

## USING ROI FORECASTING TO DEVELOP A HIGH IMPACT, HIGH VALUE TRAINING CURRICULUM

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### OVERVIEW

ROI-based training evaluations are rapidly gaining acceptance as an essential element of training and are becoming almost commonplace. By contrast, few organizations seem to be involved with forecasting ROI prior to training. When the considerable benefits of ROI forecasting are understood, forecasting will become a staple in practitioners' tool boxes. We hope that our experiences at Commonwealth Edison will stimulate others to take a closer look.

Forecasting of training ROI is not proposed as a substitute for training evaluation. ROI forecasts and ROI evaluations are synergistic. ROI forecasts rely on accurate evaluations of training costs and training impact. Similarly, ROI evaluations benefit from baseline data that ROI forecasts can provide. Forecasts and evaluations are synergistic: Ideally, both should be combined in a program that will have more impact than either by itself.

### INTRODUCTION TO ROI FORECASTING

The purpose of ROI forecasting is to identify the training that will provide the highest possible payback, and more generally, to make wise training and development decisions.

Training itself has no inherent value; its worth is dependent on performance gains it catalyzes, the performance gaps it addresses, and the opportunities it can help create in a given environment. We need the *right* training for the *right* people at the *right* time and the *right* cost. ROI forecasting does not affect the cost of training. However, it maximizes the payback from limited training resources, and it helps us avoid wasting training dollars.

In 1988 Richard Swanson and Deane Gradous wrote a pioneering book titled, Forecasting Financial Benefits of Human Resource Development. In their preface, they said, "What HRD decision makers have needed for a long time is a tool to reduce the complexities of choosing among alternative investments in HRD." They continue, "Post program analysis comes far too late in the HRD process to be useful for most decision-making purposes. We believe that what the HRD profession needs is a method for forecasting the costs and benefits *before* choosing to implement a program."

## WASTEFUL TRAINING ALLOCATION

If an organization has done a competent job of assessing training needs, then selecting from among the available alternatives is straight forward, right? Wrong! Actually, there are a large number of factors to consider in choosing the optimal training mix. Consider the following:

*Is a course that addresses one critical need a "better deal" than one that is more expensive but addresses two?*

*If we have only 10 persons with a specific skill need, is it better to offer the course in-house or send the persons to an external training course?*

*Should we first address the largest skill gap, or the gap on the most critical skill?*

*Which is more important, the skill gap that affects the most employees, or the skill gap that affects the most critical employees?*

If a person has 10 developmental needs, the one's that should be addressed first will depend not only on criticality for the job or organization, but also on the size of the employee's skill gap, the program costs, the needs of other employees that could bring down the per capita costs of training, etc. Optimal selection of training is complex and benefits greatly from an ROI perspective and analysis.

Many different approaches are utilized to allocate training. In some cases, the employer plays a major role in matching individuals and training, while other approaches give employees a lot of control over the training they receive. Some of the more common and wasteful approaches to training allocation include:

A. Tidal Wave Approach (employer matching): Flood the same training over the entire organization, (e.g. quality training). Never mind that this training may be wasted on persons who don't need it for their jobs, for those who will not need it for several years, and for some employees who already have a firm grasp of the material.

B. Forced March Approach: Everyone in a particular job takes a certain sequence of courses, e.g. a salesperson might have 10 courses to complete in two years. Wasted dollars stem from the differing needs and backgrounds of the employees.

C. Grocery Store Approach (employee selection): Employees choose courses from the company training catalog. Unfortunately, the basis of the decision is frequently different than for sound business reasons. Employees may choose training because of time, location, participation of their friends, convenience, to ensure training budget dollars are spent, etc. Again, far less than optimal benefit is achieved.

Inherently, when uniform training decisions are made about any intact group of persons, the potential for wasted training dollars is significant. Individual differences should be considered. However, an employer will not be able to arrive at the most profitable training allocation by concentrating just on individuals. For example, it is often impractical or too expensive to run a training program for 2-3 people. Also, there is often a need to prioritize training and provide more of it to individuals with a significant or critical proficiency gap because sufficient resources are not available to address all training needs. ROI forecasting offers us a way to choose from the wide array of alternatives.

## FORECASTING ROI VS. EVALUATING ROI

We feel that doing ROI analysis prior to training has some significant benefits that are not possible after training is completed.

