
The Cause of Collusion in the IT and Construction Industries

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In 2002, the Dutch construction industry encountered a problem with collusion. They had a very difficult time understanding the solution to the problem. The visionary Dutch government officials approached the Performance Based Studies Research Group (PBSRG) at Arizona State University to solve the problem. PBSRG introduced the Construction Industry Structure (CIS) and explained that collusion environment is created by the client and not the contractors. Meeting resistance from Dutch researchers, PBSRG created a new research approach upon which the Dutch BV effort flourished. Instead of consensus, PBSRG used simplistic logic, identified visionaries who could understand, and ran tests without years of theoretical discussion. The simplicity of the explanations and the results of repeated testing identified that the problem of collusion was non-technical. It was a problem with the delivery of services. The same problem came up in the ICT industry. PBSRG took the same approach to resolve the problem. Find Dutch visionary partners, educate them, run tests, and document the test and minimization of problems.

Keywords: IT industry, performance, supply chain issues, large organization, Best Value

Collusion in the Dutch Construction Industry

In the early 2000s collusion was identified in the Dutch Construction industry. The cause of the collusion was identified as contractor greed (Doree, 2004; D. Kashiwagi & J. Kashiwagi, 2011). In response to these allegations the government moved to penalize the guilty parties but discovered that the penalized amounts would be greater than the profit generated by the colluding vendors. In order to maintain stability in the industry a few scapegoats were identified and penalized, while the rest of the industry was persuaded to build a case against the scapegoats by providing information on the collusion. Those who volunteered information were promised to be exonerated. Kashiwagi proposed that the cause of collusion was the owners and not the contractors. In the price based environment, the owners used management, direction and control (MDC) of the contractors to minimize risk. The MDC is inefficient, ineffective and causes non-transparency. It minimized the profit margins of the contractors and forced them to collude to survive.

Construction Industry Structure (CIS)

The CIS model was created as a part of a dissertation in 1991 (Kashiwagi, 1991). The source of low performance was identified as an owner generated problem and not a vendor generated problem (Figure 1).

Performance	High	III. Negotiated-Bid Minimized competition Long term Relationship based Vendor selected based on performance	II. Value Based Buyer selects based on price and performance Vendor uses schedule, risk management, and quality control to track deviations Buyer practices quality assurance Utilize Expertise
	Low	IV. Unstable Market	I. Price Based Wrong person talking Management, direction, and control No transparency Manage, Direct and Control [MDC]
		Low	High

Figure 1: Construction Industry Structure (CIS) model. (Information Measurement Theory by Dean Kashiwagi, 2014a, Tempe: Ksm-inc.)

The CIS identifies that the major difference between low performance and high performance is caused by the owner's use decision-making, and attempt to manage, direct and control (MDC) the vendor's actions to minimize risk, instead of utilizing expertise. The results of this practice include (Kashiwagi, 2014a):

1. Poor performance
2. Higher costs
3. Inefficiency
4. Decision making
5. Need for relationships to be formed to solve problems
6. Low perceived value for expertise
7. Commodity practices
8. Non-transparency (an environment where the source of the problem is not easily identifiable).

It is in the priced based environment where collusion occurs. Collusion occurs when there is non-transparency, where profit margins are low, and contractors collude to survive. The concepts of the CIS was being presented in CIB conferences in Trinidad, Tel Aviv and Singapore, and eventually led to meeting a fellow CIB member (George Ang, Ministry of Housing). George Ang then brought Dr. Dean Kashiwagi into the The Hague, Netherlands to present to the various ministries in 2004 (Ang, 2011).

Kashiwagi realized that there was a problem in the Dutch construction industry and in the construction management academic research community. The problem was simple; the explanation was simple and easily observable. However, no one wanted to help solve the problem using simple solutions. Kashiwagi tried to reach out and gain consensus. It did not work. Finally, he found a visionary in the supply chain area (Sicco Santema and the consulting

group Scenter) (Van de Rijt, 2011). Five years later, the CIS model and Best Value Approach are understood by everyone.

