Allocating Resources to the Projects for a Project Management Office

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ABSTRACT

At Eli Lilly and Company the PMO conducts many projects each year aimed at satisfying the department's objectives. The projects may involve any of the PMO's service areas--including tools, business processes, training, and metrics. Traditionally, management allocates resources to these projects on an informal basis as part of the annual business planning process. The current process has several shortcomings. These include failure to prioritize the objectives, poor alignment of individual projects to the objectives, no process for adding projects during the year, no capacity assessment, and no assessment of risk. This paper presents a solution to these difficulties that is demonstrably advantageous for the PMO. This paper explores the use of the Analytic Hierarchy Process (AHP) in addressing resource allocation problems. AHP is a process that focuses on making decisions on the basis of objectives. For this analysis, an AHP model was built based upon the 2005 PMO objectives using Expert Choice software. Once the model was built, the list of proposed 2005 projects was entered into the model and measured against each objective using a rating scale. The software was used to select the group of projects with the optimal expected benefit within the total budget constraint of $681,600. This AHP resource allocation process was superior to the current method in several ways. The expected benefit was increased from 59.7% to 83.4% of the total possible benefit. The use of custom constraints allowed the incorporation of capacity limitations for each resource pool. Risk assessment was also incorporated. The results of this analysis are encouraging and offer compelling evidence for the adoption of AHP for resource allocation in the Lilly PMO, and elsewhere.

INTRODUCTION

Background

At Eli Lilly and Company the objectives for the Project Management Office (PMO) are established each year by the Project Management (PM) directors in accordance with three strategy areas: satisfying key business objectives, promoting the PMO as a service organization, and maturing the project management organization. The key business objectives tend to change significantly from year to year, and are aligned with larger corporate objectives and the strategic plan. For 2005, the four key business objectives are to maintain current operations, facilitate effective portfolio management, manage knowledge, and increase productivity. Maintaining the current operations may seem an obvious goal of any organization, but it is stated explicitly here to demonstrate that the department is not being asked to take a zero-based budgeting approach. There is general satisfaction with the current operations of the PMO, and management would like to see it supported at the same level as in the past. The PMO helps facilitate portfolio management by providing tools, processes and metrics to governing bodies and senior

management. There is a desire to continue this work, while continuing to seek opportunities to improve this service. Knowledge management is seen as a key area for growing the PMO. Increasing productivity is a corporate-wide objective aimed at improving the bottom line for the company. Promoting the PMO is a long-term objective of the PMO aimed at meeting our customer's needs, improving visibility of the PMO, and improving accessibility. Each year the PMO collects feedback from its customers, both formally and informally. This feedback is used to help set objectives for the coming year. Improving visibility is important because in order for the PMO to continue to be funded, it must be visible to and viewed positively by management. Improving accessibility is about making tools, processes and services easily available to customers. Maturing the PM organization is a goal common to PMOs. It is a challenging goal that must be accomplished in a step-wise manner over many years. The PMO at Lilly is currently focusing on a subset of project management processes and capabilities. Planning, monitor-and-control and closure are processes that will be focused on in 2005. PM capabilities that the PMO is currently focusing on include the triple constraint of timeline, budget and scope, as well as risk, communication management and integration management.

The PMO conducts many projects each year that are aimed at satisfying the department's objectives. The projects may involve any of the PMO's service areas, including implementing new tools or improving existing tools, establishing or improving business processes, creating and providing project management training, or creating or providing metrics. These projects impact one or more project management knowledge areas, as well as one or more project management process areas.

Each year the PMO reviews the list of possible projects as part of the annual business planning process, and selects those that will be conducted in the coming year. The goal of the PMO is to support the optimal mix of projects to provide the maximum value to Eli Lilly and Company. The PMO directors select projects based upon recommendations from the line managers. While some attempt is made to align these projects to the PMO's objectives for the upcoming year, the decision process is basically a BOGSAT (Bunch Of Guys/Gals Sitting Around Talking) method.

Problem Statement

The current process has several problems. While management communicates the objectives each year, their relative priority is not communicated. Because the process is informal, there isn't always a good alignment of individual projects to objectives. There is no process for adding projects during the year.

