
A Large Dutch Engineering Service Adopts the Best Value Approach

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The Best Value (BV) environment was introduced into the Netherlands in 2006. By 2008 testing was being done by a partnership of Arizona State University and Scenter (Sicco Santema, professor from Delft University). In 2010, the first significant test of the BV approach was done by the Rijkswaterstaat to deliver the \$1B fast track infrastructure projects, and by 2015, the BV approach had become the “buzzword” of procurement and the professional procurement organization NEVI. However, in the delivery of professional engineering services, larger, more traditional services which were built on a system of relationships between clients and vendors, clients controlling the expert, and the importance of “billable man-hours”. The transition from a traditional approach to a BV approach is very challenging. Large traditional professional organizations naturally will have more difficulty adapting to the new approach. The BV approach utilized the expertise of experts to replace the need for relationships and owner management, direction and control (MDC). It also places less value on traditional practices that have been used by professional services to get business (relationships and working together with the client in a trust based relationship). The study captures the efforts of a very successful engineering firm (the second largest in the Netherlands) as they attempt to become successful in this new approach. The Best Value team that they have put together has had outstanding results in using the BV approach to changing their paradigm.

Keywords: Professional services, Best Value, Netherlands, Royal HaskoningDHV, delivery of services

Introduction

Professional services were always selected differently from other construction services. They were identified as professional services which used engineering principles to solve and provide solutions to owner requirements. They developed a selection system called Qualification Based System or QBS, which selected designers based on the professional’s past performance, professional licenses, professional relationships and technical knowledge in the firm (Child, Sullivan & Kashiwagi, 2010; D. Kashiwagi, J. Kashiwagi & Child, 2014). The QBS system resulted in a system where the owner’s selected the professional firm based on relationships, marketing brochures and firms’ reputations. The selection process resulted in client’s selection boards deciding who was the best qualified. In many government environment’s, price is not a selection criteria. After the QBS was performed, a professional service is selected and price is negotiated. Oftentimes, it is a fixed percentage of the construction cost.

The QBS and other similar selection systems resulted in professional services having the following practices (Child et al, 2010; D. Kashiwagi et al, 2014; Sullivan and Michael, 2011):

1. Depending on marketing and relationships to get their work.
2. Professional services becoming more reactive to the clients' needs.
3. Strong relationships becoming the solution for engineering and design issues.
4. Design schedules becoming less important leading to design change orders and redesigns.
5. Large design services becoming more fixated on maintaining "billable man-hours" than utilizing their expertise.
6. More administrative and meeting duties than utilizing technical expertise.
7. A void of project management skills which concentrated on profit margin, efficiency, effectiveness and maximizing profit/return to the company.

These practices led to the following results (Egan, 1998; FMI / CMAA, 2004; FMI / CMAA, 2010; Sullivan & Michael, 2011; Tucker, 2003):

1. Poor customer satisfaction.
2. Clients reviewing the professional's work, and managing, directing and controlling the professional services.
3. The owners/clients' had a poor perception of designers and engineer's capability, quality of work and professionalism.
4. An inability in a large design firm to identify the expert, select the expert for a project and allow the expert to plan the project from the beginning to the end (utilizing their expertise to estimate quantities and identify the risk that other stakeholders bring to the design project and mitigating the risk by creating transparency and through a risk mitigation plan).
5. Work was procured through a marketing/relationship process called the Qualification Based System (QBS). The selection of the firm is done through an owner's selection board that decides who is the best qualified, then negotiates a contract with the selected vendor.

These design practices are in all countries and cultures (underdeveloped, developing and developed countries). The authors have been in Africa, Malaysia, China, U.S. and Europe in which the practices are observed to be the same.

The Best Value Approach has been in the Netherlands since 2007. The Rijkswaterstaat (tasked with maintaining roads and waterways in the Netherlands) delivered the "fast track projects" using the Best Value Approach (known as Best Value Procurement or BVP). The following results were realized (Van de Rijt, Witteveen, Vis & Santema, 2011):

1. Procurement transactions and costs were minimized by 50%.
2. Construction time was minimized by an average of 25%
3. 95% of all project cost and time deviations were caused by the owner/client and their professional services.

