

INTRODUCTION TO VALUE METHODOLOGY

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OBJECTIVES

- The objective of this presentation is to provide basic VM education to the degree that individuals will understand the process and be able to successfully participate in future value studies.
- This is not expected to make “*experts*” of attendees but rather to provide the foundation for growth and development in the Value Management field.
- Over the years the standards for this education have been developed and modified to keep abreast of the technology growth in VM and the needs of users, both in industry and government.

VALUE METHODOLOGY DEFINITION

- The value methodology (VM) is the systematic application of recognized tools and techniques by a multidisciplinary team to identify and categorize the functions of a project with the objective to create, select, and develop alternative approaches that will deliver cost-effective and performance enhanced project functions.
- It is applied in a logical process known as “The Value Methodology Job Plan”. The purpose of the job plan is to guide the VM study team to identify and focus on key project functions in a systematic manner, in order to create new ideas that will result in value improvements.

INTRODUCTION TO THE VALUE METHODOLOGY

- The value methodology guides a team through a structured job plan. The standard VM Job Plan initially leads a team to a point where they understand the fundamentals of the project, and its functions. The team then develops alternative concepts for accomplishing those purposes and functions. These alternatives when implemented will improve the project.
- VM may be applied as a “quick response” type of study or as a deeply integrated part of an overall organizational desire to stimulate innovation and improve quality. Similarly, VM may be an integral part of the quality assurance, quality control programs, new product development, manufacturing processes, concept development and construction. VM changes the team’s thinking of the project so that the best use of the knowledge and experience they possess can generate new ideas to perform project functions and propose alternatives to the original situation.
- The foundation of VM is based on a concept known as *function analysis*. The identification and naming of project functions develops a clear thinking by limiting the description of a function to an *active verb* that operates on a *measurable noun* to communicate what an item or activity does. This naming exercise helps multi-disciplined teams to build a shared understanding of how a system is thought to work; and, as a result, it allows them to identify where conflicts and improvement opportunities may exist and where an investment in innovation would lead to significant improvement.

INTRODUCTION TO VALUE MANAGEMENT

- Function analysis can be enhanced by using a graphical mapping technique is known as the *Function Analysis System Technique* (FAST), which is used during the VM study to allow team members (and/or individuals) understand how the functions of a project, product, or process are related to each other. FAST, developed by Charles Bytheway in 1964, added a new enhancement to the function analysis phase.
- This analysis identifies functions that could provide poor or less-than-optimum value. This is because the existing method used to perform them is costly and could be improved. These are candidate functions for applying creativity techniques for new ideas that will yield better ways to perform the same function. Promising solutions are determined during evaluation and developed into alternatives for implementation. The VM study team leader facilitates the use of team skills and the expertise from many disciplines through an efficient and effective group decision-making process. A VM study provides a common understanding that yields practical solutions for users, stakeholders, sales, marketing, design, manufacturing, operations, and distribution organizations

INTRODUCTION TO VALUE METHODOLOGY

- A fundamental basic of the value methodology is that basic functions (the necessary purpose of a project) must be preserved. That is because the basic function reveals the usefulness of the project and the reason for its existence.
- VM can be applied during any stage of a project's development cycle, although the greatest benefit and resource savings are typically achieved early in the development during conceptual stages. This is a point in time where the basic information of the intended project is established, but before major design and development resources are spent. That is because the manner in which the basic function of the project is performed has not been established, and alternative ways may be objectively identified and considered.
- VM may be applied more than once during the life of the project. Early application of VM helps to get the project started in the right direction, and repeated applications help to refine the project's direction based on new or changing information. It is important to note that the later that a VM study is conducted, the higher the cost of change will be to implement the improvements.

