Chapter 9

Measuring ROI in a Masters Degree Program

Federal Information Agency

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This case study shows how a government agency tackled a serious problem with a creative solution to deliver a very positive ROI. The Federal Information Agency (FIA) was experiencing excessive turnover of critical talent, averaging about 38%, annually. Most of the exits occurred after one year of service, and usually for more salary. Because increasing salaries was not an option, this agency implemented a creative, but expensive, solution to meet two important needs, career enhancement and skill upgrading. The solution was to offer a Masters Degree in Information Science on agency time, at no cost to the employee. The agency head required a minimum 25% return on investment for the program.

PROBLEM AND SOLUTION

The Federal Information Agency (FIA) provides various types of information to other government agencies and businesses as well as state and local organizations, agencies, and interested groups. Operating through a network across the United States, the work is performed by several-hundred communication specialists with backgrounds in systems, computer science, electrical engineering, and information science. Almost all the specialists have bachelor's degrees in one of these fields. The headquarters and operation center is in the Washington, D.C. area, where 1,500 of these specialists are employed.

This case was prepared to serve as a basis for discussion rather than to illustrate either effective or ineffective administrative and management practices. The authors, dates, places, names and organizations may have been disguised at the request of the author or organization.

FIA has recently experienced two problems that have senior agency officials concerned. The first problem is an unacceptable rate of employee turnover for this group of specialists—averaging 38 percent in the past year alone. This has placed a strain on the agency to recruit and train replacements. An analysis of exit interviews indicated that employees leave primarily for higher salaries. Because FIA is somewhat constrained in providing competitive salaries, it has become extremely difficult to compete with the private sector for salaries and benefits. Although salary increases and adjustments in pay levels will be necessary to lower turnover, FIA is exploring other options in the interim.

The second problem concerns the need to continuously update the technical skills of the staff. While the vast majority of the 1,500 specialists have degrees in various fields, only a few have masters degrees in their specialty. In this field, formal education is quickly outdated. The annual feedback survey with employees reflected a strong interest in an internal masters degree program in information science. Consequently, FIA explored the implementation of an in-house masters degree in Information Science conducted by the School of Engineering and Science at Regional State University (RSU). The masters degree program would be implemented at no cost to the participating employee and conducted on the Agency's time during routine work hours. Designed to address both employee turnover and skill updates, the program would normally take three years for participants to complete.

Program Description

RSU was selected for the masters program because of its reputation and the match of their curriculum to FIA needs. The program allows participants to take one or two courses per semester. A two-course per semester schedule would take three years to complete. Both morning and afternoon classes were available, each representing three hours per week of class time. Participants were discouraged from taking more than two courses per term. Although a thesis option was normally available, FIA requested a graduate project be required for six hours of credit as a substitute for the thesis. A professor would supervise the project. Designed to add value to FIA, the project would be applied in the agency and would not be as rigorous as the thesis. Participants signed up for three hours for the project in both year two and three.

Classes were usually offered live with professors visiting the agency's

center. Occasionally, classes were offered through videoconference or independent study. Participants were asked to prepare for classroom activities on their own time, but were allowed to attend classes on the agency's time. A typical three-year schedule is shown in Table 9-1.

Senior management approved the masters curriculum, which represented a mix of courses normally offered in the program and others specially selected for FIA staff. Two new courses were designed by university faculty to be included in the curriculum. These two represented a slight modification of existing courses and were tailored to the communication requirements of the agency. Elective courses were not allowed for two reasons. First, it would complicate the offering to a certain extent, requiring additional courses, facilities, and professors—essentially adding cost to the program. Second, FIA wanted a prescribed, customized curriculum that would add value to the agency while still meeting the requirements of the university.

Table 9-1. Typical Three-Year Schedule

M.S.—Information Science			
	Year 1	**Year 2**	**Year 3**
Fall	2 Courses—6 hours	2 Courses—6 hours	2 Courses—6 hours
Spring	2 Courses—6 hours	2 Courses—6 hours	2 Courses—6 hours
Summer	1 Course—3 hours	1 Course—3 hours	Graduate Project –3 hours
		Graduate Project –3 hours	
Graduate Project—6 hours (Year 2 and 3)			
Total Semester Hours—48			

Selection Criteria

An important issue involved the selection of employees to attend the program. Most employees who voluntarily left the agency resigned within the first four years, and were often considered to have high potential. With this in mind, the following criteria were established for identifying and selecting the employees to enroll in the program:

1. A candidate should have at least one year of service prior to beginning classes.
2. A candidate must meet the normal requirements to be accepted into the graduate school at the university.