Advantages of ROI Forecasts are:

Identifying the highest ROI alternatives: We can compare the expected value of a wide range of training options, and then choose the highest ROI training. We might use it to choose from alternative training topics, training methods, training vendors, and even training participants. ROI **evaluations** after training provide an estimate of program ROI, but don't reveal if another option would have been better.

Helps avoid costly, poor decisions: Wouldn't it be better to know the value of training before we spend money on it? Determining ROI after a training investment, especially if there is no intent to repeat the training, is at best justification. The most useful information is that which helps form the investment decision. It must be available before the investment commitment is made.

Consistency with Common Business Practice: Analysis prior to making a decision is the most accepted approach in business environments. Putting time and money into analyzing training that is already completed is much less appealing to business. Evaluations may be better suited to academic research.

Speed: In our fast-paced organizations, training needs arise very rapidly. There is a need to promptly assess the value of one or many training alternatives, to select trainees, etc. Most often a pilot program and lengthy evaluation are not possible. ROI forecasting is a viable alternative.

Applying ROI results flexibly and accurately: Unless future conditions are very similar, we may not get the same ROI from subsequent training. Training can have entirely different results with a different group of employees. Forecasting factors in some of these variables and projects likely results and necessary alterations, even if a training program was successful in the past.

Communication: Sometimes projections from ROI forecasting are needed to "sell" training and to justify its value against competing needs. Management may be less willing to risk a pilot study and a potentially neutral or negative evaluation. ROI forecasting is a relatively low cost, low risk approach that is available at the time when it may be needed most - the beginning of a project.

Forecasting of ROI requires making some assumptions, which can lead to some uneasiness. However, many assumptions must be made when doing ROI evaluations, for example how much of a gain in sales is due to training, marketing, management practices, or the economy? In fact, as Phillips (1995) has noted, many assumptions are required for most financial calculations, even those calculations that we typically assume to be very objective. These are three examples. A change in an accounting rule or convention can have a major effect on a company's reported profit and loss. Inventories are often estimates. Short term gains don't reflect possible long term damage.

In order to increase comfort with the assumptions, seek input and gain agreement from those that will review the study. Be conservative in estimating training benefits, while being very complete in costing out training, including the impact of time away from work. That way, there will be confidence when you project training will have a positive ROI. In fact, the true ROI will probably be much higher than forecasted.

## **BACKGROUND ON THE STUDY**

Commonwealth Edison (ComEd) is a large, Midwestern Electrical Utility. Its training groups are re-engineering themselves to be better attuned to the strategic direction of the company. Increasingly, HRD professionals are expected to demonstrate the value they provide, and to help the company leverage the return for each training dollar expended.

These dual needs to demonstrate value and to gain the most possible from training and development programs inspired ComEd to test ROI forecasting.

Three pilot studies were conducted: two in operating divisions and one with a central training group called Personnel Development (PD). Based on the early positive results, ROI forecasting is currently being rolled out for over 500 managers, with expectations of continuing to expand its use. This case study describes the PD Pilot Study.

## **GOALS OF THE PERSONNEL DEVELOPMENT ROI STUDY**

ROI analysis is a tool that PD can use to show the value of the training it provides to the corporation. It is also a tool that PD can provide as a service to the training groups in the operating divisions, each with their own significant training budgets and curriculums. Anticipated benefits are shown in Figure 1.

What better way is there to evaluate and learn a methodology than to experiment on oneself? The initial PD pilot included 22 professional staff such as instructors, designers, coordinators, and administrators.

## OUTLINE OF STEPS AND DELIVERABLES

The general sequence and deliverables for the ComEd PD Study were:

### STEPS

1. Identify required knowledge and skills: Group similar job tasks, assign weights, select critical skills for Instructor, Designer, etc.

2. Assess employees: Assess the current levels of competency of the PD staff on the skills required for their positions

3. Calculate Gaps and Costs: Perform a gap analysis between required skills and current skill levels

4. Evaluate Training Programs: Determine what knowledge and skills are taught by each program, and at what level. Evaluate costs of training programs.

5. Calculate ROI/Select Optimum Training: Identify existing training programs and approaches that meet current training needs, and suggest developmental areas where training should be obtained.

### DELIVERABLES

Job Profiles for positions. This includes key accountabilities, weights, and critical skills, both technical and interpersonal

Customized Skill Questionnaires for each position to assess knowledge and skills of individuals on the critical skills for their position. Ratings completed by job incumbents and their manager.

