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Enabling construction innovation: the role of a no-blame culture as a collaboration behavioural driver in project alliances

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A no-blame culture is widely accepted as a collaboration driver yet we see surprisingly scant literature on the theoretical underpinnings for the construction and project management context. A no-blame culture in project alliances, as conducted in Australasia, promotes innovative thinking in action. Innovation is dependent upon collaboration and true collaboration is inextricably linked with behavioural drivers. Foremost of these is a culture of openness and willingness to share the pain and gain from experimentation, one that requires that collaborators be protected from the threat of being blamed and held accountable for experimental failure. The Australasian project alliance procurement form has a unique 'no-blame' behavioural contract clause that can result in the type of breakthrough thinking crucial in developing a collaborative culture where innovation can evolve through a process of trial and error.

Keywords: Alliancing, Australia, innovation, organizational behaviour, organizational change.

Introduction

New project procurement relationship forms have been developed that not only support but demand behaviours that result in beneficial innovation. In extensive research Uhl-Bien *et al*. find that effective and sound decision-making is best achieved in complex and challenging situations (such as in large-scale infrastructure projects) through collaboration where bottom-up decision-making occurs within a supportive environment that allows a range of respected views to focus upon challenging issues (Uhl-Bien *et al*., 2007). The authors argue that

> Knowledge Era leadership requires a change in thinking away from individual, controlling views, and toward views of organizations as complex adaptive systems that enable continuous creation and capture of knowledge. In short, knowledge development, adaptability, and innovation are optimally enabled by organizations that are complexly adaptive (possessing requisite complexity). (Uhl-Bien *et al.* 2007, p. 301)

This raises a question about which project procurement form for complex projects best provides the necessary supportive environment to maximize collaboration that results in inclusive decisions being made that lead to innovation.

Alliancing is one of these new relationship forms. Meng's (2012, p. 190) research of the literature, supported by interviews with academics and practitioners, found that 'mutual objectives, gain and pain sharing, trust, no-blame culture, joint working, communication, problem-solving and risk allocation' were the most important indicators of strong supply chain relationships in the construction industry. Project alliances (PAs) feature all these characteristics. We argue in this paper that PAs drive innovation through the requirement for a no-blame culture. Our argument is illustrated conceptually in Figure 1.

Collaboration, knowledge sharing and organizational learning provide a supporting environment in which a no-blame culture can flourish. Baiden *et al.* (2006) researched the extent of integration, demonstrated through activities such as collaboration and

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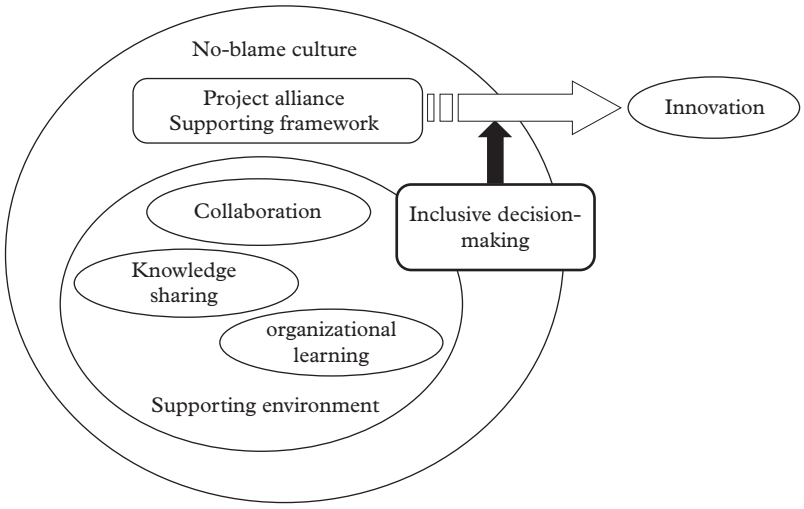

Figure 1 Conceptual argument

information sharing, that occurred within construction project teams. They concluded that equitable relationships supported working together to achieve joint resolution of problems and that the level of integration of teams and collaboration within them related to the procurement approach and the practices adopted within teams (Baiden *et al.*, 2006). An integrated, collaborative and information-sharing culture is developed through the PA's supporting legal and obligatory requirements framework and this provides a potent innovation driver through inclusive decision-making.

The research questions posed by Figure 1 are: how does a no-blame culture, influenced by the PA requirements framework, trigger innovation? What are the mechanisms? How does this work in practice?

The core supportive framework in Figure 1 is the project alliance. The switch that turns on this supportive framework is the supportive environment. This paper uses case study findings to support the suggestion that project alliances have a no-blame culture, high levels of collaboration, trust and knowledge sharing which provide an ideal environment for organizational learning that leads to innovation. Following Lalonde *et al.* (2010), we claim that this paper makes a pragmatic contribution to project management (PM) practice and theory in demonstrating how a no-blame culture within a PA constitutes a process innovation.

Project alliances as a supporting framework for inclusive decision-making

Alliances, by nature, have been shown to support innovation (Manley, 2002, 2006). This is because alliances have a no-blame, team culture and they encourage and thrive on collaboration and knowledge sharing which in turn results in organizational learning that supports innovation (Cheng *et al.*, 2004; Rowlinson *et al.*, 2006; Chan *et al.*, 2010). The concept of a PA is central to our argument. So what is a PA?

A PA is a new and developing project procurement relationship form. It is created when the specialist staff from several organizations come together in order to deliver what is usually a solution to a complex situation. These employees, from the partner alliance organizations, work within the alliance entity formed to deliver the project. All stakeholders become equally responsible for the outcome and each will also equally share in the gains, or losses, that result. In other words, the alliance partners will sink, or swim, together. Features of alliances include a no-dispute and no-blame culture, open-book accounting and unanimous decision-making (Koolwijk, 2010). They are based on the premise that the 'best-for-project' objective will support this cooperative culture and result in decision-making that will lead to success.

It is this joint and equal responsibility and risk, and the project alliance agreement (PAA), that leads to the development of a unique culture within alliances (discussed later in this paper) that does not apportion blame, encourages collaboration 'driven by interpersonal relations of trust and respect' (Provera *et al.*, 2010, p. 1065) and thus supports innovation. Across industries and settings when people from different expertise domains collaborate, new ideas emerge (Abbate and Coppolino, 2010).

What characterizes a project alliance culture?

