

# Value Added Strategies to Sustain a Successful Value Improvement Program

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## Biography



John Robinson is a Principal and Owner of Strategic Value Solutions, Inc. He serves the firm as an Executive Vice President and Senior Project Manager.

John's career includes more than 20 years dedicated to leading value engineering studies on public and private capital projects across the Continent. His education includes an engineering degree from the University of Missouri at Rolla. He is a registered professional engineer and a life Certified Value Specialist.

John's value engineering study experience includes major transportation projects, water and wastewater projects, marine and coastal projects, flood control projects, environmental restoration and much more. He also has extensive experience in military projects and other vertical construction type projects. The sizes of the projects and programs that John has conducted value studies on have ranged from a few hundred thousand dollars in capital costs to as high as \$40 billion.

John is also a major contributor to SAVE International. He has served multiple times on the SAVE International Board of Directors and has served on numerous committees for the Society. His most recent service was as President from 2003 to 2005.

## Abstract

We have all seen and many have enjoyed the fruits of successful Value Programs. We have also watched time and time again as these successful and robust Value Programs gradually spiral downward until they are no longer considered viable or beneficial. This paper addresses how actions can result in unintended consequences that contribute to the downfall of a successful Value Program. The paper will discuss many of the common compromises that are made relative to the scope of the value effort and the consequences that result from these decisions.

Further, the paper will provide value program coordinators and value consultants the knowledge, tools, and techniques to allow them to justify proper scoping of value studies to include such issues as required disciplines, number of team members, level of experience and expertise, and study duration.

### Introduction

This paper is based on my experiences in working with many established Value Programs. Some of these Value Programs have been for specific capital improvement programs and others are agency-wide long term and continuous programs. Some of these Value Programs have been established because of federal or state mandates while others are self imposed. I have been employed as a value engineering project manager and team leader within an agency-wide program and have provided services to these programs as a consultant.

I have also developed guidelines, procedures, and staff training for the start-up of two agency-wide Value Programs. Both of these programs have been in existence for 10 to 15 years and both have reported an annual return on investment resulting from the implemented value alternatives of 50 to 1 or more.

It is from the breadth and depth of my experiences that I offer the following observations, insights, and suggestions on sustaining or building a successful Value Engineering Program. While this paper is focused on multi-project type programs, much of what is presented is equally applicable to any single project as well.

### Anatomy of a Successful Value Program

Before discussing how to sustain a successful Value Program, it is important to establish a baseline for what constitutes a successful Value Program. Fundamentally, there is a value culture within the organization. Value Improvement through the application of the Value Methodology is an integral part of the project development process. Below are some of the characteristics of a successful Value Program:

- The Value Program is supported and encouraged by top management but perhaps more importantly by middle management and perhaps more important yet, by project management.
- Project managers take responsibility for the value study effort on their projects and consult with value professionals (in-house or consultant) to discuss plans and to establish proper budgets and schedules for the value effort at the onset of the project.
- The timing of value studies is scheduled within the project development process to achieve optimum results.

- Multiple value studies are conducted at various stages of project development on larger projects.
- The value effort is adequately funded to allow participation on the Value Team from all appropriate disciplines as well as to ensure the necessary support is available from the Project Development Team.
- Adequate time is given for each value study to accommodate the process and to allow sufficient development of the value alternatives.
- There is a high rate of implementation of the value alternatives; 75% or better.
- There is a return on investment for the cost savings generated to the cost of executing the Value Program of at least 10 to 1 (minimum).

This may be best illustrated by sharing how the Value Program works for one of my clients that I have served for over 13 years. For this particular organization, they have no one person designated as a “value engineering coordinator” nor do they have any state or federal mandate or even a written policy requiring them to use value engineering. Instead, value engineering has simply become a part of their culture. *This culture evolved because the General Manager and the Program Manager for a multi-billion dollar infrastructure program recognized the value in using this powerful process.* Their interest, enthusiasm and encouragement were passed down to the project managers. The project managers in turn recognized the value of the process. Today each project manager approaches the value engineering effort with as much importance as they would any other part of the project development process. This value minded culture spans from the administrative assistants to the Chairman of the Board of Directors. Virtually everyone within the organization has been exposed to the process or the results of the process. The Chairman of the Board has actually served as a team member on two separate value engineering studies even to the point of developing the value alternatives during the Development Phase.