Kashiwagi realized it was not a paradigm issue only with the industry, but also with the research community. The research community was too slow, too cumbersome, and caused more problems than solutions. By observation and logic, this would lead to silos. A new research approach would have to be used to bypass the bureaucracy of the academics who became far too comfortable with documenting what other academics were saying, instead of knowing what was actually happening. Kashiwagi identified the traditional academic research community as colluding partners (no different from the industry), accepting only what they felt comfortable with, and rejecting anything that came from somewhere else or that they were uncomfortable with because it may have conflicted with their previous academic documentation. A new approach to academic research was needed.

New Academic Research Approach

In 2004, PBSRG decided to use a totally new research approach. Unlike other researchers, who utilized government grants and publications in peer reviewed journals to be promoted and tenured, Dr. Kashiwagi decided to create a different research approach. It included:

1. Using a deductive logic based approach, using mixed methods to identify the research data and reach his conclusions.
2. Instead of using extensive literature search to identify what the industry and other academic researchers were practicing, he assumed that the industry was wrong, and their perceptions were inaccurate, and using their concepts would be a waste of time and resources.
3. Instead of using an inductive approach, he used a deductive approach, simplifying by using natural laws and common sense that minimized the need to discuss or make decisions. Even though, this was against the academic research model, and he was told that he was not a good researcher and his research had no value, he pursued this course. (reference)
4. He used natural laws that can be observed, that are commonly accepted and used simple concepts that minimized the need to discuss with peers or get peer reviewed for validation.
5. He identified industry experts who understood and agreed to test his concepts.
6. Ran repeated testing, analyzing the hypothesis and modifying the hypothesis through test results.
7. PBSRG did simultaneous research on non-traditional theoretical concepts, prototype testing of the proposed concepts and implementation into organizations.

The new research approach allowed PBSRG to use models that were simple, accurate, and easy to understand by the industry. PBSRG assumed that the academic community would not come up with a solution of the collusion, and used its multiple industry test results and simple explanations to bypass the rest of the academic community. By 2005, PBSRG had successfully tested the CIS concepts and the Best Value Approach with multiple International Facility

Management Association owners in the Phoenix metropolitan area, the State of Hawaii, United Airlines maintenance site in San Francisco, the Federal Aviation Administration, and the State of Utah.

At this time, the construction management academic research experts in the Netherlands did not come to consensus about the cause of the contractor collusion, the CIS model, and CIS explanation of collusion. It seemed too simple. Most academics perceived that the vendors were at fault, that the Dutch construction management researchers felt that the Dutch culture was different from the American culture and the CIS solution was not accurate. Only one academic research source, Dr. Dean Kashiwagi from PBSRG/ASU, the author of the CIS model and the creator of the BV approach, proposed that it was the owners and not the vendors who were at fault. He used deductive logic, common sense, and case study test results in the United States to validate his proposal.

An effort was made by Dr. Kashiwagi to involve more Dutch researchers, but his insistence to run industry tests without the consensus of all the Dutch researchers was unsuccessful. Instead of staying with the traditional, Dr. Kashiwagi, began applying PBSRG's unique research approach defined and discussed in the previous paragraph. Bypassing further discussion and consensus of the Dutch Construction Management academic researchers in the Netherlands, Dr. Kashiwagi, went right to the industry (Hijmens, Rijkswaterstaat and Scenter) and formed partnerships to test out the CIS concepts (Van de Rijt, Hompes & Santema, 2010; Koreman, 2011). A lead Dutch visionary in one of the major construction companies (Marc Gillissen), multiple visionaries in the Rijkswaterstaat, and a visionary professor in marketing and supply chain at Delft University (Sicco Santema) accepted the CIS model explanation and the Best Value Performance Information Procurement System (BV PIPS) as a solution to change the environment of the delivery of construction services resulting in the following actions (D. Kashiwagi & J. Kashiwagi, 2011):

1. Heijmans Construction licensed the Best Value Performance Information Procurement System (BV PIPS) from ASU.
2. Rijkswaterstaat was also licensed with the BV PIPS technology from ASU.
3. Scenter (private consulting company led by the visionary Sicco Santema) and the Delft University were licensed with the technology.
4. Scenter was educated and trained by PBSRG. They ran small successful BV PIPS tests in 2008-2009 (Van de Rijt, Hompes & Santema, 2010).
5. Rijkswaterstaat ran a huge test by procuring \$1B "fast track" infrastructure projects using BV PIPS (called Best Value Procurement or BVP) assisted by Scenter and PBSRG. (Van de Rijt, 2011)
6. The fast track project results using the CIS and BV concepts minimized procurement transactions and costs for all parties by 50% (owner and competing contractors), contractors reduced construction time by 25%, and test results confirmed the CIS model of utilizing expertise to minimize risk is accurate and 90% of all project cost and time deviations are actually caused by the owner. (Van de Rijt, Witteveen, Vis & Santema, 2011).
7. As a result of the "fast track" project test results, NEVI (the third largest organization of professional procurement personnel in the world) licensed the BV PIPS technology from

