VALUE STANDARD
and
BODY OF KNOWLEDGE

June 2007

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> The SAVE International Standard's Body of Knowledge will continue to be expanded to include information on the various tools and techniques used in the practice of Value

Acknowledgements

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Foreword

This Standard was originally drafted in May 1997. It has been updated periodically to address changes in the business environment and technology and to meet future integration with the International Standards Organization. The *Value Standard* is intended to provide a practical guide for applying the principles of the value methodology in a consistent manner. It may be used by both practitioners and management.

The value methodology can be applied to a wide variety of applications, including industrial or consumer products, construction projects, manufacturing processes, business procedures, services, and business plans.

The value methodology is commonly applied under the names Value Analysis (VA), Value Engineering (VE), and Value Management (VM). These terms can be used interchangeably with value methodology throughout the standard and this document. Other value improvement processes also qualify as value studies as long as they adhere to the Value Standard's Job Plan and perform Function Analysis as part of their total process.

This Standard has been prepared by the SAVE International Standards and Resources Director, a member of the SAVE International's Vice President of Education's team. It is approved by the SAVE International Certification Board and the SAVE International Board of Directors. It seeks to state the *minimum* that clients and providers should expect when the value methodology is applied to a project.

This Standard will assist managers, value program managers, practitioners, and trainers in applying value methodology in their organizations in a consistent, standard manner. It may also assist those who procure value methodology services to develop proposal requests that ensure they receive complete and useful value methodology services.

The nomenclature used throughout this Value Standard and Body of Knowledge is as follows:

Value Study -- The overarching objective of a value study is to improve the value of the project.

Job Plan – Provides the structure for the Value Study which is part of a three-stage process (see Figure 1, page 12):

1. Pre-Workshop preparation
2. Value Workshop which applies the Six Phase Job Plan (see page 6)
3. Post-Workshop documentation and implementation

Value Methodology – Provides the process and structure that is used to apply the Value Job Plan used in the Workshop.

Value Standard – Establishes the specific six-phase sequential Job Plan process and outlines the objectives of each of those phases. It does not standardize the specific <u>activities</u> that are used to accomplish each phase.

Value Standard

Purpose and Scope of the Standard

The purpose of this document is to:

1) Define the steps and components that constitute a valid Value Study.

2) Document supporting information that defines a generic methodology, common terminology, and standard practice to guide practitioners and managers in effectively applying value methodology to improve the value of their projects.

3) Guide the practitioner and manager in determining at what point to apply value methodology to a project in order to maximize:
   a. the benefits of team innovation skills and
   b. implementation of alternative(s) that add value to the project.

This document may be used by both practitioners and managers as a guide for applying value methodology.

The Value Standard allows for the tailored application of value methodology and related practices to suit the intended application.

The Value Standard has not been prepared as a legal document. If the user intends to use the Value Standard for procurement purposes the user should consult expertise familiar with contract language, including seeking legal guidance.

Users of the Value Standard should be aware that some governing bodies require that value engineering facilitator hold specific licenses or other credentials not identified by the Value Standard. If so, the user should identify such considerations when soliciting and contracting for value methodology services.

A Value Study is the formal application of a value methodology to a project in order to improve its value. This application is also referred to as value engineering, value analysis, value planning, or value management. For purposes of this standard, the subject of a Value Study whether it is a product, process, procedure, design, or service will be referred to as the "project."

The Value Standard

The value methodology is a systematic process that follows the Job Plan. A value methodology is applied by a multidisciplinary team to improve the value of a project through the analysis of functions.

The Job Plan consists of the following sequential phases. (See Figure 1, page 13):

1. **Information Phase**

   The team reviews and defines the current conditions of the project and identifies the goals of the study.

2. **Function Analysis Phase**

   The team defines the project functions using a two-word active verb/ measurable noun context. The team reviews and analyzes these functions to determine which need improvement, elimination, or creation to meet the project's goals.

3. **Creative Phase**

   The team employs creative techniques to identify other ways to perform the project's function(s).

4. **Evaluation Phase**

   The team follows a structured evaluation process to select those ideas that offer the potential for value improvement while delivering the project's function(s) and considering performance requirements and resource limits.

5. **Development Phase**

   The team develops the selected ideas into alternatives (or proposals) with a sufficient level of documentation to allow decision makers to determine if the alternative should be implemented.

6. **Presentation Phase**

   The team leader develops a report and/or presentation that documents and conveys the adequacy of the alternative(s) developed by the team and the associated value improvement opportunity.

In order to qualify as a Value Study, the following conditions must be satisfied.

A. The Value Study Team follows an organized **Job Plan** that includes, at a minimum, the six phases identified in this standard. **Function Analysis**, as defined in this document, is performed on the project.

B. The Value Study Team is a **multidisciplinary group** of experienced professionals and project stakeholders. Team members are chosen based on their expertise and experience with the project. Sometimes individuals who have relevant expertise; but are not directly involved with the project are added to provide a different point of view.

C. The **Value Team Leader** is trained in value methodology techniques and is qualified to lead a study team using the Job Plan. The SAVE International Certification Board certifies, with the designation Certified Value Specialists (CVS), those individuals who have met specified training requirements and have demonstrated competency in the application of the Job Plan. The Team Facilitator shall be a CVS, or a VMP serving under the guidance of a CVS as defined by SAVE Certification criteria, or shall be the holder other active certification recognized by SAVE International.

Body of Knowledge

The information contained in this Body of Knowledge is a general guideline and is not meant to be either fully inclusive or exclusive of all possible techniques. Differences in the application of techniques used to accomplish VE Phases will be based on the nature of the project and the preference of the value practitioner.

