision for dispute resolution in a similar format by project participants.

Guthrie (1998), in his industry address suggests that the processes we are using are ensuring the results we are getting. If the client pays as little as possible for a concept design, which is really insufficient to define the scope of work for tender. If then the problem is further compounded by giving insufficient time to tender, issuing the contract to the lowest bid expecting the contractor to carry all of the risk, which is often passed onto subcontractors. Coupled with this lack of information, prices which are too cheap, and total liability, the client often insists on an optimistic program while constantly issuing changes. Is it any wonder that at the end of the project there are problems with quality, cost, time and disputes eventuate, as the project seems to be set up to fail.

A report by the NPWC/NBCC joint working party (1990), stressed that in the late 1980's it was realized this trend towards increased disputation and litigation was affecting the efficiency and well being of the industry. The cooperative attitudes required to achieve successful project outcomes was at risk.

According to Scott (1994), the traditional form of contracting had led to developing relationships with BP's contractors, which exhibited the following features:

- short term and essentially adversarial in nature;
- unaligned objectives;
- accountabilities not clearly defined;
- risks placed on those unable to influence or manage them;
- skills not recognized and/or inefficiently used.

All of these were perceived by BP to characterize a “master/servant” relationship and to be major contributors to inefficiencies. It was clear to BP that whilst there was no single panacea for the industry’s ills, changes in behaviour and relationships by and between all parties would be critical to future success.

2.4 DEFINING NEW FORMS OF CONTRACT

2.4.1 Partnering Contracts

Davison (1996), defines partnering contracts as;

“conventional contracts to which have been added formal procedures for the prompt and effective resolution of disputes. Both parties give an undertaking to work together in a cooperative manner, and to consult regularly.”

Patching (1994), sums up the concept as follows:

“Partnering attempts to put the handshake back in the contracting process.”

Cowan (1985), also supports this theory and further adds;

“Partnering provides a mechanism for co-operation between the participants to occur, so that energy sapping disputation is removed, and productive working relationships are carefully and deliberately built based on mutual respect, trust and integrity.”

According to Hellard (1995);

“The Australian construction industry mirrors in many ways that of the UK. It has experienced a severe recession in recent years. It has a confrontational approach; conflict, dispute, arbitration and litigation are rife, and the Gyles Royal Commission into the productivity of the industry in New South Wales addressed many issues similar to those, which were the subject of the Latham study and report, and with many similar findings. The Gyles Commission learnt of the US experience of partnering and invited Charles Cowan of the US Corps of Army Engineers, then with ADOT, to explain the concepts in a series of seminars in Australia in 1992.”

“These had electrifying results, and since then:

- (a) partnering has been included as a recommended practice in the Master Builders of Australia’s Code of Practice;
- (b) the Gyles Commission promoted its use in the Science and Technology Building at Macquarie University;

- (c) it was used as the first case study in *Strategy for Excellence* by the CIDA on the North Dandeloup project. This project was the winner of the 1993 Australian FMBA Successful Partnering award; and
- (d) partnering has also been used on other projects, including:
 - the Queensland Sunshine Coast Motorway – Stage 2;
 - the Green Island Redevelopment, an important ECO project”

Ross (1999), reports that; while partnering received a surge of interest when introduced into Australia in the early 1990’s, feedback on the experiences of partnering have been mixed - in summary:

- Many examples where partnering is acknowledged to have improved the standard of project administration and delivery.
- Numerous examples where both parties have expressed great cynicism about the genuineness of the process based on their experiences - likened by some to rape with the lights on.
- A few notable cases where partnering seemed to do nothing to alleviate adversarial conduct but served to greatly increase the associated level of bitterness.

Warne (1994), gives the following reasons for this mixed reaction. Partnering by definition encourages better contract relations, and enhances communication leading to improved performance, thus accounting for the good results achieved. The problems that partnering cannot address are that good relationships cannot always be maintained within a contractually commercial regime. Various cases have shown the verbal commitments (whilst genuine at the time) given throughout the partnering process, cannot withstand the stress imposed by gross misalignment of commercial interests. Whilst partnering attempts to impose a culture of win-win over the top of a commercial and contractual framework, when problems are encountered the framework that is inherently win-lose comes to the fore.

2.4.2 Relationship Contracting

The Australian Constructors Association (ACA, 1999), uses the following definition:

“Relationship contracting is not based on altruism - it is best established as a business relationship designed to deliver optimum commercial benefits to all parties involved. Relationship contracting is founded on the principle that there is a mutual benefit to the client and the contractor to deliver the project at the lowest cost - when costs increase both the contractor and the client are worse off. It is a process to establish and manage the relationships

between the parties that aims to remove barriers, encourage maximum contribution and allow all parties to achieve success.”

The ACA qualify relationship contracting by the following points:

- “Traditional risk transfer strategies often fail, due to poor risk allocation. Relationship contracting provides the approach whereby the various project risks are allocated to the party best suited to manage them.”

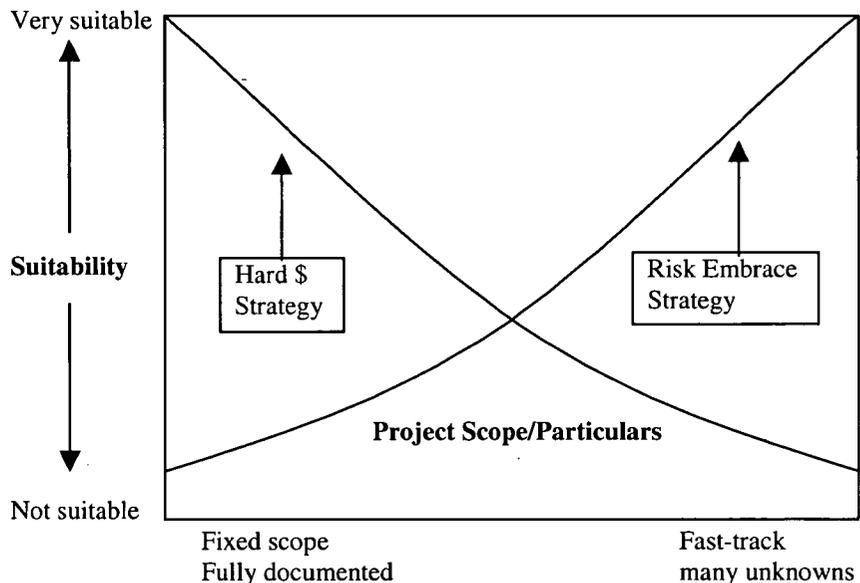


Figure 1: Risk Embrace Strategy (ACA 1999:9)

- “Figure 1 provides some guidelines for the client when deciding whether the circumstances suit a risk transfer or a risk embrace approach. In certain circumstances the owner can better manage its risks by embracing them, (rather than trying to transfer them) and then managing them within a flexible project delivery environment.”
- “Commitment to a common goal, and a clearly defined project scope enables clients and contractors to deliver optimum project outcomes that go beyond time, cost and quality.”
- “The success of relationship contracting depends on the willingness of both clients and contractors to commit to change at an individual and project level.”
- “Depending on the procurement and delivery system adopted, the practices and techniques of relationship contracting can be implemented at the initiation and concept stage of the project - through to design, construction, completion, handover and operations.”

- “Relationship contracting has been successfully implemented by leading Australian construction companies in a diverse range of projects - setting new benchmarks and delivering exceptional outcomes.”

The ACA make it apparent that careful selection of participants is paramount to the success of relationship contracting. The client’s and the contractor’s staff must undergo a culture change such that throughout the firms all participants are aligned not only through common goals, but also through shared business interests in the project’s success, firmly linking profitability to performance. To enhance this alignment the term “alliance contract” is often used.

2.4.3 Alliance Contracts

Davison (1994), defines alliance contracts as;

“long-term partnering contracts under which a joint board, or similar institution is set up, ensuring cooperation and consultation. The board would typically have two representatives each of the principal and of the contractor/contractors.”

Thompson (1998), in his industry address defines project alliancing as;

“The bringing together of an integral team comprised of the best people for the job, drawn from the organization of each of the alliance participants for the purpose of delivering a particular project.”

At the same conference, Murphy gave the following definition:

“Alliance contracts are at the very top end of the scale, a sort of horizontal alliance. It is an alliance between equal partners - the forming of a virtual company. You in fact have a board of directors set up on an alliance contract where the client and the contractor and the other partners to the alliance decide the directions of the project, and you can move about very flexibly and change the projects as you go through. There are certain performance indicators that each partner has to achieve and they get rewarded or not rewarded based on how those performance indicators are achieved. It is an open book arrangement.”

The following secrets of success in alliance contracting published by MinterEllison (2000), give a true indication of the requirements of alliance team members.

“Successful alliance contracting demands that project participants:

- have equal access to information
- have a common view on project risks and the strategy for managing those risks

- be committed to common objectives and outcomes
- share information, knowledge and skills
- develop mutual trust and respect
- be willing to share losses and profits
- use expertise efficiently
- welcome achieving gains through innovation, and
- be committed to a non-adversarial culture.”

MinterEllison (2000), quote the key difference between partnering and alliancing as:

- “The partnering commitments reside outside the contract.
- Alliance contracting focuses on contractual issues such as risk allocation and remuneration. These directly affect each party’s financial interests and allow partnering concepts to become an integral part of the contractual relationship.”

Having now looked at the evolution, and arrived at the definition of alliance contracting, it is possible to resolve the problem of: When is alliance contracting the best method of project delivery? This will be performed by reviewing each of the project management body of knowledge areas, and determining how they are performed by both traditional forms of contracting and alliance contracting.

2.5 THE DELIVERY OF PROJECTS USING ALLIANCE CONTRACTING AND THE RELATIONSHIP TO THE PROJECT MANAGEMENT BODY OF KNOWLEDGE

2.5.1 When is alliance contracting best for specific projects?

In researching alliance contracting it has become apparent that the most important aspect contributing to success is the correct selection of an alliance partner. Indeed Rigsbee (1998), stresses the importance of knowing your partner, and being clear on the goals of the intended synergistic alliance. He lists the following nine critical qualities in selecting an alliance partner:

- Wants to win;
- Knows they are ultimately responsible for their own success;
- Is an active listener;
- Understands and cares about what drives their partner’s businesses;
- Responds well to, and acts on feedback;
- Flexible, especially when events or circumstances are not what was expected;
- Trusting and with integrity respects all parties interests;
- Seeks win-win arrangements and solutions; and
- Understands that partnering is a relationship of interdependence.

These statements are further supported within an article by legal firm MinterEllison (2000), reporting on alliance contracting as follows:

“Alliance contracting is being heralded as proof that principals and contractors can work together harmoniously to get projects completed without costs blowing out and people becoming litigious. If alliance contracting works - and there is evidence that it does - the concept is worth examining because our construction industry is, and always has been, a battlefield on which relationships, productivity and efficiency have all been victims.”

Additionally Harbinson and Pekar (1999), quote the following numbers from their 1997 survey on alliance capabilities:

- 1.) Alliances have consistently produced a return on investment of nearly 17 percent among the top 2,000 companies in the world for nearly a decade. That is 50% more than the average return on investment that the companies produce overall.
- 2.) The 25 companies most active in alliances achieved a 17.2% return on equity - 40% more than the average return on equity of the Fortune 500. The 25 companies least active in alliances lagged the Fortune 500, with an average return on equity of only 10.1%.

A large proportion of projects are delivered through contracts, and this theory is supported by the Construction Industry Development Association (1993), which states that for the traditional lump sum/schedule of rates project delivery systems:

“Under the set framework each contract is analysed in terms of its underlying philosophy and how it deals with the following key issues:

- Risk Allocation;
- The Management of Time, Cost and Quality;
- Communications between the Parties;
- The Role of the Superintendent;
- Management of Provisional Sum Items (with particular reference to the role of nominated subcontractors);
- Security Arrangements (including the use of guarantees, bonds and retention funds); and
- Dispute Resolution (ADR, arbitration, litigation and so forth).”

Ross (1998), advises;

“Several major projects involving public funding in Australia have been able to reconcile the need for public accountability in decision-making with the alliance process and have adopted a project alliancing strategy - including:

- Sydney Water’s Northside Storage Tunnel Project;

- The Commonwealth Government’s Action Peninsula (National Museum) Project in Canberra;
 - Woodman Point Wastewater Treatment Plant Amplification for WA’s Water Corporation.
- The adoption of a full-on project alliance approach on these public sector projects shows that the involvement of public funds and ownership is not necessarily a bar to the effective use of the alliance process. However the process must be carefully designed and implemented to take into account the unique constraints introduced by the involvement of public funds.”

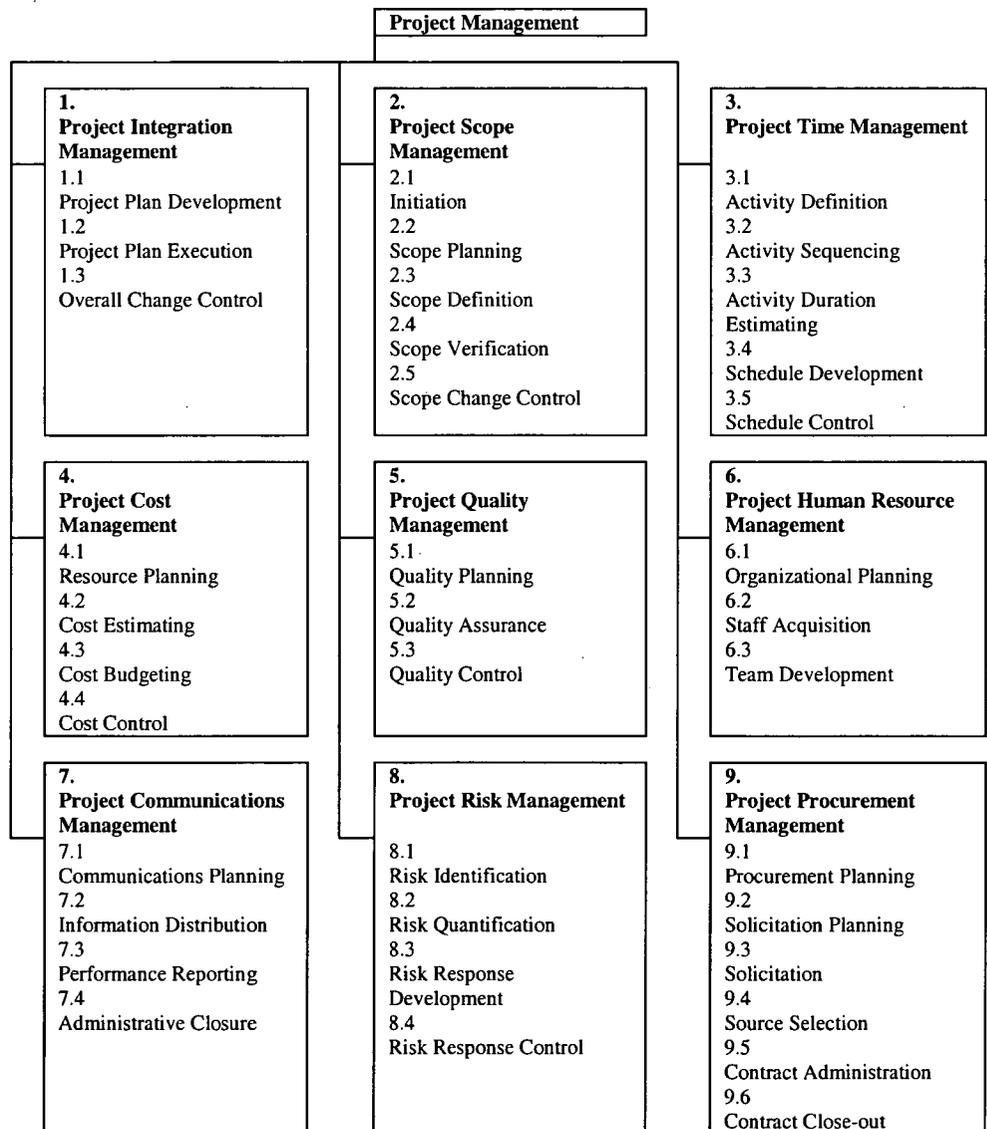


Figure 2: Overview of Project Management Knowledge Areas and Project Management Processes (PMI 1996:7)

Project management, as the name implies is management dedicated to a particular set of related activities, over a definite time period, to deliver a unique and common objective. The profession of project management has developed from a variety of organizations,

which have used projects in different ways to manage change. The Project Management Institute (1996) refers to nine project management knowledge areas and associated processes as being generally accepted within the profession of project management, and these are summarized in figure 2. Generally accepted is qualified by the PMI to mean that the knowledge and practices described are applicable to most projects most of the time, and that there is widespread consensus about their value and usefulness.

Based on this description it is appropriate to research the delivery of projects using traditional forms of contracting together with alliance contracting, by concentrating on the project management processes as they are organized into the nine project management knowledge areas, and detailing how these processes commonly interact.

2.5.2 Project Integration Management

Dinsmore (1993), describes;

“effective project management as a key factor in project success. Getting started may be the hardest part of the project planning process. But the diligence applied at the initiation stage almost certainly pays large dividends at the conclusion of the project. This is where we build the foundation for the project. Without a proper foundation of strategic thinking and organized structures, the project will crumble to the ground.”

While Levine (1991), postulates that perhaps the hardest part of the planning process is getting started, with the major cause of difficulty and procrastination being the lack of a framework for engaging in the process and developing the plan itself. The crucial items for identification fall into the following order of priority, culminating in the development of a project management plan:

1. Project objectives, constraints, and stakeholders.
2. Organizing for the project and development of the project team.
3. This team then participates in the development of a strategy for achieving the project objectives and the clarification of the role of the various project stakeholders.
4. The team then proceeds to the development of a framework for the work scope, timing, and budgeting aspects of the project, including work breakdown structures (WBS), organizational breakdown structures (OBS), structures for accounting, and project milestone schedules.

The project plan, which becomes the blueprint of how the project manager, together with the project team, intends to achieve the objectives of the project. Hence the first item of order in this

planning process is to clearly define the following project objectives:

- Technical objectives
- Timing objectives
- Budget objectives
- Scope guidelines

Upon identification of the project objectives and related constraints the project delivery strategy can be developed in the following order of priority:

- Identify and consult all of the project stakeholders and assess how the project will fit within the business and external environment. An improper fit can place the company's resources in disarray, affecting both the project and the company.
- Identify significant opportunities, threats and issues. An early evaluation of potential threats enables the project team to deal with these risks and minimize their impact. While key opportunities should already have been identified, a further review may discover secondary opportunities that will benefit the company.

Consultation with all stakeholders regarding project issues should promote knowledge of and sensitivity to the issues and prevent them from having a severe impact on the project.

- Creation of the project framework by defining:
 1. The scope in the form of a work breakdown structure;
 2. The timing in the form of a project milestone schedule;
 3. The resources and cost structures

As described by Sydney Water (1997), from a client perspective this often takes considerable time, and it is for this very reason that firms have moved to alliance contracting to achieve this good start that is paramount to project success, without the long lead times that are experienced prior to awarding traditional style contracts. The Sydney Water Corporation decided on this form of contract in 1997, to deliver the Northside Storage Tunnel project. To optimise the prospect of timely or early completion, Sydney Water decided upon alliance contracting arrangements, which would provide monetary incentives for the contractor and Sydney Water to cooperate in order to expedite the completion process. The objective, as explained by Sydney Water, was to create an environment in which Sydney Water and the contractor could collaborate to find the best solution to the overall project objectives. The alliance approach meant that concept development and detail design would not be undertaken until after the contract had been awarded. The concerns were that with traditional contracting the time required for concept and detail design could delay the completion date. Also, design and construction decisions could be rushed at the expense of the best ultimate outcomes.

2.5.3 Project Scope Management

In defining the project scope, Webster (1987), describes the scope of a project as being either the work content or components of the project. It can be fully described by naming all activities performed, the end products that will result, and the resources consumed. The scope statement is a vital document as it defines the project, not only what is included but what is not included. The management of the scope of projects is the most important and troublesome assignment for the project manager. The manager must ensure that the client's needs are met, while ensuring that any work content not in the originally contracted scope statement is billed to the client.

Lientz & Rea (1998), describe the work scope section to be the very heart of the project management plan. It demonstrates how well the project is understood. This section includes narrative descriptions of all elements of the project's scope of work. It clearly identifies the products or services to be provided to the customer. The statement of work contains enough information to allow development of the work breakdown structure, schedules, and cost estimates, as well as assignment of responsibilities.

It can be seen that for a project to be successful careful and precise definition of the project scope is essential. The precise definition of the scope of work prior to tendering lump sum contracts, which leads to long lead times, has been listed as a severe disadvantage by James, Davison, Antill and Farmer, et al. This is particularly prevalent in these times when projects are required to be delivered within extremely tight timeframes.

In his industry address Campbell (1996), observed that for the East Spar Project in Western Mining Corporation's view, the traditional contracting model was ill-suited to WMC's need to optimise the development concept without delaying the project. On that project, while a base case development plan was approved, alternative, less proven concepts, required a longer period to prove-up technically and evaluate economically. WMC required the flexibility to vary the development concept while maintaining schedule and cost.

Ross (1998), advises that where the scope is well defined, and there are few uncertainties associated with the project, the traditional risk transfer approach will deliver the best value to the owner. The more detailed the definition of the scope of the project and the better the degree of pre-planning and investigation, the more accurate will be the tender price. Additionally, the contingency allowance that the contractor must include in their tender for unknown aspects of the project will be reduced, resulting in a reduced and more appropriate tender price with improved certainty of outcome. However where there are many unknowns and

uncertainties a risk embrace approach will usually be more appropriate. In this circumstance, the key client benefits of a project alliance approach are as follows:

- Reduced project delivery time
- Reduced capital expenditure costs
- Improved operating performance in both efficiency and reliability
- Increased flexibility to match changing project requirements
- Enhanced business relationships
- Better management of the inherent risks of safety, environmental, heritage, cultural, community perceptions, etc.
- Greater personal satisfaction for all project participants.

2.5.4 Project Time Management

When describing the management of progress Lock (1996), states that the first thing a project manager must do when a job starts to run late is to consider the effect that this is likely to have on the following:

1. The current project;
2. Projects or other work queuing in the pipeline; and
3. The customer.

On some rare occasions, lateness of a non-critical activity might be acceptable and require no action. However the usual case is that some corrective action is required. The project manager must then assess the situation, decide the appropriate action and implement it. Corrective measures will only be effective when they are timely, which means that adequate warning of problems must be given. This will depend on having a well-prepared schedule, keeping it up to date, and monitoring progress regularly.

Thompson (1998), reported that BHP chose an alliance for delivery of the Direct Reduced Iron - Port Hedland Project, to alleviate concerns held that traditional style contracting would not have the ability to complete construction on time.

This is well supported by Wilson (1994), who observed that the traditional contracting model is not well suited for projects which are inherently fast tracked and very focused, and which may need to be arranged at short notice, outside the normal process of competitive bidding.

2.5.5 Project Cost Management

Wilson-Murray (1997), simplifies the finance cycle within projects into the following six elements:

1. budget approval;
2. capture of accounting information;
3. a project reporting system;
4. a project register;

5. detailed work orders; and
6. control of change procedure.

A management summary report addressing these elements provides management with a concise point of reference.

Many things can happen during the life of the project to alter the expected rate and magnitude of expenditure. However as described by Lock (1997), the principal purpose of cost control is to ensure that no preventable wastage of money or unauthorized increase in costs is allowed to happen. Hence cost control must be exercised at the time when costs are being committed.

