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Current Perspectives on the Value Methodology
Welcome to the Summer 2006 edition of Value World. This issue presents a view of the current state of our discipline that I hope will stimulate its readers to participate in the debate required to build the knowledge on which our principles and practices are based. If our discipline is to survive, it requires a fluid and regular debate among its members to underpin its development by continually questioning and improving its principles and practices. The health of our discipline demands the continual review of insights from ongoing practice or originating in other fields to debate their incorporation into our core knowledge. I ask each of you to consider this matter. What do you think of the issues addressed in this issue? Do you agree with every opinion or experience presented? Are there any insights from your own work that you think should be shared with the rest of the community?

The first paper in this issue summarises an advanced application of value engineering. Taher provides an informative insight into the ability of existing methods to inform technically-challenging problems. Value engineering provides a form-finding tool to help a project team understand the boundaries of the problem requiring solution. This contribution builds our confidence in adapting the value method to help us find innovative solutions to technical problems while retaining the rigour that ensures they will be effective.

Kaufman complements this summary of the ability of the value method to frame innovation by reminding us of the importance of the facilitator in guiding the process. Kaufman highlights the importance of the facilitator’s detailed knowledge of the value method as the project team rely on it for the process rigour that justifies workshop outcomes. Kaufman also reminds us that process knowledge alone is not enough. The value management facilitator must also possess personality traits to guide participants’ dialogue in the workshop setting.

In their paper presented at the 46th Annual SAVE International Conference, Adams and Nelson build on this aspect of facilitation by sharing approaches to managing the workshop group dynamic. They highlight problematic situations and suggest practical facilitation tactics that respond to the adoption of inappropriate behaviours by a group. Their insights remind us that facilitators currently draw on their own experiences to navigate social situations and will call upon a variety of devices, including humour, to do so. Our discipline does not yet have detailed understanding of this aspect of facilitation.

Leung concludes this issue of Value World with an overview of the education of new entrants to our discipline. This process is fundamental to our discipline’s health as it both endows new entrants with accepted core knowledge and shapes their expectations. Leung’s paper shares the problem-based learning approach used by the City University of Hong Kong to provide students with realistic learning environments that simulate workshop settings, helping them to learn from experience by applying the value method and its techniques in realistic settings.

These four papers illustrate that we remain confident that, when effectively facilitated, the value method will yield analytically sound results which might be innovative but can always be trusted because they have been developed with rigour. However, we are recognising that our approach does not provide a complete solution in some regards as we now appreciate the nuances of its application. A coherent view of what these additional issues are, let alone a consensus view on how they should be addressed, is yet to emerge.

I strongly encourage each of you to advocate your views, experiences and opinions on these—or any other—issue via Value World. With your support, I hope to be able to present further snapshots of the debate as it builds among us and informs the future of our discipline. By contributing to Value World you can become part of that dialogue. Your journal will do whatever it can to help new or inexperienced authors share their views with their peers. Your journal is intended to be an open forum for the debate of the discipline. All views are welcomed and all value-related topics will be presented. However, as Value World is currently experiencing a dearth of submissions, its ability to support your discipline is being severely curtailed. Help us by putting your thoughts forward to the community. The Value World Editorial Board and myself are here to support you in this process.

Derek Thomson, Ph.D.
Editor-in-Chief, Value World.
Form Finding and Value Engineering in the Design and Construction of the Mechanical Umbrellas for the Holy Mosque in Medina, Kingdom of Saudi Arabia

Khalid A. H. Taher

Abstract

The commission to design a convertible shade roof for the two large inner courts of the Prophet's Mosque in Madinah presented an unusual architectural and technical challenge. In a location, where tens of thousands of people congregate every day, measures had to be introduced to improve the climatic conditions without destroying the character of the open courtyards and their familiar surroundings.

The solution consisted of twelve 17m X 18m convertible umbrellas with a height of 14m in the open position that perfectly fit the proportions of the courts. With a diagonal span of 24m they are the largest of their kind ever built. The six umbrellas in each court, with their cone-shaped membranes, create the effect of a translucent vault spanning between the columns and arcades, which surround the court and thus make for a clear, expansive space. Their noble, dignified form, with carefully designed surfaces, blends in harmoniously with the traditional stone architecture; although different in character, they prove mutually complementary. This effect is felt yet more strongly when the slender, vertical sheathing of the closed umbrellas unfolds and the gathered membrane opens like a flower to cover the court.

Form finding (FF) concepts, established by Otto and Rasch1, and Value Engineering (VE) techniques were used as problem solving techniques throughout the entire process of design and construction in the Mechanical Umbrellas for the Medinah Haram project. VE and FF when coupled, form a unique tool that proved to be quite innovative and effective. This paper discusses how the two concepts work, as well as their transparency.

Introduction

The use of movable sunshades is an ancient tradition in southern climates. In the south of Spain 'Toldos' have been used for more than 2000 years to protect streets and public spaces from the sun. These textile shade roofs prevent the spaces beneath from being overheated by the sun and thus allow the climate to be regulated. However, the cooling effect is achieved not only by shading, but also by radiation of the heat to the sky when the shade roof is folded together at night. With the help of specially developed software, this principal was scientifically established by SL and has been used in a variety of shade-roof projects.

For the two courts (Figure 1) of the first Saudi extension of the Madinah Haram a shading
system was needed. Without such a system, the energy that would come into the building that was going to be air-conditioned was hard to get out again. The approximate 5,000 sqm would bring in up to 5,000 kcal per hour, an amount big enough to hamper the original intention of obtaining reasonable temperature levels in the mosque.

Various ideas as of how to cover the courts were discussed. Ideas ranged from sliding domes to fixed non-convertible roofs. But all solutions, in one way or another, had some disadvantages and could not bring a satisfactory solution.

The old, yet new idea of umbrellas was introduced and the designer (SL) got a chance to study this possibility in depth. After the first round with two times twelve square umbrellas of exactly 12 by 12 meters, the principle was established. Architectural requirements suggested a study to use larger umbrellas, so the number would come to six in each court. Architecturally this posed a problem, because of the proportion of the court would have left big unsightly looking gaps along the long sides of the court. This was tackled by going from square to rectangular umbrellas of 17 by 18 meters, an irregularity that is barely visible and looks harmonious in this precious place. Of course it was much more difficult to build because of the slight irregularity in the angles. The application of CAD-CAM processes made it possible to solve this problem too.

The design approved by chief architect of the project, called for two times six convertible umbrellas (Figure 2), that would be able to open and close the courts within a short time of two to three minutes. That solution insured leaving the spirit of the place as open court as much as possible. It was the ultimate goal, of the designer /builder, to give something to this holy place that had not changed in centuries. It was the ultimate goal, of the designer /builder, to give something to this holy place that was adequately performing the function in the same time not alter the mood and spirit of the mosque, not disturb the worshipers and if possible enhance and support the beauty of the place.

Form Finding and Value Engineering:

Otto and Rasch (1995) have identified the idea behind their concept of form finding as follows:

...For most cultures throughout history, objects of art and objects of daily use were expressions of the same sense of beauty, because it was the same unifying spirit of the culture that shone forth in both. In our contemporary culture, however, one looks in vain for any coherent spirit. The fragmentariness of its so-called aesthetic concepts has resulted in an unparalleled absence of beauty from our man-made environments. One of the first observations when working with lightweight structures is that the beauty of the structures is not designed by artists but rather appears spontaneously, usually after a laborious process of definition and optimization. The pure mathematical beauty revealed in minimal surfaces is also the beauty in nature, where all structures are optimized. This concept truly converges the otherwise centrifugal movements of Art, Science and Technology. One can best complete the natural by conforming to the necessary; the necessary is the ultimate perfection of the natural.

Form finding is a solution by constraints. In form finding one needs to understand the constraints and elaborate on them till the form can be seen. Mathematics and algorithmic models help approximate the solutions that could be realized by experiments. Experiments might be needed to check the goodness of the fit, especially when you can find the suitable analogy for the scenario in hand. Mathematical models and computer simulation, in some cases,
provide the best approach to find a form, especially when it becomes difficult to find a physical representation for the problem.

Frei1 developed models and methods in which forms generate themselves in order to observe and analyze the processes by which material objects originate in all realms of nature, technology and architecture. An enormous range of experiments were carried out at the Institute for Lightweight structures at University of Stuttgart (Germany) as part of the basic research program by various teams under the direction of Frei Otto1. Examples of the models and experimental equipment that are used as form-finding methods in architectural design include thread experiments to investigate branched constructions to find forms for optimized path systems, and sand piles to create funnel forms and debris cones and to examine earth buildings and settlement construction (see Figures 3 and 4).