VM HISTORY

- The value analysis concept was conceived by Mr. Lawrence D. Miles during the early 1940s. He worked for General Electric, a major defense contractor, which faced the scarcity of strategic materials needed to produce their products during World War II. Miles realized that if value and related innovation improvements could be systematically “managed,” then General Electric would have a competitive advantage in the marketplace. With that ambition in mind, Miles took the challenge and devised the function analysis concept, and integrated it into an innovative process that became known as value analysis (VA).
- Other companies and the U.S. Army and Navy soon realized the success of Miles’s methods. As the application of VA expanded, there was also a change in context—from review of existing parts to improving conceptual designs. This was one of two factors that marked the emergence of value engineering. The other was a desire by the U.S. Navy to use “Value Analysis” techniques for project improvement. However, no analyst positions were available in the early 1950’s. Instead engineering positions were available; so individuals practicing this new discipline were employed as “Value Engineers.”

WHY USE IT?

Functions Achieved

- **Results Oriented**
 - Enhanced operation
 - 5-15% cost savings
 - Lower life cycle costs
- **Benefit to cost 20:1**

WHO USES IT?

- Construction
- Manufacturing/Industry
- Transportation
- Environmental
- Military
- Administrations
- Banking
- Government
- Health Care
- School Systems



WHEN TO USE IT?

- Optimal Time
 - Design Concept Report (DCR) or Pre-Design
 - Preliminary Design
 - 15-30% Design Phase
- Other Times
 - Follow-up Review at 45-60%
 - Constructability Review



WHAT MAKES VE DIFFERENT?

- Function Based Approach
- Team Approach
- Results Oriented
- Focuses on Adding Value (not just cutting costs)



HOW TO APPLY VALUE METHODOLOGY TO A VALUE STUDY

- Pre-Study
- Value Study
- Six-Step Job Plan
- Post-Study



PRE-STUDY MEETING

- **Define Scope of the Study**
- **Identify Stakeholders & Decision Makers**
- **Identify Team Size & Team Members**
- **Identify Resource Advisors**
- **Determine Project Goals-Project Purpose and Need**
- **Set Workshop Goals**
- **Define Success for Project and Workshop**
- **Discuss Barriers to Success/Project Issues**
- **Define Preliminary Functions**
- **Set Performance Criteria**
- **Set Workshop Schedule and Location**

PRE-STUDY TYPICAL OUTCOME

- Clear understanding of what senior management needs to have addressed
- What the strategic priorities are
- How improvement will increase organizational value
- Determine whether the subsequent phases are likely to yield sufficient value to justify cost of the study
- May be appropriate to increase or decrease study parameters at this time

SELECTING THE VA TEAM

- Determine Team Size-usually 5 to 8 People
- Related Skills and Experience
- Diverse backgrounds
- Multi-Disciplined
- Technically Competent
- Well Organized
- Positive Attitudes
- Willingness to Investigate New Ideas
- Able to Rationally Evaluate Ideas
- Workshop Experience



PLANNING A WORKSHOP

VALUE STUDY TEAM ORIENTATION

- Location of the Study
- Schedule
- Distribution of Data Materials
- Expectations
- Overview of the Process



TEAMWORK

- Integral part of the Value Analysis Process
- An empowered team is one that sees itself as one unit that is clear about where it is going and that shares the central qualities of work