A PAA is usually made between two or more entities who, in good faith, commit to working cooperatively, sharing the risks and rewards of the project in order

to achieve the stated outcomes (Jefferies *et al.*, 2006). Expanding on this definition the *National Alliance Contracting Guidelines: Guide to Alliance Contracting* (Department of Infrastructure and Transport, 2011, p. 19) defines the relationship between the facility owner/client and non-owner participants (NOPs) to a PAA as follows:

> Under an alliance, Owners are willing to trade-off their traditional contractual rights (under a 'risk transfer' contract) in exchange for NOPs bringing to the project their good faith in acting with the highest level of integrity and making best-for-project decisions to achieve the project objectives (in accordance with the Owner's VfM Statement).

Alliances are therefore a collaborative arrangement where the alliance members jointly work to deliver project outcomes. Alliances are best suited to high risk/high uncertainty projects. They are characterized by joint member sharing of all project risks in a no-disputes and no-blame environment where unanimous decision-making takes place. This environment promotes greater collaboration than other relationship forms because the goals of all participants are aligned throughout the project delivery phases. This level of relationship provides no formal process for legal action except in the case of wilful default (Miller *et al.*, 2009).

The significance of this relational approach illustrates the commitment of all PA parties to deliver the expected key performance indicators (KPIs) for that particular PA as a coherent holistic project team entity rather than individual project teams separately striving to achieve their individual objectives for success. Co-sharing accountability suggests a no-blame culture where the immediate response of project team members is to fix a problem rather than apportion blame to other project team members and take defensive action to protect their individual home-base organization's interests.

The commitment to act in good faith by alliance parties, equally sharing overall project gains and losses, or agreeing to sink or swim together, sets the tone of the alliance culture linking powerful contractual incentives to contractual behaviour. A commercial contract covers all construction cost expenditures that are agreed through a target out-turn cost (TOC) model that is rigorously validated through reference benchmarking by independent cost consultants. Production costs are paid on an open-book reimbursement basis. Site establishment and PM running costs and a fee (profit and overhead) are similarly negotiated. This robust contractual arrangement facilitates a viable trade-off for client project owners and NOPs to consider waiving their common law rights to sue project team members within the alliance. These PA contractual arrangements facilitate a best-for-project commitment and they anchor in probity requirements that allow open-book transparency so that potentially opportunistic behaviour is deterred and can be readily identified.

It is these contractual arrangements that provide the defining difference between a PA and other voluntary collaboration project delivery approaches. The fair commercial contract balances the right of NOPs to make a reasonable profit with the right and obligation of the project owner to ensure that value for money is competitively achieved. The behavioural contract requires signatories to work together in good faith, acting with integrity and making best-for-project decisions. The incentivization contract ensures that the financial reward and penalty provisions drive motivation. It is in the interests of all parties to work closely to achieve best value. The PA also pools its insurances by negotiating an alliance insurance agreement rather than separate insurance requirements, reinforcing unity of purpose. The TOC, established early in the alliance selection phase of the project, represents fair and reasonable expected end costs. The details of budgets and all design and delivery assumptions are openly and transparently discussed for full understanding during initial post-alliance TOC agreement workshops. This enables risk to be more effectively shared and apportioned so the most appropriate alliance partner can manage it. The TOC represents a best-practice cost target because of the shared knowledge and collaboration involved in its articulation and externally validated referencing. Potential gainsharing from the incentivization contract leg is mainly achieved by innovation and so this arrangement encourages and facilitates innovation. Most innovation emerges throughout the project delivery phase. Opportunities for refining best practice methods and for creative out-of-the-box thinking result from clearer understanding of the unfolding events of the project. To summarize, contractual drivers of a PA encourage a trade-off of the normal rights to sue parties that do not perform to expectation such that they may inhibit parties achieving their KPIs. This is done by linking incentives to behaviours. The concepts of reasonable profit return and value for money are enshrined in the PAA, as are expectations of collaboration.

Project participants on traditionally procured projects tend to be risk averse. Their concern about the repercussions of failing to deliver on the plan makes them reluctant to engage in open and collaborative problem-solving. The lack of a collaborative culture in the construction industry which is characterized by blame and litigation is viewed as a major problem in the UK by Latham (1994) and Egan (1998) and in

Australia (National Building and Construction Council, 1989). Poor relationship management between construction teams has been addressed more recently through three emerging trends.

(1) Wider adoption of design and construct (D&C) forms of contracting, where innovation to improve value for money is systemized through design and construction team integration (Kumaraswamy and Dulaimi, 2001). An increased proportion of construction projects have been undertaken as D&Cs where the market favours innovative solutions rather than through the traditional design-bid-build. D&C may encourage innovation at the module or systems level for bidders to provide a design solution superior to that of its competitors.
(2) Increased popularity of partnering arrangements has improved inter-team and client relationships (Bresnen and Marshall, 2000, 2011), and has drawn in the client and wider supply chain to consider and implement innovation through collaboration.
(3) Other collaborative procurement forms that encourage innovation, particularly with early contractor involvement (ECI), have emerged (Mosey, 2009). Here the contractor's expertise is more effectively integrated into design decision-making to increase the client's awareness of the broader implications of design brief options under consideration. ECI in the construction industry has been well documented and described by others (Sidwell and Mehertns, 1996; Rowlinson and McDermott, 1999; Masterman, 2002; McGeorge and Palmer, 2002).

However, the contexts of each of the three above developments do not necessarily lock in collaborative behaviours across the project phases from design through to delivery and across all participants. Each of these forms, illustrated above in points (1) to (3), lacks an institutionalized contractual framework that supports a no-blame culture that leads to innovation capacity. Specifically, they do not anchor collaborative behaviours through contractual clauses and governance measures that are necessary to lead to innovation such as: consensus decision-making; a no-litigation clause; and cross-team incentives that are tied to overall project performance rather than team performance (so that teams are required to collaborate and help each other overcome problems).

The key element in the supporting environment in Figure 1 is knowledge sharing achieved through collaboration based upon a foundation of organizational learning.

Understanding how collaboration enables effective knowledge sharing

Knowledge sharing requires collaboration, but knowledge is sticky and difficult to transfer (Szulanski, 1996). Szulanski (1996, 2003) described four characteristics of factors that affect knowledge transfer that make knowledge 'sticky' and difficult to flow smoothly between parties. The key 'sticky' knowledge characteristic is a barren rather than fertile environment for tacit knowledge transfer to discuss and enact decisions. Effective collaboration and knowledge sharing is most likely to occur in a no-blame environment (Drejer, 2008). Dave and Koskela (2009) maintain that a highly effective way of capturing tacit knowledge is through collaboration between employees with a construction industry context. Greenwood and Wu (2012) found a positive relationship between working collaboratively and performance on construction projects. Among the nine attributes identified by Greenwood and Wu (2012) as contributing to collaborative working were trust, mutual understanding and respect, communication, problem solution mechanisms, sharing of the risks and benefits and having a win/win philosophy which all fit closely with attributes that have been identified as present within project alliances. Additionally, Greenwood and Wu (2012) identified creativity and innovation as being a positive attribute that results from collaborative working. The alliancing form of relationship-based procurement in particular results in collaboration through 'joint problem framing and solving' (Anvuur and Kumaraswamy, 2007; Mills *et al.*, 2012) driven by a best-for-project and no-blame philosophy.

