A Case Study Analysis on the Impact of a Hybrid Application of the Best Value Approach

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The Best Value Approach (BVA) has been used as a method to procure and manage services. As the BVA is further proliferated, there are applications of the BVA which deviate from the standard approach which are labeled as hybrid processes. This research focuses on better understanding BVA hybrid projects and the implications that may arise with such deviations. Using case study research, the BVA was used to procure services for the construction of ships. The research findings show the impact of hybrid applications of the BVA including (1) the selection of suppliers based on decision making instead of expertise (2) attempts to share and transfer risk, (3) incomplete clarification phase planning by expert suppliers, and (4) incomplete use of the Weekly Risk Report and Director's report to track project deviation. The resulting hybrid application was found to have increased costs, increased decision making, and created a non-transparent environment. Suggestions have been made to improve upon these areas by applying the BVA structure including a selection process to identify expertise and a project management process which utilizes the supplier's expertise to create a structure of transparency through performance metrics.

Keywords: Best Value Approach, Hybrid, Best Value Procurement, Risk.

Introduction

The Best Value Approach (BVA) was developed at Arizona State University by Dean Kashiwagi as a method to deliver projects through its complete life cycle including procurement, contract, project and risk management. The BVA is founded on the logic of the Information Measurement Theory (IMT) which Kashiwagi developed (2017). The BVA has shown to improve performance (Duren and Doree, 2008; Rivera, 2014) and has been tested in multiple industries including information communications technology, construction, human services, health services, food services, etc. (Kashiwagi, 2013) and has shown signs of growth (Rijt and Santema, 2013).

The Best Value Approach

The Best Value Approach (BVA) is not a change in processes or steps; it is a change in paradigm applied to the entire supply chain of an organization. The BVA objective is the replacement of management, direction and control of suppliers with the utilization of expertise to create transparency. The transparency created by experts should minimize inefficient practices such as thinking, decision making, and communication. The BVA includes a standard framework of core activities to achieve this objective and assist in identifying experts including (Kashiwagi, 2017):

- Competition and identification of expert suppliers through a selection process which allows suppliers to differentiate themselves based on expertise. The differentiation should be created

through simple metrics of performance which show the supplier's ability to execute the client's specific project.
- Requiring suppliers to preplan a project from beginning to end. The planning requires a detailed schedule which is simplified into a milestone schedule including time, cost and quality metrics. Additionally, the plan identifies the activities of all stakeholders involved and assumptions made based on the lack of information of project information.
- Project and risk management through the Weekly Risk Report system which tracks deviation to initial schedule (time), cost and quality metrics and the stakeholder responsible for the deviation.
- Overall management through the Director's Report which compiles and tracks the organization's performance through the compilation of Weekly Risk Reports.

The application of these principles and core activities should (1) increase the use of expertise creating higher profit and (2) Decrease project costs through the minimization of management, direction and control and all associated activities.

Research Problem, Question and Methodology

As the BVA is further proliferated in the industry there can be variations as to the application which deviate from the standard BVA process and IMT. These deviated applications can be labeled as hybrids. As the BVA process grows and a wider range of practitioners with differing levels of understanding begin to adopt the BVA, there is potential that the number of hybrid projects increase. There is a need to understand the potential impact of hybrids to the Best Value Approach.

The purpose of this paper is to explore the implications of hybrid applications of the Best Value Approach. The research seeks to answer the following main research question: *How can the impact of hybrid applications of the Best Value Approach be understood?*

To answer this research question, a case study has been performed to identify, understand and analyze the results a hybrid application. The following methodology was followed:

- Identify an organization which has implemented a hybrid Best Value Approach throughout their organization.
- Through organization documents, workshops and interviews document the organization's BVA application, deviations and results.
- Analyze the impact of the hybrid deviations and provide future actions to improve the BVA application based on the standard BVA processes.

Case Study: Ship Builder

Background

The Ship Builder (SB) employs over 200 people, maintains a network of over 137 project related suppliers and has built over 30 Ships since founded with an average of 1.7 Ships completed a year. Recently the organization has introduced a new strategic plan to provide the perfect ship. The objective is to ensure that the organization is capable to deliver a ship that fully complies with any client requirements while remaining profitable and competitive in the industry.

