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Best Value Process in the Selection of Software Services

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Abstract
Software selections and implementations have high rates of failure. Clients often perceive vendors as not providing services, not providing realistic expectations, and not providing adequate training. Software providers often consider clients as not investing enough resources to learn the system, having inadequate in-house technical knowledge, and highly liquid scopes. In this paper, best value processes developed and tested in construction, design, and facility management are transferred to the selection of software services. For the research, multiple real-time procurements and implementations were run. For the core analysis, a single selection and implementation is presented. In the analysis, the selection and installation of the primary software occurred in a highly political environment with performance metrics sometimes yielding to personal preferences. In the testing, the best value system was integrated into the selection process after the RFP had already been released to the vendors. Four vendors participated and were required, in addition to their standard technical and marketing proposals, to submit performance surveys of their key personnel, risk analysis plans, participate in individual interviews, and break out all costs in detail. The political pressures on the selection team helped funnel the final decision of a "best value" vendor. Once selected the vendor was required to participate in a quality control/preplanning phase to map and schedule the project. In addition, the vendor was required to report weekly on project status (budget, schedule, technical, and client satisfaction), all risks, and all client required action items. The results of the research are presented.

Keywords
Software service, best value, performance information, risk analysis

1. Introduction

In response to the need for higher industry performance, a value-based best value process was developed (Kashiwagi, 2004). Performance based best value incorporates a vendor selection process that is based on price and performance, along with quality control methodologies and measurement techniques. The process assists clients in selecting the best service provider, by collecting performance data on each competing vendor. The process transfers risk to the most qualified party and utilizes performance measuring, throughout the contract, to generate accountability.

Best value was originally implemented in the construction industry. Before best value, the construction industry was generating a number of new methods in an attempt to improve the industry's performance problems. Some of the methods generated were alternative delivery methods, partnering, lean construction, and just-in-time construction. Although these methods improved operations, they have not completely corrected the performance issues. Best value has been implemented on 484 projects, totaling over $521 million. The results are 98% of projects finishing on time, on budget, with zero contractor generated cost change orders, and 100% client satisfaction (PBSRG, 2007).

The best value process is divided into three phases (illustrated in Figure 1. The first phase is known as the selection phase. Through four filters, this phase identifies the potential best value vendor. The second phase of the process is the quality control/preplanning phase. Only the potential best value vendor advances to this second phase. During the quality control/preplanning phase, the vendor goes into detail regarding how they are going to perform the work. At this point a schedule is presented and all risks/concerns are communicated and planned for. At this point, if the client is satisfied with the vendor's performance, they will execute the contract. The last phase of the process is the management by risk minimization phase. This phase is carried out for the entire duration of the contract. Management by risk minimization is simplified as a weekly reporting system of the contract status. The reports present information on all risks, the budget, the schedule, client required action items, and client satisfaction. Finally, at contract completion, the client rates the vendor's performance, which has impact on whether that vendor will get work with that client again in the future.

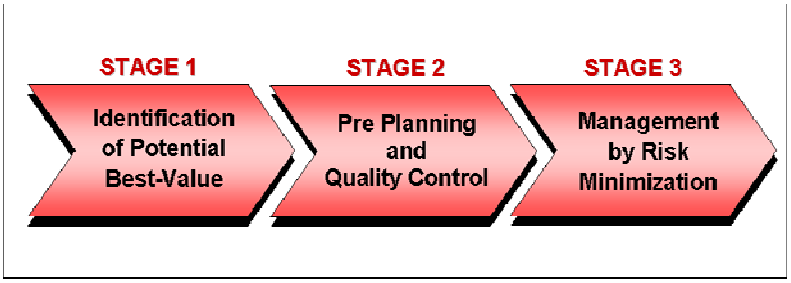


Figure 1: Best Value Process

Recently, the authors have implemented best value in industries other than construction, which are also in need of performance improvements. One of those industries is the software service industry. This paper will explain the implementation of best value on a software service vendor selection and implementation.