The models are essentially simple physical experiments that reveal the infinite diversity of possible forms and constructions without a great deal of effort. For example, these experiments made it possible to discover many methods to manipulate the shapes of soap film structures like ridge, cables or rope loops (“eyes”). It also made it possible to explain the process by which “cistems originate”. The results of most of the experiments can now be recreated with computerized simulation models and made more precise if necessary.

Bodo Rasch’s1 architectural practice developed numerical form-finding models based on the physical experiments devised by Frei Otto [1]. The results are then used in the design process. Combining these programs with current CAD software means that form-finding, statistical analysis, format and work planning can be done by computer.

In future it is certain that many numerical models will be developed with the aid of new computer algorithms based on factual mathematics that can be used to analyze and simulate self-formation processes.

Value engineering is a method that helps in form finding. Following is a procedure that shows how FF and VE combine in forming a powerful problem solving technique:

First: One has to start with a task to solve;
Second: The task has to be defined by its constraints;
Third: The constraints have to be well understood and worked with, till the form appears. Value analysis (VA), as a creative function-driven approach, constitute a powerful tool to arrive at the optimal solution. VA at this stage can be used to optimize the solution to better achieve the task. This process could theoretically continue till the required value is achieved. The more work is invested in this optimization process, the better quality of the result can be expected.

FF and VE in the design of the Haram Umbrella

In the umbrella project, the task was identified as the need to provide convertible shade roof for the two large inner courts of the Prophet’s Mosque in Madinah.

Several constraints were determined to be of importance. Those constraints included the following:

- The membrane needed to be of a material that is able to fold very well;
- The material should last in the UV rays of the fierce sun for a long enough time to justify the investment;
- The material should look nice and white and not burn in any case;
- The entire pole should be clad with white marble and receive a similar treatment as the columns with brass capitals, AC outlets and electric chandeliers;
- The maintenance activities of the mechanical objects should not be in the courts;
The umbrellas shafts should be used for the transport of cool air from ducts from the central AC, get the rainwater down in the same pipe and have some decorative lights added to the pole in the similar fashion as the normal columns of the mosque.

The constraints were studied well enough till the forms had appeared (Figures 5, 6). Following is a brief discussion of the form finding process. Value analysis studies had been informally conducted on the forms to decide their adequacy as optimal solutions for the given constraints.

1) The first constraint: The umbrella’s membrane

The membrane needed to be of a material that is able to fold very well, secondly it should last in the UV rays of the fierce sun for a long enough time to justify the investment and thirdly it should look nice and white and not burn in any case.

With the help of a specialized weaver in northern Germany it was possible to get a canvas made from a new Gore fiber made purely of PTFE ("Teflon"). Teflon is a material known to be completely UV resistant. Probes of it are exposed to full sun in Florida since 1950 and have so far not shown any sings of decay. However it was difficult to learn to weave this material as well as it was quite difficult to sew it and add the necessary accessories for proper suspension, etc. Koit Hightex was helping to develop this and...
consequently won the contract to provide the membrane for the umbrellas.

The other problems had to do with the technology of form finding. A new method of defining a minimal surface and to simulate it by FF methods in the computer had to be deployed in order to reach optimum precision and information about the folding geometry. Wind tunnel tests had to be conducted in order to establish the forces that would come from the membrane into the frame, Dynamic and static loads had to be determined. Tests were made with different types of weaving till the strength required was reached. Finally the ornamentation had to be invented that would go with this new form and with Islamic architecture as well, in the same time not interfering with the functions but rather enhancing them.

**2) The second constraint: The folding mechanism**

For the folding arm frame of a gigantic umbrella (25m in diameter) an appropriate technology had to be found. It was determined, that it is necessary for a mechanical object that the maintenance activities should not be in the courts, where it would disturb the worshipers, but it should be away in the basement together with the other mechanical infrastructure.

On top of this it was the desire of the architect to use the umbrellas shafts for the transport of cool air from ducts from the central AC, get the rainwater down in the same pipe and have some decorative lights added to the pole in the similar fashion as the normal columns of the mosque. Finally the entire pole had to be clad with white marble and receive a similar treatment as the columns with brass capitals, AC outlets and electric chandeliers.

Thorough studies had dictated that the drive system had to be hydraulic. All the pressure making equipment, pumps, vales, electric motors and the control system were placed away from the courts. A value study, suggested a place, about 150 meters away from the courts, to be assigned for that purpose and the design was modified accordingly.

In the process of searching for a reliable technology capable of rough handling and long live, the idea of using mobile crane manufacturers had come through as a result of a successful value exercise. The crane manufacturer Liebherr who have high-grade steel production for lightweight frames and reliable hydraulic equipment, was a good candidate. It took some time to convince the company that a crane manufacturer can make umbrellas. And finally the spark came over and ignited their imagination. On the basis of the designer's membrane technology and the requirements of the structural engineers a very slim and fine shaped umbrella frame using CAD techniques was developed. The CAD technology had allowed the complicated geometry of the parts to be designed in three dimensions. At the end of this process, all the struts and arms as well as the membrane were calculated in one elastic model to judge deflections and correct systems measurements in the pretensioned form as well as in the closed form.

**3) The third constraint: The cladding and the flaps**

Cladding and flaps. The importance of the place required a design of the umbrella that would look good in both open and closed position. It was clear from the beginning that a flap mechanism had to be used. It was expected of such a mechanism to close the entire umbrella when the membrane is folded up and would give the entire objects a serene and controlled appearance rather than the typical bundle of folds that were built so far with convertible structures. This was a handicap that even Frei Otto believed that it can not be achieved. Otto more than once had encouraged the designers to proceed with a simpler design that would have the membrane open. But that solution was declined.

The design team had to resort once again to the VA technique. A VA study was conducted with airplane designers, were the idea of utilizing a flap design similar to the rudders of a airplane was developed. That design had satisfied the problem's constraints. The folding constraints (or requirements) were activated by a non-linear system of shoats and eccentric bearing in a way that made a small unfolding movement of the main arms results in a big movement of the flaps and in reverse allowing these flaps to gather the fabric like arms shortly before the umbrella would be closed. These flaps were produced with special carbon fiber glass technique to make them soft enough in the longitudinal direction to follow the arms deflections, yet to be rigid against twisting in its own axis to be able to withhold the fabric in the closed position.

After all these invention were made—some of them were patented—the final design had to be optimizing in the computer. For that purpose, a prototype was built to help answer the major questions and to feed it to the system. This prototype was finished in less than six months and shortly after the successful tests were made, the client approved it.

In the meantime also in the computer, all the special items were designed from the marble cladings to the special adaptation of the artificial stone and brass capital. A special task was to develop jets at the outlets of the AC that would be able to throw cold air over 15 meters into the courts, again without developing noise, a quite difficult task.
**VE / FF in Construction:**

The concept of FF is quite applicable in construction. One can use the same procedure of constraint setting and thorough thinking to detect the natural forms in construction problems just as that described in the design scenarios. Natural construction form finding, though, is somewhat different, and that is in the sense of the process. In design scenarios, the end result of a natural form can ultimately be seen, but the process of its creation (or its construction) is usually not that obvious. The physical experiments that were discussed above do not necessarily mimic (or simulate) the actual process of form creation.

Even though Otto's models were developed for the purpose of observing and analyzing the processes by which material objects originate in all realms of nature, technology and architecture, Frei Otto's developed models and methods that allow forms to generate themselves, are of limited use here.

In construction, we do not always strive to find the process of an optimal form creation. In construction, it is typical to search for the creation process of natural and man-made forms for the given scenarios, since we deal in reality with both and even more with the later.

Many more constraints exist in the construction tasks, in comparison with the design tasks. In order to optimize a solution, one has to balance between so many factors, such as economy, load, esthetics...etc..

A form in construction should appear when one repeats the process enough to realize the most optimal way for execution or management. Highway construction, for example, has several methods (forms) that are well tested or tried out to be categorizing as optimal.

In the umbrella project, the production of the twelve umbrellas, the construction of the umbrella bases and their erection had some constraints and has constituted some challenges. Some of those challenges were technical others were time challenges.

The construction has to take place in the middle of the existing mosque as oppose to the addition, and that constraint had dictated the need to work without the interruption of the peaceful atmosphere of the holy site. On the other hand, there was less than a year to complete the work.

The main contractor has made the decision to employ the least staff for the Ubberella project. Experts were employed for the design, production and site erection stages. All the production tasks, the packing, the transportation and the erection labour was provided by sub-contractors.

