UNDERSTANDING EARLY CONTRACTOR INVOLVEMENT (ECI) PROCUREMENT FORMS

Derek H.T. Walker[1] and Beverley Lloyd-Walker[2]

[1] *School of Property Construction and Project Management, RMIT University, Melbourne Victoria, Australia*

[2] *Victoria University, Melbourne, Australia*

It is widely accepted that contractors have much potential valuable advice to offer at the front-end of project development. This concept is sometimes called early contractor involvement (ECI) and encompasses various relationship-based project procurement (RBP) forms. These are currently being globally adopted and adapted and at times this results in misunderstanding of the finer grained nuances between the forms. This often results in participants having unrealistic expectations of team behaviours and relationships between project parties, particularly what is expected of the project manager and lead sponsor accountable for project delivery. Unrealistic expectations may trigger perceived project failure. This lack of understanding of behavioural expectations of ECI form inhibits those who deliver projects from performing to expectation. Clients choosing an ECI project procurement form would benefit from a clearer definition of behavioural expectations. This paper attempts to set a conceptual behavioural framework for ECI that helps us better establish a way of understanding what ECI and RBP procurement forms offer.

Keywords: project alliances, ECI, relationship-based procurement.

INTRODUCTION

Much of the current construction management (CM) literature focuses on the delivery of a project once the design has been developed where the contractor is expected to deliver the project within the 'iron' triangle' constraints of specified time, cost and quality to deliver its fitness for purpose. This can be seen as the 'traditional' perspective. A client/project owner (PO) defines a need that is to be fulfilled through the vehicle of a constructed facility. That stage involves the PO's representative (POR), design consultants and occasionally a construction contractor organisation that may be called upon to provide advice at the front-end of the project.

Many of the standard textbooks describe the project development process in terms of a two or three phase process. Two phases most commonly described are the project definition and design followed by the project delivery phase. Other texts refer to the

[1] derek.walker@rmit.edu.au

[2] *Beverley.LloydWalker@vu.edu.au*

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operation phase where it is important for CM scholars and practitioners to better understand the life cycle nature of the project and where a sustainability emphasis is called for often a further phase of use and retirement or disposal is often identified.

The business project management literature introduces us to a pre-project process where the strategic need for the project is identified and developed (Morris and Jamieson 2004). The front-end of projects are being increasingly focussed upon for generating value through ensuring that the purpose of the project fits strategically with the PO's organisation and that the project is effectively defined and designed often based on scant information (Næss 2009; Williams and Samset 2010). This has led to the development of a number of project procurement forms that introduce the project delivery contractor's expertise and advice much earlier in the project lifecycle that has traditionally been the case in the construction industry. Forms of this early contractor involvement (ECI) where the contractor collaborates with the POR at early project development stages have been experimented with and evolving over many decades. Mosey (2009) discusses ECI extensively in his book, and it becomes clear from that and other literature sources (Masterman 2002; Walker and Rowlinson 2008), that there are a range of terms used for procurement approaches where collaboration and cooperation between the POR, the project design team and the contractor delivering the project feature strongly. There is, however, a great deal of confusion when using these terms as they vary geographically when comparing lean project delivery (for example Ballard 2008) with project alliancing (Jones 2001; Ross 2003) and across time when comparing constructability (Sidwell and Mehertns 1996) with ECI (Mosey 2009). One term seems to morph into another.

It would be useful if a fundamental framework of dimensions describing expected project team behaviours could be developed that provide an improved way of helping us understand what is expected of teams and reasons why one procurement form may be suitably deployed over another. Such a framework could help us better understand similarities and differences with procurement choice labels used around the globe.

This paper presents two contributions to reduce this confusion. The first is a representation of the project lifecycle in which the various forms of ECI can be conceptually visualised and the second is identification of 10 project team behavioural characteristic dimensions that can be used to map the extent to which any project procurement form can accommodate and encourage desired project team behaviours required to meet the project objectives.