At the start of every value engineering study, the Program Manager always attends the kick-off and always opens the workshop with his words of encouragement to the value team, his staff, and the designers. He tells everyone that the reason they do value engineering on all of their projects is because they have found that their projects are always better as a result of the value studies than they would have been without the study. He further reinforces the designer by telling them that the findings of the value team will in no way reflect negatively on the designer’s work. He creates an environment where the value team is recognized as a subset of the larger project team.

Once the value study is completed, decisions on the value alternatives are made relatively quickly. My approach is to develop multiple alternatives, often developing alternatives that are

not mutually exclusive. To assist the owner, the value team reviews the collective list of alternatives and identifies an optimum combination. This represents what the value team believes is the best value solution from the combination of alternatives. Typically, this client will accept and implement 80% to 100% of this optimum combination.

### **Cultivate a Value Culture**

If a value culture is the fundamental building block of a successful Value Program, it is important to discuss what it takes to grow such a culture. Fortunately, by human nature, most people want to do the right thing. This is something that is instilled in us as children. Therefore, the seed to grow a value culture comes from a belief that integrating the use of the Value Methodology into the project development process will in turn benefit the project and those associated with the project. While on rare occasions some people can quickly grasp the concept of the Value Methodology and can clearly understand how it could work to improve value, most people need proof through demonstration and often it takes multiple demonstrations. Having been born and raised in Missouri, the Show-Me state, I understand this mentality all too well.

For this paper, we are assuming that we are past the initial hurdle of getting the opportunity to give a demonstration. Getting that first opportunity is the subject for another paper. Here I am taking the position that we have an on-going and active Value Program but we really do not have an established value culture where there is a positive, supporting, and encouraging attitude within the organization toward the use of the Value Methodology.

For a value culture to take root, people have to see the value of the program. To demonstrate the value, the process must produce value-added results. While cost savings is usually touted as the motive for having a Value Program, cost savings is rarely (perhaps never) the catalyst for igniting a value culture. What management and project management most often want from a value effort is:

1. Validation that the project is going to do what it is supposed to do (accomplish the function).
2. Innovation – identification of original ideas (creativity)

A value culture is founded on consistently producing meaningful and useful results that benefit the project, the organization, and the stakeholders. In my experience the inability of the organization's Value Program to consistently produce value-added results is the primary reason that a value culture does not grow.

The other key ingredient to growing a value culture is value champions. There are those people in every organization that are described by words like: open-minded, forward-thinking, leader, visionary. These are people that others in the organization look to for direction; not necessarily because of their hierarchical position but because of their attitude and leader qualities. The

Value Program needs these people to be champions for the program. If they see the value in the program they will share it and others will follow their lead. Again, while having champions in senior management positions can certainly be advantageous, it is more important that they are respected in the organization for their views and positions on issues.

### **What Constitutes “Value-Added Results”?**

As stated earlier, value-added results equate to those meaningful and useful results that can serve as the catalyst for creating a value culture in an organization.

What are perceived as value-added results are those alternative solutions that cause a paradigm shift in the minds of the project stakeholders. Paradigms are mental models we all have that are created by the information filters in our brain. These filters or paradigms give us our perspectives. Project owners approach every project with their own individual and collective set of paradigms that effect the directions they give to their planning and design teams. These planners and designers bring to the project their own set of paradigms about how the project should be configured in order to solve the owner’s problem. Through the close working relationship between the owner and the designers, a new collective set of paradigms emerge. The only value alternatives that this project stakeholder team are going to perceive as beneficial, and worthy of implementation, are those that are successful in changing their paradigms about how the project should be configured. Every time the stakeholder team makes a decision together, new paradigms are formed or existing paradigms are confirmed. That is why value studies are generally more productive and more successful when done early in the project development; before too many decisions have been made and before the paradigms become too fixed.

Value alternatives that save cost without changing the project stakeholders’ paradigm may get accepted and implemented because they need to meet their project budget but they will not “feel” there was really any value added to their project. In their minds it will only be perceived as a necessary “cost-cutting” action and that in fact the value of their project was actually lowered. This is a common output of many value teams and it is a major contributor to the attitude that the value study was really not of any value to the project stakeholders.

