

RECONSTRUCTING THE RATIONALE BEHIND A PUBLIC CLIENT'S FIRST APPLICATION OF PPI

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Public Procurement for Innovation (PPI) is expected to leverage demand-side innovation in sectors such as transport and infrastructure. However, to make that happen, public clients must be willing to apply PPI. How does a public client of the construction industry come to choose for, develop and apply particular PPI procurement approaches? To explore the rationale for PPI from a public client's perspective, the reasoning behind a client's first application of a PPI-like procurement system is reconstructed in a case study. Assuming that the particular features of this system ultimately are related to overall strategy, two major concepts are used to guide this reconstruction: strategic alignment and procedural rationality. The results show how in this case PPI is triggered by, and across multiple levels of strategy is aligned with, ministerial strategy. An additional gain of this study is that it suggests how strategic alignment between a particular procurement system and overall organizational strategy could be achieved in a deliberate manner. The client is commonly viewed as an important driver for innovation. Observing that construction management literature on PPI is limited, the creation of an in-depth insight in a public client's rationale for PPI contributes to the further understanding of the client's role in innovation.

Keywords: procedural rationality, public procurement for innovation, strategic alignment

INTRODUCTION

According to public policy literature, Public Procurement for Innovation (PPI) is expected to leverage demand-side innovation in sectors such as transport and infrastructure (Edler and Georghiou, 2007). However, while the European Commission has long since been stimulating the use of innovation procurement by a range of supporting policy initiatives (see European Commission (2014) for an overview), it still observes a deficiency of innovation procurement applications. This seems to go for the construction industry as well. This study aims to create an understanding of how public clients in the construction industry come to apply PPI. Whereas literature sums up public policy rationales for applying PCP, such as economic growth, new employment, new firms, reduction of market failures and increase of quality of public services (Rigby 2016), an in-depth insight in the client's rationale is lacking.

Arguably, innovation is not a goal in itself for these clients. Instead, PPI must fit with the client's procurement strategy and higher level strategies. Therefore, application of PPI presupposes that a client in a given situation a) recognizes PPI as a relevant procurement option, b) prefers PPI over other options, c) generates a tender file to operationalize the PPI concept into a ready-for-use procurement system. So how does a public client of the construction industry come to choose for, develop and apply a particular form of PPI?

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This paper reports on an exploratory case study performed at ProRail, a major client of the construction industry in the Netherlands. Recently, ProRail has challenged the market to come up with innovative solutions that increase the safety level of passively protected level crossings.

It is ProRail's first application of a PPI-like procurement system. The study reconstructs the client's rationale for applying PPI. This is conceptually approached by combining the theoretical concepts of strategic alignment (Baier, Hartmann, and Moser, 2008) and procedural rationality (Simon 1978). Assuming that in this case PPI did fit with higher level strategies, reconstruction of strategic alignment across multiple levels of strategy is expected to yield an in-depth insight into the client's rationale. Procedural rationality is brought in to account for the possibility that some of this rationale may be difficult to uncover.

Both in construction management and public policy literature, it has been observed that the client is an important driver of innovation (Bygballe and Ingemansson, 2014). In the case of PPI, evidently the public client is a crucial actor, since application of PPI is dependent on action by the client. However, whereas construction management literature on PPI is scarce, a public construction client's perspective on PPI seems altogether absent. Therefore, the insights presented in this paper are expected to contribute to filling this gap. Also, the understanding of why a client of the construction industry would choose to apply PPI is expected to help practitioners consider this option more deliberately in future.

Since the case study concerns a particular form of PPI, which can be identified as pre-commercial procurement (PCP), the next section first shortly explains how PPI and PCP are understood here. The paper then moves on to the conceptual framework and research methodology as applied in this study. Next, the case is shortly described and followed up by case analyses and results. The discussion and conclusion sections shortly highlight the theoretical and practical implications of this study.

PPI AND PCP

In general, PPI is contrasted with 'regular procurement' where public sector organisations place orders for 'of-the-shelf' products. PPI has been associated with instances where public agencies act to purchase a product-service, good or system that does not exist at the time but could be developed within a reasonable period, in the sense that it requires innovative work (Uyarra *et al*, 2014). Therefore, in this paper PPI is used as an umbrella term to refer to an array of procurement systems targeted at innovation.