3. A candidate must be willing to sign a commitment to stay with the agency for two years beyond program completion.
4. A candidate's immediate manager must nominate the employee for consideration.
5. A candidate must be considered "high potential" as rated by the immediate manager.

The management team was provided initial information on the program, kept informed of its development and progress prior to actual launch and briefed as the program was described and selection criteria was finalized. It was emphasized that the selection should be based on objective criteria, following the guidelines offered. At the same time, managers were asked to provide feedback as to the level of interest and specific issues surrounding the nomination of candidates.

A limit of 100 participants entering the program each year was established. This limit was based on two key issues:

1. The capability of the university in terms of staffing for the program—RSU could not effectively teach more than 100 participants each semester.
2. This was an experiment that, if successful, could be modified or enhanced in the future.

Program Administration

Because of the magnitude of the anticipated enrollment, FIA appointed a full-time program administrator who was responsible for organizing and coordinating the program. The duties included registration of the participants, all correspondence and communication with the university and participants, facilities and logistics (including materials and books), and resolving problems as they occur. FIA absorbed the total cost of the coordinator. The university assigned an individual to serve as liaison with the agency. This individual was not additional staff; the university absorbed the cost as part of the tuition.

The Drivers for Evaluation

This program was selected for a comprehensive evaluation to show its impact on the agency using a four-year time frame. Four influences created the need for this detailed level of accountability:

1. Senior administrators had requested detailed evaluations for certain

programs considered to be strategic, highly visible, and designed to add value to the agency.
2. This program was perceived to be very expensive, demanding a higher level of accountability, including return on investment (ROI).
3. Because retention is such a critical issue for this agency, it was important to determine if this solution was the appropriate one. A detailed measurement and evaluation should reflect the success of the program.
4. The passage of federal legislation and other initiatives in the United States, aimed at bringing more accountability for taxpayers' funds, has created a shift in increased public sector accountability.

Consequently, the implementation team planned a detailed evaluation of this program beyond the traditional program evaluation processes. Along with tracking costs, the monetary payoff would be developed, including the ROI in the program. Because this is a very complex and comprehensive solution, other important measures would be monitored to present an overall, balanced approach to the measurement.

Recognizing the shift toward public sector accountability, the human resources staff had developed the necessary skills to implement the ROI process. A small group of HR staff members had been certified to implement the ROI process within the agency. The ROI process is a comprehensive measurement and evaluation process that develops six types of data and always includes a method to isolate the effects of the program (Phillips, Stone, and Phillips, 2001).

The evaluation of the masters program was conducted by several of these team members with the assistance of the original developer of the ROI process, Dr. Jack J. Phillips.

Program Costs

The costs of the program were estimated in advance and reflected a fully loaded cost profile, which included all direct and indirect costs. One of the major costs was the tuition for the participants. The university charged the customary tuition, plus $100 per semester course per participant to offset the additional travel, faculty expense, books, and handouts. The tuition per semester hour was $200 ($600 per three-hour course).

The full-time administrator was an FIA employee, receiving a base salary of $37,000/year, with a 45% employee benefits upload factor. The

administrator had expenses of approximately $15,000 per year. Salaries for the participants represented another significant cost category. The average salary of the job categories of the employees involved in the program was $47,800, with a 45% employee benefits factor. Salaries usually increase approximately 4% per year. Participants attended class a total of 18 hours for each semester hour of credit. Thus, a three-hour course represented 54 hours of off-the-job time in the classroom. The total hours needed for one participant to complete the program for one participant was 756 hours (14 x 54).

Classroom facilities were another significant cost category. For the 100 participants, four different courses were offered each semester and each course was repeated at a different time slot. With a class size of 25, eight separate semester courses were presented each semester. Half the scheduled courses were offered in the summer. Although the classrooms used for this program were those normally used for other training and education programs offered at the agency, the cost for providing the facilities was included. (Because of the unusual demand, an additional conference room was built to provide ample meeting space.) The estimate for the average cost of all meeting rooms was $40 per hour of use.

