Procurement strategy formation: (re-)designing rail infrastructure project alliances

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Abstract

Purpose – The purpose of this paper is to provide insights into the reasoning behind the development of new procurement approaches by public sector clients.
Design/methodology/approach – A case study approach focuses on a procurement development process by a public sector client. It investigates the reasoning behind various applications of the project alliancing concept in rail infrastructure projects over a period of 15 years. Alliancing applications are singled out and mapped against a number of criteria derived from literature on alliancing. The reasoning behind these applications and their differences are reconstructed from contextual documentation. Theories and concepts from the fields of strategic management and knowledge management literature are used to analyse the results.
Findings – The development process seems to be evolutionary rather than deliberately planned. The uncovered variations in alliancing applications can only to a very limited extent be explained by the reconstructed reasoning. This suggests that the applied designs are mostly based on implicit reasoning by individual project teams. From a strategic management perspective, the development pattern resembles the emergent type of strategy formation.
Originality/value – This study offers an initial insight into the reasoning processes behind the (re-)design of procurement approaches within a public sector client organization. A unique feature of this study is that these reasoning processes are explored from the strategy formation perspective that conceptually links the design of new procurement approaches to strategic management theory.
Keywords Public procurement, Project alliancing
Paper type Case study

Introduction

Governments have been increasingly outsourcing public service provision to the private sector (Alonso *et al.*, 2015). At the same time, public sector organizations are expected to achieve high performance standards in public service provision (Boyne and Walker, 2010). Therefore, procurement is becoming a strategic issue.

For public clients in the construction industry, the approach to procurement has changed significantly over the last two decades. Since the move away from traditional procurement (Egan, 1998; Latham, 1994), a range of alternatives has developed including Design & Build, Design-Build-Maintain, Private Finance Initiative, Partnering and Project Alliancing (Walker and Hampson, 2003). Such alternatives are commonly referred to as "project delivery systems".

Based on the view that there is no "one size fits all" approach to procurement, public clients are currently advised to consider which alternative best matches the

needs of each project (see, e.g. reports issued in the UK (Treasury, 2013), the Netherlands (Jansen, 2009) and Sweden (Eriksson and Hane, 2014)). Given the potential impact of procurement on public performance, it is not surprising that the issue of selecting the most appropriate project delivery system has received considerable attention in the construction management literature (see for an overview Love *et al.*, 2012).

The process of selecting the most appropriate project delivery system may lead to a public client concluding that it should use a system that it has not used before. Such a conclusion has practical implications. Project delivery systems, such as those mentioned above, are abstractions of procurement practice. To actually apply a project delivery system, public clients have to operationalize the conceptual project delivery system into a concrete set of contracting documents and tendering procedures. Public clients may follow one of three routes in achieving this. The first is to apply generally acknowledged standards, such as the internationally applied FIDIC suite of contracts provided by the international federation of consulting engineers (Bunni, 2013) or national standards such as the NEC3 Engineering and Construction Contract (Eggleston, 2015) used in the UK. However, simply applying a general standard might not be the best solution. A client's particular context may require modifications to the standard, for instance because of national laws or client-specific processes. Moreover, public clients who frequently procure may prefer to maintain a set of bespoke procurement documents. As such, the second route is to "adopt and adapt" a general standard. An example is the procurement practices of Network Rail, the UK's rail infrastructure manager, that maintains its own standard suite of contracts (which are publicly accessible on the internet). These include amendments to the UK's general "Infrastructure Conditions of Contract (ICC)". For example, in operationalizing the Design & Build concept, Network Rail's "NR9" document contains amendments to the "ICC Design and Construct Version". Finally, public clients could build on their own procurement practices, or even start from scratch. This is the third route to establishing a project delivery system. More so than the second route, this route involves a procurement development process in which a procurement approach is designed and then applied in practice, and perhaps subsequently redesigned.

The pursuit of higher performance through improved procurement may drive public clients to embark on procurement development processes. Such a choice involves a trade-off. On the one hand, there are the expectations of outperforming current best practices but, on the other, there are the additional costs and risks inherent to development. A trade-off may be made for one particular project, and thus result in a bespoke procurement approach. Clearly, if the developed procurement approach proves successful in that particular project, or at least appears to have sufficient potential for further development and application in similar projects, the payoff from the development will be higher. Consequently, the potential to reuse newly developed procurement approaches is an important issue for public clients.

Clearly, to benefit from previous procurement developments in future projects, the knowledge created has to be available for further applications. This has proved problematic: despite the many efforts made in practice and in research to improve learning from projects, progress still appears to be slight (Hartmann and Dorée, 2015). One of the impediments concerns the transfer of knowledge regarding the choices made in the procurement design. What problems was the development meant to overcome?

What was the expected additional value compared to current best practice? Did it meet these expectations? In so far as such questions are considered in the procurement design phase, some of the associated reasoning may later prove to be irretrievable to the organization due to knowledge transfer impediments. As a consequence, appropriate application in future projects and guidance for further development efforts are endangered. This runs the risk that developments are used only once, mistakes are repeated and opportunities missed. This leads to unnecessary costs for both the client and the private contractors involved. How can such negative consequences be avoided?

The aim of this study has been to help public clients improve procurement development processes. As such, it primarily explores the nature of the reasoning processes behind the design of new procurement approaches from the theoretical perspective of strategy formation (Mintzberg *et al.*, 2005) in combination with distinguishing between implicit and explicit knowledge (Polanyi, 1966). The expectation is that, by adopting these perspectives, insights into the reasoning process behind the development of procurement approaches will emerge that will enable public clients to better manage developments.

This paper reports on a case study into a range of developments initiated by a public sector infrastructure manager. These concern the reconstruction over a period of 15 years of applications of the same procurement concept: project alliancing. The first step was to assess whether the design of successive applications involved significant changes. The next step was to uncover the reasoning that could explain these differences. In so doing, insights emerge into the proportion of explicitly documented reasoning as against implicit reasoning during the development processes. This helps assess the relevance of managing the implicit/explicit balance since the latter is expected to contribute to a more deliberate approach to procurement development processes.

The implications of the findings from this research will hopefully stimulate both scholars and practitioners to further investigate the design, or redesign, of procurement approaches. This is important, for public sector clients, their contractors and for society, in achieving higher overall public performance through procurement.

Linking procurement to strategy formation and implicit/explicit knowledge

As outlined above, this study explores the nature of the reasoning processes behind the design of new procurement approaches from theoretical perspectives of strategic management and knowledge management (KM) literature. This theoretical section explains the connection between these fields of literature.