There is no capacity assessment performed. Individuals take a guess at how many projects can be managed, often by using rules of thumb, and typically they over-commit. There is no assessment of risk so the potential benefit of some risky projects is overestimated. As a consequence of this poor process, too many projects are planned, many don't complete, and some projects that do complete are poorly aligned with the goals and so fall flat with management. The impact on the PMO is that less progress toward the long-term vision is made each year than is possible given the resources available. Further, the PMO risks not satisfying its customers and management.

A Better Process

The solution to the difficulties with the current project selection process was to develop a new process that would result in a list of selected projects that reflects the departmental objectives, and optimizes the value that can be gained within the constraints of the budget and resources. This process includes 1) obtaining the relative priorities of the departmental objectives from management 2) collecting a list of proposed projects, and 3) assessing projects for risk, resource demand and relevance to the departmental objectives. The decision methodology used here is the Analytic Hierarchy Process (AHP) and the discrete activity resource allocation technique (DARA.)

METHOD

AHP and DARA

Dr. Thomas Saaty developed AHP almost 40 years ago. The process focuses on making decisions on the basis of the objectives of the decision makers. This distinguishes it from some other types of decision-making tools that focus on criteria or attributes. AHP defines a process for breaking down a problem (analysis), and managing the complexity of the problem by organizing its elements into a hierarchy. After the elements are analyzed in chunks that the human brain can manage, they are measured against each other using pair-wise comparisons, rating intensities or utility curves. Finally, it uses mathematical principles to synthesize the results. Expert Choice software was developed to manage the extensive mathematical calculations required for AHP. Here we use the AHP process applied to a resource allocation problem, using the discrete activity resource allocation technique (DARA) developed by Dr. Ernest Forman.. DARA involves making all or nothing funding choice for each potential project. For such resource allocation problems, optimization can be performed either for benefit or for benefit/cost ratio.

Developing the Model

For this analysis, an AHP model was built using Expert Choice software. The overall goal was defined: to determine the list of projects to be completed by the PMO in 2005 that optimizes the benefit to Eli Lilly and Company. The goal was then broken down into objectives and sub-objectives to create the hierarchy. The objectives were determined by the departmental directors and include supporting key business strategies, promoting the PMO and maturing the PM organization. These objectives were further divided into sub-objectives. The objectives and sub-objectives are described in detail above in the Introduction. The objectives hierarchy in Expert Choice is shown in Figure 1.

Figure 1. Tree View of Objective Hierarchy in Expert Choice.

Once the model was built, pair-wise comparisons were made for the objectives relative to the goal. Figure 2 shows the resulting relative priority of the objectives. Supporting key business objectives was considered most important, followed by maturing the PM organization. Promoting the PMO, while important, was considered far less important to the goal than the other two objectives.

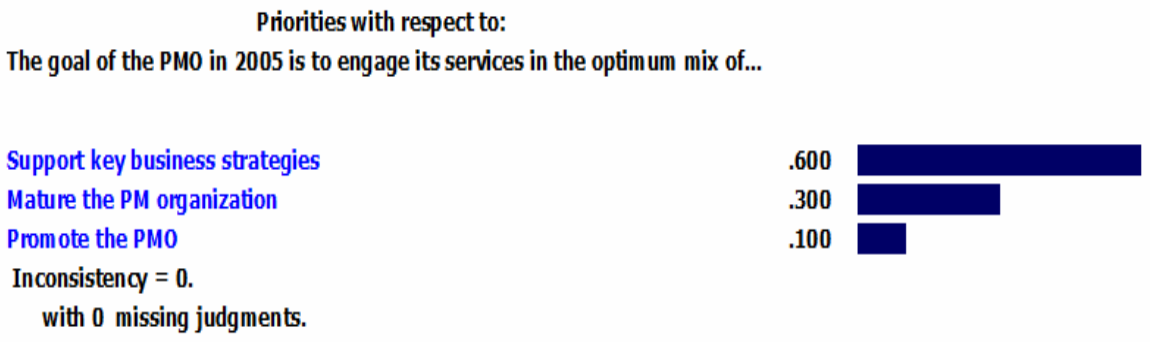


Figure 2. Relative Importance of Objectives to the Goal.