We therefore propose that new relationship forms of project delivery, in particular project alliances, provide the best setting for innovation through knowledge transfer within a no-blame culture and this view is widely supported. While a no-blame culture is widely accepted as a collaboration driver (Miller *et al.*, 2009; Abbate and Coppolino, 2010) the construction and PM literature contains few theoretical underpinnings or illustrations explaining this view. While a no-blame climate will support the creation of a culture that encourages knowledge sharing (Abbate and Coppolino, 2010) developing a no-blame culture requires designing a specific procurement strategy that features a safe environment in which joint discussion and knowledge sharing can lead to a consensus on actions and methods. This strategy needs respectful relationships between parties that build trust, commitment and consensus and it requires a governance system that supports these objectives.

Lahdenperä (2012, p. 57) found evidence in the literature that innovation in construction required both

'closer integration and improved collaboration'. Dulaimi *et al.* (2010) cited the Singapore government's C21 Report's conclusion that the fragmentation of the construction industry and thus lack of integration of contractors and processes were leading to reduced industry productivity. The Report stated that 'creativity, quality and work innovation needed to be rewarded in order to promote innovation' (Dulaimi *et al.*, 2010, p. 238). Dulaimi *et al.*'s (2010, p. 244) research found that in order to create a culture of innovation a no-blame culture, where staff have the freedom 'to experiment with new ideas' was required. This is common across industries. Yu *et al.* (2013) found a positive association between knowledge sharing and innovation in the finance and insurance industries in Taiwan. This was enhanced through the interaction between employees. Based on results of empirical research (Hampson *et al.*, 2001; Mills and Harley, 2010; Walker and Lloyd-Walker, 2011), it can be concluded that the ambience created in a project alliance (PA) best facilitates a safe no-blame, collaborative culture (Lloyd-Walker and Walker, 2012).

Innovation is the outcome of people with different skills, knowledge, experience and perspectives collaborating to find new ways to solve problems or to reflect on current methods to find more efficient and effective ways to goal accomplishment. A problem may present an opportunity to remove constraints or simplify systems in novel and unexpected ways, re-conceptualizing a risk or an uncertainty into a potential opportunity for improvement (Chapman, 2001). The trigger for change is often a shock or turbulence to the regular order, forcing re-conceptualization of the nature of the 'problem'. This may set a chain of changes and innovations in motion (Nonaka *et al.*, 2006); however, there are antecedents to such innovation: the ability to construct multiple perspectives of the problem and solution space (Parker *et al.*, 2008), to tackle this type of intellectual exercise with the ability (i.e. resources, infrastructure, capability and willingness) to respond to a challenge. This requires absorptive capacity (Cohen and Levinthal, 1990; Hughes and Wareham, 2010): the capacity to recognize new knowledge, assimilate it and use it productively. It also requires timing or entrainment of knowledge (Söderlund, 2010) which means that knowledge and perspectives about a problem and its solution often cannot be understood until a set of conditions has been fulfilled enabling that knowledge to be absorbed and used. Collaboration alone is not sufficient for innovation because the knowledge and perspectives of participants may be 'sticky' and difficult to exchange, re-conceptualize and co-create. Peansupap (2004) shows through case studies of innovation diffusion of information communication technology (ICT) in highly ICT-savvy construction companies in Australia that sufficient resources need to be provided to allow time and energy for investigating options, and critically reflecting on innovation success and failure. The call for greater innovation to achieve smarter and more effective design solutions remains one of the industry's greatest challenges (Christiansson *et al.*, 2009). It strikes deep into the heart of the quest for demonstrated value for money (VfM).

A collaborative construction innovation agenda, therefore, requires reducing the stickiness of knowledge transfer through:

(1) investing sufficient resources to allow time and energy for investigating options and critical reflection: invest in thinking time;
(2) developing variety in problem solutions: encourage diversity of responses and proposals and encourage the challenging of proposal assumptions;
(3) collaborative behaviours, information, knowledge and perception sharing for rigorous scrutiny of options: provide a safe haven for robust respectful debate and discourage a blame culture;
(4) pursuing a value generation rather than cost/time minimization mindset: focus on both effectiveness and efficiency; and
(5) structural governance measures to enable project actors to develop and deliver innovation that adds value rather than reducing cost/time: match structural drivers to desired behavioural drivers.

We believe that a 'no-blame culture' is the key element and we highlight this element's critical role in Figure 1 as supporting inclusive decision-making through project alliancing. Our aim in restricting our focus to project alliances is to illustrate how a no-blame culture is crucial for realizing innovation in construction.

What characterizes a no-blame culture?

A no-blame culture is one in which individuals do not fear repercussions from risk taking or problem identification, where employees feel free to contribute to discussions and raise issues. A no-blame approach encourages open communication, sharing of knowledge thus helping to release organizational knowledge residing within interactions between people. A key component of project alliancing as described by the relevant government department in the state of Victoria, Australia (Department of Infrastructure and Transport, 2011), a no-blame culture also has the potential to enable organizations to use the learning

gained from rare events to improve future practices; indeed the benefits of a no-blame culture are such that Provera *et al.* (2010) suggest future research to identify whether it may be considered an intangible asset that makes a large contribution to an organization's overall value.

Events within projects, and the learning from them, are often lost on project completion. An environment that supports identifying and addressing issues without fear of repercussions could enable learning from these events to feed into improved processes and practices within future projects, where appropriate. Indeed Drejer (2008, p. 9) when summarizing findings from the literature on the fundamental requirements of an environment that encourages innovation quoted Goffin and Mitchell (2005, p. 265) as having said that 'Employees' willingness to take risks very much depends on the existence of a "no-blame" culture. A strong culture fosters innovation only if it is built on norms such as accepting failure …'. Supporting risk taking and removing the barriers that recriminations for risk taking may create will support a culture of innovation. Research by Hernández-Mogollon *et al.* (2010) found that a culture where blame is attributed to individuals is one in which open-mindedness is lacking, there is no tolerance for failure and where project reviews are not performed resulting in a negative impact on innovation within the organization. Kets De Vries (2000, p. 77) identified the components of trust building related to Russia's move to the post-Soviet era as open, two-way communication; honesty and openness to build relationships that are based on fairness, mutual support and respect; and a 'safe' work environment because when subordinates feel safe they will commit to the organization, and not be afraid to speak out when required. Rather than avoiding conflict as was the case in the former Soviet era, Kets De Vries suggested that leaders needed to listen to their subordinates' views and be open to conflict. Reduced levels of conflict have been suggested as benefiting the construction industry. For future success, construction companies need to change from an adversarial culture, where blame is apportioned, to a culture of sharing (Egbu, 2004).