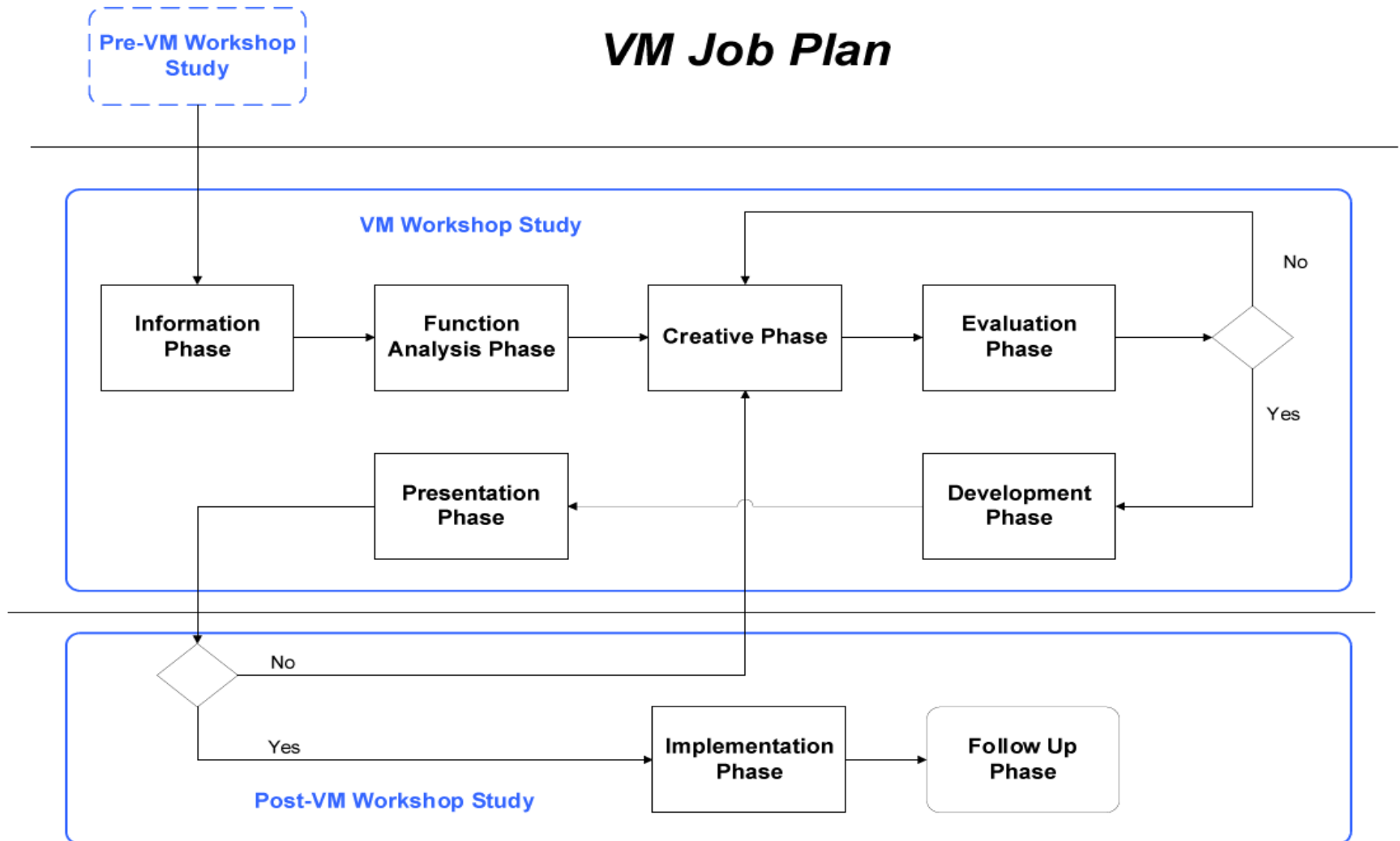


EFFECTIVE TEAMS

- Commitment to achieve common goals
- Emphasize importance of individual input
- Good communication skills both sending and listening
- Challenge team members to excel and participate
- Collaborative efforts (synergism)
- Low levels of conflict
- Respectful & supportive relationships
- Open and non-threatening atmosphere



SIX-STEP JOB PLAN



INFORMATION

Preparation is the key to the success of any study. A basic level of understanding is provided by gathering and reviewing the appropriate information before starting a project.

Depending upon the type of study, the information required will vary. However, in all studies customer needs and requirements must be understood, specific goals defined, and current costs gathered and organized. And, without question, the team members should understand and agree upon the scope of the study.

INFORMATION PHASE

- Project team presents the original and/or present design concepts of the project
- Identify project issues and constraints
- Conduct interview to ask questions and confirm opinions
- Understand project:
 - Scope
 - Schedule
 - Budget/Costs
 - Risks
 - Issues
- Identify high level project functions
- Visit site or facility if feasible
- Confirm evaluation parameters



OUTCOME OF INFORMATION PHASE

- Brings all team members to a common, basic understanding of the project. That includes tactical, operational, and specifics of the project. This functional understanding establishes identify and benchmark alternatives and mismatches, and set the agenda for innovation and brainstorming.