However, confusingly, PPI may also be used to denote a particular procurement system. In that sense, PPI is distinguished from Pre-commercial Procurement (PCP). While both target innovative products and services for which further R&D needs to be done, for PCP the commercial development phase is out of scope (Edler and Georghiou, 2007). The procurement system of this case can be identified as a PCP.

According to literature, in general PCP practices are managed in three steps (Edquist and Zabala-Iturriagoitia, 2015; European Commission 2007):

1. Solution exploration phase (selection of offers from competing suppliers).
2. Prototyping phase (simultaneous solution development by the selected suppliers).
3. Testing phase (solution validation through field tests. At least two suppliers remain to ensure future competition).

If a PCP is followed up by a regular procurement procedure, then the combination of the two overlaps with the phases of the general PPI process. Also, if further development is required, PCP may be followed by a PPI procedure instead of regular procurement. For these reasons, in this paper PCP is considered as a form of PPI.

CONCEPTUAL FRAMEWORK

To achieve an understanding of a single client's rationale for PPI, this study creates a reconstruction of the reasoning that apparently has taken place. This reconstruction is guided by two major theoretical concepts: strategic alignment and procedural rationality. In addition, two minor concepts are introduced to describe the public client's procurement context: the procurement system selection and development processes.

Strategic Alignment

Literature holds that alignment between strategic goals and procurement practices is vital for achieving performance (Baier *et al*, 2008; Zimmermann and Foerstl, 2014).

Alignment has been described as the degree to which priorities on strategic stances are consistent across different organizational levels (Andrews *et al*, 2012). Studies on alignment have mainly been of a quantitative nature, assessing alignment as a fit between particular constructs (e.g. Baier *et al*, 2008).

Instead, this study assumes that strategic alignment can be articulated in the form of means-and-ends relations, just like a causal map may represent a strategic plan (Bryson *et al*, 2004). Literature suggests to expect procurement strategies on multiple organisational levels (Hespings and Schiele, 2015).

Therefore, the rationale behind the application of any procurement system is expected to be related to higher level procurement strategies, functional strategies, the public client's strategic goals and, ultimately, governmental policy goals. This implies that the client's rationale can be viewed as a chain of reasons across multiple level of strategies.

Strategic alignment also includes decision making with regards to competitive priorities. These are managerial objectives, such as cost and quality that may be set on multiple organisational levels and for which simultaneous pursuit inherently implies making trade-offs (Baier *et al*, 2008). In this paper, competitive priorities are interpreted as trade-off decisions based on certain reasons.

Procedural Rationality

It is widely held in the literature that procedural rationality improves decision making quality (Kaufmann *et al*, 2012). Procedural rationality is defined as the extent to which the decision process involves the collection of information relevant to this decision and the reliance upon analysis of this information in making the choice (Dean and Sharfman, 1996). In this study, it is assumed that the explication of reasoning in strategy formation processes increases the level of procedural rationality.

Selection and Development Process

According to construction management literature, clients run selection processes that result in the application of particular procurement systems (Love *et al*, 2012). The term 'procurement system' only represents a concept. To operationalize the concept into a ready-for-use procurement system, public clients need to compose a set of tender documents. Moreover, to execute the procurement process, several subsystems, methods and tools are used, such as prequalification systems, contract award evaluation methods and past performance measurement tools.

For as far as these subsystems, methods and tools are selected out of a client's current portfolio (i.e. the set of procurement components released for use), the procurement system is only composed, not developed. However, if clients create new or bespoke procurement components, then a development process has been carried out as an adjunct to the selection process. The distinction between systems, methods and tools implies that this development process is not necessarily restricted to 'contract design' (Argyres and Mayer, 2007) only.

In conclusion, a client's first application of a procurement system suggests that the client has run both the selection process (conclusion: no appropriate procurement system available in the portfolio) and the development process (result: new documents, methods and/or systems created). The reconstruction of a chain of reasoning should also account for these processes. However, since scholars point out that, in practice, these processes may be run intuitively and subjectively (Ballesteros-Pérez *et al*, 2015; Love *et al*, 2008), it may be expected that parts of this chain are not explicated (i.e. have remained at a low level of procedural rationality).

