Outsourcing Evaluation Approach For An Information Systems Project

Paul Rosenthal, (E-mail: prosent@calstatela.edu), California State University, Los Angeles
L. Jane Park, (E-mail: jpark@calstatela.edu), California State University, Los Angeles

Abstract

This paper presents a detailed methodology for computing the technical and managerial scores of a Worth Index used in the evaluation of proposals during an Information Systems outsourcing project

The IS/IT industry does not have a long tradition of outsourcing. This is rapidly changing, since outsourcing for IS/IT organizations is a natural evolution from traditional industrial purchasing and subcontracting. A survey of nineteen CIO's by the IS Department at Tennessee Technology University identified six major reasons for considering outsourcing.[1]

All of the interviewed CIO's stated that cost savings, increased value, and concentrating on their core business were primary reasons for considering outsourcing.

Approximately half the CIO's stated that focus on more critical areas, increasing IS resources' flexibility, and leveraging information resources were also major reasons.

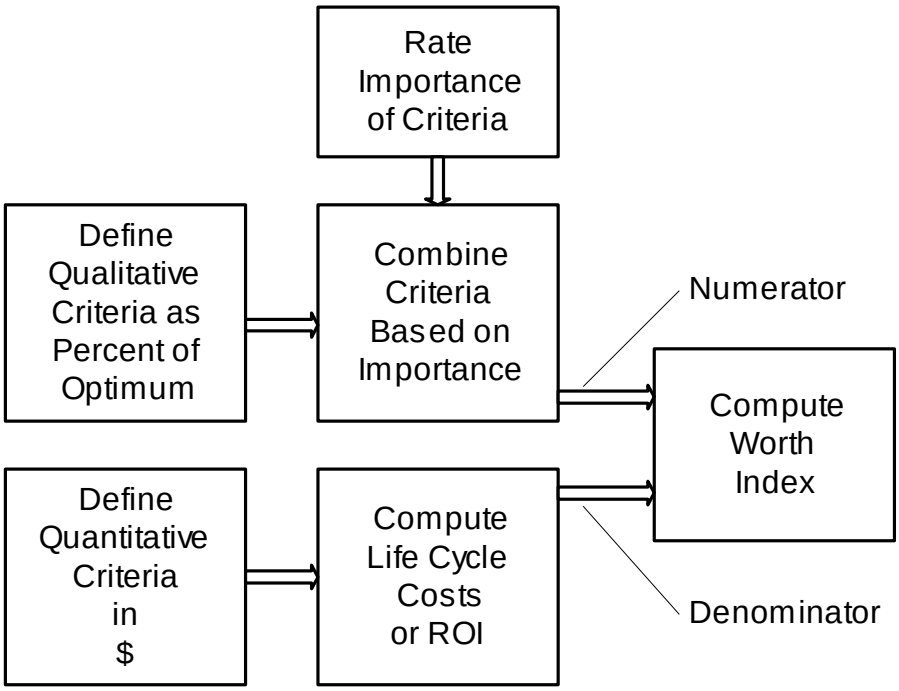
The evaluation of providers/vendors is frequently based on a cost-value analysis. The basic method for such analysis is the computation of a worth index. Since almost all outsourcing proposals are required to provide a technical and managerial proposal and a separate cost proposal, the worth index is computed as:

Worth Index = (∀Technical Score + ∃Managerial Score) / Life Cycle Cost

This paper includes a detailed methodology for computing the technical and managerial scores of the Worth Index. A detailed methodology for computing the Life Cycle Cost is outside the scope of this paper and can be found in the authors paper "Costing and Presentation Approach for an Information Systems Project". [2] The Worth Index methodology presented in these papers is applicable to functional sourcing opportunities in six areas: the full IS organization (excluding strategic planning), IS development projects, IS data center production, IS technical support, telecommunications, and architecture planning support. These functional sourcing opportunity areas exist at both the enterprise and department/ workgroup levels.

Quantitative Evaluation Methodology

A fabricated comparison between an in-house and three external vendors of an applications software package will be used to illustrate this papers proposed quantitative worth-index based process. The quantitative evaluation process is diagrammed in the following model.



