SAVE International
2010 Annual Conference
Technical Presentation Abstracts

The following papers have been selected for presentation at SAVE International's 2010 Annual Conference. They are listed in alphabetical order by title.

Alcatraz: A Case for Value in Alternative Energy

Stephen J. Kirk, Ph.D., FAIA, CVS-Life, FSAVE, LEED & Stephen Garrett, CVS

The National Park Service (NPS) is undertaking a project which will lead to the reconnection of Alcatraz Island to the San Francisco mainland electrical grid and install a photovoltaic electrical generation system to replace the diesel driven generator power on the island. Golden Gate National Recreation Area's goal is to replace the diesel generators on Alcatraz Island with cleaner sources of electricity that have as great a renewable component as feasible and to identify and implement energy conservation measures that moderate energy use and greenhouse gas emissions into the future. The combined program intends to achieve the following results: minimize future dependence on diesel powered generators and equipment; sustain baseline energy services on the island in the even the grid or grid connection fails; maximize energy conservation; minimize or avoid conflicts with natural and cultural resource preservation; minimize air and noise pollution; sustain visitor experience and visitor services; comply with NPS policy objective to reduce energy consumption by generating renewable energy and achieving "carbon neutrality".

This paper presents a case for value in considering photo voltaic systems in your project.

Application of Value Analysis for SOC Project in Korea

Sung-Hun Kim, CVS, Jong-Kwon Lim, Ph.D., CVS, Jae-Yong Kim, AVS & Yong-Min Cheon, CVS

Recently in Korea, VE actions are vigorously being taken in many ways of construction, along with those taken by VE experts and the efforts made by the MLTM (Ministry of land, transport and maritime affairs) to save budgets. In this situation, the MLTM obliges "Examination of Economical Efficiency of Design" (design VE) for construction work costing 10 billion won or more, and recently effectuated guidelines for standard bidding, and evaluation of standard research for executing VE(ministry of land, transport and maritime affairs 2008), In the construction sector's efficient of increasing customer satisfaction and raising values, is compulsorily executed at the design stage of construction and gives a tangible outcome and is expected to trigger more efficient VE execution services.

Nevertheless, when executing VE for large construction currently in process, too much focus on saving expenses may cause lowering of performance, so alternative plans are suggested. This can be caused by several reasons such as ignorance of performance when executing VE, non-execution of VE workshops, inclination toward saving expenses focusing on accomplishment based evaluation, which are the main reasons for lowering satisfaction from customers in the end.

In this research, we are introducing large construction business application of multi-stage performance evaluation method. and importance of performance evaluation for execution of efficient design VE in public construction works that are in process as a national business, and considering and suggesting a

feasible advanced analyzing method by showing how to quantify performance. The suggested multi-stage performance evaluation method will suggest a detailed performance index so interested parties such as order makers of large construction business or VE team members can have advantages when adjusting or making the agreement of opinions.

Application of VE methodology to product development that warrants compliance to key certification requirements

Daniel Arockiam, AVS and Raghavendra H. Rao, AVS

New Product development (NPD) is a detailed process involving several phases that culminate in the materialization of a product from an idea. The birth of any product starts with a need for it in the market and the heart is the functionalities expected out of it. The Value Engineering (VE) approach, with its focus on function, value and cost is a very effective technique applicable to NPD across domains.

Shrinking times-to-market, need for innovative products and diverse customer requirements pose severe challenges on product lifecycles, which are progressively getting shorter. Additionally, government agencies and regulatory bodies keep a close watch on product implementations, in order to ensure strict adherence to user safety and regulatory requirements. Typically, in domains like aerospace and life sciences, the applicable products directly impact the safety and life of the user. This necessitates that several certifications and approvals be sought before releasing the product to market.

Changes in material, shape or manufacturing process would warrant recertification. These requirements increase the VE implementation lead times and costs. Product manufacturers in these domains are therefore challenged to apply and implement VE. However, with due attention paid to specific VE phases, achieving value improvement without the need for expensive and time-consuming certifications is possible.

Applied Value Methodology and Aerospace: Airline Methods in Project Development, Maintenance Planning, and Operations of Nuclear Power Projects

Bruce L. Lenzer, CVS-Life, FSAVE, CQM/OE & Ken Goosen, PE, AVS

Value Engineering (VE) has long been successfully applied during the Engineering Phases of Projects. Typically VE is applied at the 30% design phase. However, contemporary practices have proven it is best used or implemented as early as possible to take advantage of tools and processes to maximize design alternatives and minimize design re-work in latter stages of design development. In addition, new and existing operations can greatly benefit from applied Value Analysis (VA) and Value Management (VM) techniques to proactively manage maintenance and reduce or minimize outage time. An interesting parallel exists between the Nuclear Power industry and the Aerospace-Airline industry. Both are highly regulated with a focus on public safety. Both industries rely on their products and services to be maintained for continuity of safe operations, minimal environmental impact, cost effective maintenance and public service with the expectation for maximum profitability and return on investment. This paper will discuss the following:

- Tools and benefits of VE in the early phases of project design development and stage gate decision analysis.
- Critical interface of operations and maintenance as part of the design team.

- Similarities between Nuclear Power and Airline Industry maintenance and operations.
- Development of an Approved Schedule of Maintenance using Aerospace – Airline methodologies and risk assessment models.
- Applied VA and VM processes and tools related to maintenance and operations.

Applying VE to Better Understand and Evaluate the Demands of Users of Public Works

Takehiro Kimori, CVS, Hiroaki Konishi & Kenichi Konishi

We would like to present a new approach for builders to better understand and evaluate the demands of potential users of public works in the project planning phase.

In every public works project, it is vital for builders to provide the users with services that they will truly need. For Builders, there may be ambiguity about the future needs of users; in other words, Builders usually have difficulty in defining the demands of users. To clarify their demands, most Builders conduct conventional questionnaire surveys to potential users during the project planning phase. For the most part, the questionnaire items in such surveys are in the form of YES/NO choice questions. Because the YES/NO questions tend to make the respondents passive, the results from the surveys do not accurately reflect the respondents' true desires and opinions in the resulting facilities. To clearly understand the future needs of users for the resulting facilities through such questionnaire surveys, it is necessary for Builders to contrive ways to make better questions and improve the content of the surveys.