Given procurement's potential impact on performance, for example in terms of "value for money", many methods have been proposed for determining the most appropriate project delivery system (Love *et al.*, 2012). In this study, this is referred to as the "selection process", but only if the public client already has concrete procurement documents, tender procedures, tools and methods necessary for using the selected project delivery system available. If not, then the development process discussed above will be needed. With both the "adopt and adapt" and the "self-development" approaches, a "(re-)design process" will form an adjunct to the selection process.

It seems reasonable to view both the selection and the (re-)design processes from the perspective of strategic management. Three reasons support this proposition.

First, both processes should be managed strategically. Bryson (2010, p. 256) describes public sector strategic management as "the appropriate and reasonable integration of strategic planning and implementation across an organization (or other entity) in an ongoing way to enhance the fulfilment of mission, meeting of mandates, continuous learning, and sustained creation of public value". The last element in this definition can be significantly affected by the selection and (re-)design processes since "a 'one-size-fits-all' approach to procurement is unwise" (Walker and Rowlinson, 2008, p. 41). It follows therefore that both processes fall within the strategic management domain. Second, the reasoning used in the selection and (re-)design processes directly concern the objective of the strategic planning process: "clarifying organizational purposes and the requirements and likely strategies for success" (Bryson, 2010, p. 257). Third, it is argued that strategic management is increasingly important for shaping the performance of public organizations (Andrews *et al.*, 2012). Therefore, similar to what has been argued in the private sector purchasing and supply management literature (Weele and Raaij, 2014), research on public procurement should benefit from strategic management theory and concepts.

The focus of this paper is on the (re-)design process, and in particular on the reasoning used in this process. What reasons are used in a public sector organization to explain the design or redesign of a particular project delivery method? How can this reasoning process be qualified from a strategic management perspective? To our knowledge, these questions have not yet been addressed in the literature. In this study, the reasoning process is primarily explored from the theoretical perspective of strategy formation (Mintzberg *et al.*, 2005). These authors discerned ten distinct schools of thought regarding the process of strategy formation, and argued that each has its advantages and its drawbacks. As such, analysing the reasoning behind the development process in terms of this framework should help in better understanding the nature of this process. Subsequently, it could enable public clients to deliberately choose and manage a particular strategy formation perspective in future procurement developments.

This study also establishes a link between procurement and the KM literature. Central to KM is the distinction between tacit and explicit knowledge (Ragab and Arisha, 2013), a distinction first proposed by Polanyi (1966). Explicit knowledge is knowledge that can be codified and stored, whereas tacit knowledge cannot. Viewing tacit and explicit knowledge as the two ends of a continuum (Nonaka and von Krogh, 2009), rather than as a dichotomy, introduces the possibility of less tacit or less explicit forms of knowledge. Clearly, the extent to which knowledge remains tacit, or implicit, is a factor in knowledge transfer. Although only limited literature addresses this subject in the specific context of public procurement, there are indications as to the ways in which non-explicit knowledge can be problematic for agencies. A study by Hazlett *et al.* (2008) reported various causes of errors and mistakes including a lack of understanding of the contract documentation (including historical knowledge), misunderstandings or ignorance over implementing measurements, no clear understanding of the role of the engineer within the contract, and staff simply working in the same way as they always had.

Finally, there are sound reasons for combining strategic management and KM perspectives. It has been argued that future strategic management research needs to be directed, amongst other things, at, "[…] the structuring and facilitation of organizational learning and knowledge management as integral part of strategic management" (Bryson *et al.*, 2010, p. 506).

To conclude, it seems reasonable to expect both strategic management and KM literature streams to provide theories and concepts that can contribute to better understanding the development process of procurement approaches.

Research context: the procurement concept of project alliancing

Project alliancing is a relatively new method for construction project delivery. An offshore project in the North Sea, initiated by British Petroleum, is commonly considered to be the first application of alliancing (e.g. Bakshi, 1995; Halman and Braks, 1999). Scheublin (2001), focusing mainly on the petrochemical sector, was the first to describe project alliances in the Netherlands. In the Dutch public infrastructure sector, the first project alliance was initiated by ProRail, the Netherlands railway agency, in 1998. Since then, project alliancing in infrastructure projects has been much debated in the Netherlands, but there have been few implementations. Of the Dutch public sector agencies, ProRail appears to be the most frequent user of project alliancing forms, albeit to a far lesser degree than their default mode of procuring infrastructure projects in the Design & Build form.

Since the initial project in 1998, ProRail has implemented several procurement approaches that are alluded to as "alliances". One of these has been reported in the international scientific literature (Laan *et al.*, 2011). Although some of the other alliances have gained local media attention, they have remained largely unobserved, even within large parts of the ProRail organization. At the start of this study, the prevailing view in the procurement department was that ProRail did occasionally apply project alliances, that some were seen as a great success and that they were not all alike. However, a deep understanding was limited to a few people, some of whom were no longer with the organization.

Not only within ProRail, but also in the scientific literature, alliances and alliancing are not clear-cut concepts. Several authors warn over possible confusion regarding the interpretation (Yeung *et al.*, 2007; Chen *et al.*, 2012). Further, Lahdenperä (2012) observed that concepts such as project alliancing are not stable and develop over time through interactions with other project delivery methods, and that this is likely to continue in the future. As such, the meaning attached to the term "alliance" in this study should be explained.

Walker and Lloyd-Walker (2015, p. 29) discuss three forms of alliancing that cover both capital expenditure projects and maintenance and operations activities: project alliances, design alliances and programme service alliances. In this study, design alliances are ignored since the description offered seems to reflect a specific Australian context. Further, since the investigation into ProRail's applications of alliancing only concern capital expenditure projects, programme service alliances are also out of scope. This narrows our use of the concept of alliancing down to variations within the "project alliance" form in which "a project alliance is generally formed for a single project, after which the team is usually disbanded" (Wood and Duffield, 2009). From the range of high-level descriptions of project alliancing, the description provided by the State of Victoria's Department of Finance and Treasury fits well with the ProRail context: " a method of procuring (and sometimes managing) major capital assets, where a state agency (the Owner) works collaboratively with private sector parties (Non-Owner Participants or NOPs)" (State of Victoria, 2010). Consequently, this description serves as the high-level definition of a project alliance for the purposes of this study.

Research approach

The aim of this study is to help public clients carry out deliberately planned procurement development processes. To our knowledge, this development process is scarcely addressed in the literature. Therefore, as a start, an initial insight into a public client's development process needs to be established. How can this development process be characterized?