Worth Index Computation Process

Step 1: Define Value of Specific Criteria

The specific criteria used in this illustration include:

- **Functionality**
  Package capability related to functional requirements as a percentage of perfect match.

- **Platform Utilization**
  Forecasted utilization of current processing platform as a percentage of maximum feasible available capacity.

- **Survival Probability**
  Forecasted probability, as a percent, that the vendor package will maintain or expand its share of market over the planning horizon of this application.

- **Initial Cost**
  Front end cost in $ of software, support, training, conversion and taxes.

- **Annual Cost**
  Continuing costs in $ of maintenance and support.

- **Annual Benefits**
  Estimated cost reductions or profit increases in $ due to converting to the new system.

  More details on these criteria can be found in the following section – "Sourcing Evaluation Criteria".

  A typical result of the application of this step is shown in the following table.

	Multi-Product Vendor - A	Specialized Vendor - B	Start up Vendor - C	In-house Development
Qualitative Criteria				
Functionality	70%	90%		100%
Platform Utilization	30%	40%		40%
Survival Probability	90%	80%		100%
Quantitative Criteria				
Initial Cost (000)	$300	$400		$800
Annual Cost (000)	$100	$100		$150
Annual Benefits (000)	$200	$250		$280

Step 2: Compute Life Cycle Costs and ROI

Computing a return on investment (ROI), requires (in addition to initial and continuing costs), an estimated life of the project[1]. Currently many investments in applications software involve a planning horizon that is twice the platforms technology cycle, while most investments in platform alternatives involve a single technology cycle planning horizon.

Therefore assuming a ten year planning horizon (twice the mainframe five year technology cycle) with no adjustment for inflation, an ROI computation using the internal-rate-of-return methodology follows.

	Computation Using Financial Calculator			
	Vendor - A	Vendor - B	Vendor - C	In-house Development
1) Enter Trade-In value (FV)	0	0	0	0
2) Enter Product Life (n)	10	10	10	10
3) Enter Initial Cost (PV)	-300	-400	-400	-800
4) Enter Annual Savings (PMT)	200 - 100	250 - 100	280 - 100	280 - 150
5) Compute IRR (COMP)(i)	31%	36%	44%	10%

Step 3: Compute Qualitative Criteria Index

Combining the three illustrated technical criteria requires that their relative importance be determined. This type of importance ranking methodology (called the Delphi Method when first presented by Rand Corporation during the 1950's) includes the use of expert's rankings which are then normalized into a weighting scale running from 0 to 1. Applying this approach to the illustration results in the following table:

[1] Net present value is not used here because it also requires a forecast of cost of funds over the project life cycle.

		Vendor - A		Vendor - B		Vendor - C		In-House	
	Weight	Value	Wt'd Value	Value	Wt'd Value	Value	Wt'd Value	Value	Wt'd Value
Functionality	.5	.7	.35	.9	.45	1.0	.50	1.0	.50
Platform Utilization	.2	.3	.06	.4	.08	.4	.08	.4	.08
Survival Probability	.3	.9	.27	.8	.24	.3	.09	1.0	.30
Weighted Total			.68		.77		.67		.88
As a % of Perfect		68		77		67		88	

The weighted value columns are the product of the weights assigned by the experts times the evaluation criteria scores contained in the table from Step 1.

Step 4: Compute Worth Index

The computation of a quantitative worth index for the illustrative evaluation is now straight forward.

	Worth Index Calculation			
	Multi-product Vendor - A	Specialized Vendor - B	Start up Vendor - C	In-house Development
Technical Score (from Step 3)	68	77	67	88
ROI (from Step 2)	.31	.36	.44	10
Worth Index (Technical Score X ROI)	21	28	29	.9

Based on the worth index, vendors B and C are approximately equal from an objective (quantitative) viewpoint. The decision between them would be based on subjective criteria such as competitive issues and control

The worth index can be computed in three forms, using the ROI as shown in the illustration, using net present value (NPV), and using life cycle costs. The formulas for each follow.