2. Problem Statement

The software service industry has been tagged with a reputation of not providing services, not providing realistic expectations, and not providing adequate training. Though statistics on actual performance are hard to gather, Svennson and Aurum (2006) provide a report of software implementation having a success rate of 28%, with success being defined as on time, on budget, and with a satisfied customer. The low success rate is mirrored by a 23% complete failure rate, with the remaining 49% of implementations being finished, but with limited success. The limited success of software implementations led a purchaser of software to approach the authors in an attempt to apply best value concepts into a recent software buy.

3. Hypothesis

The best value process will help minimize the risks and increase the performance of software implementations. Performance includes cost, time, and customer satisfaction metrics. In the case of this research, the client had expectations in meeting the budget, the schedule, in receiving service, in being given realistic expectations by the vendor, and in receiving adequate training from the vendor.

To test the hypothesis, best value concepts, though haphazardly, were applied to a software selection and implementation at a large public University. The application and results of the effort are provided in the remainder of this paper.

4. Test Application of Best Value on Software Services

XYZ University (*initially anonymous*) was in the market for new IT budgeting and planning software. The software was needed for all campus expenditures, which meant large scale applications and usages that would work immediately as well as throughout the future seven-years. Other concerns of the client organization included implementation, training, and integration of the new budgeting and planning software into current and future data management systems. The client operates with an annual budget of over $1.31 Billion and over 65,500 employees, researchers, students, staff, etc. Consequently, the software would need to be robust and implemented on a tremendous scale.

4.1 The Original Requirements

The University released their RFP in the traditional manner. XYZ University's traditional RFP first required the software vendors to meet the following list of qualifications

1. Successful Projects – Provide a summary of successful projects for at least three (3) and up to ten (10) clients, whose systems are comparable in complexity, use, and size to the system described in this RFP. Summary for each should not exceed two pages.
2. Project and personnel experience – Provide resumes for all individuals who will be assigned to the project. Identify the project manager.
3. Total detailed cost to purchase, successfully implement and maintain a budget system. This would include all costs associated with integrating a budget system with the platforms identified in the Scope of Work. Include software, hardware, and consulting costs.
4. Provide a timeline for the budget module implementation and a proposed method of accomplishing the work outlined in the Scope of Work. This would include the steps needed to successfully implement a budget system as well as the timeline for each step.
5. Identify level of support and local representation for all support issues.
6. Please include complete description of all modules identified in the scope of work. Identify number of releases and any pending releases of modules presented.
7. Identify level of support the University must provide to assist in implementing a budget system.
8. Currently no decision has been made, but it is the intent of the University to begin a [software name] implementation. Please describe the migration from current systems identified in the statement of work to an ERP system such as [software name].
9. Identify the detailed costs required to implement each component of future system functionality that is not currently a part of this project: grant analysis and reporting, financial reporting, capital budgeting, accounting consolidation, dashboards, and any other functionality available through the proposed system.

Once the proposals were submitted, the vendors were to be short-listed. The remaining vendors were then to give a demonstration of their software. All of the information was going to be evaluated and an award was going to be made. At the time of the RFP issuance, there was no weighting or scoring mechanism set

up to perform a uniform, unbiased, and objective evaluation. The evaluation was planned to be subjective until the data was seen, then a scoring mechanism would be considered.

Other key issues to the RFP that were notable for inefficiency included:

- Allowance of marketing within the proposal documentation was encouraged as no performance data was required of the vendors. Performance data could have included:
  - Customer satisfaction surveys on the software
  - Implementation schedule performance for past clients (planned vs. original)
  - Success rate (on time, on budget, customer satisfaction) for software implementations
  - Success rate in software usage once installed
  - Hours of training required (which is hours that the trainees are not working at their assigned jobs)
- Highly technical submissions were required (No. 6 above) with a highly non-technical review and selection committee (of the 20+ person committee, only two were knowledgeable in "technical jargon" and the current University hardware systems. The majority of the committee was composed of end users).
- The vendors were given no education on the expectations of the University outside of the RFP document. The vendors were not to meet with the buyer or the users of the software during their proposal preparation.

