LOGISTICS MANAGEMENT INSTITUTE
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Using the Enterprise Architecture to Quantify the Benefits of Information Technology Projects

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INTRODUCTION

Many organizations today face the challenge of proving the financial impact of their information technology (IT) projects. Although it is relatively easy to calculate the life-cycle cost of an IT project, quantifying the benefits across the enterprise can be difficult because many of the benefits, such as eliminating workarounds, are intangible, or soft.

LMI has developed a method for quantifying the benefits—both hard and soft—of an IT project. The method has four steps:

- Identify relevant cost drivers using the enterprise architecture layers as a categorization framework
- Collect data pertaining to the cost drivers
- Link the cost driver data to the enterprise architecture objects using LMI's customized version of System Architect
- Calculate the total dollar value of the hard and soft benefits that will result from the project. That value can then be compared to project costs.

We describe each of the steps in the following sections.

IDENTIFY RELEVANT COST DRIVERS BY ARCHITECTURAL LAYER

In this context, a cost driver is an activity that has a direct impact on cost or performance of other activities resulting in the consumption of resources (such as the number of transactions that must be processed). LMI developed a list of cost drivers that can apply to an IT project and assigned a priority level to each. The

priority levels—A to D—reflect the importance of collecting the pertinent data and the likely level of difficulty in doing so. The priority levels are defined as follows:

- A = very important and typically obtainable.
- B = very important but typically harder to obtain.
- C = important and typically obtainable.
- D = important but typically hard to obtain.

Knowing the priority levels helps the LMI analyst focus on obtaining the highest value cost data.

Table 1 lists the cost drivers that can apply to an IT project. For each driver, the table contains a definition, the priority assigned, and the SA object to which it applies. The analyst needs to select the drivers that are relevant to the particular IT project or organization being analyzed. Early identification of the drivers will enable the analyst to gather data more efficiently as well as minimize the amount of time required by representatives of the organization being analyzed.

Table 1. Cost Drivers by Architectural Layer

Driver	Definition	Priority	SA object
Business and process layers			
Budget by function	Overall budget broken out by function	C	Elementary Business Process
IT budget by organization	IT budget broken out by organization (e.g., agency)	C	Organization Unit
IT budget by location	IT budget broken out by location	C	Location
GS level by organization	Number of government FTEs and their corresponding GS level and grade (if possible) by organization (e.g., agency) (distinctions should be made between authorized and assigned FTEs)	A	Organization Unit
GS level by function	Number of government FTEs and their corresponding GS level and grade (if possible) by function (distinctions should be made between authorized and assigned FTEs)	A	Elementary Business Process
GS level by process	Number of government FTEs and their corresponding GS level and grade (if possible) by business process	D	Elementary Business Process
GS level by location	Number of government FTEs and their corresponding GS level and grade (if possible) by location (distinctions should be made between authorized and assigned FTEs)	A	Location
IT contractor labor	IT contractor labor by organization	B	Organization Unit

Table 2. Cost Drivers by Architectural Layer (Continued)

Driver	Definition	Priority	SA object
Information layer			
Databases	Number of databases, if possible, by organization, function, and location	C	Organization Unit Elementary Business Process Location
Records	Number of records by application	C	Application
Tables	Number of tables by application	C	Application
Application layer			
Average annual system acquisition costs	Average annual acquisition costs over at least 5 years (acquisition costs include all development costs for systems developed in-house, costs of all software that was purchased, and costs of customization)	A	Application
Annual maintenance costs by system and function	Annual maintenance costs (including license costs) by system by function	A	Application Elementary Business Process
Planned enhancement costs by system	Cost of future enhancements planned for each system	A	Application
Processing volume by system	Number of transactions processed monthly by each system	C	Application
Interfaces	Number of interfaces and the O&M costs of each interface	B	Application Application Interface
Reports	Number of reports, and frequency of reports, produced by application (if possible, also include average page length of report)	C	Application
Infrastructure layer			
Hardware costs	Hardware costs by number of units and type of hardware (distinctions should be made between acquisition cost and maintenance cost, if any) and pieces of hardware that are not being fully utilized or that are idle	B	Technology (for server and networks)
Communications costs	Annual communications costs by location and organization	B	Location Organization Unit