- **Using ROI**
  WORTH = SCORE X ROI

- **Using NPV**
  WORTH = SCORE X NPV

- **Using Life Cycle Costs**
  WORTH = SCORE ÷ COST

The next section will discuss and structure the subjective and objective evaluation criteria relevant to scoring decisions.

Sourcing Evaluation Criteria

The evaluation criteria used in selecting sourcing alternatives can be divided into two major categories:

- **Objective Criteria**
  These can be quantified through costing or scoring.

- **Subjective Criteria**
  These require intuitive weighing. They are normally used for screening unacceptable approaches prior to a formal comparison, and to select between approaches that are tried after an objective comparison.

The objective criteria used to compute Life Cycle Costs & ROI are discussed in the prior chapter of this report. The objective criteria evaluated through scoring are discussed in this section.

The scoring of criteria can often have different forms when applied to in-house and external vendors. When relevant, these differences are highlighted.

Criterion 1 - End User Deliverables Functionality

When relevant, this functionality criterion evaluates the quality, from the view of the user, of the application/product/service deliverables to be provided by in-house or vendor organizations.

- **Criterion**
  What is the quality of the deliverables in terms of meeting end user defined functional requirements.

- **Scoring**
  The evaluation measures for developing a score for meeting functional requirements is completely dependant on the type of deliverable (eg. application system, processing capability, image system, strategic plan, etc.). A small portion of a multi-page functional evaluation follows as an example of the type of approach often used.

Deliverables Functionality Example - Applications Software

REQ		Essential (1)/ Desired (.8)	Standard (1)/ Custom (.5)	Points
7	Generate Monthly Reports			
7.1	Yield Analysis	D	C	.4
7.2	Arrears Trends	E	S	1.0
7.3	Loan Growth	D	S	.8
7.4	Rate of Return	E	C	.5
	TOTAL POINTS	3.6	3.0	2.7
	AVERAGE POINTS			.75

Deliverables Functionality Example - Data Center

REQ		Essential (1)/ Desired (.8)	Standard (1)/ Custom (.5)	Points
5	Help Desk Capability			
5.1	Automated Task Status	E	C	.5
5.2	Automated Report Status	E	S	1.0
5.3	Automated Input Status	E	S	1.0
5.4	Rescheduling Capability	D	C	.4
	Total Points	3.8	3.0	2.9
	Average Points			.76

Criterion 2 - Product/Service Life

When relevant, this criterion is used during the evaluation of products where continuous enhancement is needed over the planned life of the product or service. Enhancement requirements can be due to such items as evolving user/legal requirements and evolving technologies.

- **In-House Supplier Criteria**
  In-house suppliers are often assumed to have an indefinite life. This can be very misleading if the internal enhancement skills required to maintain the product or service are not within the mainstream of IS activities.
  A. What is the probability that the skills needed for support of the product/service will be available over the project/service life cycle?

- **External Vendor Criterion**
  B. What is the probability that the firm supplying support will maintain or improve its competitive position over the project/service life cycle?
  C. What is the probability that the firm supplying support will still be providing adequate support over the project/service life cycle?

- **Criterion Applicability**

HARDWARE:	
Processing	A,C
Network	A,C
SOFTWARE:	
Applications	A,B
Systems	A,C

The scoring of this criterion is subjective and normally based on the number of years that in-house capability has been maintained or on the number of years that a potential vendor has been supplying the product and its competitive position during those years.

- **Scoring**
  Typical evaluation measures for developing a score for the product/service life criterion with sample weights follow for in-house and vendor providers

.