In conclusion, strategic alignment is interpreted here as the degree to which reasoning across multiple levels of strategy forms a coherent chain of choices in the form of trade-offs. This chain ultimately relates strategic goals to procurement system design. Similar to causal mapping, alignment implies that one can logically 'ladder up and down' (Bryson *et al*, 2004: 66) the hierarchy of reasons.

RESEARCH APPROACH

The exploratory character of the research question implies applying a case study approach (Yin 2014). It was assumed that a first-time application of PPI would require the public client to consider its rationale deliberately. If so, this would increase the chances of achieving a reconstruction. Therefore, a case was selected in which PPI is an innovation to the client's procurement practices.

Sources of Information

The client's reasoning is reconstructed by researching documentation, attending presentations on the project and interviewing key players in the project team (e.g. tender manager). The documentation included internal documents like the project plan, the contracting plan and the tender file, but also external documents (e.g. minister's report to the parliament) and websites reporting on the case (e.g. ministry's procurement expertise centre, national media). Data is identified as 'reasoning' if it explains why certain choices are made. For instance, where the PCP design involves an information session (choice), the argument that this 'session will increase the participant's understanding of the client's needs' is viewed as reasoning.

Observing Implicit and Explicit Reasoning

It was expected upfront that not all reasoning would be retrieved from documents only. Also, the retrieved reasoning would probably not automatically constitute a logically complete chain of reasons. Therefore, reasoning is labelled explicit if the reasoning is documented and logically connects a lower level of strategy to a higher level (completed reasoning, written out in project documents). Implicit reasoning is identified by the researcher by filling the gaps of the conceptual framework. This is done by checking the chain of means-and-ends on missing links (non-documented or incomplete reasoning, retrieved by interviews or researcher's deduction).

CASE DESCRIPTION

Level crossing safety is a crucial issue for railway operators and infrastructure managers. Each year hundreds of fatal accidents at level crossings occur across Europe, which accounts for one third of all rail fatalities and 1.2% of all road deaths (Tey *et al*, 2011). In general, level crossings are either protected by active or passive systems. Active crossings are protected by automated warning systems (flashing light, boom barrier etc.). Passive crossings only provide a stationary sign, requiring people to stop and look left and right for train traffic.

In 2016, the Netherlands' Ministry of Infrastructure and Environment started a program to target the passive crossings accident rate. The ministry formulated a twofold strategy. Firstly, the number of passive crossings is to be further reduced by removal or substitution by active crossings or overpass junctions. Secondly, because of budget restraints, innovative solutions to increase the safety of extant passive crossings is to be stimulated. Based on the philosophy that testing of concepts speeds up innovation ('from talking to testing'), the ministry defined a time frame for the testing of concepts.

The ministry commissioned ProRail, the public agency responsible for the railway infrastructure in the Netherlands, to carry out the program. Although ProRail maintains a broad portfolio of procurement systems, it was decided not to make use of any of these, but to develop a new system instead. The development process resulted in a three stage procedure called 'Proeftuin Nabo', which translates as 'experimental field for passive crossings'. The goal of this procedure was to come to 'cost-effective (innovative) solutions that increase safety of present passive crossings'.

When writing this paper, the testing phase was not completely finalized yet. However, the procedure was already evaluated positively by its participants, ProRail and stakeholders and received both governmental and national media attention.

CASE ANALYSIS

According to the conceptual framework, the reconstruction of the rationale should result in the presentation of one integral hierarchy of reasons. However, because of page size limitations, this section presents the result in two parts: the rationale for 1) choosing to develop a new procurement system and 2) the design of that system. The first part represents the hierarchy of top level strategy down to the selection process. The second part represents the development process.

1. PCP Choice Rationale

Table 1 presents a summary of the reconstructed rationale. The reasoning (first column) illustrates the relationships between separate rows. The columns 'source' and 'organisation' indicate the primary document in which a specific part of reasoning was found and the level at which it has been formulated respectively. The elements marked * in the table are added by the researchers in order to fill up the gaps revealed by applying the conceptual framework.