For this purpose, we have applied VE in a number of redevelopment plans for urban parks which we have been engaged in, and have been able to obtain excellent results. In particular, we have applied VE techniques and ingenuity to questionnaire surveys for potential users and to the evaluation of results of the surveys.

We shall introduce the procedures and key points to applying VE.

The Business Benefit of VIPs

By Nat Schatz

In today's project environment of reduced capital budgets and economic uncertainty, it is incumbent upon companies to make maximum use of the capital they employ. The efficient utilization of Value Improving Practices (VIPs)on capital projects has been proven to provide economic benefit to companies through improved capital costs, shortened execution schedule and/or improved operability/reliability of a capital construction project. Essentially, the proper use of VIPs allows the project team to design and build only what is necessary to meet the business objectives, while realizing a potential savings of 10-20% of the total installed costs of a project. It must be stated that application of VIPs is not a scope reduction effort.

VIP Economic Factor Targeting assists the Project Team in understanding the potential economic benefits that can be realized through applying the various VIPs. We know that the goal of VIPs is to identify new opportunities, improve the capital effectiveness of projects (i.e., deliver market-driven projects in an accelerated time frame and infrastructure/non-rush projects in a cost effective manner), react quickly to changing market demands, and stay ahead of today's ever-growing global competition.

In the Economic Factor Targeting Table, you will note that some VIPs impact only project execution

while other VIPs impact only operations. This reinforces the need to select the most appropriate VIPs based on the project drivers/objectives. Categories indicated with estimated percentages provide industry ranges for potential economic benefits. Those cells, highlighted in gray, are typically not impacted or could have a negative impact on the identified economic criteria. As an example, Design Tools have a potential project execution schedule savings of up to 25%, by minimizing field interferences and, ultimately, man-hours associated with field changes. Alternatively, Energy Optimization has a potential 15% economic benefit in operating costs by minimizing energy utilization. The Economic Factor Targeting Table should be used strictly as a reference and a guide of potential economic benefits that might be expected through utilization of any of the VIPs. Technology Selection and Class of Facility Quality also have economic impacts but are strictly utilized to define the most appropriate technology and the engineering design parameters.

Please note that it is not the intention of the Value Management Process to utilize all VIPs on any given project. The intent is to use the most appropriate number of VIPs that provides the greatest value based on the business and project objectives. Industry benchmark results indicate that this number is roughly 40-60% of the applicable VIPs for any project. This means that if the project would benefit from eight VIPs, the team should select approximately 4 or 5 to apply.

California Hospital Acoustic Ceiling VE Study

Matthew J. Boersma

The purpose of this report is to discuss the results of a recent Value Engineering study on acoustic ceilings for the Cathedral Hill Hospital Project in San Francisco, CA. Through function analysis we identified opportunities to reduce cost in the $6 Million acoustic ceiling budget. We are currently evaluation several alternatives that will reduce congestion and installation labor.

A Case Study on the Project Center for True CFT (Cross Functional Team)

By Dong-Hoon Lee, CVS, Nam-Ha Kim, CVS, Yong-Ryul Kim, Ph.D., CVS & Yong-Dae Choi, CVS

Despite product life cycle and development lead time that is extremely shortened, it is essential to get the utmost out of CFT (Cross Functional Team) in order that every company could create excellent results with the value methodology. Even though we can take advantage of a unified communication system which is rapidly developing, cooperation on the off-line meeting is still the unique method for enterprise-level core projects.

One example includes some different tools and “know-hows” on the basis of seven years’ operating experience and will be provided in this presentation which shows various outstanding results through a special project center called “Geobukson Center”.

First of all, the tools used in Geobukson Center are FAST (Function Analysis System Technique), 100 Indexes, WBS (Work Station Breakdown Structure), VOC (Voice of the Customer), Tear-Down, various idea conception methods, and wallpaper management, and so on.

Also, the “know-hows” that support true CFT are separated into difference spaces, like as project rooms and conference rooms, with strict observance of the process from entrance to graduation, an exceptional financial support and individual compensation, and assigning PDs (process designers) who fill the roles of facilitator, coordinator, and consultant.

The methodology of Geobukson Center was spread over all eight global business unites of Samsung Electro-Mechanics and has been a benchmarking target for many enterprises in South Korea.

Connection Process of VE Subject Selection and Functional Analysis at Planning Phase for Program Level

Chang-Taek Hyun, Ph.D., PE, AVS, Chang-yeob Song, Myung-Jin Son, Seong-Min Jo, & Seung-Won Han

As some new issues such as urban redevelopment, urban balanced development, and urban competitiveness have become more important worldwide, the mixed-use developments of program level, which is, unlike the project-level, supposed to connect various individual projects, have been actively carried out. It is highly required that the program-leveled facilities with multiple projects and diverse stakeholders meet their original functions, create new values by maximizing the land efficiency and connecting different uses, and make OM&R(operation, maintenance, and replacement) more efficient. Therefore the research related to VE(value engineering) application for program-level facilities, which could support the value enhancement and the creative thinking, needs to be performed.

In Korea, as for the construction projects which cost over ten million dollars, it is mandated to perform VE more than once respectively at both design development phase and construction document phase for cost reduction, function improvement, and value maximization. In the meantime, VE needs to be applied at the early stage such as planning phase, in order to get maximum effect for large-scaled program-level facilities. However, to do this, some problems have been raised as follows: 1) VE job plan oriented to single project and design phase, 2) Difficulty on VE subject selection according to the variety of functions and spaces in program-level facilities, 3) Lack of connection between VE subject selection and function analysis, and 4) Lack of consistency between VE subject selection and idea creation.

Especially, VE subject selection has more important meaning on program-level facilities where multi-projects are closely connected. And the careful and efficient subject selection in program-level facilities could result in the great possibility of value improvement.