The components Kets De Vries (2000) identified are those of a no-blame culture, one of sharing as Egbu (2004) suggests is required in the construction industry and the idea of an ontology of becoming offered by Koskinen (2012) reinforces this approach.

Project alliances and a no-blame culture

The total value of alliance projects between 2004 and 2009 in Australia was reported as $32 billion (Wood and Duffield, 2009, p. 7). Key characteristics of the no-blame culture (Department of Infrastructure and Transport, 2011, p. 19) which is used as a fundamental principle on PAs, can be summarized as illustrated in Figure 2.

Figure 2 illustrates the PA dynamics at work. Contractual and behavioural drivers interact to deliver a platform for performance that predicates a no-blame culture and has at its core a theory about the best way for the project owner and NOPs to interact.

True consensus requires skills in being empathic and being able to accept the perception of others as a valid negotiating point. In the traditional construction procurement approach the architect or engineer (for building or engineering works) leads the design process, has the most power and influence and hires the other specialists as instruments to develop a largely preconceived project design solution. By contrast, PA consensus behaviours turn power and communication imbalances to symmetrical input mechanisms that allow consensus about a solution to emerge, one with greater intellectual and experiential input. This may take more time but it encourages greater commitment by all parties to the decision. The PAA contract condition of shared losses or gains, along with the practical need for consensus building, means that accountability, transparency and mutual dependence are necessary. PAs closely resemble joint ventures in their shared goal and integration and collaboration requirements with features of high trust and high control (Das and Teng, 2001) similar to the high trust and simultaneous distrust described by Lewicki *et al.* (1998). The high control aspect in PAs is monitored through adherence to KPIs and an open-book approach to probity and auditing. This provides both trust and what may be perceived as distrust. Alliance members trust the governance arrangements, and integrity or probity of those that audit them through open-book access to their financial and business records.

A no-blame culture develops from these features. If all agree to a course of action then individuals cannot easily opt out when they feel that course is inconvenient. The transparency and open-book approach lowers fears that any party can 'cheat' the system. Mutual dependency binds participants closely together because the incentive contract rewards project, not individual party performance. The signing off on agreement to strive for best-for-project decisions triggers an important behavioural mindset to aim for pragmatic action. All strive for best-for project with an understanding that this involves trying new approaches and recalibrating efforts pragmatically when better understanding of the context require plans to be changed.

The PA governance structure aspects that are absent from many other collaborative procurement

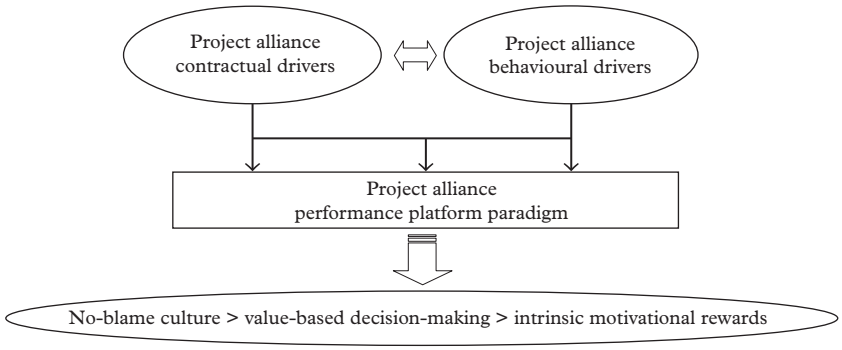

Figure 2 Characteristics and impact of the no-blame culture

forms include the enforcement of a mutual respect clause in the PAA. The dispute and issues escalation policy clearly identifies escalation steps to decide if issues can be resolved at any one level. This important measure is shared by partnering, but when combined with the sink-or-swim-together culture it adds an important layer to the effectiveness of consensus decision-making. PAA governance is designed to reinforce the links between incentivization, contractual performance and behavioural performance measures creating a unique procurement design to achieve consensus, create a no-blame culture and thus redirect resources away from defensive routines to more constructive action.

Figure 2 illustrates how the contractual and performance drivers create a performance platform in which innovation intent is escalated into innovation action through the innovation behavioural motivators. These drivers include: consensus decision-making; mutual dependence and accountability; common best-for-project goals; commitment to innovate; pragmatic learning in action; transparency; a balance between trust and control mechanisms; authentic leadership; and a structure to support and govern these within a contractual form. We suggest in Figure 2 that the no-blame culture is the key to making value-based decision-making that in turn generates intrinsic rewards.

Project procurement relationship forms and innovation

Innovation offers all industries and organizations the possibility of sustained competitive advantage (Barrett and Sexton, 2006). The construction industry is highly competitive (Barrett *et al.*, 2007) but also fragmented, with small firms and contractors potentially innovating, but those innovations do not filter through the industry. Barrett *et al.* (2007) observe that these 'hidden innovations' seem to be only occurring and remaining at the project level.

In the 1930s Schumpeter defined five types of innovation: introducing a new product or improving an existing product; process innovation within an industry; establishing a new market; new sources of supplies; and industrial reorganization (Carland *et al.*, 1984; Feeny and Rogers, 2003).

Slaughter's (1998) guide to innovation categories is based on exploiting existing knowledge, skills and experience. Innovation can range from small incremental changes to radical re-conceptualization and occur at the component, module, system, and architecture levels. Radical innovation 'signifies a break with existing knowledge and activity' (Harty, 2008, p. 1031). It can involve reconfiguring or redesigning a component; redesigning a configuration of components within a system or redesigning and reconfiguring links between systems. Innovation in construction and PM is not well covered in the literature; however the definition developed in 1998 by Barrett and Sexton (2006) included the implementation of a new idea that would enhance organizational performance. Manley and McFallan defined innovation in the project-based construction industry by building on the Organisation for Economic Co-operation and Development/Eurostat (2005) statement that innovation may be new to the world or it could be new only to a particular industry or business. Manley and McFallan (2006, p. 912) see this as including 'the adoption of existing advances developed outside a particular business'.

