

Phase III: Develop and Test the *Qualitative Approach of the IH Value Strategy*

Introduction

The purpose of Phase III of the Value of the Industrial Hygiene Profession study was to develop and test a qualitative method for determining and illustrating the business value of IH programs and practices.

The Contract Statement of Work called for:

1. A description of the *Qualitative Approach* and its components;
2. Assessment of potential representative values and/or processes to obtain them;
3. Recommended approaches, protocols, processes, and tools and processes to gather qualitative and quantitative value using quality-based systems and methods, such as those associated with the Malcolm Baldrige National Quality Program and ISO-14001 systems;
4. A “template” of an education training module;
5. A summary of the results of applying some of the tools to some actual situations.

The study team has met all of the deliverables in this phase of the work. Items 1, 2, and 4 are addressed in this section of the report; item 5 is included in the summary of site visits and case studies that are included in the Phase II and Phase V sections of this report; and item 3 is addressed in the final section of the report entitled *Management Practices Demonstrating the Value of the Profession*.

Background

As with the ROHSEI tool described earlier, most of the experience in making the business case for S&H has been with detailed, quantitative approaches (see also the Phase II and IV sections of this report) that are designed to capture the benefit of specific interventions. However, investigation and research from site visits indicates that another approach is needed. In addition to intervention-based approaches, industrial hygienists need to be able to make the value case for entire programs at the facility, business unit, and enterprise levels. Furthermore, they need to be able to make them when quantification is difficult and detailed auditable financial information is inaccessible.

Consequently, the study team developed different methods that are incorporated into the *Qualitative Approach* outlined in this phase of the report. In addition, a *Quantitative Approach* for capturing value is discussed in Phase IV of the report. Both methodologies are tied together by an *Overarching IH Value Strategy* that provides a common platform for an integrated value analysis. The *Overarching Strategy* is addressed in Phase V. To differentiate between the two approaches:

The *Quantitative Approach* allows the user to calculate generally accepted financial business metrics, such as return on investment (ROI) and net present value (NPV) by capturing detailed business data on the industrial hygiene impact on cost avoidance, cost savings, revenue generation, and other strategic aspects of the business.

The *Qualitative Approach* allows the user to estimate the value of the industrial hygiene contribution by tracking its impact on health, risk, and the business process through an evidentiary cause and effect chain that relates intermediate outcomes to the value streams listed above and concurrently isolates confounding factors that could have produced the same effects.

When attempting to demonstrate the value of an IH program or activity, a quantitative analysis with generally accepted financial business metrics is usually preferable to a qualitative approach that facilitates an (albeit) credible estimation analysis. By developing a detailed business case for an IH program or activity the IH function is more likely to be viewed favorably as a business partner and the value of IH activities and programs can more readily be compared with competing financial opportunities within an organization.

However, given the fact that many IH benefits are largely intangible, IH programs and activities sometimes defy the accurate and comprehensive quantification of financial benefits. While these benefits are less tangible, the IH should still try to capture them. That can be done by using the *Qualitative Approach*. For example, reduction of the potential for long-term occupational illness or of non-work-related ill-health effects usually defies assigning a reliable financial value. However IH activities or programs that impact them are important, and their contributions should not be lost.

Both quantitative and qualitative assessments can be used to fully capture the benefits to the organization of the IH program or activity. The more general *Qualitative Approach* to capturing value may be preferred or needed in the following situations:

1. Projects that impart a sense of urgency with respect to employee health, business process, or regulatory compliance generally do not require a strict financial analysis as a prerequisite.
2. Higher levels of documented, visible risk are less likely to require detailed financial justification.
3. Projects that address existing documented risk to employees, facilities, the product or the community are less likely to require strict financial support.
4. If the cost data that defines a project benefit is not readily available a project cannot be justified on a strict financial basis.
5. Less leadership scrutiny generally requires less financial justification.
6. Less expensive alternatives generally require less financial justification.
7. Using a qualitative approach is prudent when dealing with general organizational benefits that management recognizes, but that are difficult to assign actual value, such as: improved employee morale, enhanced community image, achieving reputation objectives, etc.

