INTERNATIONAL CENTRE FOR COMPLEX PROJECT MANAGEMENT

ICCPM

RESEARCH PROJECT 3 OUTCOMES PAPER

CONTRACTING FOR SUCCESS IN COMPLEX PROJECTS

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1. INTRODUCTION

ICCPM's research and innovation strategy is intended to examine the nature of complexity in projects and facilitate the adoption of new and emerging knowledge and practice by individuals and organisations.

Research project three aimed to explore best practice contracting in complex projects. This included investigation of critical success factors of not just the contract itself but also acquisition and sustainment strategies as a whole. In conjunction with Research Project two 'Digital Library on Complex Project Management' this task has involved a comprehensive literature review of complex projects across the public and private sector and across multiple jurisdictions to identify not just critical success factors but also contracting features that are more likely to lead to project failure.

Whilst there are many success factors associated with complex projects, the following recurring themes were identified as crucial to project success:

a. Clearly defined and shared project goals and vision,
b. Suitable Relationship/behavioural management,
c. Prudent risk management and equitable risk allocation,
d. An acquisition and sustainment strategy suited to the project at hand,
e. A robust project management and systems engineering framework, and
f. Leadership and competencies of the team.

Though not exhaustive, these characteristics are most prolific in the complex project literature as key success factors.

2. ACKNOWLEDGEMENTS

This research was conducted by the lead researcher, Dr John Davies.

3. COMPLEX PROJECT CHARACTERISTICS

Before we examine the key success factors in complex projects, it is useful to remind ourselves of what precisely a complex project is? There is a rich literature exploring complex projects and what they comprise. We should recognise that 'complexity' does not equate to 'complicated'. We also should recognise that there is no magical threshold by which a system suddenly becomes 'complex'. Projects may have elements of complexity throughout them, albeit to varying degrees. Herein lies the danger of using boilerplate contracts that cater for just 'simple' and 'complex' projects.[1] A single project may start out 'complex' and become 'simple' or vice versa. Likewise there may be complex procurement elements combined with simple elements at the same time. Rather than use rigid checklists, dollar values, or other such mechanisms to establish complexity, it is therefore more useful to look at the attributes of a project and then decide what procurement method best deals with these attributes from a bottom up perspective. The United Kingdom National Audit Office (UK NAO) offers a useful definition of complexity:

[1] For example, several jurisdictions use the Kraljic matrix for classifying procurement activities. Whilst such matrices offer a pragmatic means of assigning categories to procurement, there is great danger in using binary constructs for the metrics of 'risk' and 'value'. For many Projects there could be several activities that could fall into every quadrant of the Kraljic matrix. See e.g. P. Kraljic "Purchasing Must Become Supply Management' Harvard Business Review", September (1983).

We define a complex programme or project as one where either:

- *at the outset there is uncertainty over the route to delivering the project outcome, or the project has aspects that have not previously been encountered; or*
- *there is a high level of change in the outcome required during the project's lifetime*[2]

Another useful example is through exploring complexity through the lens of Helmsman's dimensions:

a. Context,
b. People,
c. Ambiguity,
d. Technology, and
e. Project Management[3]

We see similar themes emerge from differing sources. What is most important, though, is not how parties define the nature of a project but rather the attributes of the project itself. How then do we explore these attributes?

3.1 Complex Project Attributes

When exploring a suitable procurement method to deliver outcomes, the attributes of a project prompt us to ask the following questions:

a. Who can influence the project?
b. What technological risks are involved?
c. When do we expect risks to be retired?
d. Who is best placed to manage risks?
e. How do we deal with uncertainty?
f. What is the likely implementation and operational timeframe?
g. What is the likely market capacity and competency for delivering aspects of the project?
h. How many suppliers will be involved in delivery? and
i. How much flexibility is required?

Many of these elements are intertwined. In answering these questions we are provided with an indicator of the level of complexity to which we can develop a Procurement Methodology, or Acquisition and Sustainment strategy.[4] This step must be conducted well before we contemplate a contracting approach.

4. METHODOLOGY

The methodology applied to this task combined grounded theory[5] with qualitative, exploratory research.