Guthrie (1998), quotes an alliance Ralph M Lee were involved in with the BHP HBI Plant at Port Hedland, Western Australia where major design and budget problems were experienced by BHP. However even with the difficulties experienced, there have been no disputes. He emphasized the importance of including the designers in the alliance, as it becomes impossible to control costs if the designers are not part of the budget reviewing process. The principles of alliance contracting are:

- 1.) The owner pays for the full cost of the project;
- 2.) Partners can only make profit by achieving the goals that the owner wants for the project; and
- 3.) All contractors earn their money from the same pool.

This sets the framework for changing the contractor's behaviour by guaranteeing their existence, i.e. they are reimbursed their costs upon full and open disclosure and information sharing. In the worst case the contractor makes no profit, i.e. for poor performance they make nothing, but they don't lose their business.

Thompson (1998), advises that for the Direct Reduced Iron - Port Hedland Project BHP let its' initial contracts on a traditional basis, but decided that the disadvantages of the traditional contracting strategy were such as to give rise to serious concern as to its' ability to complete construction within budget.

Minns (1996), reported that the Wandoo Project was delivered using alliance contracting, as Ampolex was keen to avoid costs arising from duplication of activities and felt, on a more general level, that traditional contracting did not encourage contractors to use their expertise to reduce costs.

Guthrie (1998), stresses that a no disputes clause is an essential part of an alliance contract. A properly constructed contract eliminates disputes. The contractors and designers have all of their costs paid and they are rewarded for meeting the project goals. The client has access to all information and can see that he is not being cheated. He is part of the decision-making and is only rewarding the designers and constructors if the project goals are met.

The ACA (1999), reports that alliance contracting fosters an environment whereby all parties are focused on results, and continually challenge conventional standards. Combining these attributes with proven delivery strategies and techniques optimises the project deliverables, resulting in optimum commercial benefits to all parties involved. The key driver to this success is that all parties are involved at the conceptual and early design stages of the project, where the ability to reduce the overall project cost, or build in additional value is greatest. The risk/reward model of alliance contracting aligns all parties to the objective of minimizing costs, as the client and contractor gain from the savings. There is a no blame approach, whereby success or failure is a joint responsibility, thus providing greater incentive and encouragement to apply the latest technology and be innovative in design, technology, systems, processes and techniques. By aligning parties through shared business interests, firmly linking profitability to performance, they can be motivated to question costs, pursue best value and stimulate innovative ideas to achieve savings. This environment fosters technical excellence and behavioural change, encouraging the parties to operate with “open books” and mutual review of all party’s costings. The Project Target Cost is established using this methodology, and continues as a measure of performance throughout the project life cycle. The issue of “value for money” is central to the probity concerns of government. Alliance contracting is based on a cooperative approach, with a philosophy of no disputes and no blame, and a containment within an estimated target cost of the project. This can provide a more effective guarantee of value for money than traditional projects with a propensity for conflict, claims and general price blowouts.

According to Winch (2000), throughout the 1990’s the British construction industry has not delivered value for money, due to the dynamic of adversarial relations interacting with a second dynamic of over-engineering. Thus competitive tendering, despite its emphasis upon lowest price, was not actually delivering low production costs; in addition, it was generating very high transaction costs due to the requirement that designs be fully specified at tender. This promoted research to resolve the problems of the industry, with the most notable being the Latham report, published in July 1994. The main conclusions by Latham were:

- Clients are the key to project performance.
- Tendering procedures for both consultants and contractors are in need of reform and should both be developed to include quality as well as cost criteria in tender evaluation.
- Existing standard forms of contract are inadequate and generate adversarial relations. New forms of contract need to be established.
- A target of a 30% reduction in construction costs should be set for the year 2000.

Winch concludes that the adoption of partnering and the reform of standard contracts that focus on transaction governance can deliver important gains, as costs are reduced. The partnering process enables differences to be resolved before they become disputes, and disputes can be settled without expensive litigation. The important additional benefit of partnering is that it can provide the motivation for innovation, and hence significantly reduce production costs.

Matthews and Rowlinson (1999), report that typically, with project partnering, cost savings of 2-10% are achieved, and with strategic partnering savings of 30% are realistic over time. If firms commit to alliances that cooperate in improving joint performance by the client and a group of consultants, contractors and specialists engaged in an ongoing series of projects, then cost savings of 40% are not uncommon, and timesavings of more than 50% are achievable.

Kumaraswamy and Matthews (2000), in stressing the importance of improved subcontracting report that the contribution of specialist and trade subcontractors can account for 90% of the total value of the project. Subcontractors revealed that they had consciously reduced their pricing levels by an average of around 10%, in recognition of savings that they anticipated from the improved working relationships and arrangements of partnering with the main contractor. The enhanced operational efficiencies expected to arise from the partnering arrangements, resulting in such direct and tangible benefits to all party's gives credence to the changed approach to doing business.

2.5.6 Project Quality Management

Deming (1989), describes productivity improvements as an area of major management attention. Total Quality Management (TQM), with its emphasis on determining real needs and of improving performance continuously, has perhaps been one of the most potent concepts in recent years. This continuous improvement foundation is described by Dinsmore (1993), as the Plan, Do, Check, Act cycle, as shown in figure 3.

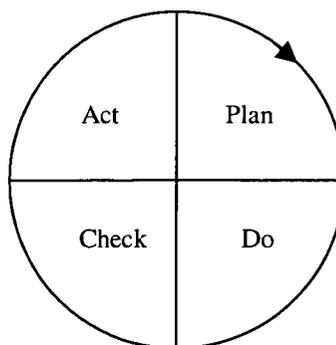


Figure 3: Continuous Improvement Cycle (Dinsmore 1993:267)

This cycle shows that the quest for improved quality is continuous and never ending, thus continuous improvement evolves when quality management tools and techniques are applied to work processes.

Mendelssohn (1990), qualifies the term of quality management further by emphasizing, the focus of quality management on projects is to control the process of executing activities to achieve customer satisfaction. In the past, control of the final results was the primary concern. Now, emphasis is placed on ensuring that the process is capable of achieving the desired results and can consistently satisfy the customer's needs. The way to make this happen is to assure the quality of each step involved in the project. The outcome of each step must be acceptable to the next person in the process (the internal customer) until the end user (the external customer) of the project is ultimately satisfied.

Verna, Truce, and Shelley (1991), advise that even in a depressed economy, partnerships can succeed and look forward to growth and a bright future, by designing a total quality management structure. All participants are bound together as a unit, with common values encouraging a culture whereby employees are motivated towards a common vision, and guided by accepted systems and policies.

Combining this information with the advice from Holland, Busted, and Balen (1993), that with increasing competition both nationally and internationally, the development of customer-driven service quality strategies will become a vital competitive tool, gives impetus for contracting firms to initiate alliance contracting. The clear message from clients, customers and competitors is that meeting or exceeding customer needs through effective quality management is a pre-requisite for success and repeat business. Continual client participation with other alliance participants, in the formation and monitoring of the project quality management plan, increases the probability of delivering the project, whilst achieving the following key components of world-class performance:

- Customer satisfaction;
- Continuous process improvement;
- Technology mastery; and
- Cost leadership.

Love, Li, Irani, and Faniran (2000), write that total quality management has not been well received by the construction industry, and consequently construction firms have not progressed to implement continuous improvement initiatives, and therefore the potential for learning has been inhibited. If the construction industry is to improve its performance, construction organizations must learn from mistakes and adapt to the changing environment. They identify total quality management and organizational learning as fundamental components that a construction organization should

embrace, if it is to become a learning organization and be a leader within the construction industry. However if total quality management is to be implemented, construction organizations may well have to change their existing mind-set so that total quality management practices become a part of organizational life. Only then can innovative management concepts derived from manufacturing be implemented successfully by the construction industry.

The ACA (1999), supports this theory in stating that alliance contracting requires a substantial change in behaviour by the client, designers, suppliers and contractors to achieve superior quality project deliverables. Facilitators have been valuable contributors to the successful establishment and ongoing performance of the integrated project team, by assisting and working with the team to:

- build best practice behaviours;
- develop an environment of trust, co-operation and open communication;
- develop the goal of achieving excellent quality results; and
- maintain a focus on common project goals and the team.

2.5.7 Project Human Resource Management

Clark (1991), refers to human resources management as a staff function, as it involves activities and processes, which are means to ends. The structure of an organization is a significant determinant of how employees behave. A social hierarchy stems from this formal structure, incorporating a status system and symbols of rank. Project managers often suffer difficulty managing project resources if they are contained within the formal organization structure.

Projects are fraught with conflicts. Rosenau (1998), poses that conflicts inevitably arise because projects are temporary entities within more permanent organizations, and that the root cause is thus competition for resources. He further adds that studies have shown three ways to reduce conflict:

1. Work at conflict reduction proactively because conflict is always present and will not go away if you ignore it or wish it was not present. In fact, left unconflicted, it normally gets worse.
2. Have and maintain good plans in the form of current and realistic schedules agreed to by the people involved.
3. Communicate thoroughly with all involved people and their management.

In his report on the Wandoo Project, Minns (1996), noted that Ampolex opted for an alliance, as this style of contract enhanced the firm's philosophy of:

- maintaining a flat company structure; and

- keeping staff numbers as low as possible.
- Ampolex was concerned that traditional style contracting would not achieve the same result.

An article by Ulrich (1998), describes organization as the only competitive weapon left. Project human resource management is a vital component of the project delivery strategy, as the project manager is often not judged by what they do but by what they deliver. In the new economy of today, winning will spring from organizational capabilities such as speed, responsiveness, agility, learning capacity, and employee competence. Alliances have much to offer in this area, as single entity organizations struggle to compete if they carry all of the human resources required to deliver a project, and traditional contracting is not always successful. Successful organizations will be those that are able to:

- quickly turn strategy into action;
- manage processes intelligently and efficiently;
- maximize employee contribution and commitment; and
- create the conditions for seamless change.

Ross (1998), advises that for alliance contracting, an alliance board is created comprising of equal representation from each of the alliance participants, with all decisions relating to the alliance project being made by the alliance board. The alliance becomes a virtual company charged with the responsibility for delivery of the project. The board appoints a project manager to head up an integrated project management team. Most of the project team resources are provided along company lines consistent with the expertise of the various participants, with key positions filled on the basis of the “best-for job” rule. This philosophy for selection of project personnel, when linked with a facilitated training program for people to work in the new environment of openness, encourages problems to be addressed with the “best interest of the project” always at the centre of decision-making. It is vital for the core alliance management team to use their leadership skills to promote the same vision and enthusiasm throughout all levels of project personnel. It may even be appropriate to implement an employee gain sharing scheme, however if not managed correctly the scheme will not deliver the benefits that it should. The assurance of project team performance does not come from any power conferred on the client under the contract, rather it arises from the model and the alliance process. The motivators, which drive contractors to perform well, are as follows:

- The personal commitment given “eye-to-eye” by their senior executives;
- A desire to enhance reputation;
- The quality of the relationship, and the genuine commitment to values, principles and shared outcomes;

- The commercial benefits, which flow to the contractor from beating the agreed performance targets. These motivators are far more effective in guaranteeing performance than the whole suite of punitive sanctions, which are typically found in traditional contracts.

Cheng, Li and Love (2000), report that an alliance can be a method employed for organizational growth. The partnership can be used for exchanging such resources as knowledge, skills, experience, visions, ideas, and information. The formation of alliances between organizations, with the equal sharing of these internal resources, can be used to improve business performance to obtain and sustain a competitive advantage in the market place.

2.5.8 Project Communications Management

Organizations are continually faced with the challenge of changing to suit the environment they work within, as described by Forman (1994). Change requires careful managerial planning and skill to achieve as it is often resisted by employees, and for this reason a project manager is made responsible to implement the change. There are many reasons employees resist change, such as self-interest, low tolerance to change, misunderstanding and lack of trust. The project manager must diagnose the potential reasons for employee's resistance to change, and choose a method to overcome resistance to the new innovation. Providing adequate information and ensuring the change is clearly communicated to those involved is an excellent strategy for overcoming resistance to change. Involving the project team in the formation and negotiation of the change gives the work force some ownership of the change thus potentially giving a better probability of successful introduction of the innovation.

Effective communication throughout the project team is paramount to success of the project, according to Lientz & Rea (1998). The manager must ensure that in getting the message across all parts of the organization, that in the exchange of messages between people common meanings are achieved. Unless meanings are shared, managers will find it difficult to influence others. It is for this reason that communication is a critical part of every manager's job. Without effective communication, even the most brilliant strategies and best-laid plans may be unsuccessful. Hence effective communication skills, both oral and written, are crucial to success. The project manager should provide opportunities for employees to participate in decision-making and for consultation and expression of worthwhile ideas. Acceptance of an employees promising suggestion not only satisfies their need for self expression, but also gives them a feeling of status and a sense of commitment to see that their proposal works successfully.

Barker and Gaut (1996), stress that good communication within any organization is vital. It should be as direct as possible, both up and down, without avoiding the official line of control. Managers must ensure adequate communication becomes the goal of their organization. Brief verbal discussion and concise written reports will increase productivity, whereas verbosity merely wastes everyone's time. This is never more apparent than in the sphere of project communications management. Successful project managers are constantly building consensus, and promoting confidence in decisions at critical interfaces in a project, by practicing active communication skills. The project manager must communicate to upper management, to the project team, and to other stakeholders. This communication process is rarely easy as the project manager often encounters barriers to effective communication, such as lack of clear communication channels and problems with technical language that must be used. The project manager has the responsibility of knowing what kind of messages to send, knowing to whom to send the messages, and translating the messages into a language that all can understand. This is further compounded by the use of a diverse composition of resources that are often foreign to the project environment. The successful leader of today organizes ideas so that the information presented to the audience is logical and easy to follow. The leader in presenting this new information must deliver the ideas effectively to sustain listener attention and motivation. The real benefits to the organization are realized through the manager providing opportunities for employees to participate in decision-making, and for consultation and expression of worthwhile ideas. This gives the employees some ownership of the new initiative to improve efficiency, and a sense of commitment to successful implementation of the change.

The NEDC Report (1992), suggests the underlying philosophy of the New Engineering Contract is to encourage efficient and effective project management on construction contracts, and it particularly encourages trust and effective communication between the parties. The style is plain English and is markedly different to the standard Australian forms.

The Zemke's (1994), list organizational communications problems as one of the serious barriers to forging a successful partnership. A successful alliance relies heavily on shared front-line information systems, as the partners must have access to the same information in a timely, easy to obtain fashion. The alliance requires a networked organization whereby the allies are able to penetrate each others organization up and down the structure, not only at the top of the pyramid. To be successful the alliance participants require shared vision and values, with opportunities for mutual learning. This can only be achieved through effective communication and changes in company culture, to develop mutually acceptable practices and foster trust. The success of an

alliance depends on mutual faith, and there must be trust, as it is hard to be enthusiastic and take risks with someone you do not trust.

The ACA (1999), reports that successful alliance contracting relies on positive changes to habits, behaviour and attitudes of all parties. Open, honest communication between all individuals is effected by their belief that they are members of the team, and that the entire team is focused on achieving the project aligned goals. Systems can be developed jointly to monitor, review and report on project performance to achieve improvements, based on agreed deliverables and key performance indicators.

Lazar (2000), reports that for an alliance to be successful communication and trust is vital for all participants to improve the likelihood of win/win partnering outcomes. Management must increase investment in preparing and implementing mixed cooperative strategies of behaviour conducive to trust development, and enhance training for personnel with emphasis on dispute resolution and organizational communication. Partnering is a system of project management built by people, relationships, and trust. The greater investment in organizational resources should be well outweighed by the increased economic return from the higher likelihood of a successful relationship.

2.5.9 The Management and Allocation of Risk

The NPWC/NBCC (1990), reported that the construction industry is subject to more risk and uncertainty than many other industries. Construction projects traditionally have an abundance of risk, which contractors cope with and clients pay for. As the clients of the industry ultimately pay the bill, it is important to understand their needs under the following headings:

- Time can mean both the need for rapid construction, and completion on the specified date.
- Cost means obtaining value for money, and completing the project within budget.
- Quality is used to cover technical standards, including such areas as safety and fit for purpose.

The relative importance of these will vary from client to client and project, however one thing is certain the client does not want any surprises, and to achieve their desired objectives a professional approach to risk management is required. For most situations, the effects of adverse events have financial consequences.

In the context of the management and economics of projects, this is supported by Raftery (1994), who stated that;

“Risk and uncertainty characterize situations where the actual outcome for a particular event or activity is likely to deviate from the estimate or forecast value.”

This is also true for the definition of risk given by Chapman (1991);

“Exposure to the possibility of economic and financial loss or gain, physical damage or injury, or delay as a consequence of the uncertainty associated with pursuing a particular course of action.”

Raftery (1994), further advises the task in hand is to identify the sources of risk which cause failure to occur, and develop a risk management strategy that provides for the appropriate organization to carry that risk. This requires a formal process of addressing the following:

- risk identification;
- risk analysis;
- risk allocation; and
- risk control;

culminating in a risk management plan for use throughout the project. Typical risks encountered on a construction project include:

- failure to complete within the specified design and construction time;
- failure to obtain the relevant approvals within the time allowed in the design program;
- unforeseen adverse ground conditions delaying the project;
- exceptionally inclement weather delaying the project;
- industrial action or strike by the labour force;
- unexpected price rises for labour and materials;
- failure to let to a tenant, or sell development upon completion;
- an accident resulting in personal injury or plant damage;
- latent defects occurring through poor workmanship;
- force majeure (flood, earthquake, shipment sunk, lost or stolen, etc.);
- a claim from the contractor for loss and expense caused by the late production of design details; and
- failure to complete the project within the client’s budget allowance.

Ultimately if any of the above risks come into fruition, one or more of the following will be affected:

- failure to deliver project within budget;
- failure to deliver project on time; and
- failure to meet the required technical standards for quality, function, fit for purpose, safety and preservation of the environment.

Thompson and Perry (1992), state that traditionally the risk in construction projects is allocated as follows:

- client to designer and contractor
- contractor to subcontractors

- client, designer, contractor and subcontractors to insurers
- contractor and subcontractors to sureties or guarantors.

This traditional risk transfer approach has the consequence of increasing costs as risk and reward go hand in hand, i.e. more risk = greater cost. If the client transfers a lot of the risk, then the contractor will charge a premium for this, and may still come back for more. Disagreement and conflict typically arising on projects have generally resulted from the following:

- an unreasonable burden of risk being allocated by the contract to one of the parties who is not equipped or capable of carrying that risk;
- ambiguous specification clauses with decisions left at the discretion of either party;
- methods rather than results being specified, with the contractor being responsible for providing the desired results;
- deficient drawings or design with discrepancies between interfaces;

and depending on the severity of the consequences if the risk occurs, may lead to disputes and litigation. The following considerations should govern the allocation of risk:

- who can best control the events that may lead to the risk occurring;
- who can best manage the risk if it occurs;
- does the client prefer involvement in management of the risk;
- who should carry the risk if it cannot be controlled;
- will the premium to be charged by the transferee be reasonable and acceptable;
- will the transferee be able to sustain the consequences if the risk occurs; and
- whether, if the risk is transferred, it leads to the possibility of risks of a different nature being transferred back to the client.

Mathews and Rowlinson (1999), report that;

“Current approaches to safety legislation have altered the accepted norms concerning responsibility for safety, and have placed much more responsibility on to the client. To some, this is seen as an excessive burden, but current safety management philosophy advocates self-regulation. Partnering offers the opportunity to share costs and responsibility for safety throughout the project team.”

MinterEllison (2000), advise that risk management strategies under alliance contracting include establishing processes and procedures much broader than simply transferring risk to a third party via an insurance contract. Risk is volatile and requires constant management throughout the life of the contract. Allocation of risk must be supplemented by agreement on processes and procedures for collective risk management. Therefore, while the contractual responsibility for a risk may lie with a particular party to the

contract, all parties are under a legal obligation to collectively manage, and in practice, to an extent share all risks. Alliance contracting has the ability to respond to, or allocate risk in any one of, or a combination of the following four basic forms:

- risk retention or absorption;
- risk reduction;
- risk transfer; and
- risk avoidance.

Minns (1996), reported that Ampolex were keen to avoid confrontational relationships in delivering the Wandoo project, and consequently decided upon an alliance to alleviate concerns that a traditional style of contracting would not deliver a satisfactory result, due to the following:

- It was believed that the client/contractor relationship would not achieve outstanding results.
- A disproportionate amount of energy would be expended arguing over claims rather than managing the project. In fact, a major construction project was becoming seen as a prelude to a protracted piece of litigation.
- Ampolex owned 100% of the project, and with a budget of \$480 million felt that good risk management demanded that this exposure be reduced.

The CRINE report on the oil and gas industry (1994), attacked a number of aspects of the traditional contracting model, and recommended the simplification and clarification of contract language, the elimination of adversarial clauses, encouragement for risk/reward relationships, and the curtailment of liquidated damages.

Sydney Water Corporation (1997), assessed Sydney Harbour as one of Australia's most recognized and valuable attractions, with the quality of water in the harbour as a key public concern. With sewage overflows during wet weather being a significant source of pollution in the harbour, the Corporation chose alliance contracting for the Northside Storage Tunnel Project, to enable them to better manage the risks involved. The alliance adopted a risk/reward structure in order to provide incentives for exceptional performance, and sharing of the risks/pain for poor performance.

The ACA (1999), report that while clients and contractors are best served when the delivery strategy suits the project requirements, many clients still use contracts structured to shift the risk. Many large projects have unknowns, and the risks can be better managed by the client through a cooperative approach, where the risk is embraced rather than transferred. For these projects alliance contracting offers the parties a variety of techniques to ensure the goals are closely aligned within a risk/reward framework that balances risk and reward, thus enabling all parties to remain

focused on the optimum project outcome. The focus is towards cooperation to continually improve the project deliverables, rather than creating a legal regime to penalize non-conformance.

2.5.10 Project Procurement Management

Inherent in the process of managing a project is the procurement of a wide variety of resources. In most instances, this requires the negotiation of a formal, written contract. Thus procurement/contract management is essential knowledge, according to Webster (1987). Different types of contracts are likely to elicit different types of behaviours by both the contractor and the contractee. These need to be matched to the requirements of the project. The processes of initiating, evaluating, negotiating, and administering contracts are essential skills. In a global business environment it is also essential to understand varying social, political, legal, and financial implications in this process.

Morris (1993), describes the degree of owner involvement being clearly related to the contractual strategy being developed. It is now generally recognized that the type of contract should relate to the degree of risk the contractor is expected and able to bear. If the project scope is not yet clear, it is probably better not to use an incentive or fixed price type contract: The contract can be converted to this form later. Contracts should be motivational, and top management support and positive attitudes should be encouraged. The parties to a contract should put in as much effort as possible as early as possible into identifying their joint objectives. It is better to spend longer working out how to make a contract a success than how to take down the other party. While competitive bidding is healthy and therefore should be encouraged, adequate time and information must be provided in order to make the bid as effective as possible. Adequate time should be spent ensuring that the basis upon which the bid is to be evaluated are the best, as price alone is often inadequate.

It becomes apparent that where the scope can be clearly defined, traditional types of fixed price contract are possibly the best vehicle for project delivery. However for projects with broad scopes that will be defined more clearly as the project develops, then this form of contract is most likely to fail if the relationship between parties is not favourable, and alliance contracting may be a better option. This decision should not be taken lightly, as MinterEllison (2000), explain that experience has shown that it takes significant resources to plan and implement an alliance. Considerable care needs to be taken to involve the customer at all times, and time must be invested in creating awareness of the alliance concept. All parties must understand that alliances require effort, and that time must be allowed for relationships to develop. However if both parties are committed to working together and sharing the risks, the benefits

for each will out weigh the perceived gains to one party in traditional methods of contracting. The challenge in alliance contracting is to get the alliance members working as an alliance. They must leave their corporate identities at the gate and work together as a team.