The main contractor, therefore, has a very flat organizational structure internally, with almost all individuals reporting directly to the General Manager. This would normally necessitate intense involvement from the General Manager who would be key to coordinating the work of the team rather as a conductor directs the members of an orchestra. However the main contractor, unusually takes the flat organizational structure one stage further by giving each individual the autonomy to direct the work in which he is engaged and the responsibility to co-ordinate his work with that of his colleagues. The comparison can be drawn then not with an orchestra controlled by a conductor, but with a jazz group composed of highly skilled individuals. In this setting, each team member will be doing their own thing, taking and then giving the lead informally around the group as the theme develops, and together creating something of beauty and complexity.

Such an unusual structure and form of team work places unusual demands upon the individuals who work within it. It is instructive to observe now with the benefit of hindsight that this was something of a form-finding approach. Those who thrived on the autonomy with interdependence took up the challenges and derived great personal satisfaction from their successes, while those who could not adapt to the seeming lack of control and direction from above quickly moved elsewhere.

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**References**


The Making of a Value Management Facilitator

J. Jerry Kaufman

Abstract

The focus of this paper is on the value management facilitator as differentiated from the general facilitator in practice. There are many books and articles available on the subject of facilitation. Much of the material is valid to the narrow focus on value management facilitation, but there are several significant differences. This paper delineates those differences and characteristics that are unique to facilitating value management events.

The Context

Much of the observations and recommendations that appear in the paper are based on over 35 years of personal experiences in value management, the experiences of direct and professional associates, and discussions with the client base served.

It has been my pleasure to assist clients with developing in-house, organizationally responsive, value management activities. Much of the text presented describes the discussion topics with those clients, and the training of VM Facilitators for those employed in that management capacity.

Introduction

Facilitation is the vehicle that synthesizes the value management discipline into a viable process, which serves as the cornerstone for a successful value-improving venture. Learning the VM structured job plan and its variety of tools is paramount. Equally important is the quality of the delivery of the message. Both parts, the process and the delivery of that process, are essential to achieving a successful VM/VE project.

Additional suggested reading of material that relates to the topics presented appear at the conclusion of the paper.

The VM Methodology

There are references made throughout this paper that relate the value management (VM) methodology to the structured, sequential steps of the value engineering (VE) job plan. Although there are some variations among practitioners about title and the exact number of steps in the VE job plan, the process captures the common methodology used in facilitating all VM events.

Value management has a proven record of success in a great variety of projects and markets. Typical projects range from organizational effectiveness, existing product cost reduction to new product development as applied in the service, manufacturing, capital and other market areas. This versatility is a direct result of the portfolio of "tools" available in the VM job plan. Figure 1 graphically illustrates the relationship between the VM methodology steps and the cabinet of ever expanding "tools" available for each of these process steps while conducting a wide array of VM projects.

Differences in Facilitation

Once armed with a working knowledge of the VM methodology, we turn to the actual process of facilitating the methodology. To examine the facilitation process it is best to identify some differences that distinguish the VM facilitation (VMF) from general facilitation (GF). Both have unique characteristics that are best suited for the respective situations and critical to both are the facilitator's interpersonal skills required to guide the project team to a successful resolution of the task at hand.

In general, all facilitators search for a process that will be accepted by the team assigned to the task by management, and who have sought a facilitator to administer the process. VM Facilitators bring the specified process/methodology (the VE job plan) with them. The VMF serves to educate the team on the guiding principles, methods and applications of VM prior to and during the process of facilitating the project team.

The structured nature of the VM facilitation process lends itself very well to time constraints; especially those imposed by budget-conscious managers within the firm. Whereas the VMF is given a prescribed amount of time to help the team resolve the issues, the general field of facilitation (GF) is more often open-ended, typically governed by the fuzziness of the issues to be resolved.

Facilitators consider the team being facilitated as the primary client, whereas VMF's consider the stakeholder or customer (firm or manager) as the primary client.

General facilitators (GF) are commissioned to help re-
solve a great range of issues, including defining the problem and scope to begin with. The VMF is involved in resolving specific value-improvement and value-adding issues after the problem is defined.

The value management facilitator establishes a clear set of goals that are later used to gauge the success of the project. The overriding objective of the VMF, regardless of the nature of the assignment, is to improve value. General facilitation assignments often lack clear performance objectives and the means to evaluate the output of the team.

In most cases the GF enters an assignment after the team has been formed and has struggled with the problem for some time. The VMF is involved before the project begins, taking an active part in determining the disciplines required on the team, the size of the team the number of sub-teams required, and the interaction of the sub-teams.

VMF: The Problem or Resource

Many VMF's face a hostile environment upon introduction to the project participants. Team members are often selected to serve on the value engineering project team with great reluctance or reservations. Complaints are often aired that their "real" work will backlog during the VM assignment. Without the proper support from management and commitment for relief of normal workload and duties, the VMF is prone to the perception of being a bigger problem than the project issues. Also, many team members believe that it is the VMF who is accountable and will benefit from the results of the project, and that they are selected only to help the VMF resolve the project issues.

To offset this limiting perception, a senior member of the Executive Review Board (ERB) should launch the project with opening remarks designed to allay the importance of the project, and set a positive tone for the event. The ERB member during the opening remarks should address three key topics.

- The importance of this project to the Firm's objectives.
- Participants want to be assured that they are being tasked
to resolve a meaningful and beneficial project, high on senior management's priority concerns.

- Team member selection - why the particular individuals were selected as team members (the particular skills and knowledge that they bring to the project).

Knowing that the participants were "hand picked" by senior management is fuel for the ego and motivation to succeed is primed.

- The ERB's expectations of the project and the team's contributions in resolving the project issues.

Once learning that senior management has directed their attention to the team and recognizes their efforts (implied rewards), determination to succeed is reinforced.

If the project scope and path to resolution are presented properly, the project participants will accept the challenge and responsibility for the successful completion of the project. In turn, this places the VMF in a support role, or in a team resource position, not the problem.

Once the team appreciates that the role of the VMF includes supporting, protecting and crediting the team with success, the process of building trust between the VMF and the team can begin.

Facilitator vs. Team Leader

The roles of VMF and project team leader often overlap. In value management, the VMF commands the process to develop proposals that will achieve the objectives of the project. The team leader is responsible for the implementation and management of the approved proposals resulting from the project. Although the two roles compliment each other, they should remain clear and distinct. One person should not assume both roles because the team may confuse directives and facilitation. The team leader must act in harmony with the facilitator by encouraging the team to actively participate in the process. This puts the team leader in a position of role model for the team during the VM event. Conversely, the facilitator must respect the role of team leader while maintaining a position of objectivity. Often, team members may induce conflict between the facilitator and team leader as a "test of power." Such conflicts must be avoided. The best way to avoid such conflicts is to hold a meeting of the minds in preparation of the event, or pre-event.

During the pre-event, or discovery phase of the process, the team leader takes an active part in laying-out the project, its boundaries and expectations. The VMF uses this information to plan the VM process, selecting the tools to use in the job plan process, and define the teams and disciplines with-in the teams needed to resolve the project issues.

The pre-event also presents an opportunity for the team leader and VMF to get to know each other and establish behavioral ground rules for the VM project.

If the VMF perceives a potential conflict, the VMF should suggest that the team leader could best support the project by serving on the executive review board (ERB) rather than on the team. Conversely, if the VMF and team leader have compatible and supportive personalities, the team leader should be encouraged to take an active role in the VM process.

Facilitator vs. Consultants

The primary difference between VMF and a consultant is the process each utilizes to resolve the project issues. The stakeholder or project sponsor (manager) expects the same outcome, but there is a significant difference in using consultation or facilitation to reach that outcome. The consultant is expected to arrive at a solution or resolution of the project's issues after performing the necessary fact finding, analysis and forming recommendations. The team is a resource to the consultant in arriving at the recommendations or proposals. The VMF is expected to apply process knowledge to guide the team who arrives at an acceptable resolution. Though subtle, in facilitation the VMF is a resource to the team responsible for the process used to achieve project results, not the project results. Yet those results will still reflect on the VMF's ability and performance.

Regardless of how knowledgeable the VMF is concerning the relevant project issues, a VMF must avoid the tendency to consult. The facilitator should use technical knowledge about the project to ask questions and raise issues that create a productive path of inquiry and discovery, but still allow the team to arrive at an acceptable resolution through a consensual approach. The major distinction can now be pointed out. In facilitation, the team must take ownership of the process on the way to achieving resolution. In consultation, the project participants supply (requested) information, and the consultant takes ownership of the resultant resolutions. By simply depriving team ownership and buy-in to the process, a potentially adverse relationship can emerge between the consultant and those affected by the proposed resolutions, resulting in resistance to the final implementation.