COLLECT DATA

Data pertaining to the cost drivers can be collected using several different methods. The method chosen depends on the type of driver and on the unique circumstances of the organization being analyzed. Below is a partial list of sources for cost driver data:

- Interviews
- Facilitated group sessions
- Organization charts
- Staffing documents
- Budget documents
- Financial reports
- Architecture diagrams
- Inventories
- Capital planning documents (alternatives analyses, business cases, OMB 300s)
- Contractual documents (contractor labor rates, system costs, license costs)
- Processing volume by system
- Application documentation (number of reports, tables, records)
- Data dictionary.

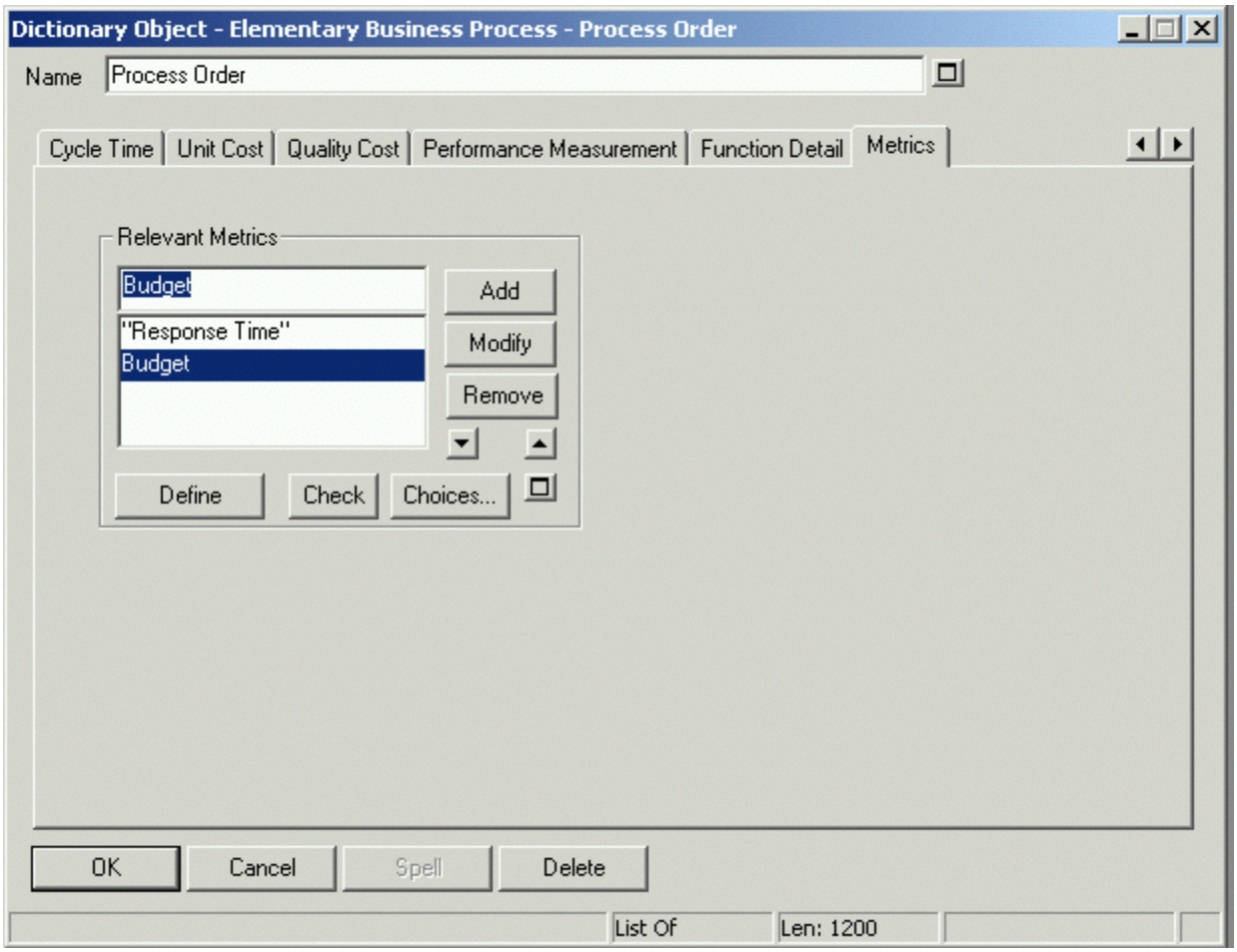
It is important to select the data collection method that maximizes the quality of the information obtained given the amount of time invested. For example, a facilitated group session would be an appropriate way to determine the amount of time the staff spends on specific activities but would not be appropriate for gathering data on system costs.