According to Smyth (1999), partnering has become an important way in which contractors sell and clients procure construction services. Through partnering, contractors have been successful by increasing the levels of client satisfaction, while securing a more stable workload than work available on the open market. The economics of repeat business can be improved through partnering, thus helping to manage the market to the mutual benefit of both parties, and inducing a win-win situation. The relationship marketing helps to overcome the low price, low value approach and induce a healthier sector economically, that is more able to pursue continuous improvement for clients through added service value.

2.6 ALLIANCE CONTRACTING CASE STUDIES

2.6.1 Overview

Concluding his address to the construction industry, Thomson (1998) stated that to date alliancing had been primarily adopted on large-scale projects, with blue-chip companies as the alliance participants. The first projects have come in successfully, and the feedback from those currently in hand is very positive. With continued good results from alliancing, this will ensure its future as a desirable project delivery strategy for major projects.

The following are examples of projects that have been delivered successfully using alliance contracting:

2.6.2 Wandoo B Offshore Oil Platform

1997, Wandoo Alliance publication. 1999, Relationship Contracting, ACA publication.

Alliance Members

Ampolex Limited (Client), Brown & Root, Keppel FELS, Leighton Contractors, Ove Arup & Partners.

Project Description

The project required the development of an oil field, located offshore Western Australia. The physical nature of the deposit created reservoir-engineering problems, which had to be resolved, meaning that the field was always a commercially marginal and high-risk deposit. The engineering solutions adopted to recover and process the oil had to be delivered within tight time and budget constraints

to ensure that the returns satisfied Ampolex's acceptance criteria.

Project Budget

The total project budget for the Wandoo Development was \$480 million. Of this, \$375 million was committed to the design and construction of the infrastructure work. The alliance delivered this portion of the project \$13 million under budget. The balance being the drilling and production operations preparation work which were the responsibility of Ampolex.

Project Schedule

The Wandoo Full Field Development was completed and achieved first oil 26.5 months after project approval. This was three weeks ahead of the Ampolex Board's target date, however the stretch target set by the alliance board of 24 months was not met. This compares most favourably with an industry norm for a similar project of 34 months based on a study of 300 projects from 26 operators.

Summary of Benefits Realized by the Alliance

- The Wandoo Full Field Development was an outstanding success. The owner, Ampolex, was able to bring a significant asset into production at least seven months faster than benchmarked world performance for similar platforms, with a cost saving of \$13 million against the sanctioned project budget, which was shared between the parties of the Alliance.
- The Alliance performed in an environment of mutual trust and respect, with open access to all project costs of the parties, and the owner and the participants departed confident of their ability to work together again.
- Ampolex is on record as saying that "...a properly formed alliance will deliver exceptional savings in project time and project cost to the client, resulting in exceptional satisfaction to each individual employed within the alliance."

2.6.3 East Spar Development

1999, Relationship Contracting, ACA publication.

Alliance Members

Western Mining Corporation, Kvaerner R J, Brown Pty Ltd, Clough Limited.

Project Description

To develop a gas condensate field located offshore Western Australia, where the scope of the project was not able to be defined at the outset, and there was a very tight window of

opportunity to meet the delivery date of gas to the Goldfields pipeline.

Project Budget

The project budget was \$270 million.

Project Schedule

This project was designed and constructed between February 1995 and November 1996.

Summary of Benefits Realized by the Alliance

- Saved time and met schedule.
- Flexibility allowed critical path work to proceed while offshore problem areas were addressed.
- Client/contractor relationship was very amicable and technical problems and issues were addressed without the normal commercial problems preventing the best solution being found quickly.
- Working relations between team members were focused on doing the job without letting contractual problems interfere - a 'whole of life' approach to the job was thus possible.
- Overall cost was minimized since all stakeholders had an incentive to improve in order to share in the outcome.
- The traditional inertia on technical issues was removed and significant innovation was achieved due to the incentive to improve outcome.
- A fair margin was negotiated in the original contract and then some additional margin was achieved.
- The ability to develop long-term relations has been beneficial to negotiating future work between the parties.
- There was no owner's representative team, which resulted in cost savings and removal of a source of conflict.
- Project decisions were taken by mutual agreement between all parties and thus implementation was able to proceed far more quickly.
- A 'whole of life' cycle approach to job decisions, equipment selection etc. was successfully implemented due to the cooperative team approach and the contract provisions to adjust the target if an issue justified it. An example was a \$1 million increase in target to use common equipment to the existing gas treatment compressors.

2.6.4 Boyne Smelter Expansion Alumina & Bath Handling Systems

1999, Relationship Contracting, ACA publication.

Alliance Members

Comalco, Barclay Mowlem Construction Limited (BMCL), Bechtel Minenco Joint Venture.

Project Description

Part design, manufacture, part supply, install, test and commission the Alumina and Bath Handling System for the Boyne Smelter Expansion. The main elements being the construction of civil foundations, 14 large steel storage bins and associated steelworks, two Air Lift Towers and associated galleries, installation of specialist equipment supplied by Alesa Alusuisse and Aluminium Pechiney and associated electrical works.

This was recognized as one of the more difficult and complex portions of Comalco's new third Potline at their Boyne Island Smelter, as early delivery was very important to the owner, hence fast tracking was required, and the design was not fully developed.

Project Budget

This particular contract had a budget of \$19 million.

Summary of Benefits Realized by the Alliance

- The project was completed in a 'world's best' construction time for this type of facility.
- Costs were well within budget.
- The contractor was encouraged to strive for continuous improvement.
- The contractor had less risk of losing money.
- The client had the flexibility to change the scope of work.
- Two thirds of the people working on the project thought it was an above-average work environment, and 75% of the people working on the project thought there was a good feeling of team work, cooperation and trust.
- The success of this project was outstanding. By completing the project on time and within budget Barclay Mowlem ensured that the first hot metal milestone on the project was achieved well ahead of schedule.

2.7 EXISTING GUIDELINES FOR SELECTING ALLIANCE CONTRACTING AS THE SUPERIOR METHOD OF PROJECT DELIVERY

2.7.1 When Should Alliance Contracting Be Selected?

Alliance contracting is described by MinterEllison (2000) to be well suited where:

- the project is complex and involves numerous contractors, equipment vendors and technology suppliers
- the project has a budget, which may necessitate additions or deletions that would not be economic, or efficient in a lump sum tendered situation
- the project warrants continuing review and/or refinement because of its magnitude, complexity or prestige
- the principal's requirements are not adequately defined or may be redefined during the design/construction process
- the funding allocation for the project requires the principal's detailed involvement in managing the cash flows or giving approvals on a stage-by-stage basis
- unacceptable risk would be placed upon a single contractor
- there are complex staging requirements such as the maintenance of user operations during construction
- there is a possibility of disruption during construction, which it would be unreasonable to expect the contractor to bear

The ACA (1999), advise that clients and contractors are best served when the project delivery system best suits the project requirements. Figures 4 and 5 illustrate a suitability matrix for evaluating and selecting the appropriate project delivery system.

	Weight	Low rating	1	2	3	4	5	6	7	8	9	10	High rating
1 Is early delivery of project of value to owner?	20%	No value at all										1.80	Of great value
2 Nature of work – green field versus brown field?	15%	Total green field site								1.20			Many critical interfaces with existing operating facilities
3 Technology – proven or radical?	10%	Well proven stable technology (will not evolve during project)							0.70				New and/or evolving technology
4 Risk culture of owner?	10%	Totally risk averse – risk transfer culture								0.80			Strategic management of risk - sophisticated view of risk
5 Tight guaranteed maximum price (GMP) essential for project sanction?	10%	Tight GMP essential							0.70				Owner flexible within a range
6 Industrial relations environment?	10%	Very low risk								0.90			Very high risk
7 Proven relationship contracting record with potential engineering contractors?	8%	No track record or bad track record							0.64				Good track record
8 Sensitivity to disruption from aboriginal/heritage/environmental issues?	7%	Very low risk							0.49				Very high risk
9 Owner's understanding/experience of project delivery process?	5%	Little experience					0.25						Very experienced
10 Will construction require single (multi-discipline) or many contractors?	5%	Will require many different contractors			0.20								Could be constructed by one contractor
	100%	Drop-down totals	-	-	-	0.20	0.25	-	1.89	2.64	2.70	-	= 7.68 (Refer Figure 5)

Figure 4: Suitability Matrix – Project Delivery Systems (ACA 1999:11)

Clients and contractors are best served when the project delivery system best suits the project requirements.

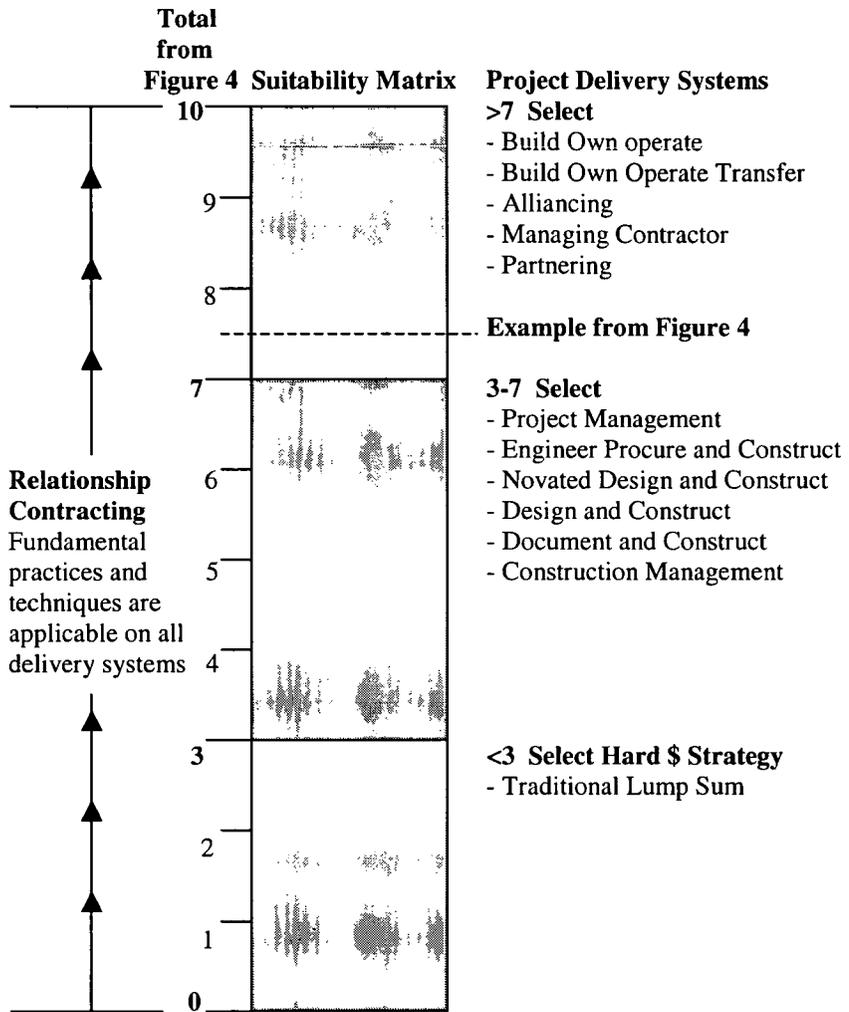


Figure 5: Selection – Project Delivery Systems (ACA 1999:12)

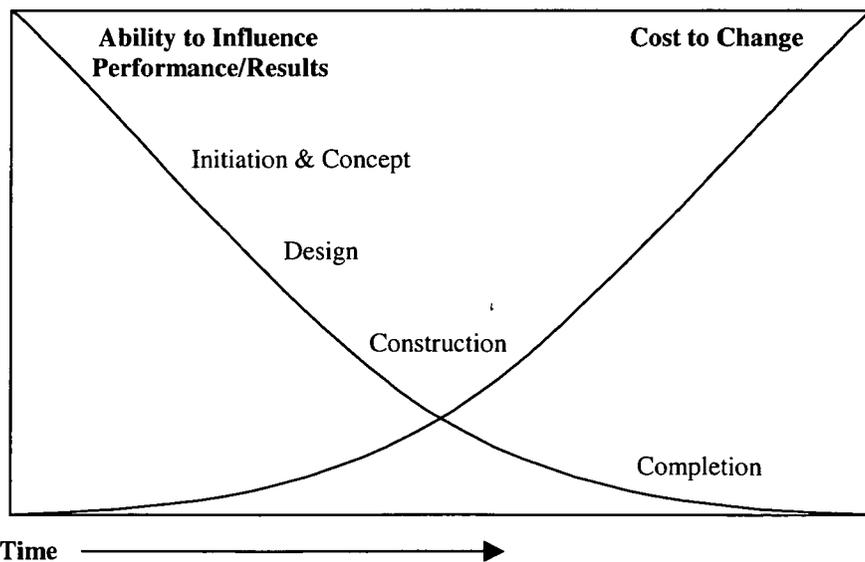


Figure 6: Project Cost Reduction Opportunity (Traditional Contract Delivery System, ACA 1999:14)

Involving the key parties very early in the project's life will maximize the very high potential for effecting optimum project outcomes, as illustrated in figure 6. The ability to influence performance is highest at the very early conceptual stage of the project. This ability to reduce the overall project cost, or build in additional value during the conceptual and early design stages is facilitated by relationship contracting.

2.7.2 When Should Alliance Contracting Be Rejected?

MinterEllison (2000), advise that alliance contracting will not work for projects where:

- the project is comparatively small, as the skill, work and expense dedicated to establishing the alliance will not return sufficient benefits to the project
- the participants in the project do not have the necessary trust and cooperative relationship necessary to form the basis of the alliance
- the participants are small players who do not have the administrative structure necessary to provide participants to the alliance management team
- the numbers of contractors to be coordinated on the job are few

2.8 SUMMARY OF FINDINGS

The review of the literature revealed; in recent years within the building and construction industry there has been a sharp increase in adversarial activity between contractors and the clients they serve. This has been attributed to projects being delivered in an environment of uncertainty, whereby the traditional risk-transfer contracting models have increasingly been shown to be inadequate. Clients, seeking cooperative and synergistic relationships between their own consultants and those of the contractor, have forced the industry to develop new forms of contracting.

In the late 1980's partnering emerged, whereby formal procedures for resolution of disputes were added to conventional contracts. The parties to the contract gave an undertaking to work together in a cooperative manner, and consult regularly.

Throughout the 1990's relationship contracting emerged as a process to establish and manage the relationships between the parties, aiming to remove barriers and encourage maximum contribution, thus allowing all parties to achieve success.

At the high end of the scale of relationship contracting sits alliance contracting. This becomes an alliance between equal partners - the forming of a virtual company reporting to a project alliance board, consisting of equal representation from the client and the contracting firms. This partnership is an open book arrangement

designed to ensure cooperation and consultation, and foster flexibility allowing the project to change easily throughout the life cycle. There are defined performance indicators that each partner has to achieve, and they are rewarded or penalized based on how they perform against the performance criteria. A no blame approach is adopted, whereby success or failure is a joint responsibility.

There is proof that alliance contracting can be used as a legitimate alternative to traditional forms of contracting, for delivering both private and public sector projects. Clients and contractors have worked harmoniously to deliver challenging projects without costs blowing out, or people becoming litigious. Research has shown that resulting from the operational efficiencies and overall project cost savings, companies most active in alliances have in fact achieved a significantly higher return on equity, when compared to companies least active in alliances. However there are many projects not suited to alliance contracting, and for these projects traditional forms of contract continue to serve the client well. Typically this would be where there is adequate time to clearly define the scope of works, the project scope is then well defined, and there are few uncertainties associated with the project.

Alliance contracting offers many benefits to the project manager in all of the nine project management knowledge areas, particularly where there are unknowns and uncertainties with the potential for changes throughout the project. In this type of environment, the risk embrace approach of alliance contracting enables the various project risks to be allocated to the party best suited to manage them, whereas traditional risk transfer strategies often fail, due to poor risk allocation. There have been cases where alliance contracting has reduced the overall project duration and cost whilst building in additional value, due to the ability to influence performance during the early project concept and design phases.

There is evidence to prove that the most effective method of achieving project success and repeat business is to meet or exceed the customers needs through effective quality management. When the alliance participants and the client are involved in the formation and monitoring of the project quality management plan, this increases the probability of delivering the project whilst achieving the following key components of world-class performance:

- Customer satisfaction;
- Continuous improvement;
- Technology mastery; and
- Cost leadership.

Open, honest communication and trust are vital ingredients for a successful alliance. The personal commitment given by senior executives of all parties encourages delivery of optimum project

outcomes that go beyond time, cost and quality. The motivators, which drive contractors within an alliance contract, are far more effective in guaranteeing performance than the whole suite of punitive sanctions, which are typically found in traditional contracts.

Projects by nature are short term, and typically require large increases in human resources for the short to medium duration. Organisation is the only truly competitive weapon left, and success will be derived from organisational capabilities such as speed, responsiveness, agility, learning capacity, and employee competence. Alliances have much to offer in the area of organisational growth, with sharing of internal resources to improve business performance and sustain a competitive advantage in the market place. Human resources are selected on a best for project basis, and operate in an environment of openness, designed to encourage problems to be addressed with the best interest of the project always at the centre of decision making. Single entity organisations struggle to compete if they carry all of the human resources required to deliver a project, and traditional contracting is not always successful in obtaining the best personnel for the project team.

Research has shown that traditional forms of contracting have not been delivering value for money projects, due to the dynamic of adversarial relations interacting with a second dynamic of over-engineering. Thus competitive tendering, despite its emphasis upon lowest price, has not actually been delivering low production costs.

A properly constructed alliance contract eliminates disputes. The contractors and designers have all of their costs paid, and they are only rewarded if the project goals are met. All parties are involved at the conceptual and early design stages of the project, where the ability to reduce the overall project cost, or build in additional value is greatest. Success or failure is a joint responsibility, thus providing greater incentive and encouragement to apply the latest technology and be innovative in design, technology systems, processes and techniques. The risk/reward model aligns all parties to the objective of minimising costs, as the client and contractor both gain from savings. The client is part of the decision making process, and has access to all of the information, thus providing a more effective guarantee of value for money throughout the delivery of the project, than traditional contracts with the propensity for conflict, claims and general price blowouts.

2.9 CONCLUSIONS

It is apparent companies have been forced to develop new forms of contracting to improve efficiency as a means of pure survival. This

of course required radical shift in mindsets, considering the past performance in the industry, particularly the lawyers view that the key to claim avoidance is to get the contract right, and then properly administer it. It is obviously a challenging, but vital project in itself, to develop a process for changing thinking from where it is necessary to win every battle, on every occasion, at the other stakeholder's expense to that of win/win thinking. To achieve this would indeed establish mechanisms, to break down some of the barriers to adequate communication, which were the root cause of many of the construction claims and their disputes. Another benefit would be that the risk allocation could be distributed appropriately at the client inception phase, by beginning with a project management plan that has adopted the total quality management approach.

As risk and reward go hand in hand, it is obvious that for complex projects with many unknowns, an alliance will be better able to manage risk, resulting in lower total project cost to the client. The fundamental logic underlying co-operative contracts is that, in certain circumstances, the owner can better manage its risks by embracing those risks, as opposed to trying to transfer these risks. By embracing the risks the client is better able to manage, enabling the management of these risks within a flexible co-operative construction environment. Additionally, instead of each party trying to deal with specific risks independently, and possibly in conflict with each other, some risks may be better managed collectively. These areas of common risk can be identified, and strategies developed collectively to deal with them in an efficient, holistic manner.

The benefits offered to clients and contractors by alliance contracting include:

- Reduced project delivery time, particularly in the scope development and early design phases;
- Optimum project cost is realised through operating efficiencies, and value added engineering;
- Better management of risks is achieved, as each risk is managed by the party best suited to manage them, and the risk/reward model aligns all parties to the objective of minimising costs, as the client and contractor gain from savings. Success or failure is a joint responsibility;
- Project personnel are selected from each of the alliance participants on a best for project basis, and work in an environment designed to foster a best for project problem solving and decision making process;
- Enhanced business relationships through a win/win approach, pave the way for future business;
- Increased flexibility to manage change, with significantly lower costs to change;

- Greater incentive to be innovative, and apply the latest technology; and
- Optimum standards of quality, safety, industrial relations, and environmental performance.

The literary review thus supports the assumptions made in the early stages of this paper:

- In the delivery of major capital works projects, the traditional approach has been to transfer the many risks involved to others;
- Many complex projects in recent years have found the traditional risk transfer contracting models to be inadequate; and
- As a result of this, many clients and construction firms are looking for new approaches, one of these being alliance contracting.

However it is clear from the case studies presented in 2.6, that they all hail from the privately operated mining resources sector, which may mean only specific areas are suited to alliance contracting, i.e. projects requiring a large amount of resources, and/or privately operated. The benefits realized by these projects may or may not apply to other industries. In determining when alliance contracting is the best project delivery method, it is the author's opinion there is justification to undertake further research, to expose alliance contracting as a legitimate alternative choice to traditional forms of contracting for the delivery of projects in:

1. Other industries; and
2. The public sector.

It is really important to discover if alliance contracting is applicable to other industries, and more extensively what is the extent of peculiarities to other industry?

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CHAPTER 3 - INDUSTRY RESEARCH

3.1 INTRODUCTION

In the review of the literature, it became apparent companies have been forced to develop new forms of contracting to improve efficiency as a means of pure survival. Alliance contracting has been successful in alleviating many of the problems encountered on particular types of project employing traditional forms of contracting. However the only case studies of alliance contracting discovered were from the privately operated mining resources sector, which may mean only specific areas are suited to alliance contracting, and certainly does not prove the benefits realized by these projects would apply to other industries.

A short questionnaire was prepared in order to determine if alliance contracting is applicable to other industries, and more importantly discover when alliance contracting is the best project delivery method. The survey was designed for respondents to advise both general company demographics, and experiences in either alliance contracting or traditional contracting. More specifically responses were sought in relation to project management knowledge areas, as highlighted in the review of the related literature, together with successes or failures in each of these areas.

A copy of the industry survey and letter of introduction are attached at appendix A. This survey was dispatched by email, to randomly selected members of the Australian Institute of Project Management. The selection covered a wide range of industry, in both public and private sector firms, across all states and territories of Australia. The AIPM has just over 2,000 members, and according to Leady (1997), a sample size of 322 is required of this population to give accurate results. The survey was distributed to 500 members, with a follow up email forwarded to those who had not responded by the deadline, asking for a response within 4 weeks. Upon closing, only 62 responses were received. This represents a 12.4% response rate, which is much lower than anticipated, however due to the homogenous nature of the population, it was deemed an appropriate sample to analyse the data for the purpose of this research.

The responses received covered a wide variety of industry, spanning mining, building construction, engineering construction, information technology, defence, education/training, telecommunications, manufacturing, government agencies, retail, spatial data, oil exploration and distribution, insurance, services, land development, and human services. The firms that responded spanned a wide range of company type from both the private and public sector, covering contractor, client and consultant type

organizations, of size from less than 20 personnel, to more than 500. The summary of survey responses is attached at appendix B.

3.2 ANALYSIS OF RAW DATA

The survey was designed for respondents to provide both written responses, and selections from multiple choices provided. The multiple-choice responses were collated in an excel spreadsheet, such that each question was allocated a specific row, and each respondent was allocated a specific column. This enabled detailed analysis of the data, e.g. easily able to determine the type and size of organization, together with the industries that have participated in alliance contracting. Refer to appendix B for a full analysis of the raw data.

While being more difficult to analyse, the written responses were most interesting, and complimented the analysis of the raw data from the multiple choice responses, culminating in a successful research of alliance contracting, and determination of when alliance contracting is the best project delivery method.