Group Skills Development Report showing a listing of skill gaps for the PD Staff as a group, ranked by annual cost of lost performance.

Individual Skill Development Priority Report showing skill gaps ranked by annual cost of lost performance

Individual Skill Performance Ratings showing actual ratings on a 1-5 scale for each skill and the breakdown for self vs. manager ratings.

Catalog of Training Programs showing courses, descriptions, maximum and minimum number of participants, skills addressed, expected proficiency level after course, and detailed breakdown of costs.

Group Curriculum showing suggested courses, and forecasted ROI of each.

Course Rosters showing suggested course participants and forecasted ROI for each.

Recommended course reports for each staff member.

**Figure 1****Goals of ROI Study****Test the capability of ROI Forecasting to:**

- √ Analyze critical skill requirements for each job
- √ Assess current skill levels of employees
- √ Identify critical employee development needs
- √ Advise on highest impact, cost effective training
- √ Determine who would benefit from specific training
- √ Provide high impact individual feedback reports on current developmental priorities

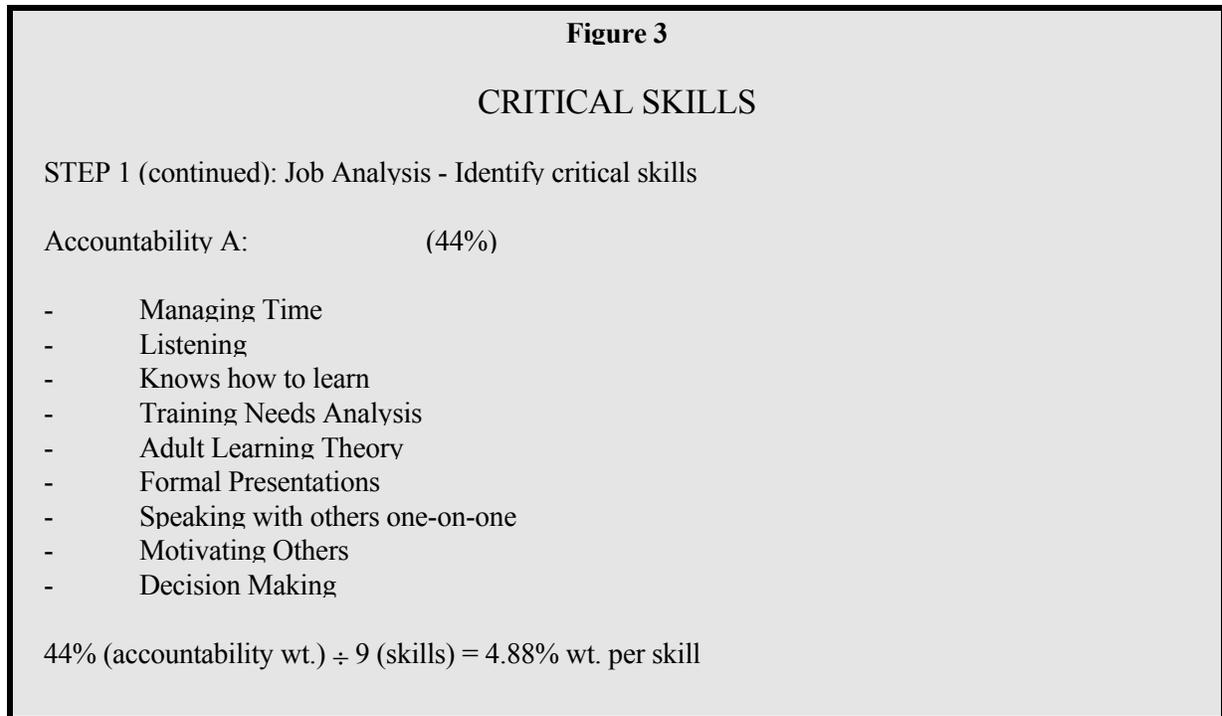
**STEP 1 IDENTIFY REQUIRED KNOWLEDGE AND SKILLS**

The ROI forecasting process began by selecting employees and/or supervisors who are familiar with a job, e.g. instructor. These subject matter experts (SME's) met typically from 1 - 2 hours.