History of the Value Methodologies

Value Analysis was conceived in the early 1940s by Lawrence D. Miles while he was employed by General Electric, a major defense contractor which was facing the scarcity of strategic materials needed to produce their products during World War II. Mr. Miles realized that if value and related innovation improvements could be systematically "managed," then General Electric would have a competitive advantage in the marketplace. With that in mind, Mr. Miles accepted the challenge and devised the function analysis concept, which he integrated into an innovative process he later termed value analysis.

Mr. Miles understood that products are purchased for what they can do—either through the work they perform or the pleasing aesthetic qualities they provide.

Using this as his foundational information, he focused on understanding the function of the component being manufactured. He questioned whether the design could be improved or if a different material or concept could achieve the function.

To focus on the function itself, he used an *active verb* and a *measurable noun* in combination to characterize the *benefit* that a part's function provides. He then searched for other ways or methods to achieve the benefit of that intended function. From this research, function analysis, the key foundation of value methodologies, was developed and has become a tool to help individuals and teams manage the way a concept is understood.

These specialized teams typically address project-related issues such as increased sales revenue, improved product performance, and reduced resource usage.

The U.S. Army and Navy, and other companies, soon realized the success of Larry Miles' methods. As the application of value analysis expanded, there was also a change in context—from review of existing parts to improving conceptual designs. This was one of two factors that marked the emergence of value engineering. The other was a desire by the U.S. Navy to use the Value Analysis techniques for project improvement in the early 1950s when there was a moratorium on hiring "analysts." Since engineering positions were available, individuals practicing this new discipline were employed as "Value Engineers."

As the value methodology gained in popularity, a group of practitioners formed a learning society to share insights and advance their innovative capabilities. Thus, in 1959, the "Society of American Value Engineers" was incorporated in Washington, DC.

Soon, the value methodology was used to improve the value of projects in government, the private sector, and the manufacturing the construction industries and value concepts spread worldwide.

Concurrent with this growth, a number of other value improving tools, techniques, and processes emerged, many of which were complementary to and were integrated with the value concepts. In an effort to attract the developers and practitioners of these emerging methods to our membership, the name of the society was changed to "SAVE International" in 1996.

Overview

The value methodology is a systematic process used by a multidisciplinary team to improve the value of a project through the analysis of its functions. Value is defined as a fair return or equivalent in goods, services, or money for something exchanged. Value is commonly represented by the relationship:

<p style="text-align:center">Value ≈ Function/Resources</p>

where **function** is measured by the performance requirements of the customer and **resources** are measured in materials, labor, price, time, etc. required to accomplish that function. A value methodology focuses on improving value by identifying alternate ways to reliably accomplish a function that meets the performance expectations of the customer.

Function Analysis is the foundation of a value methodology and is the key activity that differentiates this body of knowledge from other problem-solving or improvement practices. During the Function Analysis Phase of the Job Plan, functions are identified that describe the work being performed within the scope of the project under study. These functions are described using two word, active verb/measurable noun pairings, for example one function of a hammer is to *apply force*. The team reviews the project's functions to determine those that could be improved. These may be project functions that seem to be performed inefficiently or with more than expected cost. These functions become the focus of the value methodology team in their endeavor to improve the project.

The identification and naming of project functions enables clear thinking by limiting the description of a function to an *active verb* that operates on a *measurable noun* to communicate what work an item or activity performs. This naming process helps multidisciplinary teams build a shared understanding of the functional requirements of the project and, as a result, it allows them to identify where opportunities for value improvement exist in the project.

Function analysis can be enhanced through the use of a graphical mapping tool known as the *Function Analysis System Technique* (FAST), which allows team members to understand how the functions of a project relate to each other.

A fundamental tenet of a value methodology is that basic functions (the necessary purpose of the project) must be preserved. This is because the basic function reveals the usefulness of the project and the reason for its existence. For example, the basic function of a wristwatch could be "indicate time." Other secondary functions support the basic function. These secondary functions typically provide esteem, dependability, or convenience value for the user. An example is a gold watchcase that performs an aesthetic function which pleases both customers and those whom they want to impress.

> **Value is defined as a fair return or equivalent in goods, services, or money for something exchanged.**

The value methodology is applied using a process known as the "Job Plan." The purpose of the Job Plan is to guide the Study team through the process of identifying and focusing on key project functions in order to create new ideas that will result in value improvements.

While a Value Study is guided by the function-based Job Plan, it can be further supported by many commonly used business improvement techniques (See Activities section for examples).

Applicability

Value methodologies can be applied during any stage of a project's development cycle, although the greatest benefit and resource savings are typically achieved early in development during the conceptual stages. At this point, the basic information of the project is established, but major design and development resources have not yet been committed. The reason this is the best time to apply a value methodology is because the manner in which the basic function of the project is performed has not been established, and alternative ways may be identified and considered.

Examples of these applications are:

- *Construction projects* could benefit by identifying improvements for various project phases: concept development, preliminary design, final design, procurement and construction.

- *Manufactured products*, whether consumer, industrial, or defense, may be studied with a focus on either the design or manufacturing process of that product. A product may be the subject of a value study at any time during the product's life. A value study can be applied at the onset of the product development to better understand the customer's needs, identify the functions necessary to satisfy those needs, and develop the initial concept. Throughout the design development, value methodology can be used to refine and enhance the concept, based on the latest facts. Even after a product has been introduced and is in production, a Value Study can be used to further enhance the product and respond to changing customer and economic conditions.

A value methodology can be used to either develop new ways to manufacture a product or change an existing process.

- *Business systems and processes* may also be the subject of Value Studies. Many elements of a business or an organization may be improved through the application of a value methodology. This may be from the development of business plans and organizational studies to improving existing business processes.

- *Service organizations* can benefit from the use of value methodologies. In the past value methodologies have been used to improve processes and procedures in the medical industry (operating rooms, emergency rooms, etc.) and the legal system (police systems).