3.3 ORGANIZATION DEMOGRAPHICS

Of the 62 companies that responded there was a good spread of organization size, from small companies of < 20 personnel through to large companies employing more than 500 staff. The responses by organization size are depicted in figure 7.

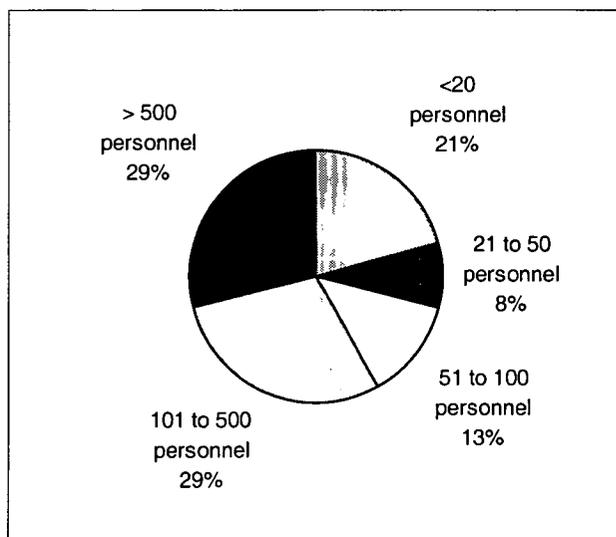


Figure 7: Responses by organization size

There was a good spread of organization type throughout the companies that responded, with 42% being of the client type, 29% from the contractor type and 29% from the consultant type of organization. There was one company that acted as both client and contractor, depending upon the project. The firms that responded

hailed from both the public and private sector, with 21% being public sector and 79% from the private sector.

Project Managers and Project Directors dominated the occupation of the respondents, which was the target audience for this research topic. This assisted the accuracy of the research, due to the homogenous nature of the population sample. The spread was as follows: Project Manager 42, Executive Manager/Project Director 12, Engineer 3, Program Manager 2, Architect 1, Quantity Surveyor 1, Consultant 1, Communications Manager 1, Contracts Manager 1, Facilitator 1, Marketing and Sales 1. There were 4 respondents who indicated they performed a dual role, eg. Project Manager and Engineer.

The responses provided a good spread across all of industry, as shown in figure 8; however this was dominated by building and engineering construction, accounting for a total of 70% of all responses. The industries that made up the other category comprised 1 respondent from each of the following: Services, Oil Exploration and Distribution, Retail, Land Development, Human Services, Insurance, Spatial Data, and Government Agencies. There were 13 companies that advised they perform work in more than one industry, eg. Engineering Construction and Building Construction.

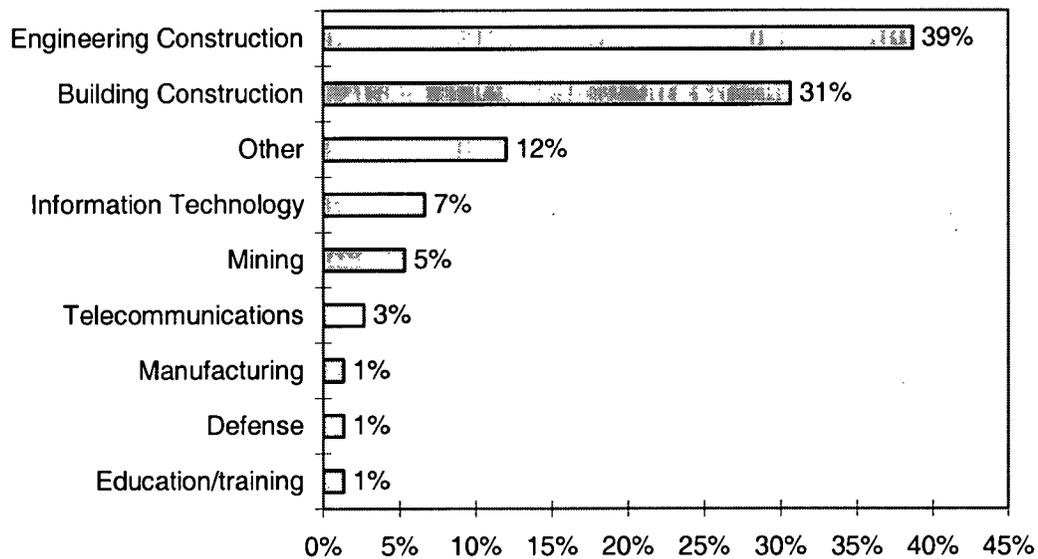


Figure 8: Responses by industry type

3.4 GENERAL CONTRACTING INFORMATION

When asked the predominant form of contracting used, the majority of respondents advised tendering, with 40% utilizing public tender and 35% opting for selective tendering. Of the remainder 17% perform contracting by invitation, while 2% favour

negotiation and another 2% use spot market and various tendering techniques.

The respondents advised their average annual value of contracting as shown in figure 9. The annual values of contracting had an approximate correlation with the organization sizes, in that the small companies typically had annual contracting values of <\$100,000 to \$10million, and the medium to large companies typically had annual contracting values of \$10million to >\$100million.

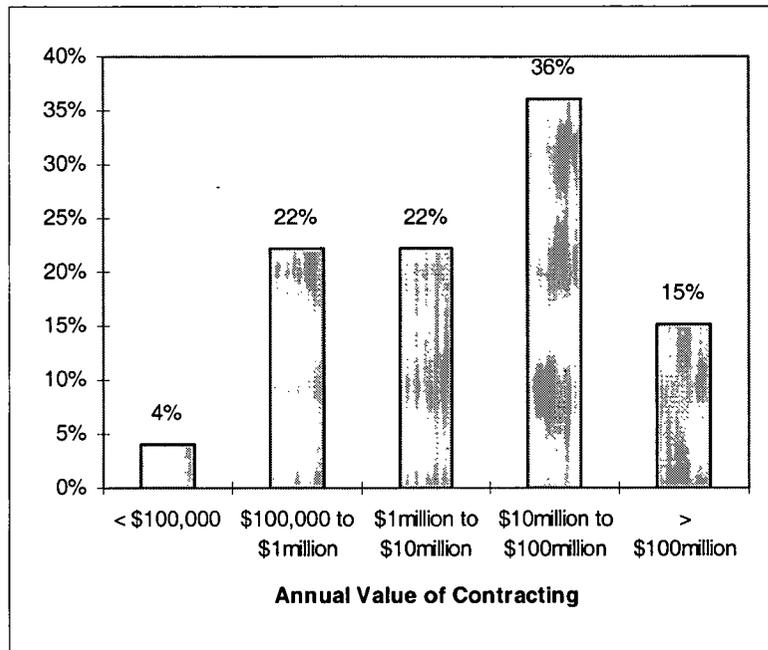


Figure 9: Average Annual Value of Contracting

Of the 62 responses received, 24 companies had been involved in alliance contracting, and 38 had not participated in alliance contracting. To receive this number of responses from companies having participated in alliance contracting was a good result, considering the small sample of the population.

3.5 GENERAL TRENDS AND CHARACTERISTICS OF COMPANIES THAT HAVE BEEN INVOLVED IN ALLIANCE CONTRACTING

Of the 24 responses received indicating their company had been involved in alliance contracting, 22 advised they would use alliance contracting again, and only 2 claimed they were not sure if they would use alliance contracting again. This was evident in that 12 companies had each used alliance contracting for the delivery of 5 projects, 2 companies had delivered 4 projects each, 3 had delivered 3 projects each, 5 had delivered 2 projects each, and 7 firms had employed alliance contracting to deliver 1 project only. Of the 38 firms that had not been involved with alliance

contracting, 29 stated they would consider alliance contracting in the future. This clearly indicates that alliance contracting may have a bright future in Australia. Additionally it demonstrates that once companies have made the commitment to participate in alliance contracting, and have realized the benefits, they continue to employ alliance contracting to deliver projects. It is worth noting that while 29 firms would consider using alliance contracting in the future, only 19 of these companies indicated familiarity with alliance contracting. This clearly indicates a market for education, training and facilitation of this form of contracting.

The responses indicated the percentages of organization type that have been involved in alliance contracting as 42% client, 38% contractor, and 21 % consultant. Of these companies 29% were from the public sector and 71% were from the private sector. The companies that responded have formed alliances with the following percentages of organization type: 55% contractor, 30% client, and 15% consultant, and of these companies 19% were from the public sector, 73% from the private sector and 8% were partially owned companies.

Of the responses received, the size of organizations that have been involved in alliance contracting were:

- 8% have < 20 staff;
- 4% have 21 to 50 staff;
- 13% have 51 to 100 staff;
- 42% have 101 to 500 staff; and
- 33% employ > 500 staff.

The numbers of personnel employed by the various alliances to deliver these projects were as follows:

- 24% engaged <20 personnel on the project;
- 19% utilized 21 to 50;
- 5% employed 51 to 100;
- 45% used 101 to 500; and
- 7% required >500 employees to deliver the project.

The value of these alliance contracts fell into the following budget limits:

- 16% required <\$1million;
- 31% used \$1million to \$10million;
- 15% took \$10million to \$30million;
- 24% expended \$30million to \$100million; and
- 15% had a budget of over \$100million.

The spread across the various industries that have been involved in alliance contracting is shown in figure 10. This shows a strong dominance in the building and engineering construction sectors, accounting for 75% of the alliance participants. This may be explained by the fact that these two industry sectors accounted for

70% of all responses received, however it is interesting to note the variance of alliance participants in the building construction and engineering construction sectors. Engineering construction has a clear dominance in this area, accounting for 56% of responses involved in alliance contracting, against 19% for the building construction sector, compared to 39% of all responses received being from the engineering construction sector, against 31% from the building construction sector. This indicates that the engineering construction sector has taken to alliance contracting more readily than the building construction sector, and it may be beneficial for the building construction sector to investigate the benefits realized by the engineering construction sector, in utilizing alliance contracting to deliver complex projects. The Defence, Manufacturing, Telecommunications, and Mining industry sectors, together with the other category made up of Spatial Data, Retail, Oil Exploration and Distribution account for the remaining 25% of alliance participants.

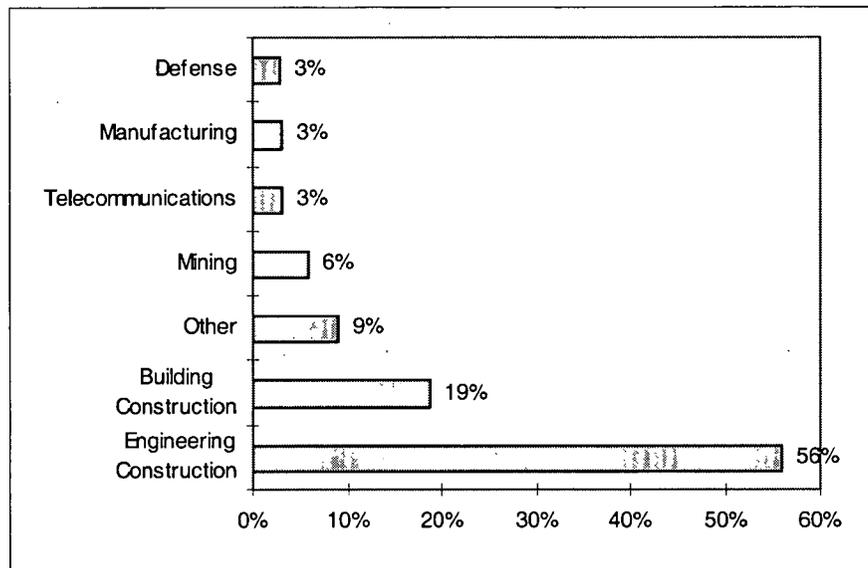


Figure 10: Industries Involved in Alliance Contracting

This wide ranging spread of data, relating to the trends and characteristics of organizations that have been involved in alliance contracting, indicates that alliance contracting has been tried by almost all types and sizes of organization, in a wide variety of industry, to deliver small projects with budgets of less than \$1million through to large projects of greater than \$100million. However there appears to be dominant trends to the following:

- Private sector companies;
- Medium to large value contracts of \$10million to > \$100million;
- Medium to large size companies of 101 to > 500 personnel; and
- Engineering Construction industry.

3.6 GENERAL TRENDS AND CHARACTERISTICS OF COMPANIES THAT HAVE NOT BEEN INVOLVED IN ALLIANCE CONTRACTING AND CONTINUE TO USE TRADITIONAL FORMS OF CONTRACTING

The dominant form of contracting used by these companies to deliver projects was fixed price contracts, accounting for 81% of the responses received, made up of 66% lump-sum contracts and 15% schedule of rates contracts. The remaining responses predominately used cost based contracts as follows: 4% use cost plus a fixed fee, 2% use cost plus a percentage, and 13% use other forms made up of hourly fee, construction management, design and construct, capped level of effort, negotiated, and percentage fee - consultancy.

The responses indicated the percentages of organisation type that have not been involved in alliance contracting are 42% client, 24% contractor, and 34 % consultant. Of these companies 16% were from the public sector and 84% were from the private sector.

Of the responses received, the size of organisations that have not been involved in alliance contracting were:

- 29% have < 20 staff;
- 11% have 21 to 50 staff;
- 13% have 51 to 100 staff;
- 21% have 101 to 500 staff; and
- 26% employ > 500staff.

The number of personnel employed by the various firms to deliver these projects using traditional forms of contracting was as follows:

- 46% engaged <20 personnel on the project;
- 22% utilised 21 to 50;
- 16% employed 51 to 100; and
- 16% used 101 to 500 employees to deliver the project.

The value of these contracts fell into the following budget limits:

- 85% required <\$1million;
- 9% used \$1million to \$10million;
- 4% took \$10million to \$30million;
- 2% expended \$30million to \$100million; and
- 1% had a budget of over \$100million.

The spread across the various industries that have not been involved in alliance contracting is shown in figure 11. This also shows a strong dominance in the building and engineering construction sectors, accounting for 66% of the respondents. As discussed with responses from alliance participants, this may be explained by the fact that these two industry sectors accounted for 70% of all responses received, however it is again interesting to

note the variance of responses in the building construction and engineering construction sectors. Building construction has a clear dominance in this area accounting for 40% of responses using traditional forms of contracting against 26% for the engineering construction sector, compared to 39% of all responses received being from the engineering construction sector against 31% from the building construction sector. This adds credence to the earlier discovery that the engineering construction sector has taken to alliance contracting more readily than the building construction sector. The Information Technology, Mining, Telecommunications, and Education/Training industry sectors, together with the other category made up of Human Services, Land Development, Services, Insurance, and Government Agencies account for the remaining 34% of companies that have not participated in alliance contracts.

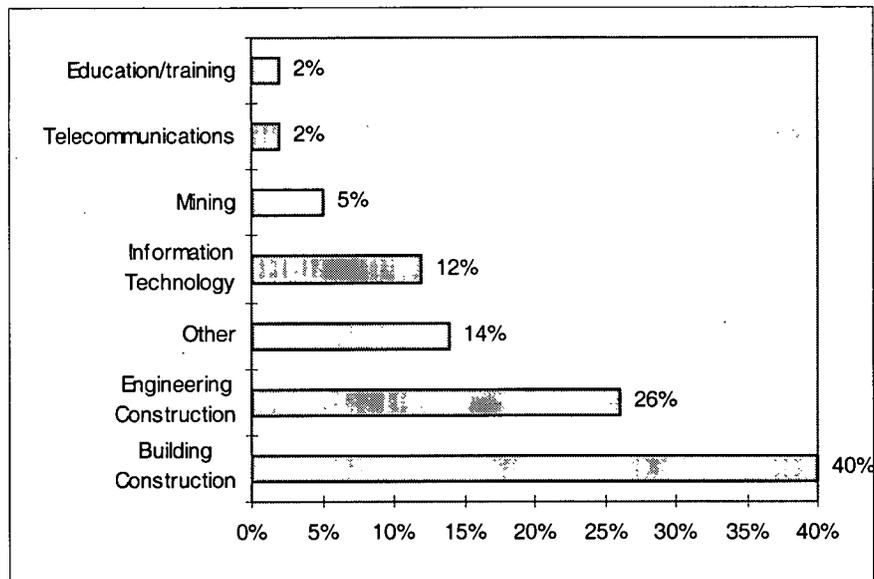


Figure 11: Industries Not Involved in Alliance Contracting

It is worth noting the following with respect to the responses received from firms not involved in alliance contracting:

- Of the 17 responses received from the Building Construction industry, 9 have been involved with partnering, and 12 would consider alliance contracting in the future;
- Of the 11 responses received from the Engineering Construction industry, 7 have been involved with partnering, and 10 would consider alliance contracting in the future;
- Of the 5 responses received from the Information Technology industry, while none have participated in alliance contracting, 4 have been involved with partnering and would consider alliance contracting in the future;
- Of the 10 responses received from the other industry sectors, 5 have been involved with partnering, and 7 would consider alliance contracting in the future; and

- Of the 25 responses that have been involved with partnering, all indicated they would consider alliance contracting in the future.

The reasons given for considering alliance contracting in the future have been categorised as follows, in descending order of popularity:

- Improved cost management, resulting in value adding for the client, and sustained profit for the contractor (5 responses);
- Better risk management through risk sharing (5 responses);
- Willing to consider in the future, but waiting to view outcomes from other projects delivered by alliance contracting (5 responses);
- Provision of broader skills between the alliance participants, and the ability to integrate specialist resources into a cooperative team, working and seeking mutual advantages and benefits (3 responses);
- Higher level of communication, and greater acceptance of processes and outcomes, hopefully breaking down the standard barrier between the client and the contractor (3 responses);
- Improved quality management (2 responses);
- Improved scope management (2 responses);
- Improved schedule control (2 responses);
- Move away from the problems encountered with adversarial standard forms of contract (2 responses);
- Tangible and measurable benefits to both parties, giving greater incentive to work together (1 response); and
- Seeking ongoing relationship to expand and attract future business (1 response).

This supports the earlier discovery that alliance contracting may have a bright future in the delivery of projects throughout Australia. However traditional forms of contracting remain as the favoured method of project delivery for many projects, and many firms will only use these forms of contract, as evidenced by the fact that there were 19 firms that had not been involved with partnering and 10 that would not consider alliance contracting in the future.

The reasons given for this were as follows:

- The types of contracts entered into are not complicated nor do they have high risk. Lump sum is an easily managed contractual base upon which to manage such projects.
- Not really applicable in my industry with the solutions that we are implementing.
- Not suitable for the short-term 1-4 month projects we generally deliver on - legal implications are too heavy.
- Effort is best put less into the form of the relationship, but into the real quality of the relationship between people - less form, more function.
- It is a risk minimisation strategy for building contractors, which invites clients to share in the construction risk as well as all the other risks the client is taking. Construction and pricing risks should stay with those best placed to control it. The client also

loses some control over the outcomes in terms of design and functionality of the final product.

- My organisation is a government organisation and until there is general policy developed for different forms of contracting, we will be maintaining the traditional forms.
- Lack of knowledge in this area.

3.7 WHY HAVE COMPANIES SELECTED PROJECT ALLIANCE CONTRACTING OVER OTHER FORMS OF CONTRACTING?

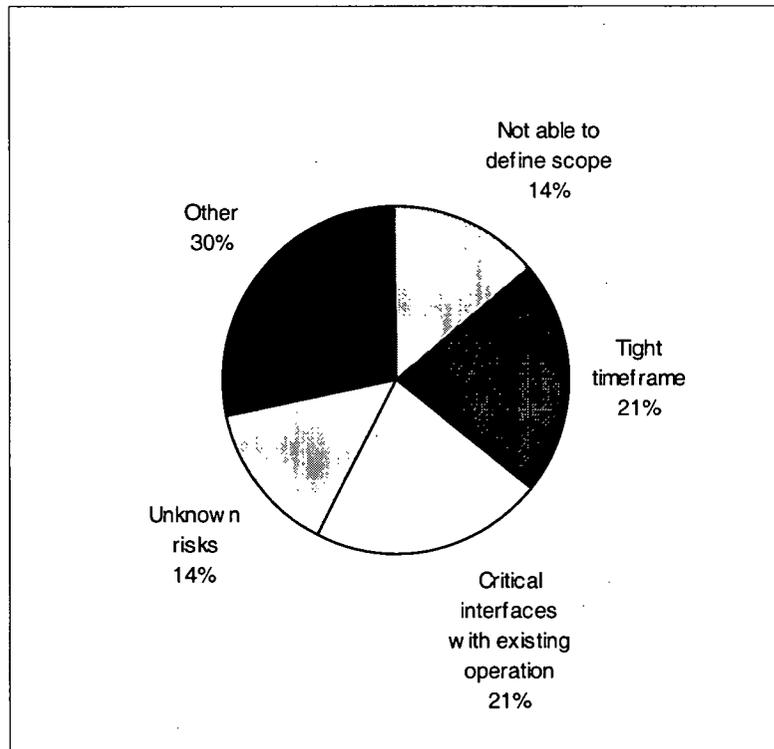


Figure 12: Reasons For Choosing Alliance Contracting

The reasons given for choosing alliance contracting over other forms of contracting were many and varied, however the predominant reasons for the selection are shown in figure 12. The category titled other (accounting for 30% of the responses) was made up of the following reasons:

- It was specified;
- Suited the client best, i.e. invited to participate;
- Client chose so as to deliver world's best practice, at the lowest cost, in the safest way;
- Political/financial reasons;
- Completion of an existing contract by alliance because existing relationship soured;
- Dollars capped;
- More "smarts" deployed on job;
- Synergies and value adding;

- Size of contract, large number of deliverables, interpretation of requirements;
- Provided contractor with incentive to perform;
- Ensured that both parties had common objectives; and
- Ensured good communications between parties.

Of the alliance participants:

- 21% chose alliance contracting due to the tight time frame given to deliver the project. These companies reported that their alliance contracting experience realised project time management that was either as successful (33%), or more successful (67%), when compared to experiences with traditional forms of contracting;
- 21% chose alliance contracting because of the critical interfaces with existing operation. These companies reported that their alliance contracting experience realised project communication management that was less successful (11%), as successful (33%), or more successful (56%), when compared to experiences with traditional forms of contracting;
- 14% chose alliance contracting because of unknown risks. These companies reported that their alliance contracting experience realised project risk management that was either as successful (50%), or more successful (50%), when compared to experiences with traditional forms of contracting; and
- 14% chose alliance contracting because they were not able to define the scope of works. These companies reported that their alliance contracting experience realised project scope management that was less successful (17%), as successful (50%), or more successful (33%), when compared to experiences with traditional forms of contracting.

These results begin to form some guidelines for the selection of alliance contracting, however before guidelines can be provided for selecting alliance contracting as the best project delivery method, a more detailed analysis of the respondents successes and failures throughout the various areas of project management, for both alliance contracting and traditional forms of contracting is required.

3.8 PROJECT SUCCESSES AND FAILURES OF ALLIANCE CONTRACTING EXPERIENCES, WHEN COMPARED TO EXPERIENCES WITH TRADITIONAL FORMS OF CONTRACT

Of the responses received from companies that have participated in alliance contracting, there were favourable ratings of success, when compared to experiences with traditional forms of contracting, as depicted in figure 13. The majority of respondents (61%) rated the alliance contracting experience for project delivery more successful, and 39% rated the experience as successful, when compared to project delivery using traditional forms of contracting. This trend was similar throughout the different project management

areas, with the majority of respondents rating the alliance contracting experience more successful, while a large portion of the remainder rated the experience as successful, and only a minority rated the experience less successful. While these results tend to favour alliance contracting, it was the written responses detailing alliance contracting successes and failures, combined with the reasons given for selecting alliance contracting, that gave the true insight into discovering when alliance contracting is the best method of project delivery.