To apply VE efficiently at the planning phase of large-scaled program-level facilities, this study tries to suggest the effective method for the subject selection. In addition, the connection process of the subject selection and the functional analysis, and the process to support the effective idea creation are to be proposed. Also the similarities and differences between 'a single project' and 'capital construction program with multiple projects' in terms of VE application, are presented.

The Development of Connection Process to VE Subject Selection and Functional Analysis for Program Level on Planning Phase

Chang-Taek Hyun, Ph.D., PE, CVS, Seong-Min Jo, Myung-Jin Son & Chang-Yeob Song

As some new issues such as declined urban redevelopment, urban balanced development, and urban competitiveness have became more important worldwide, mixed-use development at program level, which is, unlike the project-leveled, supposed to connect various individual projects, has been actively carried out. Mixed-use development, with a purpose to create new values by maximizing the land efficiency and connecting different uses, has successfully integrated equipment system and made OM&R (operation, management, and replacement) more efficient in spite of complicatedly diverse stakeholders. It is highly required that the program-leveled facilities with complex and diverse stakeholders could possibly meet their original functions, recompose the functional requirements, and connect them. For solving these problems, many researches regarding Value Engineering which could support the Function-oriented thinking have been attempted.

In Korea, the construction project which is estimated to be more than ten billion korean won is obligated to perform VE more than once at both design development and construction documents

phases, for cost reduction, function improvement, and facility value maximization. As VE is proved to be particularily effective at planning phase recently, many researches have been done on VE for large-scaled program-leveled facilities. However, some problems have been raised as following: 1) Current VE job plan of single projects mainly focusing only at design development and construction documents phase, 2) VE subject selection according to a variety of functions and spaces in construction projects, 3) Lack of the connection between VE subject selection and function analysis, 4) Lack of consistency between VE subject selection and ideas. Especially, VE subject selection is the stage where the parts with high possibility to be improved and intensive workshop and efforts for VE are distributed, so it is very important at the program level where large-scaled programs connected with a variety of projects.

Accordingly, this study was conducted to provide a process to connect VE subject selection to function analysis, limitedly focusing on 'sequential steps of a single project' and 'capital building program with multiple projects', so that more efficient idea could be created, for the purpose of applying VE at a large-scaled program-leveled in planning phase. In addition, in this study the similarity and difference in VE aspect for 'sequential steps of a single project' and 'capital building program with multiple projects' at program level were presented to provide the applicable processes according to project characteristics in applying VE in large-scaled projects in the near future.

FAST: 3D and Beyond

Gene Haba & Rahul Nagalkar, AVS

Traditionally Function Analysis System Technique (FAST) has been used by value management practitioners in a 2D format which includes the How, Why, and When directions. FAST has traditionally been difficult for team members to get up to speed and understand. Traditional thinking is a logical flow of tasks and processes vs. function-based flow. FAST has been customized by some users by utilizing a dimensioning table below the functions; for example, to assign responsibility to stakeholders for each identified function. Dimensioning can also have many other variations, some of which would be cost, schedule, duration, and so on. By utilizing modern freeware software, one can develop a 3D model of the traditional FAST diagram.

The authors will demonstrate how a traditional FAST looks in a 3D spatial format with the ability to use the graphic third dimension for dimensioning elements traditionally covered only in a table format. With additional notations, the authors' example illustrates time, cost, and responsibility all as part of the third dimension. This introduction of the third dimension sparks a new paradigm for a seasoned tool, making it easier for a novice to better understand FAST. The graphical 3D FAST representation enhances the final presentation phase of the value study by focusing on the third dimension issues instead of the FAST function logic. This 3D FAST helps the team transition from the function phase to the creative phase by easily seeing where the most opportunity exists within the established scope.

Function Analysis in Integrated Project Development

John E. Koga, CVS-Life, AIA, CDT

The construction industry is being revolutionized by a new style of contractual relationship, Integrated Project Development. This often requires a variety of representatives to be physically located in one office setting with personnel intermingled rather than segregated by discipline. It emulates the workshop setting Value Specialists have relied upon for decades. Value Methodology's Job Plan and Function Analysis can be introduced into this daily work environment. This paper describes examples using Function Analysis to help study issues on the Cathedral Hill Hospital project, a $1.7 billion program

being designed for San Francisco, CA. The Cathedral Hill project team is also focusing upon making the project Lean during design and construction. The author will be extending the use of Function Analysis to more hospital projects for Sutter Health in an integrated environment, including a new $250 million project at the St. Luke's campus that is just beginning.

Function Driven Risk Management

Robert B. Stewart, CVS-Life, FSAVE, PMP & Gregory Brink, AVS, PMI RMP

The effect of uncertainty on value can play a major role in decision making. Threats can just as surely erode project value as can missed opportunities. The improvement and utilization of quantitative risk analysis and management techniques in recent years has brought greater attention to the role of risk in effectively evaluating and delivering projects of all scope and scale. Risk studies are becoming commonplace, however, there exist gaps in thinking that directly link to a lack of understanding of project functions. The exploration of relational dependencies of risk on project functionality can allow for uncertainty to be evaluated and managed in a more effective and proactive fashion. In addition, a developed understanding of the project functions that drive risk affords proper management of the impacts of uncertainties involving threats and potential opportunities throughout the project life cycle. This paper suggests a process to fully integrate function analysis into risk management practices that will bring focus in identifying project risks, aid in prioritizing them, and focus critical thinking on the development of appropriate risk response strategies.

The Function of Food

Laurel M. Dennis, PE, CVS-Life, LEED AP

Those of us who are value professionals often say that the value methodology can be applied to any project or process. Well, what about one of the most basic processes we use everyday: food and cooking? Here is a process that is used every day, by many people and many levels, from home cook to professional chef. This presentation will show how the value methodology and especially function analysis can be applied to cooking.

Have you ever looked at a recipe and tried to substitute ingredients? Sometimes it worked, but not always. If you understand the why, function, of each of those ingredients in that recipe, you as the cook can make changes and even enhancements with greater confidence and success.