The paper is structured in four sections. The next section briefly describes the project lifecycle model. This is followed by a section that briefly explains how the 10 team behavioural dimensions framework was developed and tested and we then present it. We conclude with suggested implications for practice and concluding remarks.

THE PROJECT LIFECYCLE MODEL

One of the subject matter experts interviewed by the team as part of this research made the valid statement about relationship-based procurement that all business transactions involve a relationship. It is just that some relationships are purely transactional and other forms that involve a need for personal understanding between parties. This concurs with MacNeil (1978) who focuses on relevant future contingency contractual implications of contacts, i.e. needing to build in contingency for uncertainty and risk when contracting for future delivery of goods or services. Construction projects are not immediate dispassionate transactions but are contracts

for delivery of an output that may be varied during the delivery process and are based on assumptions, interpretation of often vague specifications and require joint understanding of precisely what the project involves so that a realistic price can be negotiated. MacNeil (1978) describes 'classical contract law' where all these contingencies are well known and well specified. He describes neo-classical law where a mechanism for appropriate adaptations and contract variations can be incorporated into the agreement. His third contract form is relational contract law which sets up the rules of engagement so that there is a less rigid format to allow mutual adjustment and frequent changes in contracted output specifics so that the parties can mutually and jointly achieve the aims without hindrance of a rigid classical or neo-classical contractual relationship. This relational form comprises the suite of project procurement forms known in the construction industry as design and construct (D&C), Management Contracting, and other ECI forms such as project alliancing and public private partnership (PPP) or public financing initiative (PFI) type forms.

Klakegg *et al.* (2010, p38-39) describes a project life cycle based on several sources including the Office of Government Commerce (2007) gateway concept, the Project Management Institute (PMI) guide to their body of knowledge (PMI 2008) and Klakegg's PhD thesis (Klakegg 2010). This has been modified in Figure 1 to illustrate how ECI can be mapped onto three of the identified four project lifecycle phases.