Value-added results come from value alternatives that:

- Improve function performance
- Reduce or simplify operations and/or maintenance
- Provide innovative solutions to chronic problems
- Provide simple solutions to complex problems
- Increase the likelihood that the project will accomplish its intended function
- Provide solutions that bridge gaps between project stakeholders’ positions to create stakeholder consensus on a solution

- Provide solutions from original ideas that were never conceived of by the owner or designer

Fortunately, value practitioners are equipped with the most effective paradigm shifting technique known to man: Function Analysis.

### Why do many Value Programs Fail to Produce Value-Added Results?

The diagram to the right is an influence diagram. Each factor is influenced by the preceding factor and in turn influences the following factor. More specifically, this is a reinforcing loop in that the cycle is self-sustaining. With a positive influence, the factors grow and with a negative influence the factors decay. Once the process is started, it will continue in that direction until there is an intervention that breaks the cycle.

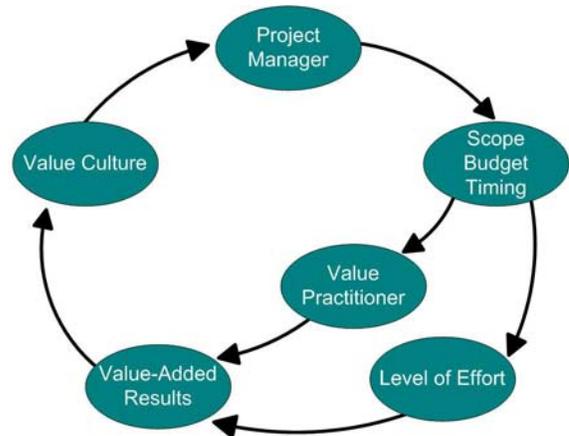


Figure 1 - Value Culture Loop

As stated earlier, for a value culture to take root, people have to see the value of the program. For the program to be of value, it must consistently produce value-added results. This is where many programs fail. Organizations go through the motions with a half-hearted effort using people that are not prepared and or not qualified. When the results of these efforts produce meaningless or un-implementable alternatives, the value of the process is questioned. To succeed, we must break this cycle. This is certainly easier said than done.

### Project Management's Role

First let's analyze how the organization's project management contributes to this perpetual cycle. The project managers often create a self fulfilling prophecy; they expect nothing to come out of the value study therefore they under-resource the effort and the value study produces "expected" results; nothing of value. Unfortunately, most project managers lack the requisite expertise in the value process and the nuances of how to structure a value study for success. Instead, most are biased by historically non-value-added results; therefore, the tendency is to minimize the "pain" and protect the expenditure of their project's resources.

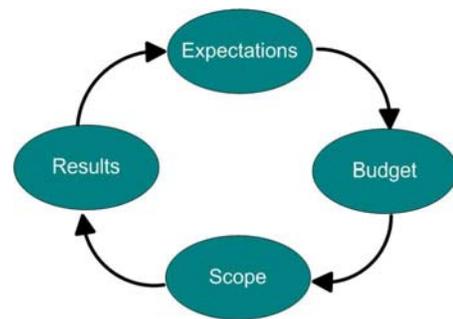
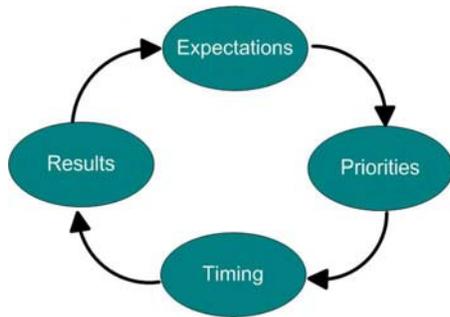


Figure 2 - Scope Reinforcing Loop

This attitude by the project managers manifests itself in under-resourced value studies. For example:

- Short duration workshops, often 1 to 3 days
- Small number of team members
- Not enough technical disciplines
- Inadequate level of technical expertise

Additionally, because the project managers often view the value engineering effort as a necessary evil, it is really the last thing they want to do. This is particularly true where the use of



**Figure 3 - Timing Reinforcing Loop**

the Value Methodology is mandated within the organization. In this case, the project manager will first try every avenue to seek approval for not doing a value study. In anticipation of getting this approval the initiation of any value engineering effort is deferred. If senior management has a similar attitude, they approve the waiver from the mandate. This in turn encourages the project manager to ask for a waiver on the next project as well. Occasionally the waiver is not approved but now the project manager has delayed the value engineering effort until the project is in

the final stages of design. Now all of the project decisions have been made and it will be extremely difficult to produce any significant value-added results because too many decisions have been made thus too many paradigms have been cast.