I. *Evaluating In-house Providers*		**Weights**
A. Product/Service Stability (.6)		
1. At least "X" years of experience		.3
2. Required expertise available from other areas		.3
B. Reputation of provider organization (.4)		
1. IT Management satisfaction		.2
2. Users satisfaction		.2
	Total	1.0

II. *Evaluating Vendors*		**Weights**
A. Product/Service Stability (.3)		
1. Firm at least "Y" years old		.1
2. Product at least "Z" years old		.1
3. Specializes in Product/Service Area		.1
B. Financial Stability (.3)		
1. Profitability		.15
2. Asset/Equity Strength		.15
C. Reference Sites Reputation (.4)		
1. Product/Service Satisfaction		.2
2. Support/Training Satisfaction		.2
	Total	1.0

Criterion 3 - Project Implementation Quality

When relevant, this criterion is used to evaluate the project management, implementation and maintenance support, and implementation planning quality that in-house and vendor providers intend to furnish for implementation of the product or service.

- **Criterion**
  What is the quality of the personnel to be assigned, and what is the probability that they will remain throughout the implementation period.
- **Scoring**
  Typical evaluation measures for developing a score for support quality together with sample weights follow.

Implementation Quality		**Weights**
A. Project Management (.4)		.2
1. Project Director Quality		.2
2. Project Implementation Team Quality		
B. Implementation Plan (.2)		.1
1. Schedule Realism		.1
2. Task Definition Realism		
C. Operations Support (.2)		.1
1. Training Quality		.1
2. Documentation Quality		
D. Maintenance Support (.2)		.1
1. Help Line Quality		.1
2. Release System Quality		1.0
	Total	

Criterion 4 - Platform Quality and Performance

When relevant, this criteria is used to evaluate the quality & performance of the processing platform(s) that in-house and vendor providers intend to use to process the desired product/service.

- **Criterion**
  What is the cost/performance, modularity, and reliability of the platform to be used; and what is the probability that it can meet anticipated performance, growth and capability requirements over the life of the project/service.

- **Scoring**
  Typical evaluation measures for developing a score for the processing platform, together with sample weights follow.

Processing Platform Quality	**Weights**
A. Platform Performance (.2)	
1. Anticipated online performance	.1
2. Anticipated batch performance	.1
B. Software Availability (.2)	
1. Development Software Quality	.1
2. Applications Software Quality	.1
C. Platform Vendor Quality (.2)	
1. Firm at least (3 x technology cycle) years old	.1
2. Financial Strength	.05
3. History of Stability & Growth	.05
D. Hardware Components Quality (.2)	
1. Product Line at least (2 x technology cycle) years old	
2. Quality & Support Reputation	.05
3. Expandable	.05
4. Availability of Compatible Systems	.05
E. Systems Software Components Quality (.2)	.05
1. Product Line at Least (1 x technology cycle) years old	
2. Quality & Support Reputation	.05
3. Enhancement Reputation	.05
4. Availability of Alternatives	.05
	.05
Total	1.00

Criterion 5 - Support Quality

When relevant, this criterion is used to evaluate the quality of support/service anticipated from in-house and vendor providers.

- **Criterion**
  What is the quality of the persons and organizations supporting the project throughout the operational life of the project/service.

- **Scoring**
  Typical evaluation measures for developing a score for Support Quality, together with sample weights follow.

Support Quality		**Weights**
A. Operations Support/Service	(.6)	
1. Staff Quality		.3
2. Training Quality		.15
3. Documentation Quality		.15
B. Maintenance Support/Service	(.4)	
1. Help Line Staffing Quality		.2
2. Release Procedure Quality		.2
	Total	1.0

Criterion 6 - End User Deliverables Architecture Quality

When relevant, this architecture criterion evaluates, from the view of the IT organization, the quality of the application/product/service deliverables to be provided by in-house or vendor organizations.

- **Criterion**
  What is the quality of the deliverables in terms of optimum balancing of their technology architecture's flexibility, effectiveness, and efficiency.

- **Scoring**
  Typical evaluation measures for developing a score for Deliverables Architecture Quality, together with sample weights follow.

Deliverables Architecture Quality		**Weights**
A. System Design Flexibility	(.4)	
1. Parametric Product Definition		.2
2. Modularity of Options		.2
B. System Structure Effectivity	(.3)	
1. Development Productivity		.1
2. Production Efficiency		.1
3. Technology Reliability		.1
C. Documentation Quality (.3)		
1. HELP Screens		.1
2. USER Documentation		.1
3. IT Documentation		.1
	Total	1.0

Criterion 7 - Provider Infrastructure

As relevant, this infrastructure criteria evaluates the fit between user and IT consumer organizations and in-house or vendor providers.