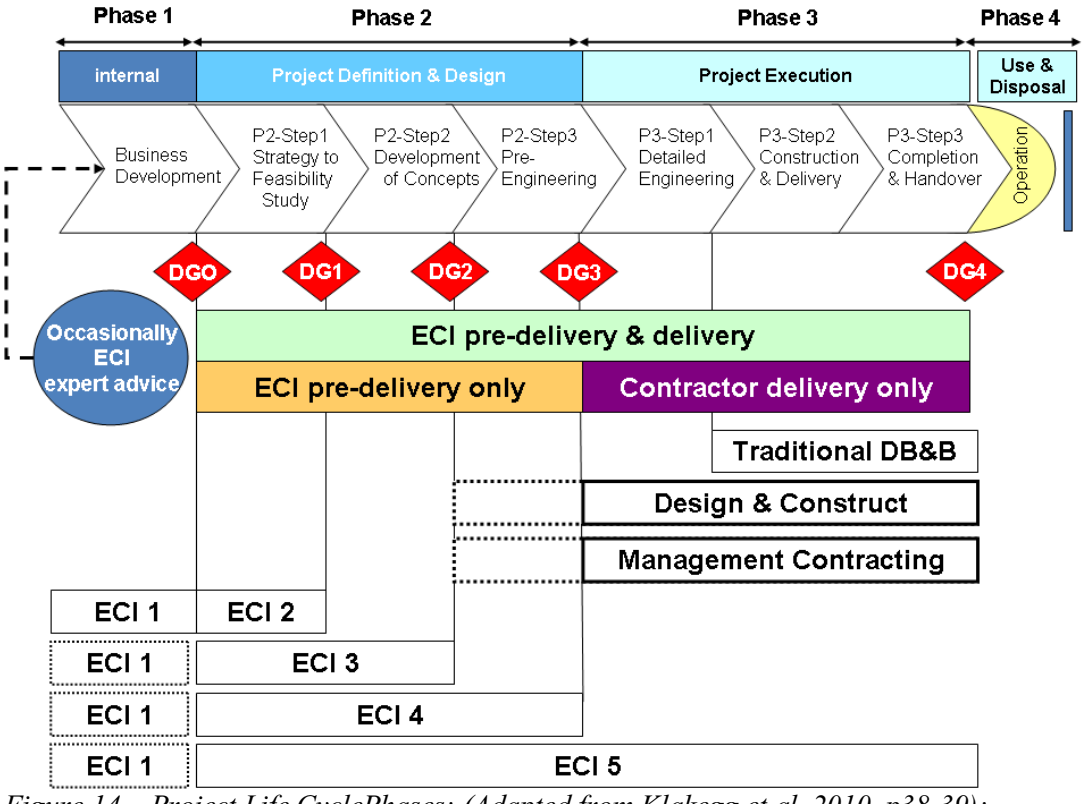

Figure 14 – Project Life CyclePhases: (Adapted from Klakegg et al. 2010, p38-39):

Decision gates: DG0 = formally recognised idea, DG1 = acceptable initiative to investigate, DG2 = choice of concept, DG3 = go/no go, D4 = accept outputs for the operation phase

We take a literal life cycle metaphor because often people talk of a project having a life of its own. Phase 1 represents a strategic idea for a project's changed direction that germinates from an embryonic business development proposal to become an identified potential entity. The embryo of a potential project idea is fertilised by the trigger

mechanism of strategic intent and imperative. A potential project becomes recognised and becomes recognised as being worthy of further development at (DG0).

Phase 2 involves project definition and design. This gestation phase involves three stages with decision gates (DG1, 2 and 3) that represent growing the foetal entity to birth or abortion. Step 1 in Phase 2 develops a fertilised embryonic proposal then tests it for its right to exist. The range of possibilities is narrowed to a generic solution and the feasibility of that form is verified and validated. The general form at DG1 can either continue to develop or be aborted. If it develops into Step 2 then the logical generic form (concept) is further defined to be further tested on its viability and right to exist at DG2. A successfully well developed embryo enters Stage 3 of Phase 2 where it is pre-engineered in readiness for birth at the Phase 3 project execution phase. It is tested for viability at this stage (DG3) and if successful moves to Phase 3.

Phase 3 is the ex-womb growth phase where it goes through three further development stages. Stage 1 is its detailed engineering when all its potential and actual features are hardwired into its maturity trajectory. Stage 2 is where its contact with its environment interacts with its genetic make up and learned responses (construction and delivery) to reveal a productive entity ready to deliver on its programmed potential. In Stage 3 the completed mature outcome is tested for authenticity as a mature and valid product (DG4) and then ‘handed over’ to do what it was designed and programmed to do.

Phase 4, often neglected in project management models, is the transition from potential to actuality by being operationalised. The facility/benefit/change can then ‘bear fruit’. This justifies the project investment and its delivery. When it has outlived its benefit it is disposed of. Contractors tend to have nothing to do with Phase 4.

Figure 1 illustrates procurement forms at Phases 1 to 3. Traditional design, bid build (DB&B) is an option most closely associated with MacNeil's (1978) 'neo-classical contract law' and as he points out due to uncertainty of the future this often leads to high transaction costs of negotiating changed terms and conditions and it leads to the need for a contingency sum to allow for unforeseen cost and time delays. Transaction cost economics (TCE) (Williamson 1979) implies that this can be a serious deficiency in the project delivery process (Winch 2001). The integration of the detailed engineering Stage 1 of Phase 3 is combined with Stages 2 and 3 for the D&C option but with a D&C option usually results in a fixed price/time neo-classical contract but interaction with the POR and client's design team only commences at Stage 1 of Phase 3 and so there is little of no knowledge sharing, collaboration of joint decision making prior to being contracted to deliver the project unless there is some degree of design novation in the D&C (Walker and Hampson 2003b, p16-19). Novated D&C does draw in the pre-engineering stage of Phase 2 with Phase 3. Management contracting is a procurement form where the agent of the POR (the management contractor - MC) is responsible for the project execution and may extend their role to pre-engineering. Under this arrangement the POR collaborates closely with the MC and so there can be greater openness, collaboration knowledge exchange and transparent development and use of a contingency fund (money and time). The MC is paid a fee to manage the packaging, bidding and managing sub-contractor and suppliers to deliver the project (Walker and Hampson 2003b, p19-23).

