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Project Alliancing at National Museum of Australia – The Collaborative Process

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ABSTRACT

Project alliancing is a new alternative to traditional project delivery systems, especially in the commercial building sector. The Collaborative Process is a theoretical model of people and systems characteristics that are required to reduce the adversarial nature of most construction projects. Although developed separately, both are responses to the

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same pressures. Project alliancing was just used successfully to complete the National Museum of Australia. This project was analyzed as a case study to determine the extent to which it could be classified as a "collaborative project".

Five key elements of The Collaborative Process were reviewed and numerous examples from the management of this project were cited that support the theoretical recommendations of this model. In the case of this project, significant added value was delivered to the client and many innovations resulted from the collective work of the parties to the contract. It was concluded that project alliances for commercial buildings offer many advantages over traditional project delivery systems, which are related to increasing the levels of collaboration among a project management team.

Keywords: project alliancing, relationship contracting, partnering, collaborative processes, procurement, National Museum of Australia

INTRODUCTION

Many trends in the US and global construction markets are forcing all construction stakeholders – owners, contractors, designers, subcontractors, suppliers, and end users – to develop alternative project delivery systems that encourage higher levels of collaboration throughout the project life cycle. High levels of litigation and confrontation among the parties over the last several decades have led to management

practices that inhibit industry productivity and discourage optimal solutions to design and construction problems. Traditional design-bid-build approaches to the completion of projects have created adversaries among project team members whose individual profitability frequently is only attainable at the expense of another party to the contract. Much time and expense is exhausted protecting one's own interest rather than developing creative solutions that improve productivity, enhance design intent, accelerate delivery time, increase quality, and, in general, provide more value for the capital investment made by the owner. All of these forces have left many seeking alternatives to "business as usual" and experimenting with new, more collaborative ways to deliver projects. This paper reviews one of these unique examples as it was used on a successful project of international significance.

FMI, a major US construction consulting firm, in their annual review of key trends impacting the construction industry, has noted that owners are driving this "proliferation of project delivery alternatives – from design/build to guaranteed maximum price." (FMI, 2000:28) Two of the common themes in all of these approaches are higher levels of collaboration among the owner's, designer's, and builder's teams and earlier involvement of the contractor in design and capital decisions.

> Owners are redefining the roles of design and construction companies…demanding that more time and money be spent on design,

> construction feasibility reviews, and planning before and during construction. Owners are finding innovative ways to involve contractors prior to bidding, to keep designers involved for on-site assistance during construction, and…are embracing the high-performance-team model as a strategic initiative on all projects to align project stakeholders behind a project's critical success factors. This model maximizes project performance by driving the collaborative work process to the trade-worker level through employee involvement programs. (FMI, 2000:29)

The project alliancing contracting method used to construct the National Museum of Australia utilizes this unique approach to commercial building construction to address nearly all of these owner-initiated goals. Alliance contracting in construction is in its embryonic stages of development internationally – having grown out of the heavy engineering sector, especially the oil and gas industry. The museum project is the first major building development in the world awarded on the basis of a joint alliance contract.

Project alliancing may be viewed as an outgrowth of partnering relationships, common to US Army Corps of Engineers' projects as well as many other international projects in both the public and private sectors, and provides many of the same benefits noted for partnered projects. (Larsen, 1995; Weston and Gibson, 1993; Thompson and Sanders, 1998; CII, 1996; Walker, et. al., 2000b; and others) However, there are important

differences between partnering and alliancing. Under traditional contracts, and under partnering as well, one team may 'sink or swim' without necessarily affecting the business position of other teams. One team may make profits from a project while other partnered firms/teams actually may incur a financial loss. With alliancing, there is a *joint* rather than *shared* commitment. Parties agree to their contribution levels and required profit beforehand and then place these *at risk*. If one party in the alliance under-performs, then all other alliance partners are at risk of losing their rewards (profit and incentives) and could even share losses according to the agreed project painsharing/gainsharing model. Although they do not merge their companies in any legal or official way, alliance members form a quasi-joint venture because they operate on one level as a single entity. (Walker, et. al., 2000a)

Parallel to the development of project alliancing – and quite independent from it – a group of owners, designers, and builders in the US have created The Collaborative Process Institute (CPI) with the mission "to revolutionize the building industry by establishing collaboration as the cornerstone of the building process." (CPI, 1997:1) They have endeavored to define 'The Collaborative Process' model designed to re-establish a spirit of collaboration at the core of the industry. This model seeks to outline the characteristics of the people and the systems that would be required to generate this spirit. The Collaborative Process includes the following maxims:

- Integrity and trust are essential for true collaboration.
- The long run is more important that the short run.

- Teams make better choices than individuals.
- In building a team, pre-qualify firms and select the right people.
- True creativity focuses on option generation, not just the selection of the 'best idea'.
- Change is inevitable: be prepared for it.
- The basis for decision-making should be facts and reason, not opinions and emotions. (CPI, 1997:5)

While elements of The Collaborative Process have been used on numerous projects in varying degrees, the major role of this model has been to establish the theoretical requirements needed to foster collaboration among contracted parties. The theory lacks definitive examples in which nearly all components of the process were brought together on a single project. In fact, one of the future directions for the Institute is to create important innovations including "new forms of contractual agreements", "new business structures", and "new information systems" (CPI, 1997:15-16) which will incorporate these principles.