Finally, using the *Qualitative Approach* is advisable when one doesn't have the time or the resources to conduct a detailed quantitative analysis.

The material that follows represents a new way of thinking in which the business value of IH activities and programs is captured by understanding their interconnectivity with and impact on key business objectives. Their impact on cost, revenue generation, and other business objectives that may or may not lend themselves to dollar quantification, is isolated.

Problem Statement

How does one demonstrate the value of IH activities and programs to the business when the costs and benefits are not directly quantifiable? In these scenarios the benefits may be intangible, there may not be a direct relationship between the industrial hygiene investment and the value generated, and/or there may not be sufficient time or data or necessary resources for a quantitative analysis.

Study Approach

The study approach was to identify potential links between risk-based IH programs and activities, key intermediate outcomes, and the business, and to capture benefits generated by those links in terms of cost reduction and avoidance, new revenue generation, and/or furthering other key business objectives. This is accomplished through a comprehensive strategy that borrows from the legal profession and other disciplines and utilizes deductive reasoning to establish the likelihood of those connections. The strategy also isolates and assesses the impacts of other factors that could have produced the same result.

Utilizing existing ROHSEI tools and materials:

The team started the analysis by reviewing the existing Return on Health, Safety, and Environmental Investment (ROHSEI) tool. ROHSEI was developed to assist users in understanding, measuring, demonstrating, and communicating how S&H investments impact S&H and business performance. ROHSEI helps answer the following questions:

- Which investments should we make?
- When should we make the investment; this year or next?
- How do safety and health investments compare to operational investments?
- To which projects should we allocate our human resources?
- Which S&H investments create the greatest value for the organization and how can this value be demonstrated?

ROHSEI measures direct benefits and costs and assesses the likely effect of hidden benefits and costs. The ROHSEI process involves four steps:

- Understand the safety and health opportunity or challenge
- Identify alternative solutions
- Gather data and conduct analysis
- Recommend a solution based on the analysis.

The Causal Loop Diagram: ROHSEI analyses are done through applying a *Causal Loop Diagram*, a *Direct Impact Module*, and a *Decision Matrix*. The group started by assessing the applicability of the *Causal Loop Diagram* to IH programs and activities.

Users identify alternative solutions to a S&H problem and then calculate the business impact of the alternatives. Potential impacts from the *Causal Loop Diagram* are identified and assessed in terms of whether or not they can be quantified. Quantifiable impacts are included in a *Direct Impact Module*; impacts that can not be quantified are addressed in the ROHSEI Decision Matrix.

The ROHSEI *Causal Loop Diagram* identifies probable links between safety and health outcomes and key business measures. The diagram takes into account key safety- and

health-related results, such as medical expenses, workers' compensation costs, fines and penalties, lost employee time, replacement time, investigation expense, non-productive investigation time, etc., and relates them to productivity, product quality, and customer satisfaction.

The Decision Matrix: The *Decision Matrix* is a structured tool that captures subjective assessments of the impact of the different proposed S&H interventions on productivity, product quality, and customer satisfaction. Sub elements are available for each category. For example, to assess the overall effect on productivity users could be asked to provide their view (H-, L-, =, L+, H+) of the intervention impact on:

- Task automation and productivity
- Process changes and productivity
- Non-production activities and productivity
- Task interruptions and productivity
- Physical strain and productivity
- Mental stress and productivity
- Overtime and productivity
- Task repetition and productivity
- Training and productivity
- Worker skill level and productivity
- Temporary workers and productivity
- Perception of management commitment and productivity
- Employee involvement and productivity
- Outsourcing and productivity
- Other factors and productivity.