ECI1 can take place at any or all of Phases 1 to 3. The contractor may have expert advice that cam be useful and accessed for a fee at Phase 1. This may be relevant for highly specialised contractors who can help the PO shape strategy at DG0. In a previous studies we interviewed the chief executive officer of a contractor that

performed this role for pharmaceutical clients who were considering locations for building facilities and needed technical input about country conditions and capacity of sub-contractors as well as highly technical issues where this contractor's tacit knowledge was of vital interest for also undertaking feasibility studies at DG1 in Phase 2 Step 1. More commonly during Phase 2 ECI2 occurs at step 1 and ECI3 at step 2. There may be considerable technical input similar to that just mentioned about the ECI1 example but where advice about the idea feasibility and its development to concept is provided by the contractor at DG1 and/or DG2. There are several forms of this engagement. ECI3 would be involvement and collaboration to the point when a concept solution is tested and ECI4 would involve advice up to the decision to tender (DG3) on a range of procurement forms that could be include DB&B, D&C or MC. The POR may choose at DG3 to engage the contractor (ECI5) on a fee based service or MC basis. The ECI5 form varies from the MC approach in the degree of collaboration and basis for jointly managing risk and uncertainty and the form of incentives adopted as well as the relationship contract arrangements. These could vary from less commitment-integration such as that seen in partnering arrangements or full-blown project alliances. Readers interested in more detail on this aspect should refer to the literature on project alliances (Walker *et al.* 2002; Ross 2003; Davis 2006).

Looking at the project lifecycle from a human metaphor perspective raises interesting issues. The various ECI interventions can be seen as project embryo nurturing and sustenance measures where the project is actively shaped and influenced through access to valuable external resources at the stages so that the best possible outcome at birth is encouraged. The decision gates represent Darwinian test points so that only the fittest project (fitting strategic intent and evolving business/external environment) is allowed to develop. ECI can play a part at the Phase 2 only or at both Phase 2 and 3 or the POR may choose to not access any ECI and simply perform all tasks in Phase 1 and 2 internally or with outsourced design development consultants and then contracting the project execution to a contractor using D&C or MC or DB&B.

This leaves us with quandary of which options to use and on what basis. Clearly, the project context and the availability of skills, knowledge and experience and the attributes that POR-external teams can bring to a project play a part in making this decision about procurement choice. We now offer and explain a framework of 10 behavioural dimensions of a project that influence the optimal procurement choice.

THE PROJECT 10 DIMENSION BEHAVIOURAL FRAMEWORK

We were asked in a previous research study to profile excellence in project managers that had the role of alliance managers (AMs) in delivering projects on a project alliance (PA) form of ECI. This project led us to interview 17 alliance management professionals during 2010 and 2011and our findings from 250+ pages of transcribed interviews were published (Walker and Lloyd-Walker 2011) and presented (Lloyd-Walker and Walker 2011;2012). Reflecting on this and much earlier work on the nature of construction projects (Walker 1995) together with intervening years of studying construction projects led us to propose 10 dimensions that can be used to characterise behavioural attributes of project team members required in response to project procurement choices. These were tested by presenting them to two recognised expert academics published in this area as well as four senior industry experts so that we could gain feedback to refine the framework. This work is in its infancy and so the following can be considered as conceptual but rooted in high quality reflection by the authors and industry and academic subject matter experts. It forms a preliminary stage

in a two year research project on understanding relationship based project procurement undertaken during 2012 and 2013.

The aim of the framework is to guide PORs to more effectively choose a project delivery procurement option that facilitates the required team behaviours to deliver their project. The behavioural framework is based upon a set of assumptions.