Recently I read a cookbook, *I'm Just Here for the Food,* by Alton Brown. He compared cooking and recipes to maps and giving directions. You can provide details directions to get somewhere and the person will likely get to the destination; but, without a map, they won't know where they are and, if they get off track or need to take a detour, they will be lost. Well, a recipe is like the detailed directions; but understanding the why provides the cook with a map. Taking this approach and applying the value methodology, including function analysis, thinking adds additional detail and understanding to the map. The goal of this presentation is to show how to apply the value methodology, including function analysis, to cooking and food using a simple example, salad dressing, as the model. This will be an interactive presentation asking the audience to help develop the functions of the salad dressing and then use those functions to develop other salad dressings.

A Guide for Idea Generation: Creating Value through System Innovation

Mohammed A. Berawi, Ph.D.

This paper outlines the articulation of a theory of idea generation by differentiating 'ideas as purposes', ideas as outcomes', 'ideas as processes', and 'ideas as functions'. This paper shares insights and offers a theory of ideas opening the way for researchers and practitioners to explore the ability to manage invention as a capability. In the context of innovation, functions need to be formulated in order to achieve the target of a system that has been designed. Identifying functions enables us to propose alternative ways to implement those functions and led us to a shared understanding and better ability to produce new ideas to stimulate innovation and add product value.

This paper will be presented during the Marketing & Communication Forum.

Hard Bid by Net Present Value (Inclusion of the Time-Value of Money in the Bid Evaluation)

Djalil H. Abadi, PE & Steven Male, Ph.D.

The majority of public Infrastructure projects are constructed by private contractors. The projects are awarded by soliciting bids from lowest bidders. The construction of this type of project requires an investment of large amounts of capital within an extended period of time. The application of the Design-Build form of contracting has extended this period even longer.

The current bid evaluation methodology is based on the total cash value of the project and ignores the time value of money. This simple evaluation methodology has been effective and practical for short term contracts. But for the long term public Infrastructure projects in the range of $100 million, ignoring the time-value of money can result in inefficient and unfair award of the contracts and promotes front-loading practices. As a result, the owner will end up contributing for the partial financing cost of the contractor without any benefit. For long term infrastructure projects over three years and above $300 million in value we recommend awarding the project based on the Net Present Value (NPV) of project cash flow instead of total cash value. The methodology for inclusion of the time-value of money in the bid evaluation process is the subject of this paper.

This methodology can simply be achieved by generating cash flow from the project bid and construction schedule, and calculation of the net present value of the cash flow for the bid evaluation. The dollar value of each bid item (from the bid schedule) and the project construction schedule (as defined by the owner) will be used by the contractors to generate cash flow based on their total bid amount. The net present value of each cash flow calculated based on the set interest rate, will be the bid amount to determine the lowest bidder. The total cash value of the bid as presented by the sum of the items in the bid schedule will not be changed and will be the base amount for awarding the contract. The evaluation method and the procedures for calculating the net present value and the cash flow will be clearly stated in the Request for Proposal and will be communicated to all potential bidders. This procedure will spotlight the financing cost of the large infrastructure projects and can promote upfront payments for costly initial setup costs by the owners while allowing them to receive a benefit in the form of total project cost reduction.

How Can Value Methodology Connect Firms of a Supply Chain?

Ferenc Nádasdi, Ph.D., CVS-Life, FSAVE

In the last few decades the competition between firms has been transferred to competition between supply chains. The success or bankruptcy of some firms depends upon the efficient working of supply chains. Analyses show that the area of logistics has a significant development, but benefits of the value methodology are used by only a few firms. Based on the author's experience, planning which takes the

partners' specific particulars into consideration can provide huge advantages for the whole supply chain. The author has experienced in some VM projects that, although firms had "good intentions" to make better supply for their partners, they did not have sufficient information about their customers. Mainly technical areas were involved. Lack of professional knowledge prevents getting information about the needs. Price, delivery, deadline, payment deadline, quality specification of the standards are fixed and stated in delivery contracts. "Better alignment" with partner firms needs tighter cooperation. Such areas are research and development, introduction of new parts and components, stopping of manufacturing old parts and components, the cooperation of field of capital investment, etc.

Specifying and creating some functions of certain parts and products are very important. The author's experience shows that some products to which the value methodology was not applied do not have all the necessary functions and some of them contained unnecessary functions. This is also valid for technologies as well.

The paper demonstrates the most important connection of the supply chain using the example of manufacturing shoes from raw hide to ready-made leather shoes. Carrying out some VM projects, the author was given very interesting and surprising results. According to the chief executive officer's opinion, applying VM has significantly improved the cooperation between employees.

How to Establish an Internal VE Process in a Manufacturing Organization

James D. Bolton, PE, CVS, PVM

The ability for manufacturing organizations to develop an internal value methodology program is critical to the long-term success of that organization, especially in the difficult global economic situation which we are facing today. Even though manufacturing organizations are trying to stretch every dollar they earn, it is more important now than ever to initiate initialize or expand their internal VE processes, as they will bring the "biggest bang for the buck" than any other process available today. This has exactly been the experience Whirlpool Corporation globally over the last 18 months.

This paper will give some insights on how and why this process is so important and the method which was used at Whirlpool to obtain corporate management's attention to "jump start" its own internal VE process.

Implementing a VE Program: The Who and the What

Lucie Parrot, Eng. CVS-Life

This presentation will illustrate how a VE program can be introduced in any organization. It will show an overview of the implementation process then a detailed view of each step. It will indicate what kind of persons should be involved and in which activities. It will discuss the roles of the consultant, to help get started; the champion, to make the program visible; the corporate program manager, to facilitate the implementation of VE and the database custodian, to maintain a lessons-learned database. The content of this paper is based on years of experience of the author helping clients establish Value engineering programs throughout their organization, whether it's small or large, private or public.