The cost for the initial assessment was also included in the cost profile. This charge, estimated to be approximately $5,000, included the turnover analysis and was prorated for the first three years. FIA's development costs for the program were estimated to be approximately $10,000 and were prorated for three years. Management time involved in the program was minimal, but estimated to be approximately $9,000 over the three-year period. This consisted primarily of meetings and memos regarding the program. Finally, the evaluation costs, representing the cost to actually track the success of the program and report the results to management, was estimated to be $10,000.

Table 9.2 represents the total costs of the initial group in the program for three years using a fully loaded cost profile. All of the cost categories described above are included. This value is necessary for the ROI calculation.

ROI PLANNING

Data Collection Issues

To understand the success of the project from a balanced perspective, a variety of types of data had to be collected throughout program implementation. During the initial enrollment process, meetings were

conducted with participants to obtain their commitment to provide data at different time frames. The program administrator had regular access to participants who were willing to provide data about their reaction to the program, and detail the extent of knowledge and skill enhancement, and the successes they achieved on the job. Measures were taken at four distinct levels:

1. Reaction to individual courses and the program, including the administrative and coordination issues
2. The knowledge and skills obtained from the individual courses and learning about the program
3. Application and implementation of the program as learning is applied on the job and the program is coordinated effectively
4. Changes in business measures in the agency directly related to the program

Table 9-2. Total Fully Loaded Costs of Masters Program for 100 Participants

	Year1	Year 2	Year 3	Total
Initial analysis (prorated)	$1,667	$1,667	$1,666	$5,000
Development (prorated)	3,333	3,333	3,334	10,000
Tuition-regular	300,000	342,000	273,000	915,000
Tuition-premium	50,000	57,000	45,500	152,500
Salaries/Benefits (participants)	899,697	888,900	708,426	2,497,023
Salaries/Benefits (program administrator)	53,650	55,796	58,028	167,474
Program coordination	15,000	15,000	15,000	45,000
Facilities	43,200	43,200	34,560	120,960
Management time	3,000	3,000	3,000	9,000
Evaluation	3,333	3,333	3,334	10,000
Total	**$1,372,880**	**$1,413,229**	**$1,145,848**	**$3,931,957**

In addition to these data items, program costs were monitored so that the return on investment could be calculated.

Collecting different types of data required measures to be taken at different time frames. It was agreed at the beginning of the program, that some data categories would be collected at the end of each semester. Reaction would be measured and learning would be monitored with individual grade

point averages. At periodic intervals, follow-up data was collected to reflect the progress of the program and its application on the job. Finally, business impact data directly linked to the program was measured during the program as well as at the conclusion. While this program was perceived to have a long-term impact, data had to be collected throughout the process to reflect any early impact that developed.

Data Collection Plan

The program administrator was responsible for the initial data collection and semester feedback sections. Individual faculty members were asked to collect reaction and learning measures at the end of each course. While most of the data would come directly from the participants, the records from the agency were monitored for certain business measures, such as turnover. In addition, immediate managers of participants provided input concerning the actual use of the program on the job. Figure 9-1 shows the data collection plan for this program.

Reaction to the program was collected at specific time periods. A few issues involving reaction and satisfaction were collected from prospective participants at an information briefing when the program was announced. Perceived value, anticipated difficulty of the courses, and usefulness of the program on the job were captured in initial meetings. Next, reaction measures were collected for each individual course as the participants rated the course material, instructor, delivery style, and learning environment. Also, at the end of each semester, a brief reaction questionnaire was collected to provide constant feedback of perceptions and satisfaction with the program. Upon completion of the program, an overall reaction questionnaire was distributed.

The initial meeting with the participants provided an opportunity to collect information about their understanding of how the program works and their role in making the program successful. Most of the learning took place in individual courses. The faculty member assigned grades based on formal and informal testing and assessment. These grades reflected individual learning, skills, and knowledge. Professors used a variety of testing methodology such as special projects, demonstrations, discussion questions, case studies, simulations, and objective tests. The overall grade point average (GPA) provided an on-going assessment of the degree to which the participants were learning the content of the courses.