The SB is unique as they outsource 100% of their construction activities to their suppliers, creating a dependence and need in the correct selection and utilization of suppliers. The Best Value Approach (BVA) was implemented in 2015 to improve the identification and utilization of the SB's network of expert suppliers. However, despite implementing the BVA for three years, the SB costs have increased, which has lowered profitability.

Network of Suppliers

The SB deals with an extensive network of over 1,000 suppliers. These suppliers are separated into three categories including: 14 comakers, 123 key-suppliers and over 1,000 suppliers. Each category has a distinct relationship with the SB. Comakers are seen as partners as they cover almost 80% of the project cost. Comakers work directly with project stakeholders including the SB personnel, other comakers and key suppliers in the development and design of the project. Key suppliers are considered subcontractors to the Comakers, their interface with other key-suppliers and the SB is limited and rarely assist in the development and design process. Suppliers are subcontractors with a small spend and risk to the project.

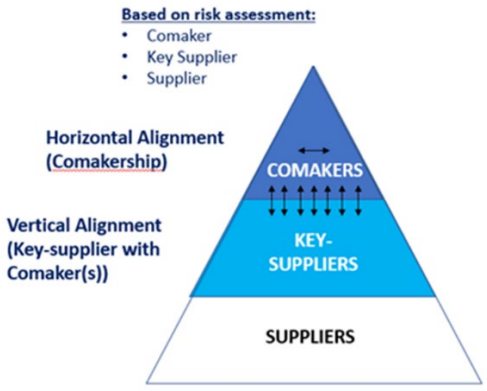

Figure 1: Co-Maker Model

Project Workflow

The SB has no standard sales process for every ship as each one is unique. However, a general framework has been defined using 5 phases (pre-preparation, preparation, selection, clarification and execution) to create transparency. The framework starts from a first sketch which eventually is developed into a final lumpsum price, based on a set of requirements defined by the SB and

the ship purchaser referred to as the client. This process is coordinated by the SB's personnel including the strategic purchaser, cost engineers, technical experts and of sales specialists.