Improving Value with a Risk Based Approach to Stakeholder Management

Fulvio Salvatori, Franca Marini, Ph.D., Franco Caron

Integrating stakeholders and risk management can improve value in development projects. Since stakeholders are source of uncertainty and their actions or behaviours can be modelized as

risks/opportunities for the project, a quantitative estimate of their salience using the concept of risk can drive to earn value.

The impact of each stakeholder own risks on project performance represents the risk load brought into the project by the source and it can be assumed as an indicator of the stakeholder salience. The project team shall allocate more resources to the stakeholders having major influence in order to avoid/run their risks/opportunities.

The analysis of the trigging dynamics from stakeholder general interest to specific influence on project performance through a systematic approach let the project team identify appropriate measures to break the chain by which the risks are trigged and satisfy stakeholders needs through appropriate actions to deal with them.

Thus, an holistic approach between these two processes consequently leads to an efficient allocation of resource and an effective satisfaction of stakeholder requirement.

The results on a major project case study proof that integrating processes is justified balancing potential savings on capex contingency for risks avoided and cost of implementing mitigation actions.

Manage Your Career: Risk Management and Essential Career Competencies

Eric Meng, AIA, CVS-Life

This interactive presentation provides an overview of risk management and then demonstrates how it can be applied to professional (or personal) career development. The presentation starts with an entertaining, yet highly illustrative, dice game in which the participants clearly experience the power of risk management. The presentation then assists the participants in developing a matrix of core competencies for their professional development, including action strategies for attaining or improving their skills and knowledge. These typically could range from additional on-the-job training, seminars, etc., all the way to new career paths and extensive formal education and degrees. Finally, risk management is formally applied to this matrix in order to map a strategy with the greatest chance of success relative to the applied effort and resources.

This topic is particularly applicable to the VE industry in that there is a wide variety of skills that draw from multiple disciplines and career paths in the practice of VE.

Methodology through Total Innovation Management

Young-Joo Suh, Ph.D., CVS-Life & Yong-Su Kim, CVS

This paper analyzes techniques used for management innovation. And VM is contents that study that is exerting some influence on these management innovation activity. VE is technique that improve value. Therefore, techniques to improve value in enterprise studied what is. And it is VE's characteristic and research paper that present direction to go forward among these methods. Extent of study compared 6sigma technique, factory improvement technique, design improvement technique, goods plan improvement technique etc. with VM.

New Value Innovation Model for Public Companies

Do-Soo Jang, Ph.D.

Under the current circumstances that global enterprises faces a social risk and a change in managerial paradigm, the Korea South East Power Company (KOSEP) is promoting three innovation strategies which

are cost innovation, sites innovation and process innovation to meet the people's expectation as a public company.

Based on those strategies, we are conducting “entrepreneuring” to establish responsibility management and also operating a “War Room” in order to practice the management by viewing management. Likewise, we are removing non-value added activities by conducting 6-Sigma activities to solve chronic problems and activating TDR (Tear-Down & Redesign), a problem solving tool that is focused on a task.

In the meantime, having tried to focus on new business areas in order to overcome decrease in domestic electric power demand and on having a consistent growth, 20 cases of foreign IPP business have been promoted. Therefore, many chances came to be given for young employees to display all their abilities by dispatching 50 of them in India, Bahrain, Malaysia, Thailand, Kazakhstan and etc. As we also had bought stake from Adaro Energy in Indonesia for coal resources development business, we could lay a foundation to have a stable fuel supply which is a total amount of 3 million tons of bituminous coal per year.

With the CEO's experience woking for Samsung, a top Korean private company, for more than 30 years, we have been actualizing the most outstanding managerial outcomes of domestic companies in the same kind since starting to work for a public company KOSEP a year ago. We have achieved a fine managerial outcome of net income caluated at 150 billion won in September 2009 which was showing deficit of 130 billion won in 2008, actualizing a value innovation as a public company.

Noah’s Ark Approach to Project Selection for Industrial Projects

James M. Guyette, AVS

Industrial companies typically have diverse product portfolios. New products and component features are added every year while the old ones remain. The result is a large quantity of potential value engineering projects.

With engineering jobs declining, research and development spending declining at a slower rate, and design engineering lead times growing, there is a greater need for choosing the right quantity and best quality value engineering projects. Past approaches analyze profitability, revenue, cost, or a combination of criteria. These approaches typically aim to cheapen products by reducing cost. They are cost centric and ignore value from the customer’s perspective.

Two-by-two matrices have been used to illustrate in simple terms complex concepts. Using value centric two-by-two matrices, practitioners will learn a new method to sort through large, industrial product portfolios to determine the best project for a value study.

A Practical Application of a Web-Based VE Supporting System for VE Facilitator and Members in VE Workshop

Jong-Kwon Lim, Ph.D., CVS, Chae-Bong Lim, Heung-Min Park, Ph.D. & Sung-Hun Kim, CVS

Based on the VM job plan, the schedule to perform a value engineering workshop does not allow sufficient time for the mutual exchange of opinions between team members. VE workshops are commonly held three to five days; however, that is not enough time to refine the function analysis and alternative ideas. To address those issues, the authors have developed a Web-based VE support system.

The system performs a step-by-VE to obtain results through rapid data processing and feedback in limited hours. In addition, the participants and the VE system have better communication with decision makers to offer their opinions to support the agreement. Using this system, based on facility design and

implementation of the base, the authors verified its effectiveness. The result of applying the system time to adjust the VE team members' feedback to the 20-30% level was reduced; individual assessment and feedback through the establishment of objective feedback could be adjusted. It is not required to spend time checking step evaluation results, because the results can be verified by using the Web. In addition, the system allows for voluntary participation of team members and the shortened time to improve the quality of performed results of VE workshop by saving time such as the idea generation stage that take a long time.

Next, this system, will be applied to a variety of VE workshops in the field of construction with the hope of reaping better results. Also, taking advantage of the system will be complemented by identifying the problem.