Application and implementation measures were assessed at several different time intervals. At the end of each year, a questionnaire was

Figure 9-1. Data Collection Plan

Program: Federal Information Agency **Responsibility:** _____ **Date**: _____

Level	Broad Program Objective(s)	Measures	Data Collection Method/ Instruments	Data Sources	Timing	Responsibilities
1	**REACTION/ SATISFACTION** • Positive reaction to program, content, quality, and administration	• 4.0 on a scale from 1-5	• Reaction questionnaire	• Participants	• At the intro of the program • End of course • End of semester	• Program Administrator • Faculty • Program Administrator
2	**LEARNING** • Maintain above-average grades • Understand the purpose and the participant's role of the program	• 3.0 grade point average out of a possible 4.0 • 4.0 on a scale from 1-5	• Formal and informal testing in each course • Questionnaire at the end of initial meeting	• Participants • Participants	• End of each course • At the intro of the program	• Faculty • Faculty

Figure 9-1. Data Collection Plan *(continued)*

3	**APPLICATION/ IMPLEMENTATION** • Use of the knowledge and skills on the job • Develop and apply innovative projects to add operational value • Enjoy a very high completion rate	• Various measures on a scale of 1-5 • Completion of project • Completion rate of 80%	• Questionnaires • Action Plans • Monitoring Records	• Participants • Participants • Agency Records	• End of each year • One year follow-up • End of Program	• Program Administrator • Program Administrator • Program Administrator
4	**BUSINESS IMPACT** • Reduce avoidable turnover • Improve job satisfaction/ commitment • Career Enhancement • Upgrade technology and agency capability • Improve operational results • Recruiting success	• Number of avoidable exits each month divided by the average number each month • 4.0 on a scale of 1-5 • Monetary values • Number of candidates	• Monitoring records • Questionnaires • Action Plans • Monitoring Records	• Agency Records • Participants • Managers • Participants • Agency Records	• Monthly • End of each year • End of Program • One year follow-up	• HR Staff • Program Administrator Program • Administrator Program Administrator
5	**ROI** • Achieve a 25% Return on Investment	Comments:_____ _____ _____				

distributed where the participants indicated the success of the program in three areas:

1. The opportunities to use the skills and knowledge learned in the program
2. The extent to which the skills have actually been used on the job
3. The effectiveness in the use of the skills

In addition, several questions focused on the progress with (and barriers to) the implementation of the program. At this level of analysis, it was important to determine if the program material was actually being used on the job. Program statistics were collected, including dropout and completion rates of the participants.

Because the program was implemented to focus on retention of specialists, the primary business measure was turnover. Turnover rates for the participants in the program were compared directly with individuals not involved in the program to determine if the rates were significantly reduced. In addition to avoidable turnover, tenure of employees was tracked, which reflected the average length of service of the target job group. It was anticipated that the program would have an impact on a variety of other business measures as well, including the following:

1. Productivity (from projects)
2. Quality (from projects)
3. Enhanced agency capability
4. Technology upgrade
5. Job satisfaction
6. Employee commitment
7. Recruiting success
8. Career enhancement

In the planning process, it was decided that these measures would be explored to the extent feasible to identify improvements. If not, the perceived changes in these business measures would be collected directly from the participants.

Graduate Projects

An important part of the program was a graduate work-study project required to complete the master's degree. The project involved at least two semesters of work and provided six hours of credit. It was supervised by a

faculty member and approved by the participants' immediate manager. The project had to add value to the agency in some way as well as improve agency capability, operations, or technology upgrade. At the same time, it should be rigorous enough to meet the requirements of the university. In a sense, it was a master's thesis although the participants were enrolled in a nonthesis option. Through this project, the participants were able to apply what they had learned. The project was identified during the first year, approved and implemented during the second year, and completed in the third year.

This project provided an excellent opportunity for participants to support the agency and add value to agency operations. As part of the project, participants developed an action plan detailing how their project would be used on the job. The action plan, built into the graduate project, provided the timetable and detail for application of the project. A part of the action plan is a detail of the monetary contribution to the agency (or forecast of the contribution). That was required as part of the project and, ultimately, became evidence of contribution of the project. Follow-up on the action plan provided the monetary amount of contribution from the graduate project.

Data Collection Summary

Table 9-3 shows a summary of the various instruments used to collect data, along with the level of evaluation data. As this table reveals, data collection was comprehensive, continuous, and necessary for a program with this much exposure and expense. Data collected at Levels 1, 2, and 3 were used to make adjustments in the program. Adjustments were made throughout the program as feedback was obtained. This action is particularly important for administrative and faculty-related issues.