Given this aim, the literature recommends case study research. According to Yin (2014, p. 10), such "how" questions deal with "operational links, needing to be traced over time, rather than mere frequencies or incidence". Such questions are likely to encourage the use of experiments, histories or case studies (Yin, 2014). Experiments can be performed when an investigator is able to manipulate behaviour directly, precisely and systematically. However, these conditions are not met in our research context. Histories are the preferred method when there is virtually no control over, or access to, behavioural events. However, this study is not restricted to "the dead past" because some of the people involved in the events could be interviewed. Moreover, since "a case study's unique strength is its ability to deal with a full variety of evidence – documents, artefacts, interviews and observations – beyond what might be available in a conventional historical study" (Yin, 2014, p. 12) this method is preferable to a history.

Further, Yin (2014) defines case study research as "an empirical inquiry that investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (p. 16). The elements in this definition are present in our situation since we:

- can inquire into the contemporary empirical context of a public sector client;

- can investigate the reasoning processes behind the applications of the project alliancing concept;

- can investigate these in depth and within the real-world context of the people operating these instruments; and

- cannot clearly establish evident boundaries between the phenomenon of these reasoning processes and the context in which they take place.

ProRail's range of alliancing applications seems to provide a relevant case for investigating procurement development processes for a number of reasons. First, the project alliancing applications appear to concern bespoke designs for single projects. Evidently, for these contracts, a (re-)design process has been carried out. Second, this case appears somewhat paradoxical at first sight. On the one hand, project alliancing is promoted by both the client and the involved private companies as a very successful method, i.e. outperforming the best practice alternative. On the other hand, the number of alliancing applications is relatively low compared to other project delivery methods applied by the client for similar projects. This raises questions about the processes of strategy formation and implementation in the client's organization. What strategy lies behind this high success but low take-up? Third, at the start of this study, there was a general perception of ambiguity in the client organization regarding the main features of each of the project alliancing applications. Were there differences between the applications best known within the organization and, if so, why? Is the distinction between project alliances and the more common Design & Construct contracts merely having an incentive mechanism added to the former?

This study set out to establish a factual basis on which one could verify the initial assumptions regarding the project alliancing development process. This involves: first, isolating project alliances from all the other procurement approaches applied in the client's projects; second, mapping variations in the applications of the project alliance concept; and third, investigating whether the motives for these variations were explicitly stated in project documents. The study covers the period from 1998 to July 2013.

Step 1 – singling out project alliances
How can one identify and single out projects that can be regarded as project alliances? In order to identify alliances among the thousands of projects ProRail undertook between 1998 and 2012, selection criteria are needed, and the literature offers some suggestions. Yeung *et al.* (2007) distinguish "soft (relationship-based) elements" and "hard (contractual) elements". Soft elements include trust, long-term commitment, and cooperation and communication. Such soft elements are disregarded in this study since selecting contracts based on these criteria would require a subtle set of criteria for objective decision-making, which is not available, if it was not to be somewhat arbitrary. Moreover, by their nature, these constitute the "hoped-for" results of a project alliance and, as such, cannot be fully created by the contract alone (Bresnen and Marshall, 2000). Hard elements include the "formal contract" and the "real gain/pain share" (Yeung *et al.*, 2007).

Addressing the hard elements, the "formal contract" is viewed in this study as providing evidence of the existence of an alliancing arrangement between companies in the form of a signed contract; and genuine sharing of pain and gain is the key criterion. However, a literature search indicates a lack of a general consensus on the precise meaning of "real gain/pain share", although a compensation model derived from Australian practice is considered typical (Love *et al.*, 2010). The present study considers a compensation element to reflect the project alliance form provided the client and other participants have signed a contractual arrangement that in some way relates to over- or under-run of targeted outturn costs. As such, the pain/gain sharing mechanism is the main determiner in identifying projects delivered through an alliance method.

Step 2 – mapping variations within the concept of project alliancing
How can the development of the project alliance method be observed and assessed? Alongside a time reference, this requires an ability to identify differences among the alliance projects. Here, six basic characteristics were chosen to differentiate in terms of context: first, contract value; second, technical scope; third, type of contract tendered; fourth, type of alliance partner; fifth, time to the alliance agreement being signed after awarding the tendered contract; and sixth, differences relative to the contract used in project no. 1.

Next to these basic characteristics, three specific alliancing characteristics were considered: seventh, activity domain; eighth, risk domain; and ninth, alliance management arrangement. These items elaborate on the "real gain/pain share" aspect discussed above. The logic for using these three characteristics is as follows. The majority of project alliance definitions emphasize "collaboration" as key to achieving high performance. This collaboration is primarily stimulated by aligning objectives (Love *et al.*, 2010), and this is established through the gain and pain sharing arrangements. In contracts, pain/gain sharing can be directed towards specifically

recognized shared project activities and/or risks, and it is not practical to include all activities and risks involved in a project. As such, some domain boundaries must be set in the contract (such as the risk that the client introduces a major change in the scope). This also applies to activities (such as those needed to convert the client's formal decision to commission a project into the tender dossier subsequently prepared by the client). Consequently, the size of the domain covered by the pain/gain mechanism in a project alliance is a design issue and thus can be used to identify differences between alliancing applications. This set of activities and risks will be referred to as "the shared domain".

Further, the creation of a shared domain suggests the need for an organization, or at least some procedures, to manage that domain. The State of Victoria's (2010) "Practitioners Guide" proposes an Alliance Leadership Team (ALT) and an Alliance Management Team (AMT) to manage the shared domain. However, the need to have certain officials involved in these teams, or even to have such teams at all, may be interpreted differently. In specific cases, the shared domain may be so small that the supposed roles of the ALT and AMT are scaled back to domain management by a single Alliance Manager (AM), or even to just a set of procedures.

Based on the above, the area to which the pain and gain sharing element is applied can be differentiated in terms of the following aspects:

- domain of shared activities (broad/narrow/not applicable);
- domain of shared risk (broad/narrow/not applicable); and
- management arrangement (ALT, AMT, AM, procedures only).

Step 3 – identifying explicit reasoning
Assuming that there are distinct variations in the application of project alliancing, what are the motives and expectations that drove this differentiation? Can the motivations and expectations be found in ProRail documentation? To answer these questions, project-related documents, including contracting plans, tendering board minutes, contracts and policy documents, were reviewed alongside less formal documents such as PowerPoint presentations. For some of the projects reviewed, internal evaluation documents were available that included reports on interviews with key players. Some of these interviews took place prior to this study, and others were concurrent but were not initiated by this study.

To facilitate categorizing the motivations found in the ProRail documentation, a list of possible motivations was derived from relevant literature. In their overview of alliancing research, Chen *et al.* (2012) distinguished between "motivations to use alliancing", "alliancing benefits" and "the applicability of alliancing". However, to avoid a too narrow definition, in this study each of these is seen as a potential motive for forming a project alliance.