Professional services were also procured by the BVP approach. Immediately, the following problems were observed (J. Kashiwagi, Sullivan & D. Kashiwagi, 2009; Kashiwagi, 2014b):

1. The design professionals were reactive and not used to being accountable to setting a plan, identifying the deliverable to be delivered, making the assumptions that should be made utilizing their expertise, and having a risk mitigation plan that minimized the risk that they did not control.
2. The owner/client's project managers were confused and thought that the clarification period was a time to make the contractors do work to identify all the unknowns.
3. The design services faced the challenge of how to identify and utilize expertise in their own organizations.
4. Large design organizations were confused how to match their need to transform their approach from concentrating on "billable hours" to utilizing expertise.
5. The definition of an expert was in question. Years of experience, education degree and leadership position in the company may no longer be sufficient to be identified and work as an expert.

The Performance Based Studies Research Group (PBSRG) identified the following about the Dutch Best Value movement:

1. Per capita, it was the most progressive Best Value (BV) effort in the world, with most number of certified experts, the largest number of BV technology licenses, more major government clients involved in Best Value tests and the only country where the professional procurement group (NEVI) and the professional risk management and engineering group (RISNET), which includes the professional organization of the engineering and design firms, are all licensed in the BV technology from Arizona State University (ASU) and their technology licensing group AZTECH (PBSRG, 2012).
2. BV consulting groups created, which proliferate the BV practices including Scenter (led by Sicco Santema, the Best Value visionary of the Netherlands), NEVI (3rd largest professional procurement organization in the world), Best Value Europe (an organization committed to spread BV throughout Europe) and the Dutch Professional Engineering Organization which is a member of the European Professional Engineering Organization (Kashiwagi, 2014b). The groups Scenter and the European Professional Engineering Organization, are now spreading the BV approach to both Norway and Poland, translating the Dutch Best Value Procurement (BVP) book into both Norwegian and the Polish languages.
3. The largest government organizations in the Netherlands are participating with the BV effort including Rijkswaterstaat, ProRail, Netherland Rail Service, waterboards, provinces and major cities such as Rotterdam, Amsterdam, Utrecht, and Groningen (Kashiwagi, 2014b; Van de Rijt & Santema, 2013).

Problem: How to Transform Professional Services into a Performing Industry

For the BV effort to be sustainable, PBSRG was interested in three major areas: professional services, medical services and IT or ICT services. Professional service was a primary target

because the traditional delivery of professional services was an area where performance was very low and had the following characteristics (Child, Sullivan & Kashiwagi, 2010; D. Kashiwagi, J. Kashiwagi & Child, 2014; Egan, 1998; FMI / CMAA, 2004; FMI / CMAA, 2010; Sullivan & Michael, 2011; Tucker, 2003):

1. Management, direction and control were being utilized to minimize risk.
2. It is a commodity area that was being differentiated based on relationships.
3. Professional services had very poor customer satisfaction ratings.
4. The professionals are the first to touch the delivery of construction services and were identified in the Netherlands billion-dollar infrastructure project as the source of 90% of the project cost and time deviations (Van de Rijt & Santema, 2012).
5. In PBSRG construction project tests, the design services and the owner's decision making was the largest source of project cost and time deviations. The owner's representatives and the design services were indistinguishable. They were one entity and were the largest problem in the delivery of construction services (J. Kashiwagi, Sullivan & D. Kashiwagi, 2009; Kashiwagi, 2014).

To have a larger and more sustainable impact on the performance of professional services, PBSRG searched for visionaries in one of the more traditional larger professional services companies.

Methodology

The research approach was simple:

1. Identify one of the largest engineering professional services company.
2. Identify if there were visionaries who understood the BV approach in the company.
3. Assist in organizing a core team of BV experts.
4. Identify the strategic plan to transform the large organization into an organization that could utilize the BV approach to increase efficiency, effectiveness and margin/profit for their organization.

PBSRG set on the following plan to meet the research objectives:

1. Present to the Dutch professional engineering organization.
2. Identify one of the larger organizations who had visionaries.
3. Educate and train the visionaries in the BV approach.
4. Identify if they could follow the BV approach in order to give their organization the ability to utilize the BV approach.
5. Convince the core group to utilize metrics.
6. Identify if the metrics can be refined to increase the support of the rest of the organization.
7. Pick a case study which shows the success of the BV approach.

