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PROJECT DELIVERY

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WHAT MAKES AN ALLIANCE AN ALLIANCE

Experiences from Australian Infrastructure Projects

• ABSTRACT •

The purpose of this research is to explore what alliancing means in the context of Australian infrastructure projects. It aims to define alliancing in this context by identifying its hard elements and to explore the relationship between the academic and practitioner points of view. This paper explores the concept of alliancing in the context of large infrastructure projects by comparing the results of a literature and document study with results obtained from an interview series conducted in Australia.
This research shows that alliancing can be identified by 25 hard elements. It seems the case that no single element is unique to alliancing, but rather it is the combination of elements that really makes the alliancing model a unique project delivery model. The study identified twelve project characteristics that make a project suitable for alliancing, along with an explanation of how the alliance elements address these characteristics.
These findings will help assist academics and practitioners new to the alliancing model understand what alliancing is and when it is suitable to use.

1. INTRODUCTION

The project alliance is a Project Delivery Model (PDM) that has become more popular in recent years as an alternative to both traditional and other forms of relational contracts. As projects become larger and more complicated, and the pressure from various stakeholders increases [1], alliancing is proving to be a valuable tool for dealing with these challenges. It is currently a well-established model in just a few countries but is beginning to gain traction with more countries exploring its use. Having originated in the UK [2], it has become a booming success in Australia. The experience in Australia has shown by example that there are alternative methods to delivering projects in order to move away from the often-adversarial, traditional project delivery models.

An alliance, in a general sense, is quite a broad term and is used in many industries and contexts, for example, a trade alliance between two or more countries. Project alliancing, as a Project Delivery Model (PDM), is yet to be commonly defined at an international level [3, 4]. In the construction industry, we have a situation where inconsistency can be created due to these two uses of the term alliance. This lack of consistency has created a confusing situation [5]. This problem is compounded by the lack of a clear understanding of what exactly makes a project alliance an alliance. For example, in some cases within the construction industry, "partnering" and alliancing are often used interchangeably despite being fundamentally different models [3, 6, 7]. Combined with the lack of a global commonly established alliancing definition, it appears that the body of knowledge is also missing a clear breakdown of what elements make up an alliance.

Alliancing does require a large investment in resources (cost to establish, dedicated leadership board etc), and so it is important to ensure that the outcome of using the model is a success. Jefferies, John Brewer [8] have identified that "*there is a clear gap in Project Alliancing, particularly with regards to identifying factors for its successful implementation in the Australian construction industry*". Due to its structure, alliancing is particularly well suited to certain projects and not others, and the body of knowledge does not seem to contain a clear summary of the characteristics of a project that determine its suitability for alliancing. Selecting alliancing for the right projects is the first step to ensuring a successful outcome.

The purpose of this study, therefore, is twofold: One, to give a clear picture of what exactly makes an alliance an alliance, in terms of formal elements, in order to resolve the confusion surrounding the term when it applies to delivering construction projects. And two, to identify the characteristics of a project that make it suitable for the alliancing PDM in order to assist practitioners who are exploring the adoption of project alliancing. This is presented succinctly by the following two research questions:

1. What makes an alliance an alliance?

2. What characteristics of a project make it suitable for alliancing?

To determine what makes and alliance an alliance, this study looks to the country that is most experienced when it comes to using the alliance PDM, Australia. Australia began using project alliancing in the mid 90's and has since completed billions of dollars' worth of projects using the model. In addition, client organisations who are exploring the adoption of alliancing often begin with the Australian model. Thus, it seems like a logical place to start to establish a point of reference for determining what makes an alliance an alliance. To establish this point of reference, a literature and document study was undertaken alongside an interview series with experienced practitioners in Australia.

In the literature, alliancing is often defined using both hard and soft elements. To increase rigidity of the study, we only include the hard, tangible elements,

without the inclusion of purely soft, intangible elements, such as trust.

2. METHODOLOGY

The research questions were addressed by conducting a thorough literature and document study of publications from Australia and other countries. In addition to academic articles and papers, documentation from government organizations were also reviewed (national contract guidelines, procurement guides etc.).

The results from the literature study were compared and contrasted with findings obtained from questionnaires conducted with a number of construction industry practitioners from Australia. The results contributed to developing the interview guide for the face-to-face interviews conducted in Australia.

--- 2.1 Literature Study ---

A literature study, following the prescription of Ellis [9], Blumberg, Cooper [10], was undertaken to develop the theoretical background for alliancing. Search terms included – but were not limited to – words as alliance, Australia, infrastructure etc. A combination of journal articles and conference papers was used to gain a theoretical perspective of the current views of the topic. A study of documents from both government and industry covering alliancing – as for example contracting guidelines and a guide to participants in alliances – was undertaken to broaden this perspective. This document study was undertaken in order to identify the government and industry perspectives on alliancing and to supplement the theoretical background. Thus, these two studies gave insight into both the theoretical and practical aspects of alliancing. From here on, the use of literature/theory includes both scholarly articles and practical written guidelines.

