BEST VALUE PROCUREMENT: LESSONS LEARNED IN THE NETHERLANDS

Abstract

Best Value Procurement (BVP, Kashiwagi, 2010) is a procurement process where performance is primary over price. The methodology fits in the category of Most Economically Advantageous Tender (MEAT). The delivery of construction services has traditionally a low performance (see e.g. Kashiwagi, 2009.) BVP originated in construction services and has been applied over 700 times, delivering construction services worth over $2.3B (1994-2010). BVP is now also used outside the construction industry to successfully deliver commodities (eg. office supplies), professional services (engineering), non-construction services (cleaning), and Information Technology services.

The method has mainly been used in the United States. The last few years BVP is also used in other countries as well. In The Netherlands, BVP was introduced in 2005 by a large general contractor. Since then, numerous tenders have been performed using BVP, worth of more than 1 bln euro's, inside and outside the construction industry. The objective of the this paper is to show that the classic problems in construction industry are supply chain issues in the procurement area, and not caused by the complexity of the construction itself.

The main research question of this paper is: 'What lessons can be learned from the first years of using Best Value Procurement in The Netherlands?'

In order to answer this question, we have applied case study research, using 6 cases in construction services in The Netherlands. Based on the results, we conclude that we can use use qualitative scales without further desegregation, that the project goals should be very clear, since they form a central role in the selection process, that BVP enables market parties to differentiate themselves from their competitors, that BVP delivers value for money to the owner and that objectivity, non-discriminatory and transparency can be realized. Thus BVP adds value and performance in the delivery of construction services.

Key words: Best Value Procurement, Value, Supply Chain

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Introduction

More than 15 years ago, Dean Kashiwagi created a process called Best Value Procurement/Performance Information Procurement System (BVP/PIPS) at Arizona State University. PIPS is a procurement method that aims to select the most suitable vendor for the job and to spur this vendor on to highest performance, while reducing the client's management and control tasks (Kashiwagi, 2009 "Revolutionary Approach"). Kashiwagi developed the method over several years with the objective of improving the procurement and management of construction projects by reducing risk in selecting the top performer. The BVP method exists of six steps, each built around a specific "filter" which focuses on a different element to separate high from low performers. Four filters are employed to select the best vendor, while two are related to project control.

At this moment the BVP process has been used in more than 700 cases with overall spending of $2.3 billion. BVP is being used all over the US, being tested in Botswana, Finland, The Netherlands, Malaysia and many other places around the world. However, since most pilot projects have taken place in the United States, not much is known about experiences and results outside the US.

This paper focuses on the application of BVP methodology in The Netherlands. BVP in the Netherlands is applied in and outside construction (ship building, IT, health care), in the public sector as well as in the private sector and across numerous phases in (different) supply chains. In 2010 BVP is on its way to become a new way of procurement in The Netherlands.

The research question of this paper is: What lessons can be learned from the first projects of using Best Value Procurement in The Netherlands ?
As methodology we used cases study research, based on available projects of the past years.

In this paper we first give some background on BVP, followed by a brief summary on the history of BVP in the Netherlands, after which we will describe the results from the cases. We finalize the paper with lessons learned and suggestions for further research.

Best Value Procurement

Best Value Procurement/Performance Information Procurement System (BVP/PIPS) was developed and refined by Dean Kashiwagi (Kashiwagi, 2011). Best Value Procurement is a process where both price and performance are considered instead of just price (and is in this way comparable with using MEAT). BVP/PIPS has been tested over 700 times, delivering construction services worth over $2.3B (1994-2010.) The results of the BVP/PIPS tests have been (Kashiwagi, 2009):

- 98% client satisfaction and no vendor caused cost deviation.
- Minimized up to 90% of the client's risk and project management.
- Vendors increased profits up to 100% without increasing the cost to the client.

BVP/PIPS is now being used to successfully deliver commodities, professional services, non-construction services, and Information Technology (IT) services.