**Figure 2****STEP 1: JOB ANALYSIS - GROUP TASKS AND ESTIMATE WEIGHTS**

Accountability A)	(44%)
<ul style="list-style-type: none"> <li>Instructs and facilitates training programs</li> <li>Facilitates meetings or processes</li> <li>Provides recommendations to self-directed work teams</li> </ul>	
Accountability B)	(32%)
<ul style="list-style-type: none"> <li>Serves as liaison for various training groups</li> <li>Provides consultation to line management</li> </ul>	
Accountability C)	(24%)
<ul style="list-style-type: none"> <li>Serves as project manager for various activities</li> <li>Serves on committees, prepares brief presentations, ...</li> </ul>	

SME's agreed on the key accountabilities of the job. Job descriptions provided much or all of this information. Next, the key accountabilities were given a weight based on their importance and the typical time spent doing them during the year. These weights added up to 100% (see Figure 2). We had SME's use an estimation procedure (called the Casio-Ramos estimation procedure) to get more accurate weights. Employees picked the highest weighted accountability and gave it 100 points. Each other accountability was then compared and given a lesser number of points. For example, an accountability that is only half as important was given 50 points.



Finally, the SME's identified the critical skills for each key accountability (see Figure 3). We suggested that they limit themselves to the most critical skills, and that they try not to exceed 7-10 skills for each accountability. The skills were picked from a list that contains both "soft" and "technical" skills. The list was modified before the meeting to include technical skills that are important for ComEd and for the Personnel Development Training Organization specifically. A few additional skills were suggested by the SME's and were added to the skill list.

## STEP 2 ASSESS EMPLOYEES

Step 2 is employee assessment. The first question is, "How will employee skills be assessed?" We could have used a variety of assessment approaches such as written tests to assess some of the basic skills (reading, math, etc.) and exercises to assess interpersonal skills required for the jobs covered in this study. However, ratings by self and others (we used self and manager ratings) was the most viable choice for this and most similar studies that cover a broad range of skills. There is good evidence that these ratings are quite accurate if raters have adequate orientation and/or training.

We used a 5 point rating scale: Beginner, Novice, Skilled, Advanced, and Expert. Each level was accompanied by a generic definition. For example, "Novice" was defined as follows:

I am able to perform simple job tasks requiring this skill without assistance. I require assistance to perform moderate or complex tasks requiring this skill.

Skill assessment questionnaires were completed separately by employees and managers, and both perspectives were weighted equally. There are other good approaches. In a different pilot study we conducted in a division, the manager and employee were brought together after making their ratings to discuss and come to agreement on ratings.

## STEP 3 CALCULATE GAPS AND COSTS

We identified employee skill gaps and then estimated the cost of the gaps in terms of lost performance. While we used special software designed for this purpose, these calculations can be performed by a wide variety of software programs readily available in most organizations.

We began by estimating the value (annual contribution) of employees in the study. That is, if Chris Smith was 100% proficient at his job, what would his worth be? We made an assumption that at a minimum, the value is the cost of his wages and benefits, a value that is set by the free market. No company will be profitable if employees do not produce value that is at least equal to salary and benefits. Therefore, the value of an employee making \$21,500 a year and receiving a typical benefits package (about 40% of salary, or \$8,600 in this case) could very conservatively be estimated at about \$30,000 per year. Other organizations may want to follow a less conservative approach. For example, value could be estimated as sales per employee. In this case, a company that grosses 10 million per year and has 100 employees would have an average employee value of \$100,000. There are a lot of ways to estimate employee values; we chose an approach that makes sense to the customers of our study.

Rather than calculate the value of each individual employee, we simplified the process by using the median of their pay range to establish their value. Therefore, we set three levels; professional, supervisory, and middle management, which were the three levels of employees in the study. The value of the middle management job was set at almost double that of the professional level, which means that a deficiency in an employee in middle management is going to receive considerably more weight than a deficiency of an employee two levels below.

In order to increase its value as a good measure of training need, we calculate "skill gap" differently than is typically done. Traditionally, a skill gap has been calculated as 2 if a person is rated a 3 out of a potential 5. However, two skill gaps of 2 have very different significance if one skill is highly critical and the other is