History of BV with Professional Engineering Groups

From 2011 – 2012, PBSRG started to brief professional engineering firms, including the Dutch professional engineering group (a subset of RISNET, the Dutch risk management professional group). In 2012, PBSRG was contacted by the second largest engineering and design firm in the Netherlands, Royal HaskoningDHV. Royal HaskoningDHV is an independent, international engineering and project management consultancy with over 130 years of experience. The company of professionals delivers services in the fields of aviation, buildings, energy, industry, infrastructure, maritime, mining, transport, urban and rural planning and water. Backed by expertise and experience of nearly 7,000 colleagues across the world, they work for public and private clients in more than 130 countries on five different continents (Royal HaskoningDHV, 2014). A visionary in the company, Elske Bosma, reached out to PBSRG for some guidance, and PBSRG started a relationship to assist her and her company to become Best Value experts.

In 2014, RISNET licensed the BV approach technology from ASU, and the Dutch professional engineering group, a subset of RISNET, acquired access to all the training materials. The Dutch professional engineering group under the leadership of Paul Oortwijn, started presenting the BV approach at the European Engineering Association in 2013, resulting in interest from Norway and Poland. Partnering with the Scenter group (private group which partnered with PBSRG to bring the BV effort into the Netherlands), the Dutch Best Value Procurement (BVP) book is being translated into both Norwegian and Polish languages, with the Polish book to be introduced to the Polish professional engineering group in March 2016.

Development of the Royal HaskoningDHV Best Value Effort

PBSRG had already researched how to transform a large organization to have the capability of providing the Best Value (Kashiwagi, 2015). The following approach and assumptions are mandated by a large bureaucratic organization:

1. There is no controlling any individuals in the company to change their conceptual thinking by management, direction or control (MDC) or influence.
2. To expect engineers to change was to increase the risk of failure.
3. Visionaries had to be identified by their affinity to the concepts of Best Value (BV) and Information Measurement Theory (IMT) which include logic, consistency, leadership characteristics and proactive motivation to make things better.
4. The group should start small.
5. Education is very important to identify more visionaries. However, after an initial push to educate, the education effort should be transformed into an implementation effort within the organization and marketing effort with clients.
6. People in the organization who do not understand BV are focused on amount of work (turnover and profit margin).
7. The BV core group will have to develop metrics that minimize decision making of the organization as soon as possible.
8. The BV group must have a mentor.

The following is a historical account of dates and activities of the development of the RHDHV Best Value effort led by the core team members (CTM): Elske Bosma (CTM1), Marcus van der Ven (CTM2) and Oscar Kerkhoven (CTM3) (E. Bosma, Personal Communication, December 9, 2015):

1. April 2012: Before the merger between Royal Haskoning and DHV, CTM1 starts a BVP network within DHV and at the same time CTM2 and CTM3 find each other in several Best Value efforts at Royal Haskoning.
2. June 2012: After the merger CTM1, CTM2, CTM3 and Fred Haarman meet. This was the start of the Best Value core team.
3. CTM2, as a project manager, uses BVP to improve performance of client construction projects. CTM3 combines an HR Business partner role with Best Value by facilitating and educating tender managers and key job-holders. CTM1 coordinates the internal network.
4. September 2013: The BV core team seeks contact with Dean Kashiwagi, the creator of Best Value. The BV core team also brings 2 colleagues of the higher management of RHDHV. Kashiwagi is very much interested in the BV effort of the core team.
5. December 2013: The BV core team presents their strategic plan to the executive board of RHDHV. The board approves the plan. A member of the executive board becomes the sponsor of the BV core team.
6. December 2013: As a HR business partner, CTM3 shares his insight with management about the explicit link between the Best Value Approach and the Royal HaskoningDHV strategy. CTM3 and CTM2 combine their effort to improve the Best Value tender success rate within the new company RHDHV.
7. January 2014: BV core team members CTM2 and CTM3 attend the BV Conference in Phoenix, Arizona.
8. May 2014: The BV core team invites Kashiwagi to the RHDHV's head office in Amersfoort. Over 100 employees of RHDHV attend his presentation and/or the workshops.
9. October 2014: CTM2 obtains the A+ certification (Highest BV certification).
10. October 2014: The BV core team organizes their first internal 2.5-day BV training for RHDHV project- and contract managers.
11. January 2015: The BV core team and 5 other colleagues attend the BV Conference in Phoenix, Arizona.
12. June 2015: Dean visits the RHDHV head office in Amersfoort. Approximately 80 persons of RHDHV attend his presentation and/or the workshops.
13. October 2015: CTM3 obtains the A+ certification based on an article about Best Value as a vehicle for organizational development and his effort within Royal HaskoningDHV in that field. Due to the success and positive metrics supporting RHDHV's BV effort, senior management is more and more convinced of the value of the BV approach and the way it aligns with the company strategy.
14. October 2015: CTM3 recruits 2 more persons to help develop the Best Value effort (One of the two is part of the upper management of RHDHV). Of the BV core team 6 persons of RHDHV will attend the Best Value Conference in Arizona in January 2016.
15. December 2015: With help of the others of the BV core team, CTM2 has educated over 60 colleagues (B- certification) in 2014/2015.