The *Causal Loop Diagram* and *Decision Matrix* ended up being fundamental building blocks for the *Qualitative Approach* included in this report. However, the ROHSEI tool was not sufficient to accomplish all of the study objectives, and as a result had to be modified and expanded.

Capturing Value: The ROHSEI program captures value by collecting data on two aspects of benefit: the impact of IH programs and activities on costs related to health incidents and on operating costs related to IH risk management. In addition, the program captures the impact on costs of implementing an IH program or activity. ROHSEI then calculates the overall benefit and produces financial metrics that describe how it relates to company performance.

Leveraging concepts from other disciplines:

The Law

The ROHSEI strategy was expanded using concepts borrowed from other disciplines. The objective was to enable industrial hygienists to identify the impact of their activities (interventions) and programs on risk, and then track the effects of those risk reductions on the business, by making a compelling case that the impacts were in fact driven by industrial hygiene.

One of the disciplines leveraged by the team was law. Legal cases are won and lost by the evidence offered at trial and by the application of the law to the facts of a particular case. The law of evidence governs the use of testimony (oral or written statements) and physical exhibits and documentary material in criminal and civil trials. Evidentiary rules

determine what is admissible and what is not. In a sense, making the value case is analogous to making a case in a legal proceeding.

When the evidence is direct, the case is easier to argue and more likely to prevail. When the evidence is not direct, the proponents try to prove their assertions through circumstantial evidence. Circumstantial evidence is evidence of an indirect nature; it is the use of one or more facts to prove the existence of another fact; proof of a chain of facts and circumstances indicating a conclusion—usually that a person is guilty or not guilty. The main fact is deduced from indirect or circumstantial evidence by a process of probable reasoning. For example, the existence of a defendant’s fingerprints or DNA sample at a crime scene is circumstantial evidence that he or she was there. An argument is deductively valid if, whenever all premises are true, the conclusion is also necessarily true.

The team utilized these concepts in creating the *Qualitative Approach*. The Approach uses deductive reasoning to establish a chain of cause-and-effect analyses that utilizes intermediate outcomes to link the IH-related reductions in risk to business value. Confounding factors (other factors that could have produced the same result) are identified and isolated at each step.

Basically it is a sequential process: IH programs or activities reduce risk; risk reduction results in changes in health, the risk reduction process, and the business process; those changes have impacts on the business; those impacts can be valued.

Continuous Improvement

A recommended approach for conducting cause and effect analysis of relationships between intermediate outcomes and IH-related reductions in risk and business value is to create what is commonly known as a “fishbone diagram.” This is a loosely-structured thought process designed to identify and evaluate the potential causes of an observed effect. (See Figure III-1)

