

A QUALITATIVE COMPARISON OF INNOVATIVE MANAGEMENT TECHNIQUES IN THE CONSTRUCTION INDUSTRY

Mir Farooq Ali and Prof. Saadi Assaf

ABSTRACT

It has been observed by researchers that the construction industry is lethargic when it comes to integrating new and revolutionary management concepts or techniques that are being used to the full by the manufacturing industry. A host of new management techniques are being proposed to correct this deficiency. These include Value Management, TQM, Reengineering and Six Sigma. But there still is a lot of work to be done if the construction fraternity is to implement these concepts successfully in their management approaches. This research proposes to define the salient features of each management methodology for better understanding of them. Then it proposes to compare these management techniques using qualitative criteria which include level of training required to implement the technique, number of personnel required for successful implementation, cost of implementing these techniques and time of the implementation etc. to achieve the purpose of making these techniques clear not only to the highly qualified top management professional but also to experienced middle level project personnel.

BANK CARDS IN THE LIGHT OF VALUE MANAGEMENT: APPLICATIONS AND RISKS

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ABSTRACT

The present study investigates features that characterize the use of bank cards, credit cards, and other possible cards using the methodology of Value Analysis. Recently, there have been significant changes not only in bill paying but also in the kinds of risks involved (in paying for goods and services), therefore there is a growing need to explore some of these new developments. The expectations of banks and the needs of clients are very different concerning the use of bank cards. The present study examines these two characteristic users of cards with an aim to create optimal conditions of use for both participants. The research reported in this study sets up a hierarchy of requirements, a function tree, a product scheme, and a morphology scheme.

DEVELOPMENT OF FAST DIAGRAMS FOR MANUFACTURING PROCESSES

James D. Bolton, PE, CVS

ABSTRACT

If the Value Engineering profession is going to survive long term in the manufacturing sector of the economy, then it is the author's belief that the proper use of the Function Analysis System Technique (FAST) is critical to understanding function analysis for any manufacturing process. The best way to understand function analysis in

manufacturing processes is to properly develop a FAST Diagram for that process which has the consensus of the total workshop team. This paper seeks to demonstrate how to perform function analysis and develop meaningful FAST Diagrams for various manufacturing processes. By utilizing this methodology of FAST Diagrams for manufacturing processes, prioritized cost/function models may be developed which may then be utilized to prioritize the creativity phase of the workshop such that the highest cost processing functions may be reviewed first, followed by those which are ranked second, third, etc. In this way, the highest functional cost drivers for any given manufacturing process may be prioritized for an efficient creativity process. If these tools are understood by the manufacturing community, then there will be no end to the application and success of the Value Engineering profession in this sector of the economy.

IMPLEMENTING THE RISK ANALYSIS IN EVALUATION PHASE TO INCREASE THE PROJECT VALUE

By Yuh-Huei Chang, Ph.D., AVS and Ching-Song Liou, CVS-Life

ABSTRACT

It is necessary to evaluate each alternative's value to select the ideas for development. When the alternatives are concerned with the risk, then the implementation of the risk analysis with value methodology will be the best solution. There have been three papers presented at the SAVE International Conference which have discussed this issue in the last decade. They are (1) "The Integration of Value Management and Risk Management" by Mr. D. Q. Kirk, (2) "Risk Management Enhances the Effectiveness of Target Costing" by Dr. Benjamin C. Wu and (3) "A Strategy for Managing Project Risks in Value Management Studies" by Dr. Devadass P. Mootanah, etc... Each of these papers suggests a full scale risk management process to be integrated with the value methodology job plan; however, sometimes for an urgent value engineering study or a limited budget study, such a process is not practicable.

In this paper another alternative way of thinking will be proposed. By integrating the risk management directly into the evaluation procedure, the project can easily reach the consensus of risk control and the project cost will be reduced. Also, the authors will use a VE case study in the Taipei mass rapid transit system to explain step-by-step how to implement the risk identification and analysis process into the VE evaluation phase.

WHAT/HOW OF THE "WORK-OUT" METHODOLOGY: COMPETITOR OR COMPLEMENT TO VM

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ABSTRACT

Many companies are utilizing a Value Improving Practice methodology known as "Work-Out". Work-Out was created and deployed within GE, the same company wherein VE started. Work-Out is a fast-paced, facilitated, team-based problem-solving methodology. It has phases that are almost identical to those of the VE Job Plan, but it does not include a formal Function Analysis. This paper will share the What and How

of the Work-Out methodology, and offer ways that VM practitioners can grow their business by facilitating and enhancing Work-Out sessions.

OKEECHOBEE ROAD VE USING VIRTUAL REALITY SIMULATION

John Dovel, PE, AVS, Richard L. Johnson, PE, CVS, Del Younker, CVS, Chuck Hixon

ABSTRACT

In 1990, the Florida Legislature established the Florida Intrastate Highway System (FIHS). FIHS facilities are the backbone of Florida's economic stability and growth, carrying 32 percent of the State's traffic and 70 percent of the truck traffic on the State Highway System.

The Department has implemented an action plan program to address issues related to the increased congestion on FIHS facilities. Okeechobee Road, also known as US 27/SR 25 has been designated as an FIHS facility. US 27, connects numerous Florida Cities including Miami, Ocala, and Tallahassee. In Miami-Dade County, Okeechobee Rd is a major east-west through route connecting southwest Broward County to Miami International airport, downtown Miami, Port of Miami and Miami Beach. An Action Plan to improve Okeechobee Road comprises approximately 9.6 miles of roadway, nine signalized intersections, a frontage road with seven signalized intersections, and an adjacent Miami Canal on the south side. The town of Medley is located in the east portion on the south side of the corridor and the City of Hialeah Gardens is located in the east portion of the north side of the corridor.