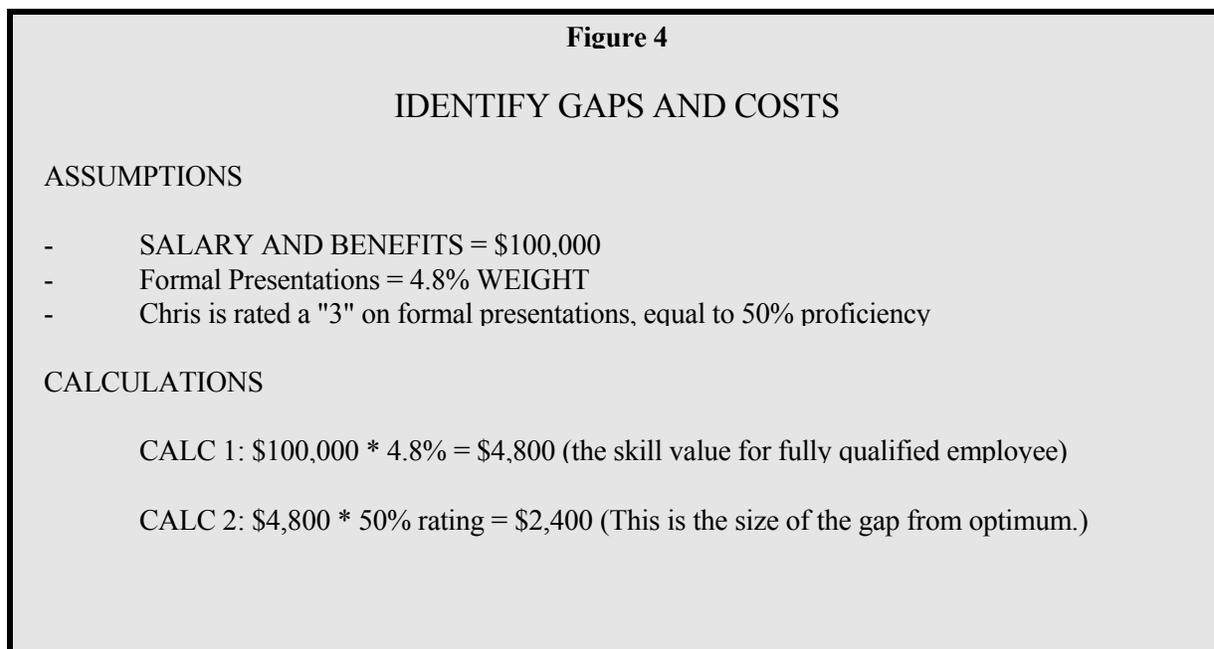
not. Therefore, we calculate a percentage skill gap that reflects the traditional rating scale gap plus the importance of the skill to the job. Then, we use the \$ value of the job to calculate the \$ impact of a skill gap.

The first step for calculating a skill gap, identifying the importance of a skill, is shown in Figure 3. Each of the skills supporting this accountability have been given an initial weight of 4.88 %. If a skill, say "Managing Time", is also critical for other accountabilities, it will receive additional weight. While this approach gives us a good first approximation of skill weight, we ask the subject matter experts to look at the estimates and to identify those weights that need to be raised or lowered.

Our second step for calculating a skill gap is the traditional one; calculating the difference between an employee's skill level and the optimum skill level (a 3 on a 5 pt. scale leaves a gap of 2). Since we had two raters (self and manager), and since we value the ratings equally, we averaged them to arrive at the appropriate employee rating. However, is a skill gap of 2 twice as important as a skill gap of 1? Based on our rating scale and training objectives, we didn't think so. We used the following scale that gives greater weight to skill gaps of employees at the lower end of the scale:

1 = Beginner	= 05% Proficiency
2 = Novice	= 25% Proficiency
3 = Skilled	= 50% Proficiency
4 = Advanced	= 85% Proficiency
5 = Expert	= 100% Proficiency

Therefore, a rating of 3 translates into a 50% skill gap; a rating of 4 as only 15%.



At this point, we can calculate the cost (significance) of a skill gap (See Figure 4). First a value is determined for the contribution of the skill to the job. Then, the skill gap (e.g. 50%) is multiplied by the skill value to determine the cost of the skill gap.

#### **STEP 4 EVALUATE TRAINING PROGRAMS**

We evaluated training programs on skills taught and cost of training.

Training programs can teach one or several skills from our skills list. For example, a course called Budgeting was rated as teaching two skills on our skills list:

Developing Budgets (4)  
Profit and Loss Statement Use (2)

The "4" reflects that most participants leave the course with an advanced skill to develop budgets. The "2" reflects that the course will only bring participants to a novice level on using profit and loss statements. These are the same levels used to assess employees in Step 2. For this study, we relied on instructors and course designers to tell us the skills and levels of training programs. Feedback we received from some program participants suggested that we should also collect training program ratings from them, preferably within a few months after they completed the training. At that time, they would be in a good position to accurately evaluate how much a particular training program really helped them to do their job.