- That the PO and POR has an intimate knowledge of the PO organisation's business strategy and context but may need to collaborate with and access knowledge from an experienced contractor at the business development idea DG0 point in Phase 1 of Figure 1.
- That the POR is most likely the best person to lead Phase 2 with close knowledge of, and support from, the PO organisation to guide the development of concepts in Phase 2. However, the POR may have insufficient depth of knowledge of the uncertainty and risks associated with project realisation solutions. The POR will rely on both organisational internal expert advice and external consultant knowledge to bridge the POR's knowledge gaps. As Williams *et al.* (2009) point out, the concept stage is one where there is scant information available and this presents both uncertainty and complexity in foreseeing likely consequences of assumptions being made. In many cases forms of ECI would bridge POR and Figure 1 Phase 2 team's knowledge gaps but that requires collaborative behaviours between the POR and non-owner project team participants (NOPs).
- The project risk literature (Ward 1997;1999; Ward and Chapman 2003) clearly indicates that teams with advanced knowledge and understanding of likely risks and uncertainty should be sourced for complex and complicated projects to identify both a justifiable and realistic contingency for risk and uncertainty. These teams should also plan how to manage that contingency to avoid it being wasted or misused.
- That much of the project complexity issues to be addressed primarily relate to people's behavioural and ability to collaborate rather than purely technical issues. There is a great need for stakeholder engagement on projects these days (Mitchell *et al.* 1997; Das 2005; Holzer 2008). A focus on team interaction is therefore vital. Team members need to understand behavioural expectations.
- It is well known that the PO and POR sophistication is a vital factor in project success (Cherns and Bryant 1984; Latham 1994; Walker 1996;1998).
- Sophisticated POs and PORs and (NOPs) know how to collaborate, communicate and productively and collegially exercise authority to ensure that responsibility and accountability is appropriately allocated.

Based on the above five assumptions we reflected on our past research and the literature to propose the following 10 dimensions of POR and NOP behavioural characteristics measured using a 7 point scale 1 = very low to 7 = very high.

1. Coping with Project Design Instability - extent to which the POR and NOPs cope with design solutions that are ambiguous, incomplete or have conflicting objectives that hinder realistic project delivery bids to be developed and tendered upon that reflecting the PO's prioritised objectives.
2. Coping with Context Complexity - extent to which the project context presents structural, technical, directional, temporal or relational complexity in developing design solutions to deliver the project. Need for taking a range of

perspectives and sensemaking to understand the internal/external and political environment.

3. Embracing Risk and Uncertainty - extent to which the POR and NOPs have the willingness, ability in terms of knowledge, skills, attributes and experience (KSAE) and capacity (institutional support delivered through the procurement approach and governance system adopted) to embrace uncertainty and potential risk/opportunity in developing project design and delivery strategies.
4. Challenging the Status Quo - extent to which the POR and NOPs have the willingness, ability (in terms of KSAE) and capacity (institutional support delivered through the procurement approach and governance system adopted) to embrace an open-mind in interpreting and re-interpreting the project brief.
5. Balanced Performance Value Position - extent to which the POR is willing and able to clarify what benefits the project vision and aims are required to deliver in both tangible and intangible value performance terms.
6. Ensuring Mutual Trust - extent to which the POR and NOPs are willing and able to develop and maintain trust in each other to deliver agreed project performance outcomes as being the prime and overarching priority.
7. Commitment to Best-for-Project Orientation - extent to which the POR and NOPs structure contractual arrangements towards a best-for-project outcome and avoid opportunistic advantage seeking behaviour.
8. Commitment to Consensus-Based Decision Making - extent to which the POR and NOPs have the willingness, ability and capacity to work collaboratively and make strategic and major project delivery decisions that all parties take equal responsibility for in committing to engender a no-blame project culture.
9. Commitment to Knowledge and Ideas Sharing - extent to which the POR and NOPs have the willingness, ability and capacity to raise and discuss ideas and to share knowledge about project design and delivery issues to deliver best-for-project process or product innovation.
10. Commitment to an Integrated Organisational Structure - extent to which the POR and NOPs develop organisational structure/procedures to lead and manage the project through an integrated POR/NOP mechanism binding POR and NOPs into a coherent collaborative structure (both physical and virtual).

