

## **WORDS TO THE WISE: HOW TO BE A SUCCESSFUL TECHNICAL TEAM MEMBER**

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**Abstract** - On good Teams, everyone has a role to play. On successful Teams, everyone plays it well. As for me, I am at the precipice of jumping into a new role during VE studies since obtaining my CVS. After five years and over 15 studies, I am about to make a tectonic shift from Technical Team Member (TTM) to a Certified Value Specialist (CVS) now that I have become a CVS.

This paper is written to take advantage of this juncture, where I can put in writing, what I have been told “must be so” if one wants to be an excellent TTM. The TTM has a critical role to play in supporting and collaborating with the CVS to ensure excellent value is received by the client as a result of a successful Value Engineering Study.

It includes a detailed presentation of the key requirements of a TTM through each phase of the Value Engineering process. It also concludes with the benefits of being a TTM and provides a summary checklist of what must be so for a Technical Team Member to achieve excellence!

**Background** - My background is fairly typical for a TTM or a CVS. I have some professional credentials; I am a licensed Professional Civil Engineer and a licensed Architectural Engineer. I have an MBA and most importantly, I have been an AVS for the last five years. In addition, I, like most Value Engineering professionals, am enamored with the creative process. I have focused on developing creativity for myself and in my company. I have also been an adjunct faculty member teaching creativity with the American Public Works Association (APWA) Public Works Institute.

From my perspective, what must be so on projects is that they must be more than just functional, they need to be unique, aesthetically matched to their context, and have some other intrinsic value beyond meeting the budget and schedule. The economics will work out if the design delivers the highest performance. I believe that is why my exposure to function analysis was an epiphany as it allowed creativity to happen in an organized way, with input from the entire group, resulting in a better outcome.

To date, I have been very fortunate to be a TTM on approximately 13 studies and an AVS assistant team leader on a few others. When I first shifted from a TTM to a role assisting the CVS facilitator, I was very surprised to learn how different the role of facilitator was. It is a sensory sport of which one must partake to fully appreciate.

The facilitator ensures that the VE team follows the process, in a timely manner, and the TTM, is generating, assessing and developing the ideas. The facilitator is a coach but must rely on the players to produce results. All of the studies were led by CVSs that I highly respect; therefore I was very motivated to do the best job I could at producing results. I also received a lot of feedback about, not only my performance, but about my teammates' performance. It was excellent candid feedback that helped me understand what is needed to vicariously satisfy the Owner and directly support the CVS so we conclude with excellent study results. What I have heard is: Quality Team Equals Quality Results.

Additionally, several studies ago, I interviewed my peer technical team members to get their take on the VE Process. Some were very experienced and excellent team members (I knew this to be true because of feedback), and some were first or second time team members. I asked them three basic questions and video recorded their responses. It was interesting to see what they had to say but very enlightening to know how similar it was to what I had felt.

So before my perspective shifts completely from that of a TTM to one of a facilitating CVS, I thought it would be good for me to share my perspectives with VE professionals in the VE community. Presented over the next few pages are some of the basic and enhanced requirements for Technical Team Members; they are generally broken down by each of the informal and formal phases of a typical VE study.

**Team Member Qualifications** – There are some basic responsibilities that are just inherent with being a professional on a VE Team or otherwise. The most important thing is to come with a good attitude. Given that a Technical Team Member has some subject matter expertise that they bring to a study, a very important thing to do is be humble and listen. They need to be very good listeners and, based on that, be open to different ideas and solutions. The next thing is to be patient and embrace or “trust the process.” However, it is important to not be afraid to ask questions. The TTM just needs to understand they are going through a specific process. These requirements are basic but will go a long way in providing the basic characteristics needed for a good Technical Team Member.

**“The only real disease in life is the hardening of the attitudes.”-- Zig Zigler**

As an enhancement to how a team member can understand the environment they are entering, the team member should consider the motivations of the Client, the CVS/Team Leader, and the Design Team. The standard client requirement is to get a return on their investment, to know that they received value. They may be under schedule pressure. And the most common problem is that the design is over budget. So, as a TTM coming into a study, be open and ready to listen to clues to assess the project needs from the client’s perspective.