ROI Analysis Plan

Figure 9-2 presents a completed planning document for the ROI analysis. This plan, which was completed prior to the beginning of the program, addresses key issues of isolating the influence of the program, converting the data to monetary values, and costing the program. As Figure 9-2 reveals, avoidable turnover, the key data item, is listed along with the technology and operations improvement expected from individual graduate projects. It was anticipated that the program would pay off on turnover and improvements from projects.

Recruiting success is also listed as a measure for potential isolation and conversion. An increase in the number of applicants interested in employment

Table 9-3. Data Summary by Evaluation Level

Type of Instrument	Reaction/ Satisfaction	Learning	Application/ Implementation	Business Impact
1. Questionnaire after intro to program	X	X		
2. End-of-course instructor evaluation	X			
3. End-of-semester evaluation questionnaire	X			
4 Individual course tests		X		
5. Annual evaluation questionnaire			X	
6. Action plans with follow up			X	X
7 One-year follow-up questionnaire			X	X
8. Monitoring records				X

with FIA was anticipated as the communication and publicity surrounding the program became known in various recruiting channels. Other business impact measures were considered to be intangible and are listed in the intangible benefits column. Intangible benefits are defined as those measures purposely not converted to monetary values. During the planning stage, it was anticipated that measures such as improved job satisfaction, enhanced agency capability, and improved organizational commitment would not be converted to monetary value. Although very important, these measures would be listed as intangible benefits—only if they were linked to the program.

The cost categories discussed earlier were detailed in this planning document. Costs are fully loaded and include both direct and indirect categories. The communication targets were comprehensive. Seven groups were identified as needing specific information from this study.

The ROI analysis and data collection plans provide all the key decisions about the project prior to the actual data collection and analysis.

Isolating the Effects of the Program

Several methods were used to isolate the effects of the program, depending on the specific business impact measure. For avoidable turnover,

Figure 9-2. ROI analysis plan

Program: MS In Information Science **Responsibility:**_____ **Date**:_____

Data Items (Usually Level 4)	Methods for Isolating the Effects of the Program/ Process	Methods of Converting Data to Monetary Values	Cost Categories	Intangible Benefits	Communication Targets for Final Report	Other Influences/ Issues During Application	Comments
Avoidable Turnover	• Comparison Group • Participants' Estimates • Manager Estimates	• External Studies	• Initial Analysis • Program Development • Tuition • Participant Salaries/ Benefits • Program Coordination Costs • Facilities • Management Time • Evaluation	• Improved Job Satisfaction • Improved Operational Commitment • Career Enhancement • Enhanced Agency Capability • Technology Upgrade	• Participants • Immediate Managers of Participants • Program Sponsor • Senior Agency Administrators • Agency HR Staff • RSU Administrators • All Agency Employees	• Need to monitor external employment conditions • Need to identify other potential internal influences on turnover reductions	Payoff of program will probably rest on turnover reduction and improvements from projects
Technology and Operating Improvements	• Participants' Estimates	• Standard Values • Historical Costs • Expert Input • Participants' Estimates					
Recruiting Success	• Participants' Estimates	• Internal Expert Estimates					

three methods were initially planned. A comparison group was identified, which would serve as the control group in a traditional control group experiment. The individuals selected for the master's program would be matched with others not in the program, using the same tenure and job status characteristics. Recognizing the difficulty of success with a control group arrangement, both the participants and managers were asked to indicate the percent of the turnover reduction they believed to be directly related to this program. A questionnaire was provided to obtain this input.

For the technology and operations improvement data, participants' estimates were used as a method for isolating the effects of the program using data from action plans for the projects. The same approach was planned for isolating the effects of the program on recruiting success.

Converting Data to Monetary Values

The methods used to convert data to monetary values varied as well. For avoidable turnover, external studies were used to pinpoint the approximate value. From various databases, studies in similar job categories had revealed that the cost of turnover for these specialized job groups was somewhere between two and three times the average annual salary. This was considerably higher than the HR staff at FIA anticipated. As a compromise, a value of 1.75 times the annual salary was used. While this value is probably lower than the actual fully loaded cost of turnover, it is conservative to assign this value. It is much better to use a conservative estimate for this value than to calculate the fully loaded cost for turnover. Most retention specialists would agree that 175% of annual pay is a conservative, fully loaded cost of turnover for information specialists.