COST MODELS

- “A diagramming technique used to illustrate the total cost of families of systems or parts within a total complex system or structure.”
- During the information phase it is important to understand component costs. One of the main objectives of most VE Studies is cost avoidance or reduction of costs.
- A variety of cost models can be used but among the most frequently used are:
 - Pareto Charts
 - Energy Models
 - Life Cycle Cost Models

PURPOSE OF COST MODELS

- **Determine Total Cost**

- First determine the appropriate level of cost for the project. The total cost of a construction project includes not only material and labor for construction, but overhead, profit, contingency, and escalation costs as well

- **Determine Cost Elements**

- To better understand the total cost of a project, organize cost into a cost model. The cost model breaks down the major cost elements into major groupings (such as site and buildings) and numerous minor groupings (including cost categories such as structural, mechanical, architectural, electrical, equipment, as well as overhead, contingencies, and profit).

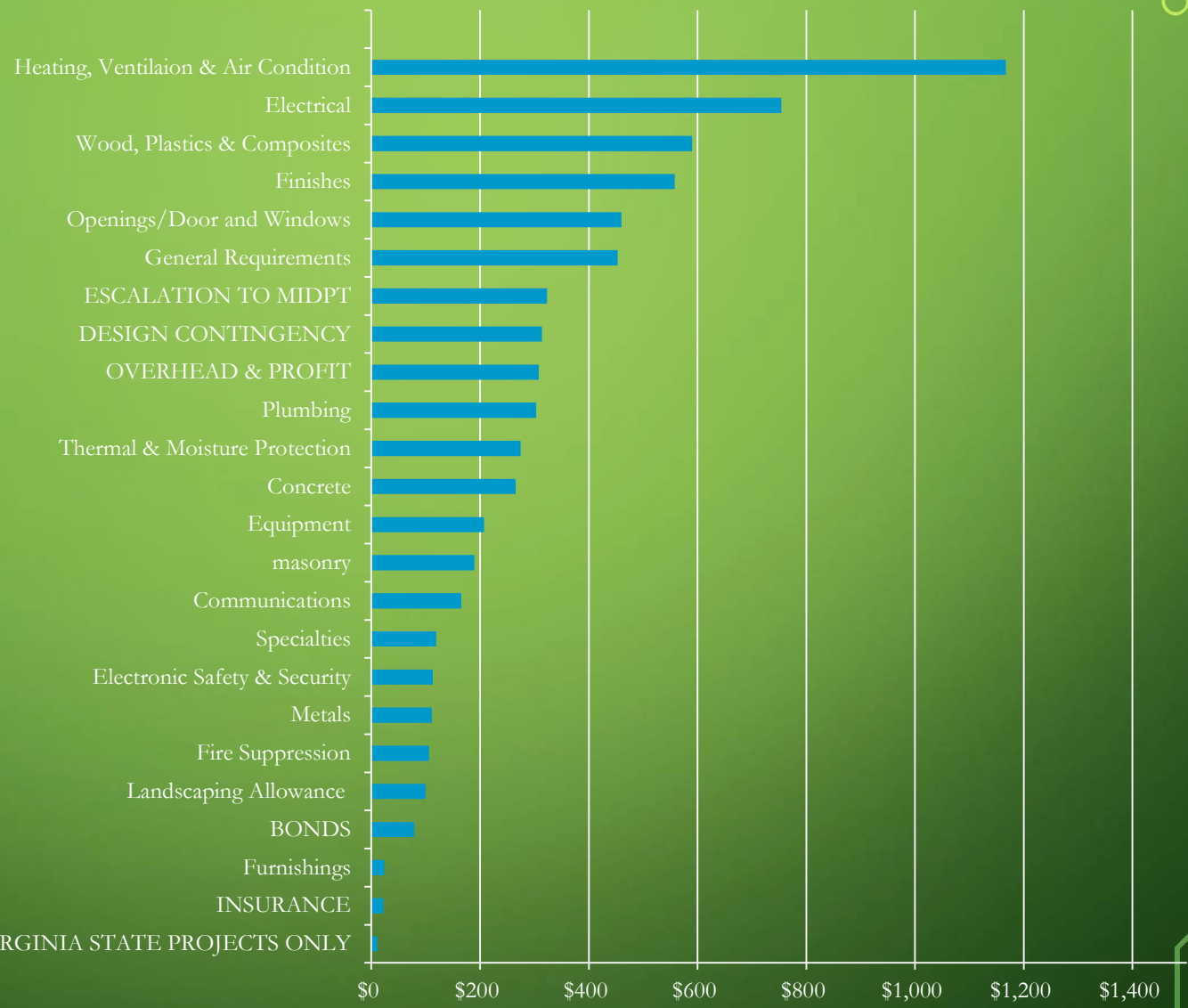
PURPOSE OF COST MODELS

- Determine Cost Within the Scope of the Project
 - Once the cost has been structured into a cost model, it is relatively easy to determine how much of the total cost of the project the team can affect. Typically, overheads, contingencies, escalation factors, etc. will be relatively unaffected by the team. These costs are represented as a percentage of the direct project cost and can be indirectly affected by the study. The point of identifying the cost within the scope of the project is to **focus** the team's attention on the direct material and costs where identifiable changes are possible.

PARETO'S LAW