Product Benchmarking Leads to VAVE Opportunities

Greg Andrysiak, CVS

This is an approach using product benchmarking as a first step leading to the use of Value Management. Systematic selections of the current products in the market place are evaluated for current advantages. Like products are dissembled. Their parts are measured, weighted, photographed, and documented. Duplicate product can also be performance tested for comparisons purposes although the general theme is evaluating product function ultimately. A side by side cost analysis is completed serving several proposes. A product to product, region to region, and design to design cost breakdown illustrates product cost advantages. This information alone is a tremendous worth to a marketplace competitor. With these tear down parts and cost analysis, effectively becomes a basis for value analysis. Depending on the objective, a clear starting point for a VAVE team is a function analysis to create the better product from the benchmark products. Thus for manufactured products, this benchmark technique brings a better product to the market place using Value Management.

Proposing a VM Approach for the Design-Bid-Build Procurement Method in the Saudi Public Sector

Mohammed A. Alalshikh, MSc, PMP, AVS, CSSBB, MoR pr. & Steven Male, Ph.D.

Value management (VM) was first adopted by the Saudi Public Sector (SPS) during the 1980s by the General Directorate of Military Works, as developed by Society of American Value Engineers (SAVE). Since then, VM has been implemented increasingly in the construction industry among Saudi public organizations such as the Ministry of Municipalities and Rural Affairs (MOMRA), the Royal Commission of Jubail and Yanbu (RCJY), and the Ministry of Transportation (MOT).

The literature demonstrates that VM has been used in the Saudi Public Sector (SPS) during or after the design stage. Furthermore, the procurement system utilized in the SPS is the design-bid-build method. This approach is criticized because of its fragmentation and separation of the project parties.

VM is applied to construction projects, for a variety of purposes according to the stage of intervention, throughout the project life cycle. However, there are specific stages in which VM can intervene and play a crucial role in improving the value of the project.

This paper discusses the utilization of VM to mitigate the effects of utilizing this procurement system on project procurement. An intensive literature review was conducted to illustrate, compare and contrast VM interventions suggested by different VM approaches. A VM approach thought to fit the design-bid-build procurement method and reduce its side effects is developed in this paper.

This approach identifies the main VM intervention points which fit the design-bid-build procurement method and highlights their benefits. Aside from the utilization of VM at the design stage in the SPS, it can be conducted at the pre-concept stage to enable the right strategic decision to be made to proceed with the project if it represents the best solution to the problem at hand, and to structure the strategic brief by reconciling stakeholders' perspectives regarding the objectives of the project. Moreover, VM can be carried out at the brief stage to structure the requirements of the stakeholders and the project brief. Further, it can be employed to realign the client and contractor value systems, if needed, during the construction stage and to discuss buildability issues. VM is a strong methodology if it is integrated with project management and combined with the stages of the project.

Resource Development to Improve Potential of In-House VE Practitioners (Practical Guide)

Mitusaki Usuginu, CVS

At SAVE International's 2009 Annual Conference, the author gave a presentation "Resource Development to Improve Potential of In-House VE Practitioners" to introduce the "Human Resource Development Program" to improve practical skills for value practitioners through resolving actual problems. The author already proposed "the basic curriculum and the application case study on this Human Resource Development Program" in his previous paper, and principle elements for problem solving ability and fostering of VE practical skill are considered as the following four points: (1) acquiring of essential skills; (2) making practitioners think with the acquired knowledge; (3) implementing value engineering activities; and, (4) pointing out problems of those value engineering activities.

This paper will show how to instruct value practitioners depending upon their level of VE practical skills and objects to which VE can be applied with more specific coping processes.

Seizing the Opportunity: MN/DOT's Initiative to Go Beyond the Federal VE Mandate

Gary R. Myers, PE, CVS

Recognizing the benefits of value engineering to its work program, the Minnesota Department of Transportation (MN/DOT) decided to investigate expanding their VE program beyond the federal mandate. The development of the expanded program entailed two phases: a pilot program to test the use of VE on projects not subject to the federal mandate and detailed development of the expanded VE program. The latter featured an inventory of six other state VE programs and consideration of nearly every conceivable facet of a state's VE program.

Selecting the projects to study using VE was a key issue. Simply lowering the dollar thresholds from the Federal requirements (i.e., $25 million for road projects and $20 million for bridge projects) would have been one way to expand the use of VE. The department recognized, however, that this would capture many projects that are not traditionally good candidates for VE, such as resurfacing projects. In addition, it would not be an effective way to prioritize the expenditure of limited VE funds.

Under the proposed program, projects will be selected for VE studies through a process that adopts familiar concepts already established in the field of risk (and opportunity) analysis. Two variables will be considered to evaluate the relative opportunity of each project in the state's work program for improvement via value engineering. The first, "potential for beneficial change," reflects project characteristics that have historically been associated with successful VE studies, including, but not

limited to project size and complexity. The second variable, "likelihood of change," acknowledges that changes identified early in the project development lifecycle have greater chance of being implemented than those suggested later as construction letting approaches. Combined, the two variables will allow Mn/DOT to rank order the projects in its work program based on their relative potential for improvement through VE.

Other key features of the proposed program include separate tabulation of "value added" proposals; guidelines for team selection, composition, size, etc.; and several measures aimed at handling the administrative and financial burdens of an expanded program.

As an indefinite delivery/indefinite quantity (IDIQ) contractor with Mn/DOT, Jacobs Engineering Group was hired to assist the department with the development of its program. The author led Jacobs's activities in completing this assignment.

The Structure and Support Required for the Ladder of Global Survival and Success

James Rains, CVS-Life, FSAVE, PVM

In real life when using a ladder, how often do you think about the rails of the ladder? For me, my thoughts focus on the rungs to insure that my weight is placed appropriately and that I do not tip the ladder to one side or the other. The fact is that the rails provide all the support for the ladder and all the weight that goes on each rung. Thus we can say that without the rails the rungs will crumble to the ground. In this paper the ladder rails represent the organization, the correct and proper organization that must be in place to support all the rungs on the ladder. The organization begins and ends with the organization's top leadership. Since the rails provide the support for the rungs, they also provide the thinking and mentality for the entire organization. One can think of this as having the mentality in the DNA of the organization. Thus the rails are like the arteries and veins of the human body. They carry the necessary nutrients to the body. In the ladder the rails carry also carry the necessary nutrients to the organization to insure that the techniques on the rungs of the ladder are carried out and utilized properly.