- **Criterion**
  What is the level of agreement between the consuming and providing organizations in terms of factors such as: management style, technology innovation, standards utilization, and productivity or quality tradeoffs.

- **Scoring**
  Typical evaluation measures for developing a score for provider compatibility, together with sample weights follow.

Provider Compatibility		**Weights**
A. Industry Understanding and Commitment	(.2)	
1. Research and Development Commitment		.1
2. Staff Development Commitment		.1
B. Contract Terms and Conditions	(.15)	
1. Initial Arrangements		.05
2. Renegotiation for Special Conditions		.05
3. Takeback Arrangements		.05
B. Management Style Compatibility	(.05)	
1. Structural Formalism		.01
2. Monitoring and Control		.02
3. Staffing and Career Paths		.02
C. Standards Compatibility	(.2)	
1. Planning Methods		.1
2. Development Methods		.025
3. Production Methods		.025
4. Communication Methods		.025
5. Data Base Methods		.025
D. Productivity and Quality Orientation	(.2)	
1. Development Performance		.1
2. Production Performance		.1
E. Innovation Orientation	(.2)	
1. Development Technology		.1
2. Production Technology		.1
	Total	1.0

Criterion 8 - User References

As relevant, this criterion evaluates the results of the provider's user site visits and/or references.

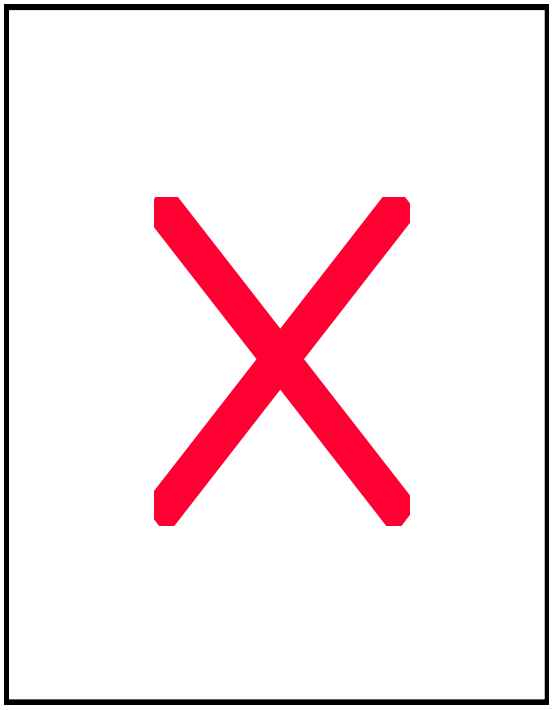
- **Criterion**
  What is the quality of the provider's reference sites, and how do their users evaluate the commitments, quality of products/services, and level of support provided.

- **Scoring**
  Typical evaluation measures for developing a score for User References, together with sample weights follow.

User References		**Weights**
A. Company Management's Evaluation		.25
B. IS Management's Evaluation		.25
C. Professional Staff's Evaluation		.25
D. User Staff's Evaluation		.25
	Total	1.0

Sourcing Cost Categories

The objective of the costing process is to present a complete and understandable set of current system costs for the denominator of the worth index, so that alternative providers can provide comparable pricing. The process advocated consists of the steps shown in the following chart.



The steps generally used to develop the costs needed involve a) determining relevant functions for organizations or locations with the potential to be outsourced, b) producing a functional cost analysis for each, c) obtaining prices from potential providers, and d) adjusting bids to produce comparable life cycle costs for each feasible alternative. Guidelines for preparing and analyzing appropriate costs are presented in the authors costing paper.[3]

The computation of an illustrative quantitative worth index is now straight forward.