--- 2.2 Interviews ---

Face-to-face interviews were conducted with alliance practitioners in Australia. Twenty-two semi-structured in-depth interviews were undertaken face-to-face with a total of 27 key industry professional in Australia, following the prescriptions of Arksey and O'Malley [11]. One interview consisted of three interviewees, three interviews consisted on two interviewees together, and the remaining 18 interviews were conducted one-on-one. Fourteen of the twenty-two interviews were case specific – one interview for each case, respectively – and the remaining eight were general in nature. The interviews ran over a period of three weeks during March and April 2016, and they were conducted in Perth, Sydney, Brisbane, Melbourne and Canberra. The interviews lasted between 30 and 90 mins. The interviewees were contacted based on their experience with alliances. One of the authors knew some of the interviewees after a former work employment within an Australian road authority, some of the interviewees were selected since they had written scientific or practical publications on the matter, and the rest were contacted after they were recommended by the other interviewees (mainly because they possessed first-hand knowledge from alliance projects). For practical reasons, not all of those suggested as interviewees were contacted. Participation in the interview series was voluntary. Respondents were chosen among project managers and contract specialists, mostly from client side (government), as in the Australian infrastructure industry, it is the government organisations that own the projects. In addition, a number of respondents from contractors (8), consultants (3), and academia (1) were included to gain a wide industry perspective on the current state of alliancing. It should be noted that six of the participants have had experience with alliances while sitting on both sides of the fence, i.e. as both the Non-Owner Participant (NOP) and the Project Owner (PO). The interviews proved valuable as they offered a great starting point for developing the tables of elements and characteristics.

--- 2.3 Case Studies ---

Data from fourteen Australian alliance projects was collected during the interview series (**Table 1**). Multiple-case design was performed in order to check for replication, as described by Yin [12]. This method suited this study as an overall picture of alliancing within the infrastructure industry could be achieved by analysing multiple alliance projects. A limitation of a project value of greater than $50M AUD was chosen to ensure that each project was considered a large infrastructure project. The case projects that were analysed varied in size from $52M up to $1B AUD.

Project	Value (M AUD)	Number of Parties	Duration (yrs)
Lawrence Hargrave Alliance	$52	4	2
Anzac Bridge Upgrade	$61	4	3
Karatha Tom Price Stage 2	$80	4	2
Windsor Rd Alliance	$105	4	1.5
Springvale Rd Rail Alliance	$120	6	< 1
Sydney CBD Alliance	$150	2	2.5
Inner West Busway / Vic Rd	$155	4	4.5
Lawson Alliance	$220	3	4
Perth Busport Alliance	$250	3	3
Perth City Link Rail Alliance	$339	3	2
Cotter Dam Enlargement	$410	4	4
Ballina Bypass Alliance	$640	5	5
Hunter Expressway Alliance	$825	4	4
Gateway WA	$1,000	6	4

TABLE 01. Details of Case Study Projects from the Interview Series

The results from the case projects represent the experiences of practitioners and are limited by their memories. They provided us answers to the best of their knowledge. Where possible, facts were cross-checked against project documentation. This discussion presents the authors' interpretation of the studied literature and interviews.

3. THEORETICAL BACKGROUNDY

This section begins by exploring current definitions of alliancing. Following, is an insight into the disambiguation between alliancing and other forms of PDMs, and a look at the present state of alliancing around the world. Furthermore, this section presents the elements identified from the literature as being key elements of alliancing along with identified project characteristics.

--- 3.1 Introduction ---

Alliancing has developed out of the need and desire to improve on, and overcome, the adversarial nature and negative impacts associated with the more traditional forms of project delivery, namely design-bid-build (DBB) and design and construct (D&C) contracts [13, 14]. Alliancing is beginning to be placed into its own unique category [15, 16], however, it often falls under the umbrella of relationship contracting [17, 18].

Alliancing is a collaboration between the client, service providers and contractors where they share and manage the risks of the project together [15, 19]. All parties' expectations and commercial arrangements are aligned with the project outcomes and the project is driven by a best-for-project mindset where all parties either win together, or lose together [17, 20]. The contract is designed around a non-adversarial legal and commercial framework with all disputes and conflicts resolved from within the alliance [18, 19].

This type of project delivery can lead to improved project outcomes and value for money, in part due to the increased level of integration and cooperation between planners, design teams, contractors and operators [21, 22].

--- 3.2 Current Definitions of Alliancing ---

The most widely accepted definition of alliancing in literature comes from the Australian Department of Finance and Treasury Victoria [23] which describes alliancing as:

"... a method of procuring ... [where] All parties are required to work together in good faith, acting with integrity and making best-for-project decisions. Working as an integrated, collaborative team, they make unanimous decisions on all key project delivery issues. Alliance agreements are premised on joint management of risk for project delivery. All parties jointly manage that risk within the terms of an 'alliance agreement', and share the outcomes of the project" (p.9).

The majority of studied literature after 2010 refer to this definition when discussing alliancing and do not contribute anything of significance in addition to that mentioned above [13, 16, 17, 20].

The above definition more recently became defined in Australia at a national level with the publication of the National Alliance Contracting Policy and Guidelines [24]. This document was updated in 2015, retaining the same definition [25], demonstrating that there is consistency within the Australian Government of what the definition of alliancing is. However, this guide does not provide a clear breakdown of the tangible elements that characterise alliancing.

Some literature includes definitions that the industry is moving away from. Such definitions include alliancing under the relationship-contracting umbrella, as opposed to defining it in a category of its own. Other definitions compare it too closely to partnering [26], which can lead to the confusion that this research is attempting to prevent. These points are explored more in depth in the next section covering the disambiguation of alliancing.