2. PCP Design Rationale

Table 2 summarizes the rationale behind the PCP design in terms of the major design choices (first column), and the corresponding reasoning (second column) and trade-offs (third column).

Table 1: Rationale for PCP

Reconstructed reasoning (* marks implicit reasoning)	Source	Organisation	Trade-off in competitive priorities (resource allocation)
Railway safety (including level crossing safety) is a strategic goal	Ministry policy	Ministry	*Other strategic goals in transport sector
While in many respects safety levels are increasing, passive crossing (PC) safety is lagging behind. Create programme to target this problem.	Ministry program, contract plan	Ministry	*PC safety issues vs other railway safety issues
Given that programme budget is insufficient for applying conventional solutions at all PC's, it is worthwhile to allocate part of budget for innovative supply side solutions.	Ministry program, contract plan	Ministry	Conventional PC reduction vs chance of coming to new cost effective PC safety measures
Commission ProRail to carry out innovation program with a 'from talking to testing philosophy'	Contract plan	Ministry	*ProRail assignment vs other options
*Railway safety is a strategic goal	ProRail strategy	ProRail	*Other strategic goals (reliable, punctual and sustainable railways)
PC safety is too complex and risks are too high to tender for innovations directly. Apply a step-by-step market approach instead: - testing phase - direct tendering phase	Contract plan	ProRail sourcing team	Risks related to single tender vs multiple tenders
*Develop a new procurement system, since no alternative in the current portfolio is appropriate	(research)	ProRail sourcing team	*Development process risks vs chance of creating successful approach
*Design procurement system by discussing PR of three procurement models	(research)	ProRail sourcing team	*Start from scratch vs select and customize model developed elsewhere

DISCUSSION

This study started off by questioning how a public client of the construction industry comes to choose for, develop and apply PPI. The results unveil how this client's first application of PPI can be traced back to the ministry's twofold strategy of continuing passive crossing reduction while also allocating part of budget to innovation. The ministry did not dictate how to achieve innovation. However, its basic philosophy of going 'From talking to testing' seems to have been a decisive factor. As far as could be retrieved, it was this philosophy that led the sourcing team to the conclusion that developing a new procurement system targeted at gathering, developing and testing innovative concepts - and to stop there for the moment - would be the best way to carry out the assignment.

Interestingly, it appears that the European Commission's innovation procurement policy reinforcement measures (European Commission, 2014) have had no (direct) influence. Considering that the ministry had not assigned ProRail to run a PCP either, this case qualifies as an example of the 'autonomous bottom up' approach to PCP, rather than the 'top-down agency model' (Rigby 2016). However, this qualification remains disputable. One the one hand, the results show that this PCP fits with the client's strategic goals. One the other, the budget and philosophy for innovation came from the ministry.

Table 2: Rationale behind PCP design

PCP design	Reconstructed reasoning (* marks implicit reasoning)	Competitive priorities
Perform marketing research (desk research, consultation of similar public clients, market consultation, concept design)	1. To enable better formulation of the demand, 2. To identify potential suppliers, 3. To inspire and quickly inform the PCP participants on relevant current state-of-art-technology	*Staff resources vs expected level of PCP effectivity and risks
Narrow down innovation area (search for solutions based on proven technology in two categories: 1. Alert road users to PC, 2. Alert road users to approaching train and include physical barrier)	Category 1 innovations are expected to be cheaper, quicker to test and implement.	Solution feasibility vs scope of innovation opportunities
*Develop concise and easy-to-understand PCP tender documentation	*Make PCP procedure accessible to non-experienced tender participants	*Staff resources vs PCP effectivity/risks
Run PCP phase 1: concept selection		
a. Attract attention in multiple ways (Next to TED also other forms of communication)	Increase market attention beyond the 'usual suspects'	*Staff resources vs level of publicity
b. Information session	Increase participants' understanding of client's needs	*Staff resources vs PCP effectivity/risks
c. Select 2 x 6 innovative concepts (two page concept descriptions; award criteria: cost, innovation, safety, impact)	1. Create a set of solutions, since no single solution will suffice for all PC's. 2. Select multiple participants to maintain post-PCP competition	*Staff and budget resources vs PCP effectivity & future opportunities
Run PCP phase 2: prototype development		
a. Close PCP-contract and pay fixed compensation for prototype development	1. Secure legal aspects. 2. Reward participant efforts.	*budget resources vs PCP effectivity
b. Select 2 x 3 prototypes for testing (same award criteria as in 1c)	(Same as for PCP phase 1c.)	(Same as for 1c.)
Run PCP phase 3: prototype testing		
a. Provide test facilities	1. Reduce uncertainties regarding solution feasibility, safety issues and stakeholder acceptance 2. Provide the supply side with client and stakeholder feedback on prototypes	*Staff resources vs PCP effectivity
b. Pay fixed compensation for participant expenses	Reward participant efforts.	*Budget resources vs PCP effectivity
c. Determine feasibility of solutions and (if applicable) develop requirements specifications	Gain valuable knowledge on why what works (or not) for potential future requirement specifications	*Staff resources vs PCP effectivity