Management Area	Less Successful	As Successful	More Successful
Overall Assessment	Nil	39%	61%
Integration	5%	32%	64%
Scope	9%	50%	41%
Time	Nil	50%	50%
Cost	9%	41%	50%
Quality	5%	59%	36%
Human Resources	5%	50%	45%
Communication	5%	36%	59%
Risk	Nil	41%	59%
Procurement	5%	52%	43%

Figure 13: Rating of alliance contracting experience, when compared to experience with traditional forms of contract

By looking firstly at the successful responses, it became apparent the objectives achieved, together with the advantages and benefits realized correlated with what the respondents deemed to be project success. The dominant characteristic being that the project objectives were met, and the client/contractor/consultant was satisfied. Some of the measures of this success were seen as:

- A happy client that is satisfied with the end results achieved;
 - The achievement of specified project goals or key performance indicators (KPI's);
 - Profitable and financially rewarding;
 - All alliance partners win, thus enhancing business relations, and strengthening the partnership for future business ventures together.
- More specifically the project objectives were defined as:
- Completion on time or ahead of schedule, which many claimed was achieved, with some realising significant savings in time;
 - Completion on or below budget, which several claimed to be the case, with some notable cases of cost reduction and value adding throughout the project life cycle;
 - Project delivered to quality standards, with timely reporting and predictability of outcome;
 - Safe delivery of project, free of accidents and incidents; and
 - Environmental standards and requirements met or exceeded, with a favourable community reaction.

It is in the analysis of project success, together with the factors influencing success, that the guidelines for selection of alliance contracting become evident, particularly when the earlier discoveries of reasons for choosing alliance contracting are also considered.

The large majority of respondents claimed that a project is successful when all project objectives are met, and the client, consultant and contractor are satisfied. Alliance contracting was claimed to have been beneficial in the achievement of success in this key area of project management, and the following factors influenced the success heralded by the alliance participants:

- Integration of client/contractor organizations, resulting in a truly integrated team of 'best for position' staff giving a higher client confidence in the ability to perform.
- Support from top management in all participating companies paves the way for full commitment from all alliance members. This commitment leads to a highly successful arrangement that fosters a realistic approach to risk issues. All participants take a share of gains as well as pain, resulting in a no lose-win situation, whereby either all win or all lose. There is good communication between all parties, and all decisions are made within the alliance, which reduces conflict, and eliminates the need for litigation. This enables all participants to focus on project results.
- A high degree of teamwork, cooperation, shared ownership of problems, and a focus on "best for project" rather than protection of organizational position, together with the ability to select and use the best people from each organization for the project results in a high degree of personnel development through cross skilling and sharing of experiences. Personnel directly involved generally rated working within the Alliance as a positive experience and stated a preference to work on alliance work compared to traditional contracts. A strong working relationship and a network has been established which continues beyond the project.

One of the most popular reasons for choosing alliance contracting was the tight time frame given to deliver the project, and several respondents defined project success as completion on time or ahead of schedule. One of the examples of this was described as: The project was extremely fast tracked, and the alliance enabled a totally different approach to the delivery of the required works. The following factors were described by alliance participants as contributing to the success of the project time management, and having complimented the fast track nature of the project:

- The client's needs were more clearly developed and tested, with less wasted energy on protecting position, and more energy available to be focused on solving the problems.
- The ability to purchase long lead-time items before scope and designs finalized and before contract executed.

- The risk/reward model used was challenging, and provided a good incentive to the alliance participants to achieve exceptional results, and enough reason for them not to fail.
- Core values such as trust, respect, integrity, determination, openness, enthusiasm and fairness were upheld. Innovation was encouraged, people were committed to challenging targets, communication was open and effective, team behaviour was fostered, people were selected on "best for project" basis, exceptional performance was recognized and a "no blame" attitude was adopted. This environment eliminated exposure to time delays that traditionally result when discussing variations to the contract. It is estimated that a blow-out of 4-10 weeks in time would have occurred had the project been completed under traditional arrangements.

Of equal popularity in reasons for choosing alliance contracting were critical interfaces with existing operation. The majority of respondents rated communications management as more successful in their alliance experience, with the following factors contributing to the success of the project communications management, and having complimented the critical interfaces with the existing operation throughout the delivery of the project:

- A clear and open link between designers, owners and constructors to ensure that costs and costly time is well controlled.
- Having the contractor's and our own personnel integrated, and working as one team improved communications. This integration made it possible to continually review issues and objectives without barriers that might be experienced in other forms of contracting.
- Clear monthly reporting of the total project position to the project "patrons", and also the client board of management.

Another popular reason for choosing alliance contracting was the unknown risks associated with delivery of the project. As good risk management is closely aligned to all of the criteria of project success, an alliance was seen as the ideal way to manage these unknown risks. Examples of this were described as:

- Risks were such that a normal management and mitigation strategy could not be applied.
- The project site was in an environmentally sensitive area, adjacent a large populated area. It was clearly evident that any environmental incident would have a profound impact, be quite expensive to remedy, reflect adversely on the alliance partners, and gain rapid and wide media coverage, giving rise to potential political grandstanding.

The following factors were described by alliance participants as contributing to the success of the project risk management:

- A "buy-in" by all partners on the risks the client faced, in terms of liquidated damages, together with the sensitive public and political image faced as a government enterprise.

- Better apportionment of risk linked to a performance measurement system of risk/reward.
- The decision to establish an alliance structure for the project was an up-front initiative, to specifically address the appropriate risk sharing mechanisms between the parties. This was so that the real challenge of project delivery could proceed in an environment that put aside the “them and us” behaviours and drove behaviour to focus on the clear elements of time, cost and quality.
- The KPI area of safety carried a legislated OH&S responsibility, and any poor performance in this area directly impacted on all alliance partners. It was incumbent on the alliance to actively manage safety. The most aggressive partners OH&S outlook was selected as the minimum safety management position and all aspects of the project were managed from this viewpoint.
- The project driver was a government initiative, which did not have universal community support. There was civil unrest, demonstrations, and significant questionable media comment. To enable the alliance to meet the contractual and stakeholder requirements, it was essential to avoid, at all cost, any adverse community reaction to site activities. The project construction sites were all on areas readily accessible to the public, often in areas of public recreational activity. Background support was secured, on a cooperative basis, from all community management agencies to the extent that the likes of police, etc. were quietly but fully informed of our activities and were able to initiate a range of subtle strategies to manage fringe community elements so behaviours did not become at odds with project site requirements. This was achieved through the close relationship between the client and contractor, sharing the risks of completing the project in an environmentally sensitive area, adjacent a large populated area.

Of equal popularity in the reasons for choosing alliance contracting was the inability to define the scope of works for the project. The following factors were described by alliance participants as contributing to the success of the project scope management:

- Choosing alliance contracting enabled the project to commence, with all participants being responsible for developing the scope as the project evolved. The alliance culture enabled this to be achieved without the normal constraints experienced using traditional forms of contracting.
- There was greater flexibility to overcome late scope changes and delays in associated approvals. A sound mechanism for the management of scope change and variation management was established, which promoted thorough scope change evaluation and variation management. This ensured adequate budgetary constraint, and yet provided the constructor with a fair price to undertake the work, without the threats and challenges of budget runaway.

Project cost management was deemed to be more successful utilising alliance contracting. In fact one participant quoted: Alliance contracting eliminates the exposures to cost blow-out as a result of contract variations. He further added: It was estimated that a 10-15% blow-out in cost would have occurred had the project been completed under traditional arrangements. The factors contributing to successful cost management were described as:

- Contractor and engineer contribute to scope development and design, which enables the introduction of innovation, constructability and cost reduction initiatives.
- A clear recognition that “the price will always be the price”.
- The open book accounting culture established a trust between the client and the contractors.
- Stronger finance.

Several alliance participants claimed project human resource management to be more successful with alliance contracting. An example of this was that one participant postulated that the additional resources available leads to a higher chance of client acceptance. The factors contributing to successful human resource management were described as:

- The ability to put all resources to a work area that is experiencing concept, detail or management difficulties.
- More technical and management competent players.
- Stronger knowledge and experience gained.
- Reduction in number of contractors on site.
- Cultural change in workplace and relationship with contractor, thus avoiding adversarial activity associated with traditional forms of contracting.
- Better equipment availability.
- Removal of non-core business activities.
- In effect the establishment of the alliance embodied a “Best for Project” discipline that ensured we were able to tap into the significant pool of experience of all alliance partners without having to consider the potential for adversarial behaviour. Some may ask “how is this possible”? It is plainly evident that there were some early misgivings, but the leadership of the alliance was “hell bent” on ensuring that the “best for project” and the “no blame” alliance principles were strictly adhered to. This did mean that the traditional roles were no longer appropriate, and each party had to find new and different ways of conducting business. There was a clear determination from all levels of endeavour, to make the best of the opportunity we all had available.

Quality management was also claimed to be more successful under an alliance contract, with one participant attributing this success to the following factors:

- The major alliance partners quality assurance system was adopted as the system by which the project would be managed.

This system was encapsulated within that partners “living and functional” QA system, ensuring that QA audits would be undertaken, and remedial actions, if required, would be promptly initiated.

This analysis of responses from successful alliance participants, together with the wide ranging spread of data relating to the trends and characteristics of organizations that have been involved in alliance contracting, indicates that alliance contracting can suit all types and sizes of organization, and is not peculiar to any specific industry sector or value of contract. These findings now alleviate the author’s concern upon completion of the literature review, that alliance contracting may only be suited to specific areas.

Throughout this analysis some clear guidelines have emerged as to when alliance contracting should be chosen as the best method of project delivery, and this is well summarised by the following response:

- “The politically driven time frame for the major project meant that there was insufficient time to adequately define and scope the project requirements. The scoping was extremely high level, a “functional scope” only, which was further developed with the alliance partners in the form of design plans and sub design packages. The development of the overall design plan also led to the development of the Business As Usual (BAU) estimate, which was validated by independent industry expert estimates. This was a challenging and critical stage of the project! This was the price setting mechanism of the project – what it would actually cost, which in turn determined the take away margin of the alliance partners. It also set the framework for the performance incentive mechanism of the project, the risk/reward benefit that each alliance partner would be able to claim if all performance areas, and the non-cost Key Performance Indicators (KPI’s) scored well during the delivery of the project. These costs related to all components of the project, from design right through to commissioning and provision of all as constructed data, drawings and intellectual property. It was at this time that all of the planning “wish lists” and all of the traditional requirements were placed under a functional, need to have and cost structure microscope to ensure that the project budget was adequate to meet the cost of the job. There were many challenges which looked into every corner of the project including:

- Requirements in excess of function
- Requirements in excess of Australian standard
- Alternative ways of providing the same function
- Appropriateness of proposed specifications
- Appropriateness of proposed work processes
- Infrastructure fit with existing interfaces
- Suitability of client and third party interfaces
- Reaction to political and bureaucratic constraints
- Non negotiable performance standards

· Compliance with NEC Code

Following the acceptance and agreement to the BAU estimate by the alliance partners, the reality of an extremely short lead-time had to be faced by designers, procurers, suppliers, contractors and the client. Risks were assessed and different actions were taken. Preliminary works, procurement and design were undertaken as a parallel set of tasks. This had the overall effect of promoting a problem sharing culture, one which removed the adversarial approach to contractor – client relations and also one which faced up squarely to the age old designer – constructor stand-off. We formed an integrated team that assessed design at various stages from a constructor and client perspective in a cooperative manner. This had the effect of significantly reducing the design to construct lead times and also resulted in negligible rework.”

While the percentages of participants that experienced poor performance with alliance contracting were very low, the analysis of these responses is useful in determining when alliance contracting should be rejected.

There were 2 respondents who claimed cost management was less successful using alliance contracting, and in particular:

- The alliance cost goals need to be clear. An open book approach is fine, but the decision-making on cost constraints needs to be clear.
- The project did not proceed past the first stage, as the client exercised their right to terminate due to cost problems.

One participant claimed:

- Scope management was less successful on some contracts where we succumbed to the lure of changing the scope, for promised but not necessarily better product performance. Budget was controlled, but the completion date was delayed significantly.

Another participant claimed communication management as less successful:

- As most of our dealings were with the Commonwealth Government their processes are not readily attuned to alliance contracting and therefore some agreements/decisions cannot be binding even if agreed in trust.

Integration management was posed to be less successful by 1 participant in that:

- The project value needs to be high, as the set up costs of an alliance are very high.

Procurement management was described by 1 participant as less successful and in particular:

- The alliance form of contract does not deter a contractor from applying damages on consultants, where delays beyond his control

occur. In large projects, the cost of these actions could also be large. Alliance does not help therefore to discourage animosity between parties to the contract.

There was 1 other participant who nominated quality management as less successful, while another described their experience suffered from less successful human resource management.

While the analysis of the successes and failures of alliance contracting provides some clear guidelines for the selection or rejection of alliance contracting, these guidelines will only be complete when a more detailed analysis of the respondents successes and failures, throughout the various areas of project management, for traditional forms of contracting has been performed.

3.9 PROJECT SUCCESSES AND FAILURES OF TRADITIONAL FORMS OF CONTRACTING

Management Area	Unsatisfactory	Satisfactory	Exceeded Expectations
Overall Assessment	7%	74%	19%
Integration	15%	76%	10%
Scope	17%	66%	17%
Time	13%	60%	28%
Cost	8%	70%	23%
Quality	10%	85%	5%
Human Resources	21%	69%	10%
Communication	17%	63%	20%
Risk	13%	73%	15%
Procurement	12%	71%	17%

Figure 14: Rating of traditional forms of contracting experience

Of the responses received from companies that have not participated in alliance contracting, there were favourable ratings of success, as depicted in figure 14. The majority of respondents (74%) rated the traditional contracting experience for project delivery as satisfactory, 19% rated the experience as exceeding their expectations, while 7% rated the experience as unsatisfactory. This trend was similar throughout the different project management areas, with the majority of respondents rating the traditional contracting experience as satisfactory, however there were significant percentages of the remainder that rated the experience as either unsatisfactory or having exceeded expectations. The reasons for this only become apparent after analysis of the written responses regarding project successes and failures. This analysis also assisted in the formation of guidelines for selection or rejection of alliance contracting as the best method of project delivery.

By firstly considering the successful responses, it was discovered that the objectives achieved, together with the advantages and benefits realized correlated with what the respondents deemed to be project success. Similar to the earlier discoveries when studying the responses from alliance contracting experiences, the dominant measure of project success was that the project objectives were met, and the client/contractor/consultant was satisfied, and in particular:

- Project cost, time and quality issues were all adequately managed to achieve our client's expectations, and our clients risk profile was minimized in all contracts.
- Good profitability and generally a good client relationship post project, sometimes with high praise for the completed product.
- Benefits were closer working team, with no disputes or blame. Confidence of actual delivery date, with quality vendors rewarded.

The respondents described the following contributing factors as having influenced the achievement of these objectives:

- The relationship with the client. Competent project managers, a skilled workforce, and reasonable clients were contributing factors. Nothing can overcome a poor client!
- Good choice of partners, provided experienced and motivated senior staff from participating firms.
- Utilization of a good strategy and proactive management. Where we are brought in at inception, and are able to guide the client, our experience with the contracting side of our projects generally exceeds everyone's expectations.
- Success of the project was due to the good management of the team directly involved, which included good communication. There was support from higher management at critical times in the project. The project team worked with the client and consultants to achieve the desired result. Increased input at the front end led to a less compacted program at the end of the project.
- Good contracts generally come about where there is a mutual understanding, and rapport/trust is created. Clear unambiguous documentation helps!
- The contracting experience in these cases exceeded expectations because the vendors were very inclusive and tolerant of the client. The vendor adapted their project methodologies to fit into our company's, or rather accommodated dual reporting and process checks. They (vendor) built trust and friendship, and took the opportunity to learn about the client organization wherever possible. The client enabled the vendor to build up organization as required, help select necessary people, and gave time and consideration to growth of small company dealing with a large project. The vendor delivered on time and exceeded quality expectations, and the client worked to do the same to form 1 team. The vendors shared information and passed on experience to the client, so that they were valuable beyond their allotted task. The

client was honest about the reality of funding, project manager's ability to influence (or lack of it) and risk to vendors. Real glue was shared interest/passion in the subject of the project - need to build on a shared experience with vendors where ever possible, tap into their reason for being in business - understand that and you can motivate and link on a number of levels. To be successful you need emotional commitment to a project from all individuals, beyond the partnership piece of paper. To build that you have to understand your own reason for doing it, the sponsor's motivations and real criteria for success, together with some tie or link into the vendor's mind set as well. Ours was a shared love of the web - and if you set high expectations for quality, not impossible but high and back it with payment and opportunity to play in a big space, then you are half way home.

A high percentage of respondents described project success as the achievement of the project triple constraints of time, cost and quality, whilst minimizing risks and disputation. The factors described as being beneficial in the achievement of these objectives were:

- High level, hands on attention to the management of the project scope, time, cost, and risk management.
- Good scope definition, reasonable pricing and good project and cost management, together with scope and communication controls were the key to success.
- The time of year that the project started, together with a realistic program and appropriate planning for the procurement of materials.
- Early design completion, enabling adequate time for material procurement, and consequently less field time, together with excellent communication, and no problems with property owners culminated in early completion of a high quality project. Communication, time and procurement are very closely related.
- The management of the project team, and the ability of each team member to perform. Adequate staff were available to undertake the work, thus eliminating the risk of error due to high workload.
- The supervision of and negotiation with sub-contractors. Negotiated work leads to a higher chance of profit, and consequently less likelihood of disputation.
- The risk management aspect exceeded expectations because the project safety objectives were realized, as a result of the Area Construction Manager's total focus towards safety.

There were several respondents, utilising traditional forms of contracting, who advised of specific areas of project management that were unsatisfactory, and in particular:

- Objectives not achieved were schedule and cost, both of which overran considerably. Twelve months after completion claims are still unsettled.

- Closeout is often messy, due to data delivery by contractor, particularly as-built drawings.

The factors nominated as having prevented the achievement of these objectives were:

- Minimal client knowledge and support to project management processes, especially in government.
- Inexperienced management appoints inexperienced people, and does not utilize standard systems, causing a poor tender and poor subsequent project delivery.
- Usually because the rapport goes and the relationship becomes adversarial. The problems of traditional delivery as opposed to more “cooperative” forms of contract are well documented. In our role as PM we spend our time “defending” the client from claims for variation on the basis of scope definition of the documents and negotiating a reasonable price/time for those variations.
- Selected a contractor based upon lowest price and contractor made up low price differential with variations because scope of works was not particularly detailed.
- Quality control systems are rarely fully implemented outside of essential areas such as compaction testing earthworks etc., primarily due to the bureaucratic nature of the systems.
- Human resource management problems are typical of large projects in Australia at present - difficult to find ‘good’ people quickly on big projects (especially on short-medium term contracts).
- Communication problems caused some work to be aborted, and resulted in some minor compromises in terms of final design.

• The contract was managed by an EPCM contract using contract personnel to manage the construction, the contract, the Superintendent’s role, safety, procurement of principal supplied items, progress reporting, etc. The EPCM team occupied premises next door to the principal’s representatives. Integration existed, however accountability did not exist. The committee theory existed. Added to this the contract was awarded to a contractor with the reputation of being uncooperative and a “claim merchant”. The works required an ore crushing station to be constructed in an underground location, approximately 2kms below the ground, where radiated heat exceeding 50⁰C existed. Delays and disruptions caused by the Principal were commonplace. The contractor at the same time was not proactive, and was obviously out of his depth in managing and carrying out the works. Factors, which prevented objectives being achieved, were:

- Contract awarded to wrong contractor;
- Absence of firm project management by the Superintendent;
- Failure to effectively negotiate continuously with the contractor;

- Failure to conduct effective pre-award meeting;
- Failure to award contract with EPCM management team in place;
- The scope of work was continuously altered by way of continuous amendments to design drawings; and
- Lack of communication between design and field resources led to procurement delays, and a total time and cost blow-out.

3.10 SUMMARY OF INDUSTRY RESEARCH FINDINGS

Of the 62 responses received, the majority of companies (70%) hailed from the engineering construction (39%), and building construction (31%) sectors. Although to a smaller extent, the remainder of companies that responded covered a wide variety of industry, spanning mining, information technology, defence, education/training, telecommunications, manufacturing, government agencies, retail, spatial data, oil exploration and distribution, insurance, services, land development, and human services. These firms spanned a wide range of company type from both the private (79%) and public sector (21%), covering contractor (29%), client (42%) and consultant (29%) type organizations, of size from less than 20 personnel, to more than 500. The majority of responses were from the medium to large companies with firms of 51 to >500 personnel accounting for 71% of the responses. Even though there were some dominant areas of industry, company type and size, it was felt that the spread was adequate, and would not adversely affect the accuracy of results. The homogenous nature of the sample was also beneficial to the accuracy of results, i.e. the large majority of respondents were project managers or project directors.

The majority (75%) of companies that responded performed contracting via the tendering process, with 40% utilizing public tender, and 35% opting for selective tendering. The annual values of contracting had an approximate correlation with the organization sizes, in that the small companies typically had annual contracting values of <\$100,000 to \$10million, and the medium to large companies typically had annual contracting values of \$10million to >\$100million.

It was interesting to note that 24 of the companies had been involved in alliance contracting, while 38 had not participated in alliance contracting. Of the 24 responses indicating their company had been involved in alliance contracting, 22 advised they would use alliance contracting again, and only 2 claimed they were not sure if they would use alliance contracting again. This was evident in that 12 companies had each used alliance contracting for the delivery of 5 projects, 2 companies had delivered 4 projects each, 3 had delivered 3 projects each, 5 had delivered 2 projects each, and

7 firms had employed alliance contracting to deliver 1 project only. Of the 38 firms that had not been involved with alliance contracting, 29 stated they would consider alliance contracting in the future. This indicates quite clearly that alliance contracting may have a bright future in Australia. Additionally it demonstrates that once companies have made the commitment to participate in alliance contracting, and have realized the benefits, they continue to employ alliance contracting to deliver projects. It is worth noting that while 29 firms would consider using alliance contracting in the future, only 19 of these companies indicated familiarity with alliance contracting. This clearly indicates a market for education, training and facilitation of this form of contracting.

Of the 24 companies that have participated in alliance contracting there was a good spread across industry, contract value, organisation type and size of company, however there were dominant trends to the following:

- Private sector companies, which may be attributed to the procurement policies of public sector companies, which prevent them from venturing into the risk-sharing arena of alliance contracting.
- Medium to large value contracts of \$10million to > \$100million, which may be attributed to the large amount of work, and high costs of establishing an alliance, not returning sufficient benefits to the smaller type projects.
- Medium to large size companies of 101 to >500 personnel, which may be attributed to the small companies not having the administrative structure necessary to provide participants to the alliance management team.
- Engineering Construction industry, which is difficult to explain, but certainly worth examination by other industries, to determine if the benefits realised by the engineering construction industry in project delivery would be applicable on their projects.

The majority of respondents (61%) rated the alliance contracting experience for project delivery more successful, and 39% rated the experience as successful, when compared to project delivery using traditional forms of contracting. The large majority of these claimed that a project is successful when all project objectives are met, and the client, consultant and contractor are satisfied. Alliance contracting was claimed to have been beneficial in the achievement of success in this key area of project management through the integration of client, consultant, and contractor organizations, resulting in a truly integrated team of 'best for position' staff, giving a higher client confidence in the ability to perform. All participants take a share of gains as well as pain, whereby either all win or all lose. There is good communication between all parties, and all decisions are made within the alliance, which reduces conflict, and eliminates the need for litigation.