--- 3.3 Disambiguation ---

In the early days of alliancing, project alliances (PA) shared many more similarities with project partnering (PP) than is the case today. PA and PP used to be used almost interchangeably before PA evolved over time down its own path and away from PP [6]. PP and PA do share similar elements today, for example, they both aim to improve cooperation, they both have a target cost with bonus/malus (in PA known as pain/gain), and they both employ an open-book approach Haugseth [27], [28, 29]. The biggest difference today, is that PP is not a standalone contract strategy and is generally adopted over the top of traditional contracts such as D&Cs [4, 16], whereas PA is a built-for-purpose, stand-alone contract strategy. Furthermore, partnering does not adopt the alliancing principle of win-win/lose-lose in the same way that alliancing does; in PP the partners remain independent within the partnership and thus there is the possibility for partners to lose while others win and vice versa [4, 19, 20, 30].

Integrated Project Delivery (IPD) is a model used mostly in the United States of America that has many similarities to Australian alliancing, with one major difference being that IPD incorporates a number of lean construction elements [16, 31, 32]. IPD's use is mostly concentrated in America, yet the principles of lean are more prevalent worldwide. Alliancing is often considered at the top end of collaborative and relational contracting [33] and is more widely distributed across the globe [6, 20]. In addition, IPD and Alliancing have often been used for different types of projects, alliancing in infrastructure projects and IPD in building projects [16]. One view is that IPD is created by combining the alliancing governance system with the lean construction operating system [31]. The key differences between IPD and alliancing will not be explored further in this paper but can be found in the studies of Lahdenperä (2012) and Rassback et al [31].

--- 3.4 Alliancing Elements ---

The literature on alliancing often focuses on just one or two particular aspects of an alliance, whether that be key success factors, achieving value-for-money or case studies on alliance implementation, with few articles providing a general overview. As such, the articles reviewed as part of this study would frequently mention key elements of alliances or project characteristics without defining or expanding upon them.

Determining what alliancing is through the literature can be confusing, but it is possible to identify defining elements that appear to be key to an alliance. These were collected, and the number of times they were referenced in literature was recorded. Some elements were easier to identify than others were. It proved useful to start with recording anything that could be a defining element of

an alliance and then to refine the list through cross-referencing and analysis of case studies.

Table 2 shows the elements of an alliance as identified in the studied literature. They have been arranged by number of citations. Included is a preliminary indication, based on the literature review, of whether the element might be unique to the alliance PDM.

Elements of an Alliance	References	Only Alliancing?	Total
Pain/ Gain share	1,3,4,6,7,8,9,10,12,14,15,16,17,18,21,23,24,25,26,29,30,31,32	No	23
Open Book Approach	1,6,7,8,9,12,14,15,16,17,18,19,21,23,25,26,27,29,30,31,32,33,34	No	22
Risk/ Reward Sharing	4,5,6,8,9,12,14,17,18,19,20,21,22,23,25,26,29,31,32,33	Possibly	20
No Dispute Clause/ No Blame/ No Fault Mentality	1,6,7,9,10,12,14,15,16,18,20,23,25,26,29,30,32,33,34	Yes	19
Alliance Leadership Team (ALT) (Board)	1,5,6,9,10,12,16,17,18,19,23,25,26,29,31	Yes	15
Alignment of Client and Commercial Participants Objectives	6,9,10,12,14,17,18,20,22,21,23,25,29,30	No	14
Auditing	1,6,9,15,16,17,18,19,21,23,25,29,30,32	No	14
Integrated Project Team	9,12,14,16,17,18,19,20,23,25,26,29,32,33	No	14
Unanimous Decision Making	1,6,7,9,10,16,18,23,25,26,29,30,32,33	Possibly	14
Target Outturn Cost (TOC)	1,5,6,9,10,14,17,18,19,21,26,29,32	No	13
Virtual Organisation	5,6,9,14,15,17,18,19,21,23,25,26,29	Yes	13
Alliance Management Team (AMT)	1,5,6,9,10,12,16,18,25,26,29,31	Yes	12
Incentivized Cost-Reimbursement	4,5,9,10,15,16,17,19,20,26,27,29	No	11
Colocation of Alliance Team	4,7,10,14,16,17,23,25,28,29	Possibly	10
Alliancing Workshops	1,7,12,14,16,17,21,25,29	Yes	9
Fee to cover Corporate Overheads and profit	1,9,17,18,19,21,25,26,29	No	9
Formal Contract	3,6,7,17,20,21,25,29	No	8
Minimum Reimbursement of Direct Costs	1,9,15,16,18,23,26,29	No	8
Dispute Resolution Kept Within Alliance	6,7,9,18,23,25,27	No	6
Key Result Areas	1,9,10,18,29,30	No	6
Three Limbed Contract	1,6,9,18,26,29	Possibly	6
Joint Responsibility	9,17,21,25,29	Possibly	5
Can be Price Competitive	7,8,9,29	No	4
Relationship Development	7,12,23,29	Possibly	4
Alliance Facilitator	9,25,29	Yes	3
Alliance Uniform and Stationary (Branding)	5,12,29	Yes	3
Collaborative Problem-Solving and Decision-Making	6,9,10	No	3
Common Goals	9,17,29	No	3
No Latent Condition Clauses	5,9,29	Possibly	3
Single Alliance Culture	5,25,29	Yes	3
Early Involvement of Alliance Partners	3,14	No	2
Internet Based Information Management System	25,28	No	2
Built from the Ground Up	25	Possibly	1

TABLE 02. Elements of an Alliance – Results from the Literature

--- 3.5 Project Characteristics ---

Alliancing is not a project delivery model that is suitable for every infrastructure project [18, 34]. Some projects, however, have key characteristics that make them highly suitable for the alliance model.