The major goal of this paper was to determine the extent to which the National Museum of Australia project incorporated the theoretical underpinnings of The Collaborative Process. Clearly, the stated goals of project alliancing and the CPI are closely related in that they both are intended to address the same ills of the international construction industry. They both are responses to significant trends in the industry incorporating

partnering techniques, high-performance teams, dispute resolution alternatives, and intensive use of recent developments in information technology. If this project is unique in successfully adopting alliance contracting to the commercial building sector, as well as incorporating many of the theoretical principles of The Collaborative Process, it may prove to be a valuable case study in advancing the benefits of relationship-based procurement in the construction industry.

The CPI (1997) identified five key areas in which development of systems is needed to further the collaborative relationships among project stakeholders: 1) high-performance teams, 2) optimization and performance measurement, 3) communication, 4) incentives and risk-sharing, and 5) problem solving and decision-making. After a brief discussion of project alliancing to distinguish this project delivery system from partnering and strategic alliances, this paper reviews how the National Museum of Australia project performed in each of these five areas.

PROJECT ALLIANCING DEFINED

Project alliancing can be defined in many ways, because of its inherent complexity, simplicity, and chameleon nature. Since application of alliancing requires a flexible approach, there is some confusion as to what project alliancing really is and how it differs from other project delivery mechanisms. It is therefore important to define

alliancing and clearly distinguish among the following three, often confused and misunderstood, terms: Partnering, Strategic Alliances, and Project Alliances.

Partnering. In the US, Charles Cowan, an officer with the US Army Corps of Engineers, championed partnering which gained momentum in Australia in the 1980s. He described *partnering* as:

> About going back to the way people used to do business, and putting the handshake back into business. Partnering empowers those involved in the project with the freedom and authority to accept responsibility to do their jobs by encouraging decision making and problem solving at the lowest possible level of authority. It encourages everyone to take pride in their work and tells them its OK to get along with each other. 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. (Cowan, 1991:2)

Partnering itself is not a contract. A partnering charter is developed to run in parallel with a traditional construction contract to provide guidelines to the relationship among the organizations. (CIIA, 1996:11) Parties agree to act reasonably and fairly and to 'shake hands on it'. (Thomson, 1998:5) Partnering relies solely on the commitment of individuals, as the partnering charter is not legally binding -- and this can be its best or

worst feature. The Construction Industry Institute (Australia) in 1994 conducted a comprehensive study of partnering in Australia. One of the interesting results was the necessity of workshops and external facilitation to enable individuals to operate in a partnering environment. (See Table 1 for a comparison of content covered in workshops on projects perceived to be a success and those perceived to be a failure.)

Strategic Alliances. Unlike partnering, a strategic alliance is an inter-organizational arrangement usually between two companies that extends beyond a specific project. Parties to a strategic alliance contract expect ongoing mutually beneficial business. Hampson and Kwok (1997) propose the attributes—trust, commitment, interdependence, cooperation, communication and joint problem solving—to be key to successful business relationships and as measures of strategic alliances. Kwok went on to analyze strategic alliances between head contractors and subcontractors in building construction and noted the following:

> Strategic alliance relationships may result in a higher initial tender [bid] price than typically achieved using open competitive tendering amongst all contracting firms regardless of their relationship with subcontractors. However, in the long-term, a higher standard of on-site construction processes may provide better value for money in respect of the facility life cycle. (Kwok, 1998:ii)

The life-cycle approach to facility ownership is becoming a higher priority for governments and other clients procuring large infrastructure projects. For example, recent projects involving water treatment and transport facilities specifically have highlighted the life-cycle costs over the first twenty or thirty years of operation. Value for money does not necessarily equate to the lowest bidder. If strategic alliances formed between parties to the construction process can produce quality workmanship with better life-cycle qualities, then value for money has been optimized.

Project Alliances. Project alliancing differs from strategic alliances in the fact that parties are brought together for a specific project or outcome. Project alliances have a defined end – typically the practical completion date of a constructed facility. Abrahams and Cullen define project alliances as:

> An agreement between entities which undertake to work cooperatively, on the basis of a sharing of project risk and reward, for the purpose of achieving agreed outcomes based on principles of good faith and trust and an open-book approach towards costs. (Abrahams and Cullen, 1998:31)

The project alliancing 'agreement' is legally enforceable - but the intention is to establish and use 'drivers' that will stimulate parties actively to support and cooperate with one another - it is not just a *feel good* approach. To encourage co-operation in project alliancing, the hard contractual issues that affect the entities' bottom lines, such as risk

allocation and remuneration, are used. This is an obvious difference between project alliances and partnering, which is solely based on soft issues. (Clayton Utz, 1998:7)

Alliance partners are selected on the basis of their expertise and ability to meet stringent performance criteria before price is considered. In alliancing, trustworthy, committed, and competent firms are invited to join with the owner/client to develop the project. As an alliance of talented professionals pooling resources to achieve the project goal, they develop the project price target through design development with agreed risk and reward sharing arrangements. The expected cost savings are derived from improved value for money through leverage of skills and expertise of the alliance partners in developing the project concept through to delivery. The concept relies on a 'best value' outcome rather than, for example, a least expensive or quickest project outcome. Defining features of alliances are as follows.

- Selection by general performance criteria that demonstrate world-class excellence, innovation capacity, and superb relationship management skills.
- Substantial design development after joining the alliance.
- Joint budget and cost/time committed targets established through an alliance board represented by key senior project champions from each alliance member and the owner/client.
- Agreement on a risk and reward formula where an open-book accounting approach is undertaken to determine cost reimbursement together with agreed and verified site management costs to establish a base target cost. The firm's

corporate profit (usually determined from audited figures over an agreed period) is placed as an 'at risk' component to ensure that the agreed project costs are met. A bonus reward mechanism to be shared by all parties is jointly established to encourage further innovation and excellence. Thus, the agreed project cost can be determined only when the alliance partners have been selected.