Results
Outcomes of Steps 1 and 2
Based on the pain/gain sharing criterion, the initial scan identified eight projects that could be interpreted as project alliances. Two of these projects encapsulated multiple project alliances, with project no. 3 containing three separate project alliances and no. 6 two. The eight projects were mapped in terms of the alliance characteristics developed in Step 2. Table I shows the results of these two steps.

Project	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
Start year	1998	2005	2005	2006	2008	2009	2011	2012
Value (€ million)	>100	25-50	<25	>100	>100	>100	25-50	<25
Technical scope	Civil works	Civil works	Installation	Civil works	Civil and railinfra works	Civil and railinfra works	Civil works	Civil works
Contract tendered	DC&M	D&C	D	D&C	D&C	PA	D&C	D&C
Type of party	CC	CC	EF	CC	CC	CC	CC	CC
Agreement on alliance contract[a]	<4 months	<5 months	<9 months	<9 months	<4 months	–	–	–
Changes to reference contract[b]	ref.	minor	major	new contract	new contract	major	new contract	new contract
Activity domain[c]	Broad	Broad	Broad	Narrow	–	Broad	–	–
Risk domain[c]	Broad	Broad	Broad	Narrow	Narrow	Broad	Narrow	Narrow
Management arrangement	ALT & AM	ALT & AMT	ALT & AMT	ALT & AM	–	ALT & AMT	–	–

Notes: D, design; D&C, design & construct; DC&M, design, construct & maintain; PA, project alliance; CC, consortium of contractors; EF, engineering firm; ALT, alliance leadership team; AMT, alliance management team; AM, alliance manager. [a]Time taken to agree an alliance contract after awarding the tendered contract. "–" indicates that the alliance contract was not preceded by another contract; [b]ref., the reference contract to which later contracts are compared; [c]"–", not present in this contract

Table I: results of Steps 1 and 2
Project no. 1 was the first project alliance and serves as a reference for comparison in terms of several aspects. First, the "changes to reference contract" aspect illustrates how alliancing applications have developed over time. This aspect addresses the question as to whether later contracts were largely based on the first one (i.e. only minor changes), or whether some clauses were reused and new ones introduced (major changes), or whether none of the clauses first used seem to be reflected in a later application (a new contract). Second, both the activity and risk domain of project no. 1 serve as a reference. Evidently, the classifications of these domains are coarsely scaled. Domains significantly larger than those of project no. 1 have not been encountered. Therefore, if later projects have domains more or less similar to those of project no. 1, then these are classified as "broad". The classification "narrow" implies that domains are significantly smaller. If there is no shared activity or risk in the contract, the domain is marked with a "–".

Project no. 4 has a striking feature in its domain management arrangement. Here, the domain is managed by an ALT, without having an AMT. Although the role of AM is incorporated in the contract, this has been a purely advisory role without any mandates.

Projects nos 6, 7 and 8 were directly tendered as a project alliance. This is a striking change, since in previous projects an indirect approach to project alliancing was followed. There, the agreement on the alliance contract was the result of negotiations between client and contractor in the contractual phase of (in most projects) a Design & Build contract. So even if the intention to create a project alliance later on was stated in the tender documents, the object of the tender procedure was not an alliance contract. In contrast, from project no. 6 onwards, the direct outcome of the tender procedure is an alliance contract signed by both parties.

The "changes to reference contract" row indicates that four contracts were "new", meaning that these contracts had hardly any similarities with project no. 1, or even with any other previous contract. In these cases, the (re-)design process, as introduced in this paper, was apparently initiated. The "major" changes seen relative to previous contracts also suggest substantial redesign efforts.

To summarize, Table I shows that some of the later applications of the project alliancing concept are strikingly different from earlier ones in terms of several aspects, although almost all are applied in the same civil works and rail infrastructure sector. This significant diversity in applications shows that alliancing is seen as a "one-off" application: that the project in question needs a contract tailored to its particular challenges. This thought is further supported by the relatively few project alliances that have been initiated in the 15-year period, especially when considering the successes claimed for some of the applications.

Outcomes of Step 3
Table II shows the results of Step 3. As in Table I, the columns represent the eight selected projects and, this time, the rows contain the possible motives as derived from the literature on project alliancing. Where a particular motive was identified in the ProRail documentation, this is shown by a "✔" at the row/column intersection. Where no explicit motivations were found for a different design to project no. 1, or even any previous application, this is indicated by "not found" in the "explicit motivations for alliance change" row.

Explicit motivations for alliance initiative	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
Cost reduction	✓	✓	✓	✓	–	–	–	–
Tight time constraint	✓	–	–	–	–	–	–	–
Flexibility in development	–	–	–	–	–	–	–	✓
High quality	–	–	–	–	–	–	–	–
Innovation required	–	–	–	–	–	–	–	–
Earlier commencement	–	–	–	–	–	✓	–	–
Economizing on resources	–	–	–	–	–	–	–	–
Source of learning	–	–	–	–	–	–	–	–
Enhancing reputation	–	–	–	–	–	–	–	–
Improving competitive advantage	–	–	–	–	–	–	–	–
Dispute avoidance	–	–	–	✓	–	–	–	–
Improving non-cost outcomes	–	–	–	–	–	–	–	–
Project complexity	–	–	–	–	–	✓	–	–
High risks	✓	–	–	–	✓	✓	–	–
Complex stakeholder issues	–	✓	✓	–	–	✓	–	–
Complex external threats	–	–	–	–	–	–	–	–
Other […]	–	–	–	✓[a]	–	–	–	–
Explicit motivations for changing alliance form	na	Not found	✓[b]	Not found	Not found	✓[c]	Not found	Not found

Notes: [a]Stimulate cooperation over seven specific problem areas; [b]no added value for contractor as participant in the alliance; [c]to allow for directly tendering a project alliance; to maximize the alliance domain

Table II: results of Step 3
Often, the motives in Table II are too briefly stated to clearly convey a meaning. However, the alliancing literature is also often vague about the precise meanings of these motives. In this study, motives found in the documentation were mapped onto the researchers' interpretation of motives derived from the literature. For instance, "cost reduction" is marked with a "✓" if, in a contracting plan, there was the expectation that the alliancing approach would reduce costs below the other options being considered. There has been no attempt to categorize where the cost reductions were targeted. Similarly the presence of a "tight time constraint" is indicated where documents stated that the project has limited time available, such as for carrying out the tendering procedure, for the spatial planning process, or for the execution of the works by the contractor.

Table II shows that the motivations for an alliance initiative or alliance variation are rarely explicitly provided in documents. This indicates that both the reasoning behind applying a project alliance approach and subsequently for entering the (re-)design process have largely remained implicit. The very limited motivation to be found in formal documents suggests that the reasoning behind the (re-)design of variants mostly occurs at the level of single project teams. Insofar as the reasoning is the result of discussions in project teams and in the organization's hierarchy, it remains largely implicit. This suggests that, for the transfer of knowledge regarding the reasoning

behind the various designs, the client organization primarily relies on staff knowing who to ask, rather than where to look, for information.