A preliminary list from the literature study of the characteristics suitable for an alliance is shown in **Table 3**. The characteristics are arranged in order of the number of articles that have attributed these project characteristics to the selection of an alliance.

Table 8 in the Appendix identifies the numbered references used in both **Table 2** and **Table 3**.

Most often, several characteristics of a project are taken into consideration when determining the choice of delivery model for a project. However, in some cases, the decision to use an alliance is based purely of one or two project characteristics. For example, Jefferies [8] highlights that "*The Queensland State Government, in the form of both their Public Works and Main Roads departments, use Alliance and Partnering arrangements as default contracts on projects with construction periods of over 12 months and/or with a dollar value of A$10 million.*" (p.477).

4. RESEARCH FINDINGS

This section will identify the findings from the interviews and discuss them in relation to the findings from the literature study and case studies.

--- 4.1. What Makes an Alliance an Alliance? ---

4.1.1. What Elements Make Up an Alliance?

A preliminary list of elements identified by the literature study formed the basis of determining the characteristics that define alliancing. A further analysis was required in order to reduce and combine the lists so that they contained the most relevant elements. Each piece of literature was analysed again to check for references made for each identified element

Project Characteristics	References	Total
Tight Time Constraint/ Need for early start	3,5,6,8,9,11,16,23,25,26,29,31,34	13
High Risk	3,6,5,8,9,11,16,25,29,30,31,34	12
High Complexity	3,6,11,13,16,18,23,25,26,29,31	11
Multiple/ Complex Stakeholders	3,6,11,13,14,16,23,25,26,29,31	11
Unclear/ Broad Scope/ Risk of Scope Change	1,3,8,11,13,16,18,25,26,29	10
Complex External Threats	3,6,11,16,25,26,31	7
High Uncertainty	1,3,9,16,29,30,34	7
Need for Innovation	8,12,18,23,29,31	6
Tight Cost Control	3,16,23,29	4
Environmental Challenges	14,16,29	3
Large Project/ High Cost	8,9,14	3
Need for Owner Involvement	11,25,26	3
Resource Shortages	8,29,34	3
Need for Flexibility	12,29	2
High Visibility	18	1
Special Requirements	3	1

TABLE 03. Characteristics of a Project that Suit Alliancing Identified by the Literature Study

and a closer look at the definitions of each element provided a starting point for refining the list. It was possible to see which elements were related and could be combined, and which elements were not necessarily 'defining' elements, and could be considered unimportant for the purpose of this study.

Further analysis resulted in the following points of note. Joint Responsibility can be seen as a result of the structure of an alliance, for example, Risk and Reward Sharing creates a situation where each party has to work together to manage the risk, and implying joint responsibility. Early Involvement of Alliance Partners is a result of other key alliance elements. All parties are involved early in that they all participate in the defining of scope, in the calculation of the Target Outturn Cost (TOC) and in the creation of the alliance agreement. An Internet Based Information Management System can be seen as a tool used by an alliance, or any other PDMs for that matter. Collaborative Problem Solving and Decision-Making was deemed to go hand-in-hand with Unanimous Decision Making, thus the two elements could be combined under the name of the latter.

Common Goals can be seen to relate to Risk and Reward Sharing, Key Result Areas, Alignment of Client and Commercial Participants' Objectives and Incentivised Cost-Reimbursement, since they all work together to create a situation where parties are working towards a set of common goals. Built from the Ground Up was a point of confusion in the case study, was only highlighted in one piece of literature and was not mentioned in the interviews. The principle of Built from the Ground Up could be incorporated in the element Formal, Stand-Alone Contract.

No Latent Condition Clauses is an element that can be seen as a component of Risk and Reward Sharing, both of which fit together under the pain/gain sharing model. The No Dispute Clause/ No Blame, No Fault Mentality is a combination of hard and soft elements. Therefore, just the hard side should be included as a result in this study. In addition, the No Dispute Clause is a similar element to Disputes Resolution Kept within the Alliance.

The description of a Three-Limbed Contract ties in with the identified elements Incentivised Cost-Reimbursement, Minimum Reimbursement of Direct Costs, Target Outturn Cost and Fee to Cover Corporate Overheads. The three-limbed contract is made up of [13, 33]:

- Limb 1 consisting of all the directly reimbursable costs including project-specific overheads
- Limb 2 consisting of the corporate overheads and profit for each NOP, determined by an independent auditor. This is placed 'at-risk' according to the pain/ gain arrangement
- Limb 3 consisting of the incentivised cost-reimbursement where all participants share in the pain/ gain associated with how the alliance performs against the pre-arranged targets in cost and non-cost key result areas (KRAs).

Finally, the Single Alliance Culture, which is also a soft element, is a result of an alliance implementing the hard elements of Alliancing Workshops, Relationship Development, Alliance Facilitator and Alliance Uniform and Stationary.