This paper will present how the Department first used function analysis to define the major components and then used Virtual Reality Visualizations to visually show the site using GIS information with aerial photography and areas where each function could be addressed. The presentation will demonstrate the virtual simulation process to show how project stakeholders are able to see what the site would look like in three dimensional perspective with finished improvements on the site.

FROM PROJECT TO PRODUCT—FORMING VALUE INTO A NEW SHAPE

John G. Downer

The development of the Value Methodology from Value Analysis (VA) has carried the imprint of VA from its tools and techniques to a pre-occupation with maximizing the value equation. VA was developed to increase the value of manufactured products and it is hardly surprising that applied to major projects there are exposed gaps and demands on the methodology.

The growth in project complexities, team size and specialization, use of consultants have all conspired to confound a VA approach developed for products managed by a stable workforce team. Whilst the number and range of issues facing projects has grown, so inversely has the ability waned to withdraw for a "40 hour" workshop.

The paper describes how, for a project, the search for value that can be readily translated into tangible improvements in functionality or decrease in cost – or both, are found by mining the 'unknown' virtual shape of the project. This shape can be explored by combining systematic open questioning with function analysis. It is then that ideas

developed during the creative phase of a workshop can have real significance, resulting in a major increase of value.

MEMORY + PREDICTION = INNOVATION: GLANDS AND THE NEOCORTEX

Theodore C. Fowler, CVS-Life, FSAVE

Value analysis is a creative-problem-solving system. At its heart is that powerful viewpointchanger Function Analysis, but its soul is in the Creative Phase. This paper attempts to put a logical face on that disturbingly irrational process that Lawrence D. Miles² originally called his Speculation Phase.

In the early steps of the development of value analysis the speculation phase got little attention. It was not until the early 1950s that Miles realized that he needed outside help to optimize the process and he reached out to Eugene K. von Fange at the neighboring GE Advanced Engineering Program in Schenectady. Together they defined an optimum sequence of steps that would often create unique alternative solutions to a problem.

Their initial methods were later generally replaced, both at GE and later in other value programs, by the new method of Osbornian Brainstorming that became the de facto standard for the Creative Phase. Since that time, literally hundreds of other organized methods of ideation have been used in value analysis studies, from Morphological Synthesis to Crawford Slip Writing, from Syntectics to the tabular listing methods of

Checklisting and TRIZ with little understanding of the actual process by which ideas are generated in the human mind. Two literary and scientific geniuses: Koestler (1964)³ and Hawkins (2004)⁴ have separately revealed the details of the functioning of the human parasympathetic nervous system and the human brain's miraculous neocortex. This paper puts these two theories together. Value practitioners are provided with a rational foundation in their search for the ideal creative problem-solving process. A three-step idealized process is suggested which builds upon this new understanding.

APPLYING VE+TRIZ METHOD TO THE PLANNING PHASE OF A DEVELOPMENT PROJECT CASE STUDY OF COMFORTABLE REST ROOMS FOR SHINKANSEN RAILCARS

Mr. Yuichi Hamamoto

ABSTRACT

It is not easy to create ideas that are aimed for the future and to describe a vision for a system being developed when a firm develops a new product.

One of the author's purposes was to determine whether a method to integrate VE with TRIZ, which has features that make it possible to create ideas aimed for the future and to describe a vision for a system being developed, would be helpful. The case study was the development project of comfortable rest rooms for Shinkansen railcars.

The vision of comfortable rest rooms for Shinkansen railcars became a novel one, different from rest rooms of railcars now in use.

This paper gives a summary of the VE+TRIZ method and the case study of the development project of comfortable rest rooms for Shinkansen railcars.

VE/TRIZ: A TECHNOLOGY PARTNERSHIP

Peter Hanik and J. Jerry Kaufman, CVS, FSAVE

ABSTRACT

Value Engineering and TRIZ have been perceived as two powerful, independent, but often, competitive problem solving tools. Practitioners of both VE and TRIZ admit to the strengths and weaknesses of each process. To date, little has been achieved to synergistically merge these disciplines to overcome the weaknesses in each discipline. This paper will address how VE's FAST model can be used as a process link, or bridge, to improve the outcome of VE project studies.

The weakness in Value Engineering is in the "Speculation Phase." Value Engineers have selected Brainstorming as the primary method for performing the Speculation phase of the Job plan, with impressive results. However, the process is limited by the creative capacity of the active VE Task Team members.

The Creative Phase of TRIZ is not bounded by the capacity of its team members. The process can access literally thousands of inventions, without paradigm limits, in its quest for innovative solutions to overcoming "contradictions," or the project goals and expectations. The weakness of the TRIZ process is in the project pre-event, or framing, and the valuation of the innovative proposals as justifiable business cases.

From VE's perspective, the key to quickly sort through the thousands of potential proposals is to clearly and precisely define the problem in functional terms. The FAST Model, in its current form, achieves the problem definition requirements. The FAST Model can be incorporated directly into a TRIZ functional model that drives creation of directions for problem solution. Additions can also be made to the FAST Model to produce additional creative directions from TRIZ.

The paper will offer "how to" process steps and case study examples to demonstrate the effectiveness of the technological partnership of VE and TRIZ.