All innovation can lead to unintended consequences and uncertain outcomes. It is easy to blame those that innovate when an expected positive outcome fails to occur or when an unforeseen hazard is encountered. The decision whether or not to innovate fuels the knowledge exploitation versus exploration debate (March, 1991). Should construction delivery teams harvest knowledge from past projects and past patterns of project delivery or should they be continually alert to

possibilities of continually 'tweaking' or radically re-conceptualizing what they deliver? Should they follow a well-trodden path or experiment with new approaches and ways to reinterpret the outcome of what they were asked to deliver?

Discussion of an innovative problem-solving process

In the previous section we developed an argument that PAs provide a superior vehicle for achieving innovation in complex construction projects. In PAs, cross-team understanding for problem-solving combines with a no-blame culture to achieve this goal. We now present a model for dealing with problems and issues as they arise first in a business-as-usual (BAU) context and then in a PA context. The alliance manager of the Hamer Hall project in Melbourne, Australia, provided this model, based on her first experience of managing an alliance project. A cultural building construction project, it entailed a $135.8 million redevelopment of the existing facility, took 45 months and was completed and opened on time.

Date	*Alliance stage*
July 2008	Pre-alliance planning phase
September 2008	Alliance officially announced by government
May 2009	Architect appointed to alliance
November 2009	Head contractor appointed to alliance
June 2012	Alliance completed

The traditional BAU and PAA approaches are compared and contrasted to demonstrate how the model of problem-solving constitutes a governance innovation.

The BAU model of dealing with problems and issues

Traditional project procurement forms require each participant to look after their own organization's interest. BAU projects are characterized by project team members and leaders managing their respective organization's risk exposure when problems arise because this is seen as their responsibility. This is what they are expected to do; it is ethical for them to fulfil their fiduciary duty to their shareholders. The result of this action, however, poses several rational but reactionary behaviours that are often against the interests of other participants and, in particular, the client. This outcome is characterized by blame and litigation and this has been seen as a major problem in the UK and Australian construction industries (National Building and Construction Council, 1989; Latham, 1994; Egan, 1998). This relationship management approach illustrated in Figure 3 illustrates how waste is a by-product of pursuing a 'claims mentality' where opportunistic behaviour leads to every opportunity being made by NOPs to claim for 'extra' work not specified in contracts, specifications or work agreements. Ms Pitman provided the researchers at their interview with her in May 2012 with prints from two PowerPoint slides explaining the model.

Figure 3 and Figure 4 are adapted from and represent models developed by the team led by Ms Annette Pitman, Alliance Manager on the Hamer Hall project alliance in Melbourne using intuitive action research through reflective practice.

Figure 3 begins with a problem being identified. A typical example would be an interface problem, where no project participant was identified as responsible for temporary work that is clearly needed to maintain schedule. Although the person who is best placed to undertake this interface work is clearly understood, contract documents are ambiguous in relation to responsibility but there is a need to instruct somebody to proceed with that action. Other examples may pertain to conformance with conflicting standards, legal requirements, local authority interpretations and an array of ambiguous resolution of coordination and compliance issues.

In a BAU context the first party asked to respond to an identified problem usually asks the question, 'Could I be blamed for this?'. The person confronted with that request is professionally and ethically obliged within a BAU context to protect their organization's interest. This results in a wide range of potential claim sources (Kumaraswamy, 1997). The most usual response illustrated in Figure 3 is to procrastinate. The party is seldom obliged to immediately respond hence they wait to see what emerges, whether the problem 'goes away' or if others volunteer to solve it. If they believe that they are not likely to be blamed for the problem they will usually detail the problem in a recordable form. There is then a flurry of communications about the issue following the same logic with each approached party asking the question: Could I be blamed for this?

The documentation system used would be the vehicle for further communications identifying whether the problem exists and if this is deemed so then more communications follow documenting the issue, who is to blame, what their responsibilities should be and what actions should take place? The responsible party for the issue identifies a strategy and this is communicated to the superintendent responsible for administrating the project. After several such communications authority is granted to proceed with resolving the issue.

This process is drawn out, inefficient and wasteful. Much energy is expended in documenting the

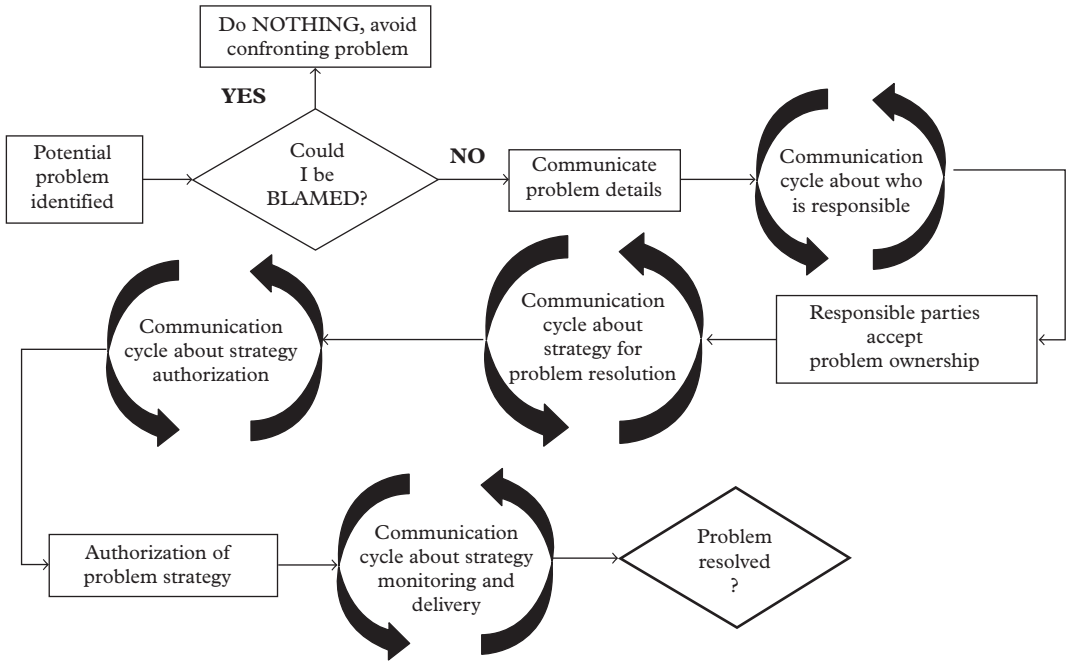

Figure 3 Business as usual problem-solving (adapted from Pitman, 2012)