The Team facilitator needs the TTMs to be present throughout the process. They need them to listen, understand, be creative, and develop value proposals that will improve the project, which means they need some to be accepted

In regards to the design team, the TTM must always deploy empathy and respect to be effective. Remember to respect your technical colleagues. However, the TTM cannot abdicate their responsibility to use their technical knowledge to verify design, vet issues and bring new valid ideas. That is what they are hired for, context-based improvement. A TTM is also obligated to provide new energy and ideas to help improve the project. The Owner needs it, it’s your job, and it’s just the right thing to do.

**Pre-Workshop Stage** – After having thought through what the client and CVS need, it is time to get prepared for the study. Although each study is unique, the TTM needs to review enough information to get a context of the project. If you are lucky, the owner and the CVS will provide you with basic information about the study. This may include a Team primer, an Agenda, workshop information, and summary of the Process that will be used. In addition, the project design reports, plans, specifications and other contract documents may be available. Having all these items is a perfect world so review them and take advantage of what you receive.

Regardless of the amount of information, one simple thing you can do to enhance your understanding of the context of the VE project is to use the Internet to research the project area, the client, and their design standards. Translating technical knowledge from one geographic area to another is one of the toughest challenges for a Technical Team Member. This will be good background for the study.

Being focused at the study is critical but with communication technology, it is difficult. You will do yourself a great service if you can plan ahead and block out your calendar from disruptions. This will also help to manage expectations of your employer and peers about your availability. If your study is on a different time zone, then you can schedule calls before and after the contact time required for your study or even perhaps at lunchtime.

As part of being prepared, you will need to bring equipment and supplies as required by the CVS team leader. Basic equipment is a laptop with Word, Excel, Outlook, Adobe Acrobat, any specialized software for your technical discipline and a USB drive. Other basic items include a pen, scale, paper, and digital phone/camera. Also, ask your CVS if there is anything else special that is needed for the workshop.

## Workshop Stage

**Information Phase** – This phase is all about uptake and verification of information, from the owner, Design Team, CVS, and other VE Team members. Having the context and background is great, but at the briefing, you get to hear the project described from the owner's and design Team's perspectives. Certain slants, opinions and biases show up to give you a feel for the project. Also, you get to see who your technical counterpart on the Design Team is.

The TTM's basic requirement at this level is to continue to listen and take excellent notes. Handwritten notes are fine but it would be great to add them to the electronic version if possible. If you are enhancing your blog, then be sure to keep the information in separate categories and also keep it in chronological order. Sometimes early information is trumped by later information so having the time when and the source of the information will help the team later.

Most CVSs like to know the important success factors from the owners and design team's perspective. Although we will look at the entire project, the CVS may ask what are the Workshop Objectives (such as how can this VE study best help you?), any constraints, and any Design Issues they are struggling with. The VE team leader may ask other guiding questions such as defining performance metrics, and project Risks. Whatever they ask, use this a time to take notes on Project goals which may be helpful later on in the process. In particular, in the Evaluation phase.

One other important thing is to establish rapport with your technical counterpart on the design team. Get their contact information and ask them if they would mind answering questions after the briefing and when the best time and best method to contact them is. This can save a lot of time later and will enhance the quality of VE proposals prepared during the study.

**Function Analysis Phase** – Function analysis is the key ingredient for Value Analysis. In fact, SAVE would not endorse a Value Engineering study that does not have some form of it. However, it is also the most confusing to new team members and even for very experienced Team members. This dichotomy sometimes causes the Function Analysis phase to be taken lightly by the TTMs because it is frustrating to try to participate. So the first requirement of a TTM in the function analysis phase is to stay engaged and go with it! Trust the process. If it is not immediately intuitive, that is normal, just trust it!

Begin with the (active) verb (measureable) noun combinations. This is basic and is the easiest thing to do to begin with (even for engineers). As you recall, a verb is an action word and a noun is a person place or thing. Do not go with provide, as Webster's has taken it off the active verb list. Understand that these two word combinations have great liberating power for creativity. By reducing a needed function to two words, it opens many possibilities as to how a project can meet a required function and also how alternate solutions can be brainstormed/identified to achieve function. Most TTMs can easily get into this phase and find it enjoyable, so go for it.

In studies where FAST diagrams are developed, understand the basic format of a fast diagram. First, notice that not all functions have to fit on the logic path. Some of the functions can be placed as all-the-time functions or design criteria. Then look at the main body of the FAST diagram. This area contains the logic path(s). All the functions in this area must follow the directional "why and how" logic.