Given the limited number of applications together with the high levels of variation and implicit reasoning, the results show that progress in the development of this procurement approach has been evolutionary rather than deliberately planned.

Other relevant results
In going through Steps 1-3, the case study also yielded a result that was not linked to any specific project. This concerns the fact that, at the end of 2011, ProRail decided to incorporate project alliancing in its general procurement policy for construction projects. For some projects this policy contributed to an intention to implement project alliancing but, for various reasons, these alliances were not established.

Two distinct logics for the shared domain
The perception of the (re-)design process being invoked for a single use may suggest that there are no trends in the development. However, Table I shows that specific procedures and the organizational forms used to manage the shared domain become less elaborate as the size of the shared domain decreases. Over time, the frequency of applying alliancing in projects seems to have grown while the size of the shared domain has reduced. If this is a genuine trend, then there must be some reasoning that goes beyond the individual project level. What might that reasoning be?

Fortunately, some explicit motivation was uncovered that might explain the trend. This was supported by recollections of past discussions and other contingent evidence. The indication is that two conflicting logics may have emerged over time. To explain this, we return to the shared domain. In the alliancing literature, the "real gain/pain share" mechanism is considered essential to the concept of project alliancing. This mechanism is thought to align interests and thus behaviour among project participants, and this is assumed to enhance project performance. In the current study, a formulation was found in the documents (project no. 6) that explicitly proclaims the extension of the pain/gain sharing domain to its "reasonable maximum". The argument underpinning this formulation follows the logic of interest alignment: the greater the shared domain, the fewer conflicts of interest to be expected. Conversely, there is evidence of an implicit preference for limiting the shared domain to that "considered strictly necessary". The latter is demonstrated in the move towards sharing only specific risks (projects nos 4, 5, 7 and 8). A logic for this standpoint was not found in the documentation but it seems to be driven by defence and risk avoidance. A reconstruction of this shifting logic suggests that the reasoning was as follows:

- Transfer risks to the party that can best manage them, but;
- if that party has only limited influence on a specific risk, then the client will not benefit much from transferring that risk;
- in such situations, the risk may be more manageable if the client and the other party have a common interest in avoiding or managing that risk; and
- a common interest is best stimulated by including pain/gain sharing arrangements.

To summarize, the results indicate that the reasoning behind the (re-)design process involves several layers of abstraction, i.e. motivations for applying a project alliance,

motivations for doing this differently than before and basic logics regarding the effectiveness of an alliance design. The results indicate that this third layer "design logic" involves two distinct logics for the shared domain.

Discussion
The aim of this study has been to help public clients improve the contribution that procurement makes to performance with the focus on procurement development processes. The first step is to provide insights in the procurement development process. How do the results contribute to understanding this process? In this discussion, we start by interpreting the results from perspectives offered in two fields of literature: (1) strategic management; and (2) KM. For each of these we discuss two rival explanations (Yin, 2014) and suggest implications to help public clients improve the procurement development process. In addition, directions for future research are provided.

(1a) The strategic management perspective: emergent strategies
The results indicate that progress in the development of the alliancing procurement approach has been somewhat evolutionary rather than deliberately planned. As such, this pattern in procurement development raises questions about the overall strategy in applying the concept of project alliancing. Here, the overall strategy refers to the alliancing development process over a range of projects, as opposed to the procurement strategy formed for a single project. How can this alliancing development process be understood from the perspective of strategic management?

One of the central concepts within the strategic management literature concerns strategy formation. Mintzberg *et al.* (2005) discern ten schools of thought on the strategy process and argue that each view has its limitations and potential contributions. In addition, Mintzberg *et al.* (2005) also discerned five different meanings that can be attached to the word strategy ("the five Ps for strategy": plan, pattern, position, perspective and ploy). Here we consider the "pattern" of strategies: strategies can be intended; deliberately carried out or emerge; and, eventually, proven to have been realized or not. By investigating the past using this set of distinctions, one may uncover a certain strategy pattern.

In this case study, the pattern seen in the development process reflects the learning school of thought. This school views strategy formation as an emergent process (Mintzberg *et al.*, 2005). In the public sector, as in the private sector, emergent strategies "[…] are grounded in the practice of staff, rather than planned by top managers. They are adopted implicitly, often unseen […]" (Bovaird and Löffler, 2009, p. 74). Three reasons support this conclusion. First, for most of the 15-year period, there has not been a procurement policy that supported the use of alliancing. As such, an explicit alliancing strategy had not been decreed by top management. This situation is typical of emergent strategies, where the pattern realized was not expressly intended. Second, in the client's organization, procurement strategies are devised for specific projects or programmes. This task is assigned to an organization-level procurement officer who is expected to develop a strategy through interacting with the project team. Since there was no explicit alliancing strategy, there must have been an implicit strategy to apply alliancing principles in particular cases. This strategy has emerged over time, with it taking over ten years for project alliancing to become part of general procurement policy. Third, although the alliancing procurement policy adopted the logic of maximizing the shared domain in project no. 6, both projects no. 7 and no. 8 diverge from this policy by seeking to minimize the shared domains. In seems therefore that

rather than pursuing a plan to diversify, decisions to diversify were made on a one-off basis. In this way, both before and after the alliancing procurement policy was formed, a pattern of strategy diversification emerged.

To conclude, the emergent strategy perspective may explain the evolutionary alliancing development process. Since this perspective is an explanatory framework in this case study, other perspectives may be applicable in other cases. The implication for public clients is that they should try to match procurement development processes to one of these perspectives. This would help a public client to increase its understanding of the potential advantages and disadvantages of the strategy formation process followed and potential alternatives to this process, and thus to make more deliberate choices in future procurement development processes.

Future research should support public clients by further investigating the implications of the schools of thought in the particular context of the procurement development process. This will probably result in a set of directions that enable public clients to manage this process more deliberately.

(1b) The strategic management perspective: Miles and Snow framework

The results may also be interpreted through another strategic management perspective. If the evolutionary development process were representative for the client's overall conduct in procurement, how would that contribute to the understanding of the development process?