HIERARCHICAL CONCEPT MODULES FOR IMPROVING FUNCTION ANALYSIS OF CONSTRUCTION VE PROCESS

Chi-Sung In, CVS & CCM, Chang-Taek Hyun, and Kyo-Jin Koo

ABSTRACT

Due to unsuitable execution of function analysis and function classification in the construction Value Engineering (VE) process, VE applications to the construction industry are considered to be less frequent and efficient than they are in the manufacturing industry. To resolve this problem, a new technique of function analysis, Hierarchical Value Engineering Concept Modules (HVECM), was created for

practically integrating function definition, function classification and FAST diagramming of the construction VE process. In HVECM, which is based on the Sticking Architecten Research (SAR) methodology and Systematic Value Methodology (SVM), zones (á, â, ã, ä, and å) and margins (e.g., Å between á and â) are composed to hierarchically execute the function definition and the function classification. For case studies, the potential of the HVECM is verified in terms of concurrent implementation of function definition, function classification and FAST diagramming with continuous hierarchical co-relation. Keywords : Construction Value Engineering, Function Analysis, Hierarchical Value Engineering Concept Modules, Sticking Architecten Research, Systematic Value Methodology.

INTERSTATE 595 CORRIDOR VALUE ANALYSIS PROCESS

Richard L. Johnson, PE, CVS, Rocco DePrimo, PE, Del Younker, CVS, and Chuck Hixon

ABSTRACT

Florida Department of Transportation (FDOT) has undertaken an innovative multi-study VE approach for a \$1 - 2 billion improvement project for the Interstate 595 (I-595) Corridor in Broward County. The process involved a one-day kickoff meeting to introduce the team to the project and the process. The team consisted of 25 people from representative divisions within FDOT and some outside consultants that were broken up into three teams that focused on specific segments of the corridor. There were a series of five-day studies that followed where the teams were guided through the five-step VE process for the planning and development of project concepts.

The proposed improvements are planned for I-595 from I-75/Sawgrass Expressway Interchange to East of the I-95 Interchange. A master plan has been completed and the identified Locally Preferred Alternative (LPA) was adopted by the Broward County Authorities and FHWA.

The proposed improvements reviewed by the three teams during the kickoff meeting included:

- Turnpike and I-595 Interchange
- Viaduct over Pond Apple Slough
- I-595 Entire Corridor

Scope of the VE Process

- The FDOT has advanced the project into the Planning Development & Environment phase
- Differs from normal PD&E due to complexity, size and integration with other projects
- VE effort will encompass a 16-month process defining the system geometry
- Each VE effort will focus on design packages

- Each design package will be coordinated with the system requirements
- Consistency will be maintained with the LPA intent

The Florida Department of Transportation (FDOT) assembled a Value Engineering (VE) team to investigate the best use and configuration for the facility. The team was comprised of professional consultants and FDOT personnel.

VE ACCOMPLISHMENTS IN ROLLING STOCK MANUFACTURING AT JR-EAST: APPLICATION OF VE IN MANUFACTURE OF RAILCARS

Takeshi Kawamura

ABSTRACT

Over 100 VE projects have been completed since JR-East's Niitsu Rolling Stock Manufacturing Factory started its commitment to VE activities in 1995. Making much of the ideal situation that the company's activities cover the whole lifecycle of their product, the plant has actively and effectively utilized information from other activities of the company. Its achievements in VE include reductions in the initial and lifecycle cost, the environmental impacts, and the frequency of malfunctions. In addition, seeking to create new value, we have been expanding VE activities into the development/design stages since 2004.

MANAGING SCHOOL DESIGN FOR LIFE CYCLE COST EFFECTIVE, SUSTAINABLE, CULTURALLY RESPONSIVE VALUE: VALUE PLANNING DESIGN CHARRETTE

Stephen J. Kirk, Ph.D., FAIA, FSAVE, CVS, LEED™ AP and Michael M Paquette, AIA

ABSTRACT

School case study to illustrate application of the value planning approach and principles followed in a recent design Charrette workshop. The project is a kindergarten through 8th grade Sioux Indian day school which will house educational classrooms, gymnasium, dining, administrative offices and support spaces appropriate to the functions required. Early childhood and adult education needs are also accommodated in the project. The value methodology (VM) was used to manage school value since the budget did not accommodate all the space needed for the school. Other performance enhancements included sustainability/ LEED, cultural expression, and school image.

IMPROVING ALIGNMENT WITH CUSTOMER REQUIREMENTS THROUGH VE AND CBA

John E. Koga, CVS, AIA, LEED AP and Theresa Lehman AVS, AC LEED AP

ABSTRACT

Having been challenged by a Mayo Health System affiliate to review the recommendations of two prior engineering firms for new mechanical heating systems in a hospital's central plant, we used the VE Job Plan and prepared a baseline FAST

Diagram. The study team recognized that enough good alternatives already existed. Value Mismatch was difficult to credibly quantify and creativity was not the answer to developing best value. Selection of the correct alternative was the problem now as it had been from project initiation. Project design was being delayed pending customer acceptance of the solution. We resorted to testing the advantages and life cycle cost of each solution. Charting this information as recommended in the Choosing By Advantages Decisionmaking System (CBA) expedited clarity and customer acceptance in only a few hours. To assure quality, we continued to check the information after the meeting and concluded the correct decision had been made, though it was different than prior recommendations of two engineering groups. This decision was completely aligned with customer requirements enabling their decision to proceed. This paper explains the process, its advantages and how it helped achieve the conclusions in our report.

THE VALUE OF SUSTAINABILITY

John E. Koga, CVS, AIA, LEED AP and Theresa Lehman AVS, AC LEED AP, CxA

ABSTRACT

In the ever-changing dynamics of business and government, the one thing that stays consistent is focus on the bottom line. As value practitioners, our focus is on the adaptation of the value methodology (VM) to meet these ever-changing requirements, especially when incorporating perceived “premium” items such as sustainable or “green” techniques into design and construction. Green buildings are not just a trend in the design and construction industry; they are a transformation in almost every sector within the industry. As value practitioners, it is our goal to prove that sustainability makes financial sense and improves value.