4.2 Implementing Best Value

Three weeks before the proposal due date, the University introduced the authors' research team to implement the best value process. This delay in implementation caused some changes to the original process described in the Introduction, as well as modifications to the best value process. An addendum that the research team generated contained four additional requirements.

The first two added requirements were associated with the selection phase of the best value process. The first of the new requirements was the collection of past performance information. Past performance surveys were required from the firm, the project manager, and the software engineer (with a requirement of only one to three surveys for each entity). The vendors were asked to send the surveys to only their best past clients and were encouraged to call ahead to ensure that the past clients would provide positive ratings. The second additional requirement associated with the selection phase was a risk assessment and value added plan. The risk assessment plan consisted of identifying potential project risks and developing a plan for minimizing the risks. The value added portion allowed the vendors to focus on points of value differentiation that separated themselves from their competitors. (Unfortunately, time did not allow for an education and explanation of the expectations for a risk assessment and value added plan, which resulted in poorly prepared plans by the vendors and a decrease in the effectiveness of the criterion.)

The third best value requirement added was the generation of pre-award documents (Stage 2 in the best value process (Figure 1)) and was related to the quality control/preplanning phase. The pre-award documents consisted of a schedule, the documentation of all risks and plans to minimize those risks, a list of client action items (tasks need by the vendor from the client), and commitments to dates by the client/University personnel (data transfer, hardware installations, etc.). This phase of the process was designated for ironing out all details, coordination issues, and risks, before the contract began.

The last requirement added was the weekly reporting system. The weekly report was for the tracking and documentation of unforeseen project risks and the effect of those risks on the schedule, the budget, and customer satisfaction. The weekly risk report also tracked and documented client action items correlated to the unforeseen risks, and was therefore was to help hold each entity (vendor and client) accountable.

4.3 The Risks in the Research Test

In implementing best value components, after the vendors had been educated and released in the traditional process, the following risks were identified:

1. No time for the education of vendors in the use of the best value system
    a. No education on the risk assessment and value added plan
    b. No education on the requirements of the pre-award phase
2. No perceived "buy-in" from upper management personnel at the University (vendors did not see the University taking the best value process seriously, but rather as a test case)
3. Minimal time was available for collecting past performance information.
    a. The amount of data was restricted to only a few surveys
4. The full traditional RFP was still required
    a. The average proposal length was 90 pages of technical descriptions and screen shots, with an additional 20-30 pages of resumes, pictures, and success stories.
    b. No differentiation was seen in the proposals.

Once the best value aspects were introduced, the University realized that the traditional RFP used had no measurement system, no weights, and no way to effectively differentiate value. The measurement and observation of the research team and the best value process within the software selection and implementation began to show the inefficiencies being incorporated by the University's procurement office and by the software committee and its prior decisions.

4.4 Selection and Award

Four firms competed for the contract. XYZ University evaluated the competing vendors via the combined efforts of a University committee and technical experts. The proposals submitted by each of the vendors, in response to the traditional RFP, contained a plethora of marketing, they were very technical, and as a result, the proposals were difficult to differentiate. This difficulty in identifying value in the proposals was supported by follow-up surveys and interviews by the research team to the committee members. In fact, the committee rated the non-best value selection materials (proposal, resume, past project descriptions, etc.) a 6 out of 10 in their ability to help identify the best vendor.