The refined list of elements, which resulted from the literature study, became part of the interview guide for the interviews. In the interviews that were case specific, the list of elements (see row 1 of **Table 4**) was used to crosscheck the elements that were present in the case projects. The elements present in each case study were collected and the results a showed that each element was present in every project, with the exception of Colocation of Alliance Team, which was only partially present in one of the projects. It appears, from this sample of projects, that the structure of alliancing within Australia is very consistent. As part of the questionnaire, the practitioners were asked if they could identify any additional key elements that were not shown in **Table 4**. This process did not uncover any new elements, providing some confirmation that the list of elements is comprehensive.

4.1.2 Elements Unique to Alliancing

The literature search identified a number of elements that can be identified as being unique to alliancing. Firstly, the majority of elements that contain the word alliance in their title are considered to be to unique to alliancing. One exception is Alliancing Workshops. The intention of alliancing workshops is to develop the culture of the team. In partnering arrangements, such workshops are used to develop the partnering mindset and therefore it is not unique to alliancing. Secondly, the elements Virtual Organisation, No Latent Conditions Clauses, Three-Limbed Contract and No Dispute Clause are also considered unique to alliancing. They have not appeared in the studied literature to be referenced to other PDMs. It should be noted that a comprehensive literature study was not performed on other PDMs and thus these results

are not necessarily a 100% accurate representation of current usage. The remaining elements have been, to some degree, mentioned in the literature in relation to other PDMs. For example, the work of Hosseini et al. [28] has shown that partnering can include such elements as Colocation of Team, Target Cost with Bonus/Malus and Open-Book Economy.

During the interview series, in particular the interviews that involved the discussion of the case projects, the participants were asked to identify whether they thought a particular element was unique to the alliancing PDM. The results from the responses of the case specific interviews are presented in **Table 4**. For the remaining interviews, despite not specifically going through the table of elements with the participants, a number of elements were mentioned as being unique to alliancing during the general discussions. These were counted, and the number of mentions appear in the second-to-last column of **Table 4**. The total number of times an element was mentioned, from both the case studies and the remaining interviews, is shown in the last column the table.

Elements of an Alliance	Indicated as being unique to alliancing by the interviewees														#	Total
Case Specific Interview Number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Pain/ Gain Share				x				x		x					2	5
Open Book Approach		x	x	x			x	x					x		1	7
Risk/ Reward Sharing	x							x		x					3	6
No Dispute Clause/ No Blame, No Fault Mentality							x	x		x			x	x	2	7
Alliance Leadership Team (ALT) (Alliance Board)	x	x		x	x			x								5
Alignment of Client and Commercial Participants Objectives						x		x					x		1	4
Auditing				x	x		x	x					x			5
Integrated Project Team (including client)		x		x				x					x		2	6
Unanimous Decision Making		x		x	x		x	x					x	x	1	8
Target Outturn Cost (TOC)		x		x			x	x					x			5
Virtual Organisation				x			x	x					x			4
Alliance Management Team (AMT)	x	x		x	x			x								5
Incentivized Cost-Reimbursement		x		x			x	x					x			5
Colocation of Alliance Team		x		x	x			x		x			x		1	7
Alliancing Workshops		x		x	x	x	x	x								6
Fee to Cover Corporate Overheads and Profit		x		x			x	x					x			5
Formal, Stand-Alone Contract																0
Minimum Reimbursement of Direct Costs		x	x	x			x	x					x			6
Dispute Resolution Kept Within Alliance							x	x					x			3
Three Limbed Contract		x		x		x		x					x		1	6
Relationship Development		x		x		x*	x	x								5
Alliance Facilitator		x		x		x	x	x								5
Alliance Uniform and Stationary		x		x	x	x	x	x					x		1	8
No Latent Condition Clauses				x			x			x				x	1	5
Single Alliance Culture		x		x		x	x	x							1	6

This column indicates the number of times a particular element was mentioned as being unique to alliancing in the interviews that were not case specific.

TABLE 04. Elements Unique to Alliancing as Identified by Australia Practitioners

What can be seen in **Table 4** is that there is a lot of inconsistency amongst the practitioners as to what elements are unique to alliancing. The elements that received the most mentions were No Dispute Clause, Open Book Approach, Unanimous Decision Making, Colocation of Team and Alliance Uniform and Stationary. Of the elements considered unique based on the literature, all were mentioned to some extent by some of the interviewees. Interestingly, some elements that were considered not to be unique to alliancing based on the literature were mentioned to be unique by some of the interviewees.

Based on the findings from the interviews, what appears to be the biggest cause for the inconsistency of identifying the unique elements stems from the practitioners' experience and background. For example, if a practitioner had only worked on D&C projects prior to working in an alliance, they might be lead to believe that the majority of the alliancing elements are unique to alliancing, as they do not appear in D&C projects. Other practitioners may have worked in different partnering projects, and the elements used in these particular partnering projects (given that there is no consistency with partnering elements [35]) will determine what they believe to be unique to alliancing. Some practitioners are actively working on new and innovative contracts that are based on the alliancing model, thus they consider none of the elements unique. As stated by one of the participants – "*Most of the alliance elements are now found in Delivery Partner* (Delivery Partner is the model used to build the infrastructure for the London Olympics)." (Participant 9).