When the use of the Value Methodology is not mandated, many project managers will not consider a value engineering effort until the project is in financial trouble. Again, the perception is that the process does not add value but it can be effective at cutting cost. Therefore, they do not want to commit project resources to this activity unless they need some cost savings. Since it is usually late in the project development process before there is an admission that the project is in financial trouble, the value engineering effort is set up to deliver its expected results; cost savings but no value added.

The Value Methodology is one of those processes that, on the surface, seems so simple that everyone thinks they are an expert. Because these project managers really do not understand the value process well enough to know how manipulating the scope and timing can affect the outcome of the study, many studies are unknowingly set up for failure. I personally do not believe that “failure” is an intended outcome of their actions, it is simply a lack of understanding the consequences of their actions.

Since these project managers see little to no value in the Value Methodology it receives virtually no attention in the project development process, even when the value studies are mandated by

policy, regulation, or law. Moreover, if senior management in the organization does not see the value either, then the project managers experience no repercussions for ignoring the policies.

### *Value Practitioner's Role*

Many value practitioners whether internal to the organization (in-house) or consultants are also complicit in this cycle of value engineering studies that produce little to no value-added results (refer back to Value Culture reinforcing loop diagram in Figure 1). First and foremost, they accept the assignment that has been improperly scoped by the project manager. Saying “No” can be a powerful message to the project manager. Accepting the assignment simply reinforces that the project manager’s perceived expertise relative to the level of effort required was correct.

If the value effort is poorly conceived then the value practitioner’s ability to produce value-added results is obviously constrained. But what if the project manager has established a proper scope, budget, and timing for the value effort, are value added-results guaranteed? Absolutely not; many times the value practitioners themselves are responsible for initiating or feeding the downward spiral or decay of the value culture loop. The value practitioner is vital to the value team’s ability to produce value-added results. Since all value practitioners are not created equal and not all have honed their Value Methodology and people skills to an expert level, owners experience a diversity of outcomes.

Here are some of the value practitioners’ common pitfalls:

1. Sacrificing or compromising steps in the Value Methodology. Obviously no one understands the benefit of the process more than the value practitioner leading the study. However, sometimes the value practitioners give in to pressures by the owner or even the team who challenge the process or certain process activities. For example, to expedite the process, the value practitioner identifies the functions for the team rather than making them struggle to come to agreement on a verb-noun combination.
2. Poor execution of function analysis. Function analysis is the heart and soul of the Value Methodology. Unfortunately too many people believe they have it mastered after taking a SAVE certified Module I training workshop. This is only the beginning of the education process. A common mistake is using tasks or activities as functions. I once reviewed a report prepared by a prominent CVS team leader where there were multiple “functions” in the FAST diagram like: replace doors, replace windows, paint walls, etc. For the record, these are not functions.
3. Compromising process for product. Function analysis has two purposes: one is process (expand understanding) and the other is product (produce FAST diagram). Many practitioners wrongly put the priority on product rather than process. Process is critical to achieving value-added results. The finished FAST diagram is important to the SAVE Certification Board but is rarely important to the project stakeholders; value adding results are important to the project stakeholders.

4. Lack of innovation. Many value practitioners do not “push” the value team hard enough to seek the innovative solutions. Many value teams that are inexperienced at the process have a difficult time reaching beyond the low hanging fruit. Unfortunately these are usually the ideas the owner and designer have already thought about but chose not to implement. Other value practitioners mistakenly believe that generating a large number of ideas is synonymous with creativity and innovation.
5. Inadequate development of the ideas. I have reviewed many value study reports prepared by a wide variety of value practitioners from in-house staff to consultants. If there is one commonality it is the lack of development and documentation of the value alternatives. For many, the focus seems to be on quantity rather than quality. That may be an acceptable criterion for brainstorming but not for development. Therefore, the value alternatives are also perceived by the project stakeholders (owner, designer, etc.) as half-baked solutions and, unfortunately, many times they are correct.