We also estimated the costs of each course. From that, a per head cost could be easily determined. To arrive at a cost, we considered:

Program Length  
Maximum & Minimum # of participants  
Design Cost (for new program)  
Instructor Costs per program  
Facility Costs per program  
Material Costs per student  
Variable Costs per day (Meals, hotel, travel etc.)  
Lost Productivity Costs

Program length multiplied by daily employee value allowed us to estimate lost productivity due to employees being in training instead of at work. In most cases, this is likely to be the largest cost.

#### **STEP 5 CALCULATE ROI/SELECT OPTIMUM TRAINING**

We then had all the information - training program benefits and costs - that we needed to calculate an ROI forecast and select a curriculum that would optimize ROI of training.

To arrive at a total benefit and a total cost for a group of employees, we added individual data. Costs and benefits may vary for each individual. For example, program costs will vary per person if the cost of lost productivity during training is considered. Costs also vary with the number of people in the class, since there are certain fixed costs regardless of how many people attend. Benefits vary based on the size of an employee's gap as well as the importance of the skill to his job and his job to the organization.

<b>Figure 5</b>	
<b>CALCULATING TRAINING COST</b>	
<b>PROBLEM SOLVING &amp; DECISION MAKING</b>	
1. Development	= \$ 1,000
2. Facilities Cost	= \$ 200
3. 15 Sets of Course Materials	= \$ 200
4. Instructor costs	= \$ 600
5. Food costs	= \$ 200
6. Cost of time away from work	= \$12,000
<b>TOTAL Costs for 15 Participants</b>	<b>= \$14,200</b>
Per Person Costs	= \$ 950
Expected proficiency at end of course = Advanced = 80% proficient	

Figure 5 shows how we forecasted the costs of a problem-solving and decision-making course for an individual we will call Chris Smith. Since we had 15 persons who would be good candidates for the course, we divided the total costs by 15 to arrive at an average course cost of \$950.

Figure 6 shows how we forecasted the benefits of a decision-making program for Chris. Before training, Chris was rated at a "3" (fully competent) or 50% of optimum. After taking Decision-Making 101, based on past experience with this course, it was estimated that Chris would be at a "4" (advanced) or 80% level, or a 30% improvement. We had already estimated the value (see Step 3 above) of decision-making for Chris's job. So, it was easy to calculate that the estimated value of a 30% improvement was about \$1,500.

Figure 7 shows an ROI calculation for Chris Smith. This is the standard ROI calculation. The numerator is benefits minus costs. The denominator is costs. The numerator is divided by the denominator, and this result is multiplied by 100. To calculate ROI for our group of 22 employees, we added the individual benefits like that shown in Figure 7.

While the 57% ROI that we project Chris Smith would get from taking Decision Making appears to be a good return, that doesn't mean that we should make this investment. It could be that there are some 100% or 200% ROI investments available, once we have investigated the other possibilities. For example, we may have many employees that will get twice as big a benefit as Chris. And, we may have other courses for Chris that will provide a higher return. This is one of the key advantages of ROI forecasting: it helps us to find the best training investments, not just the good ones.

Figure 6

## CALCULATING BENEFITS

## PROBLEM SOLVING &amp; DECISION MAKING

## DATA

Chris Smith's proficiency before training = 3 = 50%  
 Decision making #101 rating as advanced = 4 = 80%  
 Value if Chris 100% proficient = \$ 5,000

## CALCULATIONS

Benefit = gain in proficiency  
 Proficiency after training = 80% \* \$5,000 = \$ 4,000  
 Proficiency before training = 50% \* \$5,000 = \$ 2,500  
 Benefit = \$4,000 - 2,500 = \$ 1,500

THE ESTIMATED TRAINING BENEFIT IS \$1,500

Figure 7

## CALCULATING ROI

Should Chris take Problem-solving and Decision Making #101?

$$\text{ROI} = \frac{[(80\% * \$5,000) - (50\% * \$5,000)]}{\$950} * 100$$

Benefit = \$1,500      Cost = \$ 950

THE RETURN ON THE \$950 INVESTMENT IS \$1,500

Net Gain = \$ 550      ROI = 57%

IS THIS A GOOD TRAINING INVESTMENT???