Value methodologies may be applied more than once during the life of the project. Early application of a value methodology helps to get the project started in the right direction, and repeated applications help to refine the project's direction based on new or changing information. The later a Value Study is conducted in project development, more likely implementation costs will increase.

A value methodology may be applied as a quick response study to address a problem or as an integral part of an overall organizational effort to stimulate innovation and improve performance characteristics. Value methodologies may be used to enhance an organization's quality programs, new product development activities, manufacturing processes, and architectural and engineering design.

Study Duration

A value study generally encompasses three stages. (See Figure 1, page 13):

1. Pre-Workshop (Preparation)

2. Workshop (Execution of the six phase Job Plan)

3. Post-Workshop (Documentation and Implementation)

The duration for executing the Job Plan in a value study depends on several factors: the size and complexity of the project, the stage of project development, the estimated cost of the project, etc.

A typical duration for the Workshop Stage is five-days, which does not include the Pre-Workshop and Post-Workshop efforts.

Projects with a concise scope or a low level of complexity may be performed in less time. Sufficient time should be allotted to adequately apply the value methodology process and document the team's findings. Shortening the time needed to execute the Job Plan phases may result in a less-than-optimal result.

Projects of very large scope or complexity may require 10-15 days or more to achieve the study's objectives. Consideration of these factors is important to ensure that the proper time is allocated and needs to be addressed as part of the upfront planning for a value study.

Job Plan Techniques

The value methodology is a structured, disciplined procedure aimed at improving value. That procedure is called the **Job Plan**. The Job Plan outlines sequential phases to be followed which support team synergy within a structured process, as opposed to a collection of individual opinions. The activities conducted during each phase of the Job Plan will stimulate the team to identify ideas and develop them into alternatives to the original concept or design.

The team and the project stakeholders should identify and understand the project's basic and secondary functions. Basic functions must be maintained, otherwise the intended study goals will not be accomplished.

Secondary functions are analyzed and evaluated with regard to their contributions to the project objectives. By making functionality explicit (via function analysis and FAST), organizations can manage innovation to provide a sustainable competitive advantage that leads to success.

Figure 1 illustrates the Job Plan process flow. Each of the Job Plan phases must be performed in sequence because each phase provides information and understanding necessary for the successful execution of the next phase. As the team gains additional knowledge about the project, a previous phase may be revisited.
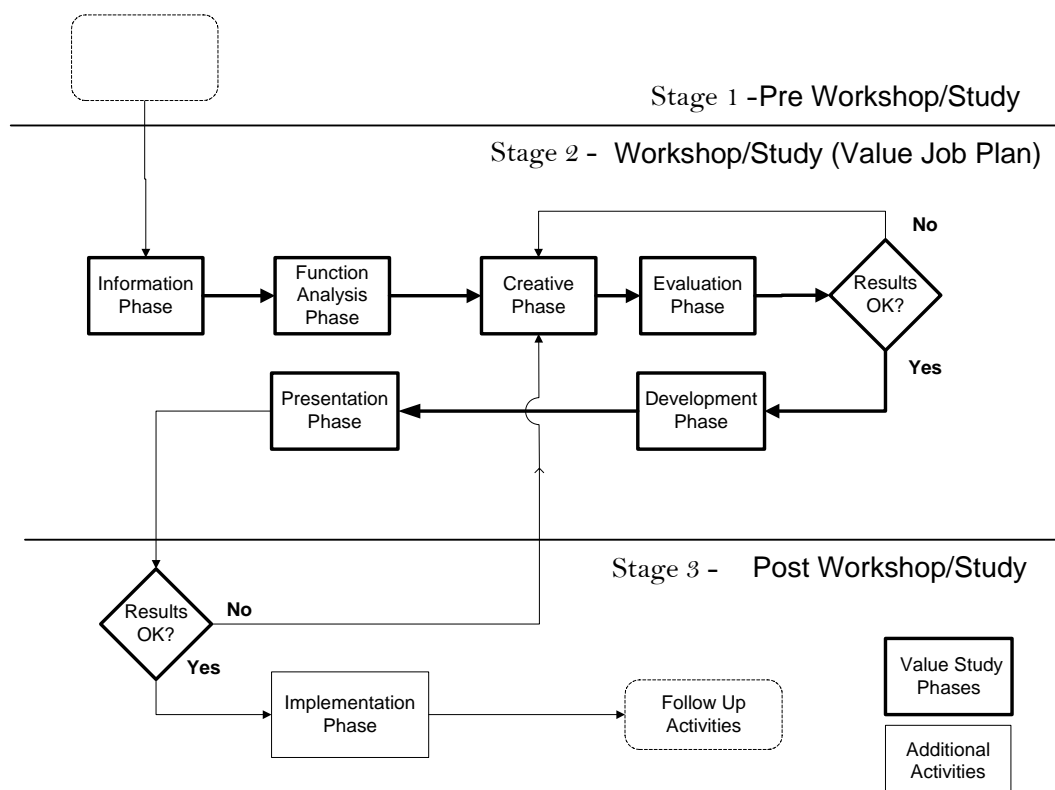

**Figure 1.
Value Study Process Flow Diagram**

Workshop Activities

The standard Three-Stage of Pre-Workshop, Workshop and Post-Workshop; and Six-Phase Workshop Job Plan Activities; are described on the following pages with related activities and suggested tools and techniques.

Pre-Workshop Activities

Purpose:
Plan and organize the Value Study

Fundamental Question:
What has to be done to prepare for a Value Study?