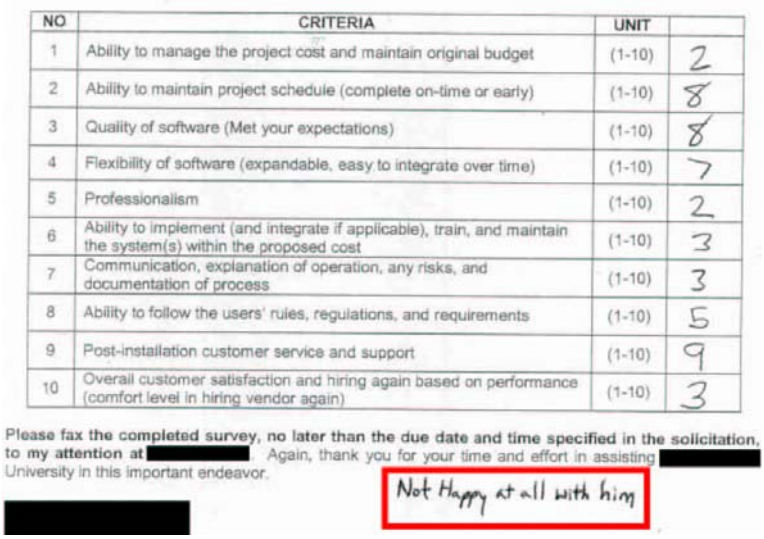
As discussed previously, regarding the effectiveness of best value criteria decreasing due to the lack of time and therefore education, the effectiveness of past performance surveys was also impared. This imparment was due to a lack of time, which resulted in a shortage of information. The largest average number of customer responses to the past performance surveys was three. Even with the shortage of information, Figure 2 shows the only past performance survey for one vendor's (Vendor C's) project manager clearly identifing risk: and the vendors were asked to only send surveys to their best past clients.

After the past performance information was collected, the vendors were interviewed and also provided a demonstration of their products. Due to the lack of time, the vendors risk assessment plans were also collected during the interviews. Because some of the University's committee members were absent for the interviews and demonstrations, the vendors created online demonstrations. The online demonstration then became an additional criterion for which the vendors were rated.

Table 1 shows the results of the selection phase from the modified best value process. The weighting for the scores in each category (to arrive at a total percentile or score) was not allowed by procurement since weighting was not given to the vendors in the original RFP.

The Vendor A was eliminated from the competition because their software system was incompatible with XYZ University's platform (given as Acceptability of System below – a pass/fail metric). Vendor D was

not competitive due to cost, when compared to remaining vendors B and C. The important criteria in the selection phase, due to differentiation between vendors, were the interviews and the demonstrations. The interviews introduced the University to the potential project personnel that they would rely on to deliver the service. The demonstrations showed the University what the software would do and how it would work. Therefore, vendor B was seen by the research team and the project manager as the better vendor. Vendor B had the best ratings for the average # of customer responses, interviews, demonstrations, and arguably customer satisfaction (based on their average # of customer responses). The average number of customer responses represents the average number of surveys received by different past clients for the vendor, project manager, and the software engineer combined.



NO	CRITERIA	UNIT	
1	Ability to manage the project cost and maintain original budget	(1-10)	2
2	Ability to maintain project schedule (complete on-time or early)	(1-10)	8
3	Quality of software (Met your expectations)	(1-10)	8
4	Flexibility of software (expandable, easy to integrate over time)	(1-10)	7
5	Professionalism	(1-10)	2
6	Ability to implement (and integrate if applicable), train, and maintain the system(s) within the proposed cost	(1-10)	3
7	Communication, explanation of operation, any risks, and documentation of process	(1-10)	3
8	Ability to follow the users' rules, regulations, and requirements	(1-10)	5
9	Post-installation customer service and support	(1-10)	9
10	Overall customer satisfaction and hiring again based on performance (comfort level in hiring vendor again)	(1-10)	3

Please fax the completed survey, no later than the due date and time specified in the solicitation, to my attention at [redacted]. Again, thank you for your time and effort in assisting [redacted] University in this important endeavor.