CONCLUSIONS AND IMPLICATIONS FOR PRACTICE

How can the framework and Figure 1 model be fruitfully used in practice? We suggest that Figure 1 is useful in helping project initiators visualise how ECI can be more extensively used than is presently used to access valuable practical knowledge about project solution options, their feasibility and the direction in designing a solution that can be effectively executed. ECI1 can be called upon where the client needs specific delivery subject matter expertise when developing project ideas. This can be valid for example for an oil and gas exploration company working with experts in building drilling platforms or developing on-shore exploration or exploitation opportunities. A real estate developer contemplating a new suburb or a mixed-use office, residential, and hotel complex may avail itself of ECI1 services to scope planning, market conditions and/or technical delivery matters.

ECI2 services may be called upon for specific benchmarking and independent advice during the project definition and design Phase 2 stages 1 as illustrated in Figure 1 where the PO/POR needs to assess the project idea's feasibility. ECI3 services can be used when the POR intends to leave convergent decision making about concept options open and independent of the ECI entity. ECI4 could apply where the client

wishes pre-engineering input and advice perhaps on buildability issues as is the case with MC services that include both buildability advice but also value engineering and value analysis (Thiry 1997; McGeorge and Palmer 2002; Male *et al.* 2007). ECI3, 4 or 5 services can be accessed when a full alliance type arrangement is envisaged that stretches from project definition through to project execution.

Project alliancing is a contract form in which the POR engages with NOPs including the contractor in an integrated organisation through a three limbed contract (Ross 2003). One limb defines the basis for cost reimbursement for direct on-site management expenses as well as payment of subcontracts and supplier delivery project costs. Another limb comprises the commercial contract for the NOPs agreeing fees, accountability and performance including determining the level of painsharing and gainsharing incentivisation and the target outturn costs (TOC), target delivery time and other key performance measures to achieve project objectives and outcome aims. The final limb defines a behavioural contract that governs the relationship between project delivery parties. This alliancing approach has become highly popular in Australia (Wood and Duffield 2009; Mills and Harley 2010) but it does require specific collaborative behavioural competences of all parties that need to be present for the relationship contract to be effective (Walker and Lloyd-Walker 2011).

The degree of integration of project team (POR and NOPs) of these organisation's commitment to a best-for-project versus a home-base performance primacy in part determines whether the ECI for is an alliance or another form of embedding the contractor into project strategy, design and delivery decision making with the POR. Another important distinguishing feature is the extent to which consensus amongst the POR and NOPs drives a sink-or-swim together mentality which results in a no-litigation contract clause in alliances (the only exception being for criminal activity or mal intent) (Walker *et al.* 2002). Lesser forms of ECI collaboration include various forms of partnering where the level of mutual commitment may be enshrined in a partnering charter but does not extend to a sink-or-swim together linkage of all parties sharing pain or gain (Walker and Hampson 2003a).

The 10 Dimensional Behavioural Framework provides a way of mapping the level of ability of the POR and NOPs to collaborate to solve the variety of complex problems and issues facing project alliances. Contractors can bring valuable risk and uncertainty management expertise, opportunities for innovation in project delivery and a sound reality check. There is a danger that contractors in an ECI relationship can take advantage of the POR and other NOPs and it is for this reason that Project Alliances uses painshare gainshare incentivisation arrangements based on joint-and-several POR/NOPs responsibility and accountability for project. A weaker relational procurement approach is partnering but while it aspires to many of the 10 behavioural framework values at the 'high' level, project teams often maintain a high priority for their home base organisation's interests over the project interest. The 10 behavioural framework could be useful in visualising behavioural expectations of all parties, POR and NOPs as well as forming the basis for a behavioural measurement tool.