- The issue of extras for contract modifications among alliance partners does not arise substantially because of the nature of the alliance's work in pre-planning and defining the project scope before agreeing to the risk and reward arrangements. Change orders have to comprise substantial, and demonstrably significant, changes in scope. Any on-site construction change orders are project managed by the alliance team.
- The intense integration of alliance partners through the above-described process requires excellence in communication at a personal level, at a business level, and at operational level. This generally requires a quantum leap in the use of shared information technology (IT) systems and information processing integration.

HIGH-PERFORMANCE TEAMS

CPI identifies effective teamwork to be, by definition, an essential component of The Collaborative Process. "The early identification of required team resources, selection of suitable team members, appropriate contracts, and strategic, well-planned team-building events are essential to creating the environment in which a group of

individuals can be transformed into a High-Performance Team." (CPI, 1997:7) On the people side of the equation, the common characteristics of high-performance teams include facilitative leadership, diversity, common purpose or vision with specific performance goals, collective work products, shared responsibility, high communication, rapid response, and trust. On the systems side, essential considerations include identification and prioritization of required expertise, selection process, contracts, team building events, and continuous improvement of work processes. (CPI, 1997)

There is much anecdotal evidence that the members of the Acton Peninsula Project Alliance – the contractual members of the team responsible for the design and construction of the National Museum of Australia – excelled at creating a successful high-performance team. All parties shared a common office space on site and the communication and cooperation levels were exceptionally high. Complex structural and managerial problems were resolved at the project team level to advance the goals of the project ahead of those of individual companies. While many of these examples could be analyzed in more detail, the team selection process is examined here as representative evidence that the museum project demonstrated the characteristics of a high-performance team.

The selection process for alliance partners was a complex one that differed significantly from procurement under traditional contracts or even partnering arrangements. This

process involved a series of proposals, interviews, and workshops as illustrated in Figure 1. It should be noted that cost proposals were not included as alliance partners were selected to help design the museum and to complete constructability reviews before the price target could be set. They were selected on the basis of their demonstrated ability to work in this collaborative arrangement.

Selection of the construction alliance partners was based on the 12 criteria listed below; proposers were required to provide specific evidence of expertise for each criterion with multiple examples of each:

1. Demonstrated ability to complete the full scope of works including contributing to building, structural, mechanical, and landscaping design.
2. Demonstrated ability to minimize project capital and operating costs without sacrificing quality. (Value analysis and life cycle costing.)
3. Demonstrated ability to achieve outstanding quality results
4. Demonstrated ability to provide the necessary resources for the project and meet the project program. (Including resumes of key staff.)
5. Demonstrated ability to add value and bring innovation to the project.
6. Demonstrated ability to achieve outstanding safety performance.
7. Demonstrated ability to achieve outstanding workplace relations.
8. Successful public relations (PR) and industry recognition.

9. Demonstrated practical experience and philosophical approach in the areas of developing sustainability and environmental management.
10. Demonstrated understanding and affinity for operating as a member of an alliance. (Collaborative experience and views on risk/reward schemes.)
11. Substantial acceptance of the draft alliance document for the project including related codes of practice, proposals for support of local industry, and employment opportunities for Australian indigenous peoples.
12. Demonstrated commitment to exceed project objectives.

Figure 2 illustrates the project alliance as it emerged from the selection process described above.

OPTIMIZATION AND PERFORMANCE MEASUREMENT

CPI defines "an optimal outcome as an outcome which has the best combination of cost, quality, function, scope, and time as defined by the unique needs of the client and the project." (CPI, 1997:8) To be successful on a collaborative project, this optimal outcome must be defined clearly so that performance measurements can be put into place that help guarantee the outcome. The common characteristics of people on teams that successfully complete this project optimization include goal setting, diversity, alternative development of options, self-regulation, and feedback. There are many systems that control the outcome of a project and establishing the appropriate level of

priority for each of these outcomes is critical to a collaborative project. The six performance measurement systems that must be monitored during a project, as identified by CPI, include cost, time, scope, function, safety, and quality. (CPI, 1997)

The project alliance agreement used for the National Museum of Australia established the performance measurements for the project and specified the optimal level for each. The members of the Acton Peninsula Alliance collectively put their profitability at risk if these performance measures were not met. Because of this collective nature of the risk and reward incentives, no member of the alliance could succeed unless all members succeeded and the failure of one partner could directly threaten the profitability of all other alliance members. It is this *joint*, rather that just *shared*, risk and reward structure that distinguishes project alliances from other forms of contracting and partnering arrangements.

The performance measurements on the Museum project were listed as the Key Performance Indicators (KPIs) in the alliance agreement and included cost, time, and design integrity/quality. This Museum was to be central to the Australian Centenary celebration. As the opening of the project was scheduled to coincide with the inauguration of activities to celebrate the 100th anniversary of the founding of the Australian Federation – and this project is located in the center of the national capital, Canberra – time on this project was critical. Reflecting this, no bonus was provided for early completion, but a substantial penalty would result for a completion delay of even

one day. The risk and reward structure for both cost and quality included both gainsharing for exceeding objectives and painsharing for falling short of expectations. The structure of risk and reward on this project is illustrated in Figure 3. These bonuses or penalties were awarded to the project alliance as a whole, with each partner sharing a predetermined proportion of the gain or loss. If the actions of just one of the partners resulted in a negative performance measure, all partners would suffer the consequence.