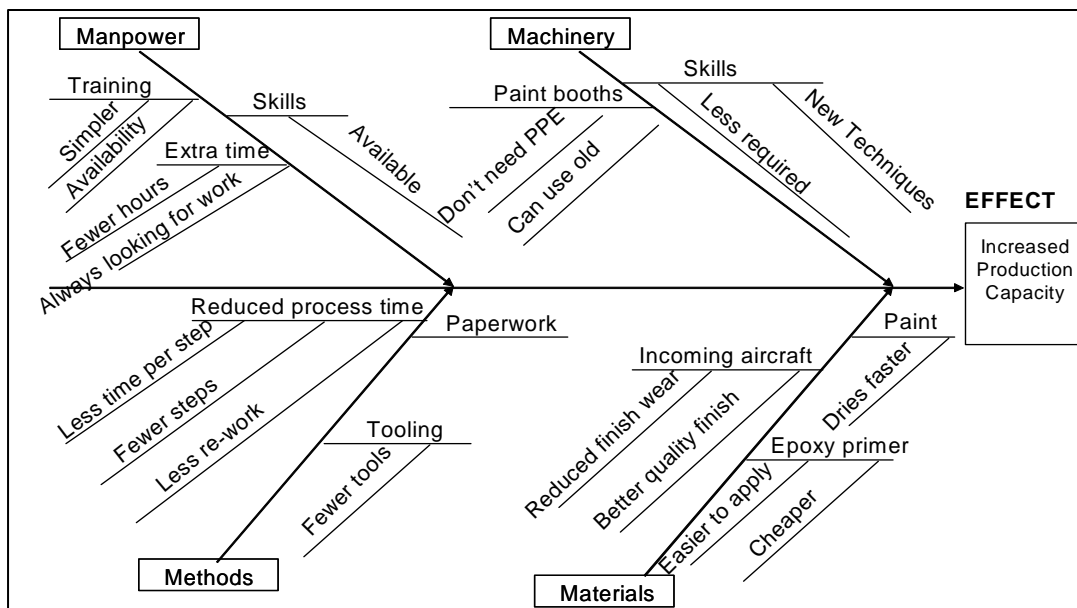


Figure III-1 . Cause and Effect (Fishbone) Diagram.

By brainstorming all the possible causes of the observed effect in key areas—such as manpower, machinery, materials, and methods—and looking at the positive and negative contributions of each, a team of IH; supervisory; hourly; and operations, engineering, and management representatives; and others who are affected by the program or activity, can determine the relationship between the IH program or activity and the effect.

Business Objectives Strategy

IH programs are often viewed in terms of their *proximate values*, such as 1) recognition, evaluation, and control of workplace chemical, physical, and biological agents, and 2) compliance with associated regulatory requirements. These values are real and substantial. However, there often are additional, more *key business values* associated with IH programs. These additional values to the enterprise must be recognized, understood, communicated, nurtured, and leveraged. The IH professional needs to “step back” and look beyond “tactical” IH programs. Specifically, the professional needs to establish how IH contributes to the greater mission of the enterprise. By clarifying and communicating value-added linkages, the IH effort becomes recognized throughout the organization as an effective, integrated asset, important for overall business success.

The Business Objectives Strategy was developed to assist health professionals in identifying how IH efforts deliver or can deliver strategic business values. The strategy correlates six categories of major objectives that an organization may consider important functions of their business. Business objective categories are often interrelated. Specific strategic business values vary by company and reflect the industry, customer base, product lines, market spaces and a host of other factors. Each of these factors must be carefully evaluated to determine how IH plays or could play a role. Nevertheless, there are some generic key business objectives common to most all organizations.

The following diagram (Figure III-2) illustrates a universal framework for capturing key business objectives and relating IH programs and activities to them.

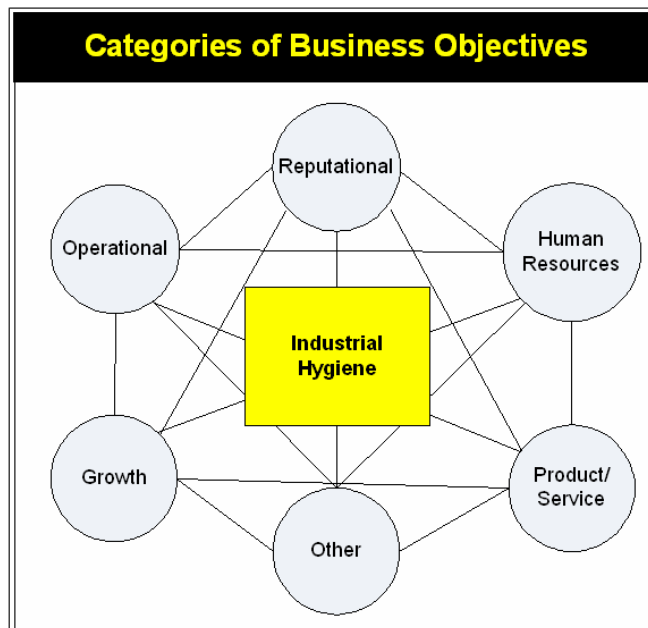


Figure III-2. Business Objectives Categories

Key business objectives within most successful companies include managing a robust **Human Resources** system, maintaining a strong **Operational** function, enhancing company **Reputation**, continually improving the **Product/Service**, and exploring potential for **Growth** (Figure III-4). These values are interdependent. For example, an Operational improvement that results in an enhanced Product/Service will often also lead to improved Human Resources and Reputation.