When discussing sustainability with a client, the first question we hear is, “What is the premium to build “green”?” This question automatically assumes that there is a premium to build green. And if we anchor the question, then we ask ourselves, “As compared to what?” More than the “normal” design and documentation fees of the design/build team; more than the actual construction costs of a conventionally built building; more than the client’s established budget; or more than the “normal” holistic costs of occupying, owning and operating a building? As value practitioners, we use a methodology that utilizes specific guidelines for establishing value based on our client’s project requirements, goals, and expectations, and often it is our primary responsibility to help develop appropriate budgets to meet these goals. We need to show our clients the total direct, indirect and external costs, as well as the benefits of sustainable design and construction in a holistic approach throughout the life-span of a building; from design to construction, to operation and maintenance, to occupant’s health & productivity issues.

Many studies have been conducted and all have produced similar findings. “Many projects achieve sustainable design within their initial budget, or with very small supplemental funding, however it is our experience that it is the construction cost implications that drive decisions about sustainable design. This suggests that owners are finding ways to incorporate project goals and values, regardless of budget, by making choices.”¹ Meaning, the choices being made to incorporate sustainability into design & construction are a result of value the client sees in the economic and environmental benefits of “green”.

So what are these “green” benefits? How do we show the value? The answer is simple. Overlay your client’s project requirements over the top of the LEED® rating system using value methodology. It’s that simple. Use the Job Plan, create a FAST diagram, select alternatives that will benefit the client based on their advantages, identify value mismatches, use some creativity, develop best value solutions, test the advantages and life cycle cost of each solution, and verify the solutions align with your client’s project requirements, enabling them to make decisions based on their definition and goals of sustainability. This paper will demonstrate the value in sustainable design and construction, will provide an understanding of the capability sustainability has in the construction industry, and why building green was the right choice for one client.

21ST CENTURY CUSTOMER VALUE: DISCOVERING HOW TRADITIONAL VM/VE FITS BIG PICTURE CAPITAL INVESTMENT

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ABSTRACT

We believe the demands of Project Teams in major capital investments in the 21st Century requires professionals supporting teams, and projects, to have a much broader skill set than those routinely expected of the “Traditional Value Engineering Practitioner.” Furthermore these approaches should exhibit a consistent, repeatable process which is underpinned by both proven theory and record of credible practice.

This paper describes such a proven integrated decision process that we use to guide and to assist project teams in assessing and planning both their early asset assessment needs, & in achieving their project delivery objectives. Advanced Decision Analyses (DA), Value Management (VM), & Project Management (PM) professionals routinely use some of the tools described herein. We document a rigorous application of several traditionally diverse tools, which are now linked together in a new synchronized and rational order. Additionally we introduce some new tools which have proven their worth in 50 Major Capital Investment Workshops over the last 3 years.

During early project stages, this integrated DA and VM approach has led to a better understanding of the business (project) opportunity and allowed Project Teams to develop a viable and compelling project execution plan for Management consideration. At strategic points during the early project cycle, the concepts of Analyses of Function can be utilized to frame the functional (organizational) work requirements. This framing is necessary to deliver a rigorous “Investment Support File.” Consequently, Management will be able to make informed choices about major capital investment, while having a better understanding the Quality of the Decision being made.

Some major concepts addressed in this paper are Tools and an Overall Business Process:

- How to Apply Phased Investment aligned with Corporate Strategy.
- How to Frame the Results to be delivered by the Opportunity / Project.
- Understand the Business and Social Priorities.
- Engage the Multidiscipline Project Team in Decisions to be made and Uncertainties to be addressed.
- How to select the Value Improving Practice (VIP) Tools appropriate to developing the Project towards funding.

- Plan the Project and define Roles / Accountabilities Interfaces, & Milestones.
- Assess the Quality of Decisions and Project Value Status and gain insights to the Value of additional information.

This methodology described here has been applied in over 50 major investment workshops within the last 3 years.

COLLABORATIVE ACTIVITIES MAKE BETTER RESULTS FOR VALUE STUDY

Chi-Yuan Lo, DBA and Larry Jung Hsing Lee, CVS

ABSTRACT

Value study is a systematic approach to get fruitful results, especially when the study team is formed by right functions of professionals. However, it is not easy to gather all the experts at the same time. So, collaborative activities can be performed in this situation to involve needed professionals. This paper describes various collaborative activities with case studies. By issuing Value Policy in company as well as to suppliers, the case company promotes a lot of collaborative activities with her customers and suppliers. During the Value study, we also form several virtual teams for some certain subjects to find out more solutions. Through emails, phones, video conference meetings, and shared discussing websites the FAST diagrams are developed and lots of ideas generated and exchanged. Finally, the improved alternative suggestions are developed. The results prove that collaborative activities can really make better results for value studies.

HOW TO BETTER MANAGE AND PROMOTE YOUR VE PROGRAM WITHIN YOUR COMPANY

Clifford Louie

ABSTRACT This presentation gives some ideas and suggestions on how new and existing VE managers can better manage their VE programs within their companies. Topics include: creating and achieving VE goals, promoting the VE program, conducting in-house VE workshops, and benefiting from lessons learned.

VALUE ENGINEERING AND DESIGN

Edward S. McMahon, AVS

ABSTRACT

An engineering design process has been developed based on: (a) design as a transition from a functional description to a physical description, (b) concepts from Value Engineering, and (c) an emphasis on the customer.

The design process begins with the identification of a customer function; what the device does, and the target cost. The customer requirements are derived from the customer functions. These customer requirements will be used to validate the design. A FAST diagram is developed based on the customer function and the technical functions.

The technical requirements are derived from the technical functions. A function-based House-of-Quality is built to determine the relationship between the customer requirements and the technical requirements. Target costs can be apportioned to customer functions and allocated to technical functions to establish function/cost guidelines. Functional synthesis is used to generate ideas for the functions. The function cost for implementing the function is compared with the allocated function cost. The design is connected with new technologies by defining the technologies in functional terms. This function-based methodology deviates in seemingly small ways from traditional design methodology but the continuous thread of functions enhances the design process.