Our next step was to find the best courses for our available training dollars. For the purposes of this study, we set a hypothetical budget of \$25,000 for the 22 professional positions in PD, and then wanted to know how we could best spend that money and what the benefits would be. We also decided for this pilot that when calculating training program costs, we would not consider lost productivity due to being in training rather than on one's job.

Based on the of skill gaps we had identified in Step 3 (calculation example in Figure 4) we chose 11 training programs from the PD curriculum that we felt might be useful. Then we calculated the expected ROI for each. The results are shown in Figure 8. They show that only 6 of the 11 courses we had considered showed a positive ROI. Therefore, we would only be able to spend about \$11,800 wisely, using the remainder from the \$25,000 some other way. The ROI we calculated was about 327%. The courses we selected are shown in Figure 9.

**Figure 8**

**TRAINING SCENARIO HIGHLIGHTS**

TOTAL BUDGET	\$25,000
TOTAL COST OF CURRICULUM	\$11,883
PERFORMANCE BENEFIT	\$50,720
ROI	326.8%
# of Courses with positive ROI	6
Average cost per trainee	\$ 304
Average benefit per trainee	\$ 1,299
Average cost per program	\$ 1,697
Average benefit per program	\$ 7,245

**Figure 9**

**SELECTED CURRICULUM**

PROGRAM	COST	BENEFIT	# TRN.
PROBLEM SOLVING & DECISION MAKING	\$4,800	\$27,023	16
SITUATIONAL LEADERSHIP	\$ 173	\$ 744	01
INTERPERSONAL MGMT. SKILLS	\$3,200	\$11,975	8
SUCCESSFUL PRESENTATIONS	\$2,780	\$ 8,470	8
MANAGING CONFLICT	\$ 420	\$ 1,140	5
BUDGETING	\$ 510	\$ 1,368	1

We could have achieved a higher forecasted ROI and used more of the available budget if we considered more training programs, including some from external vendors.

## **LINKING ROI FORECASTS TO ROI EVALUATIONS**

The ROI Forecasting approach we have described easily lends itself to level 3 and level 4 evaluations. That is because employee assessment data that is collected initially to help make a forecast serves as a pretest. Presuming that employee assessments are repeated on a regular basis, each assessment after the first becomes a post test for the previous assessment. Also, persons that took training can be compared to a matched group of those that didn't.

If level 3 evaluations are the focus, then employee assessments should be worded such that employees are evaluated on whether they demonstrate a skill, rather than whether or not they have the skill. This perspective is consistent with the notion of performance consulting whereby HRD professionals concern themselves with performance gaps whether they are due to skill deficiencies or other factors.

To facilitate rigorous Level 4 evaluations, a few more changes may be desirable. The focus of Job Analysis (Step 1, Figure 2) changes from job tasks to job outcomes. Also, some practitioners may wish to define training benefits as a performance change on an outcome such as sales, time expended, etc. However, with the current emphasis on competency development, other practitioners may be quite comfortable with our approach of using changes in employee value as the benefit gained.

## **CONCLUSION**

With several pilot studies successfully completed, a project has been initiated in one of ComEd's divisions for 500+ management personnel. The job analysis approach is being used to validate a competency model for the division and to identify the most critical competencies for each management job. A competency-based pay system is being implemented, and the demand for training is expected to soar well beyond the current high levels. ROI forecasting will help us identify the highest priority training with the most value for ComEd and individuals

In conclusion, we believe that ROI forecasting holds great promise. The data provided are a great aid for complex training decisions. Certainly the demand for wise use of training resources will continue to increase. ROI forecasting allows training professionals to give top value to their clients, and that is truly our mission.

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## QUESTIONS FOR END OF CHAPTER

1. What is ROI forecasting? What are the benefits?
2. The ROI forecasting approach described here relies primarily on three datasets: critical skills and their weights for each position, employee assessments on critical skills, and evaluation of training that impacts critical skills. Why is the use of all three important? What would be lost without identification of critical skills? The employee assessment? Training evaluations?
3. What is the basis of the authors' argument that allocating training resources wisely is a much more difficult task than is initially apparent?
4. What is the method used to convert the potential benefit to monetary value? Is the estimate of benefits "conservative"? Why or why not?
5. How might this ROI forecasting approach be used as a basis for a competency-based pay system?
6. As a consultant on this project, how might you go about strengthening this forecasting methodology?