Arizona State University (ASU) through AZTech and has begun to educate and certify all procurement personnel in BVP and the CIS and the underlying logic of the BV PIPS approach which is called Information Measurement Theory or IMT (PBSRG, 2012, AZTech, 2012). The BV PIPS approach, which moves the paradigm from the price based MDC environment, to the utilization of expertise environment is now one of the major thrusts of NEVI. They have recently hired a new Director of BVP education and are expanding their offerings to assist all stakeholders in understanding of the BV PIPS approach. (Jeroen van de Rijt, email dated 11/11/2015 from Jeroen van de Rijt to Dean Kashiwagi).

8. The RISNET organization comprising of risk managers and professional engineering groups also licensed the technology from ASU.

Results of the New “Non-traditional” Research Approach

The history of documented changes within the Dutch procurement as a direct result of the implementation of the CIS and BV paradigms along with dominant project successes have validated the CIS model and its concepts. The CIS model and the BV PIPS or Best Value Procurement (BVP) is now accepted and used as a mainstream model in the procurement of services in the Netherlands. The traditional academic research model of performing a literature search of existing concepts, proposal of a theoretical solution based on the literature search, survey of industry experts to identify which industry characteristics are most influential in the collusion, and presentation in academic journals to seek consensus in the academic world was not used due to the extensive time requirement and impracticality quickly solving and assisting the construction industry with its collusion problem.

The traditional research process would be too lengthy, would not assist the industry in a timely manner, and would utilize opinions of industry and academic personnel that were “a part of the existing problem.” Instead, the PBSRG deductive logic approach in the Netherlands and elsewhere has resulted in the following:

1. Twenty-two (22) years of research testing, \$16M of research funding, 1,800 tests, 98% customer satisfaction delivering \$6B of services (PBSRG, 2015).
2. The most licensed technology (45 licenses) developed at ASU, one of the top innovative research universities among universities in the United States without a medical school.
3. Two five-year longitudinal studies which identified the client and their representatives as the largest source of project cost and time deviations. Vendors create minimal risk when transparency allows the identification of the sources of risk (D. Kashiwagi & I. Kashiwagi, 2014).
4. The PBSRG proposed concepts and research testing results were audited by both the State of Hawaii Legislative group and by a dissertation from one of the most prestigious universities in the Netherlands, the University of Twente. (Duren & Doree, 2008; Rijt & Santema, 2013; State of Hawaii Report, 2002) PBSRG is the only research program to be officially audited and the results published by third parties. Due to research partners’ investment into the PBSRG research coming from the organizations’ operational funds, PBSRG research results are audited continually.

5. 250 journal and conference publications showing that management, direction and control (MDC) results in poor performance. (PBSRG, 2015).
6. Validated the CIS or IS model, and identified that the paradigm must be changed to deliver higher quality construction services (Kashiwagi, 2014b).
7. CIB W117 committee on the Use of Performance Information in the Construction Industry, who is one of the major sponsors of the PBSRG testing, has done research work in seven different countries and 32 different states in the United States validating the same concepts.

This new approach of simplistic explanations backed by test data resulted in the industry cooperating with the academic research. Owners are now desiring to utilize the expertise of expert vendors to lower costs and increase value. They have moved from the management, direction, and control (MDC) model to utilizing expertise. This has been accepted by NEVI (Dutch professional procurement group), by RISNET (risk management group) and the Dutch professional engineering group. The new approach has also fueled efforts by Sicco Santema, the Best Value visionary, to partner with Delft University to bring the new academic research approach to the Netherlands. This has bypassed the efforts of the traditional construction management groups.