Health professionals must view their IH programs in the context of these overall business objectives. How does industrial hygiene help deliver or support these business objectives and deliver overall value? Which IH programs have the biggest influence or potential to contribute to the overall success of the enterprise? How can IH efforts best be aligned with strategic business objectives? By carefully considering each of the key business objectives, the health professional can determine the contributions of IH programs. This in turn helps senior business leadership gain a full appreciation for the value of industrial hygiene to the organization.

Approach Description

The *Qualitative Approach* that follows represents a trade-off between the simplicity needed to be “user friendly” and the detail needed for credibility. (See Figure III-3). Need for detail varies by user, by the subject of the value study, and by the target audience for the information. The approach is constructed to provide the maximum amount of information with minimum difficulty. Materials are relatively straightforward and easy to navigate. Users have “options” for entering the approach. They only need use the steps and elements that are relevant for their particular study. Furthermore they can substitute their own existing applications and approaches whenever possible.

The *Qualitative Approach* is part of a larger, more comprehensive **Overarching IH Value Strategy** that captures the ORC Value Proposition. The eight-step **Overarching IH Value Strategy** provides a common architecture for the analysis. Steps 1 - 4 involve a structured approach to understanding IH risks and key business objectives—key steps for identifying IH value opportunities. Risk reduction resulting from the subject IH activity or program is also captured. For steps 5, 6, and 7 the user then has the option of capturing value through a *Qualitative Approach*, a *Quantitative Approach*, or some combination of the two. The last step of the **Strategy** ties the value assessments together in a common presentation framework that can be modified to best meet the needs and expectations of the target audience.

Although the architecture for the qualitative and quantitative steps are the same, the approach to capturing value is very different. The *Qualitative Approach* uses Likert scale-like measures where value is sometimes estimated from non-financial data such as expert opinions or prior experience.

After capturing the IH risk reduction, the first step of the *Qualitative Approach* is to identify changes that are likely to have resulted from the IH program or activity. The changes may be in health status, in the IH risk management process, or in the business process. Health status changes include factors such as changes in mortality, disabling injuries and illnesses, restricted work activity cases, and the like. Changes in risk management processes include changes in the complexity of IH-related duties and responsibilities, such as risk management responsibilities, recordkeeping, etc. Changes in business process include process design, work flow, material inputs, equipment, etc.

At this stage users should also consider possible confounding factors—things other than the IH program or activity that also could have produced the changes or significantly contributed to them. Those factors should be ruled out, or they should be factored into the assessment by assigning and extracting proportionate values.

The next step in the *Qualitative Approach* is to consider the impacts that result from the changes. Again, the impacts may be on health status, the IH risk management process, and on the business process. The idea behind capturing the impacts at this point is that the impacts should take the user one step closer to capturing business value. Health-related impacts include absenteeism, presenteeism, insurance premiums, labor turnover, etc. Impacts on the IH risk management process include staffing levels, PPE costs, training, equipment calibration, and the like. Business process impacts include operational process steps, cycle time, maintenance, waste, etc.

Again, once the impacts are identified, users should identify and ferret out the confounding factors—internal and external changes that have affected the business that could have produced similar results. The cause and effect analysis approach can be applied here as well.

The final step in the *Qualitative Approach* is to capture the value of the impacts that have been identified in the cause-and-effect chain. For each of the three categories (health, the IH risk management process, and the business process), the user should try to capture some value. This is done by quantifying cost savings and cost avoidance, new revenue generation, and other benefits. Cost savings can be in items such as workers' compensation premiums, health insurance, replacement labor, long and short term disability, administrative costs, materials rework, etc.