A list of proposed projects was obtained by combining requests from all the line managers and project data was entered into the model. Readers interested in the details of these projects can find descriptions in the Appendix. Resource demand estimates were obtained from each of the line managers for each of the resource pools and recorded as project hours per year. These resource pools include project managers, capacity planners, PMO staff and IT support staff. A total cost for each project was calculated. The projects were entered as alternatives in the model and the data for risk and cost were entered as well. A level of risk was assigned to each project. Risk was assessed by consensus of the line managers and was rated using a 3-point verbal scale of high, medium and low. Within Expert Choice this scale was translated into risks with probabilities of 0.50 (50%), 0.15 (15%), and 0.05 (5 %) respectively. High-risk projects were given a probability of 50%. There are riskier projects that the PMO might undertake, but those were already culled from the project list before the resource allocation process was started. Therefore, a probability of 50% corresponds to the riskiest project the PMO is willing to consider embarking upon. Moderate risk projects were given a probability of 15%. That is, it was felt that there was a 15% chance the project would not achieve the anticipated benefit, or to put it another way, the expected value of the project is only 85% of its potential value. Low risk projects were considered to be almost certain to realize their benefit. These projects were given a probability of 5%, as it was expected that they would realize 95% of their potential value. The risk functionality of the resource aligner tool Figure 3 was used to incorporate risks to each alternative (project). Benefits as calculated from the model are shown in the “Benefits" column. The “Probability of Success” column shows the risk probability that was entered. “Expected benefits” is a calculated column that is the product of the benefit multiplied by the risk probability.

Alternatives	Benefits	Risks	Probability of Success	Expected Benefits
System upgrade 11	.022	0.05	0.95	0.021
System upgrade 12	.022	0.05	0.95	0.021
2005 upgrade for portfolio reporting system	.021	0.05	0.95	0.020
Implement new throughput milestones	.028	0.15	0.85	0.024
Training for project change control db	.047	0.05	0.95	0.045
Business process improvement for Project Change Control	.050	0.15	0.85	0.043
Drive new phase definitions into the business	.020	0.15	0.85	0.017
Implement process to improve accuracy of direct expense data in global resource management system	.094	0.5	0.5	0.047
Centralize management of resource estimation process	.115	0.05	0.95	0.109
Onboarding for project managers	.073	0.15	0.85	0.062
Provide historical budget data for planning	.038	0.5	0.5	0.019
Global resource management system strategy	.049	0.05	0.95	0.047
Real-time capacity planning	.063	0.5	0.5	0.032
Microsoft Project Server	.041	0.5	0.5	0.021
New knowledge management tool	.016	0.05	0.95	0.015
Root cause analysis	.085	0.15	0.85	0.072
Centralized report request tracking	.051	0.15	0.85	0.043
Quarterly milestone metrics	.037	0.05	0.95	0.035
Knowledge Mgmt Strategy	.032	0.05	0.95	0.030
Standardize status update requirements for all governance committee's	.041	0.15	0.85	0.035
Scenario Planning	.024	0.15	0.85	0.020
Project Change Control DB v. 2.0	.031	0.15	0.85	0.026

Figure 3. Risks and Expected Benefits for Alternatives.

Once the model was built, pair-wise comparisons were made among the objectives comparing the relative importance of each toward achieving the goal. Figure 4 shows the pair-wise comparison for one of the top-level objectives, comparing the relative importance of supporting key business objectives to promoting the PMO. The pair-wise comparisons are what the priorities are derived from. There are three scales that can be used to evaluate the comparisons: verbal, numeric, and graphical. The verbal scale is shown here.

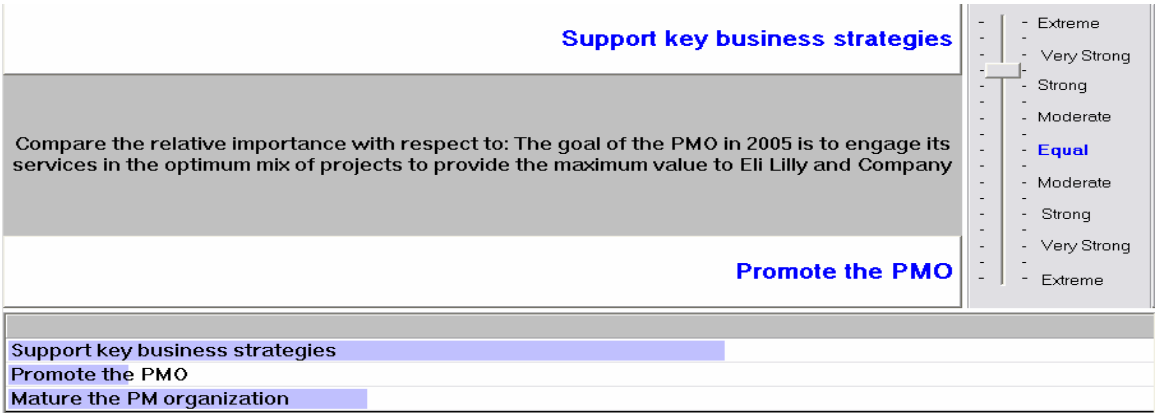


Figure 4. Pair-wise Comparison of Objectives.