[2] UK NAO HC 962 'Commercial skills for complex government projects' (2009) p 13.
[3] Helmsman Institute 'A Comparison of Project Complexity between Defence and other Sectors' (2009).
[4] The terms 'Procurement Methodology', 'Procurement System', and 'Acquisition and Sustainment Strategy' are used to describe the funding, source selection, contracting and governance framework for procurement across the whole program lifecycle.
[5] J. Thomas and S. George "The Value of Mixed Methods", in *Designs, Methods and Practices For Research in Project Management* B Pasian (ed.) p 289.

The first stage of research comprised a literature review with content analysis to identify candidate key success factors for further consideration. Triangular of findings[6] was also achieved through the conduct of discrete tasks conducted by the author in support of developing best practice guides in procurement. These tasks, conducted over the period June 2014 to December 2015, explored best practice supplier evaluation methodologies in sustainment activities, and measurement of supplier culture and relationships in source evaluation activities.

5. LITERATURE REVIEW

There is a rich literature exploring the success or otherwise of complex projects. For example, ICCPM Research Project 2 was conducted to provide a digital library of complex project management practices. This digital library incorporates over 12,500 articles relevant to complex management practice and theory. A comprehensive overview of the key literature included in this research is included in the references at the end of this paper.

6. CONTENT ANALYSIS

A content analysis[7] of the literature revealed the following recurring success factors associated with complex projects.

a. Clearly defined project goals and vision,
b. Suitable Relationship/behavioural management,
c. Prudent risk management and equitable risk allocation,
d. An acquisition and sustainment strategy suited to the project at hand,
e. A robust project management and systems engineering framework, and
f. Leadership and competencies of the team.

These were not the only features of complex projects but were the factors most prevalent in the literature. With the key success factors identified, each success factor is explored in more depth.

6.1 Goal Alignment

Goal alignment is identified as a key success factor in complex projects.[8] Goal alignment may not necessarily involve the formation of a joint venture arrangement or some form of bespoke alliance agreement, rather goal alignment requires the parties to acknowledge that there should be a shared vision for project success. There are a range of options available to encourage goal alignment between the parties. These include:

a. gainshare/painshare remuneration arrangements,
b. Joint decision making,
c. A collaborative process for managing change,
d. Integrated product teams,

[6] See eg. S. Shankar an d B. Dick "Linking Theory and practice in using Action-Oriented Methods" in B Pasian (ed.) opcit. p 220.
[7] K. Krippendorff, *Content Analysis: An Introduction to Its Methodology* (2nd ed, 2004)
[8] For example, see the Joint venture meta-analysis by Duysters, Kok, and Vaandrager "Crafting Successful Strategic Technology Partnerships" R&D Management Journal 29 (1999) p 344; T. Lendrum "Building High Performance Business Relationships" (2011); Kok and Wildeman "Crafting Strategic Alliances: Building Effective Relationships" (1998); BS 11000 (2010) *Collaborative Business Relationships*.

e. Partnering charters, and
f. No disputes/no blame frameworks.

It is important to recognise that goal alignment should be pursued across the whole procurement life cycle and at all relevant levels. This may involve not just prime contractors but strategic suppliers, financiers, and regulators. Ideally, parties to a complex project should aim to align themselves to deliver *enterprise* level outcomes. Third generation Performance Based Contracts are an example of where strategic performance measures can be used to drive outcomes at the enterprise level.[9]

Tensions may arise whereby goals of the parties could diverge. This tension is most acute where financial goals are likely to diverge between the parties. To this end, it is unwise to place too much financial risk with suppliers in complex projects.

6.2 Relationship and Behavioural Management

There is a rich literature exploring the benefits of positive relationships in delivering contract outcomes. The importance of positive relationships is more acute in complex projects given the long term nature of the project and importance of trust. Positive relationships offer:

a. Superior cost, schedule, and performance outcomes;
b. More effective risk management opportunities;
c. Better goal alignment;
d. Improved transparency
e. Dispute minimisation;
f. Reduced transaction costs;
g. Enhanced flexibility;
h. Increased likelihood for industry participation;
i. Increased prospects for repeat business;
j. Improvements in skills and knowledge transfer between parties to the contract; and
k. Enhanced personal satisfaction for all project parties. [10]

How then, can we capitalise upon these benefits?