This paper presents nascent results from a two year research project on understanding relationship-based procurement. The framework has been pilot tested using subject matter experts and draws upon complete studies and thus uses a meta-study approach to consolidate and refine findings on ECI research. Figure 1 and the 10 behaviours framework make a contribution toward clarity in understanding ECI and RBP.

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REFERENCES

Ballard, G. (2008). "The Lean Project Delivery System: An Update." *Lean Construction Journal*. 1-19.

Cherns, A. B. and Bryant, D. T. (1984). "Studying the client's role in construction management." *Construction Management and Economics.* **2** (2): 177-184.

Das, T. K. (2005). "Deceitful Behaviors of Alliance Partners: Potential and Prevention." *Management Decision.* **43** (5): 706-719.

Davis, P. R. (2006). The Application of Relationship Marketing to Construction. PhD, *School of Economics, Finance and Marketing*. Melbourne, RMIT University**.**

Holzer, B. (2008). "Turning Stakeseekers Into Stakeholders: A Political Coalition Perspective on the Politics of Stakeholder Influence." *Business Society.* **47** (1): 50-67.

Jones, D. (2001). "Keeping the Options Open: Alliance and Other Forms of Relationship Contracting with Government." *Building and Construction Law.* **17** (3): 153-163.

Klakegg, O. J. (2010). Governance of Major Public Investment Projects In Pursuit of Relevance and Sustainability. PhD, *Faculty of Engineering Science and Technology, Department of Civil and Transport Engineering*. Trondheim, Norwegian University of Science and Technology**.**

Klakegg, O. J., Williams, T., Walker, D. H. T., Andersen, B. and Magnussen, O. M. (2010) *Early Warning Signs in Complex Projects,* Newtown Square, PA, USA, Project Management Institute.

Latham, M. (1994). Constructing the Team, Final Report of the Government/Industry Review of Procurement and Contractual Arrangements in the UK Construction Industry. London, HMSO.

Lloyd-Walker, B. M. and Walker, D. H. T. (2011). *Project Alliances in Australasia - Differences with other Forms of Relationship Based Procurement*. EURAM 2011, Management Culture in the 21st Century, Tallinn, Estonia, June 1-4, Martinsuo M., H. G. Gemünden and M. Huemann, European Academy of Management**:** 40pp.

Lloyd-Walker, B. M. and Walker, D. H. T. (2012). *The Ambience of Infrastructure Construction Project Alliances in Australia* PMI Research Conference Limerick, Ireland, July 15-18, Project Management Institute**:** 22pp.

MacNeil, I. R. (1978). "Contracts: Adjustment of Long-Term Economic Relations under Classical, Neoclassical, and Relational Contract Law." *Northwestern University Law Review.* **72** (6): 854-905.

Male, S., Kelly, J., Gronqvist, M. and Graham, D. (2007). "Managing value as a management style for projects." *International Journal of Project Management.* **25** (2): 107-114.

Masterman, J. W. E. (2002) *An introduction to building procurement systems,* London, Spon.

McGeorge, W. D. and Palmer, A. (2002) *Construction Management New Directions - Second Edition,* London, Blackwell Science.

Mills, A. and Harley, J. (2010). Alliance Performance and Perception Survey in Public Sector infrastructure - 2010, Sydney, Alliance Association of Australasia**:** 17pp.

Mitchell, R. K., Agle, B. R. and Wood, D. J. (1997). "Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts." *Academy of Management Review.* **22** (4): 853-886.

Morris, P. W. G. and Jamieson, A. (2004) *Translating Corporate Strategy into Project Strategy: Realizing Corporate Strategy Through Project Management,* Newtown Square, PA, PMI.

Mosey, D. (2009) *Early Contractor Involvement in Building Procurement: Contracts, Partnering and Project Management*, Wiley-Blackwell.