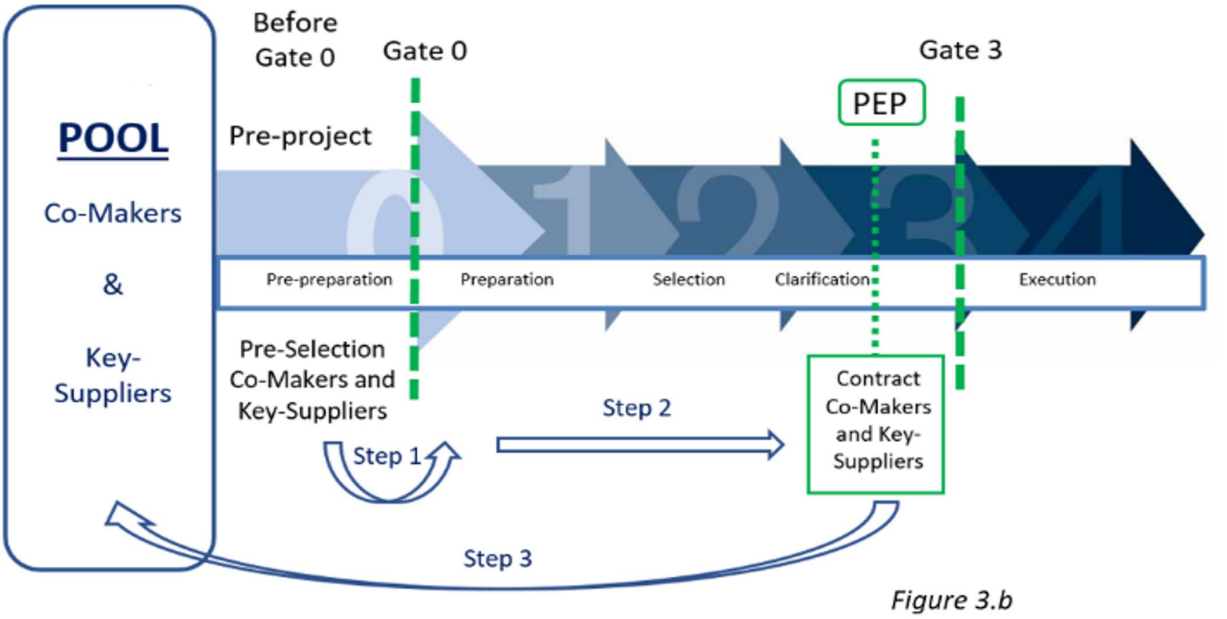

Figure 2: Project Framework Milestone Gates

- Phase 0 (Pre -preparation): a cost estimate is calculated by the SB based on a first sketch to have a rough budget indication to build the ship.
- Phase 1 (Preparation): the SB's purchaser creates a Supply Chain Initiation Document (SCID) which defines which Comakers per category will be required and requests a lumpsum price per category. Along with the SCID, the SB's naval architects then deliver a clear scope requirement which is used in the Request for Proposal (RFP).
- Phase 2 (Selection): co-makers and key suppliers are competed and selected.
- Phase 3 (Clarification): A letter of intent is created with the comakers which requires them to clearly identify and offer a fixed price for 80% of their total work. At the end of this phase the SB creates a contract and sells the ship to the client.
- Phase 4 (Execution): After the ship is sold, the SB will take the lead and start negotiations with the client to finalize the contract. Additionally, the remaining 20% of the project cost is to be procured by the SB.

Case Study: Application and Deviations from the Best Value Approach

The BVA was first introduced to the Ship Builder (SB), also referred to as the Buyer, in 2015. Due to the drastic change in paradigm, education of both the buyer's and supplier's personnel were required. The adoption level of each individual varied with some open to the approach, while others found it difficult to make the shift. For example, there were no performance metrics available on either the SB or their network of comakers. For years the SB had relied on opinion and relationships to decide which suppliers would be considered comakers in the future.

Similarly, many of the comakers who had been working with the SB for years had become accustomed to existing relationships and did not see the need in using the BVA to compete on expertise. The incomplete adoption of the BVA paradigm by both buyer and supplier was reflected in the deviations (hybrids) to the standard BVA processes.

Selection: Identification of Expertise

In running the standard BVA selection process, comakers are competed based on their expertise through the selection criteria including the level of expertise (LE), risk assessment (RA), value added (VA), and an interview. However, the SB did not strictly follow the process. For some areas, the Comakers were selected based on the SB's traditional approach of relationships and decision making instead of the comaker's expertise.

For example, during the rating of the submittals, the evaluators would recognize the Comakers from their claims and references. Instead of rating the claims and references, the evaluators would rate the comaker based on their personal experience in working with them. The evaluators heavy reliance on experience, feelings and intuition caused inaccuracy in predictions as they were not driven by metrics and transparency (Snijders, et al., 2003).

Clarification: Pre-planning and Risk Mitigation

Through the standard BVA process of the clarification phase, the expert suppliers are to take control of the project in defining the final scope, plan and contract. Releasing control of the project to the expert suppliers allow the client to ensure that sufficient pre-planning, risk management and quality control is provided on all their projects. The client would also ensure quality assurance could be performed allowing them to hold the suppliers accountable for their plans, risk management and quality control throughout the project.

In the selection phase, based on SB's project requirement, the Comakers are expected to commit 80% of their pricing up front as a "fixed cost". After the comakers submit their pricing, the SB structure does not incorporate the BVA clarification phase (as shown in figure 2) which would allow the comaker's the opportunity to clarify their complete plan and pricing through:

1. A detailed schedule which is simplified into a milestone schedule including time, cost and quality metrics.
2. Identification of the activities of all stakeholders involved and each stakeholder expected contribution to the project.
3. Supplier assumptions based on incomplete or inaccurate project information given by the SB.
4. Suggested improvement to the client's requirement based on the comakers expertise.

The clarification phase is intended to utilize the expertise of the comakers to improve and complete the inaccurate and incomplete requirement created by the SB. Instead of utilizing the comaker's expertise, the SB has skipped the clarification phase and is attempting to use management, direction and control (MDC) to transfer the SB's risk (caused by their inaccurate and incomplete requirement) and force the comakers to absorb the costs.