There are six main elements to the rails of the ladder:

1. Corporate Strategy
2. Focus on Long-term Profit Goals and Objectives
3. Customer Focus
4. Respect for Humanity
5. Respect for the Environment
6. Leadership

This paper is based on Chapter 2 of my new book, *Target Cost Management: The Ladder to Global Survival and Success*.

Synergy in Enterprise Change Models: Opportunities for Collaboration between Value Engineering and Lean/Six Sigma

Jay Mandelbaum, Ph.D. & Heather Williams

In many corporate and government organizations, process/product improvement techniques are often stovepiped. Sometimes this stovepiping is the result of the use of different vocabulary, tools, and/or methodology evolution. Whatever its cause, such stovepiping is bad. It creates destructive competition and sub-optimizes remedies by favoring a one-size fits all approach. There is substantial overlap in the principles of value engineering (VE) and Lean/Six Sigma, and the synergy of these methods has the potential for significant benefits to system quality across multiple disciplines. This paper will demonstrate how VE methodology and tools can be applied to augment continuous process/product improvement efforts with additional benefits for organizations and their customers.

Like Lean/Six Sigma, VE is driven by customer requirements and strives to create quality through collaboration and data analysis. Lean/Six Sigma utilizes a define, measure, analyse, improve, and control (DMAIC) approach. The VE job plan resembles value-stream mapping and the two can be collaboratively applied to improve a system's effectiveness and efficiency. Synergies between DMAIC and the VE job plan will be discussed. This paper will show how VE can contribute to the broader objectives of lean thinking within an enterprise by eliminating waste and to Six Sigma's practices in reducing variation within a targeted product or process. It will describe ways of using the VE job plan to find and eliminate the seven wastes identified in lean thinking. The paper will also discuss ways to use Six Sigma applications as an area to market VE capabilities in a complementary manner to enhance the benefits achieved.

Because VE offers a way to incentivize government contractors to reduce costs by sharing savings, VE facilitates problem solutions that might not otherwise be feasible. This enables even greater synergies among the methods. Therefore, the paper will also demonstrate how a successful synergy of VE with these initiatives has not only the potential to reduce waste and create value but also to provide additional benefits to the customer.

Total Value Improvement by Creating a More Robust VE Process

R. Terry Hays, CVS-Life, FSAVE

Value engineering (VE) has traditionally been perceived as a “cost cutting” tool and mistakenly perceived as one that sacrifices project performance for the sake of cost. This paradigm of being a “cost cutting” tool is largely because cost is the primary measurement used throughout the value study to analyze the project, identify improvements, and measure the benefits of the value study.

It is important to note that VE has been successful for over 50 years because it can and does significantly reduce project costs. But this success may be inhibiting our future. There are many who do not want VE on their projects because they perceive—and many have experienced—that the cost savings proposed reduce their project scope, quality, or features that they consider essential. As a result, many organizations have been reluctant to use VE to address their real problems and only use the methodology when required.

As long as the VE process is thought of as a cost cutting tool, the risk to the value profession is high. In most applications of VE, value improvement is addressed by focusing on just one part of the value equation—cost—as that is how the current process has been structured. While improvements to characteristics of the project other than cost do occur during value studies, it is by accident.

By developing techniques to integrate other critical project performance factors into the job plan, non-financial improvements to the project can result on purpose and total value improvement (improving performance *and* reducing cost) can result.

The technique to do this—Value Metrics—has been developed and refined over the past 10 years and has been proven to work. Value Metrics is a system of techniques designed to enhance the traditional value methodology. Value Metrics integrates critical performance attributes into the VE process at each stage of the job plan so that the team is focused on total value improvement and not steered toward just cost reduction, which the typical VE process does.

With Value Metrics integrated into value studies, it is possible to identify those project requirements and attributes that are most important to stakeholders and to integrate this information into studies so that more holistic, value-based solutions can be developed. This approach has consistently resulted in the development of alternatives that are better balanced with respect to the project's need and purpose. Value Metrics also permits project stakeholders to base their decisions on total value to the project, not just cost savings.

Understand Why Some Teams Click Using Organizational Behavior Theory and Psychology

Ashley Carson, CVS

All of us have walked away from VM studies exhilarated from the unique synergistic atmosphere created by that particular team. Likewise, we have all completed studies feeling disappointed that the group never "clicked" or "gelled." VM facilitators continually navigate through group development, regardless of whether we are familiar with or understand organizational behavior theories and the psychology behind them.

This paper focuses on applying Bruce Tuckman's Model of Group Development to VM team building to understand the group's evolutionary process to catalyze and expedite the group's transformation to a synergistic team.

Using the Stream Flow for Function Analysis in Construction Project

Chi-Sung In, CVS, Chang-Taek Hyun, Ph.D., PE, CVS & In-Il Namkung, AVS

VE is one of the construction techniques to eliminate the improperness, maximize the construction implementation, and be within budget. To adapt this VE methodology in design and construction phase in construction structure, the concept of VE, function analysis, needs to be improved to get rid of some weak points of process.

Most of the products in industry have their own main function stream and which has its own Function Flow, whether active or passive, such as liquid flow, electricity flow and power transition etc. For easier adaptation of function analysis, this study shows a kind of spectrum of function flow and how to apply to the products, construction structures and other projects with conceptual drawings and case study.

For activation of the VE methodology, especially function analysis in construction field, this study will be followed via stream flow concept.

Because of specific condition for construction process and unique function of each project, improper VE implementation takes place. To get rid of this situation, this study makes function analysis easier and becomes a new paradigm in construction field.