The authors are proposing that what has been going on in the Dutch construction industry, is also going on in every other industry. Through the efforts of NEVI, the Best Value Approach is reaching every industry, including the information, communication technology (ICT) industry. When collusion charges came up against a major ICT vendor, the authors quickly identified the collusion as caused in major part by the owners who were buying ICT.

Collusion in the ICT or IT Dutch Industry

The delivery of services in the IT (information technology) or ICT (Information, Communication Technology) industry is perceived as being non-performing. The following has been documented on the nonperformance of the ICT industry:

1. ICT non-performance is estimated as high as 75% (D. Kashiwagi & I. Kashiwagi, 2014).
2. Major consulting company claims that the projects are too complex, and the complexity is causing the nonperformance. (Standish, 2013)
3. New project management model, the agile approach, which maximizes communication and documentation, movement in smaller increments of time, and works from beginning to end instead of from the end to the beginning (Scrum Alliance, 2013).
4. Dutch government inquiry is held to identify the source of the ICT industry nonperformance and the large amount of resources being wasted on ICT projects. The result of the inquiry shed no more understanding of the problem (Tweede Kamer, 2014).

One of the larger Dutch ICT industry partners was identified as being in collusion with Dutch government officials. (Zembla, 2014) Even though the company has not been convicted of crime of collusion, the company was cast in a poor light. At the same time, PBSRG was notified of

another large government client was having problems with another major ICT vendor on a Best Value project.

Past research results showed that the client/owner was/is the biggest source of risk in the delivery of construction services. Because the source of risk is not technical (client/buyer using MDC to deliver projects and minimize risk), the authors propose that the problem is not a technical problem (complexity of the technology, lack of technical expertise, or complexity of the requirement). The authors propose that the CIS or IS, identifies that poor performance and collusion is caused by the client attempting to manage, direct and control (MDC) projects to minimize risk. The authors propose that the client is creating an environment, which is:

1. Nontransparent, confusing and based on relationships.
2. Does not utilize expertise.
3. Filled with decision making from non-experts.
4. Resulting in inefficiency, ineffectiveness, and poor performance.
5. Not understanding what risk is and how to utilize expertise because experts have no risk.
6. The areas of risk management and project management have to be redefined and new paradigms must be utilized to increase the performance of the ICT industry.

This research takes the following simplistic path. It has been identified that collusion is caused by the owners attempting to minimize non-performance by making decisions and attempting to manage, direct, and control the expert vendor. The research will first gain access into the Dutch ICT industry to attempt to identify if an ICT vendor can have high performance in the Dutch ICT industry by utilizing expertise instead of using management, direction, and control (MDC). The research will then select large traditional ICT vendors who will have more difficulty changing from the non-transparent, inefficient, and bureaucratic environment to a Best Value environment, and identify if they have interest in the BV approach, and how they are attempting to change from a MDC environment to a BV approach. The following steps will be taken:

1. The researchers will search and identify an ICT vendor that does not utilize MDC to deliver their service. Their performance will be identified.
2. If the performance is dominantly higher than the industry performance of 25% success, the authors will investigate if the problem of MDC is in the ICT industry.
3. Identify a large traditional ICT vendor and identify if they have a bureaucratic or MDC environment.
4. Identify if the large traditional ICT vendor has a performing project or a BV project.
5. Analyze the project to identify what made the project different.
6. Analyze the owner/client of the performing project and identify what they did differently.
7. Also, identify if the client/owner visionary is facing resistance from MDC personnel in his own organization.
8. Identify an effort with a large ICT vendor responding to BV project request that resulted in the client using decision-making and MDC to eliminate the vendor's BV effort.
9. Identify the difference between the price based and BV environments, and identify the difficulty for a large ICT vendor to change into a BV oriented vendor.
10. Analyze the results of the case studies to see if the environment delivering ICT services is in the price-based arena resulting in low performance.