COMMUNICATION

The very basis of the word "collaboration" implies a communication among parties as they work jointly toward a common goal. Traditional, hierarchical organizational structures do not promote the type of communication among equals necessary to succeed in a collaborative environment. CPI concludes that collaborative communication must be based on key principles, which include "equality, openness, problem-orientation, positive intent, empathy, and extensive use of technology." (CPI, 1997:11) The Collaborative Process can be hindered by the creation of different levels of status on the project team, the imposition of one's ego in place of a problem orientation, physical separation of team members by either distance or walls, or lack of empathy for different individual styles of communication. The process can be improved through the introduction of systems designed to promote efficient communication including the use of effective meetings, professional facilitation, appropriate contractual agreements, and high levels of informal correspondence. CPI has established, as one of its major goals,

the development of new information technology systems designed to facilitate the levels of communication needed on collaborative projects.

> The emergence of new information technologies has made possible shared databases ("Data Warehouses") which serves as the repository of all project information. All team members would have access to project status and historical information, taking open-book and high-communication practices to a new level. The emergence of the Internet and World Wide Web as a new standard of messaging and collaboration allows The Collaborative Process to leverage its existing techniques many-fold. (CPI, 1997:16)

The National Museum of Australia project was very successful in achieving effective levels of communication through the use of professional facilitation, contractual agreements that bound parties to common goals, and the co-location of team members in a common, open on-site office facility. Interviews with key members of the alliance confirmed that communication levels on this project exceeded the levels experienced on other project sites. However, one of the most important differences on this project involved the extensive use of information technology (IT) to create a centralized location for all documents and to facilitate instant communication among the parties.

A quantitative assessment of the use of IT in construction is being investigated by analyzing data from this case study project. All parties in this project were encouraged

to make use of the "ProjectWeb" system, designed and maintained by the constructor entity in the project alliance. ProjectWeb is used via the Internet, combining all common forms of business communication (other than voice) into a single managed system. ProjectWeb can be used for email, requests for information, electronic document transfer/transmittal, electronic document library management, site instructions, calendar events, project directory, and document version control. All of these communications can be logged and archived for future reference. Users can access relevant information about the project at any time and communicate with others in a secure environment.

One early result of examining the communications data is shown in Figure 4. This shows initial enthusiasm and subsequent growth in senders of email and the later stabilization with broadcasting to "all recipients" declining, maybe as users of the information became more focussed or as the project progressed and information needs became better defined. Further analysis is continuing in this area.

Surveys were conducted during the project to examine IT implementation from seven different, but interconnected, perspectives. Subjective performance indices, as reported in Figure 5, provided an overall measurement of the effectiveness of IT implementation early in the project and helped to establish user-standard benchmarks for IT performance on future projects. The Acton Peninsula Alliance members rated the project organization impacts of ProjectWeb (speed of responses and support of the

alliance) particularly highly. Direct benefits (such as cost and time savings) were rated lowest of all categories, but at a very respectable 68%. Ongoing surveys continued to show high levels of acceptance and use of this web-based tool, and supported conclusions about its effectiveness in promoting high levels of communication on the Museum project.

While the web-based tool used on the National Museum of Australia project was custom designed by the constructor entity in the project alliance, other similar tools are now available on the market with similar operability. Internet software applications available from Primavera Systems, Meridian Systems, e-Builder, and others provide user-friendly packages that enhance communication, open-book cost control, document administration, and other management functions for all parties to the contract. Any of these systems can be adapted readily to meet the information needs of a project alliance and attain the communication levels envisioned by the CPI. (Stevens, 2001)

INCENTIVES AND RISK-SHARING

A consistent theme of the CPI is the alignment of individual incentives with the common goals of the project team. "Establishing a common set of objectives is one thing; setting up mechanisms to increase the likelihood of achieving those objectives is another. The Collaborative Process seeks to align the motivations of team members

with the goals of the team." (CPI, 1997:14) People are motivated by many things. CPI suggests that these motivations can be identified in the following questions:

- How will my actions affect me?
- How will my actions affect my organization?
- How will my actions affect my profession?
- How will my actions affect my society? (CPI, 1997:14)

Several social and legal systems can be used to create the incentives that will motivate individuals to be aligned with the goals of a construction project team. These systems include reputation, references, repeat business, contracts, compensation, public appreciation, and avoidance of risk. To establish a successful collaborative process, considerable time must be spent creating an incentive structure that both recognizes individual motivational patterns and utilizes existing social and legal systems to align individual interests with the goals of the project team. (CPI, 1997)

It has been described already how the alliance contract for the National Museum of Australia created incentives for the alliance partners themselves, and that discussion will not be repeated here. However, the use of common incentives and risk sharing was evident throughout the contractual relationships on this project. Many members of the Acton Peninsula Alliance created "sub-alliances" with key subcontractors and suppliers to generate the same motivations in favor of the goals of the alliance. It was assumed

correctly that the establishment of adversarial relationships at the subcontractor level would not benefit the collaborative process being promoted at the top.

In another interesting development on this project, an incentive-based project agreement was negotiated with the trade unions on the site designed to align the motivations of the craft workers with the key performance indicators included in the alliance contract. The relationship between the construction trade unions in Australia and the Commonwealth Government over the past two decades can be described as contentious at best. (Productivity Commission, 1999) While many positive changes have occurred in recent years, the prospect of a labor dispute impacting the completion date of this high-profile federal project in the national capital was very real at the start of construction and of great concern to the project alliance.