[9] Dr Andrew Jacopino and Dr John Davies "Deploying Performance-Based Contracts for Outcomes" Presentation to 2015 IACCM Australasia Forum (Brisbane (2015) available at https://iccpm.com/sites/default/files/kcfinder/images/Resources/2015_iaccm_performance_based_contracting.pdf

[10] See Esp., Arthur McInnis, 'Relational Contracting under the New Engineering Contract: A Model, Framework and Analysis' (paper presented to the Society of Construction Law, UK September 2003); State of Flux 'Supplier Relationship Management Research Report 2012: Voice of the Supplier - A Step Closer to Mutual Benefit' (2012); Australian Contractors Association, 'Relationship Contracting, Optimising Project Outcomes' (1999) ch 5; Queensland Government Chief Procurement Office 'Better procurement guide: Relational Procurement Options - Alliance and Early Contractor Involvement ' (2008) [10.1]; Australian Government Department of Infrastructure and transport 'National Alliance Contracting Guidelines Guide to Alliance Contracting' (2011) p 32; T. Lendrum 'Building High Performance Business Relationships' (2011); State of Flux 'Six Pillars of Success 2013 Global SRM Research Report' (2014);

6.2.1 Best Practice Relationship Management

A plethora of acquisition and sustainment contract options are available to promote better relationships in commercial dealings. These include alliances, partnering charters, early contractor involvement, and performance based contracts to name but a few. These options differ from traditional arms-length contracts by adopting a more collaborative approach to delivery. A review of the features of these contracts reveals a set of attributes that are more likely to generate positive relationships and drive the right behaviours. These include:

a. Best for project culture,
b. No blame culture,
c. No disputes,
d. Transparency and a culture of no surprises,
e. Integrated Project Teams, and
f. Joint decision making. [11]

Other attributes that are often cited in the literature as leading to positive relationships include: long term commitment, fairness, good faith, and trust. Good faith and fairness are often implied, and in some instances, express terms in a contract. [12] Trust, on the other hand is something that takes time to develop and cannot normally be included in the contract terms.[13]

What then are the features of these attributes that are more likely to lead to positive relationships?

- **Transparency** – a culture of no surprises. Openness demonstrates trust from both customer and supplier perspectives. Transparency could involve open book financial reporting, and sharing tactical and strategic information such as risk and issues logs.
- **Best for Project -** Positive outcomes occur if parties are focussed and project outcomes rather than self-interest. This does not suggest that buyers or suppliers abandon their commercial objectives; rather, they must have an interest in project success.

[11] See esp., Australian Contractor's Associate opcit p 10; Derek Walker and Keith Hampson (eds), *Procurement Strategies: A Relationship-based Approach*, (2003); Steve Rowlinson and Fiona Cheung, 'A Review of the Concepts and Definitions of the Various Forms of Relational Contracting' in Satyanarayan Kalidindi and Koshy Varghese (eds), Proceedings of the International Symposium of CIB W92 on Procurement Systems, (Chennai, India, January 7th-12th 2004) 227-236; Arthur McInnis, 'Relational Contracting under the New Engineering Contract: A Model, Framework and Analysis' (paper presented to the Society of Construction Law, UK September 2003); State of Flux 'Supplier Relationship Management Research Report 2012: Voice of the Supplier - A Step Closer to Mutual Benefit' (2012)

[12] Many alliances incorporate an express good faith clause J. Davies 'Alliances and Public Sector Governance' (2008). See also International Sales of goods Legislation which follows the Vienna convention with an express goof faith clause e.g. *Sales of Goods (Vienna Convention*) Act 1986 (NSW)

[13] Some contracts can incorporate a fiduciary standard, e.g. *United Dominions Corp Ltd v Brian Pty Ltd* (1985) 60 ALR 741. These circumstances are exceptionally rare in procurement contracts.

