

From the pages of Purchasing Magazine Online

Value Analysis makes a comeback

By Jim Morgan -- 11/20/2003

Don't look now, but an old discipline (**value analysis/value engineering**) is on the comeback trail. Spurred on by a growing number of corporate cost reduction programs, many purchasing departments are responding by reaching back to a discipline that went into decline in the mid 1990s. Caught in a demand by executive management to cut costs radically, many procurement executives and supply management chiefs are responding with VA/VE programs.

Originally called merely VA by its inventor, Larry Miles, an engineer in GE's purchasing operation, VA/VE uses a value equation that says value is equal to function divided by cost. If, for example, the buyer wants to get more item value, he/she needs to either increase the item's functionality at the same time he/she is containing cost; or he/she needs to reduce cost while holding or improving its functionality. Either way, the result is more value for the customer.

As noted by Ron Nussle, managing director of global materials and supply chain at Lam Research Corp., value analysis is the study of function. VA looks at the relationships of design, function, method of manufacture, use of materials and sources of supply. As it first evolved, VA was thought of as a tool for measuring the value performance of an item before it goes into initial production and after it has been manufactured for a period of time. Typically VA evaluation techniques were brought into play to detect whether:

- Unnecessary features had crept into the design during the manufacturing stage.
- A possible improvement had been left out of the design, or a less satisfactory one put in due to the lack of the right idea at the right time.
- Temporary conditions of supply or tooling had forced the company to use a less desirable material or less efficient method of processing.
- A design or production decision was the wrong one for the product.

In any case, coming up to the 21st Century many VA programs were washed into design departments or simply allowed to fall into disuse. The idea of using VA as a strategic tool in winning global competitive races was held in low esteem.

VA starts with lots of questions

To value analyze a specific item or service it's first necessary to identify the item's purpose by asking such questions as:

- What is its function?
- How can the function be performed?
- What is the best way to do the job?

The primary function of an item can usually be defined in one or two words. For example, the primary function of a tie clip is to "hold tie." A vacuum cleaner is designed to "remove dirt" or "clean material." Often, secondary functions also are involved. In the case of the tie clip the use function (holding the tie) must be considered in conjunction with other considerations. Appearance, for example, is important to the acceptance and salability of the clip.

A more complex product like a vacuum cleaner has a number of secondary functions. It has to be able to store dirt. It also should be portable, easy to operate, shock resistant, and attractive.

The product as a whole has a prime function, but each component part can be described in terms of its specific task. One portion of the vacuum housing is made to hold the dust bag. Another section acts as a support for the motor. The motor drives a shaft. The cord transmits electricity. When you identify the function of each part, you almost automatically can suggest other ways of performing the same task.

How to get there?

Once function is defined, the next step is to determine how it can be performed. Since all value is relative, this step is best done by comparison. What else will do the job? How can the function be performed at the lowest overall cost consistent with the reliability required?

Value Analysis makes a comeback

With the tie clip, there are a number of ways to perform the function. A paper clip or a safety pin will do the job. Or a spring assembly. Different qualities of materials can be examined.

Comparison of different materials and methods of manufacture is what makes value analysis more than just getting lower unit costs. Value analysis requires determining how a function can be performed satisfactorily and economically.

Standard questions in most VA studies go like this: What other material will do the job? Can we use a standard part? Can assembly be simplified? Is the part necessary? Can we combine parts? Can we outsource these steps in manufacture? Can delivery and storage of parts be made more efficient?

Evaluation

The evaluation step is sometimes referred to as the blast, create, refine method. The sequence goes like this:

- Gather all available information.
- Analyze the problem from all possible angles.
- Evaluate all suggestions.
- Plan the program.
- Carry it out.
- Record the results.

At this stage no idea is too far out, no suggestion is rejected.

In the second, or creative stage, suggestions are reviewed to see if there are alternate means of accomplishing the function. This produces a number of alternatives for action.

Finally, alternate approaches are refined and evaluated. The end result is the best combination of material, method, and cost to achieve the desired result. From the start, to help identify the problem, the analyst asks these five basic questions:

- What is it?
- What does it do?
- What does it cost?
- What else will do the job?
- What does the alternative cost?

A detailed look at how VA/VE can be combined with other cost reduction tools to form an integrated cost reduction strategy is scheduled for publication in book form in early 2004. Keep an eye on purchasing.com for details on its release.