More particularly, Australian trade unions generally expect separate project agreements for large or complex construction projects. The National Museum site manager stated that such agreements are usually about buying industrial harmony by paying each worker an additional sum of about $1.50/hour over the industrial norm or award rates. The money is paid up front and if there is a problem with the quality of work or schedule completion there is no way to get the money back. Recent standards established by the Commonwealth Government, however, stipulate that contractors must seek the client's authority prior to negotiating a project agreement with trade unions on any federal project. The threshold issue for the government is the

requirement that the proposed project agreement provides a demonstrable benefit to the project (most likely in the form of time or cost savings), and be subject to review by contract officials against performance benchmarks. In the case of the National Museum of Australia, the client, while indicating some support for the use of a project agreement to manage workplace relations, required a process that demonstrated how any bonus or over-award payments would improve productivity and provide demonstrable benefits to the client.

Twelve months of rigorous negotiations took place at the start of the project, but there was no labor disruption during the negotiation of the project agreement. Union representatives showed a clear understanding of their members' concerns and needs, but also understood the objectives of the alliance and how they could benefit union members and the industry in general. A considerable amount of trust and respect was built up between the parties during the negotiations. The relationship established was crucial in the establishment of the final agreement and the ongoing assistance for implementation. The parties involved in the negotiations for the project agreement believed that the principles behind the project alliance were invaluable in establishing this trust and open communication.

The agreement was comprehensive and even handed in its provision for enforcement through a management plan that included the establishment of an agreement Monitoring Committee. This committee was made up of an alliance partner, a

subcontractor nominee, an independent party, a contractor employee representative, and a subcontractor employee representative. The Monitoring Committee considered ways in which the aims and objectives of the agreement could be achieved. It included discussion of such aspects as developing more flexible ways of working, enhancing job site safety, reviewing productivity plans, and ensuring that enhancements to the processes and procedures were adapted to the mutual benefit of all parties.

An interesting concept developed in this agreement was that of performance based bonus payments. Each performance component had benchmarks and was measured by an independent panel before rewards were paid. The additional site allowance payment for such a project of about $1.50 per hour was replaced with a sliding scale payment made upon proven performance based on productivity achievement. This was assessed based on benchmark measures established by the Monitoring Committee.

The percentage score given by the panel was used to determine the amount of *Excellence Allowance* owed to the individual workers. The *Excellence Allowance* was based on $1.75/hr for a 100% score. The following is an example of the payment in relation to percentages:

- 100% performance score achieved, $1.75/hr
- 80% performance score achieved, $1.40/hr
- 50% performance score achieved, $0.88/hr
- 0% performance score achieved, $0/hr (no reward)

This approach was adopted for each of the five performance components and a weighted score was then produced to objectively assess performance. The composition of the assessment team, the rationale for the measures used, and the mode of application were transparent and arrived at objectively. All parties were confident that the system was consistent with the agreement, excellence in work practices, and the project objectives.

While this process may appear to be onerous, needlessly bureaucratic, or wasteful in human effort, it appeared to actually foster savings through the reduction of waste caused by re-work, injury, poor workmanship, and poor planning. For example, the degree of planning required represents excellence in standards. Previous research into Australian construction projects has indicated that similarly high levels in construction planning and monitoring were associated with improvements in time performance of 30%. (Walker, 1996) Demonstrating evidence of a capacity to achieve this level of excellence was part of the selection requirements for the successful alliance group. The effort required to demonstrate and achieve this level of professional practice will help secure future projects that may adopt similar selection requirements.

PROBLEM SOLVING AND DECISION-MAKING

The way in which problems are resolved and decisions are made is central to The Collaborative Process. "Traditional, command-and-control organizational structures

for problem solving and decision-making" are replaced "by applying techniques founded in decision theory and research on group interaction…to achieve optimal solutions." (CPI, 1997:12) People on successful teams promote buy-in and commitment, identify biases and "agendas" that influence individual input, emphasize trust and cooperation, seek consensus in a context of diversity, and encourage proactive listening. Team members must be skilled in the tools of brainstorming, chip voting, action planning, flow diagrams, and decision trees. Systems that enhance effective decision-making in teams include a common measurement system, agreement on how decisions are made, and a systematically applied interactive problem solving approach. (CPI, 1997)

In the construction environment, problem solving and decision-making are the result of an ongoing process of negotiation among parties to the contract. The way in which parties negotiate should reflect the level of collaboration on the project team. During the National Museum of Australia project, research was conducted that was designed to assess changes in the negotiation styles of the participants. There were 32 survey forms administered with 25 replies (78% response rate). This was a small sample in itself, but represented a large proportion from a single project alliance.

Respondents were asked to compare their experiences with negotiation in the following three situations:

1. Average to Normal BAU (Business as Usual) – most common situation – usually high/constant conflict.
2. Best BAU (Business as Usual) – the occasional project where all parties to the project work exceptionally well together as a team.
3. Project Alliancing – the project delivery strategy used on the National Museum – to force collaboration as the means to achieve best project outcome by all teams involved.

The following is a sample analysis of responses directly related to negotiation styles.

Table 2 indicates respondents believed their negotiation styles were quite similar for Best BAU and Project Alliancing. There is, however, a significant difference between Average to Normal BAU responses and Best BAU and Project Alliancing responses. This response should not be surprising – since Project Alliancing is trying to create the same, if not better, collaborative team environment as the Best BAU situations. From an operational perspective, there may be no difference between Best BAU and Project Alliancing. The problem is that Best BAU only occurs occasionally and Average to Normal BAU is more common. Project Alliancing may take the *hit or miss* characteristic out of achieving the Best BAU situation.

Table 3 is similar to Table 2 with a similar response rate for Best BAU and Project Alliancing. There are two interesting points to make:

1. 0% of respondents believed they had damaged relationships negotiating in the Project Alliance environment, whereas 35% in Average to Normal BAU believed this, and
2. 87% of respondents under Project Alliancing believed they focussed on issues and respected people, whereas only 47% in Average to Normal BAU believed this.