Common Activities:
- Obtain senior management concurrence and support of the job plan, roles, and responsibilities.
- Develop the scope and objectives for the Value Study
- Obtain project data and information
- Obtain key documents such as scope of work definition, drawings, specifications, reports, and project estimate
- Identify and prioritize strategic issues of concern
- Determine the scope and objectives of the study
- Develop the study schedule
- Undertake competitive benchmarking analyses
- Identify Value Team members
- Obtain commitment from the selected team members to achieve the project objectives
- Review the project costs
- Gather appropriate customer/user information about the project
- If appropriate, invite suppliers, customers, or stakeholders to participate in the Value Study

- Distribute information to team members for review
- Develop informational models and diagrams about the project
- Determine the study dates, times, location and other logical needs
- Clearly define, with senior management, the requirements for a successful Value Study results

Typical Outcome:
The desired outcome is a clear understanding of what senior management needs to have addressed, what the strategic priorities are, and how improvement will increase organizational value. It is during this phase that a view is formed as to whether subsequent phases are likely to yield sufficient value to justify the cost of the study within the terms set. It may be appropriate to increase or decrease study parameters at this time. Team members are knowledgeable of and committed to achieve the project's objectives.

Workshop (Job Plan) Activities

Information Phase

Purpose:
Understand the current state of the project and constraints that influenced project decisions.

Fundamental Question:
What is really going on in the tactical and operational contexts?

Common Activities:

- Obtain project data and information and key documents such as scope of work definition, drawings, specifications, reports, detailed project cost information, quality data, marketing information, process flow charts, etc.
  Tools: Quality Function Deployment, Voice of Customer
- Identify and prioritize strategic issues of concern. Further define the scope and objectives (management expectations) of the study
  Tools: SWOT (Strengths, Weaknesses, Opportunities and Threats); Project Charter
- Project Team presents the original and/or present design/product/process concepts
- Perform competitive benchmarking analysis
  Tools: Benchmarking, Tear Down Analysis, Pareto Analysis, Design for Assembly
- Determine the study schedule; dates, times, location and other logistical needs
- Distribute information about the project for team member review
- Understand project scope, schedule, budget, costs, risk, issues, non-monetary performance.

- Confirm the most current project concept
- Identify high-level project functions
- Visit site or facility
- Confirm success parameters

Typical Outcome:

This phase brings all team members to a common, basic level of understanding of the project, including tactical, operational, and specifics of the subject. The functional understanding establishes the base case to identify and benchmark alternatives and mismatches and set the agenda for innovation.

Function Analysis Phase

Purpose:

Understand the project from a functional perspective; what must the project do, rather than how the project is currently conceived.

Fundamental Question:

What are the functions and how are they related?

Common Activities:
- Identify the project functions (team format strongly encouraged)
  Tools: Random Function Identification
- Classify project functions
- Develop function models
  Tools: Function Analysis System Technique (FAST), Function Tree
- Dimension the model with cost drivers, performance attributes and user attitudes to select value mismatched functions to focus the creativity phase
  Tools: Cost to Function Analysis

(Function Matrix), Failure Measurement Error Analysis (FMEA), Performance to Function Analysis, Relate Customer Attitudes to Functions

- Estimate worth of functions to select value-mismatched functions on which to focus the creativity phase.
Tools: Value Index (function cost/function worth)

Typical Outcome:

This phase focuses the team on validating that the project satisfies the need and objectives of the customer. It provides a more comprehensive understanding of the project by focusing on what the project does or must do rather than what it is. The team identifies value-mismatched function(s) on which to focus in order to improve the project.

Creative Phase

Purpose:

Generate a quantity of ideas related to other ways to perform functions

Fundamental Question:

How else may the functions be performed?

Common Activities:

- Conduct creative warm-up exercises
- Establish rules that protect the creative environment being developed
Tools: Creativity "Ground Rules"
- Employ group idea stimulation techniques
- Generate alternate ideas that may improve value.

  Tools: Brainstorming, Gordon Technique, Nominal Group Technique, TRIZ, Synetics

Typical Outcome:

The team develops a broad array of ideas that provide a wide variety of possible alternative ways to perform the function(s) to improve the value of the project.

Evaluation Phase

Purpose:

Reduce the quantity of ideas that have been identified to a short list of ideas with the greatest potential to improve the project

Fundamental Question:

Of all these ideas, which are worth spending quality time to further develop?

Common Activities:

- Clarify and categorize each idea to develop a shared understanding
- Discuss how ideas affect project cost, and performance parameters.
Tools: T- Charts
- Select and prioritize ideas for further development
Tools: Pugh Analysis, Kepner-Tregoe, Life Cycle Costing, Choosing by Advantages (CBA), Value Metrics
- Explain how ideas are to be written as stand-alone risk-reward investment proposals

Typical Outcome:

The team produces a focused list of concepts that warrant quality time to develop into value-based solutions that can be implemented into a project or a project feature.

Body of Knowledge

Development Phase

Purpose:

Further analyze and develop the short list of ideas and develop those with merit into value alternatives.

Fundamental Questions:

What is an informed description of each selected idea? What is the rationale for making this change? Which ones are mutually exclusive and are independent?

The selected ideas are developed into value alternatives that are clearly written so that the owner and other project stakeholders understand the intent of the alternative and how it benefits the project. Write-ups also identify any potential negative factors associated with the alternative. The alternative should include text, sketches, diagrams, assumptions, supporting calculations, vendor information, cost comparison work sheets, and other information which may be necessary to convey the intent of the alternative. The text should also identify other alternatives which may be enhanced or complemented by acceptance of an alternative. Issues addressed include reliability, customer convenience, quality control, capital cost, O&M cost, life cycle cost, schedule, risk, availability, political ramifications, and perception. Ideally, an action plan is developed for each alternative. The action plan should, at a minimum, include what needs to be done, who will do it, and when it will get done.