Places to look for value

Where should a purchasing professional start looking for value? For many, the best starting place is a review of the basics. In fact, the following checklist offers a good summary of candidates for applying the principles of value analysis to searching out value:

Metals

- Are we keeping a close watch on metals prices and availability and considering substituting lower cost or more available materials?
- Does hedging offer new opportunities for assuring long-term price stability?
- Are we checking new and improved materials as substitutes for those currently in use? Are there manufacturing advantages that make a switch worthwhile?
- Are special requirements being investigated to determine if standard materials will be acceptable?
- Do we make sure close tolerances on metal parts are not tighter than they need to be?
- Do we analyze all materials purchases for "extras" that aren't needed or can be replaced with less costly ones?
- Can a supplier perform fabrication or assembly processes more economically than our own shop?

Value Analysis makes a comeback

- Where rejection rates are high on certain parts is there a possibility of substituting more suitable metals or materials?
- Is there a possibility of reducing scrap by buying materials and parts closer to finished sizes?
- Can we standardize metals buys to take advantage of volume discounts?
- Will our current metals supplier stock materials until needed under a blanket ordering or other stockless ordering plan?
- Is metal scrap segregated in a way that assures a better price?

Chemicals and plastics

- Are lower prices available through long-term contracts or offshore sourcing?
- Are we ordering chemicals in economic lots?
- Is bulk shipment of chemicals possible? Can we buy in tank car lots instead of drums?
- Could outsourcing of any manufacturing step save money and/or improve quality?
- Could consolidating distributor purchases lower total costs?
- Could reusable or recyclable packaging eliminate disposal costs?
- Will buying locally reduce freight costs?
- Are we paying extra for colors (of resin) that aren't needed?
- How many grades of the same chemical or resin do we need?
- Will a more expensive material reduce our handling costs?
- Are we paying for extras we don't need? What is the end use? Is the chemical purity spec tighter than needed?
- Can we eliminate scrap problems with our plastics if we change specifications? If not, can we re-sell the scrap? Can we save by buying another company's scrap?
- How much reserve inventory do we carry? What is the cost of storage? Can we get the vendor to stock bulk materials and deliver as needed?
- Are storage and handling procedures adequate for handling hazardous chemicals? Would ordering smaller quantities at more frequent intervals reduce fire hazard and lower insurance costs?
- Would buying plastics in a semi- finished state reduce the overall cost?

Component parts

- If the part is nonstandard, will a standard item do the same job at a lower cost?
- If the part is now a standard component and is used in high volume, will a nonstandard item do the job at lower cost?
- Will a design change permit the item to be made in a lower cost process or with a lower cost material?
- When was the item last value analyzed? Relative costs and prices change. Every major item should be checked at least every two years.
- Is the item good value in terms of the function it performs? Can a cheaper item be made to perform the same function?
- Is our supplier using the most economic process to make the item? If not, why not?
- Are we paying too much to pack and ship the item?
- Does the part have tolerances and finishes that are not really needed?
- Has the function performed by the part changed since it was originally designed?
- Could cost be reduced by having suppliers produce prototype parts?
- Are suppliers involved in the design process early enough to add maximum value?
- Can a specialty supplier make it for less?
- If we buy a higher quality part can we save money on direct labor?
- How many different sizes do we stock? Can some of them be combined to reduce inventory and enable us to take advantage of quantity buying?

MRO supplies

- Is it possible to reduce the amount of transaction processing that goes on in the department?
- What about our use of distributors? Does supplier-managed inventory make sense for our company?
- What's in our storeroom? Are we maintaining inventories of MRO goods that could just as easily be maintained by a distributor or two?
- Do we have a system for recycling and replacing worn-out work gloves and protective clothing?
- What does our spare part inventory look like? How much safety has been built into our safety stock? Could this be managed by an outside supplier?
- How many grades of lubricants are we using? Do we need them all? Can we do some standardizing?
- Do we have a testing system for new cleaning compounds, lubricants, hand tools, etc.? Are we keeping up to date on new products?

Value Analysis makes a comeback

- Can we use purchasing cards for small value items to eliminate paperwork?
- Can a purchase card system be integrated into our use of systems contracts and single sourcing supplier agreements for MRO goods?
- Have we investigated new style lines in safety shoes and safety glasses. Would better-styled goods help in convincing employees to wear safety articles regularly?
- Would throwaway protective clothing be more economic than current protective clothing in use?
- Have we investigated the cost of using outside suppliers of cleaning and maintenance services?