[redacted]

Not Happy at all with him

Figure 2: Performance Questionnaire

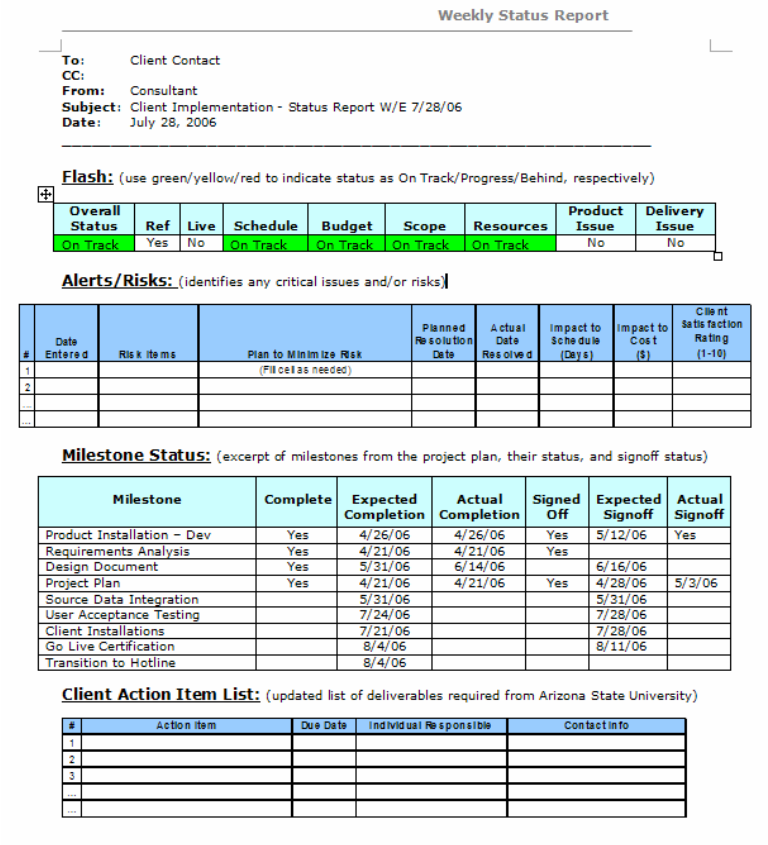
Table 1: Selection Results

No	Performance Criterion	A	B	C	D
1	Price	$662,390	$779,880	$701,233	$857,235
2	Customer Satisfaction (1-10)	9.1	8.0	5.0	8.6
3	Average # of Customer Responses	4	3	1	1
4	Bid Package Evaluation	4.5	5.7	6.9	6.8
5	Acceptability of System	70%	88%	94%	86%
6	Interviews	6.6	8.6	7.3	6.7
7	Demonstration	4.9	9.2	7.4	5.1
8	Web Demos	-	6.4	7.6	7.4

Vendor C was ultimately awarded the contract by the University. Although it was already collected, the core group of decision makers was not allowed to see the data shown in Table 1. It is still unclear as to why Vendor C was chosen, but "scuttlebutt" said that a key senior member of the decision making team had used vendor C at a previous place of employment (i.e. relationship bias). This is unsubstantiated but would help explain the selection. Once Vendor C was chosen to move into the pre-award phase, the University told them to hold off on the pre-award document requirements introduced by the best value process. This not only increased the risk of problems occurring on the project, but also gave the vendor the impression that the University was not taking the best value process or the research group seriously.

It was decided by the University that it would be better to wait for a schedule, risk plan, and action list until after the implementation had begun, so the vendor would better know the true needs of the University. Conversely, the best value process offers that a vendor should know the basic requirements and needs of a client, and be able to perceive where the key areas of risk might be, based upon their experience.

Another deviation from the process came when the vendor insisted on using a modified version of a proprietary report for the weekly report (Figure 3) and then fought against having it included in the contract requirements once the contract was forged and ready to sign. The requirement was finalized as part of the contract.