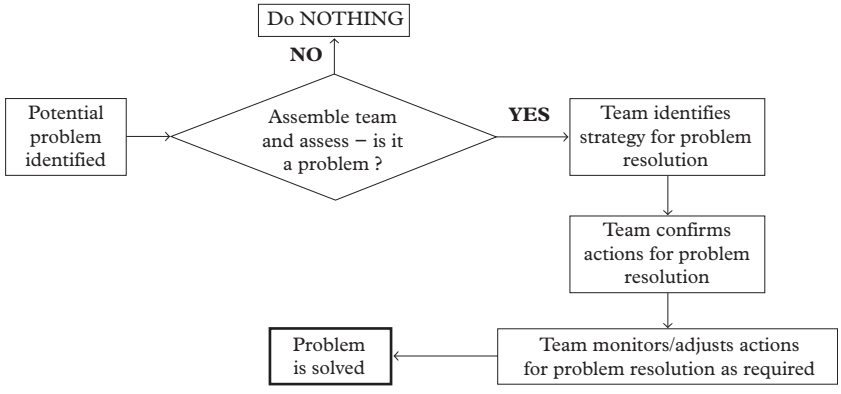

Figure 4 PA problem-solving model (adapted from Pitman, 2012)

communications and what risks and liabilities may ensue and how claims for additional work and time extensions should be agreed to between the PO's representative and those who have to fill this identified gap; do what needs to be done. All parties to the project pay for this systemic inefficiency because of the governance arrangements that prescribe how such issues should be dealt with in traditional transactional as well as in many relational-based procurement approaches. This stresses a deterministic product paradigm, where participants truly believe that the specifications, plans and forecasts are 'real' and 'truthfully' represent agreed actions. Naturally, opinions vary on how issues should be interpreted leading to a time-consuming process of claim and counterclaim that depletes energy and physical resources. Innovation is inhibited through the wasteful, unproductive time and resources required to administer claims. The governance system is also highly normative, prescriptive and compliance-oriented thus depriving parties of latitude to explore initiative or to experiment with more pragmatic options.

The PAA model of dealing with problems and issues

This approach can be contrasted to what usually happens in PA situations as illustrated in Figure 4.

Figure 4 begins in the same way as Figure 3 except that the relevant team members are assembled to assess and agree actions about the identified problem. This ad hoc team would comprise those that the governance

system would require to take action so that authority to proceed and conversations about liability, accountability and responsibility can be dealt with together against the backdrop of the 'incentivization' and behavioural leg of the PAA. Because it is in the interests of all parties to resolve the issue quickly and pragmatically, and because the best-for-project behaviour is linked to potential pain/gainsharing, a totally different dynamic is enacted from that portrayed in Figure 3. Additionally, by looking at the 'problem' with the broad expertise of the ad hoc team and also by considering potential opportunities triggered by the crisis event the ad hoc team can create new knowledge about the context that triggered the problem through a more thorough and wide-reaching investigation of potential cause and effect loops and other symptoms and causes. The focus that is applied because of the governance system (the way that teams are designed to behave towards each other, the contractual arrangements and the ambiance of the PA) dismisses issues of blame from the conversation and instead introduces an action learning process both to resolve the issue and to imbibe and absorb learning from this learning event exercise.

In this way a strategy to resolve the problem is developed, this is confirmed and documented through the document sharing system for later access as a potential 'lesson learned' and the action is processed with monitoring, adjustment and further documenting of the action and how the process worked. The problem is thus resolved.

More important perhaps is the intangible value created through this illustration of the process. This can be summarized for successful problem-solving as follows:

(1) The problem is more effectively and efficiently resolved.
(2) Relationships are generally enhanced and reinforced through collaborative problem-solving that increases absorptive capacity and generates new knowledge about the project context.
(3) The value of collaboration and knowledge sharing is enhanced and so the perceived value of each participant in the ad hoc team and what they offer in terms of knowledge, skills, experience and social capital are enhanced.
(4) The project context becomes better understood and appreciated and so it becomes a richer context in terms of knowledge transfer; often team members learn something new from exposure to solving the problem.
(5) The process is documented to help make explicit previous tacit knowledge and to embed that through productive socialization; theories are tested by experimentation.
(6) A potential innovation may have resulted out of this process to be leveraged throughout the project.

Discussion and illustrations from practice

We now provide a discussion of problem-solving models set against three illustrations of how the dynamics of a no-blame culture unfolded on PA projects.

Discussion of the problem-solving models

If the above approach is an innovation then what is innovative about it? On the surface Figure 4 appears a trivial simplification that is a peripheral continuous improvement process innovation at best. Changes illustrated between Figure 3 and Figure 4 relate to communication and identification of who is responsible for solving the problem.

We argue that the act of problem-solving in this way is itself a significant innovation as conceptualized in Figure 2 as having arisen out of the no-blame culture and that key elements to this innovation are:

(1) The governance and contractual innovation is centred on a consensus and no-blame concept. The PAA requires a further level of collaborative engagement beyond partnering for example where a ladder of dispute resolution is formalized to contain the disputes within the authority of those best able to solve them. The ladder of authority for taking action is the same but what is added is the requirement for consensus and it is this requirement that obliges all parties to collectively 'own' a problem and its resolution. Other forms of project governance stop short of turning problem blame into collective responsibility for problem resolution and complete interdependency.
(2) An ontology of becoming rather than being: problems are identified as transient phenomena, being not 'faults' but a product of a system of interactions whose influence can be better understood to enable guiding the transformation from a 'problem' to being part of the project's complex tapestry.
(3) The process described above is facilitated by a governance innovation beyond partnering and other productive relationship contexts. This governance innovation is centred around the following:
    (a) the joint-and-several shared responsibility to the end result of the project's success (sink-or-swim mutual dependency to share the pain and gain);

(b) the non-blame approach is encouraged by building consensus over a problem resolution strategy so that all parties take responsibility for its success;
(c) the best-for-project behavioural driver and contract condition relieve team members of the need to act opportunistically to advantage their home organization's interests above the project's interest;
(d) the behavioural driver requirement of respect for all participants means that valuable knowledge, expertise and social capital are valued by all team members as necessary ingredients for problem-solving.

(5) While the aim of the problem-solving event may not be specifically to innovate, often innovation emerges out of this process because either incremental or radical problem solutions can be safely considered.
(6) The leadership style required of the alliance manager represents a move away from a command-and-control one towards authentic leadership (for more detail see Lloyd-Walker and Walker, 2011) and the team interaction displays great distributed leadership as various participants collaboratively take the initiative for shaping decisions and taking action in a pragmatic learning-in-action way.