Revenue generation should only include new revenue that is created as a result of the “impacts.”

Other benefits include improved productivity, product quality, employee recruiting retention, morale, improved capacity, business strategy, etc.

It is important to note that the *Qualitative Approach* is not linear. By that we mean that changes in health status that result from an IH activity or program often result in multiple benefits outside of health. They not only result in health-related impacts and health-related value, they may also result in changes to the business process, and in some circumstances may even result in the generation of new revenue. At each step of the *Qualitative Analysis* the user should consider all three categories of potential value—health, the IH risk management process, and other business processes—when trying to identify key linkages.

This requires some sensitivity. The user should avoid double-counting where it is inappropriate (see the Phase IV section of this report for more explanation). However, some improvements will legitimately result in multiple benefits, and industrial hygienists should take credit for all of their different value contributions. For example, an IH intervention that reduces disabling illnesses may result in less absenteeism and lower workers' compensation costs. As a result workers' compensation premiums may decrease and replacement costs may be lowered. Capturing these benefits is clearly an opportunity. If, at the same time, the intervention resulted in improvements in productivity, those benefits should also be captured.

The *Qualitative Approach* is important because it captures downstream effects and links to key business objectives (outlined in Step 8 which is covered in detail in the Phase V section of this report). The value captured by the *Qualitative Approach* can be summarized in quantitative terms, qualitative terms, or a combination of both. A graphic depiction of the *Qualitative Approach* follows on the next page (Figure III-3).

The Issue of Representative Values

Making the value case for IH requires that industrial hygienists think differently about what they do and about the business. The *Qualitative Approach* is unique in that it provides industrial hygienists with maximum flexibility—they can use parts of the *Strategy* that work for them and not use others, and they can substitute their own data and processes for components of the *Strategy* architecture.

However, in some situations industrial hygienists trying to make the value case may not have access to all of the data needed. This is clearly the case for some quantitative assessments and it might even be the case for some qualitative assessments. In those situations it would be useful to have some representative or default values from “like companies” in similar industries with similar operations that could be plugged in to the *Strategy* to facilitate a complete analysis.

The study team recognized this from the outset and agreed to examine the data in the ROHSEI Users’ Library and other sources to see if assembling representative data were feasible at this time. The study team concluded is that it is not feasible at this time. Certainly some data could be gleaned from past ROHSEI analyses. But the challenge is whether that data would really be “representative” of anything that would be connected to industrial hygiene. To be useful a default value must be an accurate approximation of what the data would be if users were able to obtain it from within their own operations. There simply aren’t enough data in the ROHSEI Users’ Library to compile those kinds of values. Also, much of the data in the ROHSEI Users’ Library is related to safety investments.

Certainly the topic warrants further study. An examination of possible outside sources indicates that the most fertile ground for these data may be organizations related to health. Possible sources include the cost of treating cases, state workers’ compensation agencies, major rate-setting organizations, workers’ compensation research organizations, medical expenditure surveys, the National Center for Health Statistics, and on-line workers’ compensation calculators, such as one posted by Michigan’s Economic Development Corporation. But evaluating these sources will take a substantial amount of additional work, and there are still the non-health issues that require additional investigation.

Developing representative values may be the next iteration of the value equation. The study team encourages AIHA to develop an AIHA users’ library, and would be glad to continue to work with AIHA to develop representative values where appropriate and to accomplish this purpose.

Here is how the strategy works: (the *Qualitative Approach* is part of a larger strategy that includes risk.)