One of the participants mentioned an aspect that is not directly related to a unique element, but is unique to the alliancing experience: "*Everyone gets a better understanding of all the parties' drivers. Contractors and consultants have said that they never really understood some of the client perspectives, and because you have those discussions all together in an alliance everyone gets to understand that and why you would want to do certain things and why you've gone down a particular path.*" (Participant 4). This communication could also be considered to be one of the benefits of alliancing.

The most likely case, is that no single element is unique to alliancing, but it is the unique combination of elements that really makes the alliancing model unique in the world of PDMs. One participant, who stated, "*The unique combination of all the elements are what make an alliance, not the individual elements*" (Participant 10), seconded this finding.

--- 4.2 Characteristics of a Project That Make it Suitable for Alliancing ---

The purpose of this research is to consider the project characteristics. It is outside the scope to consider internal and external factors of the project in detail. It can often be the case that the nature of the project will dictate the choice of PDM [36]. For example, a project may have a very tight timeframe that can only be achieved if all parties are involved from the very beginning. This way, certain aspects of planning, design and execution can happen concurrently. Such a situation lends itself to alliancing. That being said, alliancing is not a form of project delivery model that is suitable for every infrastructure project [18]. Some projects however, have key characteristics that make them highly suitable for the alliance model.

A review of the characteristics identified by both the literature and the interviews was undertaken. Each characteristic was analysed for uniqueness; where similarities were identified between characteristics, they were combined. In addition, the characteristics were judged by the weight placed on them in the literature and interviews, and the number of times they were cited by different sources.

A number of the characteristics can be combined based on their similarity. For example, if a project has the Need for Flexibility or has High Uncertainty, when it applies to how alliancing addresses this issue, it is very similar to the project having an under-defined scope or having a Risk of Scope Change. In all these cases, every participant works together to solve the issues as they arise and they do this by maintaining a high degree of flexibility in the process. Special Requirements was mentioned briefly by just one source, so with limited information on this characteristic, it is not considered as being relevant to this study. However, it was noted that this descriptor could potentially cover other characteristics as mentioned here, such as complexity, innovation, need for owner involvement, etc., depending on the view of the PO.

After taking a closer look at the initial results from the literature, a table of characteristics was developed that was used in the case specific interviews in Australia (note, **Table 5** is the result of the analysis of **Table 3** and thus appears slightly different). The interviews identified a number of different drivers that have influenced the selection of alliancing in Australia. Alliances have been the preferred PDM when the project has one or more characteristics from the list in **Table 5**. This finding is consistent with the results from the literature review in that eleven of the sixteen characteristics identified by the interviews appear in **Table 3**.

Project Characteristics	Characteristic influenced project														Total
Case Specific Interview Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Tight Time Constraint/ Need for Early Start	x			x	x	x	x		x		x	x	x	x	10
High Risk	x	x	x	x	x		x		x					x	8
High Complexity	x			x	x	x	x	x	x		x			x	9
Multiple/ Complex Stakeholders	x			x			x	x	x	x				x	7
Unclear/ Broad Scope/ Risk of Scope Change		x		x	x	x	x	x	x	x	x	x	x	x	12
Complex External Threats		x									x				2
Need for Innovation		x		x	x						x		x		5
Tight Cost Control			x	x				x	x	x				x	6
Environmental Challenges				x	x							x			3
Large Project/ High Cost				x	x				x						3
Need for Owner Involvement	x	x	x	x	x		x	x	x		x			x	10
Multiple Interfaces	x	x	x		x		x	x	x					x	8
Market Situation (External Factor)															0
Client Organisation (Internal Factors)				x					x						2
Other: Reputation (Internal Factors)			x												1

TABLE 05. Project Characteristics Suitable for Alliance as Identified by Fourteen Australian Alliance Projects

While going through the table of characteristics with the interviewees, the interviewers asked if there were any additional reasons why the client went with an alliance. This identified two new characteristics to the list: Reputation and Political Commitment. However, it is noted that Reputation should be identified, along with the characteristic of Client Organisation, since being internal factors, as they are internal logic of the organisation and not necessarily project characteristics. Following the same logic, Market Situation and Political Commitment can be identified as being external factors that influence PDM selection, not project characteristics. They have been included here to show that they were considered during the selection process. However, since they are not (obvious) project characteristics, they will not be considered in detail.

The results in **Table 5** show the three most referred to project characteristics to be Unclear/Broad Scope/ Risk of Scope Change, Tight Time Constraint/ Need for an Early Start, and Need for Owner Involvement. Other notable mentions are Multiple/ Complex Stakeholders, High Risk, High Complexity and Multiple Interfaces.

The findings show that there was a general consensus among the participants that projects that are high risk, complex, and/or uncertain are best suited to an alliance. One participant highlighted that alliances are not suitable for straightforward projects stating "*[I] would go alliance every single time for the most high risk and important projects if you had the right competent staff. Don't do alliances for routine work.*" (Participant 2). Other characteristics mentioned were *tight timeframes, multiple interfaces, need for owner involvement and complex stakeholder issues.*

When comparing the findings from the interviews with the findings from literature, it can be seen that the literature does not reflect reality when it comes to recognising the Need for Owner Involvement and Multiple Interfaces as being project characteristics suitable for the alliancing model. Despite influencing nine and seven projects respectively, these characteristics were only identified by three

and zero publications respectively. However, overall, the results from the interviews do show alignment with the results from the literature study, thus helping to confirm the findings of this research.