### Setting up a Value Study to Produce Value-Added Results

To reverse or prevent a negative influence on our value culture loop, the key is to make sure the value effort is given every opportunity to create value-adding results. So how do we increase the likelihood that a value study will produce what will be perceived by the project stakeholders as a value-added contribution to the project development? Let’s start with establishing a budget. This is not necessarily the cost for the value effort. The approach is to identify, at project inception, how much could be spent on the value effort based on a desired return on investment.

One of the most effective approaches is to use a return on investment (ROI) approach. It is very simple. Identify the desired ROI. A generally accepted ROI within the value industry is 10:1 which means that the value effort will return \$10 in savings for every \$1 spent on the value effort. This is very achievable and will usually exceed the expectations of the project manager. The next step is to estimate the anticipated savings (implementable) in terms of percentage of construction cost. This requires some experience. If in doubt, 5%-10% is usually a good estimate. Divide the potential savings by the desired ROI and you have a preliminary budget. This budget represents the amount that could be spent on the value effort with a high probability of delivering the ROI. Generally the

#### Example 1

Assumptions:

- New large diameter pipeline project
- Construction cost = \$50 million
- Anticipated cost savings = 10% of construction cost
- Desired return on investment for the value effort = 10 to 1

Potential Savings

$$\begin{aligned} &= \$50 \text{ million} \times 10\% \\ &= \$5 \text{ million} \end{aligned}$$

To achieve a 10:1 ROI, divide the potential savings by the ROI.

$$\begin{aligned} \text{Potential budget for value effort} \\ &= \$5,000,000 / 10 = \$500,000 \end{aligned}$$

In this example, the budget equals 1% of the construction cost. This is a reasonable upper limit. This does not mean the project manager needs to spend the entire amount – it is a budget.

budget for the value effort should be between ½% and 1½% of the construction cost.

Now that we have a preliminary budget, let's establish a proper scope within the budget. It is paramount that the value practitioner give input to the project manager early in the programming and planning phases of the project development in order to influence the scope, budget, and timing of the value engineering effort.

If we break the scope down into its key components we get:

- number and timing of workshops
- duration of workshops
- disciplines and number of team members
- level of expertise

### *Number and Timing of Workshops*

Many owners and project managers think that one value study is sufficient. That may or may not be true. Further, the study should be done at nominally 30%-35% design completion. From my experience, a project that is at 35% design completion has 70%-90% of the decisions already made. Remember earlier I explained that these decisions equate to paradigms, therefore it is difficult to affect change. For this reason, if only one study is going to be conducted, it should be toward the end of the planning phase. Based on the size and complexity of projects today, many projects will warrant multiple value efforts. From Example 1, experience would suggest that this project would return a benefit from three value efforts. The first should be conducted on the planning documents to validate the planning decisions and to optimize the plan. The second should be during preliminary design (prior to starting final design) to optimize the design at a systems level, and the third late in final design with a focus more on constructability. This level of effort would fit within the preliminary budget that was calculated in the example.

### *Workshop Duration*

The project manager often wants the workshop(s) as short as possible to minimize the cost and disruption to the project schedule. Frequently, the argument will be made that the project is small, simple, straight-forward, etc., and will want to limit the workshop to 1 to 3 days in duration. The value practitioner needs to educate or inform the project manager that there is an internationally recognized standard for value engineering that has been developed by SAVE International, the professional society for value engineering. Most project managers are not aware there is actually an international standard for the value study process that has been adopted by our federal government. This standard provides the protocol on how a value engineering study is conducted. To not follow this standard would be asking the value practitioner to not follow the generally accepted practices of the value industry.

The value team needs time in the workshop just to execute the process activities. For a 5-day workshop these activities take approximately 50% of the workshop time. This percentage actually increases slightly as the workshop duration is shortened because there are portions of the process that cannot be appropriately reduced. Therefore it is not a linear reduction. Secondly, the value team needs sufficient time to adequately document the value alternatives; this takes the other 50% of the duration. Do not sacrifice this time. Explain to the project manager that this time is critical for the value team to make sure the value alternative concepts are fully developed by the team that conceived the ideas. This ensures that the value study does not present half-baked solutions that waste the time of the project designers and other stakeholders to review and ultimately reject.

The project manager will often suggest using members of the design team to reduce the Information Gathering Phase of the process and also reduce the Development Phase since they can develop the value alternatives as part of their design process. This is seldom, if ever, a good idea. A tenet of the Value Methodology is that objectivity breeds innovation (ideas not previously identified). This is where a discussion on paradigms can be very effective. While some time can be saved, the potential loss in value from the value study is an order of magnitude greater if not more. Of course there are always exceptions to this rule but, if the objective is to set the stage for the value study to have the greatest likelihood for success, then we should reduce our risk of failure.