Table 4 highlights how construction team members on the National Museum perceived their own negotiation tactics to change under Project Alliancing.

It is important to acknowledge the small survey size and the limited conclusions that can be reached from such a survey. However, if the survey is viewed as an indication of a potential trend, then it is clear that, in relation to negotiation styles and outcomes, the respondents indicated a difference between Average to Normal BAU negotiations and Project Alliance negotiations. Respondents also believed that this change in negotiation style had reduced conflict and the impact of conflict.

CONCLUSIONS

In March of 2001, the National Museum of Australia opened on time and below budget to the rave review of the general public. Just as importantly, all participants in the Acton Peninsula Alliance reported having worked well together and that significant

value was delivered to the client as a result. Robert Peck, one of the lead architects on the project, made the following assessment:

> Innovation during the delivery of a building or engineering works is only possible if the contracting parties facilitate the process. Most forms of contract mitigate against innovation. Innovation should lead to better, safer processes with the final product delivered at a substantially lower total cost and better quality to the project sponsor. The Museum Alliance Contract resulted in the Commonwealth achieving a product on original time and budget and, in the opinion of Jim Service, the Chairman of the Construction Committee [for the Museum], at a price $20 – 30 million below what it would otherwise have been. The extent of innovation in the project delivery was very high and the quality scores were exceptional. (Peck, 2001)

There have been many efforts in recent years to develop systems to institutionalize the innovations in construction project management that result from team efforts and non-adversarial conditions. The Collaborative Process has been proposed as a theoretical model, elements of which occur on many projects under various contract types. Project alliancing as a contractual project delivery alternative – used mainly to date in the heavy engineering sector – was developed in response to many of the same pressures noted by CPI. Apparently, the theoretical response and the contractual response developed quite independently of one another. The key question addressed here was:

Does project alliancing in commercial building construction substantially address the central issues outlined in The Collaborative Process? The National Museum of Australia project, as the first example of a project alliance in a major commercial building, was used as a case study to address this question.

For each of the five key elements of The Collaborative Process, numerous examples were cited of ways in which this alliance agreement supported this model. In the area of high-performance teams, the selection process for alliance team members employed most of the CPI recommendations. To support optimization and performance measurements, the alliance risk and reward system that reinforced the key performance indicators was offered as an example. For communication enhancement, the information technology system developed on this project met nearly all of the theoretical specifications offered by CPI. In the area of incentives and risk-sharing, the sub-alliances and the unique project agreement negotiated with the trade unions on this project were excellent examples. Finally, the notion that problem solving and decision-making on collaborative projects demand different approaches is supported by the perception of changes in negotiating styles and results on the museum project.

Although their development was parallel and separate from one another, the project alliancing contract used on the National Museum of Australia project was an outstanding example of The Collaborative Process. This project delivery alternative deserves further study and emulation by other project teams around the world.

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Content covered in workshops	Projects perceived as a success	Projects perceived as a failure
Self-perception exercises	56%	43%
Training in team skills	39%	43%
Development of goals and objectives	96%	86%
Dispute resolution plan	89%	**43%**
Anticipated problems	78%	71%
Action plan to address problems	78%	**57%**
Development of a charter	100%	100%
Celebration	89%	**29%**

Comments:

Significant differences between projects *(perceived as successful or a failure)*

- Dealing with problems as they inevitably arise.
- Commitment to training and development appears poorly cultivated.

Table 1: Partnering Workshop Content (CIIA, 1996:21)

Please tick the boxes that best describe your negotiation style – not what you think your negotiation style should be.

Negotiation Styles *(adapted from Fisher and Ury, 1991, XII)*	**Average to Normal BAU**	**Best BAU**	**Project Alliancing**
Soft Negotiation: Involves avoidance of any personal conflict and the making of many concessions	8%	8%	9%
Hard Negotiation: Involves treating negotiation as a contest between stronger and weaker, where 'hanging tough' and 'holding out' are treated as virtues.	34%	4%	4%
Principled Negotiation: Involves deciding issues on their merits rather than through a 'haggling' process.	58%	88%	87%

Table 2: Negotiation Styles

Please tick the boxes that best describe how you feel at the end of negotiations: not how you would like to feel

Negotiation Outcomes *(adapted from Fisher and Ury, 1991, XII)* **At the end of negotiations do you feel:**	**Average to Normal BAU**	**Best BAU**	**Project Alliancing**
You have been exploited & compromised	18%	11%	13%
You have damaged relationships	35%	6%	0%
You have dealt with issues harshly but people have been respected	47%	83%	87%

Table 3: Negotiation Outcomes

Rate your responses for the appropriateness and the likelihood of your using the following negotiating tactics in the following situations:

		Average/Normal BAU		Best BAU		Project Alliancing	
Tactic #	*Tactic Description*	**Appropriateness**	**Likelihood**	**Appropriateness**	**Likelihood**	**Appropriateness**	**Likelihood**
4	Hide your real bottom line from your opponent	40%	41%	33%	34%	15%	16%
5	Make an opening demand that is far greater than what you really hope to settle for	34%	34%	26%	27%	14%	16%
10	Make an opening offer or demand so high (or low) that it seriously undermines your opponent's confidence in his/her ability to negotiate a satisfactory settlement.	12%	13%	9%	10%	7%	7%
13	Convey a false impression that you are in absolutely no hurry to come to a negotiated agreement, thereby putting more time pressure on your opponent to concede quickly	22%	23%	18%	19%	8%	8%