Illustrations from practice

The first illustration comes from data presented from the National Museum of Australia (NMA) Alliance report (Hampson *et al.*, 2001). Agreement with a set of statements using a relative importance index method (Kometa *et al.*, 1994; Chan and Kumaraswamy, 1997) was measured from a survey of 14 members of the PA team. As mentioned earlier, alliancing is a new project procurement relationship form and not many had had the opportunity to work on an alliance at this time. We sought participants from a fairly small group of practitioners who had decades of experience within traditional project procurement forms and also had worked on this alliance project. They were asked to respond to the statement: 'We *volunteer help* and support to our partners when they need help and we are happy to provide resources in a crisis' and to rate the importance of this on a low to high seven-point scale. This was asked for a business as usual (BAU) perception and the NMA alliance project at three stages of the project: at the beginning, about two-thirds of the way through, and close to the end of the project. The participants' responses were consistent and showed ratings of 45% for BAU and 87% for the NMA (Walker, 2002) and illustrate how collaboration and the sink-or-swim together mentality operated. This result means that respondents felt the statement was twice as important on the alliance projects compared to BAU projects.

The key differentiator of PAs from other collaborative forms of project delivery is the signing of a contract that binds parties to share losses and gains equally (Walker *et al.*, 2001, p. 212). Partnering in projects requires that all signatories to a partnering charter agree to collaborate, cooperate and generally work to overcome problems collectively but they are not financially penalized if a partner fails to perform. In a PA the incentivization component of the alliance contract stipulates that all rewards and penalties are pooled and apportioned in a previously agreed manner. All key performance indicators (KPIs) based on key results areas (KRAs) apply to the whole project, not just to the performance of selective non-owner participants. This means that if a KPI is not achieved then all alliance NOPs are penalized making it in everyone's interest to ensure that the KPIs are met or exceeded to enable all NOPs to share in any gains. This sink-or-swim together feature provides a powerful incentive for alliance parties to work together and to ensure that they effectively integrate and coordinate their actions to maximize the chances of project success.

A second illustration of innovation dynamics within PAs comes from a profiling professional excellence in PAs study (Walker and Lloyd-Walker, 2011). The study entailed intensive semi-structured interviews conducted in 2010 with 10 project alliance managers, and three interviews taking on average one hour with the managers of the alliance managers. This was followed in early 2011 by two workshops to present results to gain feedback and insights and involved a further nine PA team members ranging from senior managers reporting to alliance managers and those that the alliance managers report to. These participants' experience in project alliances totalled more than 30 years and collectively they had over 200 years of experience of traditional projects. This provided an excellent basis from which these participants could draw conclusions, make comparisons or overall comment with authority on project alliancing. In all, over 250 pages of transcript of recorded interviews and workshops were analysed using a grounded theory technique and NVivo as a tool to facilitate this. The researchers identified a number of themes from analysis of the transcript data, including the two themes relevant to this paper and presented in Table 1 detailing the theme/sub-theme and questions arising out of the transcripts. Relevant quotes from the interviews are provided to illuminate the implications of the innovation of this form of project procurement approach.

The quotes in Table 1 illustrate the atmosphere that develops within a PA. It goes beyond culture and we

Table 1 Quotes arising out of the transcripts

Selected quotes from the report	Quotes
Interview 4	I think alliancing is preferable … because it puts me in a better position to try and resolve all of the risks around the project delivery rather than just some of them. It also allows me and allows the client to understand these other drivers and agendas and pushes those agendas aside to some extent, to give you better control over outcome.
Clear risk allocation	… I don't subscribe to the theory that alliancing is better because it's a relationship style contract, because you can make any contract delivery method a relationship style contract because of the risk allocation.
Relationships and the no-dispute contract clause	… it's like life itself. You get through the hard times and get to the good times, and certainly in a project, if it was a design construct and you were in an adversarial environment, you'd come to a hard time and then the hard times just get harder and you'd end up in court. Whereas in an alliance, you said at the very start, 'We won't end up in court, and what's more, we've got a deciding body that sits there and will decide on everything that goes on here if there's disagreement, called the Alliance Leadership Team.
Consensus decision-making and trust	… how you measure the success of an alliance, … coming out of the bad times, for me – and this is something you don't normally measure in other contract delivery methods, you look back and you say how good were the trusting relationships on that contract? … That is the basis of it all. If you don't have trust in relationships, you don't have an alliance.
Interview 7 Innovation	… we are up to about 250 innovations so far I think on this project and we've been really pleased the way we've been able to innovate during the bid stage and we've continued that innovation through the TOC process. That innovation has continued on after the TOC process. Obviously the more you innovate, the less opportunity later on to innovate because you're sort of getting into the building phase. So some of the size of those innovations may have changed but the whole process continues on and the net effect of them is very promising.
Early input by all project team members	… because of a broader agenda of value for money and handing over to suppliers from before the project starts, you're getting those inputs early. So when we've been in some of our structural elements, we've incorporated maintenance issues into them but beyond what we normally incorporate into maintenance access issues. Normally you do the proper design of maintenance activity for maintenance processes beyond, during the life of the project, but we've enhanced that side having the various ALT members on early as part of the team.
Alliance agreed values and behaviours	[*on aligned project values*] … And that is precisely the values and behaviour, the natural values and behaviours that we're trying to drive through to the team. So that's the really pleasant thing to be aligned on that as well, not just the commercial side.
Interview 9 Working in an alliance	… you come together and you continue to be paid by your parent company … working early on in the establishment of the alliance we can set our own culture … if we exclude employment conditions, everything else we would like to get one culture so we're all operating under one umbrella is the way I explain it. …
Alliance values and behaviours – established principles	One of the best things that we did is we looked at the alliance principles because normally a fair bit of time is spent looking at the alliance principles … what we did is we sat down and we got both alliance and non-alliance people from the client's organization but also the AMT and the ALT and we had a workshop for the day and what we did is we looked at the alliance principles and we said okay to live that principle what are five acceptable behaviours and what are five unacceptable behaviours. … I got those printed up … got them posted in front of everyone.
Safe environment Trust Respect	… the types of things were talking [about] as a practical example or speaking your mind in the meeting and not walking out and then putting the daggers in as you go out … So I think the upfront culture alignment is really important and that you focus on that and not just on the scope of the project as that's just as important.
Lack of fear of blame Respect for all Innovation that reduced costs	[*in response to questions about innovation and out-of-the-box thinking*] … we were collecting all this information, we had to design 3000 litre irrigation meters, now the design wasn't that complicated all we needed to do was understand what the highest point was in the

(*Continued*)

Table 1 (*Continued*)

Selected quotes from the report	Quotes
	paddock and we had to understand what the water level was within the channel, the operating water level, we then had to understand what the friction loss was through that so they were maybe the three points that we needed to understand. … we were sending surveyors out to [get] this information. … this graduate … probably four or five years out said that there were some constructed drawings that the client had which provided the information … So he downloaded that and put it through pivot tables and all sorts of things and effectively designed all the meters overnight. So we said we needed all these levels and we were going to go out and grab a surveyor and we were going to get him to check this and make him do 20 a day and we were going to turn them over that way … that saved a significant amount of money. It could have been anyone that did it but it was a younger fellow who just turned up every day.

have termed this the PA ambience. Quotes from only three interviews have been provided, but what came through in these and many others was the feel of the PAA culture.