Appendix A lists questions that can be used as a starting point to identify soft benefits and obtain data needed to quantify them, and Appendix B lists questions pertaining to hard benefits.

LINK DATA TO ARCHITECTURE OBJECTS

Cost driver data are stored in the System Architect encyclopedia as Metrics objects. To create a new Metrics object and link it to the applicable architecture object (see Table 1), open the window definition of the architecture object (Elementary Business Process, Application, Entity, or Technology) and select the Metrics tab as shown on Figure 1 (you may have to click on the right arrow to have the tab displayed).

Figure 1. Linking a Cost Driver to an Architectural Object in System Architect

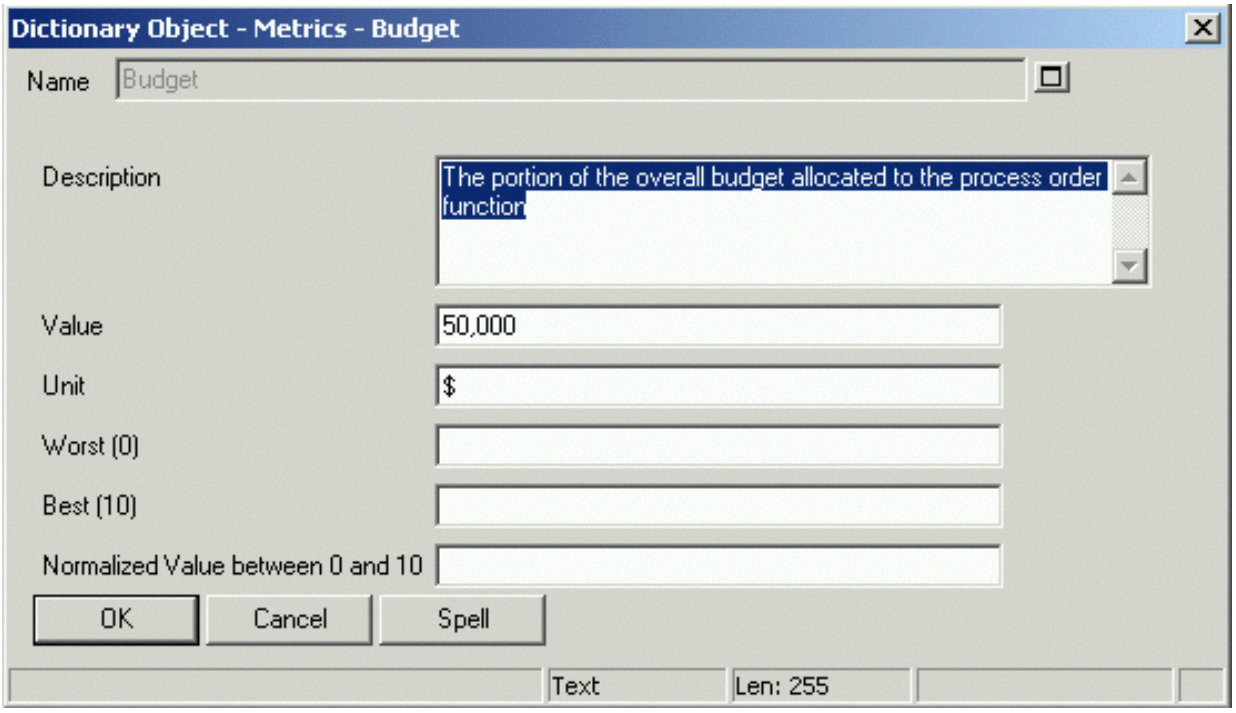


In the Relevant Metrics text box, enter the name of the cost driver you want to create. Clicking Add moves the name to the box under the text box.