Sub-objectives were rated for each of the alternatives using the same rating scale as shown in Figure 5. A five-point verbal intensity scale was used. The scale is a ratio scale of the derived weights for each intensity level.

Intensity Name	Priority
Very strongly	1.000
Strongly	.587
Some	.267
Little	.125
Not at all	.000

Figure 5. Rating Scale for Sub-Objectives.

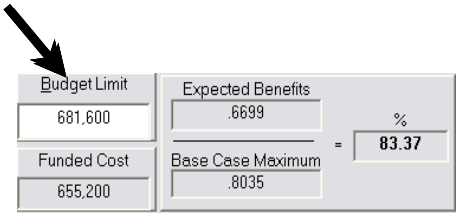
The authors performed all the ratings. Line management was not involved in completing the ratings. Prior to completing the work shown in this paper, a proposal was made to line management that the methodology presented here be used in performing resource allocation for the 2005 PMO projects, but was rejected. The primary reason for the rejection was that no one in the PMO has experience with AHP or other decision-making methodologies. It is the author's hope that the results of this analysis will help to persuade them to use this methodology for the 2006 resource allocation. Figure 6 shows how ratings were entered for each of the sub-objectives. This data grid view in Expert Choice shows the alternatives in the left-most column shaded blue. The rating scale for the highlighted column is shown across the top. Each of the RATINGS columns shows one of the sub-objectives and contains the verbal ratings for each alternative. The gray shading in the rating cells shows the numerical value of the rating graphically. The Total column shows the total benefit calculated by the program.

Very strongly	Strongly	Some	Little	Not at all
1 (1.000)	2 (.587)	3 (.267)	4 (.125)	5 (.000)

Distributive mode		RATINGS	RATINGS	RATINGS
Alternative	**Total**	**Support key business strategie Maintain existing operations**	**Support key business strategie Improve productivity**	**Support key business strategie Support portfolio management**
☑System upgrade 11	.022	Very strongly	Not at all	Not at all
☑System upgrade 12	.022	Very strongly	Not at all	Not at all
☑2005 upgrade for portfolio	.021	Strongly	Not at all	Little
☑Implement new throughput	.028	Not at all	Little	Some
☑Training for project change	.047	Some	Little	Not at all
☑Business process	.050	Little	Some	Not at all
☑Drive new phase definitions	.020	Not at all	Not at all	Some

Figure 6. Entering Ratings for Each Sub-Objective for all the Alternatives (Projects).

An overall budget constraint was set, and four alternatives were designated “musts.” Alternatives marked “must” are mandatory inclusions for the optimized list of projects. In this case, four projects have been designated “must” because the PMO must conduct these projects in order to maintain its current resource management system as mandated by senior management. Figure 7 shows the main screen for the Advanced Resource Aligner tool in Expert Choice. The black arrow points to the total budget ($681,600.) The optimizer will apply this budget as a constraint and not allow the total cost of the selected projects to exceed this amount. The red arrow points to a check box indicating where one of the projects has been marked “must.” Designating these four projects as must-dos had an impact on the effectiveness of the optimization. The expected benefit from the selected projects is 83.4% of the total possible expected benefit. Removing the “must” constraints results in an optimization that is 93.4% of the total expected benefit.