- **No blame culture** – independent of the contractual framework and risk allocation position, a culture of no blame can lead to positive outcomes. If parties focus on 'fixing the problem and not the blame' then significant benefits can be realised. This position must be tempered against the contractual liability framework cognisant of the fact that if a party has a legal right then it does not necessarily follow that that right *must* be exercised.
- **No disputes** – disputes and issues are inevitable. The principle of positive relationship management is to ensure disputes are resolved fairly and at the lowest possible level.
- **Integration** - Strategic suppliers and customers feel part of the one team. Common information systems, procurement systems, and rules are used for consistency. Selection of customer or supplier frameworks is dependent on what is easier to use and lowest cost (subject to governance constraints). Subcontractor and supplier interfaces are also included here as observed in the Australian Contractors Association Relational Contract Guide:

  "Contractors must manage and work with subcontractors and suppliers to create a team environment which will achieve the optimum project outcomes, without compromising safety and quality and which will not erode the subcontractors' and suppliers' profit."[14]

- **Joint decision making** – critical project decisions allow for supplier representation. Buyers and suppliers should commit adequate and qualified resources to leadership teams when needed.

Achievement of these objectives can be pursued in the contract itself with no blame/no dispute clauses, gain/share painshare remuneration, joint governance boards, and requirements for open book financial reporting. Though these options can drive positive outcomes they also introduce risks in themselves. Dilution of accountability, deadlocks, assignment of liability (especially for insurance) can all be problematic. Nonetheless, the relationship benefits often outweigh these governance costs.

6.3 Prudent Risk Management and Equitable Risk Allocation

Complex Projects are categorised by high risks, emergence, intense scrutiny, and uncertainty.[15] Traditional contracts for the provision of services or products typically rely on an arms-length relationship between customer and supplier. This is often an 'adversarial' arrangement, in which the buyer attempts to transfer as much risk as possible to the supplier. Such a risk transfer strategy may come at a high price to the buyer and will normally appear in the 'all up' contract price as 'contingency' or risk adjusted profit for the contractor. Such traditional approaches are therefore unsuited to complex projects, hence a more equitable means of managing risk is required.

[14] Australian Contractors Association, opcit. p22.
[15] D. Cooper et al *Managing Risk in large Projects and Complex Procurements* (2005) pp 323-7.

6.3.1 Best Practice Risk Management

Success in complex projects requires careful and equitable allocation of risk. Successful projects often involve collaboration in risk assignment. The Early Contractor Involvement approach with 'negotiated risk transfer' is a good example of this strategy.[16] Other successful initiatives include:

a. Joint risk and opportunity identification workshops,
b. Participation by insurance brokers into risk workshops,
c. Multi stage projects whereby risk allocation varies as a function of the procurement lifecycle, and
d. Sharing risks where appropriate.

Prudent and equitable risk management requires a holistic approach to identifying enterprise risks. Whilst many organisation are effective in identifying risks against the traditional dimensions of consequence, likelihood, and ownership, many organisations fail to explore the 'temporal' dimension of risk. That is, when would the risk likely be retired? By exploring risk from this perspective we can better chose an Acquisition and Sustainment Strategy that preserves relationships, minimises disputes, and minimises transaction costs.

6.4 Acquisition and Sustainment Strategy Selection

Many procurement activities adopt a course of action that attempts to fit an activity into a discrete acquisition or sustainment package. Many organisations, for example, attempt to fit projects into a Kraljic risk/value category or assign a project as either simple, complex or strategic.[17] Similarly an emphasis of contract value is often used by procurement agencies.[18] As a consequence, organisations often utilise boilerplate contracts rather than bespoke contracts with an assumption that the complete procurement lifecycle will be adequately served by such an approach. For complex projects we should explore risk retirement profiles well before we select an acquisition and sustainment strategy. Consider Figure One below. For risk profile one, we have high risks retained right throughout the project. A suitable acquisition strategy here could be cost reimbursement with fixed fee or some form of gainshare/painshare arrangement. For risk profile 2, we have high risks in the design phase and modest risks during construction/implementation. In this situation a two stage contract would be appropriate with risk transfer to the supplier occurring after high design risks are retired. At the other end of the spectrum, risk profile 3 has low risks which are gradually retired as the project progresses. A firm fixed price arrangement may be suitable here.