Now begin placing the functions in the logic field to develop a logic path. Every function's relationship may not make sense to you, or you may put it in a different order, but if it makes sense and the Group is good with it, then you are done. This is an awareness creating and relative consensus building process. Note, it is important to participate and buy into the function analysis phase otherwise you may not be providing helpful value engineering suggestions later in the process.

Try to identify any unnecessary or duplicate functions as well as those that are outside of the scope. The FAST is a tool to eliminate unnecessary components of a project. This will help during the Creative and Evaluation phases.

One final suggestion is to look at the functions with the greatest risk (or high cost). In the modern era of Value Engineering, consideration of Risk has taken on a high level of emphasis. It is important to develop an understanding about the high risk functions.

**Creative Phase** – In my opinion, this is the most important part of a study. It is absolutely my favorite part of the VE process. The end result is to have an extensive list of clearly stated ideas. This is when creativity is applied to improve value. It is a time when a technical expert can have quite a bit of fun. However, there still is a process that must be followed and considerations made. I will go through these but, before I get to that, I just want to have a little fun and elaborate a little more about why creativity is so special to me.

I have always wanted to be creative yet practical. Otherwise all your thoughts just go to waste. The norm in society is that some people are left-brained (logical) or right-brained (creative). Supposedly the neural functions or cognitive processes tend to be predominantly in one side of the brain or another.

For me, I believe life doesn't have to be a choice between aesthetics and functionality. I have always believed that the two can co-exist. Why do you have to use only your left brain or your right brain? Why can't they work together? The desire to have both is the affliction that I have lived with for my whole life, until, Value Engineering.

Below is an intermixed list of randomly ordered basic and exceptional things a TTM can do during the Creative Phase.

Have fun! Everyone is creative. Believe that Creativity and logic or intelligence can co-exist! If Einstein sees it that way, then why shouldn't we?

At this phase, you will be loaded with ideas as I typically am. Some of them sound better and better, while others are waning. Candidly, I am chomping at the bit to let them out. However, if you have a lot of ideas, be sure to pause to let others share their ideas.

Never critique, evaluate or eliminate peoples' ideas. Also, don't pre-judge your own. It is not allowed in brainstorming. It will not only waste time but it may cause a team member to withhold their idea. I witnessed an example of the extreme extents of creativity when I was about 8 years old. My Dad asked my brother, sister and me to help him think of street names for a new subdivision. He said anything goes. I threw out Chip and Dale because that was the cartoon I wanted to be watching instead of brainstorming. As a result, today in Fort Wayne many families live on "Chippendale Court".

Adjust your ideas based on the needs of the project and the stage that it is in. This doesn't mean big ideas are out, but focus on ideas that will be of value. For example, if the project is at the 90% design stage, and the owner is not interested on going back and redesigning a lot of things, focus on things that have a chance of implementation. Ideas that support constructability, bidding enhancements or design element refinement have a better chance of being implemented. Reconfiguring an entire building or the entire project at that stage is very unlikely and unless there is a huge fatal flaw, that idea won't be implemented.

Spur on creativity by supporting others and their ideas. All ideas that are serious in the eyes of the person that generated them are valid. Unfortunately, early criticism is as common as it is deadly to creativity.

More is better. Know that the Team needs as many ideas as possible. The winnowing process will take place in the next phase, Evaluation. Don't leave any remotely reasonable ideas in your notes.

When you brainstorm by function, make sure you understand the baseline assumption that is accomplishing this function. This will give you context for your solution. For example, your idea will state that the design accomplishes this function in this way but the proposal would accomplish the function in this other way. This helps explain the benefit of the new idea.

Don't restrict your ideas to be within your discipline. (Quote from Tina in DC "I was surprised to see that people were able to bring up so many good ideas that were in areas outside their discipline.")

Be as specific as possible when describing your idea. However, don't limit the idea so it would fail. State how else you can accomplish the function. Variations should be stated as different. Be specific in the location.

Have fun!

**Evaluation Phase** – There will be many different ways that CVSs will direct the team to evaluate the Creative idea list and winnow it down to the ideas that will be developed. Nominal Technique, numerical scoring, assessment of potential value provided, listing ideas by ordinals, etc. This step happens right after the Creative Phase and it is easy for the TTM to be eager to get through and rush into the evaluation with their ideas pre-selected. However, at this point, a great TTM will maintain a balance between objectivity and passion for ideas. The key to doing this is to step back and remember what is best for the project while hanging on to the ideas you are most passionate about.