To obtain the monetary values of project improvements, participants were asked to use one of four specific methods to identify the value:

1. Standard values were available for many items throughout the agency, and their use was encouraged when placing monetary values on a specific improvement.
2. Historical costs could be used, capturing the various costs of a specific data item as it is improved, by the project. These cost savings values are taken directly from general ledger accounts and provide a very credible cost value.
3. If neither of the above methods is feasible, expert input, using internal sources was suggested.

4. Finally, if the other methods failed to produce a value, participants were instructed to place their own estimates for the value. In those cases, the confidence of the estimate would be obtained.

RESULTS

Reaction Measurements

Reaction measurements, taken during the initial program introductions, were informal and confirmed that the participants recognized the value of the program and its usefulness to them as well as the agency. Also, any concerns about the difficulty of the program were addressed during that meeting.

Two opportunities to collect reaction and satisfaction data occurred at the end of each semester. For each course, the instructor obtained direct feedback using standard instrumentation. Table 9-4 shows the faculty evaluation selected for this program. It was a slightly modified version of what RSU normally collects for its instructors. In addition to providing feedback to various RSU department heads, this information was provided to the program administrator as well as the major sponsor for this project. This constant data flow was an attempt to make adjustments if the faculty was perceived to be unresponsive and ineffective in delivering the desired courses. As Table 9-4 shows, on a scale from one to five, the responses were extremely effective. The only concerns expressed were with the presentation and ability to relate to agency needs. At several different times, adjustments were made in an attempt to improve these two areas. The ratings presented in Table 9-4 were the cumulative ratings over the three-year project for the 100 participants who initially began the program.

Table 9-4. Reaction to the Faculty

Issue	Average Rating*
Knowledge of Topic	4.35
Preparation for Classes	4.25
Delivery / Presentation	3.64
Level of Involvement	4.09
Learning Environment	4.21
Responsiveness to Participants	4.31
Ability to Relate to Agency Needs	3.77

*On a 1-5 scale, with 5 = exceptional

Table 9-5. Measures of Reaction to the Program

Issue	Average Rating*
Value of Program	4.7
Difficulty of Program	4.1
Usefulness of Program	4.5
Quality of Faculty	3.8
Quality of Program Administration	4.4
Appropriateness of Course Material	3.9
Intent to Use Course Material	4.2
Amount of New Information	3.7
Recommendation to Others	4.6

*On a 1-5 scale, with 5 = exceptional

At the end of each semester, a brief scanable questionnaire was collected to measure satisfaction with and reaction to the program. Table 9-5 shows the various items rated on this questionnaire. The goal was to have a composite of at least four out of five for this program, and it was achieved. The only areas of concern were the quality of the faculty, the amount of new information, and the appropriateness of the course material. Adjustments were made to improve these areas.

Learning Measurements

Learning was primarily measured through formal testing processes used by individual faculty members. As stated earlier, a variety of methods were used ranging from objective testing to simulations. The tests yielded an individual grade that translated into a grade point average. The grade objective for the overall program was to maintain a 3.0 grade point average out of a possible 4.0. Table 9-6 shows the cumulative grade point average through the three-year period ending with an average of 3.18, exceeding the target for the overall program.

Application and Implementation Measures

Application and implementation were measured with three instruments: the annual questionnaire at the end of each program year, the follow-up on the action plans, and a one-year follow-up questionnaire. The two questionnaires (annual and follow-up) provided information about overall application and use of the program and course material. Table 9-7 shows the categories of data for the annual questionnaire, which, for the most

part, was duplicated in the follow-up questionnaire. As this table reveals, nine topical areas were explored with the focus on the extent to which the participants were using the program and the skills and knowledge learned. It also explored improvements and accomplishments over and above the individual project improvement. Barriers and enablers to implementation were detailed, in addition to input on the management support for the program, along with recommendations for improvement.