The reasons given for selecting alliance contracting were many, and varied from being specified by the client, through to cost reduction and value added benefits. Others nominated synergies, common objectives, incentive to perform and improved relationships, however the most popular reasons given were:

- Time related with 21% choosing alliance contracting due to the tight time frame given to deliver the project. These companies reported that the alliance contracting experience realised project time management that was either as successful (33%), or more successful (67%), when compared to experiences with traditional forms of contracting. Alliance contracting was claimed to have complimented the fast track nature of projects, by having an integrated team approach to clearly develop the client's needs, with less energy wasted on protecting company position, and more energy available to be focussed on solving the problems. Procurement of long lead- time items proceeded while the scope was developed, and the design was finalised. Exposure to time delays that traditionally result when discussing variations to the contract were eliminated.
- Improved communication with 21% choosing alliance contracting because of the critical interfaces with existing operation. These companies reported that the alliance contracting experience realised project communication management that was less successful (11%), as successful (33%), or more successful (56%), when compared to experiences with traditional forms of contracting. It was described that having the contractor's and our own personnel integrated, and working as one team achieved improved communications. This integration made it possible to continually review issues and objectives, without barriers that might be experienced in other forms of contracting.
- Improved risk management with 14% choosing alliance contracting because of unknown risks. These companies reported that the alliance contracting experience realised project risk management that was either as successful (50%), or more successful (50%), when compared to experiences with traditional forms of contracting. It was claimed that risk management was more successful because of the better apportionment of risk, which was linked to a performance measurement system of risk/reward. This enabled the real challenges of project delivery to proceed in an environment that put aside the "them and us" behaviour, and drove behaviour to focus on the clear elements of time, cost and quality.
- Scope related with 14% choosing alliance contracting because they were not able to define the scope of works. These companies reported that the alliance contracting experience realised project scope management that was less successful (17%), as successful (50%), or more successful (33%), when compared to experiences with traditional forms of contracting. Alliance contracting was claimed to provide greater flexibility to overcome late scope changes and delays in associated approvals. A sound mechanism

for the management of scope change and variation management was established, which promoted thorough scope change evaluation and variation management. This ensured adequate budgetary constraint, and yet provided the constructor with a fair price to undertake the work, without the threats and challenges of budget runaway.

Other areas of project management, which were claimed to be more successful under alliance contracting were:

- Project cost management was deemed to be more successful because the contractor and engineer contribute to scope development and design, which enables the introduction of innovation, constructability and cost reduction initiatives. Alliance contracting eliminates the exposures to cost blow-out as a result of contract variations.
- Human resource management was claimed to be more successful, due to the availability of more technical and management competent resources. This provided the ability to put all resources to a work area that was experiencing concept, detail or management difficulties.
- Quality management was also claimed to be more successful under an alliance contract, as quality assurance is the responsibility of all participants.

The percentage of participants that experienced poor performance with alliance contracting was very low, and was typically attributed to poor control, or was policy related. One comment of particular interest was; the project value needs to be high, as the set up costs of an alliance are very high.

Of the 38 companies that have not participated in alliance contracting, the dominant form of contracting for project delivery was fixed price contracts, accounting for 81% of the responses received, made up of 66% lump-sum contracts and 15% schedule of rates contracts. There was a good spread across industry types, contract values, organisation types and size of companies, however there were dominant trends to the following:

- Public sector, client organisations, which may be attributed to the risk transfer allegiance of government departments.
- Small value contracts of \$<1million, which may be attributed to the smaller, less complex projects being ideally suited to traditional forms of contracting.
- <20 personnel employed on the project, which may be attributed to the dominance of small value of contracts.
- Building Construction industry, which may be attributed to the discovery that this industry does not appear to have accepted alliance contracting as readily as the engineering construction industry.

The majority of firms (74%) rated their traditional contracting experience as satisfactory, while 19% advised the project delivery had exceeded their expectations, and a further 7% described the project delivery as unsatisfactory. While these firms advised they had not participated in alliance contracting, there were 29 firms that had been involved in a partnering arrangement, and all of these indicated they would consider alliance contracting in the future. This sends a clear message that many companies, which have not done so previously, may form an alliance to deliver their project in the future, providing they receive the correct advice and guidance.

The reasons given for considering alliance contracting in the future were many, and varied across all areas of project management, in particular improvements were anticipated in schedule control, quality, cost and scope management. It was expected value adding for the client, and sustained profit for the contractor, together with better risk management through risk sharing, would enhance relationships for future business. A move away from adversarial traditional forms of contract, to a cooperative arrangement, was thought to be beneficial to project success, and improved communication, achieved by having a fully integrated project team of specialists from each partners firm, would break down the standard barrier between the client and the contractor.

There were several firms that were waiting to view other companies' forays into alliance contracting, and 10 companies that would not consider alliance contracting in the future. The reasons for this were mostly policy related, in that alliance contracting did not meet company procurement policy, or was not suited to the projects delivered by these firms.

CHAPTER 4 - CONCLUSION AND RECOMMENDATIONS

4.1 CONCLUSIONS

This research has established to a degree, the use of alliance contracting within Australia, and provides clarity as to when alliance contracting may be selected for project delivery. Hence the following conclusions can be drawn from the literature review, and the industry survey by questionnaire.

It should be noted that the following conclusions have a strong influence from the building and engineering construction industries, however enough data was collected from other industries for these comments to be applicable to any industry, which is looking to improve their contracting relationships, and levels of service in project delivery.

There are many risks involved in the delivery of all major capital works projects, and to achieve optimum outcomes for the project, the client must select the most appropriate strategy for managing these risks. For many years the traditional risk transfer approach has proved successful for many projects, particularly where the scope has been clearly defined, and the risks have been easily identifiable. In more recent years complex projects have been delivered in an environment of uncertainty - driven by diverse stakeholder interests, shifting business or political imperatives, and rapid technological change, whereby the traditional risk-transfer contracting models have increasingly been shown to be inadequate to deal with these circumstances. Consequently, the building and engineering construction industry in Australia has experienced extreme examples of adversarial conduct between contractors and the clients they serve. This trend towards increased disputation, litigation, and consequential financial losses, resulted in changes in attitudes, which promoted increasingly aggressive and confrontational relationships. Many initiatives focused on non-adversarial project delivery methods of contracting have been developed throughout the last decade, to correct the adverse effect this was having on both the efficiency and well being of the industry. Alliance contracting has evolved from this environment as a legitimate and superior alternative to traditional forms of contracting for delivery of specific projects. The following guidelines should prove useful for selecting alliance contracting as the superior method of project delivery:

4.1.1 Project Delivery Timeframe

If early delivery of the project is of great value to the owner, then alliance contracting should be selected. Alliance contracting compliments the fast track nature of projects by having an integrated team approach to clearly develop the client's needs, with

less energy wasted on protecting company position, and more energy available to be focussed on solving the problems. Alliance contracting provides greater flexibility to overcome late scope changes and delays in associated approvals. Procurement of long lead-time items is able to proceed while the scope is developed, and the design is finalised. Exposure to time delays that traditionally result when discussing variations to the contract is eliminated. This enables the client's requirements to be adequately defined, and redefined throughout the design and construction phases of the project life cycle. A sound mechanism for the management of scope change and variation management is established, which promotes thorough scope change evaluation and variation management. This ensures adequate budgetary constraint, and yet provides the constructor with a fair price to undertake the work without the threats and challenges of budget runaway.

Conversely if early project delivery is of no value at all to the owner, and adequate time is available to clearly define the scope of works, with little likelihood of change, then a traditional form of contracting may be more suitable.

4.1.2 Critical Interfaces With Existing Operation

If there are many critical interfaces with existing operations, then alliance contracting should be selected. Alliance contracting is based upon having the contractor's and the client's own personnel integrated and working as one team, thus improving communications. This integration makes it possible to continually review issues and objectives, without barriers that might be experienced in other forms of contracting. Any disruptions to either the existing operations or the construction schedule, as a result of the critical interface with the existing operation can be discussed in a cooperative environment, with a greater potential of achieving the optimum solution on a best for project basis.

Alternatively if the project is a total green fields site, then a traditional form of contracting may be more suitable.

4.1.3 Certainty of Risks

If the project is complex, and has many unknown risks, then alliance contracting should be selected. As high risk is associated with high costs, and can lead to long delays in time, it is often better for the client to share in these risks, rather than placing unacceptable risk upon one contractor. If the project involves new or evolving technology, there is a strong possibility of industrial disputation, or there is sensitivity to aboriginal, heritage, and environmental issues, and the client has a sophisticated view of risk, then alliance contracting will enable the client and the

contractor to share in the management of risk, with the best qualified party taking responsibility for managing the particular risk. This better apportionment of risk, which is linked to a performance measurement system of risk/reward, enables the real challenges of project delivery to proceed in an environment that puts aside the “them and us” behaviour, and drives behaviour to focus on the clear elements of time, cost and quality, resulting in lower total project cost to the client. The fundamental logic underlying co-operative contracts is that; in certain circumstances the owner can better manage its risks by embracing those risks, as opposed to trying to transfer these risks. By embracing the risks, the client is better able to manage these risks within a flexible, co-operative construction environment. Additionally, instead of each party trying to deal with specific risks independently, and possibly in conflict with each other, some risks may be better managed collectively. These areas of common risk can be identified, and strategies developed collectively to deal with them in an efficient, holistic manner.

However if the client has a risk transfer culture, the project involves well proven stable technology, all of the risks are known and are best managed by the contractor, then a traditional form of contracting may be more suitable.

4.1.4 Size and Complexity of Project

If the project requires large amounts of resource, is complex, and requires continual review and refinement, and the budget is flexible within a range, or requires the client’s detailed involvement in managing the cash flows and giving approvals on a stage-by-stage basis, then select alliance contracting. Under an alliance arrangement, the contractor and engineer contribute to scope development and design, which enables the introduction of innovation, constructability and cost reduction initiatives. Cost reduction and value adding is driven by the fact that all participants take a share of the gains as well as the pain. Involving these key parties very early in the project’s life cycle maximizes the very high potential for effecting optimum project outcomes. The ability to reduce the overall project cost, or build in additional value is highest at the very early conceptual and design phases of the project. Open book accounting is employed, which establishes trust between the client and the contractor. Alliance contracting eliminates the exposures to cost blow-out as a result of contract variations. Human resource management is more successful with alliance contracting, due to the availability of more technical and management competent resources from within each of the partner’s organisations. This provides the ability to put all resources to a work area that is experiencing concept, detail or management difficulties. Quality management is claimed to be more successful

under an alliance contract, as quality assurance is the responsibility of all participants.

If however the project is straight forward, and a tight guaranteed maximum price is essential for project sanction, or the project is comparatively small, and the participants are small players, then a traditional form of contracting may be more suitable. The skill, work and expense dedicated to establishing the alliance will not return sufficient benefits to small projects, and small firms will not have the administrative structure necessary to provide participants to the alliance management team.

4.1.5 Characteristics of Alliance Participants

In researching alliance contracting, it has become apparent that the most important aspect contributing to success is the correct selection of an alliance partner. For an alliance to succeed, the project participants must have the necessary trust and cooperative relationship necessary to form the basis of an alliance. If the client has a good understanding and is experienced in the project delivery process, and has a proven relationship contracting record with potential contractors, then an alliance will most likely succeed, however support and guidance from a facilitator who is familiar with alliance contracting is recommended. If the client has little project delivery experience, and no track record, or a bad track record of relationship contracting with potential contractors, then an alliance will most likely fail, unless the client utilises an experienced campaigner in alliance contracting to manage their affairs throughout the alliance contract.

The research has revealed dominant trends to the following:

- Private sector companies, which may be attributed to the procurement policies of public sector companies, which prevent them from venturing into the risk-sharing arena of alliance contracting. However several major Australian projects, involving public funding, have been able to reconcile the need for public accountability in decision-making with the alliance process, and have adopted a project alliancing strategy - including:

- Sydney Water's Northside Storage Tunnel Project.
- The Commonwealth Government's Action Peninsula (National Museum) Project in Canberra.
- Woodman Point Wastewater Treatment Plant Amplification for WA's Water Corporation.

The adoption of a full-on project alliance approach on these public sector projects shows that the involvement of public funds and ownership is not necessarily a bar to the effective use of the alliance process. This indicates that an increase in public sector involvement in alliance contracting may occur, however the project delivery process must be carefully designed and implemented, to

take into account the unique constraints introduced by the involvement of public funds.

- Medium to large value contracts of \$10million to > \$100million, which may be attributed to the large amount of work, and high costs of establishing an alliance not returning sufficient benefits to the smaller type projects. This indicates that smaller type projects may be more suited to traditional forms of contracting or a partnering approach.
- Medium to large size companies of 101 to >500 personnel, which may attributed to the small companies not having the administrative structure necessary to provide participants to the alliance management team. This indicates that smaller companies may not be suited to alliance contracting.
- Engineering Construction industry, which is difficult to explain, but certainly worth examination by other industries, to determine if the benefits realised by the engineering construction industry in project delivery would be applicable on their projects.

4.1.6 Benefits Realised by Selecting Alliance Contracting for Project Delivery

With regard to the industry survey, the majority of respondents rated the alliance contracting experience for project delivery more successful, when compared to project delivery using traditional forms of contracting. The large majority of these claimed that a project is successful when all project objectives are met, and the client, consultant and contractor are satisfied. Alliance contracting is being heralded as proof that clients and contractors can work together harmoniously to get projects completed, without costs blowing out and people becoming litigious. If alliance contracting works - and there is evidence that it does - the concept is worth examining because our construction industry is, and always has been, a battlefield on which relationships, productivity and efficiency have all been victims.

The benefits offered to clients and contractors by alliance contracting include:

- Reduced project delivery time, particularly in the scope development and early design phases;
- Optimum project cost is realised through operating efficiencies, and value added engineering;
- Better management of risks is achieved, as each risk is managed by the party best suited to manage them, and the risk/reward model aligns all parties to the objective of minimising costs, as the client and contractor gain from savings. Success or failure is a joint responsibility;
- Project personnel are selected from each of the alliance participants on a best for project basis, and work in an environment designed to foster a best for project problem solving and decision making process;

- Enhanced business relationships through a win/win approach, pave the way for future business;
- Increased flexibility to manage change, with significantly lower costs to change;
- Greater incentive to be innovative, and apply the latest technology; and
- Optimum standards of quality, safety, industrial relations, and environmental performance.

4.1.7 Reasons for Selection of Alliance Contracting for Project Delivery

In support of the above findings, it is worth noting the previous research conducted in 1997 by Harbinson and Pekar, which revealed companies actively participating in alliances have consistently produced a return on investment that nearly doubles the achievements of companies not involved in alliances.

Organization has been described as the only competitive weapon left. Project human resource management is a vital component of the project delivery strategy, as the project manager is often not judged by what they do but by what they deliver. In the new economy of today, winning will spring from organizational capabilities such as speed, responsiveness, agility, learning capacity, and employee competence. Alliances have much to offer in this area, as single entity organizations struggle to compete if they carry all of the human resources required to deliver a project, and traditional contracting is not always successful. Successful organizations will be those that are able to:

- quickly turn strategy into action;
- manage processes intelligently and efficiently;
- maximize employee contribution and commitment; and
- create the conditions for seamless change.

It is apparent companies have been forced to develop new forms of contracting to improve efficiency as a means of pure survival. This of course required radical shift in mindsets, considering the past performance in the industry, particularly the lawyers view that the key to claim avoidance is to get the contract right, and then properly administer it. It is obviously a challenging, but vital project in itself, to develop a process for changing thinking from where it is necessary to win every battle, on every occasion, at the other stakeholder's expense to that of win/win thinking. To achieve this would indeed establish mechanisms, to break down some of the barriers to adequate communication, which were the root cause of many of the construction claims and their disputes. Another benefit would be that the risk allocation could be distributed appropriately at the client inception phase, by beginning with a project management plan that has adopted the total quality management approach.

The private sector construction industry has successfully implemented alliance contracting, for the delivery of large complex projects within Australia. Other industry would do well to study this form of contracting, and if it is discovered that their project fits the criteria for selecting alliance contracting as the superior method of project delivery, move to establish an alliance. Figure 15 provides guidelines for selection of the best project delivery method.

Select Fixed Price Contract	Select Partnering Style of Contract	Select Alliance Contract
All risks identifiable & best managed by contractor	Some unknown risks that would suit a cost based contract	Complex project with many unknown risks
Total green field site	Some interfaces that require client input.	Many critical interfaces with existing operation
Flexible end date within a range, and early delivery of little value	Early delivery of some value	Extremely tight time frame, and early delivery of high value
Clearly defined scope of works that is unlikely to change	Scope of works has potential to change	Scope of works developing & requiring continual refinement
Tight (GMP) guaranteed maximum price essential for project approval	Willing to pursue options to reduce GMP	Flexible budget within a range
Small value contract of < \$1million	Medium value contract of \$1million to \$10million	Large value contract of > \$10million
Small amount of resources < 20 personnel	Medium amount of resources 20 to 100 personnel	Large amount of resources > 100 personnel

Figure 15: Selection of the best project delivery method.

4.2 RECOMMENDATIONS

Reflecting upon the discoveries from previous work performed by others and the conclusions from this research, the following recommendations are made in order to improve the overall efficiency, together with the numbers of successful alliance contracting relationships within Australian industry as a whole.

4.2.1 Critical Review of all Projects for Selection of Superior Project Delivery Method

The diligence applied at the initiation stage of a project almost certainly pays large dividends at the conclusion of the project. In the formation of the project plan, companies should be encouraged to firstly consider alliance contracting. If the project does not fit the criteria to form an alliance, then seek alternative forms of contracting for project delivery.

4.2.2 Guidance in the Formation of an Alliance

As with the formation of any contract, expert opinion should be obtained in forming an alliance. The legal profession play an important role in detailing how the contract is formed, and a facilitator with experience in alliance contracting is mandatory in establishing the alliance principles. The most important aspect contributing to success is the correct selection of an alliance partner.

4.2.3 Seek Companies Suitable for Partnership in an Alliance

Smaller companies that are tendering for large complex projects, and have experienced difficulty in winning contracts on their own should seek companies that have the right culture, resources and commitment to form an alliance. This will enable your company and your alliance partner/s to share in the mutual benefits normally afforded to the larger companies, which have previously beaten you in the bidding process.

Client's that have experienced difficulty in delivering complex projects should seek expressions of interest from companies that have the right culture, resources and commitment to form an alliance. This will give a greater potential for world's best practice project delivery, with the subsequent ongoing benefits realised from a successful project.

4.2.4 Critically Review Existing Alliances

An extremely difficult challenge for the client in an alliance relationship is determining the best value for money throughout the delivery of the project. For those companies that have an ongoing relationship, benchmarks need to be established. These benchmarks should be challenged continually to ensure that the alliance is part of the continuous improvement cycle, and continues with world's best practice for project delivery. The most effective method of achieving project success and repeat business is to meet or exceed the customers needs through effective project management.

CHAPTER 5 - RECOMMENDATIONS FOR FURTHER RESEARCH

In summary this research to date, together with the review of the literature has examined project management in Australia, and determined to a degree the extent of project delivery using alliance contracting, along with the benefits realised on projects delivered under an alliance.

Throughout this research a number of unsolved problems arose, which if investigated further may provide solutions for a particular sized project, company type, industry, and size of organisation in determining when alliance contracting is the best method of project delivery. The following may warrant further research:

- There was a distinct trend to the engineering construction sector having utilised alliance contracting more than the building construction industry. There was no indication of any research undertaken to determine why the building construction industry has not accepted alliance contracting as readily as the engineering construction industry.
- Another strong trend in the utilisation of alliance contracting for project delivery was to the private sector. There have been several cases where alliance contracting has been used in the public sector, however there appears to be no research into whether public sector firms can change their culture to accept alliance contracting. For these risk averse companies that are accustomed to selecting from fixed price bids, it may be useful to develop methods of testing value for money when using alliance contracting.
- An alliance participant revealed that an existing contract was completed under an alliance, because the existing relationship soured. It may be beneficial to investigate the opportunities for utilising alliance contracting in the rescue of projects that have failed to meet the specified project objectives, i.e. the style of contract selected has not suited the particular project, and a more cooperative approach is required to overcome the problems encountered, and complete the required scope of works.
- It appears to be an accepted fact that small value projects, and likewise small companies are not suited to alliance contracting, however there appears to have been no attempt made to investigate if alliance contracting can be customised to suit the requirements of a small value, complex project, or a small firm with something to offer in the delivery of the project.

- There is a lot of interest in alliance contracting amongst project managers within Australia, however there does not appear to be any formal training or education relating to this form of contracting. The research highlighted a lack of knowledge in alliance contracting, and it may be beneficial for firms specialising in these services investigating the need for training, education and facilitation of alliance contracting.

APPENDIX A

LETTER OF INTRODUCTION AND INDUSTRY SURVEY

**UNIVERSITY OF SOUTH AUSTRALIA
SCHOOL OF GEOINFORMATICS, PLANNING, AND
BUILDING**

Dear AIPM Member,

**RE: ALLIANCE CONTRACTING; WHEN IS IT THE BEST
PROJECT DELIVERY METHOD?**

As a postgraduate of The University of South Australia, currently undertaking the Master of Project Management in the School of Geoinformatics, Planning and Building, I am pleased to invite you to participate in the above mentioned research study. I have contacted you because your email address appears in the AIPM 1999 Project Management Handbook, and as an AIPM member your response will be invaluable to my study.

I have attached a questionnaire and I am hopeful that you will take the time to complete it and become an important part of my research. **The questionnaire is SHORT and should take approximately 10 to 15 minutes to complete.** I guarantee complete confidentiality of your responses. You will not be individually identified by any means at any time. If you have any queries in relation to this survey please contact me on telephone (08) 8404 7223 or my supervisor for this research, Mr. Mauro Maurovic on telephone (08) 8226 7342 or email mauro.maurovic@dhs.sa.gov.au

As the time available for this study is short, I would appreciate return of the questionnaire by 17th November. In return for your participation, I will gladly make key findings available upon request. Thanking you in anticipation of your response by return email.

Note from Mauro Maurovic:

I urge you to complete this short questionnaire. The topic is an important and practical one for project managers. The usefulness of this research depends on the number and quality of responses. Thank you.

Yours faithfully,

J.D. Smith

John Smith
Master's Student

M.M. Maurovic

Mauro Maurovic
Supervisor

Prelude to Questionnaire

There have been many instances of adversarial activity in the construction industry, resulting in clients seeking the establishment of more cooperative relationships. Partnering has been utilized throughout the 90's with mixed reactions. A further advancement to partnering (termed relationship contracting) has also been successfully utilized more recently in the Australian construction industry.

This research will focus on project alliance contracting, a further advancement on these initiatives, and one that can be considered as the highest level of relationship contracting. This form of contract is a partnership directed by a joint board, ensuring cooperation and consultation throughout the project. A virtual company is created to deliver the project, comprising of the best people for the job. This arrangement promotes flexibility, and enables changes for the better of the project, as it progresses through the life cycle. There are certain performance indicators that each partner has to achieve, and they get rewarded or not rewarded based on how those performance indicators are achieved. It is an open book arrangement, and project reporting is directed to the Project Alliance Board, consisting of equal representation from all alliance participants.

The key difference between partnering and alliancing is:

- The partnering commitments reside outside the contract.
- Alliance contracting focuses on contractual issues such as risk allocation and remuneration. These directly affect each party's financial interests and allow partnering concepts to become an integral part of the contractual relationship.

The information gathered will be used to investigate when alliance contracting is the best method of project delivery. The questionnaire contains both questions that require a written response, and questions that require a response selected from those provided. The questionnaire is divided into three sections:

- Section A seeks general information to analyse trends in the findings;
- Section B is for those who have participated in alliance contracting; and
- Section C is for those who have not participated in alliance contracting.