Remain objective - Focus on the value provided by reviewing the owner's goals and objectives for the project and the VE session. What was the owner's criteria for the project? These were collected at the information session and are contained in the design documents. What areas of the project were considered as "Sacred Cows" and do they need to stay that way? Think of the issues the design team wanted help. Your CVS team leader may prepare a paired comparison to identify the critical performance attributes.

Hold onto your Passion – There are always a few ideas that a TTM will feel passionately about. Good, hang on to those as they can be the best VE proposals! However, realize that you have a slight bias for your favorite ideas and test that with other Team members' opinions. Great ideas seem to pop out and get noticed by all team members. It is entirely possible, and it has happened to me several times, that you are the only one that understands the benefits of an idea. Often it is a lack of technical understanding of your subject matter or discipline by others. Remember, it is your responsibility to your team to evaluate ideas using your technical expertise.

**Development Phase** – This phase is where the rubber meets the road. I am not going to sugar coat it, it is a grind. However, this is where ideas are turned into very specific proposals that compel the client to accept them and bring greater value to the project. So, bring your lunch pail and expect to be guided. The basic requirements for a TTM during Development are listed below.

Be a grinder, but a flexible one. Use pictures and sketches. Succinct writeups, refer back to the quotes that were given at the information in brief.

First thing, listen anew. This phase represents a major gear shift in the process. Be sure you understand what the CVS wants from you. At this time, many TTMs want to jump into the writing and others are nervous about proceeding because they are not sure what to do. A great TTM will listen closely to the CVS when this phase starts because the CVS has very specific and time saving ways to develop the VE proposals. There are usually very specific forms and document control rules that the CVS needs everyone to use. What they want you to write in each area is often very specific. Listen and ask questions because it will save you a lot of time later.

I have heard often that good VE Proposals equal a good VE session. A good VE proposal has all the ingredients needed to convince the client to adopt it. Reference to the baseline proposal, what function(s) the new proposal serves, an objective assessment on the impacts and implementation considerations, and most importantly, provides greater value based on comparable life cycle costs. Also, excellent graphics are needed. This really comes in handy when presenting the VE proposal as time will typically be short on getting the message across.

Be collaborative. It is important to assess the skills of the entire team. Ask each team member what their strengths may be. Writing and preparing graphics are the two areas that TTMs usually have a wide range of proficiencies. Barter work with other team members. For example, I am fairly detailed (verbose) in my writing but sometimes need help with the use of technology for graphics. I have often helped beef up some of my team members' narratives while they help me create and edit my graphics. There are many other examples of how the entire team can do a better job with the expertise and time allowed. A great TTM will know that you are not done until the team is done so share the workload.

Finally, manage your time wisely. All I can say is that it, it usually takes longer than you think, and even when things come together, there is always more you can do.

**Presentation/Implementation Phase** – This is the culmination of the VE process for a TTM. The CVS gets to package up the entire report, but for a TTM, this is basically it! This is the time where you must present the VE idea and get the owner and design team to support the Proposal.

Use your presentation skills wisely. I have seen and been a part of many presentations, and in general, VE presentations are very good. This may be due to the fact that the presenters are typically robustly passionate about their ideas. At the same time, there are a wide variety of styles that seem to be effective. The old adage of making a connection with the audience seems to work easier in this environment. Look the client in the eyes and make a connection and they will see if you really believe this is a good idea or not.

Support and be respectful of the Client and Design Team, especially your technical peers. This is one of the toughest tightropes to walk. Elaborating on why the design as currently proposed can be better implies that the design team is bad or not fully competent. It is also possible that the Owner directed the Design Team to address a specific function in a certain way. This is not the case and there are many things that they know that a TTM will not know. The best advice here is to put yourself in their shoes.

As with any presentation, be ready for some curve balls. Be prepared for questions as the audience must fully understand what you are presenting. Be ready for questions to be a lead in for criticism. Be prepared to pleasantly defend your proposal even though the audience has been instructed not to dismiss it. Allow for technical glitches. For example, bring a hard copy of your proposal sketches in case the power point has a glitch.