Kashiwagi (2011) argues that BVP/PIPS is a process/structure to deliver services. It changes the procurement agent's role from being the guardian over the award of a contract, to a facilitator of the delivery of services. The new role of facilitator starts when a user has a requirement, and ends when the service has been delivered. Instead of being a procurement process, it assists in the development of an intent of the client by expert vendors, identifies the best value vendor (most value for the lowest price), assists the best value vendor to determine if they can meet the intent of the client, and then ensuring that the vendor can deliver on their proposal (Kashiwagi, 2011). The BVP/PIPS has three phases: selection, pre-award, and management of the project risk. The selection phase has five filters: past performance information, competitive ability to manage and minimize project risk, interview of key personnel, prioritizing the vendors, doing a dominance check to ensure that the best value vendor is the best value.
Kashiwagi (2011) argues that BVP/PIPS differs from other procurement and risk management systems because it minimizes subjective decision making of the client's experts. It forces the vendors to compete based on value (quality risk management capability and price.) By making the assumption that the vendor is an expert, and disciplining the client's representatives to follow this structure, the client's representatives do not make any technical decisions or judgments on the vendors. If a vendor is dominantly better (easy to see, get a consensus dominant rating, or a non-technical reason why they are dominantly better), they have provided information that clearly shows their dominant performance. If not, the process will be followed, and the best value for the lowest price vendor shall be identified.

In BVP/PIPS, the client's representatives assume the vendors are experts through the selection process, then assume the best value vendor is not an expert in the pre-award phase to minimize the risk of the vendor. The paradigm is to minimize the need for technical decision making in the selection process, and maximizing the need for the best value vendor to prove they are an expert in the pre-award phase (Kashiwagi, 2011).

The philosophy of BVP/PIPS assumes that the suppliers are the experts and the client is the non-expert. This notion implicates that the client cannot understand or grasp ex-ante all possible ways to solve its needs. The client is not fully aware of all its preferences, due to the fact that is has incomplete knowledge on what is possible in the market (and what is not possible). In the philosophy of Best Value Procurement the suppliers each set their own performance level, without the client indicating which performance level it wants (the client does not know what is possible).
Having a client set all criteria, standards, norms and specifications leads to getting more or less the same bids from the different vendors. The advantage of this is that all bids can be easily compared. The downside however is that there is (almost) no differentiation between the bids. Another major disadvantage is that, because of the fact that the vendor is the expert en the client the non-expert, some possible solutions that the client could have gotten are left out up-front (because the client did not see it).
To be able to compare the performance levels with each other scoring functions will have to be created. Scoring functions allow the transformation of the performance levels set on each performance into partial scores set on an numeric scale representing attractiveness (“preference” or “value”) between each performance level on a given criterion (Belton and Stewart, 2001). Scoring functions can be relative or absolute. Relative scoring functions

define the score of a tender by comparing its performance with the ones of other tenders. This implies that it is impossible to score a tender without having knowledge of other tenders. This notion assumes that the scoring rules before the tender are known and that the tender evaluation model is consistent with the real preferences of an owner (Dreschler; 2009 and Mateus et al. 2009). This assumes that the owner is aware of all his preferences (and the exact utility function) before knowing what the tenderers can offer. It has been argued that qualitative scales are subjective and ill defined, because a performance measure should be as clear and objective as possible. The performance measurement should be measurable and the contract documents should clearly and objectively define the aspects that are in competition (Mateus et al. 2010).
BVP/PIPS seems to ignore most of the rules and demands on evaluation criteria based on the literature; the major exception being the alignment of evaluation criteria to the project goals. In the philosophy of Best Value Procurement the performance level is set by the contractor and the client is not aware of its preference. It is therefore impossible to evaluate a tender without having knowledge of all the other tenders. These scoring functions are known as relative scoring functions. The problem of relative scoring functions is that the overall ranking of tenderers can be dependent of another tenderer and that a phenomenon called rank-reversal can take place (Chen, 2008).

A brief history of BVP in The Netherlands
The first BVP projects in The Netherlands started in 2005. Table 1 shows a historical overview in a time line of known BVP projects that have been done in The Netherlands since the start in 2005.