It should be noted that, one reason why some characteristics are mentioned more than others in the literature, could be that many publications build from the work presented in previous publications. Thus, a particular publication that mentions a certain characteristic can influence the publications that come after it, multiplying the number of mentions of that characteristic. It was outside the scope of this study to take an in depth look at this.

4.2.1 The Ways Alliance Elements Address the Identified Characteristics

The structure of alliances lends itself very well to addressing the issues created by the identified project characteristics. *The shared risk and pain/gain arrangements combined with the alignment of client and commercial participants' objectives creates an entity that is adept at dealing with projects that are high risk or have high levels of uncertainty*. When problems arise, it is in the best interest of all the parties to find the best-for-project outcome and find it quickly. In addition, these elements work together to enable the alliance to deal effectively with complex external events. The elements mentioned previously, combined with unanimous decision-making, no dispute clause and open book help to ensure the win-win principle of alliancing necessary to deal effectively with the issues that arise.

The fact that all parties become involved in the project from the very beginning creates an environment where innovation can thrive. All options can be considered and explored for their merits. Many different perspectives all working together in the early phase can lead to very innovative solutions. This benefit was recognised by many of the interview practitioners as being a key advantage to the alliancing model. "*[Alliances] generate innovation, can change standards, [and put you] in a better position to generate this because you have got experts together, good people, it's a positive work environment and you can throw in extra resources if you need to get these outcomes. This doesn't happen in other forms of contracting, there is a lot more negative tension, in D&C in particular, it's us and them.*" (Participant 11). "*A lot of risk mitigation is done when developing the design with all the participants. [It creates a] promotion of/breeding ground for innovation [and] continuous improvement.*" (Participant 18).

This arrangement of concurrent engineering creates an environment where normally successive stages can run in parallel. For example, the contractor can begin with the early works while the designers are finalising the design and the client is working on planning permissions and community consultation. This reduces the duration of the project significantly and allows for an early start. Many interviewees stated this as a reason for their project being delivered ahead of time.

In some cases, alliances were chosen for a project due to the tight cost control needed. For example, some projects were given the problem, and a budget, and told to find the best solution that addresses the problem and fits the budget. Alliances have a certain freedom to vary solutions on the go, as they are not locked into a pre-design. Combine this factor with the fact that it is in the best interest of all parties to find the best solution, meet the incentivised KRA's, and reduce the project cost in order for them to make money, and it becomes clear that alliancing is well suited to dealing with tight cost control.

The integrated project team is crucial for enabling alliances to deal with complex stakeholder issues. Having the most suitable person for the job in each position means that you can manage the issues very effectively. For example, as identified by one of the practitioners, often the client has well established community consultation systems and networks, while contractors may not have such systems and networks in place. Thus, it makes sense to have key client personal in the relevant position within the alliance. The integrated project team becomes very useful when there is a need for owner involvement as the client is imbedded in the team for the duration of the project and can maintain a level of influence over the project outcomes.

5. CONCLUSION

Due to its relatively new breakthrough into the world of large infrastructure delivery, alliancing is still finding its place amongst the more establish project delivery models. This development has been increasing rapidly since alliancing's birth in the 80's. The rapid development has led to much confusion surrounding alliancing, in particular, what separates it from other relational or collaborative contracts. It seems that the body of knowledge has not yet fully addressed this confusion. This paper supplements the existing body of knowledge by answering the questions:

1. What makes an alliance an alliance?

2. What characteristics of a project make it suitable for alliancing?

This list identifies elements that make up an alliance and recognise the elements unique to the alliancing PDM. **Table 6** contains the final list of twenty-five elements that make an alliance an alliance.

Throughout the analysis, a number of elements were identified as being related, yet deemed important enough to secure their own place. This is represented by the use of dot-points to show when an element/s relates to one of the fourteen 'parent' elements. All the attributes in **Table 6** either define alliancing or are key elements that make up an alliance, and have been observed by the fourteen case studies.

When it comes to the elements that are unique to alliancing, the situation is not so clear-cut. Perhaps a few years ago, before the emergence of new PDMs, many of the elements could have been said to be unique. However, today, Australia is seeing an increase in innovative and relational PDMs that have adopted many elements used in alliances. What could be said is that what separates alliancing from other PDMs is the unique combination of all the elements listed in **Table 6**.

Elements of an Alliance
Open Book Approach
Risk/ Reward Sharing
• No Latent Condition Clauses
• Pain/ Gain share
No Dispute Clause/ No Blame, No Fault Mentality
• Dispute Resolution kept within alliance
Unanimous Decision Making
Integrated Project Team
• Colocation of Alliance Team
Alliance Leadership Team (ALT) (Alliance Board)
Auditing
Alignment of Client and Commercial Participants Objectives
Alliance Management Team (AMT)
Virtual Organisation
Three Limbed Contract
• Target Outturn Cost (TOC)
• Incentivized Cost-Reimbursement
• Minimum Reimbursement of Direct Costs
• Fee to cover Corporate Overheads and profit
Single Alliance Culture
• Alliancing Workshops
• Alliance Uniform and Stationary
• Relationship Development
• Alliance Facilitator
Formal, stand-alone Contract

TABLE 06. Elements That Make an Alliance an Alliance

Project Characteristics
Tight Time Constraint/ Need for early start
High Risk
Unclear/ Broad Scope/ Risk of Scope Change
Multiple/ Complex Stakeholders
High Complexity
Need for owner involvement
Need for Innovation
Complex External Threats
Tight Cost Control
Large Project/ High Cost
Multiple Interfaces
Environmental Challenges

TABLE 07. Project Characteristics Suitable for Alliancing

In addition to determining what makes an alliance an alliance, this research has identified twelve characteristics of a project that make it suitable for alliancing. Based on the literature studied, and the results from the interview series, it can be concluded that alliancing is a very effective PDM, which is suitable for projects with particular characteristics, provided it is selected for the right reasons. **Table 7** contains the final list of project characteristics based on the results of the methods contained within this study.