Næss, P. (2009). Up-front Assessment of Needs. *Making Essential Choices with Scant Information - Front-end decision Making in Major Projects*. Williams T. M., K. Samset and K. J. Sunnevåg. Basingstoke, UK, Palgrave Macmillan**:** 85-105.

Office of Government Commerce (2007) *The OGC Gateway™ process - A manager's checklist,* London, The Stationary Office (TSO).

PMI (2008) *A Guide to the Project Management Body of Knowledge,* Sylva, NC, USA, Project Management Institute.

Ross, J. (2003). *Introduction to project alliancing*. Alliance Contracting Conference, Sydney, 30 April 2003, Project Control International Pty Ltd,

Sidwell, A. C. and Mehertns, V. M. (1996) *Case Studies in Constructability Implementation,* Adelaide, Construction Industry Institute Australia.

Thiry, M. (1997) *Value Management Practice,* Newtown Square, PA, Project Management Institute.

Walker, D. H. T. (1995). "An Investigation Into Construction Time Performance." *Construction Management and Economics.* **13** (3): 265-274.

Walker, D. H. T. (1996). "The Contribution Of The Construction Management Team To Good Construction Time Performance - An Australian Experience." *Journal of Construction Procurement.* **2** (2): 4-18.

Walker, D. H. T. (1998). "The Contribution of the Client's Representative to the Creation and Maintenance of Good Project Inter-team Relationships." *Engineering and Architectural Management.* **5** (1): 51-57.

Walker, D. H. T. and Hampson, K. D. (2003a). Developing Cross-Team Relationships. *Procurement Strategies: A Relationship Based Approach*. Walker D. H. T. and K. D. Hampson. Oxford, Blackwell Publishing**:** Chapter 7,169-203.

Walker, D. H. T. and Hampson, K. D. (2003b). Procurement Choices. *Procurement Strategies: A Relationship Based Approach*. Walker D. H. T. and K. D. Hampson. Oxford, Blackwell Publishing**:** Chapter 2, 13-29.

Walker, D. H. T., Hampson, K. D. and Peters, R. J. (2002). "Project alliancing vs Project Partnering: A case study of the Australian National Museum Project." *Supply Chain Management: An International Journal.* **7** (2): 83-91.

Walker, D. H. T. and Lloyd-Walker, B. M. (2011). Profiling Professional Excellence in Alliance Management Summary Study Report, Sydney, Alliancing Association of Australasia**:** 36.

Walker, D. H. T. and Rowlinson, S., Eds. (2008). *Procurement Systems - A Cross Industry Project Management Perspective*. Series Procurement Systems - A Cross Industry Project Management Perspective. Abingdon, Oxon, Taylor & Francis.

Ward, S. C. (1997) *Project Risk Management : Processes, Techniques, and Insights,* New York, Wiley.

Ward, S. C. (1999). "Assessing and Managing Important Risks." *International Journal of Project Management.* **17** (6): 331-336.

Ward, S. C. and Chapman, C. (2003). "Transforming Project Risk Management into Project Uncertainty Management." *International Journal of Project Management.* **21** (2): 97-105.

Williams, T. and Samset, K. (2010). "Issues in front-end decision making on projects." *Project Management Journal.* **41** (2): 38-49.

Williams, T. M., Samset, K. and Sunnevåg, K. J., Eds. (2009). *Making Essential Choices with Scant Information - Front-end decision Making in Major Projects*. Series Making Essential Choices with Scant Information - Front-end decision Making in Major Projects. Basingstoke, UK, Palgrave Macmillan.

Williamson, O. E. (1979). "Transaction-Cost Economics: The Governance of Contractual Relations." *The Journal of Law and Economics.* **22** (2): 233-261.

Winch, G. M. (2001). "Governing the project process: a conceptual framework." *Construction Management and Economics.* **19** (8): 799-808.

Wood, P. and Duffield, C. (2009). In Pursuit of Additional Value A benchmarking study into alliancing in the Australian Public Sector, Melbourne, Department of Treasury and Finance, Victoria**:** 191.