Table 1: Historical Overview of Dutch BVP Projects

2005	Radboud UMC: maintenance projects (€700K)
2008	Heijmans: Bitumen supply (€12M)
	Ballast Nedam: Acoustic fencing along railway track (€300K)
	Ballast Nedam: Metal piles (not finished)
	IHC Merwede: Personal Protection Equipment (€500K)
	Ballast Nedam: Decorative prefab screen along railway (postponed)
	Heijmans: Bitumen emulsion/road surface dressing (€2M)
	IHC Merwede: Renovation of tugboats (not finished)
2009	Ballast Nedam: Fuels for cars and machinery (€8M)
	Heijmans: Gas iol supply for projects (€9M)
	Municipality of Den Bosch: Retention settling tank (€1M)
	Rijkswaterstaat: 16 infrastructural projects in the Fast Track Project (approx. €600M)
2010	Rijkswaterstaat: ESA project (€2M)
	Water board De Dommel: Hydrology services (€300K)
	Boehringer Ingelheim: Individual Business Travel (€375K)
	Ballast Nedam: Prefab concrete paving stones (€3M)
	Woningcorporation: Building seven apartments (€1M)
	Waterbedrijf Limburg (currently running: €1M)
	Ballast Nedam: Wholesalers for hardware and tooling (€6M)
	Corus: inspection and renovation of sewers (€600K)

As table 1 shows, most projects took place in the construction industry. In 2002 a number of fraud cases led to the installation of the Netherlands' parliamentary inquiry Committee of

Construction Fraud. The most important recommendations of the Committee were threefold (Van Leeuwen, 2011). First of all there was a need for harmonized procurement policies for public contract authorities. Secondly, public authorities should adapt their policies towards more integrated project delivery models, such as Design-Build and Design-Build-Finance-Maintain. The third recommendation was to make more use of award criteria based on price *and* quality (use of so-called "Most Economically Advantageous Tender; or "MEAT").
The Directorate-General of Public Works and Water Management, part of the Ministry of Transport, Public Works and Water Management, anchored the policy of integrated contracts and the use of best value procurement in 2004 (Rijkswaterstaat). The ambition for 2012 is to award 90% of all contracts on quality and price (Rijkswaterstaat, 2008).[1]. A very specific way of awarding contracts based on quality and price is using the methodology of BVP.

A major milestone for BVP in The Netherlands was the decision in 2009 by Rijkswaterstaat to resolve 16 major road bottlenecks in the Netherlands using BVP. The so-called Fast Track Program is the world's largest BVP program with a combined worth of €600 million ($800 billion).

Application of BVP/PIPS in 6 Dutch Case Studies
The Directorate-General of Public Works and Water Management is responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands. To help solve the countries' congestion problems, the Dutch Ministry of Infrastructure and Environment has identified 30 major bottlenecks, which need to be (partly) resolved by May 1, 2011. The main reason for using BVP/PIPS is that the procurement of Design and Build-contracts usually leads to high transaction costs (efforts of all possible suppliers) and long tender procedures. In 2009 the tender capacity in the Dutch market was limited. Therefore suppliers have asked the Directorate-General of Public Works and Water Management to develop a procurement strategy heavily based on quality to lower the transaction costs and shorten the tender procedure (Van de Rijt & Witteveen, 2011). As a government agency the Directorate-General of Public Works and Water Management has to follow the European legislation on public works. The tender process needs to be transparent, non-discriminatory and objective.
The Directorate-General of Public Works and Water Management has adopted BVP/PIPS for 16 of the 30 bottleneck projects in order to avoid transaction costs. For each of the projects very concrete project goals were set. While designing the process, the intention was to stay as close to the original PIPS methodology (as developed by Dean Kashiwagi) as possible, with a few adaptations. Van de Rijt & Witteveen (2011) have summed up the 11 differences with the "pure" methodology. The philosophy when applying the adapted methodology however was still completely intact: it was aimed at finding the highest quality vendor within the budget (like in the original methodology as developed by Dean Kashiwagi), using the risk assessment plan, valued added plan, planning, interviews and price.

- The qualitative criterion Risk Assessment Plan was meant to find out in which way the vendors minimized the risks (mostly risk they do not control) in order to realize the project goal.
- The qualitative criterion Value Add Plan was meant to find out in which way the vendors could add value in order to realize the project goal.
- The qualitative criterion Schedule was meant to find out in which way the vendors could identify the plan from beginning to end in relation to the risks and value adds

- The qualitative criterion Interviews was meant to find out in which way the key people of the vendors could understand their plan from beginning to end.