Role Playing (The Devil's Advocate)

An important VMF skill is the ability to switch roles during the project activity. Adopting the role of a vested party separate from the team, and presenting varying viewpoints for consideration, tends to move the team to broaden their collective discussion boundaries. For example, while
observing the team engaged in a technical discussion, the VMF may gingerly assume the role of the Business Manager, or stakeholder, and question the investment risks of the proposal being discussed. This should not be intended to inject a negative aspect into the discussion, but to help resolve certain issues that will serve to strengthen the proposal.

When and how an “outsider”’s issue is offered or inserted into the discussion and how the team receives it depends on the facilitator’s ability at role-playing. If effective, new or broader perspectives can take shape among the team members. A facilitator who may lack honed interpersonal skills might present a new issue for consideration by asking: “Did you consider the investment risk?” A more effective way to raise the issue or concern may be to ask, “What do we need to do to convince the stake holders that this creative proposal is indeed a good investment?”

Note the use of the little word we. Demonstrating that the facilitator is “on their side” requires constant reinforcement. Establishing and maintaining a relationship of trust with the team is vital for the facilitator’s success in engaging with the team and helping them achieve the project’s goals.

Facilitator Style

The VMF must work closely with the team without entering the team’s “bubble,” or sphere of influence. The VMF could choose to maintain a comfortable distance and simply present the methodology steps, stand back and wait for an invitation from the team to engage again at random points throughout the process. A better but more challenging approach is to work close to the bubble’s surface, even dimpling it a bit, by carefully guiding and encouraging the participants through each phase of the job plan. The latter can be a bit more risky, but also the most rewarding approach. But be advised under no circumstances should during the event the VMF pierce or stagger into the sphere. Doing so would reduce the role of the facilitator from an objective process resource, to a team member with just one more opinion.

There is nothing wrong with the VMF assuming a personal responsibility for the performance objectives of the assignment. On the contrary, it is even encouraged, because passionate facilitation reflects credibility and true concern. However, objectivity must always be maintained. In guiding the team through the maze of alternate approaches, the VMF must remember that it is the team that must take ownership of their developed proposals. The VMF, an outside resource, should never force proposals upon the group no matter how knowledgeable the VMF may be in the technical aspects of the project.

Establishing Trust Relations

The effective VMF must establish an environment of open exchange with the team. This requires the VMF to establish a trustful relationship with the team from the outset. If the team perceives the VMF an agent of senior management, reporting back the comments and behavior of the team, the participants may likely cap their efforts, making the job of facilitation much more difficult. In order to establish trustful relations with the participants, the VMF must convincingly demonstrate an ability to guard, guide, mentor and give credit to the team members engaged in resolving the project issues. This sense of investment can be demonstrated by the VMF guiding the team up to and including the preparation of the closing management presentation, but not taking an active role in the presentation. After all, it is the team that must commit to the recommended proposal, not the VMF. Such commitment deserves full team credit and exposure to senior management (the ERB) in the form of a well prepared, confidently delivered presentation of the results and proposals stemming from the completed project.

It should be noted that establishing a trustful relationship should preclude the VMF from negotiating assignment fees based on a percentage of projects cost savings. If the group participants discovered this form of contractual arrangement, the VMF would lose the perception of objectivity and trustful relationship would not be established – the cynical mentality would thwart objectivity necessary for the process to work properly.

The Dominant Personality

As the team culture develops during a given project, the personality of the emerging team is usually guided by the dominant personality among the group. The fortunate VMF will have at least one positive dominant personality as a team member, making facilitation a pleasurable task. On the other hand, a dominant negative personality should be neutralized early in the life of the project if the facilitator and the group are to meet their objectives.

A dominant personality describes the person who has influence over the group’s behavior. This differs from the VMF because the dominant personality is inside the “bubble,” or a member of the group. The VMF is an external resource to the group and, as previously noted, should avoid the temptation to momentarily become a member of the group.

Facing down the dominant negative personality in front of the group, even if the group is at odds with that
person is ill advised, due to the group “herd factor.” As a herd factor example, assume that “Joe” is overly obnoxious and disruptive and is perceived to be the dominant personality. This perception is formed when the group, or team leader (if a team member) does not take action to neutralize Joe’s negative contributions.

Should the VMF attempt a test of wills or authority with Joe in front of the team, chances are the team will circle the wagons around Joe to protect him from an outside attack, even if the group knows that Joe’s pursuits are in the wrong. Joe may be a “spoiler,” but he is their “spoiler”.

A good strategy would be to separate Joe from the “herd” (group) and attempt to reach a balance without the benefit of the whole group learning of this action. Arranging a private meeting with Joe after the day’s events or during a break would be ideal. This would negate Joe’s incentives to perform for the group, as his personality dictates. Getting Joe to enter a comfortable discussion by asking open questions, listening to his responses with interest and allowing his ideas to present value.

Don’t scold, demand or argue in an attempt to affect a change in Joe’s attitude; after all, he’s gotten this far in life and who are you to change him by yelling at him one more time! Try to have Joe understand and appreciate that he is the dominant personality on the team, and as such allows him to make some very valuable contributions if done in a spirit of cooperation. He bears a significant responsibility in meeting the project’s objectives. If Joe indicates that he doesn’t believe in the project or its objectives, offer to intervene with his supervisor to relieve Joe from the assignment, without prejudice.

The best solution is to reach an understanding with Joe, solicit his cooperation and assistance and reinforce positive behavior and contributions. Should the only solution be that Joe leaves the assignment, the group must know that it was Joe’s idea to leave, and not the VMF’s idea. Good diplomatic and communication skills are critical facilitator attributes.

The VM Facilitator—A Profile

Pre-occupation with status symbols is usually an outward sign of one’s insecurity. Professional value managers, in the role of facilitator, achieve status and reward through the recognition of the quality of their performance by the persons that employ his or her services as VM facilitator. If the value manager is dedicated, pride in a job well done and adequate compensation provides the sought after status. Value managers derive job and social satisfaction from their work, but these do not constitute the only sources of motivation. This is a major difference between the professional value manager and the amateur who practice the art of facilitation. What are some other differences?

- Delivery of the appropriate message(s).
- Mastery of the value management methodology
- Ongoing pursuit of relevant skills and tools
- Formation of a relevant and defendable theory, philosophy, point of view.
- Employment of a consistent set of practices and techniques.
- Optimal utilization of limited resources
- Perceived objectivity
- Skillful process deployment.
- Professional character and mannerisms
- Ability to establish trust and motivate
- Effective role as an enabler.
- Style of and flair for the work at hand
- Dedication to the profession, its creeds, principals, publications and value.

Facilitation typically occupies about 65 to 75 percent of the value manager’s professional activities. Value managers, to be professional, should be thoroughly familiar with their field of practice. As professionals, value managers must continually enlarge and augment their basis for knowledge, continually study to inform themselves and stay current. On the other hand, the so-called “designated” facilitator who is normally engaged in other areas of responsibility within the firm, has neither the time nor the inclination to become “expert” in the value management methodology, thus leaving the practice of facilitation woefully shy of the necessary attributes. This generally results in a great disservice to a given facilitated project. The designated facilitator depends on the professional for facts, interpretations, delivery techniques, and a statement of practice and part time guidance. The professional value manager facilitator must be prepared to perform to the best of their ability, maintain integrity and passion for the job. This would place a considerable demand on the part time practitioner of facilitation.

Effective communication of knowledge requires the right tools and skills. The value manager must excel at many things required for facilitation, and should have mastered as many tools as applicable to give scope and depth to those skills. If there is a need to organize and facilitate a committee, task team, seminar, or workshop, the value manager must know how to effectively do so, and know how to convey the use of information. The more skills and tools the value manager has (especially interpersonal, diplomatic and public relations skills) and knows how to effectively employ them, the more vital and necessary the value manager becomes to the firm trying to optimize its products, processes, organization subject to budgetary and
time constraints. The value manager’s efforts can be wasted unless they are built on a solid set of values, philosophy, a conscious awareness of goals, and a defined point of view controlled by and oriented to the value manager’s background, knowledge and training.

The untrained or designated facilitator, on the other hand regardless of how knowledgeable about the given project issues, will nearly always skirt or circumvent rigors of tireless thought and discipline required of a dedicated, professional commitment. Unless the value manager seeks to consciously map out the philosophy, strive arduously to understand the theory, principals and processes that support the VM facilitation in practice, and work hard to achieve a positive, persistent attitude toward his/her work; the VM Facilitator is nothing more than a technician. There is nothing wrong with being a technician, but a technician is not a value manager.