The questionnaire has been designed to be distributed and returned via email. Please click reply to sender, move through the document filling in the answers in the spaces provided (as if you were filling it in on a hard copy), and then click send when completed.

Thank you for taking the time to complete this questionnaire and being part of my research.

SECTION A

GENERAL - All participants to complete. This information is for research comparison purposes only. All information will be kept confidential.

Mark all answers with an X in the space provided, and fill in "other" if your occupation, organization type or industry is not mentioned.

1. What type of organization do you work for?

X

Contractor		1
Client		2
Other _____		3

X

Public		4
Private		5
Other _____		6

2. Your organization Size (Full Time Equivalent Employees).

< 20	21 to 50	51 to 100	101 to 500	> 500
7	8	9	10	11

3. What industry do you predominantly work in?

Mining		12
Building Construction		13
Engineering Construction		14
Information Technology		15
Defence		16
Education/training		17
Telecommunications		18
Manufacturing		19
Other _____		20

4. Your current occupation.

Project Manager		21
Architect		22
Engineer		23
Quantity Surveyor		24
Other _____		25

5. For the previous 2 financial years, what was your average annual value of contracting work?

< \$100,000		26
\$100,000 to \$1million		27
\$1million to \$10million		28
\$10million to \$100million		29
> \$100million		30

6. Your predominant method of contracting.

Public Tender		31
Selective Tender		32
By Invitation		33
Other _____		34

7. Has your organization been involved in alliance contracting? Refer to prelude to questionnaire for definition.

Yes, Please proceed with section B, question 8.		35
No, Please proceed with section C, question 18.		36

SECTION B

This section assumes you have undertaken one or more alliance contracting relationships - IF NOT PLEASE PROCEED TO SECTION C, QUESTION 18.

The purpose of this section is to identify WHAT OBJECTIVES WERE ACHIEVED, TOGETHER WITH THE FACTORS THAT INFLUENCED THE ACHIEVEMENT OF THESE OBJECTIVES in your projects.

8. How many project alliance contracts has your organization been involved in?

1	2	3	4	5	>5
37	38	39	40	41	42

9. What type of organization did you form an alliance with, and how many people were directly engaged on the project, <20, 21 to 50, 51 to 100, 101 to 500, >500.

	X	Number
Contractor	43	<20 49
Client	44	21 to 50 50
Number engaged from your firm	N/A	51 to 100 51
Other _____	45	101 to 500 52
		> 500 53

Public	46
Private	47
Other _____	48

10. List the number and value of the alliance contracts you have participated in, eg. 2 for \$1 million to \$10 million and 1 > \$100million.

< \$1million	54
\$1million to \$10million	55
\$10million to \$30million	56
\$30million to \$100million	57
> \$100million	58

11. **Why did you choose project alliance contracting over other forms of contracting?**

Not able to define scope		59
Tight timeframe		60
Critical interfaces with existing operation		61
Unknown risks		62
Other _____		63

12. **Rate your overall alliance contracting experience, when compared to experience with traditional forms of contract.**

Less successful	As successful	More successful
64	65	66

13. **Using the same rating system, rate the following project management knowledge areas, for your alliance contracting experience, when compared to experience with traditional forms of contract.**

Management Area	Less		As		More	
Integration Management		67		68		69
Scope Management		70		71		72
Time Management		73		74		75
Cost Management		76		77		78
Quality Management		79		80		81
Human Resource Management		82		83		84
Communication Management		85		86		87
Risk Management		88		89		90
Procurement Management		91		92		93

14. **If you rated your alliance contracting experience more successful than experience with traditional forms of contract, please describe why? Briefly detail the advantages and benefits realized. What objectives were achieved, and what were the factors that influenced the achievement of these objectives. 94**

15. **If you rated your alliance contracting experience less successful than experience with traditional forms of contract, please describe why? Briefly detail the disadvantages and problems encountered. What objectives were not achieved, and what were the factors that prevented the achievement of these objectives. 95**

16. **With reference to your answers to questions 12 - 15, what does the term project success mean to you? 96**
17. **Would you use alliance contracting to deliver a project again?**

Yes	No	Don't know
97	98	99

SECTION C

This section assumes you have not been involved with alliance contracting relationships.

The purpose of this section is to identify WHAT OBJECTIVES WERE ACHIEVED, TOGETHER WITH THE FACTORS THAT INFLUENCED THE ACHIEVEMENT OF THESE OBJECTIVES in your projects.

- 18. In what form of contracting does your firm predominantly engage for the delivery of projects?**

Lump-sum fixed price		100
Schedule of rates		101
Cost plus a percentage		102
Cost plus a fixed fee		103
Other _____		104

Note: Questions 19 to 24 relate to the previous 12 months.

- 19. List the number and value of the contracts your firm have participated in over the last 12 months, including current contracts, eg. 2 for \$1 million to \$10 million and 1 > \$100million.**

< \$1million		105
\$1million to \$10million		106
\$10million to \$30million		107
\$30million to \$100million		108
> \$100million		109

- 20. For the top 5 contracts in order of value, how many people were directly involved, including your firm? <20, 21 to 50, 51 to 100, 101 to 500, >500?**

\$ Value	Number engaged	
1		110
2		111
3		112
4		113
5		114

21. **Rate your overall assessment of the success of these projects.**

Unsatisfactory	Satisfactory	Exceeded expectations
115	116	117

22. **Using the same rating system, rate your assessment of the success of the following project management knowledge areas, for these projects.**

Management Area	Unsat.	Satis.	Exc.
Integration Management	118	119	120
Scope Management	121	122	123
Time Management	124	125	126
Cost Management	127	128	129
Quality Management	130	131	132
Human Resource Management	133	134	135
Communication Management	136	137	138
Risk Management	139	140	141
Procurement Management	142	143	144

23. **If your contracting experience exceeded your expectations, please describe why? Briefly detail the advantages and benefits realized. What objectives were achieved, and what were the factors that influenced the achievement of these objectives. 145**

24. **If your contracting experience was less than satisfactory, please describe why? Briefly detail the disadvantages and problems encountered. What objectives were not achieved, and what were the factors that prevented the achievement of these objectives. 146**

25. **With reference to your answers to questions 21 - 24, what does the term project success mean to you? 147**

26. **Has your firm been involved with partnering?**

Yes	No
148	149

27. **Are you familiar with alliance contracting?**

Yes	No
150	151

28. Has your firm ever attempted to form an alliance contract?

Yes - Go to 29.	No - Go to 30.
152	153

29. Why did previous attempts at alliance contracting fail?
154

30. Would you consider alliance contracting in the future?

Yes	No
155	156

Please explain why? 157

THIS COMPLETES THE QUESTIONNAIRE – THANK YOU FOR YOUR INVOLVEMENT
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APPENDIX B
SUMMARY OF SURVEY RESPONSES AND
ANALYSIS OF RAW DATA

Q1	1	Contractor - type of organisation	18	29%
	2	Client	26	42%
	3	Other	18	29%
	4	Public	13	21%
	5	Private	49	79%
	6	Other	0	0%
Q2	7	<20 - size of organisation	13	21%
	8	21 to 50	5	8%
	9	51 to 100	8	13%
	10	101 to 500	18	29%
	11	> 500	18	29%
Q3	12	Mining - Industry	4	5%
	13	Building Construction	23	31%
	14	Engineering Construction	29	39%
	15	Information Technology	5	7%
	16	Defence	1	1%
	17	Education/training	1	1%
	18	Telecommunications	2	3%
	19	Manufacturing	1	1%
	20	Other	9	12%
Q4	21	Project Manager - occupation	42	64%
	22	Architect	1	2%
	23	Engineer	3	5%
	24	Quantity Surveyor	1	2%
	25	Other	19	29%
Q5	26	< \$100,000 - value of contracting	3	4%
	27	\$100,000 to \$1million	16	22%
	28	\$1million to \$10million	16	22%
	29	\$10million to \$100million	26	36%
	30	> \$100million	11	15%
Q6	31	Public Tender - method of contracting	31	40%
	32	Selective Tender	27	35%
	33	By Invitation	17	22%
	34	Other	3	4%
Q7	35	Yes - involved in alliance contracting	24	39%
	36	No - not involved in alliance contracting	38	61%
Q8	37	1 - No. of alliance contracts	7	24%
	38	2	5	17%
	39	3	3	10%
	40	4	2	7%
	41	5	12	41%
	42	>5	0	0%

Q9	43	Contractor type of organisation	18	55%
	44	Client	10	30%
	45	Other	5	15%
	46	Public	5	19%
	47	Private	19	73%
	48	Other	2	8%
	49	< 20 - people engaged on the project	14	24%
	50	21 to 50	11	19%
	51	51 to 100	3	5%
	52	101 to 500	26	45%
	53	> 500	4	7%
Q10	54	< \$1million - value of contract	11	16%
	55	\$1million to \$10million	21	31%
	56	\$10million to \$30million	10	15%
	57	\$30million to \$100million	16	24%
	58	> \$100million	10	15%
Q11	59	Not able to define scope - reason for alliance	6	14%
	60	Tight timeframe	9	21%
	61	Critical interfaces with existing operation	9	21%
	62	Unknown risks	6	14%
	63	Other	12	29%
Q12	64	Less successful - alliance vs traditional	0	0%
	65	As successful	9	39%
	66	More successful	14	61%
Q13	67	Less successful - Integration Management	1	5%
	68	As successful	7	32%
	69	More successful	14	64%
	70	Less successful - Scope Management	2	9%
	71	As successful	11	50%
	72	More successful	9	41%
	73	Less successful - Time Management	0	0%
	74	As successful	11	50%
	75	More successful	11	50%
	76	Less successful - Cost Management	2	9%
	77	As successful	9	41%
	78	More successful	11	50%
	79	Less successful - Quality Management	1	5%
	80	As successful	13	59%
	81	More successful	8	36%
	82	Less successful - Human Resource Management	1	5%
	83	As successful	11	50%
	84	More successful	10	45%
	85	Less successful - Communication Management	1	5%
	86	As successful	8	36%
	87	More successful	13	59%
	88	Less successful - Risk Management	0	0%
	89	As successful	9	41%
	90	More successful	13	59%
	91	Less successful - Procurement Management	1	5%
	92	As successful	11	52%
	93	More successful	9	43%

Q14	94	Why was alliance more successful?	Written	
Q15	95	Why was alliance less successful?	Written	
Q16	96	Define project success	Written	
Q17	97	Yes - would use alliance contracting again	20	91%
	98	No	0	0%
	99	Don't know	2	9%
Q18	100	Lump-sum fixed price - form of contracting	31	66%
	101	Schedule of rates	7	15%
	102	Cost plus a percentage	1	2%
	103	Cost plus a fixed fee	2	4%
	104	Other	6	13%
Q19	105	< \$1million - value of contract	1460	85%
	106	\$1million to \$10million	152	9%
	107	\$10million to \$30million	64	4%
	108	\$30million to \$100million	37	2%
	109	> \$100million	9	1%
Q20	110	< 20 - number engaged	84	46%
	111	21 to 50	40	22%
	112	51 to 100	29	16%
	113	101 to 500	29	16%
	114	> 500	0	0%
Q21	115	Unsatisfactory - assessment of projects	3	7%
	116	Satisfactory	32	74%
	117	Exceeded expectations	8	19%
Q22	118	Unsatisfactory - Integration Management	6	15%
	119	Satisfactory	31	76%
	120	Exceeded expectations	4	10%
	121	Unsatisfactory - Scope Management	7	17%
	122	Satisfactory	27	66%
	123	Exceeded expectations	7	17%
	124	Unsatisfactory - Time Management	5	13%
	125	Satisfactory	24	60%
	126	Exceeded expectations	11	28%
	127	Unsatisfactory - Cost Management	3	8%
	128	Satisfactory	28	70%
	129	Exceeded expectations	9	23%
	130	Unsatisfactory - Quality Management	4	10%
	131	Satisfactory	33	85%
	132	Exceeded expectations	2	5%
	133	Unsatisfactory - Human Resource Management	8	21%
	134	Satisfactory	27	69%
	135	Exceeded expectations	4	10%
	136	Unsatisfactory - Communication Management	7	17%
	137	Satisfactory	26	63%
	138	Exceeded expectations	8	20%
	139	Unsatisfactory - Risk Management	5	13%
	140	Satisfactory	29	73%
	141	Exceeded expectations	6	15%
	142	Unsatisfactory - Procurement Management	5	12%
	143	Satisfactory	30	71%
	144	Exceeded expectations	7	17%

Q23	145	Why did your experience exceed expectations?	Written	
Q24	146	Why was your experience less than satisfactory?	Written	
Q25	147	Define project success	Written	
Q26	148	Yes - involved in partnering	21	53%
	149	No	19	48%
Q27	150	Yes - familiar with alliance contracting	19	48%
	151	No	21	53%
Q28	152	Yes - attempted to form alliance	1	3%
	153	No	38	97%
Q29	154	Why did previous attempts fail?	0	0%
Q30	155	Yes - would consider alliance contracting in future	29	74%
	156	No	10	26%
Q31	157	Why?	Written	
		What type of organisation has participated in alliance contracting?	- Client	10 42%
			- Contractor	9 38%
			- Consultant	5 21%
			- Public	7 29%
			- Private	17 71%
		What size organisations have participated in alliance contracting?	<20	2 8%
			21 to 50	1 4%
			51 to 100	3 13%
			101 to 500	10 42%
			> 500	8 33%
		What industries have participated in alliance contracting?	- Mining	2 6%
			- Building Construction	6 19%
			- Engineering Construction	18 56%
			- Information Technology	0 0%
			- Defence	1 3%
			- Education/training	0 0%
			- Telecommunications	1 3%
			- Manufacturing	1 3%
			- Other	3 9%
		If reason for alliance was not able to define scope,	- less successful	1 17%
			- as successful	3 50%
		was scope management	- more successful	2 33%
		If reason for alliance was tight timeframe,	- less successful	0 0%
			- as successful	3 33%
		was time management	- more successful	6 67%
		If reason for alliance was critical interfaces with existing operation,	- less successful	1 11%
			- as successful	3 33%
		was communication management	- more successful	5 56%
		If reason for alliance was unknown risks,	- less successful	0 0%
			- as successful	3 50%
		was risk management	- more successful	3 50%
		What type of organisation has not participated in alliance contracting?	- Client	16 42%
			- Contractor	9 24%
			- Consultant	13 34%
			- Public	6 16%
			- Private	32 84%

	What size organisations have not participated in alliance contracting?	<20	11	29%
		21 to 50	4	11%
		51 to 100	5	13%
		101 to 500	8	21%
		> 500	10	26%
	What industries have not participated in alliance contracting?	- Mining	2	5%
		- Building Construction	17	40%
		- Engineering Construction	11	26%
		- Information Technology	5	12%
		- Defence	0	0%
		- Education/training	1	2%
		- Telecommunications	1	2%
		- Manufacturing	0	0%
		- Other	6	14%
	What industries have been involved with partnering?	- Mining	1	4%
		- Building Construction	9	36%
		- Engineering Construction	7	28%
		- Information Technology	4	16%
		- Defence	0	0%
		- Education/training	1	4%
		- Telecommunications	0	0%
		- Manufacturing	0	0%
		- Other	3	12%
	What industries are familiar with alliance contracting?	- Mining	2	9%
		- Building Construction	10	43%
		- Engineering Construction	5	22%
		- Information Technology	2	9%
		- Defence	0	0%
		- Education/training	1	4%
		- Telecommunications	0	0%
		- Manufacturing	0	0%
		- Other	3	13%
	What industries would consider alliance contracting in the future?	- Mining	2	6%
		- Building Construction	12	36%
		- Engineering Construction	10	30%
		- Information Technology	4	12%
		- Defence	0	0%
		- Education/training	1	3%
		- Telecommunications	1	3%
		- Manufacturing	0	0%
		- Other	3	9%
	What industries involved with partnering would consider alliance contracting in the future?	- Mining	1	4%
		- Building Construction	9	36%
		- Engineering Construction	7	28%
		- Information Technology	4	16%
		- Defence	0	0%
		- Education/training	1	4%
		- Telecommunications	0	0%
		- Manufacturing	0	0%
		- Other	3	12%

	Size of organisation and value	<20 & <\$100,000	3	25%
	of contracting work	<20 & \$100,000 to \$1million	3	25%
		<20 & \$1million to \$10million	4	33%
		<20 & \$10million to \$100million	2	17%
		<20 & >\$100million	0	0%
		21 to 50 & <\$100,000	0	0%
		21 to 50 & \$100,000 to \$1million	0	0%
		21 to 50 & \$1million to \$10million	0	0%
		21 to 50 & \$10million to \$100million	3	60%
		21 to 50 & >\$100million	2	40%
		51 to 100 & <\$100,000	0	0%
		51 to 100 & \$100,000 to \$1million	0	0%
		51 to 100 & \$1million to \$10million	2	25%
		51 to 100 & \$10million to \$100million	4	50%
		51 to 100 & >\$100million	2	25%
		101 to 500 & <\$100,000	0	0%
		101 to 500 & \$100,000 to \$1million	1	6%
		101 to 500 & \$1million to \$10million	5	28%
		101 to 500 & \$10million to \$100million	10	56%
		101 to 500 & >\$100million	2	11%
		>500 & <\$100,000	0	0%
		>500 & \$100,000 to \$1million	1	6%
		>500 & \$1million to \$10million	5	28%
		>500 & \$10million to \$100million	7	39%
		>500 & >\$100million	5	28%

WRITTEN RESPONSES

Question

1. **What type of organization do you work for?**
Other • Consultant x 18 (Engineering x 3, Project Management x 6, Legal x 1, Procurement strategies x 1, Non-specific x 7)

3. **What industry do you predominantly work in?**
Other • Government agencies
• Retail
• Spatial data
• Insurance
• Services
• Oil exploration and distribution
• Land development
• Human services

4. **Your current occupation?**
Other • Executive Manager/Project Director x 12
• Operations Manager
• Consultant
• Communications Manager
• Contracts Manager
• Facilitator
• Marketing and sales
• Program Manager x 2

6. **Your predominant method of contracting?**
Other • Client's seem to favour negotiation
• Spot market & various tendering techniques

9. **What type of organization did you form an alliance with?**
Other • Consultant x 4
• Partially owned companies

11. **Why did you choose project alliance contracting over other forms of contracting?**
Other • It was specified
• Suited the client best, i.e.. invited to participate
• Client chose so as to deliver world's best practice at the lowest cost in the safest way
• Political/financial reasons
• Completion of an existing contract by alliance because existing relationship soured
• Dollars capped
• More "smarts" deployed on job

- Synergy's and value adding
- Size of contract, large number of deliverables, interpretation of requirements
- Provided contractor with incentive to perform
- Ensured that both parties had common objectives
- Ensured good communications between parties

14. If you rated your alliance contracting experience more successful than experience with traditional forms of contract, please describe why? Briefly detail the advantages and benefits realized. What objectives were achieved, and what were the factors that influenced the achievement of these objectives.

- It was not that it was more successful. The circumstances encouraged us to head in the alliance direction. Poor scope definition and high uncertainty of risk favoured alliancing.
- I would not say that the experience was better than may have been achieved with a lump sum or schedule of rates contract, but in the situation where the scope could not be precisely defined, it provided sound and effective control over the activities of both the contractor's activities and those of our own project team.

Objectives Achieved, Advantages and Benefits Realized

- Project completed within schedule
- Profitable
- Client's satisfaction
- More turnover
- More chance being qualified for the contract
- Traditional form of contracting is adversarial and cultural change was desired in relationships with contractors
- A world-class facility on time and below budget
- Easy to manage, expeditious, time saving, cost reducing, full cooperation from all parties, sharing responsibilities, project focused.
- Achievement of the completion objective under budget.
- The main advantages and benefits gained were the ability to assess any difficulties as a team rather than adversaries and by brainstorming attempt to reach a win-win result. This then resulted in less time being required in thinking up strategies to scuttle the other party.
- 1st project completed under the alliance was completed 1 week ahead of time, and 5% over the initial estimate but within overall project approval
- The latest project was completed in excess of 8% under the initial estimate and ahead of schedule; stage 1 (3 weeks), stage 2 (7 weeks), stage 3 (11 weeks) and stage 4 (13 weeks) early

- After payment of performance incentives principal achieved cost reduction of 2.5% against project budget despite numerous scope changes and approval delays
- Project involved work in environmentally and culturally sensitive areas and was politically sensitive. The project was completed with no environmental or cultural incident and received a positive response from Environmental agencies
- Substantial cost reduction
- Performance improvements
- Both projects were of a fast track nature and a high degree of focus on all the management facets indicated above in Q13 resulted in all project objectives and all but one 'stretch' goal being met.
- The projects were delivered ahead of time in both cases and to Safety, Quality and Environmental goals.
- The lower value project, which was the first project completed under an Alliance, went marginally over budget. The second project was completed at 8.5% below budget and the reputations of the Alliance Participants were significantly enhanced.

Factors Influencing Success

- Communication
- Performance Measurement System of risk/reward
- Integration of Client/Contractor organizations
- Client confidence in ability to perform is higher.
- A truly integrated team of 'best for position' staff
- Full commitment from all alliance members
- No lose-win situation, either all win or all lose. Decisions are made within alliance. No need for litigation's. Need support from top management in all participating companies to make it a successful arrangement.
- Focus on project results, share of gains as well as pain, realistic approach to risk issues, good communication between all parties, reduced conflicts.
- Having the contractor's and our own personnel integrated working as one team improved communications and made it possible to continually review issues and objectives without barriers that might be experienced in other forms of contracting.
- Risks were such that a normal management and mitigation strategy could not be applied
- Stronger finance
- More technical and management competent players
- Stronger knowledge and experience gained
- Greater flexibility to overcome late scope changes and delays in approvals

- Personnel directly involved generally rated working within the Alliance as a positive experience and stated a preference to work on alliance work compared to traditional contracts
- Some of the key elements for the successful completion are as follows;
 - ability to purchase long lead-time items before scope and designs finalized and before contract executed.
 - contractor/engineer contribute to scope development and design, which enables introduction of innovation, constructability and cost reduction initiatives.
 - ability to select and use the best people from each organization for the project then a cross skilling, development and sharing of experiences. Strong working relationships and a network has been established which continue beyond the project
 - high degree of teamwork, cooperation and shared ownership of problems and a focus on "best for project" rather than protect organizational position
 - eliminates time and \$ exposures as a result of variations. It is estimated that a 10-15% blow-out in cost and 4-10 weeks in time would have occurred had the project been completed under traditional arrangements.
- Reduction in number of contractors on site
- Better apportionment of risk
- Cultural change in workplace
- Better equipment availability
- Removal of non-core business activities
- Additional resources available leads to a higher chance of client acceptance
- Core values such as trust, respect, integrity, determination, openness, enthusiasm and fairness were upheld. Innovation was encouraged, people committed to challenging targets, communication was open and effective, team behaviour was fostered, people were selected on "best for project" basis, exceptional performance was recognized and a "no blame" attitude was adopted.
- The Risk/Reward model used was challenging and provided a good incentive to the Alliance Participants to achieve exceptional results and enough reason for them not to fail.
- From the project lawyer's view it is difficult to know why a project has succeeded. Achieving KPIs is an indicator of success but not why successful. Perhaps to put it simply the alliance worked, project tackled by a team approach. The best people for job were given the job, no

turf protection, good problem solving and innovative approach to problem.