Next, select the cost driver and click Define, which opens a Metrics window, as shown in Figure 2. Three boxes are used to specify the attributes of the cost driver:

- In the Description box, define to the cost driver, describe the data collection method, and, if appropriate, include explanations related to the other boxes in the window.
- In the Value box, enter the value of the cost driver.
- In the Unit box, enter the measurement unit of the cost driver.

Figure 2. Metric Definition Window to Store Cost Driver Information



CALCULATE THE DOLLAR VALUE OF THE BENEFITS

Once the links have been established and the cost driver data have been entered, the analyst can export the information to an Excel workbook for further processing. In this step, the analyst develops formulas that use the cost driver data to calculate the value of each hard and soft benefit. Calculating the value of hard benefits is straightforward. For example, if two applications perform essentially the same function, the hard benefit of retiring one of them is the operations and maintenance cost of the retired system.

Soft benefits are not easily quantified. Examples of soft benefits are savings due to

- standardizing data,
- eliminating work-arounds,
- sharing resources (IT staff, software),
- using standard tools and methods (rather than spending time developing new tools and methods), and
- integrating systems (eliminating time spent reconciling data from disparate systems).

Clearly, an organization would benefit from taking any of the actions, but the dollar value of the benefit can only be estimated.

For example, the savings due to eliminating a work-around can be estimated by first, determining the amount of time the staff spends performing the current process, which includes the work-around. Next, the amount of time the staff will spend performing the process when the work-around has been eliminated can be estimated. Then, the analyst must determine the number of times the process is performed annually, calculate the average salary for the employees involved in the process, and multiply the annual time savings by the average salary. An example calculation follows:

- Current process takes 4 people 8 hours = 32 hours.
- Future process will take 3 people 8 hours = 24 hours.
- Process is performed monthly.
- Time savings = (32 hours–24 hours) (12 times/year = 96 hours annually).
- Average salary = $56,000 annually or $28.57/hour (using a 1,960-hour work year).
- Annual savings = 96 hours ($28.57/hour = $2,742.72).

Therefore, the benefit that the organization would realize by eliminating the work-around would have a dollar value of $2,743.

The last step is to calculate the total estimated value of the hard and soft benefits that will result from the project. When doing so, it is important to note what percentage of the benefits is hard and what percentage is soft because this is a good indication of the certainty of your total benefits calculation. In other words, confidence in hard benefits is high because those benefits are easily quantified.

Confidence in soft benefits will vary, depending on the thoroughness of the analysis and the validity of the data.

The effect of different confidence levels is demonstrated in Tables 2 and 3, which contain hypothetical dollar values of the benefits that might be realized from two sample projects.

Table 3. Example Project A

Benefit type	Amount ($)	Percentage of total
Hard	400,000	25
Soft	1,200,000	75
Total	1,600,000	—

Table 4. Example Project B

Benefit type	Amount ($)	Percentage of total
Hard	800,000	50
Soft	800,000	50
Total	1,600,000	—

Assuming the costs of the projects are the same and the projects have the same priority given other factors such as alignment with mission, management support, risk, and organizational impact, project B would be a better investment than project A because a higher percentage of the total benefits is hard. Thus, you will have a greater confidence in the financial calculations of project B and therefore less financial risk.

Once total benefits have been calculated, those dollar values can be used in a variety of financial calculations (net present value, return on investment, payback period) to evaluate the financial impact of the project.

CONCLUSION

Our method for calculating the dollar value of a project's benefits is a structured approach to gathering cost driver data, identifying hard and soft benefits, and calculating the overall financial impact of an IT project. In short, LMI's method gives a more complete picture of the benefits of a project. And it can be adapted to meet the needs of a wide variety of organizations.