Now that the rationale has been reconstructed, does it satisfactorily explain why this client came to apply PPI? Perhaps not. Potentially interesting additional insights may be generated by a) taking an innovation diffusion perspective (Abrahamson 1991) or b) interpreting the client's strategy in terms of exploration and exploitation (March 1991). The first seems logical because a client's first application of PPI can be seen as an innovation to the client's procurement practice (why now, how exactly did the 'Proeftuin' idea reach the sourcing team?). The latter seems sensible since a client's general strategy may be to first explore how such procurement systems work out in the client's particular setting, before exploiting these on a greater scale. The presence (or absence) of such a general strategy may influence the extent to which experimenting with innovations in procurement systems is stimulated.

The conceptual framework of this study has merits that go beyond the topic of PPI. Firstly, in purchasing and supply management literature the link between procurement practice and overall performance has been studied intensively (Zimmermann and Foerstl, 2014). However, while strategic alignment is central in those studies, to our knowledge, as yet it has been studied by using theoretical constructs, not by composing chains of empirical reasoning. Therefore, this paper presents one of the first detailed examples of links between high level strategy and detailed procurement system design. Secondly, this study's approach to investigating a client's rationale for a particular procurement system deviates from construction management literature on the selection process (Love *et al*, 2012). While many procurement system selection methods have been proposed, as yet strategic alignment has not been used as a central concept. Since it is such a key concept both in strategic management and purchasing and supply management literature, it could serve as a fruitful perspective for reviewing current selection process methods.

Thirdly, the conceptual framework distinguishes a development process from the selection process within the client's organisation. The case study results show that the choices made in this process may be equally relevant for success as those in the selection process. Therefore, this study suggests that the development process should be regarded as a process in its own right.

Two managerial implications follow from this study. Firstly, since the case shows how PPI can fit with a public client's higher level goals, practitioners are encouraged to consider the added value of PPI to their current portfolio of procurement systems. Secondly, the conceptual framework may help to deliberately create or assess strategic alignment in practice. While literature claims that creating strategic alignment is vital for performance (Baier *et al*, 2008), how it is created exactly remains unclear. This case provides a detailed example of how it could be done for procurement systems in a structured and explicated manner. In this vein, it strikes that the study unveils much non-explicated reasoning for the aspect of competitive priorities. This may indicate that it is easier to create a reasonably related set of choices than to explicate the corresponding trade-offs on potentially relevant alternatives per choice. However, based on the concept of procedural rationality, doing both deliberately will enhance the quality of the selection and design process, and thus, ultimately, may positively contribute to a client's overall performance.

CONCLUSION

Innovation is not a goal in itself for public clients in the construction industry. Public policy rationales for applying PPI may not be in the client's main interest either. However, this study shows that applying PPI can fit with the client's strategic goals. Therefore, public construction clients are encouraged to deliberately consider the potential added value of PPI to their current portfolio of procurement systems.

Observing that literature is unclear in detailing out how to create strategic alignment, an extra gain from this study is that it presents a detailed example of how creation of strategic alignment between procurement systems and strategic goals could be achieved. It also suggests that explicit consideration of competitive priorities may help to achieve strategic alignment in a more deliberate manner.

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