It is estimated by the Comakers that change orders due to the SB's inaccurate and incomplete designs is 20% per project. As a result of the SB's attempts to transfer their risk through a "fixed cost contract", Comakers have responded by increasing their costs by 20% with what they call the "SB factor" to serve as a contingency. The SB did not realize that a fixed price does not assume that suppliers must absorb the cost of risk outside their control. This type of assumption forces all stakeholders and participants into a decision making made, reactively trying to protect their own interests.

Execution: Project Management

In the standard Best Value Approach, after the clarification of the project, the supplier would then move into the execution phase. The execution phase would utilize the weekly risk report (WRR) and director's report (DR) to track the performance of the supplier. The WRR would be reported on a weekly basis with regular meeting to discuss progress. The WRR would have the following functions:

1. Track the milestone schedule and quality metrics.
2. Track deviations to the project schedule, cost and quality with the assigned stakeholder which caused the deviation.
3. Provide the performance metrics including deviation to time, cost, and quality metrics (by stakeholder).

The WRR system maintains regular meetings to the coordinate and update these core areas. The Director's report is then used to compile the WRRs and provide the organization's overall performance including deviation to time, cost, and quality metrics (by stakeholder). The DR allows projects and comakers to be compared on a relative basis.

Through the proper use of the WRR system comakers can be held accountable to mitigate risk they do not control but are not financially responsible for the impact it may cause to the project. In the situation which these risks cause deviation, the comaker can clearly document the reason for the risk and the stakeholder responsible for it. In this way, through the WRR system, transparency can be created which utilizes the supplier's expertise to mitigate risk without using MDC to transfer the financial burden of another stakeholders' risk.

The SB deviated from the BVA standard process by introducing bi-weekly reporting to monitor the Comakers performance. The WRRs being used are often not completed or used inconsistently. This causes a lack of performance information [metrics] regarding a project's status [on time, budget and client satisfaction]. Additionally, currently the only area being tracked through the WRR are the number of risks to the project and the time to mitigate those risks (see figure 6). The WRRs do not provide any of the functions the BVA WRR including milestone schedule, quality metrics, deviations to project and assigned stakeholder, and performance metrics.

Comaker	WEEK	22	24	26	28	30	32	34
COM 1	mitigated before due date		3	7	3	1		
	mitigated after due date with impact		0	1	0	2		
	In progress (after due date)		0	1	2	0		
	In progress (before due date)		7	3	1	1		
	new	10	5	2	1	2		
	Total open risks	10	12	6	4	3	0	0

Figure 6: WRR example: Risk Tracking

Due to the incomplete tracking of the WRRs, key performance information is similarly lacking in the Director's report (DR). The SB's DR only tracks risk metrics. Some of the results of project Y720 are shown in figure 7. Here you can see the number of risks per project and per comaker on a monthly basis.

Without proper schedule tracking, the documentation of deviation to cost and time caused by risk, and the identification of the stakeholder responsible for the deviations, there is a lack of transparency on projects. The lack of transparency has increased the MDC functions of the Buyer including the attempts to transfer the financial burden of risks to comakers. The Buyers actions have discouraged comakers to utilize their expertise to preplan, mitigate risk and improve performance.

		Month	JULY-1			JULY-2		
Package	Comaker	Metrics / Projects	NO. 1	NO. 2	NO. 3	NO. 1	NO. 2	NO. 3
CONSTR	COM 1	mitigated after due date with impact	2	2	1	3	3	4
		In progress (after due date)	3	1	3	2	1	1
CONSTR	COM 2	mitigated after due date with impact	0	0	0	0	0	0
		In progress (after due date)	0	0	0	0	0	0
HVAC	COM 3	mitigated after due date with impact	4	2	2	2	3	4
		In progress (after due date)	0	2	4	1	3	5
ELEC	COM 4	mitigated after due date with impact						
		In progress (after due date)						
ELEC	COM 5	mitigated after due date with impact						
		In progress (after due date)						

Figure 7: Director's Report format SB

The SB has introduced a different method of coordination during the execution phase. The project Steering Committee introduced the GAME idea, with the objective to improve collaboration between the SB and a group of Comakers. The steering committee defined three topics (Learning, Strategic Goals, and Unbound) which are discussed every 4 months. These sessions are used to improve "Working Together."