Alternative	Funded	E.Benefit	Cost	Partial	Must	Must Not
System upgrade 11	YES	.0209	143,424	☐	☑	☐
System upgrade 12	YES	.0209	145,920	☐	☑	☐
2005 upgrade for portfolio reporting system	YES	.0200	35,040	☐	☑	☐
Implement new throughput milestones	YES	.0238	1,920	☐	☐	☐
Training for project change control db	YES	.0447	19,968	☐	☐	☐
Business process improvement for Project Change Control	YES	.0425	39,936	☐	☐	☐
Drive new phase definitions into the business	NO	.0170	36,960	☐	☐	☐
Implement process to improve accuracy of direct expense data in global resource management system	YES	.0470	19,008	☐	☐	☐
Centralize management of resource estimation process	YES	.1093	144,192	☐	☑	☐
Onboarding for project managers	NO	.0621	44,928	☐	☐	☐
Provide historical budget data for planning	NO	.0190	14,400	☐	☐	☐
Global resource management system strategy	YES	.0466	7,680	☐	☐	☐
Real-time capacity planning	YES	.0315	34,272	☐	☐	☐
Microsoft Project Server	YES	.0205	6,240	☐	☐	☐
New knowledge management tool	NO	.0152	32,640	☐	☐	☐
Root cause analysis	YES	.0723	21,504	☐	☐	☐
Centralized report request tracking	YES	.0434	2,880	☐	☐	☐
Quarterly milestone metrics	YES	.0352	7,680	☐	☐	☐
Knowledge Mgmt Strategy	YES	.0304	6,432	☐	☐	☐
Standardize status update requirements for all governance committee's	YES	.0349	3,264	☐	☐	☐
Scenario Planning	NO	.0204	42,720	☐	☐	☐
Project Change Control DB v. 2.0	YES	.0264	15,840	☐	☐	☐

Figure 7. Total Budget Constraints and Musts.

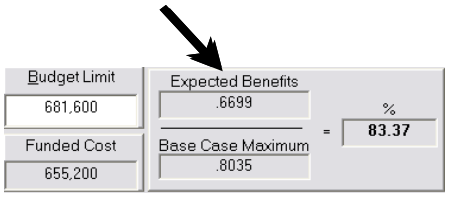
Resource constraints were implemented in the form of custom constraints. Constraints reflecting the total capacity for each of the resource pools were applied. They were based upon the resource pool manager's estimate of supply and are given in hours per year. As can be seen in Figure 8 (showing the custom constraint screen from Expert Choice), project manager supply was set at 1,000 hr/yr while capacity planner, PMO and IT were set at a supply of 1,200 hr/yr, 3,400 hr/yr, and 2,000 hr/yr respectively. These constraints were added to prevent the demand for the selected projects from exceeding the supply of any of the four resource pools.

	Capacity Planners	IT Resources	PMO Resources	Project Managers
System upgrade 11	200.0	624.0	590.0	80.0
System upgrade 12	200.0	690.0	570.0	60.0
2005 upgrade for portfolio reporting system	40.0	250.0	35.0	40.0
Implement new throughput milestones	0.0	0.0	20.0	0.0
Training for project change control db	80.0	0.0	48.0	80.0
Business process improvement for Project Change Control	160.0	0.0	96.0	160.0
Drive new phase definitions into the business	60.0	75.0	170.0	80.0
Implement process to improve accuracy of direct expense data in	120.0	0.0	78.0	0.0
Centralize management of resource estimation process	20.0	0.0	1,482.0	0.0
Onboarding for project managers	0.0	0.0	268.0	200.0
Provide historical budget data for planning	0.0	0.0	150.0	0.0
Global resource management system strategy	0.0	60.0	10.0	10.0
Real-time capacity planning	240.0	0.0	37.0	80.0
Microsoft Project Server	0.0	15.0	25.0	25.0
New knowledge management tool	0.0	40.0	180.0	120.0
Root cause analysis	0.0	0.0	144.0	80.0
Centralized report request tracking	0.0	0.0	30.0	0.0
Quarterly milestone metrics	0.0	0.0	80.0	0.0
Knowledge Mgmt Strategy	0.0	25.0	10.0	32.0
Standardize status update requirements for all governance	0.0	0.0	10.0	24.0
Scenario Planning	200.0	80.0	85.0	80.0
Project Change Control DB v. 2.0	40.0	0.0	85.0	40.0
Min				
Max	1,200.0	2,000.0	3,400.0	1,000.0
Actual	1,100.0	1,664.0	3,350.0	711.0

Figure 8. Custom Constraints for Resource Pools.

RESULTS

The software was then used to synthesize the results. Since risk has been incorporated as described in the methods section, expected benefit rather than benefit was used for the optimization. The Advanced option of the Expert Choice Resource Aligner module was used to select the optimal list of projects. The output was a list of projects to be funded for the upcoming year. The result shown in Figure 9 is that all but five projects were selected. The selected projects are shaded yellow. The resulting expected total benefit (marked by a black arrow) is 0.67, which equates to 83.4% of the total possible benefit of 0.80.