THE FUTURE OF YOUNG MEMBERS IN VE: POSSIBILITIES & HOW TO GET THERE

Lisa Mitten, AVS

ABSTRACT

To ensure that value engineering continues to the next generation, SAVE International and individual VE consultants and firms need to act now to identify, train and nurture young value practitioners. What is the best way to achieve this? This paper examines the nature and interests of SAVE International and individual VE consultants, and then proposes that the best way to support young members now would be for SAVE International to lower the barriers to entry into value engineering by reducing the cost of training and attendance at the annual conference for young members. After the costs are lowered, it is up to individual VE consultants and firms to bring young members into the community.

MONEY FROM AN INTUITIVE PERSPECTIVE: ANOTHER APPLICATION OF FUNCTION ANALYSIS AND FAST TO UNDERSTAND DECISION-MAKING IN PRACTICE

Gary R. Myers, PE, CVS

ABSTRACT

Organizations seek a rational approach to money by employing accounting practices that often differ from those intuitively employed by individuals. Organizational practices appear to be superior, while, in contrast, the way that individuals treat money often seems haphazard and even irrational. As a result, individual practices are often labeled as biased and flawed.

This paper asserts that maligned individual practices can be shown to be logical and reasonable. To support this premise, function analysis and FAST are used to reveal the tacit reasoning behind the apparent biases demonstrated by numerous psychological experiments. The logic of this tacit reasoning is then shown to result from the presence of valid alternative perspectives on the decision at hand.

The resulting understanding of these alternative perspectives allows a value practitioner to guide teams to analyze monetary decisions in a manner that resonates with the intuition of the study members.

VALUE MANAGEMENT IN HEALTH CARE (“ THE PRODIGAL BEGGAR”)

Dr. Ferenc Nádasdi , CVS, Ph.D., Dr. Mária Berényi, AVS, and Kornélia Vámosi, AVS

ABSTRACT

The Module I workshop is taught at the College of Dunaujváros in two semesters (60 contact hours+30 hours of home assignments). In the second semester, the students are required to select a task for a “mini” project. One candidate for such a project is the field of health care. Value Analysis may play a key role in health care as well. At the moment, the available information is rather scarce in this field. One promising area in this respect is the production and use of pharmaceutical drugs. In our research, we have investigated why there are so many pharmaceutical products with the same function but with a different price. Very often there are several products for the same disease. Specialists argue that this is because the affected groups of patients are not homogeneous. The groups of patients may be divided into various sub-groups on the basis of e.g. allergic reactions. Together with our physicians we have come to the conclusion that the information provided by the patients are not sufficient for making the right decision when establishing the demand for a drug. In the first place, patients provide information about their own condition. The physician then performs several further examinations (with or without instruments), but the final decision must be made by the physician. At the same time, function analysis can greatly assist the physician to make the right decision that is optimal for the patient. The paper will present a specific example for this kind of cooperation.

CII'S NEW ON-LINE VALUE MANAGEMENT TOOLKIT

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ABSTRACT

An introduction to the Construction Industry Institute's (CII) Value Management Toolkit was presented at the SAVE Annual Conference in 2003. Now, two years later, this paper will describe the finished on-line product. The VM Toolkit is CII's first integrative Value Management initiative that revisits some established value processes and also characterizes some relatively new techniques. It was developed by a project team that represents a diverse cross-section of CII members: from government to manufacturing, and from building to industrial sectors. The goal of the CII VM Toolkit is to increase industry's awareness of the wide array of Value Management Processes (VMP's) that go beyond basic project management, to facilitate the selection of the right VMP's for individual projects, and to offer implementation aids to assist users. It is a web-based resource that blends fundamental process information - in the form a two-page Descriptive Profile for each of the 44 identified VM Processes - with a VMP Selection Tool that screens and selects specific VMP's for use based on multiple selection criteria. Recently initiated, a CII Education Module for the Value Management Toolkit will be developed to further enhance the understanding and application of the tool.

A NEW EVALUATION METHOD OF INTERACTION EFFECTS USING COMPOUND ADDED FUNCTIONS AND THE ANALYSIS ON ITS RELATIONSHIP TO THE ATTRIBUTES OF POTENTIAL CUSTOMERS

Masao Okuhara, Masayasu Tanaka, and Hiroo Hirose

At 2004 SAVE Conference, the authors have proposed a method for actually evaluating the interaction effects produced by compounding added functions monetarily using the 3 indices of the amount of the interaction effects, the ratio of the interaction effects, and the rate of recognizing the interaction effects, and clarified its usefulness. In this study, they further analyze the difference in the scale of effectiveness of interaction effects caused by attribute difference of potential customers, and clarifies the relationship between the attributes of potential customers and the interaction effects. They demonstrate that leveraging the relationship between the potential users and the interaction effects can help calculate predicted selling price, which is the key to establish a strategic product concept-making, a standard selling price and a target cost.

A NEW METHOD FOR GENERATING CREATIVE IDEAS IN MANUFACTURING VE FOR MATURE PRODUCTS

Noboru Onaya, VES

ABSTRACT

It is hard to generate high-quality, creative ideas for process improvement in the manufacturing stage due to constraints associated with customer expectations and manufacturing conditions. In other words, people become less and less able to deal with this type of problem through simple brainstorming techniques for idea generation. This paper proposes a new method to bring about creative ideas to ensure an enhanced idea generation phase of VE activity in the manufacturing stage. It consists of three steps: 1) brainstorming as a basic technique, 2) creating a checklist for the manufacturing process, and 3) integration of QB, a step in the NM Method.