In analyzing these meetings, it was identified that there was a focus on collaboration and trying to understand each other. However, since the WRR and DR performance metrics are not available, this resulted in maximized communication. During interviews with four of the Comakers it was confirmed that there is a need for having metrics which would identify

performance. All agreed that having metrics would predict the outcome of a project without decision making or increased communication.

The meetings created an environment of non-transparency which does not allow for the critical information to be communicated nor for stakeholders to understand each other. The current structure is based on "working together" and sharing of responsibility and accountability. It is a natural law that if a group shares responsibility, no one is responsible. Sharing responsibilities leads to questions and decisions when risk occurs. It is therefore important that risk is not transferred, but expertise is used to mitigate risk caused by nonexpert stakeholders. As a result, the meeting provided little understanding of one another, minimized accountability and wasted resources.
This GAME idea is and example of how the SB and Comakers are struggling to create simplicity and transparency, caused by the deviated approach in the clarification and execution phase. The SB structure does not provide simple documentation of the plans, risk mitigation and performance of comakers that is collected through implementation of the WRR and DR.

Analysis of Resulting Hybrid Model

The BVA selection documents (LE, RA, and VA) and rating process were created to minimize the use of decision making through performance metrics (Kashiwagi, 2014). The SB's selection process does not strictly follow the BVA selection documents and rating system, as a result the SB does not have documentation which justifies the selection of comakers through objective evidence. The lack of objective documentation increases the risk of selection based on criteria other than the comakers expertise.

The BVA clarification documents are intended to provide transparency of the schedule, cost and responsibilities of each project stakeholder (Kashiwagi, 2014). The SB's clarification process does not require such clarification documents and as a result the SB projects do not start with a project plan inclusive of a schedule with assigned responsibilities of each project stakeholder, detailed project cost, and risk management plan. The lack of a clear plan inclusive of costs and responsibilities increases the risk of project failure (Jiang et al., 1999; Kappelman et al., 2002).

In the execution phase the SB should does not utilize the standard functions of the WRR and DR including tracking of project deviations, tracking of milestone schedule and quality metrics, and displaying the project performance of deviation to time, cost, and quality metrics [by stakeholder]. The adoption of these standard functions have shown to (Kashiwagi et al., 2009; Sullivan et al., 2007):

- Create transparency for all parties involved.
- Communicate information as quickly as possible without getting into issues with Comakers.
- Utilize the expertise of makers to preplan and mitigate risk.
- Assign accountability and encourage continuous improvement.

As a result of the deviation of the WRR and DR the SB does not have accurate performance metrics on their projects including the time deviation, cost deviation, project stakeholders

responsible for deviations or customer satisfaction. Without accurate performance metrics it is not possible to identify the current state of their projects nor the effectiveness of the methods used.

In the analysis of the implementation of the BVA in the SB, there were various deviations to the standard BVA process. In answering the papers research question, the impact of the hybrid application of the Best Value Approach resulted in performance results (increased cost and decreased profit) which were lower than the documented results of standard BVA applications. Additional project characteristics contrary to the BVA emerged including:

- Shared responsibilities and reliance on relationships.
- Increased flow of detailed information.
- Increased communication (meetings, emails, etc.).
- Silo and self-preservation mentality.

In order to improve the situation, it is advised to integrate and adopt the standard BVA core processes as mentioned in the selection, clarification and execution phase without any deviations.

Conclusion

The Best Value Approach (BVA) is not a change in processes or steps; it is a change in paradigm. However, to assist in this change in paradigm and framework has been created to simplify and assist in emphasizing this new paradigm. In deviating from this framework hybrids have an increased risk of poor performance as shown through the SB case study. Applicators of the BVA should be conscious and aware of these risks and ensure they have a Best Value Approach Expert when making any deviations to the standard framework.

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