Common Activities:

- Compare the study conclusions to the success requirements established during the *Information and Function Analysis Phases*

- Prepare a written value alternative for each idea selected for further development
- Assess and allocate risk judgments and costs, where appropriate
- Conduct cost-benefit analysis
- Generate sketches and information needed to convey the concept
- Confirm that an alternative should be further developed
- Finish initial alternative development
- Develop an action plan to define implementation steps, dates, and responsibilities for each value alternative

Typical Outcome:

The Value Study team creates alternatives and low-, medium-, and high-risk scenarios and offers these alternatives to senior management as options that address the Pre-Workshop strategic objectives.

Presentation Phase

Purpose:

Present value alternatives to management team and other project stakeholders or decision makers.

Fundamental Question:

How can we help the project team and senior managers make more informed decisions so that they can select ideas that fit their strategic plans?

Common Activities:

- Prepare presentation and supporting documentation
- Compare the study conclusions to the success requirements established during the Information and Function Analysis Phases

- Offer to management "risk-reward" innovation scenarios to select value alternatives for implementation
- Exchange information with the project team
- Ensure management has full and objective information upon which they can make decisions
- Outline an anticipated implementation plan
- Prepare formal report

Common Value Study products include a briefing document, risk analysis; cost vs. worth comparisons; Present worth analysis; advantages vs. disadvantages

Typical Outcome:

Ensure management and other key stakeholders understand the rationale of the value alternatives. Also generate interest to sanction implementation.

Post-Workshop Activities

Implementation Activities

Purpose:

Ensure accepted value alternatives are implemented and that the benefits projected by the Value Study have been realized.

Fundamental Question:

What are the program changes, and how will the project team manage them?

Following delivery of the value study preliminary report, management and the project team should consider and agree upon the value alternatives to be implemented and then *how* and *by when* the implementation will occur. In some instances, additional study and information may be required. Implementation of alternatives is the responsibility of management with assistance from the project and value teams.

Common Activities:

- Review the preliminary report
- Conduct an implementation meeting to determine the disposition of each value alternative.
- Establish action plans for those alternatives accepted and document the rationale for the rejected alternatives
- Obtain commitments for implementation
- Set a timeframe for review and implementation of each value alternative
- Track value achievement resulting from implemented alternatives
- Sign off deliverables
- Validate benefits of implemented change

- Ensure that new practices become embedded by establishing and managing an implementation plan

Typical Outcome:

The project stakeholders determine what will be changed in the project as a result of the Value Study. These are changes to the original concept or base case of a study, resulting from the value alternatives, that the project development will incorporate in future design or product development activities.

Value Study Follow-Up Activities

Purpose:

Follow up on implementation of the Value Study results and improve the application of a value methodology for future studies.

Fundamental Question:

What have we learned about how best to create or improve value of the subject under study?

Common Activities:

- Prepare a report of the results of the study, lessons learned, or other items to be recorded and/or tracked through implementation
- Identify where opportunities were missed
- Identify roadblocks to innovation and understand why they existed
- Debrief and record lessons learned
- Integrate Value Study results into organization's lessons learned or program reporting

- Reflect on the value study and consider how the experience has developed new capabilities

Typical Outcome:

Individuals become better value creators by reflecting on theories they held before the value study, comparing the way things turned out, and ascertaining how that knowledge affects the way they believed their own theories in the first place. This is a key step in learning what will help the organization become better at managing innovation.

Body of Knowledge

Roles and Responsibilities

Management

The aim of a value methodology is to increase organizational value through a union of strategy, tactics, and operations with emphasis on "customer need," cost effectiveness, and/or profitability. The link between the Value Study and the organization is the role of management in value improvement. Two key management roles exist: Senior Management and the Value Manager.

Senior Management responsibilities are to provide clear leadership and make strategic expectations explicit in a purposeful and prioritized manner. Senior management should understand the potential benefit from a Value Study, approve the expenditure of resources necessary to support the study, and guide the implementation for approval of required funding necessary to realize the recommendations.

The roles and responsibilities of the Value Manager (an organization's designated manager of value) vary throughout the life of the project. At all times the Value Manager should confirm that value methodology activities are coordinated and performed effectively in order to meet the goals and objectives of the organization. A value methodology can be used throughout project development with a different focus at each stage.

At the conceptual stage, a value methodology can be used to determine the cost versus the worth of basic project functions. At this early stage it is the Value Manager's responsibility to ensure that all parties who have a vested interest in the project participate in the Value Study, including suppliers, customers, clients, end users, and possibly outside interests, in order to gain the total perspective of real 'needs' vs. 'wants' so as to provide the maximum value for the project being studied.

As the project approaches the design phase, a value methodology focuses more on the functions of each element or component within the detailed design, with the results of function analysis and creativity being more limited since resources have been allocated and money spent. It is senior manager's responsibility during a Value Study at this stage of the project to assess which value alternatives are economically feasible based upon the requirements of the customer or client.

> The roles and responsibilities of the **Value Manager** vary throughout the life of the project.

As a project moves into the implementation phase (construction or production), a value methodology process works to ensure changes are made. Although many projects can still benefit from a Value Study at this stage of a project, it is the responsibility of the Value Manager to encourage early involvement of the organizations that are affected by the changes to ensure the maximum benefit for any Value Study. For any given project, it is important that the senior management team be made aware that the earlier a Value Study can be performed, the more potential benefit there will be for the client or customer.

Another role of the Value Manager is to ensure that the proper amount of Pre-Workshop activities take place prior to any Value Workshop. These Pre-Workshop activities may not need the attention of the whole team. However, a successful Value Study is unlikely without proper planning and information sharing so all interested parties have a clear understanding of the purpose and details of the project. This, again, is the responsibility of the Value Manager in charge of the project. If these details are properly communicated with the clients and customers involved, the potential for a successful Value Study is greatly increased.