Where a project identifies one or more characteristics shown in **Table 7**, an alliance can be highly considered during the selection process for the project's delivery model. By looking closely at the elements of an alliance, it was shown how they address the identified project characteristics. For example, the integrated project team drives innovation and gives the owner more control within the project. The win-win culture created by the combination of a number of alliance elements enables the alliance to handle complex or high-risk projects and projects with great uncertainty.

Based on the results of this study, a conclusion of, what makes an alliance an alliance and what characteristics of a project make it suitable for alliancing, is reached. These findings will help assist those academics and practitioners who are new to the alliancing model, understand what alliancing is and when to use it.

The conclusions are based largely on the Australian experience, however, the lessons learned are transferable to other countries. Continued research into this area can build upon this conclusion to ensure that the identified research gap is fully addressed.

6. FURTHER WORK

The first departure point for further work would be to improve and build upon this study by addressing the identified limitations of this study. This study could be improved by drawing results from a larger number of both academic and industry publications. Additionally, further interviews could be undertaken to expand, confirm, and/or challenge the findings presented here. Furthermore, this study focused on the "hard" tangible elements of alliancing. To build upon these results, further work could be undertaken to include all the "soft" elements of alliancing.

This study also highlighted a number of other departure points for further work. The findings highlighted that there are many new PDMs being developed in Australia, and around the world, in the area of collaborative or relational PDMs, many of which stem from the alliancing model. The body of knowledge could benefit from research into these new models. One of the participants, in relation to the Australian alliancing experience, highlighted the importance of involving academia into emerging fields. "Australia began studying alliances after it was so successful and then became controversial. So it was difficult to study after the event. Many studies performed were deeply flawed. A much more intelligent collaboration between academia right from the start and consistently involved would have allowed much better knowledge and intelligent data from the actual experiences with some academic rigour."

7. ACKNOWLEDGEMENTS

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• APPENDIX •

Paper	#	Authors
Performance of Project Alliancing in Australasia: A Digest of Infrastructure Development from 2008 to 2013	1	[13]
Alliances in construction: Investigating initiatives and barriers for long-term collaboration	2	[6]
Overview of alliancing research and practice in the construction industry	3	[20]
Reducing opportunistic behaviour through a project alliance	4	[14]
Delivery of Low-Volume Road in Pilbara Region of Western Australia by Alliance Contracting	5	[37]
Overview of the Australia-based Studies on Project Alliancing	6	[15]
Making sense of the multi-party contractual arrangements of project partnering, project alliancing and integrated project delivery	7	[16]
Price Competitive Alliance Projects: Identification of Success Factors for Public Clients	8	[21]
National Alliance Contracting Guidelines Guide to Alliance Contracting (including guidance note 3)	9	[24]
Longitudinal Study of Performance in Large Australasian Public Sector Infrastructure Alliances	10	[17]
In Pursuit of Additional Value A benchmarking study into alliancing in the Australian Public Sector, Melbourne, Department of Treasury and Finance	11	[38]
Alliancing in Australia - No-litigation contracts: A tautology?	12	[39]
The Case for an Alliance	13	[40]
Using a Case Study Approach to identify Critical Success Factors for Alliance Contracting	14	[41]
RMS and Alliance Contracts - Fact Sheet	15	Roads and Maritime Services
Procurement Methodology Guidelines for Construction	16	[42]
Project Alliancing at National Museum of Australia—Collaborative Process	17	[30]
Project Alliancing: A Relational Contracting Mechanism for Dynamic Projects	18	[1]
Project Alliancing vs Project Partnering: A Case Study of the Australian National Museum Project	19	[43]
A review of the Concepts and Definitions of Various forms of Relational Contracting	20	[44]
The definition of alliancing in construction as a Wittgenstein family-resemblance concept	21	[4]
Conceptual Model of Partnering and Alliancing	22	[45]
Alliance Contracting Removing the Boundaries for Infrastructure Delivery	23	[18]
Project alliance contract in The Netherlands	24	[26]
Introduction to project alliancing	25	[33]
Alliance Contracting in Australia- A brief introduction 2009	26	[2]
Optimising Contracting for Alliances in Infrastructure Projects	27	[46]
Enthusiasm, commitment and project alliancing: an Australian experience	28	[43]
Alliancing: A Participant's Guide	29	[34]
Enabling Construction Innovation – the role of a no-blame culture as a collaboration behavioural driver in project alliances	30	[19]
Infrastructure Development Using Alliances- Lessons and Observations	31	[47]
Innovation through alliancing in a no-blame culture	32	[48]
Overview of Collaborative Contracting	33	[49]
Understanding the motivation and context for alliancing in the Australian Construction Industry	34	[22]

TABLE 8. Numbered Reference List for Tables 2 and 3

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