Research Case Studies

The first case study is to identify a high performance ICT provider in the Netherlands who is utilizing expertise to have high performance. Schuberg Philis (SBP) is one of the ICT companies in the Netherlands that is known for their high performance and unique company structure (D. Kashiwagi & I. Kashiwagi, 2014). After studying SBP it was confirmed that SBP was an expert company that delivered high performance (See Table 1):

Table 1		
<i>Schuberg Philis Overall Performance Line</i>		
#	Criteria	Metrics
1	Total # of projects in last 10 years	991
2	# of large projects (€150K- € 3.3 Million)	47 (72)**
3	% of large projects on time	89.36%
4	% of large projects on budget	95.74%
5	% of large projects customers satisfied	93.62%
6	Highest customer satisfaction 7 years in a row (Market Average)*	8.9 (6.9)*
7	Recommended by customers by year	100% 5 years in a row
8	Business Process Availability past 4 years	99.994%
* Market average was taken from 2014 GiarTE Report		
**72 projects existed however; documentation older than 6 years was discarded and not available.		
Source: Schuberg Philis Audit on Project Metrics 2009-2014 by Sandeep Panday, 2014: Schuberg Philis.		

The following are documentation on Schuberg Philis:

1. They are the top rated ICT vendor in the ICT infrastructure area (in every category measured).
2. They have a project performance of 89.36% on time, 95.74% on budget, and 93.62% customers satisfied on 47 large projects in the last six years.
3. Of the six most critical ICT providers that support financial vital infrastructures as stated by DNB (same function as Federal Reserve Bank); they are the only vendor with 100% customer recommendation for outsourcing.
4. In the last four years, their business process uptime performance is 99.994.
5. Their customer satisfaction rating was 8.9 in 2013 – highest in the IT market for 7 years in a row, 2 full points above the market average (6.9).

Some unique characteristics about their organizations is that (D. Kashiwagi & I. Kashiwagi, 2014):

1. They have no MDC.
2. They have very high performance.
3. The authors conclude that Schuberg Philis is a BV company that delivers high performance.
4. They prove that if a vendor is BV oriented (no MDC), they will deliver very high performance.

The authors conclude that Schuberg Philis (SP) is an expert vendor who utilizes expertise in the Dutch ICT industry. Their operations are in a BV environment. If ICT vendors mimicked SP's operations, the need to collude would disappear. By deductive logic, the authors propose that the low performance in the Dutch ICT industry is caused by owners using MDC. This is identified by the Industry Structure (IS) model as the price based environment. IS identifies larger, traditional organizations or vendors, are more likely to be bureaucratic, inefficient and in the price based environment. Using deductive logic and observation that the large ICT vendors are having difficulty changing their paradigm, the Dutch ICT industry is in the price-based environment (identified by organizations using MDC to minimize risk, no transparency, inefficient and wasteful, and allows collusion). The authors will identify large traditional ICT vendors and show that even if their operations are in the MDC or bureaucratic environment, they are seeking to gain the capability of using the BV approach. If the large traditional vendors are having difficulty in making the transformation, it validates the idea that it is the price based paradigm and not the malicious intent of the ICT vendor that is causing the perceived collusion. This will logically show that the collusion is being caused by the price-based environment, which is controlled by the owner and not the ICT vendors.

Case Study of Large Traditional ICT Vendor

One very large traditional ICT Vendor was accused of being in collusion. When questioned by the research team, they had no understanding why collusion occurs. In their efforts to change the public perception and mentality of the company, the vendor began to investigate the Best Value Approach. As the BV approach stressed "win-win" relationships and utilization of expertise to deliver high performance and low costs, the vendor formed a BV core group to achieve these results. The BV core group discovered that some of their experts within the company were already thinking and acting with the BV approach. An example of this was identified was the vendor's BV performing project at the Port of Rotterdam.

The project was investigated to identify its level of performance. Five key participants on the buyer's side were interviewed and the status of the project was reviewed. Findings include (Port of Rotterdam project participants, personal communication, June 6, 2015):

1. The owner/client's procurement manager utilizes BVP as the procurement approach.
2. The client PM faces resistance from his own organization.
3. BV approach required a change in paradigm from MDC to utilizing expertise on both the buyer and vendor side. This required both the vendor and buyer to go through a learning curve changing their paradigm.
4. The paradigm shift had been a big challenge to the project for both the vendor and the buyer.
5. The project is successful, and the project team identifies the project as a success.