VALUE METHODOLOGY SUCCESSFULLY LEADS TO COST-EFFECTIVE TREATMENT AND DISPOSAL OF MIXED LOW-LEVEL WASTE RETRIEVED FROM THE 218-W-4C BURIAL GROUND

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ABSTRACT

Bechtel Hanford, Inc., under contract with the U.S. Department of Energy (DOE), has committed to identify technologies and methods to be used as part of environmental remediation activities that would lead to cost-effective treatment and disposal of waste while still providing protection to workers and the environment.

Approximately 9,000 drums of mixed low-level waste (MLLW) from the 218-W-4C Trench are being proposed for treatment and disposal in the Environmental Restoration Disposal Facility (ERDF) at the Hanford Site. The MLLW that is being retrieved from the 218-W-4C Burial Ground is contaminated with hazardous substances and radionuclides. The vast majority of the drums are reported to be filled with "step-off pad"-type waste. Because of this, the drums are considered to have significant void space potential that could adversely impact the integrity of the future ERDF cap if not addressed.

To resolve the above-mentioned problem, potential optional methods were evaluated in order to select a method by which ERDF can receive, treat, and dispose of this waste stream with the least possible life-cycle cost (LCC). The evaluation used a value engineering process and considered a limited set of treat-and-dispose options against criteria established during subsequent meetings.

The value engineering study was performed in two distinct phases: Phase I for developing and weighting criteria for evaluation and selection of treatment and disposal ideas, identifying the “base case” of operations, and pre-screening and selecting other “options” as potential candidates for treatment and disposal of MLLW; and Phase II for preparing LCCs for the base case and selected options, and recommending the best solution.

Under the Phase I study, the base case and five other options were selected for further detailed study for the treatment and disposal of MLLW. Subsequently, DOE selected an additional option for further study. Through the Phase II study, the base case and the six selected options were evaluated using value methodology techniques. The team determined and compiled rankings based on LCCs and advantages and disadvantages and arrived at composite final rankings for the base case and the six selected options.

In the final analysis, the value study team determined that the option described below, with the least LCC and best final ranking, provided the best solution for treatment and disposal of MLLW retrieved from the 218-W-4C Burial Ground.

Recommended Option: Send MLLW debris in drums from the Central Waste Complex directly to ERDF for disposal and macro-encapsulation within Environmental Restoration Contractor designed and -constructed structural concrete vaults at ERDF.

The recommended option will comply with ERDF waste acceptance criteria, will not jeopardize the integrity of the future ERDF cap, and provides substantial protection to workers and the environment. It also identifies potential savings of approximately \$3 million (30% of base cost) compared to the cost of the base case. The project accepted the team’s recommendation and commenced implementation of the same.

INTEGRATING LEAN WITH VALUE ENGINEERING

Donald E. Parker, PE, CCE, CVS, FSAVE

ABSTRACT

Lean thinking is a concept that has blossomed in the last decade to be a manufacturing savior. This paper describes the Lean concept and outlines how value engineering is the complementary methodology to use with Lean programs for effective results.

This paper is based on knowledge of Lean principles described in two books, both of which can be purchased from Amazon.com.

The first book is “Lean Thinking,” the latest technique in the last decade to influence the manufacturing segment of our nation. The book is an excellent read to learn the basics of ‘Lean’ and is recommended to all. It is authored by James P. Womack and Daniel T. Jones ©1996, Simon and Schuster.

The second book is "Lean Enterprise Value," © 2002, Palgrave. It was written by 13 authors based on insights from the 8-year Lean Aerospace Study being conducted at the Massachusetts Institute of Technology. Their credentials include: three members of the U.S. National Academy of Engineering; fellows and past presidents of the Institute of Industrial Engineers and the American Institute of Aeronautics and Astronautics; a fellow of the American Association for the Advancement of Science; a former secretary of the U.S. Air Force; a former head of MIT's Department of Aeronautics and Astronautics, a former deputy dean of MIT's Sloan School of Management; and significant careers in the aerospace industry and U.S. Navy.

SCOPING PROJECTS WITH VALUE ENGINEERING TO OBTAIN CONTEXT-SENSITIVE SOLUTIONS

Mike Pearsall, P.Eng., AVS

ABSTRACT

The growing interest in Context Sensitive Design (CSD) over the past decade has led to increasing opposition to the Value Methodologies, as historically many Value Engineering (VE) studies on construction projects have focused more on reducing cost than truly increasing value. Furthermore, these same studies are often conducted after design has been initiated and there is less opportunity for value improvement and less willingness to accept change. Far too often resistance to the Value Methodologies is encountered from those citing examples of 'stripped' projects. A notion has developed that VE and CSD can't co-exist on the same project. In reality the processes share a lot in common as they both involve a collaborative, interdisciplinary approach to the project. The incorporation of project Performance Measures into the VE process has provided a means by which stakeholder's objectives can be captured, weighted, and used to evaluate value improvement concepts. More importantly, using the Value Planning approach, this process can be used at the outset of a project, or at a major project decision point, as a scoping tool to aid in building the right project. The result of using select Value Engineering techniques at the right time in a project can be a Context Sensitive Solution with increased value further promoting the use of Value Engineering.

CREATING AND MAINTAINING AN EFFECTIVE AND SUCCESSFUL VALUE ANALYSIS PROGRAM

James A. Rains, Jr., CVS, FSAVE

ABSTRACT

The Value Methodology is beginning a rebirth of growth across industry. Many companies are re-adopting or establishing for the first time value improving groups with responsibilities to initiate and maintain value analysis (VA) programs within their organizations. The author worked in a successful VA program that existed for over 20 years. He has seen many corporate programs that have disappeared for various reasons. This paper will identify the key steps to create a VA program for your company. A second purpose of this paper is to identify elements of a successful program to insure longevity and perpetuation. Finally the author will list key responsibilities for those that work in a value improving department. The Value Methodology is a term offered by SAVE International about ten years ago as an umbrella definition for what we do.