Computers and business systems

- Do the PCs and notebook computers in use have the power needed for the jobs we're expecting of them these days? How do we hedge our office equipment purchases so they don't go obsolete too quickly?
- Do we have periodic reviews of computer power with assessments of what's needed in different office environments?
- What about other pieces of office equipment—fax machines, copiers, mailroom equipment? Are we running periodic surveys to make sure needs and equipment match up?
- Should we consider leasing our computers and other major pieces of office equipment. Have we made cost comparisons recently?
- Have we set up acquisition standards for our computer networks and desktop technology?
- Would a stocking agreement with one of the major office supply houses make economic and efficiency sense for our company?
- Are we getting the best long-distance telephone rates for our business needs?
- Do we have a materials evaluation checklist comparing advantages of wood vs. metal vs. plastic for furniture, tile vs. wood vs. carpeting for floors, synthetic vs. natural fibers for upholstery and drapes?
- How often is a light meter used to check lighting levels at all office work stations and are findings compared against recommended standards?
- Are product guarantees and equipment maintenance contracts followed up and kept current?
- Can we combine or eliminate forms? Are we using the most effective approach to having the forms needed for the job?

Electronic components

- What mechanical components in our company's products could be replaced by electronic components? Do we make periodic checks to see if such substitutions make economic sense?
- What single function components in our company's products could possibly be replaced by multifunctional components? Has a cost comparison been done recently?
- Can digital signal processors be used to eliminate mechanical parts in appliances that use motors^{3/4}to make the end product cheaper, quieter, more efficient?
- Can greater use of electronic commerce help us take more of the cost out of acquisition of electronic components?
- Do we periodically investigate manufacturing sites to insure that quality standards are actually met on such components—thus eliminating costly rework problems later in the manufacturing cycle?
- Have we investigated the possibilities of using more product modification services from our distributors—such as cable and harness assembly, board assembly, and programming?
- What about kitting? Can use of kitting services eliminate labor on low volume product runs?
- Have we looked into distributor programs that take full or partial responsibility for inventory replenishment? Can they help reduce our inventory and sequencing problems?
- Are there manufacturing jobs in our operation that could be done by a contract manufacturer?

Transportation services

- Do carrier representatives periodically inspect shipping and receiving room facilities and offer recommendations on possible improvements?
- Do we have specific incoming or outgoing logistics problems that could be more effectively handled by third party logistics companies?
- Are we sure that buyers understand the meaning of the various FOB terms? Where the customer takes control of cargo is important because it determines how much control the customer has over the way shipments are handled.
- Are our freight bills audited periodically and do we periodically review the audits to detect structural problems within our logistics operation?
- How do we measure performance of our carriers and do our measurements also show where our operation is to blame?

Value Analysis makes a comeback

Diagrams:

- Have we prepared a transportation fact file on each of our major suppliers and does it include all of the significant information needed to move the goods being shipped? Is our file computerized and can it be brought into the transaction automatically?
- Is our transportation base sufficiently broad to handle our needs and is it sufficiently compact that we can control it?
- Do we use information technology efficiently when dealing with our key transportation providers? If they and we have advanced information systems, are carrier employees trained sufficiently to use all information optimally? What about our own staff?
- Are there redundant or inefficient shipping and receiving procedures in the plant that can be cleaned up?
- Can we increase transportation-based asset utilization? Can we eliminate assets that aren't essential to the company's core function?

Packaging

- Is the packaging we're using for our main products the best suited for the job? When did we last review our packaging needs?
- Are there new materials that have come on the market that would be more appropriate for our product(s)?
- Can lighter weight packaging materials be used to save transportation costs?
- Are there recycling considerations that need to be included in our plans for future packaging needs?
- Is package size an important factor in selling our product(s)? Have we done any research recently on the market effectiveness of the packaging of our products?
- Would it be appropriate to use a laboratory testing service to simulate all the shocks, bumps, vibrations, and compression loads our product will undergo while in the package?
- Have we fully explored all the carton-sealing options available for our packaging?

10 key questions

When Larry Miles, father of Value Analysis began practicing the discipline after World War II he laid down these 10 principles for purchasing people to use in evaluating a product. They're still in use today in many companies across the U.S.

1. Does its use contribute to value?
2. Is its cost proportionate to its usefulness?
3. Does it need all its features?
4. Is there anything better for the intended use?
5. Can a usable part be made by a lower-cost method?
6. Can a standard product be found that will be usable?
7. Is it made on proper tooling—considering quantities made?
8. Do materials, reasonable labor, overhead, and profit total its cost?
9. Will another dependable supplier provide it for less?
10. Is anyone buying it for less?