Table 2

Sample analysis of data Table explicitness

#	Criteria (10 is strongly agree, 5 is don't know, 1 is strongly disagree)	Results
1	The owners' inability to utilize expertise of expert vendors is a source of risk and poor performance.	8.2
2	Unlike Schuberg Philis, which was already practicing a BV approach, many larger traditional companies (using MDC and reactive behavior) have a very difficult time changing to the BV approach.	7.6
3	Owners also have difficulty changing from the MDC approach to the Best Value Approach.	8.2
4	Until larger vendors change their approach, the industry will not have the momentum to change paradigms.	6.2
5	Large owners would have a difficult time changing the traditional buyers and project managers' paradigm.	5.8
6	The owner have a difficult time implementing a clarification period.	5
7	The implementation of a clarification period would tremendously increase the project performance.	9.4
8	A clear plan which includes the functions of all the stakeholders would increase the performance of the project.	8.2
9	The Best Value Approach changes the project management, risk management and the definition of risk (what the vendor does not control).	8.6
10	Decision making is reduced if the expert's plan is utilized.	8
11	The Best Value Approach is the optimal approach to increase project value and performance.	8.4
12	The expert vendor can utilize the Best Value Approach even if the selection methodology was a more traditional relationship award, if it implements a clarification period, a weekly risk report, and creates transparency.	6.6
13	Rate the vendor's performance (1 is unacceptable, 5 is average and 10 is outstanding).	8.4
14	What would the performance be under the traditional approach?	5.6
15	Was the performance delivered by the BV vendor higher than would have been delivered under the traditional approach (MDC)	4 out of 5 (yes)
16	Is the traditional PM model (MDC) accepting of the BV approach?	5 out of 5 (no)
17	Did the PMs have to change their paradigm to do BV?	3 out of 5 (yes)

The following observations are made on the responses of the owner's team:

1. The owner's team understood that their weakness was to utilize the vendor's expertise, instead of MDC the vendor.
2. They were undecided about the ability of their large organization to change.
3. Then in question 5, they identify that they do not know if their project managers can change their paradigm.
4. They did not understand the clarification period (key period where the vendor lays out a detailed plan from beginning to end of what will be delivered).
5. Even if they did not understand the clarification period, they agreed that to have a good clarification period would increase performance.
6. They also rated the vendor's performance under the BV effort as much better than under the traditional approach of MDC.
7. They all agreed that the traditional price based MDC environment was not accepting of the BV model.

This case study proposes the following:

1. The owner's visionary, who was the procurement manager, faced great resistance during the BV test from stakeholders in their own organization.
2. Some of the stakeholders attempted to remove the visionary BV expert from the project.
3. At the end of the project, the stakeholders would now do the BV effort again, even if they opposed it at the start of the project.
4. The owner's traditional ICT environment is a MDC, price based, non-transparent environment.
5. The owner's test team realized that the BV environment delivers higher performance.
6. The client has to change their paradigm to use more of the BV approach.
7. The large traditional owner and vendor is having a difficult time changing their paradigm.

By observation, both the large owner's organization and the large ICT vendor is having difficulty changing the paradigm from a price based to a Best Value paradigm. This confirms that the vendor, which is being accused of collusion, is in the price-based environment and will need to change its paradigm to avoid the possibility of collusion.

Case Study of Large Traditional ICT Vendor Submitting on a BV Effort

This large traditional ICT vendor also attempted to win a Best Value project. Being coached by an A+ BV certified expert and PBSRG, the vendor understood the BV process and knew they would require experts in order to compete and secure the subject project. The ICT vendor put their best experts on the project; one of their best project managers and best technical experts on Oracle. In responding to the request for proposal of the buyer they attempted to show how they could provide a high expertise in relation to the buyer's project objectives. In one of the three two-page documents, some of their main substantiations of their expertise include (personal communication, July 7, 2015). The following sections are directly from the ICT vendor's submittal:

“(Objective 1 & 4): The key personnel of the supplier are an experienced project leader Transition and an experienced service delivery manager, which contributes to the objective of unburdening with regards to system management and a risk-free and effective transition. The project leader Transition has successfully:

1. *Brought 2 ERP (Enterprise Resource Planning) environments to system management through a transition in the past 4 years. The results were:*
 - a. *Deviation regarding time and budget 0% (Fixed Price projects)*
 - b. *Average project budget €5.1 million*
 - c. *Customer satisfaction 8*
 - d. *On average more than 10 interfaces and 20% custom work*
2. *Taken care of 3 ERP implementations in the past 7 years, including decharge. The results were:*
 - a. *All 3 > 3 million*
 - b. *Deviation regarding time and budget less than 5%*