Executive Review Board: Senior managers set the initial strategic goals for the Value Study and, at a later date, decide which outputs will be invested so they can be implemented. These managers do not always participate in the day-to-day working of the Value Study but are part of the overall value program.

Sometimes managers are designated as Sponsors or Champions to support a value study and/or the value program within an organization.

Technical Champions: Those members of the Value Study team who are selected because of their technical expertise.

Value Team Members

Value Team members are expected to participate in a Value Study in the following ways:

- Participate in all meetings
- Gather information as requested
- Analyze information
- Identify functions
- Contribute ideas

- Evaluate ideas using their experience and expertise
- Develop alternatives
- Present results

Team Members' Responsibilities

1. Keep accurate notes as assigned by team leader
2. Consult with team leader on any problem that may handicap progress
3. Show respect through timely attendance
4. Share workload equally whenever possible
5. Be willing to admit if they don't know; but strive to get the answer. Don't be afraid to make mistakes
6. Stay focused - avoid tangents - follow the basic problem-solving steps and get help from Value Team Leader on what techniques may be most suitable for the particular problem
7. Don't waste time discussing whether or not a step should be used; do it and evaluate it all after the entire workshop
8. Understand the approach being taught and its purpose, including the reason for each step and the technique being applied
7. Do the job together as a team. Don't force individual solutions - sell them! Remember, there can be more than one solution to a problem
8. Be a good listener; don't cut people off and don't second guess what other people are going to say and what they are thinking

9. Bring all data that bears on the problem – some objective, some subjective. Keep an open mind and don't be a roadblock
10. Be enthusiastic about the project and what it is that you are doing
11. Do not attempt to take over as a Team Leader – be as helpful as possible. Remember, the leader already has a difficult job in trying to guide, control and coordinate the overall effort

Team Leader

The Value Team Leader will plan, lead, and facilitate the Value Study. Other key responsibilities are noted below.

This individual is also expected to have numerous skills and experience that are listed in Key Competencies for Value Practitioners (See Key Competencies for Value Practitioners). To ensure that the Team Leader is trained and qualified to lead the team, that person shall be a CVS (Certified Value Specialist) as certified by SAVE International, or equivalent, as defined elsewhere in this Standard.

Team Leader's Responsibilities

1. Ensure proper application of a value methodology and follow the Job Plan
2. Guide the team thorough the the activities needed to complete the pre-study, the Value Study and the post study stages of a Value Study.
3. Delegate responsibilities as appropriate
4. Schedule follow-up team meetings and prepare the agenda
5. Keep team focused on specific topic
6. Keep team members involved in the discussion and the work that needs to be done
7. Keep all team members together whenever possible. It is desirable that everyone breaks together, to maintain team continuity
8. Be a catalyst to keep team moving and motivated. Be diplomatic; not dictatorial.

Standard Revision Process

The SAVE International *Value Standard* is intended to provide a practical guide to apply the principles of a value methodology in a consistent manner. It may be used by both practitioners and management.

The Value Standard, originally drafted in May 1997, has been through a process of periodic updates to address changes in the business environment and technology, and to meet future integration with the International Standards Organization. Prior to 2007, a formal process for reviewing and updating the Standard did not exist. As part of the 2007 Value Standard update, the following process was developed and adopted to address future updates.

Standard Responsibility

The SAVE International Director of Standards has the primary responsibility for managing the review process and updating the Value Standard and Body of Knowledge. The Director of Standards appoints and maintains a Standards Review Team of experienced practitioners, one member of which (excluding the Director) should be a Fellow of SAVE International who is actively practicing a value methodology full time. Another member will be a member of the Certification Board. The team shall have a minimum of three members (including the Director of Standards) and a maximum of seven members. This team will perform a review of the document and recommend improvements/changes to the Board of Directors.

The Standard and Body of Knowledge will be reviewed for possible updating every four years, concurrent with the installation of a new SAVE International President. The Director of Standards and the Standards Review Team will review the current Standard and report to the Executive Board any actions necessary to update the Standard. This action will be completed by the fall Board of Directors Meeting following the installation of the new President.

SAVE International members in good standing can, at any time, provide the Director of Standards with a written request to modify or update the Value Standard or Body of Knowledge. When this occurs, the Director of Standards and the Standards Review Team will review the request and provide a recommended plan of action to the Board of Directors.

Once the Board of Directors approves an action to update the Value Standards and Body of Knowledge, the following process will be used to amend the wording or content of this document:

1. The Board of Directors approves the specific areas of the Value Standards and Body of Knowledge to modify.

2. The membership of SAVE International is notified of the scope of changes under review via *Interactions*, a magazine published by SAVE International. The membership will direct all comments to the Director of Standards.

3. The Director of Standards may add up to a total of seven members to the Standards Review Team in order

to ensure the proper expertise is present on the team to develop the changes.

4. The Director of Standards and the Standards Review Team will:

   a. Develop specific changes to the Standards to address the areas approved by the SAVE Board.

   b. Review the rest of the Standard to ensure that the changes do not conflict with the rest of the document.

5. A Board of Director's Oversight Team comprised of the President, Executive Vice President, and VP of Education will review, provide comments, and issues a preliminary approval of the change.

6. Once the Oversight team has approved the changes, the changes will be submitted to the Certification Board, whose members will review, provide comments, and approve the changes.

7. Any changes recommended by the Certification Board are to be agreed to by the Director of Standards,

Standards Review Team, and Board Oversight Team before the changes are taken to the SAVE International Board for final approval

8. The SAVE International Board of Directors will review, provide comments, and issue the final approval of the change after any comments are addressed. Any changes made by the SAVE International Board of Directors will be resubmitted to the Certification Board for approval.