- “The majority of the costs, about 80%, of the system or project will be found in 20% of it's components.”
- Often called the 80/20 Rule

GROSS RECEIPTS TAX ON VIRGINIA STATE PROJECTS ONLY



Thousands

FUNCTION ANALYSIS PHASE

- Function analysis techniques are used in defining, analyzing, and understanding the functions of a project.
- It is important to see how functions relate to one another and which functions require attention if the value of a project is to be improved.



Function Analysis Steps

- Define function
- Identify the functions
- Classify the functions by type
- Model Functions
- Determine Function Costs
- Determine Function Worth
- Select Functions for Study



WHAT IS A FUNCTION?

□ A function is the original intent or purpose that a product or service is expected to perform, expressed in two words – an **active verb** and a **measurable noun**.

□ An **active verb** indicates what the item does

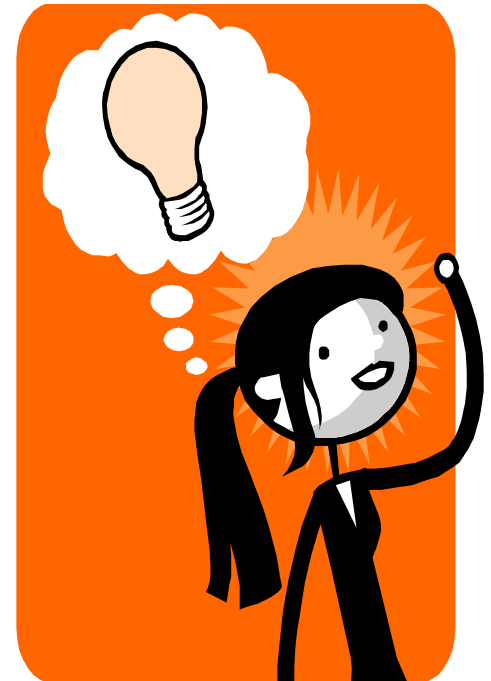
□ A **measurable noun** indicates what the item does to it

□ Functions identify **what** is to be accomplished by a project or service - **not how** it is to be accomplished.

□ Functions defined in broad terms increases **creative** alternatives.

CLASSIFYING FUNCTIONS

- **Higher Order Function**
 - Defines the problem goal
 - Outside the scope of the study
- **Basic Function**
 - Defines a performance feature that must be obtained
 - Satisfies only user's need not desires
 - Answers "What must it do?"
- **Secondary Function**
 - Defines performance features other than those that must be accomplished
 - Are these the user's desires rather than needs – "What else can it do?"



CLASSIFYING SECONDARY FUNCTIONS

- **Required Secondary Functions**
 - Necessary to allow basic function to work or perform better
- **Aesthetic Secondary Functions**
 - Improves the appearance of the produce and make it more desirable to the customer