One of the prominent frameworks in the literature on the private sector is the Miles and Snow typology of prospector, defender, analyser and reactor (Miles *et al.*, 1978). Private sector evidence suggests that prospectors outperform defenders and analysers, who in turn outperform reactors (Meier *et al.*, 2007). This framework has also been modified for use in the context of public organizations (Boyne and Walker, 2004). However, here there does not seem to be a clear overall success hierarchy of the strategy types (Andrews *et al.*, 2006; Meier *et al.*, 2007; Bryson *et al.*, 2010). Moreover, organizations are likely to pursue a mix of strategies (Boyne and Walker, 2004; Andrews *et al.*, 2012). Nevertheless, the idea of researching the procurement development process from the perspective of this framework is attractive. Public clients who are innovative in the procurement field might be considered as taking the prospector stance. Will such public clients achieve higher performance than those adopting a defender stance, i.e. clients that seek to optimize their set of frequently used procurement approaches? Support for this standpoint may result in an implicit overall strategy of the procurement department that stimulates procurement developments, perhaps to the extreme that each project deserves a tailor-made contract. Therefore, the presence of a prospector strategy may help explain the evolutionary development process. This implies that public clients striving to manage the development process more deliberately should investigate the procurement department's general conviction regarding the different stances.

We note that the prospector strategy explanation can also be considered as a combination of Mintzberg's typology of strategic thinking (Mintzberg *et al.*, 2005) with the Miles and Snow typology (Miles *et al.*, 1978), since this throws up a similar question: could it be that public clients that apply a learning school perspective foster a creative procurement environment that subsequently enables them to achieve the prospector stance? Evidently, investigating such questions is beyond the scope of this paper. Future research may help the prospecting type of public clients to steer procurement developments between the extremes of "rational deliberateness" and "the very disintegration of strategy" (Mintzberg *et al.*, 2005).

Finally, an interesting alternative could be to apply the Miles and Snow typology on an individual level instead of the organizational level mentioned above, i.e. to classify the people involved in the procurement development process in terms of this typology. This may help public clients to focus on, or deliberately create, situations in which argumentation is made explicit, since discussions between prospectors, defenders, analysers or reactors on procurement developments will force reasoning to become explicit. Future research may bring this line of thought further and provide public clients with concrete tools.

(2a) The KM perspective; Knowledge Management System (KMS) strategies

The fact that the alliancing contracts used in projects nos 1, 2 and 6 are similar on most aspects shows that at least some knowledge has been reused. As noted in the introduction section, achieving an effective transfer of knowledge can be complicated in project-based organizations. Therefore, we hypothesize that the extent to which alliancing knowledge during the evolution of alliancing applications is transferred may influence the procurement development process. How can the client's KM practice in this case study be characterized?

We approach this question from a perspective seen in the general KM literature. There, the term KMS is used to allude to the ways in which an organization supports its KM efforts. A KMS has been described as a configuration of managerial, technical and organizational systems that is structured to support the implementation of KM within an organization (Massa and Testa, 2009). Three main approaches to establishing a KMS have been identified: codification; personalization; and people finder (Ragab and Arisha, 2013). Codification is a "people-to-documents" strategy and involves documenting and storing knowledge in order to enable access to this knowledge by other people and/or future applications. In contrast, personalization is a "person-to-person" strategy that focuses on the transfer of knowledge through face-to-face social interactions. The people-finder strategy focuses on mapping the location of knowledge within the organization.

Earlier, it was already indicated that ProRail seems to primarily rely on staff knowing who to ask, rather than where to look, for information. Following the classification of KMS approaches, this is a person-to-person strategy. Although the study shows that some motivations are indeed documented and accessible in archives, it also found that the codification strategy is not actively applied when it comes to the (re-)design process. The same is true for the people-finder strategy: although such a strategy is facilitated by the intranet function in the client's organization, it is not actively applied in the (re-)design process. It seems therefore that the apparent limited effectiveness of the applied mix of KMS approaches may help explain the evolutionary pattern uncovered in the alliancing development process.

In conclusion, this perspective implies that public clients can work more consciously on the procurement development process by deliberately connecting it to KMS approaches. Easy access to knowledge (what, why and how) of previous applications will facilitate procurement officers to consider changes to previous applications more explicitly.

(2b) The KM perspective; knowledge taxonomies

Observing so much diversity in the applications in this case study, one wonders what knowledge inspired the (re-)design processes. Kakabadse et al. (2003, p. 78) show that "There are numerous definitions and taxonomies of knowledge that contribute to

theory and praxis from a variety of perspectives". Therefore, in this case study, it is useful to consider the nature of the procurement knowledge that is applied in the development process. Here, we propose two opposite types of alliancing knowledge that may help explain the evolutionary alliancing development process.

Lahdenperä (2012) showed, on the macro-level, how the project alliancing concept has a history of travelling around the globe, evolving while interacting with other procurement approaches along the way. On the one hand, Lahdenperä (2012, p. 57) recognizes "project alliancing as a project delivery system in its own right" due to certain key features. On the other, Lahdenperä (2012, p. 74) also states that "any application is likely to be a highly specific combination of practices, manifesting itself in different ways and making it hard to generalize". This line of thought resembles the idea-construct of the "pure type", as in Weber's (2009) sociology. A "pure type" is formed from characteristics of the given phenomena, but it is not meant to correspond to all of the characteristics of any one particular case. Perhaps, similarly, the procurement designs were inspired by knowledge of project alliancing at the conceptual level of a "pure type" delivery system. This may explain the variations in the translation of the concept into actual contracts. Procurement designers may have their own individual ideas on how to operationalize the concept. For instance, whether the procurement officer involved in the project at hand is a "domain maximizer" or "domain minimizer" may result in different designs. Different individual-level opinions and theories regarding what constitutes the "pure type" may thus drive the design process in different directions. Moreover, the (re-)design processes have been carried out in the context and dynamics of individual projects, as opposed to a (re-)design process executed independently of a project. Therefore, the procurement officer's perception of the particularities of the project at hand may also influence the operationalization of the pure type.

However, previous applications within the client's organization may also be the source of inspiration. Not in the sense of a "pure type", but more as a concrete and practical tool that apparently worked in mitigating a particular issue. This seems likely since only a limited number of procurement officers worked on the designs – albeit sometimes unaware of other designs. Moreover, most of these officials had worked in the same department during the greater part of the 15-year period examined in this study. This suggests that these officials may have been able to quickly retrieve concrete contractual alliancing clauses used in particular projects since they knew what to look for and where in the archives. Once retrieved, the clauses could then be reused or altered with little effort. In this way, alliancing ideas may easily survive the duration of several projects, and might even be reused after a few years have passed.

The implication of this perspective is that public clients would benefit from identifying the source of inspiration in the (re-)design process, since both types of procurement knowledge arguably have advantages and drawbacks. For example, the "practical tool" kind of procurement knowledge associates with a quick-fix approach, with the potential advantage of limited cost and time consequences, but the potential drawback of having a bad match to the rest of the contract. The "pure type" procurement knowledge associates with the reverse: an expensive, time consuming but high quality "from scratch" design process. Being aware of such pros and cons may help a public client manage the development process more deliberately. Future research could support public clients by analysing the (re-)design process from this knowledge-type perspective.