For complex projects there may be many interdependent systems that each has a unique risk profile. In such cases the acquisition and sustainment strategy may deal with each system severally with multiple contracts, each of which may have very different liability regimes and remuneration strategies. Those successful complex projects recognise that the acquisition and sustainment strategy must take a holistic, enterprise approach ensuring risks are allocated equitably and effectively. This does not require a rigid and inflexible acquisition and sustainment strategy. On the contrary, successful projects recognise

[16] See e.g. D. Mosey *Early Contractor Involvement in Building Procurement* (2009);
[17] Australian Department of Defence 'Procurement Categorisation Tool V1.2' (2012);
[18] See eg. UK Ministry of Defence Procurement Thresholds at http://www.contracts.mod.uk/guidlines/value-bands/

problems with emergence and uncertainty. The acquisition and sustainment strategy must therefore offer gate reviews and effective variation processes.

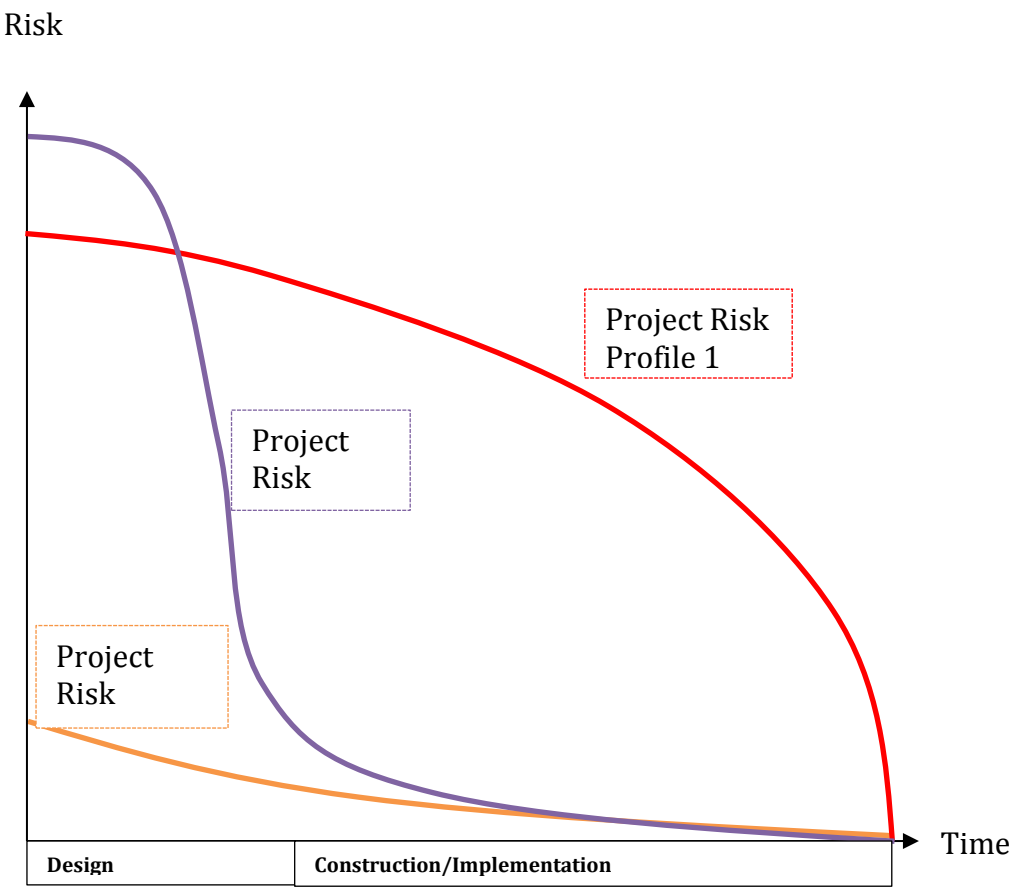

Figure 1: Risk Retirement Profiles for Three Projects

6.5 Leadership

Establishing and maintaining effective relationships is not just about agreeing to a commercial framework that supports such behaviours. There must be effective leadership and an organisational culture that supports positive relationships. The ANAO Better Practice Guide on Public Sector Governance observes that:

> *Leadership sets the 'tone at the top', and is absolutely critical to achieving an organisation-wide commitment to good governance.*[19]