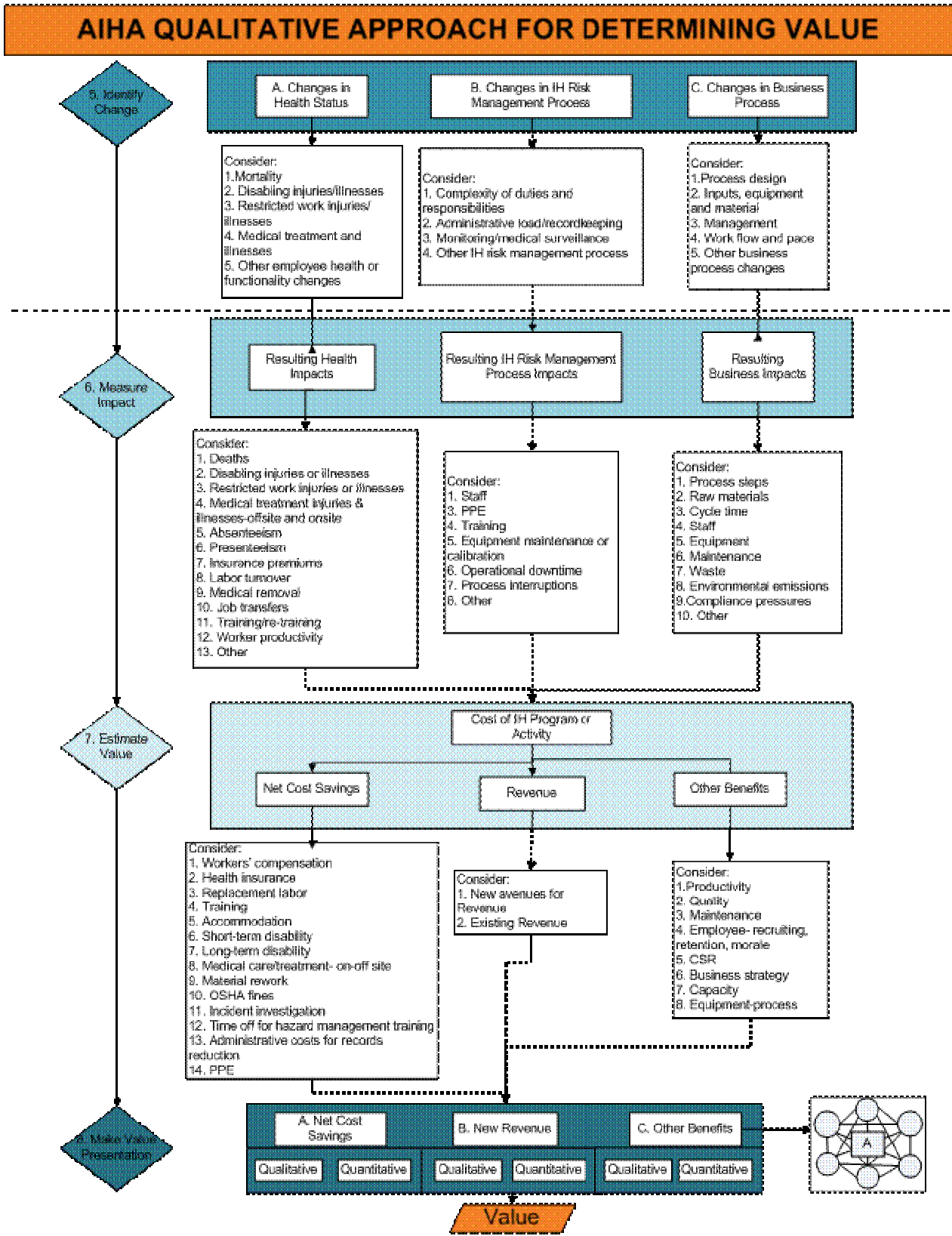


Figure III-3. The Qualitative Approach.

Education and Training Template

ORC has trained hundreds of users on making the value case for S&H over the years; mostly with the ROHSEI application. The ORC experience is that users need clear direction and understanding of the concepts. But even more important, they need experiential learning. Case study analysis often is the best way to familiarize users with the concepts and approaches.