In the forest of value management, with its many trees (details), it is easy to lose the far view, to fall from the mount of objectivity onto the path of aimlessness and confusion. This should be avoided at all costs. The value manager must retain objectivity in all situations drawing on his or her facilitation skills. This does not preclude the value manager from identifying with the goals of the client, or the team or the stakeholder. But it does mean that the value manager cannot become involved in the political (hidden agenda), or personality-driven aspects of the assigned project. This does not mean that the value manager skimps on the details. But it does mean that value manager does not get lost among those details (trees). As for the political, or personality-driven aspects of the assigned project, value managers should avoid taking sides on issues with participants. Rather, the VM should take sides with a point of view. Value managers should not practice politics. They provide a compass and indicate direction. The good of the project, the client and stakeholder should be the prevalent consideration, and they should govern their actions accordingly.

As a professional, the value manager does not seek acceptance, recognition, new experiences, status, etc., for their own sake. These fulfillments accrue as rewards secondary to the satisfaction of achieving their goals and those of his client. On the other hand, minor irritations such as personal defeat do not deter value managers. They do not quit if a study is rejected, or if their projects are tabled. The value manager takes things in stride with the full knowledge those higher management issues or priorities have precedence over the immediate value manager’s concerns. In short, the nobility of his conscious motivations structures the moral and sublimes the inner drive and character of the value manager.

The professional value manager ultimately serves the project team by helping them help themselves. Thus, the value manager is an “enabler.” When discussing a particular course of action with the project team, the value manager should avoid himself or herself to the team. The value manager must emphasize the value methodology in such a manner as to apply the right tool at the right time and not encumber the team with grand illusions of one’s ability or mastery of value management, inserting opinion at every turn and every question. He or she should do so only when the team requires such help. Value managers should avoid usurping control should the project leader be less skilled or informed. Once the proceedings begin subsequent to the tutorials on the methodology, the VM should not try to “run the show.” He or she must always remember that the value being added and the credit for that added value belongs to the people who are directly responsible for the project resolutions. Value managers who boast of achieving project cost and performance goals are usually misstating the facts and may have lost sight of their real contribution to the customer.

Of course there are areas where the value manager is directly responsible for the results, good and bad. One of them is personal and professional performance. Another is the personal encounter with personnel and “image” leadership. Value managers do not make policy; they recommend and implement it. Value managers do not lead in the indigenous sense, they “enable” leadership.

How well value managers adapt to a given situation and begin to work with their associates on a daily basis actually determines their respective added value. The value manager is a colleague to the executive, operations management and line management at the firm, respecting the others’ spheres of influence, function, and authority but always in a congruous effort of coordination and cooperation. The value manager’s approach in dealing with their colleagues must always be one of respect, appreciation, and spirited cooperation, especially if they have any expectation of receiving the same.

Much of this reflected recognition depends on the style, conduct and method of the services rendered by the value manager. It is certainly distinct from that required of the designated facilitator. Value managers must conduct themselves in accordance with a set of high standards and within in a set of strict disciplines. Professional ethics, mastery of the discipline, dedication to the task, tools and techniques, heightened spirit of cooperation, courtesy, positive reinforcement and sense of enlightenment are all observable traits that set apart the value manager from the general facilitator or designated facilitator. This establishes the value manager as a professional.
Additional Recommended Reading


J. Jerry Kaufman, CVS, FSAVE, is President of J. J. Kaufman Associates, Inc. He has engineering degrees from the Academy of Aeronautics and Johns Hopkins University. As Corporate Director of value management for Cooper Industries, Jerry developed and successfully implemented VE in the corporate organization. His over 40 years of progressive management positions with the Martin Co., Honeywell, and Cooper spans the industrial, energy, process, service and aerospace industries. Jerry has written four books, many papers and articles on value management. He is past President of SAVE International, and past Chairman of the CVS Certification Board.

SAVE International Consultants Directory Accepting Listings, Advertisements for 2007

SAVE International will expand the usefulness and relevance of its annual consultants directory with the 2007 issue. The society accepts listings and advertisements from members and now welcomes patrons whose businesses support the VM industry and its practitioners. The complementary service and/or product information will make the directory even more useful to VM professionals. SAVE International requests that members invite those consultants whose support services they use to advertise in the 2007 directory. Invitations have been sent to the society’s affiliates for further distribution among their members.

The society encourages all VM consultant firms to advertise in the directory, which is viewable online and mailed to anyone free upon request.

SAVE International will accept listings and advertisements for its 2007 issue of the annual consultants directory from July 31 through September 29, 2006. Patrons who submit their orders by Friday, September 1, will receive a 10 percent discount off the total order. Beginning July 31, patrons place their directory orders online. Order forms will be also available on the website (www.value-eng.org) for download. Prices for the 2007 directory orders remain the same as in the previous year.

SHARE YOUR VALUE EXPERIENCE

SAVE International offers value professionals and their clients a variety of ways to share the value experience.

- **Value World**: The world’s premier forum for the scholarly discussion of VM applications and innovations lets you discover new innovations, learn new techniques, and observe a variety of successful case studies.

- **Achieving Value**: Answer questions posed by executives and decision makers—“How will VM benefit my company? My project?”—with concise, illustrated case studies.

- **InterActions**: Keep your finger on SAVE International’s pulse through the membership newsletter with news of successful VM applications, discussions on tools and techniques, and society updates.

All three SAVE International publications warmly welcome submissions. Value in Action and InterActions also accept advertisements. For more information, go to www.value-eng.org.
Facilitation Skills from the Trenches

Ginger R. Adams, CVS-Life, FSAVE and Jill K. Nelson, PE, SE, CVS

Abstract

Value study team leaders are facilitators. We must coach a team through the value methodology (VM) process, keep the group focused on the project and tasks at hand, keep the group communicating effectively, and interact with outsiders such as designers, owners, external stakeholders and the like, all with a goal of producing meaningful results in a very short period of time. A team leader’s skills at facilitating a multi-disciplined group of people from various cultures, social circles, academic levels, and technical expertise is essential to the success of any value study. And the reality is, we are not really taught to be good facilitators. Much of what we do in this regard is learned as our VM career evolves. This paper will demonstrate some tried and proven techniques for dealing with the good, the bad, and the ugly personalities you encounter when leading a VM study. The tips and tricks will be based primarily on the authors’ experiences, in combination with other professional facilitators’ recommendations.

Introduction

According to “Basic Facilitation Skills”, published by the International Association of Facilitators in 2002, a facilitator is:

...someone who uses knowledge of group processes to formulate and deliver the needed structure for meeting interactions to be effective. The facilitator focuses on effective processes (meeting dynamics) allowing the participants to focus on the content or the substance of their work together.

Is that not what a CVS does during a VM study? Do you use processes to keep the team members focused and on track to reach their goals by the end of your schedule? Did you learn the skills to facilitate when you took your VM training?

Imagine a scenario:

• You are one of four CVSs hired to teach a Module I training workshop for a very large group. You are in the front of the room at the beginning of the first day, the audience members have introduced themselves, and you begin asking some questions to determine whether any of the participants have been involved in VM studies, had any VM training, what they expect from the Mod I, etc. As you ask questions, you notice that every head in the audience turns to one person at the end of the first row before anyone responds to your questions. What do you do?

• You are facilitating a VM study and the group is evaluating ideas. One of the team members repeatedly shouts out things like “We’re all engineers here; we know how to fix this situation. Why are we talking about this?” and “That’s the same idea we just discussed” (in reality it’s a different approach to achieve the same result) and “What makes any of us think this group is going to come up with anything the original designers didn’t consider?” How do you handle the disruptive team member?

• You are facilitating a VM study with a team of about 8 people. From the beginning of Day 1, one team member waxes prolifically about the topic of his choice, regardless of what the group is doing, regardless of the topic under discussion, regardless of whether anyone else in the room is talking. What do you do to turn him off, keep the study going, and maintain your professionalism and sense of humor?

• You are introducing the VM process at a VM study kick-off meeting for a very large, very expensive, high profile, and politically sensitive project. There are 50 or so people in the room, including local citizens and members of the local county Board of Supervisors. It is an election year. One of the Supervisors interrupts you mid-presentation and effectively says there’s no way this [VM] team is going to evaluate alternatives ... she knows what her constituents want, and that’s what she plans to deliver to them. How do you keep the Supervisor engaged, and keep control of the process?

• You are several hours into the first day of a VM study, coaching the group through function analysis, when one of the team members announces “I have a Ph.D. in geotechnical engineering. My colleague here has one in environmental planning. Who do you think you are telling us how to identify and define functions?” As the facilitator, how do you respond?

All of the above examples actually happened to us. They are not contrived, they are not fictitious. They are not scenarios we “studied” to handle. They are a few prime examples of the surprises one must expect and be prepared
to address when facilitating a VM study. If you have facilitated group meetings of any kind on a regular basis, you have learned that people are unpredictable. Add to that the lack of understanding of the value methodology, and how stakeholders and team members both may fear what a VM team is about to do, and the unpredictability escalates.