Value Analysis in Action: Launching an Award Winning New Approach to VA Training

Stephen Holmes, CVS

The Ontario Ministry of Transportation recently launched a new VA training strategy to increase organizational awareness of VA, introduce tools and techniques, and promote the use of VA from the ground up. The response has been overwhelming with requests for the training throughout the Ontario government. Over 99 percent of participants who submitted a course evaluation indicated they would recommend the course to others.

Learn what MTO is doing differently in delivering VA training in accordance with adult learning principles, why Value Analysis in Action earned a gold medal from the Canadian Society of Training and Development, and how you can do the same for your organization.

Value Engineering Applied to Mega Projects

Randall K. Sprague, PE, PP, CVS

This paper focuses on value engineering opportunities that assess the program as it progresses and, for the purposes of this paper, are referred to as a VE assessment study. Value engineering allows for a rapid, independent assessment of the mega project. It also allows for a reality check of where the project currently is, where it is going, and if original assumptions and goals are still valid. Value engineering can assess the project at a details or summary level for design alternatives, constructability, project risk, procurement, cost control, and program parameter validation. It can also incorporate lessons learned from ongoing construction. The results can then be applied to add value, mitigate risk, and make mid-course project adjustments.

Value Engineering in the Motion Picture Industry

Jeffrey Plant, MBA, P.Eng, PMP, AVS

From concept to release, the creation of a motion picture is a complex undertaking that requires patience, perseverance, talent, believers, investors, skeptics and critics. While many pictures may start with a good script and a champion, not all good scripts become motion pictures and not all motion pictures have good scripts. However, all motion pictures have at least one thing common: the champions were able to find investors and raise sufficient capital to produce the picture.

There is, for virtually every motion picture ever produced, an almost infinite number of ways in which the story could have been told. A story may be told with a $10 million budget or a $100 million budget. Once a budget is struck, the producer and director must decide how it may best be allocated: whether on cast, sets, stunts, special effects or locations, for example. Production decisions are made more complex by competing tax and cost incentives from a large number of jurisdictions and the inherent insurance, bonding and financing considerations. In all cases resources are inevitably scarce!

Value Engineering provides a sound basis for decision making in the production of motion pictures. By bringing together a talented group of industry professionals in a structured workshop setting, a Value Specialist can help the group to establish the essential story line functions that must be addressed by the motion picture, to identify the cost drivers and to identify alternative ways of conveying the essential story line information. The objective of value engineering in a motion picture context is either to produce a better picture within the constraints of the available budget or to convince the investors that a bigger budget would produce a much better picture!

The workshop will explore value engineering applications in the motion picture industry

Value Management Curve

Hisaya Yokota, CVS

The author developed the VE/VE techniques for project leaders and business managers to optimize allocation of resources and to maximize their values. The collect value is the accumulation of value of each resource. This can be shown in the Value Management Curve graph.

It is common knowledge that VA/VE can be an excellent problem solving methodology. Most project leaders and business managers would always endeavor to make the best use of resources in order to maximize the collected value. To apply VA/VE to projects and businesses in general, it is necessary to manage and solve multiple problems simultaneously.

The use of the Value Management Curve helps analyze the characteristics of projects for project leaders and businesses for business managers. It also helps them plan projects and businesses.

VE Process Applied to Optimize Current Production Profits

Miguel A. Sanchez, PE, AVS & Oscar Villegas, PE, AVS

The use of value engineering in product development and value improvement of an existing product portfolio is a key methodology that can dictate whether a corporation succeeds or fails during these critical economic times. Although the main effort of value engineering should be applied to new product development/processes where the room for value improvement is maximized, value engineering offers, as well, great opportunity to improve the value of products and processes already in production and where the profit levels must be improved to survive.

This paper will share ways in which function analysis on products and processes can be applied, in combination with other tools, to provide moderate value improvement despite constraints of pre-established product designs and process parameters difficult to change significantly and where time and resources are restricted.

VE Surprise Endings—You Gotta Love 'Em

Warren A. Knoles, PE, AVS

One of the most fascinating aspects of the value methodology is that its use in a Value Engineering study often results in surprising outcomes. This was certainly the case on the Morgan Street bridge replacement VE Study.

The City of Rockford was required by FHWA mandate to conduct a value engineering study for replacing a bridge over the Rock River and the Illinois Railwat (IR) in downtown Rockford, Illinois. The concept design for the project was an outgrowth of a context sensitive solution (CSS) design process that included a community focus-group-selected bridge type and a signalized intersection east of the bridge. It appeared that only minor value enhancements and/or cost savings would be feasible. However the value methodology led to two very unexpected outcomes that improved the performance of the project and reduced its cost to the city.

Surprise Outcome #1 - Function analysis of the railroad flagger cost element resulted in an alternative concept of temporarily relocating the IR rail traffic, which post workshop, led to a city-led permanent relocation of the IR rail traffic to a parallel rail line of another railroad. Permanent relocation of the IR railroad eliminated the cost of the railroad flagger during construction, provided an economical route to

transport construction materials to the bridge site, allowed the bridge to be reconfigured into a more economical span arrangement and eliminated four at-grade rail/highway crossings in Rockford. In addition, the abandoned IR rail structure and rail bed (utility value) were then taken over by the city for use as a recreational path (esteem value) in its community revitalization plan.

Surprise Outcome #2 – One of the study constraints was that a DOT-approved signalized intersection east of the bridge was to be excluded from value analysis. However, one of the VE team's creative ideas was to utilize a roundabout design instead of a signalized/channelized intersection design. As a scope exclusion (a "foul ball"), it was not allowed to be developed into a VE Proposal during the workshop, but the idea was described in the presentation to the city. The city subsequently reconsidered and authorized the VE team to develop a VE Proposal for this idea which revealed that it would provide the necessary capacity with a life cycle cost savings of $248,000. The Roundabout VE Proposal was ultimately accepted by the city and incorporated into the project. The value methodology turned a "foul ball" (out of scope idea) into a "base hit" (accepted VE Proposal).

This VE study demonstrates that even routine "check the box" studies with seemingly modest VE promise can result in surprisingly beneficial results. The power and effectiveness of the value methodology should not be underestimated.