- c. *Customer satisfaction 8*
3. *Implemented information security 1 time at a government agency so client and supplier are compliant to the information security policy (BIR).*
 - a. *Deviation regarding time and budget 0% (Fixed Price Project)*
 - b. *Budget 70 days*
 - c. *Supplier received discharge*

The service delivery manager was responsible at two EBS & BI (E-Business Suite & Business Intelligence) clients for 3.5 years for the delivered services (FAB, TAB and TB) and achieved the following results:

1. *Client 1:*
 - a. *System management budget €325,000 per year*
 - b. *Customer satisfaction: 8*
 - c. *17 EBS modules, 16 interfaces and 164 custom work components*
2. *Client 2:*
 - a. *System management budget €1,860,000 per year*
 - b. *Customer satisfaction 8*
 - c. *22 EBS modules, 12 interfaces and 157 custom work components*
 - d. *Score of 8.4 for availability and 7.1 for performance EBS platform*
 - e. *Availability 99.98% (24/7)*

(Objective 5): Provider allocates a certified experienced information security specialist on the project that has a proven track record in meeting the compliance of managed systems. This contributes to the objective of fulfilling all requirements regarding the protection of personal data and information security. Supplier allocates an information security specialist:

1. *Certified CISSP (associate)*
2. *Who ensures the information security policy for 55 ERP contracts (34 EBS, 21 SAP) and performs 6 compliancy checks every month.*
3. *Finds an average of 1 customer security incident per month and manages it.*
4. *Supplier has been audited by an external party and holds the certificates ISO/IEC 27001 (Information Security for all types of organizations). 130 system management contracts are part of the certification. The system management contract of Buyer will also fall under this.*

*(Objective 1 & 3): Supplier achieves an availability of the production environments of at least 99.8%, 24*7 (excluding agreed maintenance slots), this contributes to the objectives of Buyer for continuous availability, availability outside regular office hours and makes working from home possible. Supplier achieved this high availability in 2014 at three similar clients with EBS/BI system management contracts:*

1. *Average availability production 99.95%*
2. *Average number of managed interfaces 17*
3. *Average number of users 1750*

(Objective 2) Supplier achieves the desired service levels from the SLA from day 1, this contributes to the effective cooperation with Buyer and in particular with Functional System Management. Performances of the supplier in 2014 are:

- 1. Handled a total of 1294 technical EBS client notifications for 34 system management contracts*
- 2. Achieved SLA response time in 91%*
- 3. Achieved SLA resolution time in 92%*
- 4. Achieved SLA resolution time for 14 technical EBS client notifications with priority "Very high" in 100%"*

The results of this submittal shocked the IT vendor as they had thought they had provided sufficient information to reflect their expertise to this project. However, the client/buyer rated them with a neutral rating of six on a scale 2 to 10 in their claims of expertise for the following reasons:

1. Good linking support to performance targets; Applicant thus demonstrates in principle to achieve all project objectives.
2. Applicant shows experienced people, which are more likely to have done ERP transitions and less frequently EBS transitions.
3. Many quantitative substantiation of the claims which the question is how verifiable (and dominant) are these numbers? Performance support is limited in relation to the actual Buyer proposed approach. This makes Vendor less clearly understand the mission.
4. Conclusion: Vendor provides a relevant achievement underpinning; here, however, shows no (dominant) added value that justifies a higher score than neutral.

The subject vendor did not make it to the shortlist. From observation, the owner's selection committee made a decision to eliminate the subject vendor (this is against the rules of the BV PIPS procurement system). The PBSRG researcher (Kashiwagi is also the creator of BV PIPS and industry expert) who analyzed this case and who understands the BV approach, comes to the following conclusions:

1. The subject vendor should have received a 10 rating based on their performance metrics supporting their expertise.
2. The owner made a decision, which goes against the BV approach and the selection phase rules.
3. If owner's representatives continue to do this, they are resisting the change to the BV paradigm of utilizing expertise and minimizing MDC.