What to Do

So how do we handle these rebels, these saboteurs, these know-it-alls? We smile politely, turn on all our charms, beg forgiveness and understanding, and try to accommodate them. NOT!!!!

A facilitator must have a variety of skills to address surprises...which, by the way, are not limited to those described above. There are also the team members who refuse to participate in the group process, the class clowns who think everything is a joke, the hidden agendas brought in by individuals trying to effect a behind-the-scenes direction of the outcome of the study, and the always chattering best friends who continuously hold their own little private meeting, without regard for what’s happening in the group. We could add more to this list, and we’re certain you could as well. All of these situations disrupt the team dynamics that should occur in a VM study, and it’s up to you, the facilitator, to keep them in check.

Team Dynamics

To create a team is an art. It rarely happens without planning and active manipulation of the group. We stress to teams that the VM Job Plan is a dynamic process, with each step building upon the ones that preceded it. As the team members work their way through the process, they find more and more opportunity to collaborate on ideas and outcomes. But the dynamics don’t just happen as a result of the VM job plan. Team building is a large part of the success of any VM study, and it is the facilitator’s responsibility to make it happen. You need to initiate some activities early in the study to start the team building dynamic.

For example, when you have everyone introduce themselves, ask them to state what they expect to get from the VM study and, more importantly, tell one personal thing about themselves. These two pieces of information give the team members a basis for casual conversation during breaks, and help them to get to know one another. Sometimes they also provide the basis for some of the humor that occurs during a study. Something else that can help strengthen the team identity is combining a project site visit with lunch, providing another opportunity for get-to-know-each other conversation as opposed to pure project discussion.

If you find that the group is not a team, but is still a collection of individuals, try something new. One tactic might be as simple as having the team rearrange their seating to better accommodate the current activity. They may start out by grumbling, but will end up as a team creating a solution and successfully implementing it. Another option is to change your method of communicating. If you’re using a projector on a wall, change walls, or switch to using flip charts (or go from flip charts to a projector). This causes the group to change direction, allows for a new start, and breaks up the process.

To effectively manage the group a facilitator must have the group’s trust. The group needs to believe in your ability to manage the process, minimize the effects of outside influences, and control the internal dynamics. More often than not we are called upon to run a VM study where we do not have a contractual relationship with team members. The team may include agency people assigned to the study, or people from other jurisdictions “borrowed” for the study. Many of the people in the study may be potential clients. Most of these people have other obligations and feel pressures, or have no idea what the process is about. Others are excited about the process, have participated in the past, and are ready to solve the issues of the world. To be successful in this constantly changing environment requires team leaders act as facilitators and gain the trust of the group. This can only occur if the facilitator actively addresses the team dynamics by applying two basic facilitation skills: strong communication, and adaptability.

Communication

One of the most important skills a facilitator needs is the ability to listen effectively. Listening involves hearing both the spoken and the unspoken words, recognizing body language, and especially paying attention to the behavior of the group. Take, for example, the constant talker. That person obviously is a disruption to the continuity of the VM process, when you must repeatedly stop to rein him in. But what else is he causing? He’s creating resentment among the rest of the team. They are looking to you to shut him up, he’s enjoying being the center of attention, and you are trying to politely override him to keep the process on track. The first thing to consider is engaging him. Ask if there are any particular points he wants to bring relative to the project being studied, or the VM process, or the study goals. Create the opportunity for him to talk, but keep his topic focused to what’s happening in the group. Another tactic to consider is the use of mild humor. Engage the other team members in some “we’re not worthy” type of treatment; you’re likely to find that the team members will then take it upon themselves to try and control the talker. Unfortunately, sometimes you will be forced to have a private conversation with the offender, pointing out that he must
refrain from the constant dialogue and, when he does talk, stay timely and on topic.

**Sense of Humor**

An essential part of the communication skill is humor. Not everyone can use it, but if you can it is powerful. If, as a facilitator, you permit the troublemaker to push your buttons, make you lose your cool, make you angry or otherwise emotional, you lose credibility. It is imperative that you take nothing personally, keep everything on a professional level and, at all times, maintain a sense of humor. If you are comfortable with it, make yourself the object of the humor to engage the team in some laughter. If the team is open enough give a team member a nickname, and soon the team members will be naming each other (and you as well). On a recent project in which one of us was involved, a particular team member who happened to have a Ph.D. stated facetiously that he was dyslexic. One of the other team members immediately dubbed the first one a “PDH”. The label held throughout the study, and was the source for laughter on multiple occasions. That same team had nicknames for about half their members by the third day of the project. How does this help you facilitate? During difficult or confrontational discussions, you might employ one or more of the nicknames to lighten the moment.

Humor, and the ability to laugh at yourself or the situation, is powerful in defusing pressures and building teams. However, humor needs to be carefully applied. There are cultural issues, stereotypes, and life style issues that, if inappropriately used, can backfire and alienate the team instantly. For many of us humor is one of our strongest tools in dealing with people, but it must be carefully employed.

**The Terminator**

Is there ever a time to remove or dismiss a team member from a study or training workshop? While neither of us has had to do this extreme, one of our colleagues did actually remove a participant from a Module I many years ago. The individual sat in the first row and challenged or contradicted everything the instructor stated – from VM history to steps in the job plan—from the beginning of Day 1. It was only hours into the training, after the CVS attempted numerous tactics to quiet the disruptive individual, that he looked at the student and said “You’re excused.” After having to repeat those words several times, the instructor actually ended up assisting the participant with gathering up his belongings and walked him to the door.

What are some of the tactics we can use for difficult people, especially if those people are in positions of power? There are no easy answers and each situation requires a different approach. To best solve the problem we need to understand where the individual is coming from. Is there a personal issue that came to work? A work issue? Or let’s face it, some people are just that way. One of the best things about leading VM studies is that they are short. It is not up to us to solve the issue permanently, just to control it for the duration of the study.

Ways to find out what is causing the attitude can be as simple as listening to what is really being said, asking team members that you have worked with in the past what is going on, or calling a break and discussing the situation with the individual directly. Ignoring the problem is an answer, but one that can destroy the team’s trust in your ability to handle this issue and others.

As part of the prestudy effort we often will ask our contacts if there are “strong personalities” expected to attend all or part of the VM study. In the case where the “strong personality” is a stakeholder we will even go so far as to describe some possible scenarios, and methods for handling the issue, and get direction on how the client would like it addressed. And yes, when all the proper and right solutions didn’t work, we have all stooped to moving the problem child to a seat right by us. Standing close while they are sitting quiets most anyone. Or you might assign the troublemaker a specific task that will temporarily remove them from the room, such as making copies, or sending an e-mail, or making a phone call for information needed by the team.

**Adaptability**

Adaptability is another skill that is critically important to a facilitator’s success. When someone challenges what the VM team is going to do, based on a misunderstanding of how the VM process works, you are tasked with raising their comfort level with the VM process, yet still being able to use the process to effect a meaningful outcome. It is not uncommon, especially among governmental agencies at every level, for people to fear the meaning of the term “evaluate alternatives.” In this era of Environmental Impact Studies and Reports (EIS/EIR) where multiple project alternatives are studied over a multi-year process, a misunderstanding of the VM process results in a fear that the EIS/EIR may have to be started again from the beginning if the VM team creates an alternative that had not been previously considered. It is the facilitator’s role to relieve those fears with a calm, rational explanation of how the environmental constraints are taken into consideration when the VM team evaluates ideas and develops VM alternatives. It is also important to emphasize that VM alternatives developed by the VM team must be considered and evaluated by owners and designers before any of them are accepted for implementation into the project. One of the most common misconceptions held
by stakeholders attending kick-off meetings and/or presentations during a VM study is that whatever the team develops is going to happen, and that belief lays the foundation for a lot of miscommunication.

Adaptability doesn't stop with addressing people's questions. Sometimes the VM process itself must be adapted to address group composition, study goals, new information, or change of direction part way through the study. In some cases, a simple change in terminology will enable the VM process to continue, but be received more positively by stakeholders and decision makers. Many times something as simple as a particular word (such as the previously mentioned “alternative”) has a specialized connotation within a discipline, organization or agency. Recognize when the group reaction is out of proportion to what you are saying, address the issue as it occurs, develop a new word, and establish the definition as a group. This type of action shows that you are willing to learn as well as lead, and helps to establish a trusting and strong working relationship.