Weekly Status Report

To: Client Contact
CC:
From: Consultant
Subject: Client Implementation - Status Report W/E 7/28/06
Date: July 28, 2006

Flash: (use green/yellow/red to indicate status as On Track/Progress/Behind, respectively)

Overall Status	Ref	Live	Schedule	Budget	Scope	Resources	Product Issue	Delivery Issue
On Track	Yes	No	On Track	On Track	On Track	On Track	No	No

Alerts/Risks: (identifies any critical issues and/or risks)

#	Date Entered	Risk items	Plan to Minimize Risk	Planned Resolution Date	Actual Date Resolved	Impact to Schedule (Days)	Impact to Cost ($)	Client Satisfaction Rating (1-10)
1			(Fill cell as needed)					
2								
...								

Milestone Status: (excerpt of milestones from the project plan, their status, and signoff status)

Milestone	Complete	Expected Completion	Actual Completion	Signed Off	Expected Signoff	Actual Signoff
Product Installation – Dev	Yes	4/26/06	4/26/06	Yes	5/12/06	Yes
Requirements Analysis	Yes	4/21/06	4/21/06	Yes		
Design Document	Yes	5/31/06	6/14/06		6/16/06	
Project Plan	Yes	4/21/06	4/21/06	Yes	4/28/06	5/3/06
Source Data Integration		5/31/06			5/31/06	
User Acceptance Testing		7/24/06			7/28/06	
Client Installations		7/21/06			7/28/06	
Go Live Certification		8/4/06			8/11/06	
Transition to Hotline		8/4/06				

Client Action Item List: (updated list of deliverables required from Arizona State University)

#	Action Item	Due Date	Individual Responsible	Contact Info
1				
2				
3				
...				
...				

Figure 3: Sample Modified Weekly Risk Report

4.5 Project Results

Approximately one month into the project, the service began reflect the 72% non-performance rate cited buy Svennson (2006). The following occurred:

- The project immediately fell behind schedule due to differing expectations of the client group and software provider. The client expected the vendor to lead them through the process – the vendor waited for the client to tell them what to do.
- Within a month of the contract signing, the vendor issued a $78,000 change order for additional consulting charges due to their under estimate of support required by the University. The University at first denied the change, but later had to accept in order to maintain project progress.

- The vendor stopped utilizing the weekly report (Figure 3), because it was reflecting and logging all mistakes, delays, cost overruns, and client concerns/problems.
- The vendor's project manager stopped communicating with the University and left the country (twice) to work with other clients.
- The vendor proposed the client implement their latest version of software, ensuring, though it was a beta version, that it would work immediately and no additional cost or time would be required of the client. The installation and testing of the beta version led to further problems, as it was found to have no functional components. This required additional client resources, over the allocated budget, resulting in a $60,000 expenditure by the University (in addition to the $78,000 change order previously issued).
- Frustrated, the client project manager wrote a list of grievances (over three-single spaced pages in length) to the vendor hope for better results and effort from the vendor. The vendor's only response was an email correspondence – "Thanks for the feedback."

In the end, the project was delayed 220%. Once the University became increasing involved and added three additional members to the client PM team, problems began to be minimized and the vendor supplied an adequate product and service. In debriefing, the University said, "We had to push them (the vendor), but once we did, they seemed to perform."

5. Conclusion/Lessons Learned

This research was the first test in proving or disproving the hypothesis that best value concepts and methodologies can improve the performance of the software services industry. From this test, the hypothesis cannot be supported or rejected due to the impurity and haphazardness in the application of the best value process. However, the research was not seen as a failure, instead it was a tremendous learning opportunity. The following observations were realized and are worthy of future exploration:

- Traditional software proposal contain mostly marketing or highly technical material. This results in difficulty for evaluators to differentiate between vendors.
- Performance measurement is not standard practice in software services.
- Due to the industry paradigm of marketing and salesmanship, identification and minimization of risks are difficult for software vendors to achieve in a proposal process.
- Clients can be forced to take the lead in the implementation process, even though the vendor is the true expert. This practice requires the client to be the primary risk minimizer, instead of the expert vendor.
- Education of the best value process is paramount as the concepts often require a cultural shift in approaching services.
- Contracts contain no leverage and very little protection over poor performing vendors.

6. References

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