Research limitations

The exploratory character of this case study means that a number of research limitations need to be addressed. Given that we had to establish a method to identify project alliances from a large number of assorted contractual arrangements, we mainly focus on this aspect.

First, the selection criteria used in Step 1 led to eight projects that, at least at first glance, could be considered to be project alliances. However, the choice of "formal contract" and "real gain/pain share" as the selection criteria was somewhat crude and a bare minimum. People who had experienced working in a "full" project alliance, such as in projects nos 1, 2, 3 and 6, might not see the other selected projects as alliances. They might easily view them as Design & Construct contracts with an additional incentive mechanism. As discussed earlier, the alliancing literature does offer several other potential criteria in the form of informal or non-contractual aspects such as trust and long-term commitment (Yeung *et al.*, 2007). Although it would be difficult to use these aspects as selection criteria, such criteria can, and probably should, be used as evaluation criteria during a project. Further, the different logics used by the domain "maximizers" and "restrictors" suggest that the size of the shared domain should be developed into a third "hard" criterion.

Second, while the selection method employed did identify alliance projects, it also excluded those projects in which a project alliance was intended but where the attempt failed, or considered but then rejected as the optimal delivery method. Studying such projects would be valuable in research aiming to uncover motivations and expectations. As such, the selection strategy employed in this study rejected relevant data and data sources leaving questions unanswered. Why was the implementation stopped in the project? Would there have been any new insights regarding the motivations, were there other circumstances that led to different reasoning processes?

Third, in Step 2, additional characteristics of the variations could also have been considered. Although the limited number used in this study was sufficient for confirming the initial assumption of there being differences among the alliance applications, considering a greater range of characteristics might have yielded further differences. Moreover, the distinctions, for example between narrow and broad, are rather crude. Refining the categories would yield a more detailed insight into the variations.

Fourth, in Step 3, a number of potential motivations for alliance projects were identified. The study of formal documents showed that the choices made regarding the alliance method were either apparently "different per project" or "seldom explicitly motivated in the documents". This is indicative of the implicit nature of the reasoning in selecting a procurement method. More-extensive interviews with key players might have yielded more information and insight into the implicit side of the motives and expectations used in individual cases. This could lead to a fuller reconstruction of the reasoning. However, in this case study, interviews with key players were not held since reports of earlier such interviews were already available for some of the more recent projects. These included answers to questions that were specifically aimed at the reasoning process. Moreover, interviewing may not be as successful as one hopes due to selective memory and biased hindsight. Longitudinally observing project teams as they determine a delivery method might reveal a clearer picture of the logic and reasoning used.

Fifth, the "standard" motivations derived from the literature could be further elaborated and sharpened. For instance, "cost reduction" might be anticipated through several factors such as greater efficiency, fewer conflicts and better design optimization.

Attributing documented project motivations to items on such an extended list would probably require less interpretation.

With regards to the discussion section, we note that this case study is establishing links between the procurement development process and the fields of strategic management and KM literature. Evidently, the theoretical perspectives applied in this study concern only a selection out of a range of potentially interesting theories and concepts. Although some rival explanations are suggested in this study, other explanations may also contribute to carrying out procurement development processes more deliberately.

Conclusions and suggestions for further research

Since public clients depend more and more on outsourcing, procurement is becoming a strategic issue. To improve procurement's contribution to the client's overall performance, current procurement practices may require new developments. This paper contributes to the understanding of procurement development processes. It holds that, given the increasing role of public procurement, a proper understanding of the reasoning behind these development processes is key in improving procurement's impact.

This paper contributes to this understanding by offering an initial insight into the reasoning behind the (re-)design processes at the micro-level of a single public sector client. It reports on a case study that investigates the development of procurement approaches that can all be identified as variants of the "project alliancing" delivery system. The paper first explains the strategy used to distinguish alliance projects from other project delivery systems. It introduces a rationale, based on a typology of the shared domain, for mapping variety among alliances, and hints at opposing logics regarding this shared domain. Practitioners considering alliancing as a project delivery system could use these results to reflect upon their motives and logics regarding the shared domain and pain/gain structures.

Next, shifting the focus from alliancing to the evolutionary development process encountered in this case study, the main contribution of the paper is in interpreting this finding from various theoretical perspectives. This paper primarily establishes a link between the development of procurement approaches and theories and concepts drawn from the strategic management and KM literatures. Two prototype theories are offered to explain the evolutionary development process. In addition, two rival explanations are briefly outlined to trigger further reflection on the nature of the procurement development process. Both for researchers and practitioners, these perspectives provide a basis from which useful lessons can be drawn with regard to the management of procurement development processes.

The case study has only considered one particular procurement approach from a range of approaches applied within the single public client. This is too small a base on which to draw general conclusions. However, the results have triggered reflection on a number of topics relevant for the procurement development process. Therefore, suggestions for further research are also provided that are briefly summarized here:

- Strategy types: to further investigate the implications of Mintzberg's *et al.* (2005) schools of thought in the particular context of the procurement development process.

- Strategic stance: to explore the applicability of the Miles *et al.* (1978) typology on the individual level of people involved in the procurement development process.

- KMSs: to further explore how access to relevant procurement knowledge of previous applications can be facilitated.
- Procurement knowledge types: to further investigate what taxonomy of procurement knowledge can help to manage the procurement development process more deliberately.

References

Alonso, J., Clifton, J. and Díaz-Fuentes, D. (2015), "Did new public management matter? An empirical analysis of the outsourcing and decentralization effects on public sector size", *Public Management Review*, Vol. 17 No. 5, pp. 643-660.

Andrews, R., Boyne, G., Law, J. and Walker, R. (2012), *Strategic Management and Public Service Performance*, Palgrave Macmillan, Basingstoke.

Andrews, R., Boyne, G.A. and Walker, R.M. (2006), "Strategy content and organizational performance: an empirical analysis", *Public Administration Review*, Vol. 66 No. 1, pp. 52-63.

Bakshi, A. (1995), "Alliance changes economics of Andrew field development", *Offshore*, Vol. 55 No. 1, p. 30-34.

Bovaird, T. and Löffler, E. (2009), *Public Management and Governance*, Routledge, New York, NY.

Boyne, G.A. and Walker, R.M. (2004), "Strategy content and public service organizations", *Journal of Public Administration Research and Theory*, Vol. 14 No. 2, pp. 231-252.

Boyne, G.A. and Walker, R.M. (2010), "Strategic management and public service performance: the way ahead", *Public Administration Review*, Vol. 70, Special Issue, pp. s185-s192.