	WORTH INDEX CALCULATION			
	Multi-product Vendor - A	Specialized Vendor - B	Start up Vendor - C	In-house Development
Technical/Managerial Score	68	77	67	88
ROI (from Step 4)	.31	.36	.44	.10

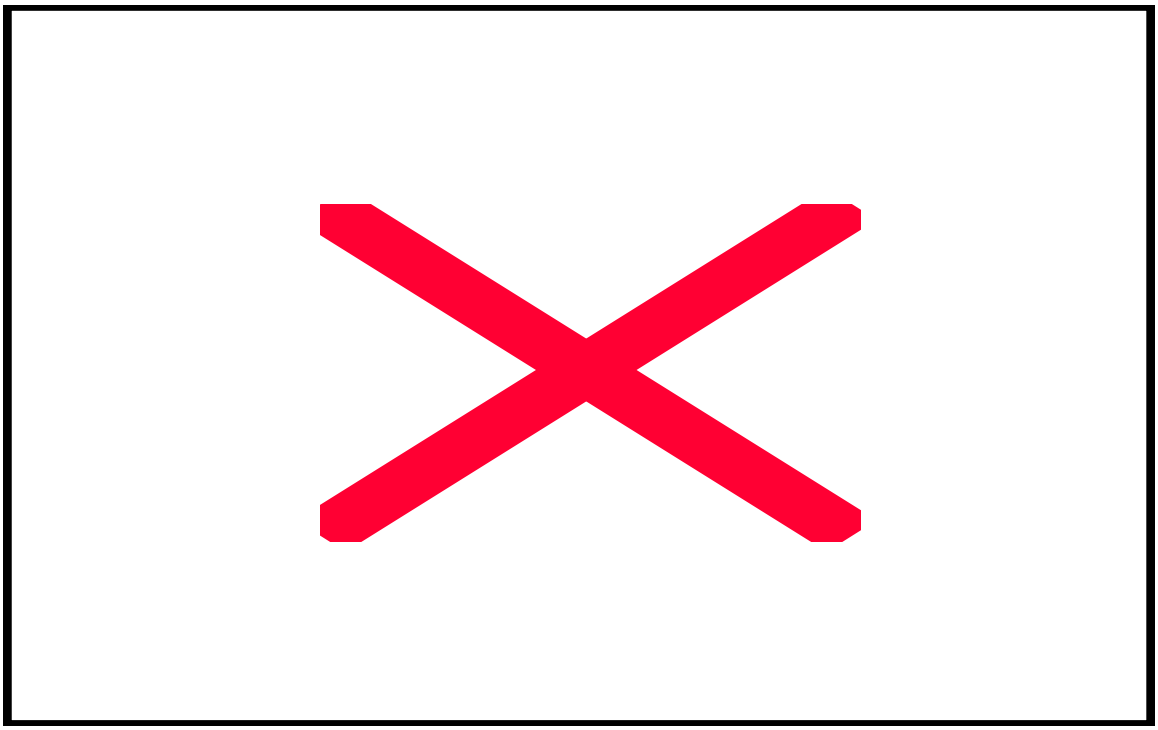
Worth Index (Technical Score X ROI)	21	28	29	9

Based on the worth index, vendors B and C are approximately equal from an objective (quantitative) viewpoint. The decision between them would be based on subjective criteria such as competitive issues and internal control.

5. Worth Index Oriented Presentation Methodology

The following chart (extracted from a real sourcing project) has been useful in presenting the results of the worth index methodology to management. Note that two of the loan application scores were very close, while there was an obvious winner in the finance area. This is type of result is typical based on the authors' experiences.

The final decision was based on site visits to vendor-A and vendor-B user sites.



Platform Architectures: MF is mainframe, HP is high performance, PC is PC/LAN, AS is a mini

[1] Guimaraes and Wells, "Outsourcing for Novices". *Computerworld*, June 8, 1992, pages 89-91.

[2] Park, L. Jane and Rosenthal, Paul (2003). "Costing and Presentation Approach for an Information Systems Project", *Proceedings of the Hawaii International Conference on Business*. Honolulu, June 18-21, 2003.

[3] ibid.