- Client's needs were more clearly developed and tested. Less wasted energy on protecting position and more energy available to be focused on solving the problems.
- The decision to establish an alliance structure for the project was to specifically address the appropriate risk sharing mechanisms between the parties as an up-front initiative so that the real challenge of project delivery could proceed in an environment that put aside the "them and us" behaviours and drove behaviour to focus on the clear elements of TIME, COST and QUALITY.
- The most recent, and largest (\$25M) project was extremely fast tracked and the alliance enabled a totally different approach to the delivery of the required works.
- In effect the establishment of the alliance embodied a "Best for Project" discipline that ensured we were able to tap into the significant pool of experience of all alliance partners without having to consider the potential for adversarial behaviour. Some may ask "how is this possible"? It is plainly evident that there were some early misgivings but the leadership of the alliance was "hell bent" on ensuring that the "best for project" and the "no blame" alliance principles were strictly adhered to. This did mean that the traditional roles were no longer appropriate and each party had to find new and different ways of conducting business. There was a clear DETERMINATION, from all levels of endeavour, to make the best of the opportunity we all had available.
- The politically driven time frame for the major project meant that there was insufficient time to adequately define and scope the project requirements. The scoping was extremely high level, a "functional scope" only, which was further developed with the alliance partners in the form of design plans and sub design packages. The development of the overall design plan also led to the development of the Business As Usual (BAU) estimate, which was validated by independent industry expert estimates. This was a challenging and critical stage of the project! This was the price setting mechanism of the project – what it would actually cost, which in turn determined the take away margin of the alliance partners. It also set the framework for the performance incentive mechanism of the project, the risk/reward benefit that each alliance partner would be able to claim if all performance areas, and the Non Cost Key Performance Indicators (KPI's) scored well during the delivery of the project. These Costs related to ALL components of the project, from design right through to commissioning and provision of all as constructed data, drawings and intellectual property. It was at this time that

all of the planning “wish lists” and all of the traditional requirements were placed under a functional, need to have and cost structure microscope to ensure that the project budget was adequate to meet the cost of the job. There were many challenges which looked into every corner of the project including:

- Requirements in excess of function
- Requirements in excess of Australian standard
- Alternative ways of providing the same function
- Appropriateness of proposed specifications
- Appropriateness of proposed work processes
- Infrastructure fit with existing interfaces
- Suitability of client and third party interfaces
- Reaction to political and bureaucratic constraints
- Non negotiable performance standards
- Compliance with NEC Code

Following the acceptance and agreement to the BAU estimate by the alliance partners, the reality of an extremely short lead-time had to be faced by designers, procurers, suppliers, contractors and clients. Risks were assessed and different actions were taken. Preliminary works, procurement and design were undertaken as a parallel set of tasks. This had the overall effect of promoting a problem sharing culture, one which removed the adversarial approach to contractor – client relations and also one which faced up squarely to the age old designer – constructor stand-off. We formed an integrated team that assessed design at various stages from a constructor and client perspective in a cooperative manner. This had the effect of significantly reducing the design to construct lead times and also resulted in negligible rework.

What did we achieve?	Influencing factors
A project delivered ON TIME	<ul style="list-style-type: none"> · A clear focus on the goals and objectives by all members of the alliance team, from CEO’s right through to the designers, constructors and commissioning team. · A “can do” attitude to all aspects of the delivery of the project. · A “by-in” by all partners on the risks the client faced in terms of liquidated damages and sensitive public and political image faced as a government enterprise. · A bonus to the performance was a clear undertaking by the partners to assist by way of exemplary performance, in enhancing the client image as an innovative and committed government enterprise as the client organization was put up for sale, and ultimately sold, in a competitive and high profile sale arena.

<p>A project delivered within budget</p>	<ul style="list-style-type: none"> · A clear recognition that “the price will always be the price”. · The open book accounting culture established a trust between the client and the contractors. · The ability to put all resources to a work area that is experiencing concept, detail or management difficulties. · A clear and open link between designers, owners and constructors to ensure that costs and costly time is well controlled. · A sound mechanism for the management of scope change and variation management, that promoted thorough scope change evaluation and variation management that ensured adequate budgetary constraint and yet provided the constructor with a fair price to undertake the work without the threat/challenge of budget runaway. · Clear monthly reporting of the TOTAL project position to the project “patrons” but also the client board of management.
<p>Other “Non Cost” Key Performance areas.</p>	<p>The project alliance framework included four Non Cost Key Performance Indicators (KPI’s)</p> <ul style="list-style-type: none"> · Safety · Quality · Environment · Community relations
<p>Safety</p>	<p>This KPI area carried a legislated OH&S responsibility and any poor performance in this area directly impacted on all alliance partners. It was incumbent on the ALLIANCE to actively manage Safety.</p> <p>The most aggressive partners OH&S outlook was selected as the minimum OH&S/safety management position and ALL aspects of the project were managed from this viewpoint.</p>

Quality	<p>The major alliance partners systems were adopted as the system by which the project would be managed. This system was encapsulated within that partners “living and functional” QA system. This ensured that QA audits would be undertaken and remedial actions, if required, would be promptly initiated.</p>
Environment	<p>The Project site was in an environmentally sensitive area, adjacent to a large populated area. It was clearly evident that any environmental incident would have a profound impact, be quite expensive to remediate, reflect adversely on the alliance partners and gain rapid and wide media coverage giving rise to potential political grandstanding.</p>
Community	<p>The project driver was a government initiative, which did not have universal community support. There was civil unrest, demonstrations, and significant questionable media comment.</p> <p>To enable the alliance to meet the contractual and stakeholder requirements it was essential to avoid, at all cost, any adverse community reaction to site activities.</p> <p>The project construction sites were all on areas readily accessible to the public, often in areas of public recreational activity.</p> <p>Background support was secured, on a cooperative basis, from all community management agencies to the extent that the likes of police, etc. were quietly but fully informed of our activities and were able to initiate a range of subtle strategies to manage fringe community elements so behaviours did NOT become at odds with project site requirements.</p>

- 15. If you rated your alliance contracting experience less successful than experience with traditional forms of contract, please describe why? Briefly detail the disadvantages and problems encountered. What objectives were not achieved, and what were the factors that prevented the achievement of these objectives.**
- Less successful on some contracts where we succumbed to the lure of changing the scope for promised but not necessarily better product performance. Budget was controlled but completion date was delayed significantly.
 - As most of our dealings were with the Commonwealth Government their processes are not readily attuned to alliance contracting and therefore some agreements/decisions cannot be binding even if agreed in trust.
 - Project value needs to be high, as the set up costs of an alliance are very high.
 - The alliance cost goals need to be clear. An open book approach is fine but the decision-making on cost constraints needs to be clear.
 - The alliance form of contract does not deter a contractor from applying damages on consultants where delays beyond his control occur. In large projects the cost of these actions could also be large. Alliance does not help therefore to discourage animosity between parties to the contract.
 - The project did not proceed past the first stage, as the client exercised their right to terminate due to cost problems.
- 16. With reference to your answers to questions 11 - 14, what does the term project success mean to you?**
- Project objectives met, and client/contractor/consultant satisfied: 24 responses
 - Achieving the client's objectives within the defined project parameters, and basically that the client at the end of the day is happy and satisfied with the results obtained.
 - Successful outcome for all stakeholders with respect to their desired objectives, i.e. a win-win result for both client and contractor.
 - Delivery of the total scope of work/deliverables required by the contract.
 - Delivering the project to or within agreed goals and objectives is recognized as having "set the benchmark" in the successful delivery of Electrical Transmission projects.
 - Achieving KPI's.
 - Achieves specified project goals.
 - All alliance partners win
 - Profitable and financially rewarding.

- A pleasurable experience and enhancement of personal and organizational standing of all involved

Generally this can only be achieved through effective planning and program management, realistic cost estimating and cost control, recognition and management of risk, dedication of resources and above all discipline in the pursuit of the objectives (management of scope).

- Time related: 9 responses
 - Completion on-time or ahead of schedule
 - Reduced time on non productive activities (e.g. interpretation and argument over contract)
- Cost related: 7 responses
 - Completion on or below budget, including meeting the cost of any performance incentives.
- Quality related: 4 responses
 - Quality product/service
 - Quality reporting and predictability of outcome
- Safe delivery of project, free of accidents and incidents.
- Environmental standards and requirements met or exceeded. A favourable community reaction, especially those near to the work being undertaken.
- Future business with a clear commitment from all alliance partners to actively pursue the alliance structure development for future project delivery, regardless of project size, complexity or timeframe.
- Some other learnings have also surfaced from alliancing that the traditional “principal, or client ” should wake up to:
 - Contractors are really product integrators and as such have much more market leverage than the client – wake up guys and buy in!
 - Contractors have a much wider range of experience than do the client since the contractors do “it “ for (and to) many clients Australia wide (and some, world wide) – make use of this and get this experience without fighting for it!!
 - Clients look for the lowest price too often and this can lead to selecting a sub-optimal contractor and then proceed to “do battle”. There is a fair price available from contractors who are ready and experienced at relationship (alliance) contracting and who are prepared to put their considerable resources to the clients need in this type of framework.
 - Contractors are not aware of the drivers and constraints that the client must meet as part of their business. One way of gaining recognition and support from the contractor is to open the door a bit further and allow the contractor some insight. Alliancing provides this advantage, and often

innovative solutions come from the other viewpoint that the contractor takes.

Clients, ask yourselves “why should we NOT use alliancing as our preferred project delivery relationship – it really works!

I have the firm belief that the alliance project delivery is a BENCHMARK project delivery system. I believe that organizations developing and/or delivering infrastructure should ask “why should we NOT use the alliancing project structure. I also believe that the contracting community should also show leadership by actively promoting the principle of alliance based project delivery.

I have a personal commitment to attempt to influence the drift of standard (?? Adversarial??) towards the alliancing positioning. We have much more to gain in the construction industry by putting aside the adversarial behaviour in favour of the cooperative and balanced risk embracing positioning that alliancing creates and delivers.

I will take every opportunity to look for, and foster opportunities for alliancing in the future.

18. In what form of contracting does your firm predominantly engage for the delivery of projects?

- Other
- Hourly fee
 - Construction Management
 - Design & Construct
 - Mix of Fixed Price for early analysis definition phases & schedule of rates or fixed price contracts for IT build construction phases depending on the assignment of risk & elements of risk/reward included to balance risks & encourage early delivery. Time is key generally.
 - Percentage fee – consultancy
 - Capped level of effort
 - Negotiated

23. If your contracting experience exceeded your expectations, please describe why? Briefly detail the advantages and benefits realized. What objectives were achieved, and what were the factors that influenced the achievement of these objectives.

Objectives Achieved, Advantages and Benefits Realized

- Time, cost and scope objectives met and disputation minimized.

- The risk management aspect exceeded expectations because the project safety objectives were realized.
- Good process, on time and on budget under enormous pressure.
- Project finished on time, made a profit and the client was happy with the end product.
- Unfavourable weather conditions, however delivered prior to scheduled completion date. No tangible benefits, but allowed crews to move to other projects earlier.
- Benefits were closer team, no disputes or blame, confidence at delivery date of actual delivery with necessary quality, vendors rewarded.
- Cost, time and quality issues were all adequately managed to achieve our Clients expectations and our Clients risk profile was minimized in all contracts.
- Good profitability and generally a good client relationship post project, sometimes with high praise for the completed product.

Factors Influencing Success

- Experienced senior staff available from participating firms.
- Utilization of proactive management led by our company as project managers.
- Where we are brought in at inception, and are able to guide the client, our experience with the contracting side of our projects generally exceeds everyone's expectations.
- Major factor contributing to success was the Area Construction Manager's total focus towards safety.
- Success of the project was due to the good management of the team directly involved, which included good communication. There was support from higher management at critical times in the project. The project team worked with the client and consultants to achieve the desired result. The project increased in put at the front end. This led to a less compacted program at the end of the project.
- Adequate staff were available to undertake the work, thus eliminating the risk of error due to high work.
- Negotiated work leads to a higher chance of profit
- The management of the project team
- The program being realistic
- The relationship with the client
- The ability of each team member to perform
- The planning for the procurement of materials
- The supervision of sub-contractors
- Negotiation with the sub-contractors
- The time of year that the project started

- Early design completion - time for material procurement - less field time - excellent communication - no problem with property owners - high quality - early completion. Communication, time and procurement very closely related.
- As a single person project management firm I am able to provide high level hands on attention to the small number of projects that I manage. My expertise is in cost, scope and time management, and I endeavour to exceed expectations in these areas. This results in exceeding expectations in risk management.
- The contracting experience in these cases exceeded expectations because the vendors were very inclusive of the client & tolerant. The vendor adapted their project methodologies to fit into our companies, or rather accommodated dual reporting & process checks. They (vendor) built trust & friendship, and took the opportunity to learn about the client organization wherever possible. The client enabled the vendor to build up organization as required, help select necessary people & gave time & consideration to growth of small company dealing with large project. The vendor delivered on time and exceeded quality expectation, and client worked to do the same - form 1 team. The vendors shared information & passed on experience to client, so that they were valuable beyond their allotted task. The client was honest about reality of funding, project manager's ability to influence (or lack of it) and risk to vendors. Real glue was shared interest/passion in the subject of the project - need to build on a shared experience with vendors where ever possible, tap into their reason for being in business - understand that and you can motivate and link on a number of levels. To be successful you need emotional commitment to a project from all individuals, beyond the partnership piece of paper. To build that you have to understand your own reason for doing it, the sponsor's motivations and real criteria for success & some tie or link into the vendor's mind set as well. Ours was shared love of the web - and if you set high expectations for quality, not impossible but high and back it with payment and opportunity to play in a big space, then you are 1/2 way home.
- Good choice of partners, experienced and motivated people, good strategy, good management enabled the procurement of some large complex projects.
- Generally reasonable clients, good scope definition (except one - client problem), reasonable pricing and good project and cost management. Competent project managers, skilled workforce and reasonable clients were contributing factors. Nothing can overcome a poor client!

- Good contracts generally come about where there is a mutual understanding and rapport/trust is created. Clear unambiguous documentation helps!
- Scope and communication controls were the key to success.

24. **If your contracting experience was less than satisfactory, please describe why? Briefly detail the disadvantages and problems encountered. What objectives were not achieved, and what were the factors that prevented the achievement of these objectives.**

- Although the project management experiences were unsatisfactory, the contracting experiences were satisfactory

Objectives Not Achieved, Disadvantages and Problems Encountered

- Close-out is often messy due to data delivery by contractor, particularly as built drawings.
- Objectives not achieved were schedule and cost both of which overrun considerably. Twelve months after completion claims are still unsettled.

Factors That Prevented the Achievement of These Objectives

- Less than satisfactory experiences have been very rare, and have generally been caused by inexperienced clients.
- Scoping and specification is a bit loose.
- The contract was managed by an EPCM contract using contract personnel to manage the construction, the Contract, the Superintendent's role, safety, procurement for Principal supplied items, progress reporting, etc., etc. The EPCM team occupied premises next door to the Principal's Reps. Integration existed however accountability did not exist. The committee theory existed. Added to this the Contract was awarded to a Contractor with the reputation of being uncooperative and a "claim merchant". The works required an ore crushing station to be constructed in an underground location approx. 2kms below the ground where radiated heat exceeding 50 deg.C existed. Delays and disruptions caused by the Principal were commonplace. The Contractor at the same time was not proactive and obviously out of his depth in managing and carrying out the Works. Factors, which prevented objectives being achieved, were:

- Contract awarded to wrong Contractor;
- Absence of firm Project Management by the Supt;
- Failure to effectively negotiate continuously with the Contractor;
- Failure to conduct effective pre-award meeting;

- Failure to award contract with EPCM management
 - team in place;
 - The scope of work was continuously altered by way of continuous amendments to design drawings; and
 - Lack of communication between design and field resources led to procurement delays and a total time and cost blow-out.
- Usually because the rapport goes and the relationship becomes adversarial.
 - The one bad outcome was when the client had little idea of what was required and blamed contractors for problems with scope definition, access to the site, coordination and the need for large variations in the project. Payment then became a problem. The client is well known in the building industry as a poor client and bad payer. A good relationship with the client was impossible.
 - The problems of traditional delivery as opposed to more “cooperative” forms of contract are well documented. In our role as PM we spend our time “defending” the client from claims for variation on the basis of scope definition of the documents and negotiating a reasonable price / time for those variations.
 - Quality Control systems are rarely fully implemented outside of essential areas such as compaction testing earthworks etc., primarily due to the bureaucratic nature of the systems.
 - Minimal client knowledge and support to project management processes, especially in government
 - Too much interference in choice of vendor by senior management - with ‘preferred candidates’
 - A project with 1 large vendor to deliver a confidential transactional web site. The issue was where the vendor team did not share common goals, because their own marketing organization had ‘sold’ them onto the project but the technical and business representatives lacked the necessary vision and skills to complete the task. (Known fact pointed out at the time...) The objective was a joint delivery for both parties benefit of a complex transactional web site. The problem was that the vendor, because they were unskilled in this area had to be dragged and led the whole way, delivered sub-standard or tolerable work that disappointed - which then demotivated them further. The project failed as the vendor (in this case a large bank) could not deliver on time to specification - people were fired within their organization and the wrong ones of course. It was not the partnership organization that was at fault, actually the project management of the team structure, meetings etc. was good text book stuff, but the vendor lacked understanding of the content, so deadlines were

missed, project deliverables were 'failed'. The vendor was criticized at the end by auditors for concentrating on partnership structure as if 'colouring by numbers' and not on the actual content of the work & endless missed deadlines.

- Selected a contractor based upon lowest price and contractor made up low price differential with variations because scope of works was not particularly detailed.
- HR Management problems are typical of large projects in Australia at present - difficult to find 'good' people quickly on big projects (especially on short-medium term contracts).
- Communication problems caused some abortive work to be undertaken and resulted in some minor compromises in terms of final design outcomes.
- Inexperienced management appoints inexperienced people and does not utilize standard systems, causing a poor tender and poor subsequent project delivery.

25. With reference to your answers to questions 21 - 24, what does the term project success mean to you?

- Project objectives met, and client/contractor/consultant satisfied: 41 responses
 - Client/Customer satisfied
 - Minimal conflict
 - Profitable
 - Happy project team at end of project
 - Leads to more work/future recommendations
 - Maintaining realistic expectations
 - Minimal variations
 - No disputes or litigation proceedings
 - Predictable outcomes
 - Clients risk profile was minimized in all contracts
- Time related: 28 responses
 - Delivery on time or ahead of schedule
- Cost related: 27 responses
 - Delivery within budget
 - Delivery within 10% of budget
- Quality related: 25 responses
 - Meet all objectives to agreed quality standards

30. Would you consider alliance contracting in the future?

Yes. Please explain why?

- Higher level of communication and sharing of risk.
- Greater acceptance of processes and the outcomes.
- Ability to integrate specialist resources.
- I must emphasize we would consider. We are always receptive to how we can do it better.

- We would consider alliance contracting where we thought it would add value on any of our client's projects. Our company operates on each of our projects in such a way that, for example, all of the benefits of a partnering approach are intrinsic in our project management style and procedures, without having to "formalize a Partnering Agreement". We also undertake comprehensive Risk Management exercises that involve all stakeholders, including Contractor(s) at the appropriate time, and where common goals and objectives are agreed to between all concerned. In our view, alliance contracting (where it involves inexperienced players) will suffer from the inexperienced players involved. In other words if you have the right mix of experienced people, and they're working together under the leadership and guidance of a skilled and experienced Project Manager, then you're well on the way to having a successful project. As a project manager who has directed a number of Hospital Redevelopment projects throughout Australia, I obviously come with a bias toward the use of independent Project Managers, however I feel strongly that the best people ensure a project success - by definition.

- Sounds like a good approach. Will wait and read some case studies of how it has worked.
- Improve quality, scope, cost and schedule criteria from both sides of the contract, and should attract future business.
- Once further successes of this form of contracting demonstrated. Need to clearly demonstrate value.
- Because I'm a firm believer (dreamer) in cooperative team working and seeking mutual advantage/benefits, thus achieving win-win scenarios. But, I'm not sure that many of our contracts are large enough to warrant formal alliances via boards etc.
- Generally when an ongoing relationship was anticipated, such as material suppliers. Any ongoing symbiotic style of relationship has a long term benefit for both parties and logic will generally dictate that a predictable business relationship has mutual benefits. One-off contracts are often subject to opportunistic behaviour. It's hard to beat human nature.
- For some projects this could be an ideal means of controlling and minimizing project risks.
- Tangible/measurable benefits to both parties.
- It would foster greater communication and greater understanding between parties and hopefully would breakdown the standard barriers between the client and contractor.
- Possible benefits to client in cost and quality.

- If it could be demonstrated to add net value to the Client, i.e. a demonstrably “better” project in the Client’s view, measured in time and/or cost
- Asian situation not so clear-cut
- Provision of broader skills between the alliance partners
- Sharing of risk
- There could be significant advantages when used with the right project. Standard contracts do tend to be adversarial in nature, which creates a number of problems.
- Normal contracting uses big stick approach to get performance - lots of incentive to meet targets but little incentive to do much better than that. Like to try a system that works as a true ‘partnership’ (but not a partnering agreement - still a big stick aspect to this) where both parties take share of wins & losses - would mean much greater incentive to work together, etc.
- It is not an arrangement that we currently need to be involved in, however if we determine to expand our business at a faster rate, and this provides us with an avenue to do this with acceptable risk and profit levels then we would consider it.
- It would reduce the risk of doing business.
- The benefits to all parties of more cooperative forms of contract are well documented in seeking to address the needs of all stakeholders and respecting those needs in the project delivery process to achieve an outcome that is “successful” for all stakeholders rather than being a series of win / lose negotiations.

No. Please explain why?

- The type of contracts entered into are not complicated or have high risk. Lump sum is an easily managed contractual base upon which to manage such projects.
- Not really applicable in my industry with the solutions that we are implementing.
- Not suitable for the short term 1-4 month projects we generally deliver on - legal implications are too heavy.
- Effort is best put less into the form of the relationship, but into the real quality of the relationship between people - less form, more function.
- It is a risk minimization strategy for Building Contractors , which invites Clients to share in the construction risk as well as all the other risks the Client is taking. Construction and pricing risks should stay with those best placed to control it . The Client also loses some control over the outcomes in terms of design and functionality of the final product.

- My organization is a Government organization and until there is general policy developed for different forms of contracting, we will be maintaining the traditional forms.
- Lack of knowledge in this area.
- I am retiring and therefore will not have the opportunity.

APPENDIX C:**GLOSSARY OF TERMS**

ACA	Australian Constructors Association.
Business As Usual (BAU) estimate	Sometimes referred to as the Target Cost Estimate, which is an estimate of cost to complete the project that is agreed to by all alliance participants. This becomes the capital expenditure KPI.
Key Performance Indicators (KPI's)	Measurable key performance areas for which the outcomes determine the sharing of gains or pain. KPI's can be established for time, cost, quality, etc.
EPCM	Engineering, Procurement and Construction Management.
NEC	The National Electricity Code regulates the technical and market operations of participants in the National Electricity Market.
NPWC/NBCC	National Public Works Conference and National Building & Construction Council.
Stretch Target	Stretch Targets are defined as very ambitious targets that are committed to without the parties quite knowing how they can be achieved. Achieving a stretch target requires a change in the previous ways of doing things, high levels of performance and problem solving, being innovative, and using the latest technology.
Traditional Contract	A fixed price risk transfer approach to contracting. Refer to page 13.
Partnering Contract	A conventional contract, which has formal procedures added for consultation and cooperative resolution of disputes. Refer to page 19.
Alliance Contract	A cooperative partnership under which a joint board is set up to deliver the project. The contract focuses on issues such as risk allocation and remuneration, such that they become an integral part of the contractual relationship. Refer to page 21.