### *Number of Team Members*

The project manager will typically want to minimize the size of the team to minimize the cost of the effort. The team should be sized considering: required disciplines, plus sufficient production capacity, plus team dynamics. List the major features of the projects and the disciplines required to review each of these features. Ask the project manager if he wants the value team to look at each of these features. If the answer is yes, then obtain his concurrence that it will require this list of disciplines.

Depending on the size and complexity of the project or simply the nature of the project, it may be appropriate to have multiple people on the team for key disciplines. This serves multiple functions. For one, it provides greater potential for innovation by having multiple perspectives and experiences represented in the same discipline. Secondly it increases the team's production capacity to develop value alternatives in the project aspects where the greater number of ideas are likely to be generated. For example on a \$100 million highway project there will likely be a large number of ideas related to roadway configuration, geometrics, etc., therefore multiple roadway design disciplines would be appropriate in order to make sure all of the worthy ideas are fully developed.

The final consideration is team dynamics. A significant factor in the effectiveness of the value process is the team synergy that is created. This synergy is the fuel for the creative process. It

generally takes a minimum of five team members to stimulate the creative idea generation process. With this minimum number the team will start to build on each other's ideas and work together to create ideas that would not have been conceived by any one individual.

If the rationale above does not convince the project manager to provide a sufficient budget for the number of team members, use an economic justification similar to the one in Example 2. This often helps the project manager to see how trivial the cost of a team member is relative to the potential value they can bring to the project.

### *Value Team Expertise*

The expertise of the staff on the value team is another critical ingredient to success. Particularly when value teams are staffed by the owner's staff, there is a fairly common practice to use people that are the least busy – there are usually good reasons why these people are not as busy as others. This can happen with consultant teams as well. In most cases, the value study teams should be staffed by individuals with a level of experience and expertise that is at least equal to and preferably greater than the experience and expertise on the design team. Project manager level and design section leaders are usually the appropriate level of expertise. For some project features a more junior person may be adequate and for others it may be appropriate to seek out national or international level experts.

If the value team does not have adequate or equivalent expertise to the design team, it will become abundantly clear when they start asking questions during the Information Phase and when presenting the value alternatives at the end of the workshop. If the designers do not perceive the value team members as peers (relatively equal capabilities) or experts, the designers and owner's staff will lack confidence in the results. For credible results, the value team must be able to stand toe-to-toe with the design team.

Furthermore, if the objective is to find possible solutions that have not already been considered, then it would be unreasonable to expect team members with limited experience and expertise to

### **Example 2**

Assumptions:

- Administrative/Office Building project
- \$25 million construction cost
- 5-day workshop
- On a project with this construction cost, the team will focus on the ideas with the highest likelihood of implementation that have an expected savings of \$50,000 or more
- For a 5-day workshop, each team member will develop an average of 4 value alternatives
- Average team member for a 5-day workshop will cost \$10,000 for labor and expenses

Savings potential from one team member = 4 value alternatives x \$50,000 savings = \$200,000

It will only cost \$10,000 for the potential to save \$200,000.

Even if only one value alternative is accepted, that is still a 5 to 1 return for that team member.

Keep in mind, these are the minimums.

identify solutions that escaped the design team. A value team with an inadequate level of technical expertise will not be able to generate and develop the paradigm shifting value alternatives that will truly add value to the project.

Beyond the technical expertise is the expertise of the value team leader. In my opinion, the value study should never be led by a person that is not a Certified Value Specialist (CVS). This is the highest level of certification given by SAVE International to demonstrate competency in executing the Value Methodology. With the simplified certification process in place today, it is not unreasonable to require this level of certification.

### **Conclusion**

In conclusion, for any Value Program to be sustainable, a value culture must be established in the organization. In order to establish a value culture, the Value Program must be managed and the value studies executed in such a manner that value-adding results are the consistent outcome of these studies. This requires changing common project manager practices by integrating the value practitioner into the project development process to influence the scopes, budgets, and timing for value studies early in the project programming phase. It also means holding value practitioners to a higher standard of performance to ensure the Value Methodology is properly performed.