Table 4: Negotiating Tactics

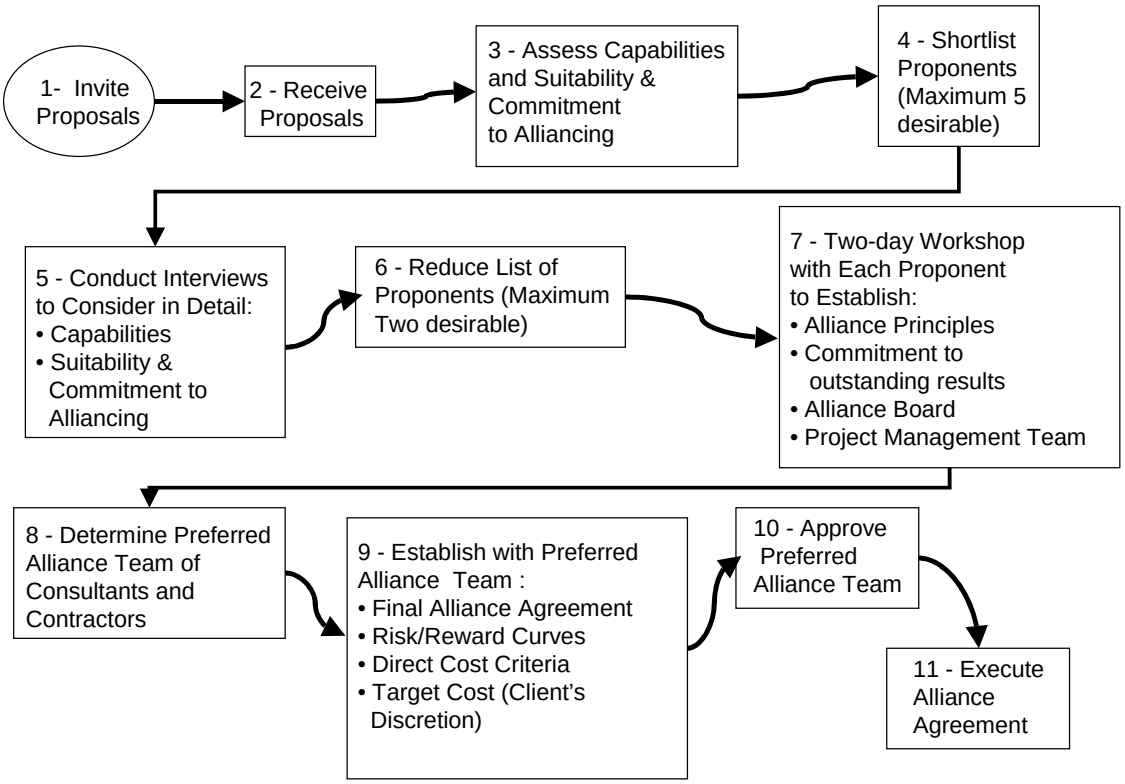

Figure 1 - Alliance Selection Process (KPMG, 1998)

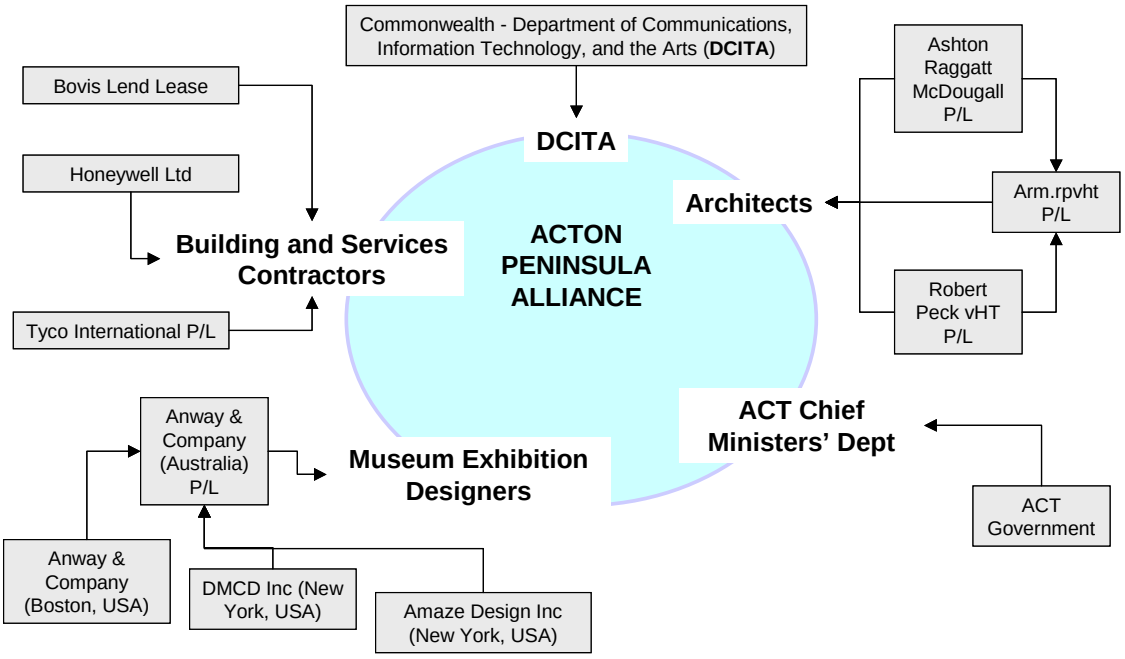

Figure 2 - Alliance Members (Auditor-General of the Australian National Audit Office, 2000:38)