The remainder of this paper will use the term value analysis because that is the term that was first used for our methodology.

STAR TRACKING: A FIVE POINT, OMNOLOGICAL SYSTEM FOR PROGRESS AND REALIZATION

Jeff Rude, AVS

ABSTRACT

We value practitioner are of a mindset that the value methodology can do virtually anything. We often use it outside of our professional lives with groups we belong to, in our own decisions, maybe even to build a house, and we sit back making theories on just how far this methodology really could go.

The Star Track is an exploration into just how far we really can go. Combining three different scientific and organizational theories, including the six step job plan the Star Track is a process to turn the spirit into the flesh and make the ordinary extraordinary.

Called the Star Track for its ability to bring out the star qualities of an individual, a group or just about anything dealing with humans that are striving for something more. Though still in its beginning phases as a full workable process, this paper should help to introduce the theory behind the system itself and also show what need it fills in our society.

INTRODUCING SUPERIMPOSED F.A.S.T IN PRIVATIZATION DECISION MAKING

Prof. Emad W. Shublaq, Ph.D. (Civ), CPEng., CVS, F.IEAust., F.ASCE, F.AITD

ABSTRACT

In this paper, value engineering approach is used as a vital tool in contributing to Privatization (private participation) transactions in Saudi Arabia. The application of VE is presented here in by integrating business process re-engineering and privatization processes of Sea water desalination. As a result, a decision making approach is demonstrated and a superimposed F.A.S.T, may be for the first time, is introduced.

SUCCESSFULLY UPGRADING LEGACY SIMULATION EQUIPMENT USING THE VALUE METHODOLOGY

Mr. Everette J. Stephens

ABSTRACT

Modernization of computer based training and simulation systems are an ever-present concern as hardware platforms mature, and software-operating systems improve. The struggle to balance the considerable investment in the legacy systems against the possible enhancements achievable by inserting new technology is best evaluated by multi-disciplined teams including users, maintainers, planners and developers.

The need for success validates the importance of conducting a focused work-study or workshop event to rapidly reduce complex problems/challenges to a workable solution. It demonstrates that teamwork provides the needed capabilities and achieves across-the-board acceptance, especially by those who have to implement the results. Use of the Value Methodology allowed several diverse ideas to be compared to one another. The teams looked at feasibility, risk, cost and life cycle considerations while maintaining focusing on the functions and meeting the customers needs and expectations.

THE EFFECTIVENESS OF CONJOINT ANALYSIS IN VE FUNCTIONAL EVALUATION

Kenji Takaki, VEL

Value Engineering addresses functions of products or services as subjects of study, and the functions must be the ones which are necessary for customers. In allocating the limited management resources effectively to those areas of greater importance through function-oriented VE activity, an important stage for selecting the functional field to improve is the functional evaluation stage, which determines the direction of VE activity.

In this paper, the author applies consumer behavior analysis in this important functional evaluation stage in order to determine the direction of VE study, aiming at customer satisfaction by evaluating functions from the standpoint of customers. He selected conjoint analysis as specific method for analyzing and examined the effectiveness of the demonstration by a questionnaire survey.

VALUE STREAM MAPPING & VM

William C. Thorsen, AVS, LEED AP

ABSTRACT

Value Stream Mapping is the simple process of directly observing the flow of information and material as they occur and summarizing them visually. It is a tool being used by General Motors to analyze process flows from a systems perspective and to document the performance of the process. A Value Stream involves all of the steps, both value added and non-value added, required to bring a product or service through the process steps. Value Stream Mapping (VSM) is a visual tool used to help see the hidden waste – and sources of waste – in the value stream. A Current State Map is drawn by a cross-functional, multi-disciplined team to document how things actually operate (this is the “as-is” process vs. how it should be). Then, a Future State Map is developed to design a lean process flow through the elimination of the root causes of waste and through process improvements – all leading to an Implementation Plan that details the action steps needed to support the objectives (the what, who, and when). This paper will demonstrate the Value Stream Mapping techniques and discuss the application to the Value Methodology.

AVOIDING THE CHAOS: USING VALUE MANAGEMENT TO ACHIEVE INTEGRATION FOR MERGERS AND ACQUISITIONS

Thomas Wiggins, CVS

ABSTRACT

Value Management (VM) is a powerful problem solving tool used successfully in both product improvement and development ('hard') and business operations improvement ('soft') applications. If business literature is any indication, post-merger integration is a serious and difficult issue. Integration is change, which is often not well planned or easily accomplished. Practitioners know the power of VM to improve value in change situations and can offer a fresh approach to planning and implementing integration strategies. An understanding of basic integration strategies and issues allows VM practitioners the ability to insure that some key, but often overlooked, elements of proper integration planning are part of the integration workshops. The paper discusses basic integration strategies and issues, particularly the apparent lack of concern for company climate or culture during integration planning. The paper is the result of living through an acquisition and the subsequent integration process. It suggests that there is a vast market opportunity in need of a better way. It suggests that Value Management could improve the process and outcomes in post-merger integration.