Bresnen, M. and Marshall, N. (2000), "Motivation, commitment and the use of incentives in partnerships and alliances", *Construction Management & Economics*, Vol. 18 No. 5, pp. 587-598.

Bryson, J., Berry, F. and Yang, K. (2010), "The state of public strategic management research: a selective literature review and set of future directions", *The American Review of Public Administration*, Vol. 40 No. 5, pp. 495-521.

Bryson, J.M. (2010), "The future of public and nonprofit strategic planning in the United States", *Public Administration Review*, Vol. 70 No. S1, pp. S255-S267.

Bunni, N.G. (2013), *The FIDIC Forms of Contract*, Blackwell Publishing, Chichester.

Chen, G., Zhang, G., Xie, Y.-M. and Jin, X.-H. (2012), "Overview of alliancing research and practice in the construction industry", *Architectural Engineering and Design Management*, Vol. 8 No. 2, pp. 103-119.

Egan, J. (1998), *Rethinking Construction*, Department of Environment, Transport and the Region, London.

Eggleston, B. (2015), *The NEC 3 Engineering and Construction Contract: A Commentary*, Wiley Blackwell, Chichester.

Eriksson, P.E. and Hane, J. (2014), *Entreprenadupphandlingar – Hur Kan Byggherrar Främja Effektivitet och Innovation Genom Lämpliga Upphandlingsstrategier?*, Konkurrensverket (Swedish Competition Authority), Stockholm.

Halman, J. and Braks, B. (1999), "Project alliancing in the offshore industry", *International Journal of Project Management*, Vol. 17 No. 2, pp. 71-76.

Hartmann, A. and Dorée, A. (2015), "Learning between projects: more than sending messages in bottles", *International Journal of Project Management*, Vol. 33 No. 2, pp. 341-351.

Hazlett, S.A., McAdam, R. and Beggs, V. (2008), "An exploratory study of knowledge flows: a case study of Public Sector Procurement", *Total Quality Management & Business Excellence*, Vol. 19 Nos 1-2, pp. 57-66. doi: 10.1080/14783360701602205.

Jansen, C.E.C. (2009), *Leidraad Aanbesteden*, Regieraad Bouw, Gouda.

Kakabadse, N.K., Kakabadse, A. and Kouzmin, A. (2003), "Reviewing the knowledge management literature: towards a taxonomy", *Journal of Knowledge Management*, Vol. 7 No. 4, pp. 75-91.

Laan, A., Voordijk, H. and Dewulf, G. (2011), "Reducing opportunistic behaviour through a project alliance", *International Journal of Managing Projects in Business*, Vol. 4 No. 4, pp. 660-679.

Lahdenperä, P. (2012), "Making sense of the multi-party contractual arrangements of project partnering, project alliancing and integrated project delivery", *Construction Management and Economics*, Vol. 30 No. 1, pp. 57-79.

Latham, S.M. (1994), *Constructing the Team*, HM Stationery Office, London.

Love, P.E., Davis, P.R., Chevis, R. and Edwards, D.J. (2010), "Risk/reward compensation model for civil engineering infrastructure alliance projects", *Journal of Construction Engineering and Management*, Vol. 137 No. 2, pp. 127-136.

Love, P.E.D., Edwards, D.J., Irani, Z. and Sharif, A. (2012), "Participatory action research approach to public sector procurement selection", *Journal of Construction Engineering and Management*, Vol. 138 No. 3, pp. 311-322.

Massa, S. and Testa, S. (2009), "A knowledge management approach to organizational competitive advantage: evidence from the food sector", *European Management Journal*, Vol. 27 No. 2, pp. 129-141.

Meier, K.J., O'Toole, L.J., Boyne, G.A. and Walker, R.M. (2007), "Strategic management and the performance of public organizations: testing venerable ideas against recent theories", *Journal of Public Administration Research and Theory*, Vol. 17 No. 3, pp. 357-377.

Miles, R.E., Snow, C.C., Meyer, A.D. and Coleman, H.J. (1978), "Organizational strategy, structure, and process", *Academy of Management Review*, Vol. 3 No. 3, pp. 546-562.

Mintzberg, H., Ahlstrand, B. and Lampel, J. (2005), *Strategy Safari: A Guided Tour Through The Wilds of Strategic Management*, Simon and Schuster, New York, NY.

Nonaka, I. and von Krogh, G. (2009), "Perspective – tacit knowledge and knowledge conversion: controversy and advancement in organizational knowledge creation theory", *Organization Science*, Vol. 20 No. 3, pp. 635-652. doi: 10.1287/orsc.1080.0412.

Polanyi, M. (1966), *The Tacit Dimension*, Doubleday, New York, NY.

Ragab, M.A.F. and Arisha, A. (2013), "Knowledge management and measurement: a critical review", *Journal of Knowledge Management*, Vol. 17 No. 6, pp. 873-901. doi: 10.1108/jkm-12-2012-0381.

Scheublin, F. (2001), "Project alliance contract in The Netherlands", *Building Research & Information*, Vol. 29 No. 6, pp. 451-455.

State of Victoria (2010), *The Practitioners' Guide to Alliance Contracting*, Department of Treasury and Finance, Melbourne.

Treasury (2013), *Infrastructure Procurement Routemap: A Guide to Improving Delivery Capability*, Infrastructure UK, London.

Walker, D. and Hampson, K. (2003), *Procurement Strategies: A Relationship-Based Approach*, John Wiley & Sons, Hoboken, NJ.

Walker, D. and Rowlinson, S. (2008), *Procurement Systems: A Cross-Industry Project Management Perspective*, Taylor and Francis, New York, NY.

Walker, D.H. and Lloyd-Walker, B.M. (2015), *Collaborative Project Procurement Arrangements*, Project Management Institute, Inc, Newtown Square, PA.

Weber, M. (2009), *The Theory of Social and Economic Organization*, Simon and Schuster, New York, NY.

Weele, A.J. and Raaij, E.M. (2014), "The future of purchasing and supply management research: about relevance and rigor", *Journal of Supply Chain Management*, Vol. 50 No. 1, pp. 56-72.

Wood, P. and Duffield, C. (2009), *In Pursuit of Additional Value – A Benchmarking Study into Alliancing in the Australian Public Sector*, Evans & Peck, The University of Melbourne, Melbourne.

Yeung, J.F., Chan, A.P. and Chan, D.W. (2007), "The definition of alliancing in construction as a Wittgenstein family-resemblance concept", *International Journal of Project Management*, Vol. 25 No. 3, pp. 219-231.

Yin, R.K. (2014), *Case Study Research: Design and Methods*, Sage Publications, London.

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