To safeguard to objectivity, Kashiwagi's concept of "dominant information" was used to evaluate the different bids. This means information that is simple and easy to observe: different ratings could only be given if there was dominant information that there was a qualitative difference in the bid. Like in the BVP/PIPS process, each team member rated the Risk Assessment plans, the Value Added plans, the schedules and the interviews individually and independently, after which all individual scores were discussed in the team. This team needed to come to a consensus score. The extra "safeguard" (compared with the "pure" methodology) was that for the Risk Assessment plans, Value Added plans and scheduling two teams were installed. This way the process consisted of the following 3 steps:

- Each team member rated the vendors individually on all qualitative criteria (risk assessment plan, value added plan and schedule); with the project goals as a reference
- Coming to a consensus score in a team:
  - The 5 team members of team A came to a consensus score for each of the vendors on each of the qualitative criteria (again with the project goals as a reference)
  - The 5 team members of team B came to a consensus score for each of the vendors (parallel to team A) on each of the qualitative criteria
- Using the consensus scores of team A and of team B a "final" score for each of the vendors (for each criterion) was reached

By having this 3-step-approach using dominant information, objectivity can be realized. This is a different way of realizing objectivity then by having very detailed and prescriptive criteria.

Unlike in Kashiwagi's system relative scoring was not used. The bids were assessed by comparing them in quality, but the actual score of a specific bid was done in an absolute way. In the Dutch infrastructure sector bigger public clients have adapted a specific way to combine price and quality into best value (PSI Bouw, 2007), where all "quality" criteria are "transformed" into "fictitious" Euros. To calculate which vendor has the most economically advantageous tender, the amount of "fictitious" Euros scored on quality is deducted from the vendor's budget. E.g. : for a € 100 mln project, the maximum (fictitious) deduction is € 70 mln (=70%). This would lead to a fictitious price for this vendor of € 30 mln. For each criterion, a vendor could get a deduction on its price (when the grade on the quality criterion is more than a "6") or there could be an addition to the price (when the grade on the quality criterion is lower than a "6"). See table 3.
E.g.: if RAVA plans counts for 20% in the ranking of a € 100 mln project, the maximum deduction (resulting from interviews) would be € 20 mln. A score of "7" on interviews would lead to a deduction of € 5 mln.

Grade	% of maximum value
10	100
9	75
8	50
7	25
6	0
5	-25
4	-50
3	-75
2	-100

Table 2: scoring system

Results of the cases

An evaluation of the tender process was commissioned by the Directorate-General of Public Works and Water Management. The study consisted of an analysis of existing documentation, and interviews with the market players involved as tenderers for the packages, as well as with those involved within RWS. In addition, conversations were held with market players who have not participated in the tendering process, and with industry organisations. Market players support this method of award, scoring it with an 8 (out of 10). During the interviews most market players actually advocated an even greater weight being placed on quality in the overall assessment. Only a limited number of interviewees are in favour of putting a slightly greater weight on price - 40% or 50% instead of 30%. The Directorate-General of Public Works and Water Management is also positive about the approach. Greater weight has indeed been put on quality, but not as much as intended. That may be due to the tenders lacking points of distinction or to the assessment by the Directorate-General of Public Works and Water Management. Interviewees indicated that extreme scores are hardly ever given; there is a natural tendency to refrain from this. Incidentally, this proves better than expected when the variation in assessment is compared for each part of the package. Table 4 shows the minimum and maximum scores for each of the evaluation criteria for the six projects (A-F).

	A		**B**		**C**		**D**		**E**		**F**	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Risk assessment	7	3	8	3	7	5	8	5	7	4	7	3
Value added	8	5	9	4	8	6	8	5	7	4	9	6
Schedule	7	5	7	5	8	6	8	6	8	4	8	7
Interviews	9	4	9	4	8	5	8	5	9	3	9	6

Table 3: minimum and maximum scores in the Fast Track Projects

Conclusion

The research question of this paper was: 'What lessons can be learned from the first projects of using Best Value Procurement in The Netherlands?'

The cases indicate that the next lessons can be learned:

- It is possible to use qualitative scales without further desegregation
- The project goals however should be very clear, since they form a central role in the selection process
- BVP enables market parties to differentiate themselves from their competitors
- BVP delivers value for money to the owner
- Objectivity, non-discriminatory and transparency can be realized

These lessons can change the way the relationship between supplier and buyer are shaped, changing the accountability up the supply chain, towards the expert in the field.

Limitations and suggestions for further research

This paper has a work in progress status. Obviously the case study results are only based on six cases, all from the Directorate-General of Public Works and Water Management and all in the construction industry. Numerous cases from other owners and other industries should proof these results, before they have generic applicability.
So we will continue with our research, acquiring more data in order to validate the results.

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