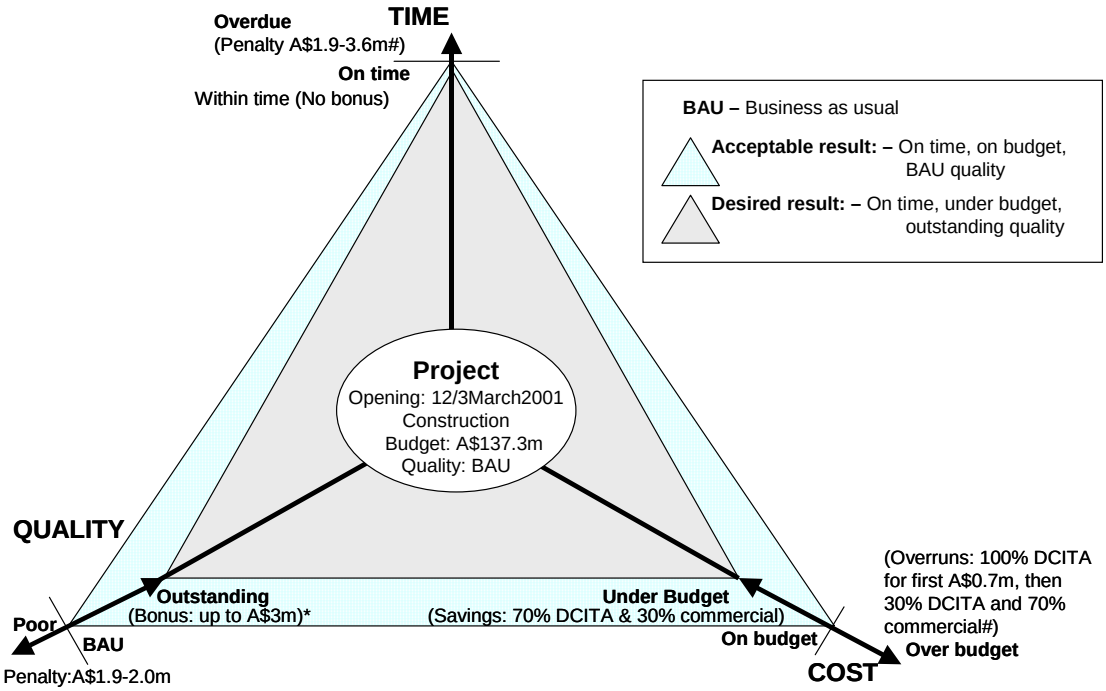

Figure 3 - A Typical Risk and Reward Graph for Cost, Time, and Quality (Auditor-General of the Australian National Audit Office, 2000:103).

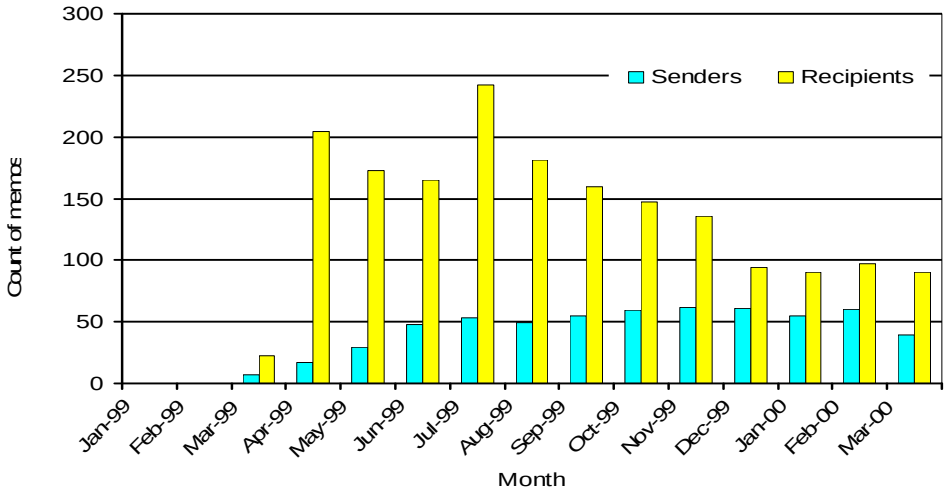

Figure 4 - Use of email over time

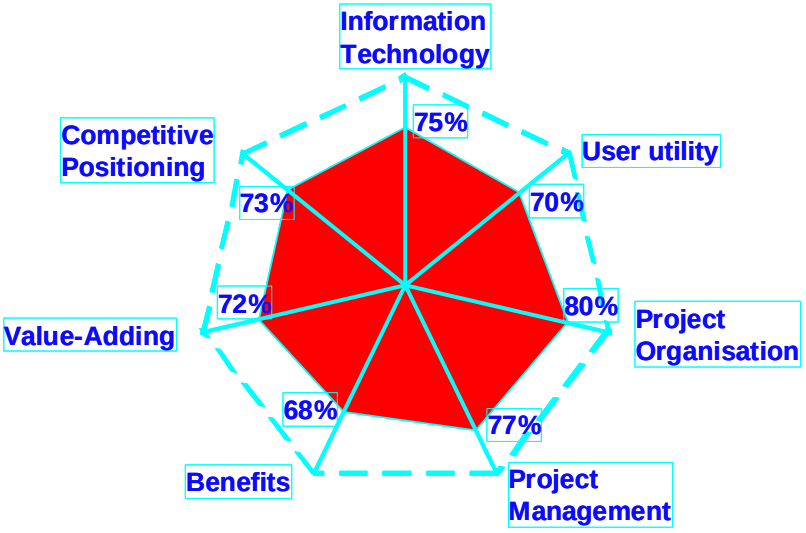

Figure 5 – Initial Alliance Member Satisfaction with Web-Based Management System