The communication issue can also be a lot larger than a misunderstanding of terms. There are times when you walk into a room, start the study, and realize that some or all of the people gathered there are expecting a different process or result. The up front communication in setting up the study was flawed, and now it is your problem. It is our responsibility as facilitators to recognize this situation, whether it's communicated through strong body language or direct confrontation. Call a recess, get your client and the stakeholders in the room, and openly discuss what the expectations are, where everyone is coming from, and what action needs to be taken. Also suggest a couple of courses of action so that everyone sees you as the solution to the problem, not the cause of the problem. Once the revised course is set, restart the process, and inform the group of the new direction.

**What Not to Do**

As human beings, none of us enjoy being criticized. However, if we can take the criticism and turn it into a lesson learned it will help to make us better at what we do. We all should consider our mistakes as an opportunity to add to our personal “Continuous Improvement Program.”

One of us once had a client say that our body language came across negatively when responding to some questions during the VM study kick-off meeting. A colleague was once described as knowing the client's organization better than the client does. We have both worked with facilitators who interpret and restate team members' ideas before writing them down. We have both worked with facilitators who go into a VM study with a preconceived solution and guide the team to that solution.

There are lots of lessons to be learned. Here are a few:

- **Do not** guide the VM team to a predetermined outcome and finish the client's language.
- **Do not** interpret what someone else said. If their statement is unclear, have them clarify it for you.
- **Do not** interrupt another speaker, unless it's to bring them back on topic. Even then, be tactful and professional.
- **Do not** finish others' sentences for them.
- **Do not** interpret or rewrite what someone else said. If their statement is unclear, have them clarify it for you.
- **Do not** assume you know more about what's right for the client than the client does. Even if it's true, they are not paying you to say so. Let the VM process work.
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watch. Our clients can make us into superb facilitators if we let them.

References


Ginger Adams has more than 30 years experience in business management and administration, including 27 years in value analysis/engineering. She has provided value study and/or meeting facilitation for public agencies and private sector organizations including transit and transportation agencies, cities, counties, military groups, architect/engineering firms, and petrochemical corporations. Project experience includes building facilities, roads, bridges, highways, transit centers, and vehicle maintenance facilities. Ms. Adams has facilitated numerous studies of processes and procedures, ranging from enforcement of child support collection to city-wide mail handling to right-of-way condemnation to scheduling and staging complex and/or politically sensitive construction work. Ms. Adams studied business at East Texas State University. She is a life member of SAVE International, holds membership in the International Association of Facilitators and Decision Innovations Institute, and is a guest lecturer on value analysis in the Colorado State University, Department of Construction Management.

Jill K. Nelson has way too many years of experience, but thankfully a few less than Ginger. She has been active in the VM community since the 1980s, starting as a structural team member. Since receiving her CVS, she has facilitated teams on a variety of projects ranging from traditionally scoped VM studies on municipal facilities, transportation projects, and buildings, to military works and others. In addition to these traditional uses of VM, Ms. Nelson has facilitated design charrettes and Functional Analysis Concept Development (FACD) studies which focus on aligning the scope, schedule and budget with the customers’ expectations. Ms. Nelson has degrees in engineering from the University of Nevada and the University of Washington. She is a licensed Professional Engineer (PE) and Structural Engineer (SE) in Washington and California. She serves as the chair of the Advisory Board for Civil and Environmental Engineering at the University of Seattle, is an active member of the SAVE Certification Board, and is a LEED Accredited Professional.

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Why Offer VM at Universities?:
The Hong Kong Experience

Mei-yung LEUNG

Abstract
VM techniques have been adapted in Hong Kong since 1990, while the Hong Kong Institute of Value Management (HKIVM) was established in 1995. A number of formal documents (WTBC16/1998; Tang2001; WTBC35/2002) strongly recommend a wider adoption of VE techniques in order to achieve an excellence in the quality of construction products. However, there still limits qualified formal VM training in the higher education in Hong Kong. In recent years, a value management course has been added in the construction programs offered at the City University of Hong Kong. The course is recognized by the ‘SAVE International, “The Value Society” in the USA. Students can become a qualified chartered construction professional and, simultaneously, an Associated Value Specialist in the industry after the graduation of construction program in the department. The paper aims to introduce the recognition arrangement of a qualified VM course and report the result of feedback evaluation from the VM students in the university. A Teaching Perspectives Inventory (TPI) evaluation is used to assess the teaching approaches of the VM course. Students generally highly satisfy the interactive project-based VM training in the construction higher education.

Background
VM techniques have been adapted in Hong Kong since 1990, while the Hong Kong Institute of Value Management (HKIVM) was established in 1995. Construction professionals should not only acquire technical knowledge in this present day, they must also develop various management skills for setting the primary goals. A number of formal documents (WTBC16/1998; Tang2001; WTBC35/2002) strongly recommend a wider adoption of VE techniques in order to achieve an excellence in the quality of construction products. A recent survey with construction professionals in HK indicates that VM is one of the most useful decision tools for the industry (Leung et al. 2002), while the other similar survey revealed that most of the practitioners in the Hong Kong construction industry misunderstood and had false perceptions of VM (Fong and Shen 2000). In fact, a limited number of professionals have acquired VM knowledge and skills through professional training or undergraduate study in Hong Kong.

Aims and Objectives
The VM course aims:
1) To introduce the concept of value engineering and demonstrate its application to meet the expectations of the public for enhanced project value
2) To provide practical knowledge in specialized techniques used in value engineering such as: creativity, weighted evaluation, design-to-cost, life cycle costing, FAST diagramming and human relations.
3) To further develop students communication and presentation skills in an inter-disciplinary professional context.
4) To understand the entire value engineering process in the construction industry.

Introduction
To meet the expectations of the public for better construction project value (lower life cycle cost and higher performance), a value management course has been added in the construction programs (construction engineering and management, building surveying and quantity surveying) offered at the City University of Hong Kong (CityU) since 2002-03. In the past two years, 30 students were trained in the VM courses at the CityU, while 26 students have selected it in the coming semester B of 2004-05. Students not only learn the systematic construction knowledge, but can also well equip decision and personal skills to communicate and discuss among various stakeholders logically in the complicated construction industry. Indeed, it is important to train construction students with the whole personal development in the university.
“Selling Course” to University

Recognizing the importance of VM for Hong Kong, I decided to approach the programme leaders in the Department of Building and Construction at the City University of Hong Kong to discuss the possibility of offering a course. The benefits of VM to Hong Kong were explained along with a description of the VM methodology. After much consultation with the Miles Value Foundation and the SAVE Certification Board, a course outline was developed. The programme leader approved the semester course and I was selected to teach the class. Members of the MVF mentored me in VM and provided training course materials, lectures, quizzes, exams, and textbooks. Actual project applications and the formulation of student teams for study were an important part of the course.

Construction projects are typified by the involvement of a number of participants. Each project team member has his particular expertise, and can contribute towards the success of the project. However, since their inputs are often interdependent, conflicts may arise in some circumstances. This is particularly evidenced when they are working within limited resources in terms of time and budget. Value in ‘value management’ topic is defined as the relationship between function and cost. To select the best value (project goal) among various stakeholders in the project team, value management is a good systematic methodology for solving the problems in a team. Therefore, the VM course is a cross-disciplinary subject for multi-disciplinary students such as construction engineering and management, building surveying and quantity surveying students in the department.

In recent years, whole personal development is emphasized in the higher education. University students should not only be taught by the basic and fundamental construction knowledge, but also learn various personal and technical skills in the university. Value management involves various problem-solving and teamwork skills such as information searching skills, logical thinking skills, creativity skills, evaluation skills, and discussion skills. It really supports the construction professionals in team to solve the complicated problem in the real world and develop a value-added service in the society in the future.

As this course is recognized by the SAVE International Certification Board equivalent to a “Module I” course in the USA, all VM teaching materials were approved by SAVE before the commencement of course at the CityU. A good communication channel and clear guideline are essential for us—an overseas university. To ensure the VM course quality offered at the CityU, the course examiner of the VM course must be a Certified Value Specialist and a qualified VM trainer who completed the approved VM Modules I and II training workshops and passed the AVS/CVS examination successfully. In fact, our VM course examiner further equips practical VM facilitation experience in industry, and conduct academic research in the VM area.

The course adopts a project-based teaching approach with the action learning method, practical projects for VM study and sufficient space and facilities for team discussion are the difficulties to implement this new teaching approach. To solve this problem and get the course started in the construction program, the course examiner has to collect the practical project information from the practitioners (e.g., architectural drawings, structural drawings, building services drawings, cost planning, construction programs, etc.) and request the university to allocate a large classroom with a full-set of IT facilities for the VM class (e.g., a 40- or 60-seat classroom for 20 VM students). Therefore, we were thus scheduled in the earliest time-slot in the past two years starting from 8:30 a.m. which was not favored by the students in the university.
Course Design

Since I had expressed our intention for the establishment of this new VM course for construction undergraduates in Hong Kong, a lot of VE experts including Mr. Donald E. Parker (representative of Lawrence D. Miles Value Foundation), Mr. Howard Ellegant (Director of Howard Ellegant Associates), Mr. Jerry Kaufman and Mr. James McCuish (Directors of J.J. Kaufman Associates, Inc.), and Mr. James Rains (President of Advanced Value Group) freely and generously gave their invaluable information to me for the preparation of VE teaching materials and the recognition of “Module I” training.