Leadership is a key component for supporting collaborative behaviours as observed by the UK NAO:

> *Every case study ranked leadership as the most important factor in developing collaborative relationships.*[20]

[19] ANAO Better Practice Guide 'Public Sector Governance' Vol 1 (2003) p 16.
[20] UK NAO Good Governance 'Measuring Success Through Collaborative Working Relationships' (2006) p 8

Positive relationships will be facilitated where there is a corporate culture of collaboration with behaviours set by the example of leaders. Successful projects often display the following:

a. Key management participation in the project (participation in monthly reviews)
b. A common understanding of the capability principles is established throughout the organisation (shared vision)

Mixed messages from management, inconsistency in approaches, and reversion to transactional behaviours will all thwart positive relationships. What management say and do will influence all members of the buyer's and supplier's team. The following comment from the Former Director General of the troublesome UK NHS IT system illustrates how key messages can influence relationships:

> *"Managing the NHS IT suppliers is like running a team of huskies. When one of the dogs goes lame, it is shot. It is then chopped up and fed to the other dogs. The survivors work harder, not only because they have had a meal, but also because they have seen what will happen should they themselves go lame."* [21]

6.6 Robust Project, Commercial, Systems Engineering, and Supply Chain Management

A final success factor for supporting positive outcomes is to ensure all the procurement 'hygiene' factors are supported. Adopting all the other attributes will be meaningless if we do not have competencies in and suitable application of the following:

a. Project Management,
b. Configuration Management,
c. Quality Assurance,
d. Systems Engineering,
e. Commercial and Contracting Disciplines, and
f. Logistics.

Project managers may be seduced into using relational contracts or agile contracts to mask deficiencies in any of the above areas. As previously discussed in this paper, good relationships are necessary but not sufficient for project success. Equal consideration needs to be applied to the key competencies required for project delivery. A useful example of where failing to address hygiene factors can lead to relationship problems is illustrated in the Engineers Australia Report "Getting it Right First Time". This report identifies that 60 to 90 percent of variations stem from poor specifications.[22] Variations are often a catalyst for disputes;[23] hence requirements discipline will only lead to better relationships. The same holds for other areas of program management.

[21] UK Parliament, Committee of Public Accounts (26 June 2006) *http://www.publications.parliament.uk/pa/cm200506/cmselect/cmpubacc/uc1360-i/uc136002.htm*

[22] Engineers Australia, 'Getting it right first time: A plan to reverse declining standards in project design documentation within the building and construction and industry' (2003)

[23] See esp., IACCM Top Ten Negotiated Terms (2012) where during the post-award phase of the contract, 27 percent of respondents identified 'change management' as the most frequent source of a claim or dispute?.

7. CONCLUSIONS

The complex project success factors are tied to relationship management, collaboration, principles of fairness and equity. There is nothing new in these observations. What we have seen though, it the realisation of these principles in novel contract approaches that eschew the traditional arm's length approach of risk transfer contracting. Pursuit of relational contracting approaches though does not mean that project 'hygiene' factors should be ignored. Successful projects still require sound project management principles.

Ongoing research by ICCPM aims to develop a better practice guide for complex project acquisition and sustainment strategies. Acquisition and sustainment strategies must capture enterprise risks across the whole procurement lifecycle. Our research will capture these themes to offer practitioners a rich picture of the various benefits and costs of acquisition and sustainment approaches.

8. FURTHER RESEARCH OPPORTUNITIES

Whilst the broader success factors of complex project acquisition and sustainment have been explored, further research opportunities exist to quantify the benefits delivered by these success factors. Erosion of value is acute in complex projects.[24] Though Cobb's paradox alerts us to the steps that must be taken to address this erosion of value, which steps are most likely to yield success? Further research is therefore warranted to quantify the savings to be expected from 'business as usual' project management approaches. This will allow project sponsors to focus efforts on those activities most likely to yield success and allow for more robust business case development.

[24] For example, Flyvbjerg et al identify that for mega-projects, cost escalation of between 50 and 100 percent is common from initial estimates, B. Flyvbjerg, N. Bruzelius and W. Rothengatter Megaprojects and Risk: An Anatomy of Ambition (2003) pp 10-11.

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