RHDHV Metrics

One of the objectives of the BV approach is to use metrics to minimize decision making inside and outside of the organization. The BV core team had the following objectives (Royal HaskoningDHV, 2015):

1. Show increased value of the core team activities.
2. Show that if the BV approach and the BV core team were utilized, the amount of work acquired and the success rate will increase. When the numbers become simple, policies will be set by the company that help the non-BV experts to utilize the BV core team.

Table 1 shows the core teams’ metrics. Table 2 shows the metrics that minimize decision-making, and will lead to changing RHDHV policies. The RHDV core team also identified a BV expert who began to keep metrics on his own procurement projects (Table 3 and 4). PBSRG will continue to work with RHDHV and the engineering consulting professional groups in the Netherlands, Norway and Poland to assist the industry to transform itself into a Best Value industry. (Royal HaskoningDHV (2015) Best Value Performance Metrics. Unpublished raw data.)

Table 1

Royal HaskoningDHV Performance Metrics to Minimize Decision Making

Performance Criteria	2013-2015
# years BV core team	3+
# BV procurement as client PM	12
# BV tenders for engineering consultancy projects	24
# won	11 (46%)
# BV tenders in consortium for construction projects	13
# won	2 (15%)
# BV interview training key personnel	50+
# BV procurement educations	20+
# BV presentations	50+
# BV knowledge meetings	10+
# BV presentation for higher management	6
# A+ Certifications	2
# B+ Certifications	8

Table 2

Royal HaskoningDHV Performance Metrics

Performance Criteria	BV Support	No BV Support
# of Tenders	14	24
Tenders Won	6 (43%)	7 (29%)
Scored 1st or 2nd in PC Submittals	13 (93%)	14 (58%)
Risk Assessment Score	5.8	5.3
Value Added Score	6.2	6.1
Level of Expertise	7	5.8
Interview	7.4	6.5

Table 3

RHDHV Performance Metrics using BVA on Client Construction Projects (summary)

#	Performance Criteria	Results
1	# BV projects as client PM	10
2	Scope in euro's	42M
3	% client satisfaction >8 (1-10)	100%
4	% running below client budget	100%
5	Average % below client budget	-15%
6	Average % cost deviation (contract value)	3% (100% caused by client risk)
7	% running on time	70% (7/10) (2/3 caused by client risk)
8	Average % schedule deviation	6%
9	Estimated cost efficiency	20-30%

Table 4

Individuals Performance Metrics on Procure Company Projects

#	Project	Client Budget (euro)	Contract value (euro)	Progress	Cost Deviation	Time deviation	Estimated cost reduction contract management
1	Pumping Station Schore	2.60 M	2.40 M	100%	1%	0%	-50%
2	Pumping Station Schilthuis	0.69 M	0.68 M	95%	0%	20%	-20%
3	Ankie van Beek Ohrlaan	0.56 M	0.54 M	100%	2%	1%	-40%
4	Pumping Station Essenburgsingel	2.25 M	1.94 M	40%	0%	15%	-20%
5	TenSec 2.0	28.30 M	25.00 M	20%	2%	0%	-20%
6	INFRA1	5.40 M	4.90 M	20%	0%	1%	-30%
7	Sewage System Triangel	1.20 M	0.74 M	100%	20%	20%	-50%
8	Renovation 7 Pumping Stations	3.50 M	2.21 M	30%	0%	0%	-10%
9	Sewage System Westergouwe	1.12 M	0.90 M	40%	3%	0%	-20%
10	INFRA2	3.00 M	2.90 M	10%	0%	0%	-30%

Conclusion

The professional engineering organization in the Netherlands has been proliferating the Best Value Approach and the Information Measurement Theory (IMT) concepts. They have been successful in moving the technology into Norway and Poland. PBSRG has identified and is mentoring the second largest engineering firm in the Netherlands, Royal HaskoningDHV (RHDHV) into increasing its BV capability and utilizing metrics to minimize the decision making in their organization.