DISCOVERING THE REAL PROJECT USING BUSINESS PROCESS MODELING

David C. Wilson, P.Eng., CVS

ABSTRACT

The Value Methodology (VM) has been successfully used for six decades to enhance the value of projects. Although some innovations have been introduced along the way, many VM practitioners are somewhat reluctant to stray away from the traditional 6-step job plan to embrace new analysis techniques that could enhance their understanding of how the project should work. It is generally expected that the core activity of VM – function analysis – will reveal a good understanding of how the project should work. The track record suggests that this is a good bet. But what happens when it doesn't? What do VM practitioners need to do when they still do not have a good understanding of the underlying needs of the project? Business process modeling (BPM) can be used to provide additional insight into the project. In some cases, BPM can reveal the real project and/or associated issues to enhance the function analysis activity. This paper provides a general overview of the BPM method and how it can be integrated into the VM Job Plan. Two recent successful case studies are presented to highlight BPM. Finally, the paper highlights the key tips, tricks, and traps of BPM.

PROJECT SCREENING IN A TARGET RICH ENVIRONMENT

David C. Winyard, BSME, MSME

ABSTRACT

At the Defense Supply Center Richmond, which is responsible for procurement and supply of almost one million parts for military weapon systems, value improvement opportunities abound, but keeping up with changing national priorities makes it difficult to set and maintain project priorities. By gradually shift its focus from reporting procurement savings to improving the overall value provided to customers, the Center's Value Engineering Program has taken strides toward greatly improved long-term benefits to America's armed forces.

A VALUE MANAGEMENT APPROACH TO IMPROVING QUALITY PERFORMANCE

James R. Wixson, CVS-Life, CMfgE

ABSTRACT

In October 2001, the Department of Energy's, Office of Price-Anderson Enforcement determined that the continuous improvement aspect of the INL Quality Assurance Program was inadequate. At the request of the INL Senior Management, a Quality Assurance Operations (QAO) Task Team was identified and requested to review the INL practices to determine whether the INL was performing the activities that are required for Quality Implementation. The team consisted of INL managers from Operations, Quality Assurance, Document and Records Management, Construction Services, Radiological Control, and Engineering. FAST modeling combined with other analytical techniques were used to identify areas for improvement and resolve the issues related to inadequate continuous improvement efforts.

VALUE ANALYSIS: AN EFFECTIVE TOOL FOR ORGANIZATIONAL CHANGE

Jill Ann Woller, CVS, FSAVE

ABSTRACT

Value Analysis (VA) is a powerful tool for facilitating change within organizations when studies are carefully planned and supported by senior management. The results include empowerment of line staff to be agents of change, solid proposals for improvement, and a roadmap for moving from the status quo to a new paradigm. Sensitive facilitation is one key element for success, as is thorough preparation in documenting the current process under review. Since change is uncomfortable for most of us, a safe environment must be established to encourage the full participation of internal staff team members. Candor leads to the development of good ideas and also fosters teambuilding. The structured VA job plan is an asset in keeping the group focused on their mission. Additionally, the use of function vocabulary helps to disconnect the team from their current process to enable them to see alternatives. The Value Methodology is a proven tool for process change within organizations as long as acknowledgement of human factors forms the centerpiece of the effort.

PAIRED COMPARISON: WHY TOOLS AND TECHNIQUES FIT WITHIN THE VALUE METHODOLOGY.

Dr Roy Woodhead

The explanation of techniques such as Paired Comparison often reveals a view of procedures and rules described in a quasi algorithmic fashion as a series of steps; first do A, then do B, et voila! This 'how to' approach seeks to 'train' people rather than 'how and why' approaches that educate them. Such a limited 'competence' focus often traps newcomers into the performance of an algorithm without fully understanding 'why it has relevance'. For newcomers to our disciplines, the need to gain qualifications such as AVS and CVS in the hope of greater job security and career advancement can place

them in a master-servant relationship with those, possibly without realising it, that promote narrow and unconnected views of practice designed around episodic consulting engagements. For example, some experienced practitioners ask "Which attribute is most important?" in the use of Paired Comparison and inadvertently direct the study-team's attention away from a sense of the customer's values-importance (i.e. what's important to customers-purchasers, the product is intended to wow) and erroneously promote an internal view of values-importance based on considerations not necessarily relevant to the focus of the Value Study (i.e. what's important to manufacturers-providers trying to ensure the efficient deployment of resources).

This paper uses the case of Paired Comparison to articulate the links between 'tools and techniques', the process they are used within (e.g. VE), the guiding framework provided by the Value Methodology and the philosophical theory which gives credence to a synthetic view of reality that functions.

It will also suggest an alternative approach to the 'training' agenda be brought into our society through the concept of 'Reflective Practice' and mentoring. This supplementary approach to learning will enable a different relationship between learners, both newcomers and established VE, VA and VM masters, all at different stages of the same educative and formative journey. It is an approach to learning in which dialogue forms the means to better understanding of tools and techniques in relation to the transformation of functioning (i.e. innovation) so as to liberate more value.

CREATIVE VE ACTIVITY USING VALUE CURVE

Byung-mo Yang

ABSTRACT

In VE activity, one of the major goals is cost reduction in developing products or services. To achieve more innovative and effective cost reduction, Samsung Electronics uses the Value Curve. The Value Curve, introduced by W. Chan Kim and Renée Mauborgne, visually shows how a company invests in the factors of competition and how a company might invest in them in the future and can be used to represent the range of value propositions. Using the Value Curve, we can develop new products and perform VE activity more efficiently, in addition to matching customer's needs. This paper will introduce the use of the Value Curve and a case study of using the Value Curve to decide which functions should be eliminated or created, and raised or reduced in the FAST Diagram.

A NEW EVALUATION METHOD OF VALUE FOR PUBLIC WORKS

Hisaya Yokota, VES, PE

ABSTRACT

Japanese public works design has shifted from "Standardized Mass-Production" to "Distinctive Custom Made" and is now increasing value using VE. However, public works cannot apply the same VE methods as for the other manufacturing and service industries since public works have unique features resulting from their design as a custom made product. This article introduces a new value method for public works

organizing the four primary factors - function, cost, time, and process. This also proposes formulas to determine value in public works design.