The third example of the collaborative dynamics of innovation within a PA is drawn from a transcript from an interview with a participant in the Hamer Hall case study outlined above ('Discussion of an innovative problem-solving process'). This PA delivered a severely time-restricted refurbishment of a concert hall and developed a culture that supported inclusive decision-making that triggered innovation. The project outcome required high-quality acoustics and comfortable air conditioning but the existing building ceiling height restricted air conditioning ducting layout proposals. One Friday the project delivery team reached a point where they could see no resolution to their problem. Sound quality could not be maintained within the ceiling height without risking movement and 'rattling' or noise that would diminish the quality of the sound. The acoustician, demonstrating a high level of commitment to the project, and the team demonstrating a high level of trust in the acoustician, agreed that he would work on the problem over the weekend and deliver a solution on the Monday. The solution was delivered at the Monday morning meeting and the principles developed have been documented for use in other similar environments.

A culture that assured the acoustician that there would be a lack of blame if the solution could not be found, indeed a culture where blame would not be apportioned in relation to any issues, difficulties or problems encountered, had been conveyed. The PAA assures all participants of this so the PAA itself is a radical innovation. It enables the PA participants to operate more effectively than in a BAU and even other relational forms of project procurement. The above selected quotes and example illustrate the lived reality of a PA, particularly when it is operating as intended and designed by the PAA.

Discussion

Slaughter's (1998) work formed the basis by which we categorized innovation, focusing on radical process innovation to investigate the PAA. March's (1991) theory of knowledge exploitation and exploration aided the process of contrasting the traditional construction exploitation of knowledge to provide competitive bid solutions with the exploration of knowledge used in problem-solving and interpretation of design information. Based on the results of this process we argue that the PAA facilitates knowledge exploration through a safe, no-blame haven where participants exchange and create knowledge free of power and status asymmetry. Koskinen's (2012) paper was used to rethink PAs from an organizational learning perspective by contrasting the ontological, epistemological paradigm perspectives of traditional construction PM with a PA approach. This revealed that traditional and partnering approaches are dominated by a positivist, instrumentalist and product thinking ontological stance, with a paradigm of 'being' whereas a PA is structured to encourage an interpretivist, relational process thinking ontological stance, with a paradigm of 'becoming'.

Using a range of project procurement literature a summary of levels of collaboration and potential for innovation and its realization is presented in Table 1. Literature on innovation in construction identifies a gap in relation to stickiness of knowledge transfer for innovation diffusion. Using the framework developed by Szulanski (1996, 2003) to describe characteristics of factors that affect knowledge transfer stickiness, we identified the no-blame concept as having addressed the 'barren' environment characteristic of knowledge stickiness for knowledge transfer as a trigger, through the PAA framework, for innovation. The characteristics of a PA culture are based upon both academic and relevant government/industry guidelines and reports resulting in the model in Figure 2 that illustrates the contractual and behavioural drivers that influence a

no-blame culture and the necessary PA ambience for collaboration to deliver innovation.

Testing of this theoretical work against real-life examples of PAs as presented in a number of research studies provided deep insights into how a no-blame, collaborative culture impacts upon innovation in PAs. Two models of problem-solving contrast BAU and PA approaches. Converting theory into practice this enabled demonstration of how a project team's safe, no-blame culture can facilitate innovation through collaboration in construction PAs. Examples from practice provide evidence (see 'Illustrations from practice' section) and combine with direct quotes gathered from a previous large study on the profiling professional excellence in PAs to further support the identification of attributes of PAs that support innovation.

Conclusions

The purpose of this research was to compare and contrast traditional and alliance project relationship forms to gain a better understanding of how innovation is encouraged (or discouraged) within these project procurement forms. The research was designed to gain insights into any aspect of each of the forms that may be identified as better supporting motivation and thus contributing to improved project performance over time. Using a range of theoretical frameworks the following research questions were answered.

The research questions and the findings in relation to each:

Q.1 How does a no-blame culture, influenced by the PA requirements framework, trigger innovation?

A.1 The no-blame environment created within PAs ensures safety for those experimenting and exploring alternatives thus triggering innovation.

Q.2 What are the mechanisms?

A.2 The PA framework and agreed code of conduct detailing expected behaviours within the alliance provide the mechanism for this to occur. And,

Q.3 How does this work in practice?

A.3 Agreement to and constant reinforcement of the acceptable behaviours and the overall 'best for project' attitude this incorporates support and build the notion of 'sinking or swimming together'. This leads to a high level of trust; the facilitation of knowledge transfer and learning; and expectation of experimentation the aim of which is to ensure that the best for the project approach will enable all to swim together. It is this that provides the impetus for innovation to happen in practice.

These findings are supported here by only a few of the quotes available to use as evidence to support our conclusions. They are based on analysis of findings from two large-scale studies into PAs in a construction context. Results detailed in the National Museum of Australia (NMA) Alliance report (Hampson *et al.*, 2001) and the profiling professional excellence in PAs report (Walker and Lloyd-Walker, 2011) and a survey of PAs in Australia (Mills and Harley, 2010) were also used. More details of the data used to support these findings can be found in these publications and appendices to them. Details of how the conclusions were arrived at are given above ('Discussion of the problem-solving models').

It becomes clear that a critical differentiator of the PA approach from other forms of relational project procurement forms is the no-blame culture and how the PA facilitates inclusive decision-making that delivers innovation. Figure 1 illustrated the mechanism of how collaboration through organizational and individuals sharing knowledge provides a supporting environment for a no-blame culture. We explained how the unique features of the PAA provide a supporting framework for innovation.

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Appendix

Abbreviations

BAU	business as usual
D&C	design and construct
ECI	early contractor involvement
ICT	information communication technology
KPIs	key performance indicators
KRA	key results area
NMA	National Museum of Australia
NOPs	non-owner participants [to a project alliance agreement]
PA	project alliance
PAA	project alliance agreement
PM	project management
TOC	target out-turn cost
VfM	value for money