Table 9-6. Cumulative Grade Point Averages

Learning Measures	
Year	**Cumulative Grade Point Average**
Year 1	3.31
Year 2	3.25
Year 3	3.18

*Out of a possible 4.0

Several questions were devoted to each of these categories. For example, Table 9-8 presents application data for knowledge and skills, showing four specific areas and the ratings obtained for each. While these ratings reveal success, there was some concern about the frequency of use and opportunity to use skills. The input scale for these items was adjusted to job context. For example, in the frequency of skills, the range of potential responses was adjusted to reflect anticipated responses and, consequently, in some cases it may have missed the mark. Some skills should be infrequently used because of the skills and the opportunity to use them. Thus, low marks on these two categories were not particularly disturbing considering the varied nature of program application.

Business Impact

Although business data was monitored in several ways, the annual and follow-up questionnaire obtained input on the perceived linkage with impact measures. As shown in Table 9-7, the third category of data provided the opportunity for participants to determine the extent to which this program influenced several impact measures. As far as actual business improvement value, two data items were converted to monetary values: turnover and project application.

Table 9-7. Categories of Data for Annual Questionnaire

- Course Sequencing / Availability
- Use of Skills / Knowledge
- Linkage with Impact Measures
- Improvements / Accomplishments
- Project Selection and Application
- Barriers to Implementation
- Enablers to Implementation
- Management Support for Program
- Recommendations for Improvement

Table 9-8. Application Data: Use of Knowledge and Skills

Issue	Average Rating*
Opportunity to use skills / knowledge	3.9
Appropriateness of skills / knowledge	4.1
Frequency of use of skills / knowledge	3.2
Effectiveness of use of skills / knowledge	4.3

*On a 1-5 scale, with 5 = exceptional

Turnover Reduction. The primary value of the program would stem from annual turnover reduction of the target group. Table 9-9 shows the annualized, avoidable turnover rates for three different groups. The first is the total group of 1,500 specialists in this job category. The next group is the program participants, indicating that of the 100 initial participants, 12 left during the program (5 percent, 4 percent, 3 percent), and three left in the first year following completion, for a total of 15 in the four-year timespan. For the similar comparison group, 100 individuals were identified and the numbers were replenished as turnover occurred. As the numbers revealed, essentially the entire comparison group had left the agency by the end of the third year. This comparison underscores the cumulative effect of an excessive turnover rate. Using the comparison group as the expected turnover rate yields a total expected turnover of 138 in the four-year period (34 percent, 35 percent, 33 percent, and 36 percent). The actual, however, was 15 for the same period. Thus, the difference in the two groups (138 - 15) equals 123 turnover statistics prevented with this program, using the control group arrangement to isolate the results of the program.

The participants and managers provided insight into the percent of the turnover reduction attributed to the program. For their estimate, the process starts with the difference measured in the total group compared to the actual. Using a base of 100, the total group was expected to have 144

Table 9-9. Turnover data

Annualized Avoidable Turnover	1 Year Prior to Program	1st Year Sept to Aug	2nd Year Sept to Aug	3rd Year Sept to Aug	1 Year Post Program
Total Group 1,500	38%	39%	36%	35%	34%
Program participants Group	N/A	5% (5 participants)	4% (4 participants)	3% (3 participants)	3% (3 participants)
Similar Group	N/A	34%	35%	33%	36%
Four-Year Expected Turnover Statistics = 138 Four-Year Actual Turnover Statistics = 15 Four-Year Total Group Turnover Statistics = 144 (with a base of 100)					

turnover statistics (39 percent, 36 percent, 35 percent, and 34 percent). The difference between the total group and the actual turnover statistic is 129 (144 - 15 = 129). Because there were other contributing factors, participants were asked to indicate what percentage of this reduction they attributed to the program. The participants' and managers' estimates were combined (using a simple average to reflect equal weight) to yield a 93 percent allocation to this program. The confidence estimate for this value is 83 percent (the average of the two).

Obviously, both groups realized that this program was accomplishing its major goal of reducing turnover. Thus, if 129 are adjusted by 93 percent and 83 percent, the yield is 100 turnover statistics. Given the choice of using 123 or 100, the lower number is used, although it might not be as credible as the actual control group comparisons. It is conservative to indicate that at least 100 turnover statistics were prevented in the four-year time frame for this analysis.

The value for the turnover reduction is rather straightforward, with 1.75 times the annual earnings used as a compromised value. The total value of the turnover improvement is 100 X $47,800 X 1.75 = $8,365,000. This is a significant, yet conservative, value for the turnover reduction.