During the course, students apply the VE methodology in a team (7-8 students) to an actual project in order to gain practical experience using what they learn. In the beginning of the course, students are assigned to play different roles in the team such as architect, structural engineer, building services engineer, quantity surveyor, construction manager, etc. for designing/solving the practical construction projects throughout the course. A number of real construction projects were used as case studies for VM application. Examples include new development of Vacation Inn in Tung Chung, renovation of a traditional school to millennium school, formwork design for typical residential buildings, and design of bathroom in hotel.

The course was mainly taught by a qualified VM facilitator. Among various techniques in the Value Methodology, team building among construction professionals and creativity are the weaknesses of construction students in Hong Kong. Two psychologists were thus invited to teach collaboration for the topics of teamwork building section and creativity phase. The two psychologists facilitated students to improve their practical working experience in the construction industry.

Since value management is a new topic in Hong Kong, a web-based value Management Technique Centre for Construction Undergraduates (www.bcm.cityu.edu.hk) has been constructed, supported by the LEARNet production fund in Hong Kong. The web-site seeks to enhance the teaching method and improve/enrich individualized learning with free of time limitations. The focus of the centre is toward proactive learning and development of critical thinking skills, including VM analyzing methods, problem solving skills, creativity/evaluation techniques, etc.

Table 1: Summary of Teaching Evaluation (TPI) by VM Students (data collected at the end of course)

<table>
<thead>
<tr>
<th>Year</th>
<th>Transferring</th>
<th>Shaping</th>
<th>Traveling</th>
<th>Growing</th>
<th>Total no. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>2003-04</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>5</td>
<td>19</td>
</tr>
</tbody>
</table>

Note: Transfer Theory - teacher develops and refines their methods of transfer and devise elaborate teaching aids in order to transfer knowledge accurately and absolutely. Shaping Theory - teacher views students as raw material (metal or clay) to be shaped, or mould, or turned to a predetermined. Traveling Theory - teacher helps students solve their confusion with experience and knowledge in order to put students on the right track. Growing Theory—teacher emphasizes on personal growth rather than gaining knowledge from the particular subject.
Students' Feedback

In order to fully understand the interactive teaching style, a Teaching Perspectives Inventory (TPI; Pratt 1998) evaluation is used to assess the teaching approaches of the VM course. The results are listed in Tables 1 and 2.

Although it is common to use different teaching approaches such as lectures, tutorials, laboratory, project-based course, etc., in the higher education in Hong Kong, they are still generally taught by teachers. Students carry out their assignments or projects based on a structural framework or standard recognized by the construction system. Table 2 reveals that most/all VM students (8+19) at the end of VM course considered the project-based VM teaching approaches as traveling and growing rather than transferring/shaping merely. It represents that VM teaching emphasizes traveling and growing teaching approaches allowing students to solve the problems by themselves.

Although students still have some difficulty to learn the knowledge (due to too early, small class and time limitation), they were generally highly appreciative of the teaching approaches (see items 1-43 in Table 2). An interactive learning environment, active learning approach, effective

<table>
<thead>
<tr>
<th>Pros</th>
<th>Effective Teaching Method</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interactive (various games / activities)</td>
<td>21. Good teaching method compared with the traditional teaching method</td>
<td>1. Time is too early</td>
</tr>
<tr>
<td>2. Relax atmosphere</td>
<td>22. Effective teaching methods</td>
<td>2. Too much workload</td>
</tr>
<tr>
<td>3. Use animated and colorful PowerPoint → attractive</td>
<td>23. Interesting learning mode (sit in a circle)</td>
<td>3. No format notes but only PowerPoint, need more text if needed</td>
</tr>
<tr>
<td>4. Good notes preparation</td>
<td>24. Many extra-curricular activities (talk by other experts)</td>
<td>4. Not enough stimulations in thinking &amp; discussions</td>
</tr>
<tr>
<td>6. Friendly</td>
<td>26. Sufficient guideline to do the assignment</td>
<td>6. Tight time for homework</td>
</tr>
<tr>
<td>7. Reasonable workload</td>
<td>Logical Thinking</td>
<td></td>
</tr>
<tr>
<td>8. Good atmosphere in class</td>
<td>27. Enable me to think in a systematic &amp; logic way</td>
<td>7. Difficult to find relevant info.</td>
</tr>
<tr>
<td>9. interesting exercise &amp; course</td>
<td>28. Not only consider the cost but also the value</td>
<td>8. It would be more attractive and better for presentation, if Chinese become the medium of instruction.</td>
</tr>
<tr>
<td>10. Feel free to learn</td>
<td>10. Feel free to learn</td>
<td>9. More participation</td>
</tr>
<tr>
<td>11. learning skills for searching information</td>
<td>11. learning skills for searching information</td>
<td>10. More participation</td>
</tr>
<tr>
<td>12. More time for discussion and thinking</td>
<td>12. More time for discussion and thinking</td>
<td>11. Always have the chance to practice what we learnt</td>
</tr>
<tr>
<td>13. experience the group discussion</td>
<td>13. experience the group discussion</td>
<td>12. Reality experience the problems &amp; procedures of the VE</td>
</tr>
<tr>
<td>14. Students become the active one in the class not only listen to the teachers</td>
<td>14. Students become the active one in the class not only listen to the teachers</td>
<td>15. Good practice for students</td>
</tr>
<tr>
<td>15. Training to solve problem effectively &amp; efficient</td>
<td>15. Training to solve problem effectively &amp; efficient</td>
<td>16. Good Achievement in team work</td>
</tr>
<tr>
<td>16. More participation</td>
<td>16. More participation</td>
<td>17. Always have the chance to practice what we learnt</td>
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<td>20. Good Achievement in team work</td>
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<td></td>
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teaching method, logical and creative thinking techniques can enhance learning ability and develop discussion skills in teamwork. It definitely supports students to pass the AVS examination, improves their personality and enhances group discussion in the industry, especially among various construction stakeholders.

Qualification Achievement

To obtain the recognitions of SAVE and other construction professional societies (e.g., Hong Kong Institute of Surveyors, Hong Kong Institute of Engineers (Building Division), etc) in Hong Kong, the VM course profile was submitted to all relevant societies before actual conducting the training in the program. Through a year communication, and assessment, this VM course was finally approved by the SAVE Certification Board, in early of 2002, as equivalent to the “Module I” course offered by the SAVE International in the USA. Students can then become a qualified chartered construction professional and, simultaneously, an Associated Value Specialist in the industry after the graduation of construction program in the department.

For the achievement of construction professional societies in Hong Kong (e.g., HKIE, HKIS, etc.), students need to submit a VM report via the full VM workshop in the class and take a 3-hour examination at the end of the semester. According to the requirements of SAVE International in the USA and HKIVM in HK, students planning to become Associate Value Specialists or facilitators/co-facilitators in Hong Kong further need to attend an AVS examination recognized by SAVE in USA. In order to minimize the transportation cost between Hong Kong and American for our students in Hong Kong, the CityU obtains the approval from the SAVE and arranges the AVS examination in Hong Kong for VM students at the CityU. A number of students have passed the AVS via such examination arranged in Hong Kong.

Summary

Value is defined as the relationship between function and cost. It involves various professionals in a construction project. The value management course allows multi-disciplinary construction students to attend. It introduces a clear and complete value concept to students for construction product (i.e., not only focusing on the cost for surveyors or the design for architects), helps teachers to apply ‘traveling’ and ‘growing’ teaching approaches in the dynamic higher education and provides a good environment to students for developing their whole personality (e.g., inter-personal skills, information searching skills, group discussion skills, creativity skills, etc.).

Construction industry emphasises teamwork for solving complicated construction problems within a specific period. The value management course is a good methodology to support their decision making in the real world in the future. In order to have value added services to the construction professionals in the industry, VM course in the university is a key point to open the door in the society.

Anyone who are interested in starting a VM course at his/her university could contact the SAVE Education Board or me for any further information and support. I really enjoy this dynamic teaching approaches for “traveling” and “growing” our students’ learning. I am sure that it would also be beneficial for your students, university and industry. Hopefully, we could gain the win-win-win outcome via the VM course in the university.

References


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