#### **Post Workshop Stage**

Even though you get to enjoy a few moments of euphoria after the presentation is over, there are still a few things you can do after the presentation is over to support the CVS and to ensure the process is completed with the best chance of success.

Be available for questions from the CVS. Many times the information produced during the session may have a few missing items or in need of some clarification or other follow up that needs to be completed.

Keep your VE proposals and any non-sensitive information for at least two months.

Delete any confidential information from your computer and any other storage devices. If need be, e-mail your information to the CVS or ask them if they would like it.

Keep track of key VE Study information for your resume.

Get your VMA by attending a Module 1 workshop on your way to a CVS!.

Extol the virtues of true function based VE and spread the word about how it can benefit any project or product.

**Benefits of Being a Technical Team Member** – This paper contains a long list of things to do as part of your journey to be an excellent technical team member. Many of them are common sense and instinctive to professionals with technical expertise. However, why do all this?

First, you bring great benefit to the owner. Owners deserve it all. They deserve the best assets, be it infrastructure, products, even services, at the minimal cost. Although the popular phrase “you get what you pay for” may make it sound like you are destined for cheap or expensive, VE is proof that it doesn’t have to be a tradeoff.

Second, you bring benefit to the community in which people live, work and play. Ofte times a VE is for a major infrastructure project, a government project, or for a product in manufacturing that has superior value to society. It provides a technical team member an opportunity, in a very short period of time, to bring great benefit to the society where it is implemented. That translates to an improved quality of life.

Finally, you bring great benefit to yourself. My experience with VE has been very rewarding personally. It has allowed me to be a more creative Engineer. I get to challenge both sides of my brain. This is what caused me to become enamored with VE. To be objective, it is sometimes difficult managing the time to be present and focused during a VE study but those are just part of the challenges of a TTM.

I know that I am not the only Technical Team Member who really enjoys being a TTM as part of a VE Study. As part of the preparation of this paper, I interviewed about a dozen TTMs and got their insights on the VE process. See some quotes on the next page that can only be considered cathartic for a true VE Technical Team Member.

**Feedback from Other Technical Team Members**

"I think the best idea I can remember is when we discovered we could just eliminate the project." We discovered that it was not needed in order to achieve the function they wanted."

Laurie Dennis - CVS Life



"I like the creative aspect of VE and the camaraderie with the team. Being around smart people is always fun, you always learn something new. It is hard to be able to see the big picture but also get into the detail enough to make some sense of it."

John Mauk - Cost Estimator



"The VE experience is an opportunity to engage many disciplines at the same time and in a rather short period of time which makes a good academic and technical environment to identify



original design."

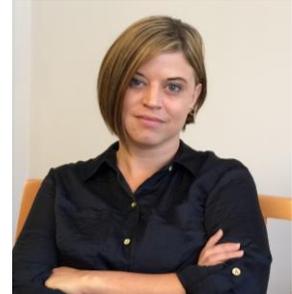
Rod Mercer - Landscape Architecture

issues and opportunities... The biggest challenge is to put yourself in the position of designers in a relative short period of time and come up with recommendations that are equally compelling to the

After her first VE study – "I thought it was going to be more challenging than it turned out to be. Only having a brief description, I felt like 'why do I need to sit through all the disciplines?' I was really surprised to see how we all really worked together and how important it was for us to all be in that room

together. Everybody brought things to the table even though it was outside their area of expertise." "I learned a lot and the process really worked"

Tracy Tato - Interior Design



"I enjoy the challenge of being creative when there is not a lot to be creative with. You must try to minimize your impact so you will be beneficial to the VE study. You don't want to be hurtful and damaging to the design team". Understand that

the VE process is a helping process not a deconstructive process."

Rodrigo Hurtado - Architect

"I like that you have to think and make valid technical decisions on the fly with limited information."

Steve Highfill - Structural Engineer



Note to Maripat Traino and Reviewer:

I prepared my Scholarly Paper and submitted it with my CVA Application in January of 2017. My paper was accepted and it was recommended that I submit my paper as a white paper for the 2018 SAVE Value Summit. However, the white paper format requirements are different than those for my Scholarly paper so I have taken out information to conform my paper to the submittal requirements and to allow it to be accepted. Additional items that would be included in my presentation include definitions, additional feedback from technical Team Members, and a one page summary checklist of things TTMs should do during a study to be a successful Technical Team Member.

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