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Project Change Control DB v. 2.0	YES	.0264	15,840	☐	☐	☐

Figure 9. Project Selection Results.

Constraints and Optimization

Relevant Constraints

The constraint relevance report shows that there are four constraints that actually affect the results. The supply of PMO resources was a relevant constraint to the optimization for benefit. The supply would need to be increased to change the list of projects chosen. Two “must” constraints were relevant--projects 2 and 5. In this case, relevance means that these projects were not selected because they helped to realize an optimum total benefit, but merely because they must be done. If they had not been marked “must” they would not have been selected for the final project list. The other six constraints including total budget, musts for alternatives 6 and 13, and supply maximums for Capacity Planners, IT Resources, and Project Managers were not relevant in optimizing for benefit.

Optimization Path

A common question asked by managers is “how much more benefit could I get if we applied additional resources?” The authors have explored this question in an iterative fashion, suggesting several ways to increase benefit over the 83.4% of the possible benefit obtained in the original optimization. First, increasing PMO resources by 331 hours will increase the expected benefit to 90% of the total possible benefit at a cost of $31,776. Second, after increasing PMO resources the budget could be increased by an additional $18,528 to increase the expected benefit to 91.3%. Third, removing the must constraint on the

system 11 upgrade project and adding 111 project managers hours at a cost of $10,656 would increase the expected benefit to 97.5% and would allow all projects to be undertaken with the exception of the system 11 upgrade. Finally, to undertake the system 11 upgrade project and realize the maximum expected benefit, the budget would need to be increased to $826,848, and the following hours would need to be added, 160 hours capacity planners, 80 hours project management, 472 hours PMO at a total increase in cost of $213,600--or 31% over the base plan.

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

This AHP resource allocation process was superior to the BOGSAT method currently being employed in several demonstrable ways. First, the expected benefit was increased significantly through the use of AHP and optimization. Using derived expected benefits for the project list selected by PMO management for 2005, the expected benefit was calculated to be 59.7% of the total possible benefit. The optimization performed in Expert Choice gave a considerably higher expected benefit of 83.4%. Second, through the use of custom constraints the capacity limitations of the relevant resource pools were incorporated. Due to the complexity of incorporating capacity considerations, it is not being done in the current project selection process. Third, an assessment of risk was incorporated in a rational and consistent way. While the BOGSAT method assessed risk, there was no systematic way of adjusting the probable benefit of the alternatives based upon the risks. Fourth, creating the hierarchy of objectives and doing the pair-wise comparisons requires a discussion of what the objectives are, and their relative priority. Further, rating the projects on their relevance to the sub-objectives forces consideration of how well each of the alternatives satisfies the sub-objectives. Typically, the current process only involves a very brief discussion of objectives. Often the department objectives are distributed to the managers along with the senior leadership's directive to "ensure that your 2005 objectives align with the strategic vision outlined." Since the objectives are articulated in broad, sweeping terms, translating them into project work is a subjective operation for each individual manager. Fifth, the AHP process could be used to add new projects during the year, allowing the PMO to adjust course as new projects drop in. The current process does not include a way to make these course adjustments. When new projects drop in, personnel are simply asked to work yet more overtime to get the new work done.

The results of this analysis are very encouraging because they show real advantages over the current process for resource allocation in the PMO. Unfortunately, up to now, this has been an academic exercise. As mentioned earlier, the PMO management rejected the use of this process for the 2005 resource allocation. Using the data presented here, the next step is to try to convince PMO management to

implement this process in 2006. First, the results of this analysis will be shared with the PMO management. As was mentioned in the method section, line management was not involved in completing the ratings for this paper. The PMO managers may be more ready to accept this methodology after reviewing these compelling results, particularly if the advantages discussed above are clearly articulated and backed up by data. Other information about this methodology should help to persuade management to uptake this new idea. It will be made clear that management completely controls the construction of the model and can iterate until the model and their intuitive understanding of the needs of the department align. Line management will make the decisions regarding the pair-wise comparisons of the objectives that directly lead to the derived priorities. Further, they retain control over what projects are selected in many ways. First, project selection is based upon the objectives they set. Second, individual projects can be marked for inclusion and exclusion. Third, as is shown here, risk can be incorporated as a factor. This methodology allows line management to retain decision authority while making the process of decision-making transparent and logical; effectively increasing the control line management has. A proposal will be made to use this process for the 2006 prioritization process. If this is accepted, then this model will be adapted with input from management to ensure they agree with the objectives hierarchy, the derived weights of the objectives, the rating scales, and risk analysis. It is the authors' hope that the results will be compelling enough to change the way the PMO does resource allocation in the future.