The following have been successfully achieved in this case study research which uses mixed methods to verify the changes:

1. Selected Royal HaskoningDHV as the large engineering service.
2. RHDHV selected a core team.

3. Core team educated their organization by explicitly placing BV in line with its company strategy, and using metrics to show their activity.
4. Core team refined their metrics to show their organization that the core team should be utilized to increase RHDHV's competitiveness on potential projects.
5. Identified a BV expert within the core team to compete for and run BV projects. The BV expert has been extremely successful.

The RHDHV organization has acquired BV capability. They have shown that a large engineering firm can gain the capability of the BV approach and change the paradigm of professional engineers. They will become more competitive and successful as they continue to change their paradigm. Their case study shows that a large organization whose traditional paradigm does not match the BV approach, has the capability to transform itself into the BV organization. Their success ensures that the Dutch BV effort will continue to be sustainable.

References

Child, G. S., Sullivan, K., & Kashiwagi, D. (2010). Delivering the Design Services and Other Professional Services. PM-05-Advancing Project Management for the 21st Century, Heraklion, Crete, Greece, 152-159.

Egan, J. (1998). Rethinking Construction, Construction Task Force Report for Department of the Environment, Transport and the Regions.

FMI / CMAA Fifth Annual Survey of Owners (2004). Management Consulting - Investment Banking for the Construction Industry. Retrieved December 9, 2015 from <http://www.cmaafoundation.org/files/surveys/2004-survey.pdf>.

FMI / CMAA Fifth Annual Survey of Owners (2010). Management Consulting - Investment Banking for the Construction Industry. Retrieved December 9, 2015 from <http://www.cmaafoundation.org/files/surveys/2010-survey.pdf>

Kashiwagi, D. (2014b). 2014 Best Value Standard. Performance Based Studies Research Group. Tempe, Az. Publisher: KSM Inc., 2014.

Kashiwagi, D. (2014b). 2014 Best Value Standard. Performance Based Studies Research Group. Tempe, Az. Publisher: KSM Inc., 2014.

Kashiwagi, D., Kashiwagi, J., & Child, G. (2014). Price Based Environment of Design and Engineering Services. Journal for the Advancement of Performance Information & Value, 6(1).

Kashiwagi, J., Sullivan, K. and Kashiwagi, D. (2009) Risk Management System Implemented at the US Army Medical Command, Vol. 7 No.3, 2009 pp. 224-245.

PBSRG. (2012, July 3). Best Value in the Netherlands: NEVI Certification, DSA Award, and Upcoming Events «. Retrieved December 8, 2015, from <http://pbsrg.com/publications/newsletters/best-value-in-the-netherlands/>

Royal HaskoningDHV (2015) Best Value Performance Metrics. Unpublished raw data.

Royal HaskoningDHV (2014) Royal HaskoningDHV Annual Report 2014. Netherlands: Royal HaskoningDHV Marketing & Communications.

Sullivan, K. T., & Michael, J. K. (2011). Performance Measurement Approach to Contracting and Delivering Design Services. *Journal of Professional Issues in Engineering Education & Practice*, 137(4), 248-257.

Tucker, W. W. (2003). Construction Productivity Study: Executive Summary. Michigan Tripartite Committee. URL <http://www.mitripartite.com/ExecutiveSummary1.pdf> Mangasarian (visited 2009, 2 September).

van de Rijt, J., Witteveen, W., Vis, C., & Santema, S. (2011). Best Value at the Directorate-General for Public Works and Water Management in The Netherlands: A Case Study of the Procurement of Infrastructure Projects Worth \$1,200 M. *Journal for the Advancement of Performance Information & Value*, 3(1).

Van de Rijt, J., & Santema, S.C. (2013). *Prestatieinkoop: met Best Value naar succesvolle projecten*. Driebergen: Graphicom International.