Case Study of another Large Traditional ICT Vendor Winning a BV Effort

In the initial development phase of the Best Value Approach another large IT vendor began competing and investigating the approach. The Vendor bid and won a telephone/communications integration project. However, due to the buyers and Vendors inexperience with Best Value and the current maturity of the BV approach in the Netherlands key elements of the process were overlooked such as the clarification phase. The project ended in failure with the Vendor was

unable to deliver the client's expectations and the project reverting to a traditional paradigm of the owner making decisions and utilizing management, direction, and control (MDC).

Table 3

Vendor BV core team bid results

Involvement of BV Team	% to next phase interviews	% to next phase: clarification/won	Involvement of BV Team
BV team part of bid team	100%	56%	BV team part of bid team
BV team support role	67%	25%	BV team support role
BV team not involved	36%	18%	BV team not involved

Since then, the Vendor has become more involved and educated in the BV effort and has formed a BV core group within their organization. The BV core group has become knowledgeable and successful in winning project bids and educating company individuals to deliver high performance, some key indicator of success includes (See Table 3) (personal communication, October, 29, 2015):

1. +/- 10 members (solution consultants, bid manager, project managers).
2. Internal training sessions (since 2013 63 training sessions, > 600 participants).
3. 100% success rate in going to the interview phase of project bids when BV team is part of bid team, 67% when BV team is in a support role (less active role), and 36% when BV team is not involved at any level.
4. 56% success rate in winning bids, 25% when BV team is in a support role, and 18% when BV team is not involved at any level.
5. Vendor is expanding their effort from the sales/marketing group to the project management group and are observing that level of expertise has diminished due to long period of owner's MDC approach to ICT services.

Conclusion

The problems in the ICT industry are the same problems that were faced in the construction industry. This research resulted in three case studies. In the first case study the following was observed and documented:

1. A high performance vendor was identified who does not use management, direction, and control (MDC) in the delivery of their service by using expertise. Their performance is the best in the Dutch industry. It shows that if a vendor has a Best Value environment, they will perform to a very high level.
2. The high performance ICT vendor has no performance issues. Their performance is dominantly better than the other large traditional ICT vendors.
3. The study of their performance shows that they are in the BV environment. A bank study identified the most impactful ICT vendors in the Netherlands. The high performance vendor is one of the vendors.

Two of the other large ICT vendors who are trying to gain the capability to deliver performance were approached. Both vendor environments were in the price based environment (bureaucratic, difficulty identifying expertise, and difficulty in meeting the requirements of a BV effort). Both large ICT vendors were engaged in a BV effort, and both clients had problems in implementing the BV environment due to a lack of understanding of the BV paradigm. In both cases the clients were facing the resistance of traditional approaches to delivering projects. Both clients showed that there must be a paradigm shift in not only the vendor's approach but the client's approach. Both large ICT vendors have visionaries who realized the importance of changing the project management and risk management paradigms.

The research shows that the CIS model can be utilized in the Information Communications Technology (ICT) industry. It also validates that the largest source of risk is the owner's decision-making, and their use of management, direction, and control (MDC) to minimize risk and deliver performance. The authors propose that the use of expertise will reduce project cost and increase vendor profit.

The ICT industry is in the price-based environment where the owners are attempting to manage, direct, and control (MDC) the vendor to minimize project cost and risk. The ICT industry is facing the same issues as the construction industry. The results of this study propose that the owners can increase project value and minimize project cost by utilizing expertise. By observation of both industries and the case study results over 20 years in multiple countries and cultures, the changing of the environments from a price-based environment to a BV environment requires experts who think differently (see into the future before they do a project, identify the project requirements in simple terms that all stakeholders can understand, identify everyone's role in the delivery of the service, and minimize the risk of the project by creating transparency and not MDC to assist everyone to see into the future to minimize risk).

The ICT case studies have shown that resistant stakeholders resist because they do not understand the future outcomes, and will cooperate if they can see the future outcomes. This is the requirement of the expert, to simplify and create transparency so that all stakeholders can see the future outcomes. This environment requires a new project management approach and a new risk management approach, both of which the Dutch Best Value effort is working to develop.

This research has also validated through deductive logic and mixed methods the Industry Structure model. It has identified that the owner/buyers have created an environment, which is conducive to collusion through their MDC based procurement systems. The Dutch ICT industry collusion case is no different from the Dutch construction collusion case. The research also shows that the BV model has worked in both industries and can assist vendors in the Dutch ICT industry to improve.

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