9. If, after going through this process, full agreement has not been reached, a special committee will be formed to resolve this issue. This committee, chaired by the President and comprised of the Certification Board Chair, the Executive VP, the VP of Education, the Dean of the College of Fellows, and the Director of Standards, will resolve any disputes.

10. Final revision will be posted on the SAVE International website followed by membership notification of the change.

Key Competencies for Value Practitioners

A Value Practitioner should understand the following principles and be able to effectively communicate them to management and team members. Mastery of these competencies will help ensure effective leadership of a wide range of multidisciplinary Value Study teams.

Value Principles

- Historical development of the Value Methodologies

- The relationship between an organization's strategies and a value methodology

- Fundamental value principles, methods, and job plans

- The relationship between value, functions, and solutions

- Function analysis

- Types of value

- Value drivers (e.g., cost, schedule, quality, risk, user attitudes etc.)

- Investment appraisal techniques

- Key thought-provoking questions

Value Job Planning

- Major phases and activities in a Value Job Plan

- Purpose and objectives of each phase of the job plan

- Overview of techniques in a typical job plan

Strategic Problem/Opportunity Framing

- Reviewing the business case

- Discounted cash flow modeling

- Analysis through key financial ratios

- Strategic models, decisions, choices, and uncertainties

- Identification of causal relationships and their modeling

- Identification of attributes and value drivers

- Analysis of performance attributes (non-monetary factors that affect value)

- Defining the base case and benchmarking

- Determining whether the remaining phases of the value study can justify the client's investment or whether what they have is good, as understood within the terms and references used

Function Analysis

- Purpose and need

- A "thing", "process", "product" or "project" and their functions

- Defining functions with active verb and measurable noun context

- Function classification

- Levels of abstraction

- Function Analysis System Technique (using how-why logic)

- If-Then and Caused-By logic flows of classical and technical FAST models, often termed "When"

- The differences among various FAST diagrams and models (customer, technical, classical, hierarchical)

Function, Performance, Worth, Cost and Customer Attitude

- Purpose and need

- Cost as resource expenditure

- Performance-to-cost relationships hitchhiking

- Cost-to-worth relationships

- Cost-to-function allocation

- Function worth identification and understanding

- Cost-value relationships

- Cost-value mismatches

- Pareto analysis of major cost drivers

Creativity

- Purpose and need

- Managing divergent thinking

- Brainstorming techniques

- Unrestricted idea generation

- Large quantity of ideas is the goal

- Suspending judgment until the evaluation phase

- Other idea generation techniques

Evaluation

- Purpose and need

- Managing convergent thinking

- Building greater understanding of other people's ideas

- Evaluation methods and techniques

VM Study Recommendation Documentation

- Document the key information related to a Value Study recommendations
  - Original Concept
  - Proposed Change
  - Discussion of benefits of the change
  - Cost impact analysis
  - Sketches
  - Implementation considerations
  - Follow-up actions

- Investment appraisal

- Technical implementation feasibility

- Political implementation feasibility

- Initial and subsequent revenue impacts

- Initial and subsequent cost impacts

- Initial and subsequent schedule impacts

- Life cycle cost analysis

- Initial and subsequent impacts on other key attributes

- Sketches and other communication aids

Presentation

- Purpose and need

- The relationship between a value methodology and the needs of senior management decision makers

- Presentation skills

- Content organization

- Implementation plan

- Change management strategies

- Explanation of value tracking process

Management of Value Programs

- Management roles and responsibilities

- Reporting responsibilities

- Establishing links between Value Study outcomes and organizational results

- Value training

- Facilitation skills training

- Organizing and implementing Value programs

- Team Leader skill development

- Strategic diagnosis and problem/opportunity identification techniques

- Selecting and leading Value Studies

- Coordinating Value Study logistics

- Facilitator skills

- Tracking Value Study implementation results and other reports as necessary

- Coordinating with other organization or client quality improvement programs

- Educating the organization in the value methods

- Recognizing Value success and failures and how to learn as a team

- Sharing value insights with the community and stakeholders

- Periodic Value Program review for continuous improvement

VM Glossary

In 1985, the Lawrence D. Miles Foundation created the College of Fellows of the Society of American Value Engineers (SAVE), now SAVE International, with the specific intent of developing a Glossary of Terms related to value. Over a two year period, approximately 10 Fellows worked individually and in teams to define, refine and finalize a glossary of value related terms. In 2006, the Glossary was reviewed by the Certification Board and those definitions most essential to the current application of value methodologies were identified and refined where necessary.

ASSOCIATE VALUE SPECIALIST (AVS)	AVS is a recognition designed for individuals who are new to the value methodology. An AVS is encouraged to progress to VMP or CVS certification.
CERTIFIED VALUE SPECIALIST (CVS)	CVS is the highest level of certification attainable through SAVE International. Designation is reserved for Value Specialists and Value Program Managers who have demonstrated expert level experience and knowledge in the practice of the value methodology.
COST:	The expenditure of resources needed to produce a product, service, or process.
COST, LIFE CYCLE:	The sum of all development acquisition, production or construction, operation, maintenance, use, and disposal costs for a product or project over a specified period of time.
COST MODEL:	A financial representation such as a spreadsheet, chart, and/or diagram used to illustrate the total cost of families of systems, components, or parts within a total complex product, system, structure or facility.
FUNCTION:	The original intent or purpose that a product, service or process is expected to perform. It is expressed in a two-word active verb/measurable noun structure.
FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST):	A graphical representation of the dependent relationships between functions within a project. • *Classical FAST Model:* A function displaying the interrelationship of functions to each other in a "how-why" logic. This was developed by Charles Bytheway.