Project Values. The participants developed projects that were designed to add value to the agency by improving capability and operations. Table 9-10 shows the summary of the data from the projects. Eighty-eight individuals graduated from the program, and all had approved and implemented projects. Of that number, 74 actually provided data on their project completion in the one-year follow-up on their action plan. Of that number, 53 were able to convert the project to a monetary value. The participants were asked to estimate the amount of improvement that was directly related to the project (percent), recognizing that other factors could have influenced the results. The values are reported as adjusted values in Table 9-10. Only 46 of those were useable values, as unsupported claims and unrealistic values were omitted from the analysis. For example, the highest value ($1,429,000) was eliminated because of the shock value of this number and the possibility of error or exaggeration. The average confidence estimate was 62 percent. When each project value is multiplied by the individual confidence estimate, the total adjusted usable value is $1,580,000.

Table 9-10. Monetary Values from Project

Number of Projects Approved and Implemented	88
Number of Projects Reporting Completion	74
Number of Projects Reporting Monetary Values	53
Number of Projects with Usable Monetary Values	46
Average Value of Project - Adjusted	$ 55,480
Highest Value of Project - Adjusted	$ 1,429,000*
Lowest Value of Project - Adjusted	$ 1,235
Average Confidence Estimate	62%
Total Value (Adjusted twice)	**$ 1,580,000**

*Discarded in the analysis

Intangibles

The intangible benefits were impressive with this program. Recruiting success was not converted to monetary value, but included instead as a subjective intangible value. All of the intangible measures listed in the initial data collection plan were linked to the program, according to participants or managers. A measure was listed as an intangible if at least 25 percent of either group perceived it as linked to the program. Thus, the intangibles were not included in the monetary analysis but were considered to be important and included in the final report.

BCR and ROI Calculations for Turnover Reduction

The benefits-cost ratio (BCR) is the total monetary benefits divided by the total program costs. For turnover reduction, the BCR calculation becomes:

$$\text{BCR} = \frac{\text{Monetary Benefits}}{\text{Total Program Costs}} = \frac{\$8,365,000}{\$3,931,957} = 2.13$$

The ROI calculation for the turnover reduction is the net program benefit divided by the cost. In formula form it becomes:

$$ROI = \frac{\text{Monetary Benefits - Total Program Costs}}{\text{Total Program Costs}} = \frac{\$4,433,043}{\$3,931,957} \times 100 = 113\%$$

BCR and ROI Calculations for Total Improvement

The BCR for the value obtained on turnover reduction and project completion yields the following:

$$BCR = \frac{\$8,365,000 + \$1,580,000}{\$3,931,957} = \frac{\$9,945,000}{\$3,931,957} = 2.53$$

The ROI—Usable program benefits for the two improvements—is as follows:

$$ROI = \frac{\$9,945,000 - \$3,931,957}{\$3,931,957} = \times 100 = 153\%$$

Communicating Results

Because these are large values, it was a challenge to communicate them convincingly to the senior team. The conservative nature of this approach helps defend the analysis and make the results more credible and believable.

The step-by-step results were presented to the senior team using the following sequence:

1. A brief review of the project and its objectives
2. Overview of the methodology
3. Assumptions used in the analysis
4. Reaction and satisfaction measures
5. Learning measures
6. Application and implementation measures
7. Business impact measures
8. ROI
9. Intangibles
10. Barriers and enablers
11. Interpretation and conclusions
12. Recommendations

This information was presented to the senior team in a one-hour meeting and provided an opportunity to present the methodology and results. This meeting had a three-fold purpose:

1. Present the methodology and assumptions for capturing the ROI, building credibility with the process and analysis
2. Using a balanced approach, show the impact of a major initiative and how it provides a payoff for the agency and taxpayers
3. Show how the same type of solution can be implemented and evaluated in the future

   The project was considered a success.

Questions for Discussion

1. Can the value of this program be forecasted? If so, how?
2. Most of these costs are estimated or rounded off. Is this appropriate? Explain.
3. What issues surface when developing cost data? How can they be addressed?
4. Are the ROI values realistic? Explain.
5. Is this study credible? Explain.
6. How can this type of process be used to build support for programs in the future? Explain.