The template which follows (Figure III-4) reflects the ORC experience and serves as an initial attempt at a training program outline. It is only an attempt because to be effective training really needs to be targeted and adjusted to meet the needs of each audience.

Qualitative Strategy for Determining IH Value: <i>Training Outline</i>	
I.	Introduction <ul style="list-style-type: none">a. Understanding the qualitative approach<ul style="list-style-type: none">i. Evidentiary methodii. Qualitative Process Mapb. Top Level Process Map<ul style="list-style-type: none">i. Identifying Changesii. Assessing Impactsiii. Estimating Valueiv. Present the Value Proposition
II.	Identify Changes <ul style="list-style-type: none">a. Changes in Health Statusb. Changes in IH Risk Assessment Processc. Changes in Business Processd. Key Considerations and Tools for Capturing Changese. Practice Case Example
III.	Assess Impacts <ul style="list-style-type: none">a. Resulting Health Impactsb. Resulting IH Risk Management Process Impactsc. Resulting Business Impactsd. Key Considerations and Tools for Capturing Impactse. Practice Case Example
IV.	Estimate Value <ul style="list-style-type: none">a. Cost of Program or Activityb. Net Savings/Cost Avoidancec. New Revenued. Other Benefitse. Key Considerations and Tools for Capturing Valuesf. Practice Case Example
V.	Presenting the Value Proposition <ul style="list-style-type: none">a. Qualitative and Quantitative Summaryb. Presentation Tool

Figure III-4. Training Program Outline.

Potential *Qualitative Approach* Application

The application of the strategy was tested in several ways. The study team conducted several site visits that are summarized in the Phase V section of this report. The purpose of those visits was to capture the value generated by IH by applying the *Quantitative Approach*, the *Qualitative Approach*, or both.

The site visits were also used to answer fundamental questions about the questionnaire elements, including:

1. Is the element the right one for the strategy?
2. Are its key sub elements listed correctly?
3. Is it correctly named? Will the users know what it means?
4. Is it adequately defined, so that consistent answers will be given by different users?
5. Will it be consistently interpreted over time?
6. Do companies have the data to support it?
7. Will the IH be able to access the data?

These site visit analyses are summarized in Appendix E of this report.

Furthermore, a retrospective analysis of the strategy was performed by going back to the ROHSEI User's Library and applying the new concepts from the current *Quantitative* and *Qualitative Approaches* to the existing ROHSEI case studies. The concepts worked favorably in those circumstances too. A summaries of these analyses is included in Appendix E of this report.

Conclusion

ORC has trained users on a quantitative approach for capturing the value of S&H for over a decade. While the strategy has received very positive feedback regarding its completeness, it must be acknowledged that there are other quantitative strategies and approaches in the marketplace.

However, this *Qualitative Approach* appears to represent several "firsts." It is likely to be the first strategy that is totally focused on industrial hygiene (the *Quantitative Approach* provided in the Phase IV section of this report also fits within this special category). It is also one of the first strategies for looking at value in a broad context and providing techniques and approaches for capturing value when data are not available to support a quantitative analysis. Finally it appears to be one of the first attempts at a comprehensive, integrated approach to value analysis, where a wide range of benefits are captured by using a mixed bag of approaches—qualitative and quantitative—custom tailored to each individual situation.

The concepts behind the *Qualitative Approach* are not new. They have been used by ROHSEI users, legal professionals, and others for years. What may be new is the organization of the thought process.

Hopefully this will lead to something that is even more important and groundbreaking: industrial hygienists actually choosing to do the value analysis for their activities and programs and starting to take credit for their very significant contributions to the business

process and business strategy that heretofore have been largely ignored. The real value of the *Qualitative Approach* is that it can be used where detailed costs and benefits are hard to obtain, and where time or resources are inadequate for a quantitative approach.