	• *Hierarchy Function Model:* A vertical "hierarchical" chart of functions. This places the basic function at the top. The function of each major system is placed beneath the basic function. The functions that support each of these functions are then placed on the next row. This process is continued until the team feels the level of detail is sufficient for the intent of the study. ▪ *Technical FAST Model:* A variation to the Classical FAST that adds "all the time" functions, "one time" functions and "same time" or "caused by" functions. ▪ *Customer-Oriented FAST Model: This variation of the FAST diagram was developed to better reflect that it is the customer that determines value in the function analysis process. Customer-oriented FAST adds the supporting functions: attract users, satisfy users, assure dependability, and assure convenience. The project functions that support these customer functions are determined by using the how-why logic.*
FUNCTION ANALYSIS:	The process of defining, classifying and evaluating functions.
FUNCTION, BASIC:	The specific purpose(s) for which a product, facility, or service exists and conveys a sense of 'need'. In 'continuous innovation' projects the basic function must always exist, although methods or designs to achieve it may vary. In 'discontinuous innovation' projects, which seek to create new industries, the existence and persistence of the basic function is itself the focus of challenge.
FUNCTION COST:	The expenditure of resources to perform the function.
FUNCTION, HIGHER ORDER:	The specific goals (needs) for which the basic function(s) exists.
FUNCTION, LOWER ORDER (ASSUMED or CAUSATIVE):	The function that is selected to initiate the project and is outside the study scope.
FUNCTION, SECONDARY:	A function that supports the basic function and results from the specific design approach to achieve the basic function.

FUNCTION, SELL:	A function that provides a subjective expression of something that is to be achieved. In Function Analysis, sell functions are qualitative and are described using a passive verb and a non-measurable noun. Sell functions are also sometimes referred to as "aesthetic" functions.
FUNCTION, WORK:	A function that provides an objective expression of something that is to be accomplished. In Function Analysis, work functions are quantitative and are described using an active verb and a measurable noun. Work functions are also sometimes referred to as "use" functions.
FUNCTION WORTH:	The lowest overall cost to perform a function without regard to criteria or codes.
JOB PLAN:	A sequential approach for conducting a value study, consisting of steps or phases used to manage the focus of a team's thinking so that they innovate collectively rather than as uncoordinated individuals.
PERFORMANCE:	The capacity of a product to fulfill its intended function. Factors such as reliability, maintainability, quality and appearance are some examples.
PROJECT:	A temporary endeavor undertaken to create a unique product, service, or result. For the purpose of Value Studies, a project is the subject of the study. It may be a physical product such as a manufactured item, or a structure, system, procedure, or an organization.
PROCESS:	A sequence of activities that delivers a product or project.
SAVE INTERNATIONAL CERTIFIED PROFESSIONAL:	For the purpose of a Value Study, the Job Plan shall be facilitated by a Certified Value Specialist (CVS), or a Value Methodology Practitioner (VMP) working under the supervision of a CVS. SAVE International Certification requirements are identified by the SAVE International Certification Board, which maintains a list of currently certified individuals.
SCOPE:	The portion of the overall project that is selected for the value study. The analysis accepts everything within the defined scope in order to focus attention on the functions within those limits.
VALUE:	An expression of the relationship between function and resources where function is measured by the performance requirements of the customer and resources are measured in materials, labor, price, time, etc. required to accomplish that function.

VALUE ANALYSIS:	The application of value methodology to an existing project, produce or service to achieve value improvement.
VALUE ANALYST:	See VALUE PROFESSIONAL.
VALUE ENGINEER:	See VALUE PROFESSIONAL.
VALUE ENGINEERING:	The application of a value methodology to a planned or conceptual project or service to achieve value improvement.
VALUE INDEX:	A ratio that expresses function cost ÷ function worth. This ratio is used to determine the opportunity for value improvement, which is usually identified in the Function Analysis Phase.
VALUE MANAGEMENT:	The application of value methodology by an organization to achieve strategic value improvement.
VALUE METHODOLOGY:	A systematic process used by a multidisciplinary team to improve the value of projects through the analysis of functions. See Value Engineering, Value Analysis and Value Management.
VALUE METHODOLOGY ALTERNATIVE (or ALTERNATIVES):	An alternative or alternatives prepared by the value study team and presented to management to provide financial and/or performance improvements and which is within acceptable terms and conditions of the Value Study.
VALUE METHODOLOGY PRACTITIONER (VMP):	VMP recognizes individuals with basic value training and some experience in the application of the methodology. Value methodology practitioners participate in or lead Value Studies.
VALUE PROFESSIONAL:	One who applies the value methodology principles to study and search for value improvement. Synonymous with value analyst, value engineer, value practitioner, or value specialist.
VALUE PRACTIONER:	See VALUE PROFESSIONAL.
VALUE STUDY:	The application of a value methodology by SAVE International certified professionals using the Value Job Plan.

References

Publications Catalog, SAVE International: Describes textbooks and educational materials on Value Methodologies and related programs. This catalog includes videotapes and information on *Value World*, SAVE International's peer-reviewed, technical journal.

Annual Conference Proceedings, SAVE International: Includes all presentations given at each annual conference. Also available is a value bibliography, a compilation of all presentations since 1980, and articles from *Value World*. Each presentation shows title, author, abstract, and source. Papers may be individually ordered from SAVE International.

SAVE International website: http://www.value-eng.org

"Standard Practice for Performing Value Analysis (VA) of Buildings and Building Systems," American Society for Testing and Materials, Publication E-1699.

Value Certification Manuals (on SAVE International website/home/certification)

- Certification/Recertification Manual
- Certified Workshop Manual
- Certification Examination Study Guide
- SAVE International Internet Web Site: http://www.value-eng.org

Lawrence D. Miles Value Foundation Internet website: http://www.valuefoundation.org

Techniques of Value Analysis and Engineering, Lawrence D. Miles