REFERENCES

Expert Choice Inc., (n.d.). retrieved Nov 13, 2004, from Expert Choice Web site: http://www.expertchoice.com.

Forman, E., & Selly, M. (2001). *Decision by Objectives*. River Edge, NJ: World Scientific Press.

APPENDIX
Project List

No.	Project	Type	Project Description	Total Cost
2	System upgrade 11	Tool	System upgrade 11 for global resource management system. Including enhancements	$143,424
5	System upgrade 12	Tool	System upgrade 12 for global resource management system. Including enhancements	$145,920
6	2005 upgrade for portfolio reporting system	Tool	Manage implementation of the 2005 upgrade to current portfolio reporting system	$35,040
7	Implement new throughput milestones	Tool	Change from starting development phases based upon business decision milestones to starting phases with new throughput milestones. This will involve changes to the global resource management system, the portfolio reporting system, system reporting tools, and business processes.	$1,920
8	Training for project change control db	Training	Train project managers on project change control DB being delivered in 2004.	$19,968
9	Business process improvement for Project Change Control	Process	Design and implement a revised project change control process that reduces efforts and simplifies the process.	$39,936
10	Drive new phase definitions into the business	Process	Implement necessary business process changes to drive tracking and reporting by new definitions for phase of development.	$36,960
13	Implement process to improve accuracy of direct expense data in global resource management system	Process	Accurately capture direct expenses both actuals and forecasts.	$19,008
14	centralize management of resource estimation process	Process	Create single point of contact for resource estimation in the PMO. Move effort of managing the process from the project managers to the PMO.	$144,192
15	Onboarding for project managers	Training	Develop robust onboarding process for project managers. Complete gap analysis on current process. Develop new training as necessary. Focus is on getting all new PMs versant with basic project management skills.	$44,928
17	Provide historical budget data for planning	Metrics	Improve the quality of current archetypal project data. Use historical to provide average budget data for projects by phase and type of project. Include information on factors that drive costs.	$14,400

No.	Project	Type	Project Description	Total Cost
18	global resource management system strategy	Tool	Develop strategy for future development of global resource management system.	$7,680
19	real-time capacity planning	Process	Put in place processes and perhaps tools that will allow for "real-time" updates to the global resource management system. Initial goal is to move from quarterly forecast updates to weekly.	$34,272
21	Microsoft Project Server	Tool	Evaluate Microsoft Project Server. This would allow central access to timeline data, provide audit capability and allow for easier collection of timeline metrics.	$6,240
23	new knowledge management tool	Tool	Identify and implement new PM knowledge management tool. Consolidate current LAN folders and databases into the new tool. Assign process owners to manage documents, and hold them accoutable for database accuracy.	$32,640
24	root cause analysis	Metrics	Implement routine collection of project level root cause analysis for all teams. Collate and shared lessons learned with all teams through planning session process.	$21,504
25	Centralized report request tracking	Metrics	Create central tracking mechanism to prevent overlap and ensure history is not lost. Multiple people in PMO now receive requests for data from customers. Sometimes work is duplicated.	$2,880
26	quarterly milestone metrics	Metrics	Report out metrics for project milestones showing how all teams performed against their baseline plans each quarter. Collate data and share with teams through planning session process.	$7,680
27	Knowledge Mgmt Strategy	Process	Develop strategy for knowledge management and document mangement for PM. This should help with shared learning, asset management and could improve efficiency.	$6,432
28	Standardize status update requirements for all governance committee's	Process	Standardize format of status reports across all governance committees to help make creation of status reports more efficient.	$3,264
29	Scenario Planning	Tool	Enhance current global resource management system to allow for scenario planning. This would allow teams to plan multiple scenarios. It would also allow teams to consider a new possible scenario without the data feeding the operative system.	$42,720
30	Project Change Control DB v. 2.0	Tool	Deliver further enhancements to the project change control database. Satisfy Customer requests.	$15,840